



United States
Department of
Agriculture

Granite Area Mining Projects

Draft Environmental Impact Statement

Forest Service
Pacific Northwest
Region



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Umatilla National Forest

North Fork John Day Ranger District



Abstract:

The Forest Service proposes to approve Plans of Operation on 16 mining claims located within the Granite Creek Watershed on the North Fork John Day Ranger District, Umatilla National Forest. Recently the Columbia River bull trout and Mid Columbia steelhead trout were listed as threatened under the Endangered Species Act. Both these species are found in the watershed. In addition, a number of streams in the watershed are on the State of Oregon “303(d) list”. Two action alternatives were developed to assess the issues raised through scoping. Key issues centered on water quality, aquatic habitat and the listed fish species. After reviewing the effect of the proposed action and alternatives, the Responsible Official has selected Alternative 3 as the Preferred Alternative.

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USDA Forest Service
Pacific Northwest Region



Umatilla National Forest
North Fork John Day Ranger District

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SUMMARY

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LOCATION AND OVERVIEW OF THE AREA

The analysis area is located on the North Fork John Day Ranger District, Umatilla National Forest. The decision area includes approximately 320 acres of claimed lands within Grant County, Oregon. It is within the Boundary of the Granite Creek Watershed. The legal description of the decision area is as follows: T8-10S, 35, 35-1/2E, W.M. surveyed. Some proposed activities are within the boundary of the North Fork John Day Wilderness Area.



Gold was discovered near the town of Granite, July 4, 1864, and a small gold rush shortly followed. Initially gold production in this area was placer gold mined from the gravel and bars of streams. During the late 1860 and 1870's, mining districts were established as placer miners scattered about the territory. Since there were not yet any counties established, the districts were a means of keeping track of where specific claims were located. Vein deposits were discovered soon after the advent of placer mining. Quartz mines were worked as early as the 1870's in the Granite area. In the late 1880's, lode mining began to develop rapidly with the advent of equipment such as the "pneumatic" drill, the stamp mill for crushing ore, and new chemical methods to extract gold from it's alloys. In 1938, the Porter Brothers dredge was built near Granite. During the next several years, portions of Granite, Bull Run, Clear and Olive creeks were dredged. Numerous rock piles, the result of the dredging operations, are still visible along these streams.

Currently, some exploration is taking place but no major production is occurring. Most of the existing mining activity consists of small-scale placer operations.

PURPOSE AND NEED

On July 10, 1998, Columbia River bull trout (*Salvelinus confluentus*) were listed as threatened under the Endangered Species Act (ESA). On May 24, 1999 Mid Columbia steelhead trout (*Oncorhynchus mykiss*) were listed as threatened under the ESA. Both of these species are found in streams located within the Granite Creek watershed.

Under the Surface Use Regulations (36 CFR 228.4), a Notice of Intent is to be filed for any mining operation, which might cause disturbance of surface resources. If through an analysis of the Notice of Intent, the District Ranger determines that the proposed operation will cause a significant disturbance, or if the operator initially plans a significant surface disturbance, the regulations require that a Plan Of Operation be filed. Operations, which cause a significant surface disturbance, may require a reclamation performance bond. At any time during operations under an approved plan of operations, the authorized officer may ask the

operator to furnish a proposed modification of the plan detailing the means of minimizing unforeseen significant disturbance of surface resources.

The District Ranger on the North Fork John Day Ranger District has determined that many of the existing mining claims located within the Granite Creek watershed will likely cause significant disturbance of resources. This finding is based on the direct and indirect effects the mining operations could have on threatened bull trout and steelhead trout.

Claims in the area fall into one of two categories. On some claims, there is an existing Plan of Operation that was approved before the listing of bull trout and steelhead trout as threatened. Since conditions have changed since the Plans were approved, there is a need to approve modifications to these plans, as specified in 36 CFR 228.4(e), which include the changes that will be made to mitigate the effects on the two newly listed species.

Other Claims located within the watershed and determined to likely cause significant disturbance, do not have an approved Plan of Operation. There is a need to approve Plans of Operation, as specified in 36 CFR 228.4(a), submitted by the operators for these claims.

PROPOSED ACTION

The proposed action is to approve 16 plans of operation for mining claims located within the Granite watershed on the Umatilla National Forest. The proposed action is a compilation of plans submitted by claimants operating within this area. A plan of operation includes “Information sufficient to describe or identify the type of operations proposed and how they would be conducted, the type and standard of existing and proposed roads or access routes, the means of transportation used or to be used as set forth in 36 CFR 228.12, the period during which the proposed activity will take place, and measures to be taken to meet the requirements for environmental protection in 36 CFR 228.8”. Generally, plans of operation are reviewed and updated every 5 years or sooner if unforeseen circumstances arise and a change in the operation is necessary. In preparation for this analysis, claimants were contacted and asked to update their plans of operation. In some cases, revised plans were submitted and two claimants who recently purchased existing claims submitted new plans. However, in most cases claimants said they did not wish to change their existing plan and the plan currently on file with the Forest Service should be included in the proposed action. Several of the miners contacted indicated that they were only going to do assessment work in the foreseeable future and it was determined that a Plan of Operation was not necessary. On claims where no valid plan of operation was on file, and the claimant did not submit one for this analysis, it was assumed that assessment work was the only activity planned during the next 5 years.

KEY ISSUES

Water Quality

Past management practices have altered water quality throughout the Granite Creek Watershed. Mining has reduced the potential of the riparian areas. Shade has been removed along some streams, resulting in increased summer water temperatures. Historic mining is the overriding influence on morphology of the streams. Placer, hydraulic, and dredge mining

affected many channels in this watershed and few have been able to repair their morphology. Past timber harvest and road building has also negatively affected water quality in the watershed. Stream flow, water quality and the timing of flows have been affected by changes in vegetative cover. Road density is high in many of the sub-watersheds, and roads located within riparian areas are common.

Most of the respondents to scoping expressed concern about the effects continued mining would have on the water quality in the Granite Creek watershed. They point out that continued mining, in combination with other activities within the watershed, further degrade water quality. It was pointed out that Granite Creek and Clear Creek are on Oregon's 303(d) list of impaired waters, and their tributaries. It was suggested that any activities permitted in the area must be designed to improve water quality.

Others believe that the mining being proposed will have no effect on water quality. They state that existing State regulations, as well as Forest Service mandated mitigation are sufficient to protect water quality.

Fish and Aquatic Habitat

Granite Creek and its tributaries support runs of spring Chinook salmon and summer steelhead. Granite Creek is a major tributary to the North Fork John Day River. The John Day River is the last major stream in the Northwest to have free runs of Chinook and Steelhead, due to the lack of dams on the River itself. Historically, bull trout, redband trout and the anadromous fish species occupied the entire watershed. Stream surveys for streams in the watershed indicate there is some good habitat, but other areas have poor to fair habitat. Stream cover, streambank stability, pool habitat, and stream temperatures are limiting spawning and rearing habitat for anadromous fish species and bull trout.

The long-term trend for average number of redds per mile has been declining since 1959 for spring Chinook. Historically the North Fork John Day River and the mouths of its tributaries have been used by steelhead for spawning and rearing habitat. Presently, fish populations are at a low level. Historically bull trout inhabited most of the North Fork John Day River drainage and its tributaries. Presently only small populations exist in isolated sections of the drainage. Bull trout are at moderate to high risk throughout this drainage and are at high risk in the upper North fork.

There is little question that an overall decline in the fisheries resource within the Granite Creek watershed has occurred. However there is disagreement over what factors are responsible for this decline. Many of the miners believe that the decline has more to do with ocean harvest, dams and Columbia River gill nets than mining operations. They point out that mining has occurred in the drainage for over 100 years, yet fish populations only started to decline within the last 20 years.

Others believe that mining, together with the cumulative effects of other activities managed by the Umatilla National Forest has caused significant watershed and fish habitat damage within the project area and downstream.

ALTERNATIVES

The Interdisciplinary Team considered various approaches to meeting the legal requirements for a No Action Alternative. The 40 CFR regulations, which were developed to implement the National Environmental Policy Act, require that a No Action Alternative be analyzed to establish a baseline for the effects of alternatives. No mining was considered for the No Action Alternative, but the Team determined that no mining was an action, since it would represent a change from the current situation.

Alternative 1 – No Action

The No Action Alternative is defined as no change from the current situation. The Plans of Operation for the 16 claims included in the analysis would not change. This alternative maintains the current situation; it allows currently approved Plans of Operation to continue. No revised modifications to existing plans or proposed new plans would be implemented. This alternative cannot be implemented, since Forest Service Regulations in 36 CFR 228, subpart A, does not provide for denying a reasonable Plan of Operation.

Alternative 2 – Proposed Action

Alternative 2 is the Plans of Operation as submitted by the claimants. In some cases revised plans were submitted, but in most cases the proposed action includes the plan currently on file with the Forest Service. In addition to the Plan submitted by the claimant, applicable Management Requirements as well reclamation plan and where necessary a reclamation bond were added to the Plan. The same requirements are incorporated in Alternative 3.

Alternative 3

The intent of alternative 3 is to minimize adverse environmental impacts on National Forest surface resources [36 CFR 228.8]. In addition to the management requirements identified for Alternative 2 and 3, mitigation will be added to individual Plans of Operation to address specific resource concerns related to those operations. In addition to this mitigation, the following other actions are incorporated into Alternative 3:

1. Forest Service Road 1035-012 will be gated and motorized access will only be available to the miners with claims along this 1.23 long mile road. Although designated as a closed road on the District Access and Travel Management Plan, the road currently remains open.
2. A focused Roads Analysis was completed for the area in and adjacent to the 16 mining claims in this analysis. The need for each existing road in the area was reviewed and as a result of that analysis the obliteration/decommissioning of 3 roads totaling 2.25 miles will be included in Alternative 3.

EFFECTS OF ALTERNATIVES BY KEY ISSUE

Key Issue 1: Water Quality

Mining operations can have a negative effect of water quality. Roads, placer mining, and vegetation removal in riparian Habitat Conservation Areas (RHCA) may reduce stream shade, resulting in higher water temperatures, while erosion of exposed and disturbed upland soils and stream bank can increase sediment load. Drainage from lode mines and tailings dumps can introduce metals potentially toxic to aquatic biota into stream waters. The nature of the proposed action (mining) and the physical location of many of the mines in or adjacent to local creeks will in some cases introduce sediment into creeks. Suction dredging can adversely impact aquatic resources by destabilizing channels, at least locally, and by mobilizing sediments. Other impacts can include noise, competition for use of riparian areas, and chemical pollution by petroleum hydrocarbon fuels, lubricants, and remobilizing chemical contaminants (such as mercury) sequestered in bed sediments.

All action alternatives include a similar level of mining activities, so effects to water quality will not differ greatly between each alternative. In Alternative 1, six claimants propose to use suction dredging as well as various other mining activities. In Alternative 2 and 3, an additional two placer claims will have suction dredges operating in streams. However a comprehensive set of management requirements will be added to each POO under Alternative 2 and 3. In addition, Alternative 3 will include additional mitigations as well as other restoration activities. Overall, the least effects to water quality will occur under Alternative 3.

Key Issue 2: Fish and Aquatic Habitat

Adverse impacts to fish habitat can be directly related to mining operations, including negative effects on water quality (see Key Issue 1: Water Quality). Mining operations have the potential for affecting several sensitive and threatened fish species occurring in the watershed including steelhead trout, bull trout, westslope cutthroat trout, interior redband trout and chinook salmon.

Suction dredging can affect aquatic resources such as aquatic and riparian organisms. It can greatly alter stream channels and mobilize fine sediments. Other mining operations could diminish the quality of the fish habitat by removing streamside vegetation, which shields water from solar radiation, provides hiding cover and food sources for fish, and entraps low levels of sediment. Also, mining activities could result in increased erosion and sedimentation due to loss of soil cover and cohesion, and increase runoff and peak stream flows. Fry emergence and insects that provide food for fish could be reduced by an increase in fine sediment, further impacting fish populations. Differences in effects to the fishery resource by alternative, will be similar to those disclosed for water quality.

PREFERRED ALTERNATIVE

Alternative 3 has been selected as the preferred alternative.

CHAPTER 1: PURPOSE AND NEED

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DOCUMENT STRUCTURE

The Forest Service has prepared this Environmental Impact Statement in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Impact Statement discloses the direct, indirect and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four chapters:

Chapter 1. Purpose and Need for the Proposed Action and Issues: The chapter includes information on the history of the project proposal, the purpose and need for the Proposal, and the agency's Proposal for achieving the Purpose and Need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2. Alternatives, including the Proposed Action: This chapter provides a more detailed description of the agency's Proposed Action as well as alternative methods for achieving the stated Purpose and Need. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

Chapter 3. Affected Environment: This chapter describes the existing environmental condition of the lands affected by this action. This section is organized by resources.

Chapter 4. Environmental Consequences: This chapter describes the environmental effects of implementing the Proposed Action and its Alternatives. This chapter is organized by alternative and resource area. Cumulative effects by resource area are addressed within its resource section. Overall cumulative impacts are addressed by alternative in the latter part of the chapter.

Chapter 5. Supporting Information: This chapter provides a list of preparers and agencies consulted during the development of the environmental impact statement. It also contains a glossary of terms and a literature cited section.



INTRODUCTION

This environmental impact statement (EIS) is being prepared to disclose the site-specific direct, indirect, and cumulative environmental effects from approving proposed Plans of Operation on mining claims located in the Granite area, within the Granite Creek watershed, a tributary to the North Fork John Day River. During the past 2 years, several species of fish residing within streams located in or near the project area have been listed as threatened under the Endangered Species Act. After reviewing the new listings, the District Ranger

determined that some current mining operations could significantly affect these fish species. Therefore it is necessary for persons operating on mining claims in the project area to submit new or modified Plans of Operations to the Forest Service. Under the regulations at 36 CFR 228.4 and 228.5, and because of the potential significance of the effects, these plans must be analyzed in an Environmental Impact Statement.

LOCATION AND OVERVIEW OF THE AREA

The analysis area is located on the North Fork John Day Ranger District, Umatilla National Forest (Figure 1.1). The decision area includes approximately 320 acres of claimed lands within Grant County, Oregon. It is within the Boundary of the Granite Creek Watershed. The legal description of the decision area is as follows: T8-10S, 35, 35-1/2E, W.M. surveyed. Some proposed activities are within the boundary of the North Fork John Day Wilderness Area.

BRIEF HISTORY

Gold was discovered near the town of Granite, July 4, 1864, and a small gold rush shortly followed. Initially gold production in this area was placer gold mined from the gravel and bars of streams. During the late 1860 and 1870's, mining districts were established as placer miners scattered about the territory. Since there were not yet any counties established, the districts were a means of keeping track of where specific claims were located. Vein deposits were discovered soon after the advent of placer mining. Quartz mines were worked as early as the 1870's in the Granite area. In the late 1880's, lode mining began to develop rapidly with the advent of equipment such as the "pneumatic" drill, the stamp mill for crushing ore, and new chemical methods to extract gold from it's alloys. The major lode mines in the Granite area were the Buffalo, Monumental, La Belleview and Cougar-Independence. In 1938, the Porter Brothers dredge was built near Granite. During the next several years, portions of Granite, Bull Run, Clear and Olive creeks were dredged. Numerous rock piles, the result of the dredging operations, are still visible along these streams.

The critical point in the downfall of gold mining in the area was the onset of World War II. The U.S. Government issued Administrative Order L-208 ("War Act"), which was designed to stop mining of non-essential minerals (mostly gold and silver), and focus on strategic mineral production such as chrome, tungsten, copper and iron. Shutdowns in underground mines are a serious matter because mines must be continually maintained or they deteriorate. After the war, several mines, which had been operating before shutdown, were found in ruin. Many of the building structures had been destroyed by fire and water had filled many of the tunnels. Currently, some exploration is taking place but no major production is occurring. Most of the existing mining activity consists of small-scale placer operations.

MINING LAW ADMINISTRATION

The 1872 Mining Law, as amended, provides for the exploration and purchase of all valuable mineral deposits in lands belonging to the United States. The Federal Land Policy and Management Act of 1976 (FLPMA) requires that all mining claim locations be recorded with the Bureau of Land Management.

The Mining Law Administration program is managed by the Bureau of Land Management (BLM), as authorized by the Secretary of the Interior, and involves the recordation, maintenance (annual assessment requirements), and mineral patents. The Forest Service administers surface management on National Forest System lands. Joint administration of the mining laws on National Forest System lands is provided for in a Memorandum of Understanding (MOU) between the BLM and the Forest Service. The purpose of the MOU is to ensure coordination between the general surface resource management of the Forest Service and the administration of the mining laws by the BLM. Operations on mining claims within the surface jurisdiction of the Forest Service must comply with the surface management requirements as set forth in the Federal Regulations for the Forest Service, 36 CFR 228, Subpart A.

The Forest Service has been charged with making minerals available for the economy, while at the same time, minimizing the adverse impacts of mining activities on other resources. The Organic Administration Act of 1897 provides for the continuing right to conduct mining activities under the general mining laws, rules and regulations. It also states that miners and prospectors have access rights into National Forests for all proper and lawful purposes, including that of prospecting, locating and developing the mineral resources in the forests. Therefore mining on the National Forest System lands is a statutory right.

There are four types of mining claims: lode, placer, mill site and tunnel site, although the latter two are not often used in the area of this analysis. A lode mining claim is defined as a claim that covers a vein, ledge, tabular deposit, or other rock in place. A placer mining claim is defined as including all forms of deposits except veins of quartz or other rock in place, typically found in stream or river gravel deposits. An individual is allowed a maximum of 20 acres per placer claim while an association of eight or more persons may claim up to 160 acres. There is no statutory limit on the number of individual mining claims a person may locate. A mining claim is a property right and cannot be taken without due process. The Forest Service does not have the authority to invalidate a mining claim. However, through the MOU, the Forest Service has the authority to determine the existence of a discovery of valuable minerals.

As discussed in Forest Service Manual 2811.5 - Requirements for Valid Mining Claim, the general mining laws impose certain obligations on a claimant who wishes to take advantage of the privileges those laws provide. A claimant must:

1. Discover a valuable deposit (FSM 2815.1, item 1) of a locatable mineral in federally owned public domain land open to the operation of the mining laws. Satisfaction of other requirements of the 1872 act does not make a claim valid absent a discovery of a valuable deposit.
2. Locate a claim on the valuable deposit.
3. Identify and monument the claim in the manner required by State law.
4. File in the appropriate office of the Bureau of Land Management a copy of the official record of the notice of location or certificate of location, including a description of the location of the mining claim or mill or tunnel site sufficient to locate the claimed lands on the ground. The copy must be filed within 90 days after the date of location of the claim(s).

5. Perform annual assessment work or annual labor worth at least \$100 on, or for the benefit of, the claim.
6. File a copy of an affidavit of assessment work or notice of intent to hold in the county office where the location notice or certificate is recorded.
7. File in the appropriate office of the Bureau of Land Management a copy of the affidavit of assessment work or notice of intent to hold. The copy must be filed by December 30 of each year following the calendar year in which the claim was located.

With the fulfillment of these requirements, a claimant obtains a valid mining claim. So long as such conditions continue to exist, the claimant is entitled to possession of the claim for mining purposes. It is optional with the claimant whether to apply for patent. Patent procedures and requirements, are described in FSM 2815.

The term "valid claim" often is used in a loose and incorrect sense to indicate only that the ritualistic requirements of posting of notice, monumentation, discovery work, recording, annual assessment work, payment of taxes, etc., have been met. This overlooks the basic requirement that the claimant must discover a valuable mineral deposit. Generally, a valid claim is a claim that may be patented.

Although the statutes require the discovery of a valuable mineral deposit prior to the location of a claim, the courts and the Department of Interior have recognized a right of possession, in the absence of the discovery required by statute, if the claimant is diligently prospecting. The Forest Service recognizes this principle, and in keeping with the policy of encouraging bona fide prospecting and mining, will not discourage or unduly hamper these activities. Rather, the Forest Service should aid the legitimate activities of a prospector making bona fide efforts to obtain a discovery on a good prospect. On the other hand, the Forest Service should oppose attempts by prospectors to build permanent structures, cut timber, build or maintain roads, unless authorized by special use permit or approved operating plan.

A mining claim may lack the elements of validity and be invalid in fact, but it must be recognized as a claim until it has been finally declared invalid by the Department of the Interior or Federal courts.

A claim unsupported by a discovery of a valuable mineral deposit is invalid from the time of location, and the only rights the claimant has are those belonging to anyone to enter and prospect on National Forest lands.

However, an operator may prospect or explore (test) for minerals without having a mining claim, as every American citizen has the right to prospect and explore for minerals on lands open to mineral entry

An examination to determine the validity of a mining claim would be conducted 1) if the claimant wants to patent his claim (acquire title to it as private land); 2) to resolve a conflict between a mining claim and other land uses; or 3) if the area is withdrawn from mineral entry. If the area is withdrawn, operations on those claims examined and found to have valid existing rights may continue to operate. A certified mineral examiner, in conducting a validity examination, must either verify or refute that a discovery exists within the bounds of the claim, as alleged by a mining claimant. The cost of a validity examination varies widely; however, an average cost to the government is approximately \$30,000.

LAWS, REGULATIONS, POLICY ON MINING:

FEDERAL: The authority for exploration, development and removal of gold on public lands is the General Mining Law of 1872, (17 Stat. 91: 30 U.S.C. 21-54), which declares all valuable mineral deposits in lands belonging to the United States...to be free and open to exploration and purchase. Most National Forest System Lands in the western United States are open to 1872 Mining Law activities. Special areas, such as Wilderness, Wild and Scenic Rivers designated “wild”, and various administrative sites are withdrawn from mineral entry. Mining claims in withdrawn areas can be operated only if Valid Existing Rights, at the time of withdrawal and today, are established through Forest Service mineral examination. The Forest Service regulates surface resource management pursuant to the authority of the Organic Administration Act of 1897 and regulations at 36 CFR 228 Subpart A.

RIGHTS OF MINERS UNDER THE 1872 MINING LAW: Mining is unlike the “multiple use” activities on federal lands in that the General Mining Law of 1872 grants the federal land management agencies far less authority over mining activities than over timber harvesting, recreation, grazing and other activities. Under the General Mining Law of 1872, a valid mining claim is a property right owned by the claimant. All State and Federal regulations must be complied with; and proper permits from State and Federal agencies must be obtained where applicable. The Forest Service minerals regulations, 36 CFR 228 require that where feasible, mining operations be conducted to minimize environmental impacts. The Forest Service does not have the authority to deny mining on valid claims, or condition the activities so that it results in the taking of a claimant’s property rights.

REGULATING AUTHORITIES UNDER 36 CFR 228: The Forest Service minerals regulations state that a person proposing an action which “might cause disturbance of surface resources” is required to submit a Notice of Intention to the Forest Service District Ranger on whose District the mining is proposed. The operator is required to submit a Plan of Operations if the District Ranger determines “that such operations will likely cause significant disturbance of surface resources,” (36 CFR 228.4). If a Plan of Operations is submitted, the Forest Service conducts an environmental analysis resulting in an Environmental Assessment (EA) or Environmental Impact Statement (EIS).

The regulations require that all mining operations are conducted, where feasible, to minimize adverse environmental impacts, and to comply with the Air Quality, Water Quality, and Solid Waste statutes and standards. In addition, the regulations require that measures are taken to protect scenic values, fisheries and wildlife habitat. The regulation also requires the proponent to reclaim surface disturbance and to prevent or control on-site any off-site damage to the environment (36 CFR 228.8).

FOREST SERVICE POLICY: It is the policy of the U.S. Forest Service and direction under the Umatilla Forest Plan to encourage and facilitate the orderly exploration and production of minerals, which is consistent with the Mining and Minerals Policy Act of 1970. The Act of 1970 fosters and encourages private enterprise in the development of domestic resources to help assure satisfaction of industrial, security, and environmental needs. Within this context, the National Forests and Grasslands have an essential role contributing to an adequate and stable supply of mineral and energy resources while continuing to sustain the land’s productivity for other uses and protecting and maintaining ecosystem components and functions.

PROPOSED ACTION

The proposed action is to approve 16 plans of operation for mining claims located within the Granite watershed on the Umatilla National Forest (Figure 1.2). The proposed action is a compilation of plans submitted by claimants operating within this area. A plan of operation includes “Information sufficient to describe or identify the type of operations proposed and how they would be conducted, the type and standard of existing and proposed roads or access routes, the means of transportation used or to be used as set forth in 36 CFR 228.12, the period during which the proposed activity will take place, and measures to be taken to meet the requirements for environmental protection in 36 CFR 228.8”. Generally, plans of operation are reviewed and updated every 5 years or sooner if unforeseen circumstances arise and a change in the operation is necessary. In preparation for this analysis, claimants were contacted and asked to update their plans of operation. In some cases, revised plans were submitted and two claimants who recently purchased existing claims submitted new plans. However, in most cases claimants said they did not wish to change their existing plan and the plan currently on file with the Forest Service should be included in the proposed action. Several of the miners contacted indicated that they were only going to do assessment work in the foreseeable future and it was determined that a Plan of Operation was not necessary. On claims where no valid plan of operation was on file, and the claimant did not submit one for this analysis, it was assumed that assessment work was the only activity planned during the next 5 years.

Listed below are brief descriptions of each project and the work planned on the claim in the next 5 years. A copy of the actual Plan of Operation submitted by each claimant is filed in the Planning Record.

Lower Granite Creek

The Lower Granite Creek subwatershed project area extends from the confluence of Granite Creek and the North Fork of the John Day River upstream to the confluence of Clear Creek and Granite Creek.

REPUBLICAN COMEBACK #7**Claim Description**

The Republican Comeback #7 placer claim is located on Rabbit Creek at its confluence with Granite Creek. The claim is accessed by an approximately 30-foot wide (August 2000), 12- to 18-inch deep hardened ford across Granite Creek. Substrate in the ford consists of rounded to sub-rounded rocks ranging from 1 to 14 inches.

The claim is situated on a relatively broad alluvial fan developed at the mouth of Rabbit Creek, at an elevation of approximately 4240 feet. On the claim, Rabbit Creek consists of several distributary channels. Groundcover on the claim consists of native grasses, herbs, shrubs mixed with lodgepole and Douglas fir to 40 feet high.

The visibly active portion of the claim consists of a small pit excavated into a high bar 30 feet east of Rabbit Creek and several hundred feet south of Granite Creek. The high bar is estimated by the claimant to contain approximately 50,000 cubic yards of material. An old trailer is located on the north side of Granite Creek, east of Rabbit Creek.

Plan of Operations

The owner submitted the updated POO on February 20, 2001. The owner proposes to excavate and wash approximately 300 cubic yards of material annually. Processing water will be withdrawn from Rabbit Creek, passed through the wash plant, be discharged to a settling pond, and recirculated. The owner plans to test several other areas located on the south side of Rabbit Creek, and proposes to use a suction dredge on both Granite Creek and Rabbit Creek.

Top soil will be stockpiled for use in reclamation, which will be kept current with the operation. Petroleum fuels will be stored in the vehicles in which it is transported to the site.

REPUBLICAN COMEBACK #10 AND #11Claim Description

The Republican Comeback (RC) #10 and #11 placer claims are located within the North Fork John Day Wilderness. RC #10 is reached by a jeep trail, which crosses Granite Creek at a hardened ford, and RC#11 can be reached either by the jeep trail or a trail that traverses the northern hillside approximately 100 feet above the creek. The claims encompass both the north and south banks of the creek.

Plan of Operations

The claimant proposes to mine approximately 1/8 acre per year of alluvial material from the open pit on the north side of the creek described above. Gravel from hand testing on the south side of Granite Creek will be hauled across Granite Creek to the processing plant, located on the east end of RC #1.

Equipment to be used in the operation will include a loader, propane-powered backhoe, trommel, 2" pump, gold grabber, gold spinner, and a pickup trommel capable of processing 3 to 4 CY per hour. A suction dredge will be used in ponds, and in Granite Creek from July 15 to August 15. Fuel will be stored in the back of a pickup truck, which will be kept at least 50 feet from ponds and Granite Creek. A zero-discharge recycling system will be used, and the creek will be visually monitored whenever material is being processed.

Washed placer tailings will be returned to the excavation. Topsoil will be stockpiled above the annual floodplain, and be used during reclamation. Reclamation will be ongoing and will include use of a Forest Service approved seed mixture. The claimant will maintain the two rock fords and not allow them to widen. Roads will be water-barred and rocked, as needed. Surface water will be controlled with ditches. Garbage will be hauled offsite.

HOPEFUL #2 AND #3Claim Description

The claim is developed with a small wood-frame cabin, three storage sheds, and a metal-siding clad building, all on the north side of Granite Creek. A variety of heavy equipment is kept on the property including a dump truck, a grader, a small dozer, and a small backhoe. Equipment is stored at least 100 feet north of the creek.

The westernmost building is used to filter water, piped from a mineral spring on the south side of creek, through activated charcoal to recover metals dissolved in the water. Once passed through the filters, water is discharged to Granite Creek. The sheds are used for storage.

The actively mined portions of the claims are on the north and south sides of Granite Creek, and total $\frac{1}{4}$ to $\frac{1}{2}$ acre. Workings on the south side are reached by two hardened fords. On the south side the gravels being mined are approximately 40 feet above the creek and 50 to 100 feet south of the creek bank.

Plan of Operations

An undated POO was submitted for the Hopeful 2 & 3 for the 2001 season. The POO calls for work on the claim to begin in May 2001, and is expected to last for 5 years. A small cat or backhoe will be used to dig test holes on the north and south sides of Granite Creek. Up to 300 cubic yards of material could be processed each year. Material will be processed through a trommel at the two mining sites, and existing settling ponds will be used to catch and recirculate process water. Process water will be withdrawn from a nearby, nonfish-bearing stream. Some tree-cutting is anticipated.

Fuel will be stored in a 55-gallon drum in the back of a pickup truck. If the existing fuel tank on the property is to be used, it will first be bermed as directed by the Forest Service. Mined materials will be stockpiled for later use in reclamation. A cabin is used as quarters when the owner is present.

HOPEFUL

Claim Description

The Hopeful placer claim is located along Granite Creek in T8S, R35E, NW1/4 Section 29. The "Miners Road" along the northern side of Granite Creek provide access to the claim. Valley bottom gravels are disturbed, having been placer mined earlier. Historical placer mining activities appear to have involved stripping and stockpiling fine-grained topsoils in elongated piles approximately 50 to 100 feet to the north and south of the creek, and then processing the more coarsely grained creek gravels.

There is a small cabin on the claim. The active working consists of an approximately 10 by 10 foot pit excavated into the stockpiled topsoil pile on the south side of the creek, approximately 50 feet east of the cabin and 30 feet north of Granite Creek.

Plan of Operations

The owners will continue to work the small pit described above, which was originally opened in 1989. Upon completion, the pit is expected to be no larger than 30 by 30 feet. The current POO does not call for working tailings on the south side of the creek, precluding the necessity of fording the creek.

Equipment to be used will include a small backhoe, pick and shovel, pan-o-matic, and a small trommel. Wash water from the plant will be pumped from the creek and recirculated through a shallow pit excavated in dredge tailings gravels approximately 15 feet north of the

creek. The small volume of tailings generated will be disposed of in an old dredge hole 20 to 30 feet north of Granite Creek.

Any petroleum products used will be stored vehicles and be removed from the site at season's end. Topsoil will be stockpiled and used later for reclamation.

Ten Cent Creek

The Ten Cent Creek project area extends from the confluence of East Ten Cent Creek and an unnamed tributary upstream a distance of approximately one mile. Elevations of the various claims range from 4820 feet to 5190 feet above sea level. The lower reaches of Ten Cent Creek within the study area have been highly disturbed by historic placer mining.

PBGF #1, #2, AND #3 CLAIMS

Claim Description

The PBGF #1, #2, and #3 placer claims are located within the East Ten Cent Creek RHCA, immediately north of FS Road 7350.

The gradient of East Ten Cent Creek averages 2 percent to 3 percent. Substrate includes sand and gravel, and there are piles of cobbles/boulders from historical placer operations along the approximately 30 foot wide flood plain. Creek banks are steep, approximately three to four feet high, and consist of a mixture of silt and sand.

Hillsides to the east and west of the claims rise at approximately 10 percent to 15 percent, and are covered with mixed conifers. Alder occurs within the disturbed riparian area.

The claims show little in terms of their development. There are no buildings or any equipment on the claims. There was no evidence of recent excavation or operation evident on the claims.

Plan of Operations

The current POO calls for mining gravels from pits located over 30 feet from Ten Cent Creek, using a backhoe. Excavations will be dug to bedrock, and only one test hole will be open at one time. Topsoil will be stockpiled for later use in reclamation work.

Placer gravels will either be processed on site or be trucked off-site for processing. A suction dredge may be used in the pits, and may be used in Ten Cent Creek during the dredging season in accordance with permits. Washed gravels will be returned to holes, and covered with stockpiled topsoil that will be covered with straw. No trees that provide shade to the creek will be removed, and shrubs/brush along the creek will be left undisturbed.

Process water will be from seeps, and will be recycled through three (3) settling ponds located approximately 100 feet from the creek. A small washing plant will be set up in the old placer tailings at least 100 feet from the creek.

An area along a small tributary creek will also be tested. Backhoe excavations in this area will be at least 20 feet from the tributary in areas where the banks are not steep. A 10-foot

wide undisturbed area will be maintained between the test sites and dredge ponds, and a 30-foot wide buffer between the test sites and Ten Cent Creek.

EAST TEN CENT CLAIM

Claim Description

The East Ten Cent Claim is located along a highly disturbed reach of East Ten Cent Creek immediately upstream from the PBGF group of placer claims. Access is provided by FS Road 7350, then by dirt road ¼ mile.

East Ten Cent Creek is relatively narrow and confined upstream from the claim. Substrate consists mainly of gravel, cobbles, and sand. The valley widens at the claims, resulting in the deposition of the placer gravels that were hydraulically mined earlier. Placer gravels are mantled by up to 24-inches of fine-grained ash-derived soils which are easily eroded where not stabilized by vegetation. The placer-mined area measures approximately 100 feet by 600 feet, and is characterized by piles of cobbles and boulders stacked alongside the creek.

The claim is developed with a small wood cabin and a shed. Workings consist of a small pit excavated into the steep creek bank on the west side of the creek. Bales of hay to prevent the introduction of sediment into East Ten Cent Creek enclose the current active area.

Plan of Operations

Placer gravels will be mined from existing pits located 20 feet from Ten Cent Creek. Pits will be backfilled with washed gravels, covered with topsoil, and then by straw to help minimize erosion. Additional test pits will be excavated with a backhoe. A 30-foot wide buffer between test sites and East Ten Cent Creek will be maintained. Topsoil will be stockpiled separately at least 30 feet from the creek for later reclamation use. No shade-providing trees or brush along the creek will be destroyed. A suction dredge may be used with groundwater as a water source in test pits.

A dredge may be used in the creek during dredging season if permits are available. Process water will come from settling ponds and a spring, and will not be withdrawn from the creek. The primary processing plant will be set up on the north end of the claim on the west side of the creek. Any additional processing sites, which may consist of settling ponds and/or material storage areas, will be situated at least 30 feet away from the creek.

Gravels will be tested using hand tools along a small tributary stream. Testing will occur from 2 to 20 feet from the tributary.

Equipment to be present on the claim may include a small washing plant and trommel, a rock crusher, a sluice, a backhoe, water pumps, a generator, pickup trucks, a dump truck, a conveyor, trailers, ATVs, motor homes, a dredge, and hand tools. None of the equipment will be driven across East Ten Cent Creek.

The current claimants plan to remove a small cabin left on the claim by the previous claimant.

BRICE #1, #2, AND #3

Claim Description

The Brice group of claims (#1, #2, and #3) are located in the headwaters of East Ten Cent Creek in T8S, R351/2E, near the center of Section 21. The claims lie at elevations ranging from approximately 5000 to 5160 feet. Access is provided by a gated Forest Service road (055) along the east side of the East Ten Cent Creek canyon.

Claim development is minimal, except for the presence of several small pits of unknown age. A sluicebox is located near the creek where FS Road 055 ends at the creek.

Plan of Operations

Pick and shovel work along the Ten Cent Creek will begin on May 1. A sluice and hand-fed washing plant, which uses 4 – 6 gallons of water per minute, will be used to process gravels. Process water will be withdrawn from the creek, and discharged into low rocky areas situated away from the stream. The pump will be screened to ¼ inch to protect small fish. Washed material will be returned to the holes from which it was mined.

The claimant plans to dredge Ten Cent Creek during the State instream period of July 15 to August 15 using a 4-inch suction dredge. The claimant will visually check East Ten Cent Creek to ensure that the sediment plume has settled within 300 feet of dredging operations.

The claimants will avoid placing rocks and materials within the riparian zone. Any large woody debris (LWD) moved during mining operations will be replaced.

Miners will live in travel trailers, which will be removed from the site at the end of the season. Reclamation will include seeding areas of bare soil.

TARHILL TEN CENT CLAIM

Claim Description

The Tarhill Ten Cent placer claim is located immediately upstream of the East Ten Cent claim. The claim lies at an elevation of approximately 5960 feet and is accessed by a gated dirt road spur off FS 050, which also provides access to the East Ten Cent Claim.

The claim is situated upon the same alluvial deposits as the East Ten Cent Claim, which were deposited where the canyon of East Ten Cent Creek widens and gradient decreases. The narrow flood plain (100') in the area has been disturbed by placer activity, and subsequently re-contoured and seeded. The creek flows along the east side of the canyon, and may have been moved there by the re-contouring program. The creek is moderately confined by one-to four-foot high banks along the Tarhill claim reach, with banks consisting of light brown mineral soil. The creek gradient averages 2 percent to 3 percent, and substrate consists of sand and gravel. The west side of the creek, which was mined, has been re-graded and seeded. There is a small, very old sluice gate at the north end of the seeded area. There are no buildings or equipment on the claim.

Plan of Operations

A backhoe will be used to open test pits no more than 0.25 acre at one time. Topsoil will be stockpiled for later reclamation use. The claimant would prefer to haul mined materials

approximately 5 miles to private property for processing, and to back-haul the material to the claim for disposal in mined areas. Equipment to be used includes a D6 cat, backhoe, trommel, pickup truck, pump, small dump truck, and hand tools. The claimant plans to use a 4-inch suction dredge in East Ten Cent Creek in accordance with their State permit.

If mined material can not be hauled offsite, the claimant will use an 8' by 24" trommel to process approximately five to ten (5-10) cubic yards of material per day. Ten-gallons per minute will be required for the washing plant. Process water would be pumped from Ten Cent Creek until settling ponds (10' X 20' X 8' deep) are full, and water would then be recycled through the system.

Some small trees and 12 western larch snags will need to be removed during mining. Reclamation will entail re-contouring the land surface, covering with stockpiled topsoil, and seeding with a Forest Service recommended mix free of noxious weeds. The claimant will maintain a ten-foot wide buffer between excavations and East Ten Cent Creek, and will visually monitor the creek to ensure sedimentation impacts are minimized.

Upper Granite Creek

SW SAINT PAUL

Claim Description

The SW Saint Paul lode claim is located on the steep (30 - 40 degree) western (east-facing) slope of the Granite Creek drainage, approximately 100 feet to the west of the creek. A steep hillside to the east and NF Road 73 to the west along this reach confine Granite Creek. NF Road 73 and an unimproved jeep trail that traverses the hillside and also provides access to the Independence Fraction provide access to the claim.

Development on the SW Saint Paul claim consists of two adits (apparently caved), a well-maintained cabin, a shed, an outhouse, and the collapsed wooden remains of either a tippie or stamp mill. The lower adit is approximately 200 feet west of Granite Creek. The disturbed area is less than 0.25 acre and is at least 100 feet from Granite Creek.

Plan of Operations

Both tunnels will be sampled for assay. There will be little new disturbance of the surface area other than an increase in the size of the tailings dump. Explosives may be used underground, but not on the surface. Ore will be removed from the adits and be hauled to a mill at Cabell City for processing. Mining timbers may be cut on the claim. A backhoe will be used at the lower portal to remove slough. The entrance will be shored up and the first 20 feet on the tunnel will be timbered for safety. A door will then be installed on the lower adit to prevent public entry. The upper tunnel will be cleaned out and sampled by hand.

The cabin will be occupied during mining operations. The operator will remove garbage and debris from the site. No fuel will be stored on site.

MAGNOLIA

Claim Description

The Magnolia Group comprises eight (8) lode claims (Magnolia, Violet, Jupiter, Tacoma, Rose, Atlas, Helena and Emporium). The Magnolia Group is located in Lucas Gulch approximately 0.5 mile north of its confluence with Granite Creek. Access is by an unimproved jeep trail, which is gated at NF Road 73. The unimproved road fords Granite Creek several hundred feet west of NF Road 73.

The Magnolia claim group is developed with at least three (3) adits, and a single wood cabin. Two (2) adits were driven eastward into the ridge between Chipman Creek and Lucas Gulch. A third adit was driven westward into the slope on the west side of Lucas Gulch. Only the lower of the first two mentioned adits is active, and was caved at the portal during the first site visit. An adit located several hundred feet upslope from the active adit was also caved, and the adit on the west side of the gulch is open but is not being worked.

Plan of Operations

Only maintenance and assessment work is being proposed on the Magnolia Mine. Equipment to be operated on the claims includes a backhoe, small cat, one-yard loader, air compressor, a pickup truck, and hand tools. Fuels are to be stored out of the flood plain. A small cabin on the site is used for storage. Two wastewater ponds will be maintained to manage mine effluent discharging from the main portal. Road maintenance will be accomplished annually on the one mile of road needed to access the claim.

OLD ERIC #1 AND #2

Claim Description

The Old Eric #1 and Old Eric #2 placer claims are located immediately upstream of the confluence of Granite Creek and Bull Run Creek, at the intersection of NF Road 73 and County Road 24. The claims and surrounding area were dredged over 50 years ago, and the dredge spoils are now covered with small lodgepole pine. The claims are primarily within the Granite Creek floodplain, although portions of the claim impinge upon an andesitic bedrock knoll to the southwest. The substrate in Granite Creek consists of sand, gravel, and boulders to 12 inches, and the creek is locally confined and channeled by dredge spoils. The creek is approximately 8 feet wide along this reach.

The two Old Eric claims are essentially unimproved and little disturbed by recent activity. A small wooden bridge crosses Granite Creek on the claims to provide access to a small pit excavated to bedrock approximately 70 feet west of Granite Creek. An approximately 80 by 54 by one (1) foot deep settling pond, apparently used to catch and filter process water, is thickly overgrown with native grasses. There are no buildings on the claims, although a small mobile trailer is moved onto the site during operations. The area of disturbance is less than 0.25 acre.

Plan of Operations

Work on the claims would include hand digging, and processing gravels through a small wash plant. Process water will be pumped from a holding pond, and wash water is to be

discharged back to the holding pond. The claimant may also operate a small suction dredge under the terms and conditions of a dredging permit from July 15 to August 15. A backhoe may be used to deepen the prospect hole. Other equipment to be used on the claims includes a pickup, and a small trailer that is removed from the claims in the fall. All petroleum products will be stored away from the creek. A travel trailer will be used for camping while the claim is being operated.

ROSEBUD #1, #2, #3, AND #4

Claim Description

The four (4) Rosebud placer claims are located on the north side of NF Road 73 approximately 0.5 miles upstream from the confluence of Granite Creek and Clear Creek. Granite Creek flows in a westerly direction approximately 500 to 600 feet to the south of the claims on the opposite side of NF Road 73, which forms a barrier between the claims and Granite Creek.

The claims enclose a large, linear area of historic dredge spoils (gravel, cobbles and boulders) in the flood plain of Granite Creek, and an andesitic bedrock ridge to the north of the floodplain. A series of ponds has formed in low-lying areas where the dredge spoils do not exceed the level of groundwater under the highly disturbed floodplain. The ponds are filled with hydrophytic plants such as sedges (*Carex*), cattails (*Typha*), and duckweed (*Lemna*). Small lodgepole pines, scrub willow, and native grasses have taken hold in the spoil piles. The ponds drain through a culvert beneath FS Road 1035 into Granite Creek near the western end of the claim group.

The claims show little evidence of recent work due in large part to the coarse, sparsely vegetated nature of the spoil piles, which does not readily record recent disturbances. There are no buildings or equipment on the claims.

Plan of Operations

Approximately one to two cubic yards of material are to be excavated by hand or backhoe each year from individual holes cut into the hillside high bar, to a maximum of 10 cubic yards per year. Test areas are located outside the riparian area on level ground. Equipment to be used on the claims includes a pickup truck, small backhoe, trommel, water pump, gold spinner, and 3 cubic yard dump truck. No fuel is stored on the site.

Excavated material will be processed through a small trommel and gold spinner located near the test holes. Process water will be pumped from water-filled depressions in historic placer tailings, and be discharged to natural depressions where it will soak into the ground. No process water will directly enter Granite Creek.

Tailings will be stockpiled and returned to excavations at the end of the season. Topsoil will be stockpiled for later use in reclamation. Reclaimed areas will be seeded with a Forest Service approved seed mix. All garbage will be hauled offsite for disposal.

TROY D

Claim Description

The claim is about 1½ miles east from the intersection of NF Roads 73 and 13. It lays on a large, linear area of historic dredge spoils (gravel, cobbles and boulders) in the flood plain of Granite Creek just south of NF Road 13. A number of old mining ponds are located next to Forest Road 13. The ponds are filled with hydrophytic plants such as sedges (*Carex*), cattails (*Typha*), and duckweed (*Lemna*). Small lodgepole pines, scrub willow, and native grasses have taken hold in the spoil piles that are located between the ponds and Granite Creek. Granite Creek flows through the southern half of the claim, is well entrenched, and is separated from the proposed work area by a large, linear pile of historic dredge tailings.

A portion of the claim was used for gravel storage during reconstruction of NF Road 13.

Plan of Operations

A wash plant will be placed in the tailings area near the east end of the claim. Existing ponds will be used to store and recirculate water. A test hole will be excavated to bedrock at least 50 feet from Granite Creek. Water will be pumped from the hole to the existing ponds and vein material will be sampled. The test site will be refilled if values of test material to not prove productive and other holes will be dug and sampled in the same manner.

After testing, mining will begin in the piles of placer tailings. A backhoe will be used and up to 50 cubic yards of material will be processed daily. Black sand concentrates will be collected and shipped off site for processing. Access to the south side of Granite Creek will be across private land. Granite Creek will not be forded.

Water from the discovery pit will be tested. Carbon columns will be placed in a small trailer and water will be pumped through them. Electroplating will also take place in the trailer. Two power poles will be placed to facilitate running electricity to the claim to power the extraction system. A second trailer will be moved to the site and used when the extraction system is operating.

Clear Creek

The Clear Creek subwatershed project area extends from the confluence of Clear Creek and Congo Gulch upstream to the confluence of Clear Creek with Lightning Creek. Elevations of the various claims in this portion of Clear Creek range from approximately 4780 to 5057 feet above sea level.

GRUBSTAKE CLAIM

Claim Description

Access to the claim is by NF Road 13, and a narrow wood bridge across Granite Creek. Clear Creek was heavily placer mined along the reach of the creek along which the claim is located, and the streambed and flood plain are heavily disturbed. Log weirs have been built above, along, and below the reach of Clear Creek encompassed by the Grubstake claim, and the banks are locally armored with rip-rap. The entire reach comprises pools developed behind log weirs. Improvements on the claim include several sheds, near which is stored a

variety of washing equipment. The visibly active area of the claim is a ten-foot deep pit, located several hundred feet west of Clear Creek. A washing plant, set up near the pit at the time of the 2000 site visit, consisted of a screen, a trommel, and a sluice box. Several reclaimed pits were noted in the vicinity as well.

Plan of Operations

The POO calls for excavating and washing materials from locations at least 100 feet from Clear Creek. Wash water will be pumped from an off-channel pond, and be recycled through settling ponds approximately 10'x10'x 4' deep, located at least 100 feet from Clear Creek. A rock tailing and vegetated buffer strip at least 100 feet wide will be maintained between the processing plant and the creek.

Test holes will be backfilled with washed gravels. Stockpiled topsoil will be used for reclamation when testing in each area is completed, and reclamation will be ongoing. Trees will be replaced to the approximate density as before mining. Once mined out, the bridge and equipment will be removed from the site.

BUNCH BUCKET #1 AND #2

Claim Description

The Bunch Bucket #1 and #2 placer claims are located along a reach of Clear Creek where the creek turns from north to east near its confluence with Ruby Creek. Access to the claims is by FS Road 1310. The creek does not appear to have been as heavily placer mined along the Bunch Bucket reach since it was farther downstream, although there are indications of local explorations.

The Bunch Bucket #1 claim is located between FS Road 1310 and Clear Creek. A large portion of the claim is disturbed, having been cleared. This area appears to be underlain by soils derived from Mazama Ash, which are fine-grained, easily eroded, and do not appear to support the growth of ground covering plants well. The eastern approximately one-half of the cleared area is covered with lodgepole saplings approximately 10 feet high. An approximately 50 to 80 foot wide zone of native vegetation buffers the cleared area from Clear Creek. A depression on the claim may have been used as a settling pond at one time. The claim includes a large tailings pile at the mouth of the Scandia Tunnel, which is located on the north-facing hillside on the south end of the claim.

Bunch Bucket #2 is located between the road and the hillside to the south and southeast of the road. The proposed placer mining area consists of a low alluvial terrace which stands a few feet above the grade of Clear Creek, and is east of FS Road 1310. The claim is covered with lodgepole pine

Plan of Operations

Eight 2-foot wide trenches will be excavated to bedrock using a backhoe, and will be situated in such a manner as to spare lodgepole saplings in the area, where possible. Four of the trenches will be located on the east end of Bunch Bucket #1, and four will be located near the center of Bunch Bucket #2. Overburden and/or topsoil will be stockpiled along the trenches for later use in reclamation. Excavated materials will be trucked to the trommel, which will probably be set up on the southeast side of Bunch Bucket #1, approximately 150 to 200 feet

south of Clear Creek. The trommel site will remain the same for the life of the project. Equipment to be used on site will include a medium size backhoe.

Up to 600 cubic yards of material may be processed the first year. A trommel capable of washing up to 30 cubic yards per hour will be used. Washed gravels will be used as backfill in the trenches. Water will presumably be withdrawn from Clear Creek, and be re-circulated through settling ponds. The claimant proposes to place log dams across a seasonal stream that drains the site to minimize the amount of sediment that might otherwise wash into Clear Creek. All garbage will be hauled off site for disposal.

The site will be seeded and reclaimed upon completion of mining work.

Lightning Creek

The Lightning Creek subwatershed (93K) extends from the confluence of Clear Creek southward to the headwaters of Lightning Creek near the former town of Robinsonville.

LUCKY STRIKE

Claim Description

The claim, which is located at least 1000 feet south of the headwaters of Quartz Gulch and 2500 feet east of Lightning Creek, lies on a ridge dividing Lightning Creek and Quartz Gulch. The claim has been developed over the years with a cabin, a shed, a 2-stamp stamp mill, and a small head- frame. Mine workings include a shallow adit (locked), a shaft, and several prospect pits, which are scattered about the ridge above the cabin. Light gauge track (150') services the adit.

Plan of Operations

The claimant proposes to reclaim the existing tunnel system, and backfill exploratory holes excavated by the original claimant. A tunnel will be extended through an existing “vertical tunnel” (shaft) along the vein. The stamp mill and cabin will be restored to original condition. Any “viable” material will be hauled offsite for processing, or may be processed in the mill onsite depending on ore quality. Ongoing tunnel extension, including exploratory testing in an adjacent tunnel, is anticipated.

Equipment to be used on site will include a rubber-tired backhoe, pick, shovel, ore car, chainsaw, electric roto-hammer, and 4000-watt generator. Small volumes of fuel will be kept on site.

As this is essentially a hand operation, the volume of tailings generated will be small. Tailings will be cribbed using downed timber to minimize erosion. The operators are currently reforesting the original mine site with native species.

PURPOSE AND NEED

On July 10, 1998, Columbia River bull trout (*Salvelinus confluentus*) were listed as threatened under the Endangered Species Act (ESA). On May 24, 1999 Mid Columbia steelhead trout (*Oncorhynchus mykiss*) were listed as threatened under the ESA. Both of these species are found in streams located within the Granite Creek watershed.

Under the Surface Use Regulations (36 CFR 228.4), a Notice of Intent is to be filed for any mining operation, which might cause disturbance of surface resources. If through an analysis of the Notice of Intent, the District Ranger determines that the proposed operation will likely cause a significant disturbance, or if the operator initially plans a significant surface disturbance, the regulations require that a Plan Of Operations be filed. Operations, which cause a significant surface disturbance, may require a reclamation performance bond. At any time during operations under an approved plan of operations, the authorized officer may ask the operator to furnish a proposed modification of the plan detailing the means of minimizing unforeseen significant disturbance of surface resources. A Plan of Operations is not a permit. The General Mining Law of 1872 gives miners a statutory right to prospect and mine. The Plan of Operations is an agreement between the miner and the Forest Service about what will be done to mitigate surface resource impacts.

The District Ranger on the North Fork John Day Ranger District has determined that many of the existing mining claims located within the Granite Creek watershed will likely cause significant disturbance of resources. This finding is based on the direct and indirect effects the mining operations could have on threatened bull trout and steelhead trout and the potential effect they may have on State listed 303(d) streams.

Claims in the area fall into one of two categories. On some claims, there is an existing Plan of Operations that was approved before the listing of bull trout and steelhead trout as threatened. Since conditions have changed since the Plans were approved, there is a need to approve modifications to these plans, as specified in 36 CFR 228.4(e), which include the changes that will be made to mitigate the effects on the two newly listed species.

Other mining operations located within the watershed and determined to likely cause significant disturbance, do not have an approved Plan of Operations. There is a need to approve the Plans for these operations, as specified in 36 CFR 228.4(a), submitted by the operators.

MANAGEMENT DIRECTION

This Environmental Impact Statement (EIS) process and documentation has been done according to direction contained in the *National Forest Management Act*, the *National Environmental Policy Act*, the *Council on Environmental Quality (CEQ) regulations*, *Clean Water Act*, *Clean Air Act*, and the *Endangered Species Act*. This EIS is tiered to the *Umatilla National Forest Land and Resource Management Plan (Forest Plan)*. This includes the clarifying direction of Plan Amendment #10 “*The Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California*” (PACFISH), dated February 24, 1995, which is intended to arrest and

reverse the decline in anadromous fish habitat in the Pacific Northwest Region until a more in depth analysis is completed. It also includes Plan Amendment #11 “*Continuation of Interim Management Direction Establishing Riparian, Ecosystem, and Wildlife Standards for Timber Sales*”, dated June 12, 1995, which is intended to maintain options for old growth-related and other species until a more in-depth analysis is completed. It is also tiered to the *Managing Competing and Unwanted Vegetation FEIS*, its *Mediated Agreement*, and *Record of Decision* (December 8, 1988). This EIS incorporates by reference the Environmental Assessment (EA) for the *Management of Noxious Weeds* and its Decision Notice (May 24, 1995), and other sources of information, documents, published studies, and books referred to in this document and its analysis file.

FOREST MANAGEMENT PLAN

The goal in the Forest plan for minerals and energy is to “provide for exploration, development and production of a variety of minerals on the Forest consistent with various resource objectives, environmental constraints, and considering cost efficiency”. Mineral exploration and mineral removal are permitted throughout the Forest except in withdrawn areas. During development of operating plans of plan modifications, reasonable alternative mitigation measures and/or operating requirements will be developed to define the appropriate stipulations needed to protect other resources while still meeting the objectives of the mineral operator. The test for operating plan requirements is “reasonableness.” Reclamation standards will be developed using an interdisciplinary process to insure land restoration to a productive condition to the extent reasonable and practicable. When reasonable, opportunities to enhance other resources will be considered. Concurrent reclamation will be stressed. Reclamation bonds will be based on actual reclamation cost.

The Forest Plan divided the Umatilla National Forest into management areas, each with a specialized management strategy that emphasizes particular resources and values. A management area’s Desired Future Condition describes how the Forest should look to provide the associated resources and Standards and Guidelines provide the guiding direction for achieving the Desired Future Condition. The analysis area includes the management areas listed below (Figure 1.3). The management area’s goals and primary description of the Desired Future Condition are included in italics, while activities proposed within that allocation and other pertinent information occur in regular type. For further description of the Desired Future Condition and Standards and Guidelines, please refer to Chapter 4 of the Forest Plan.

A3 – Viewshed 1 (Forest Plan p. 4-99 to 104): *Manage the area seen from a primary travel route, use area, or water body, where forest visitors have a major concern for the scenic qualities (sensitivity level1) as a natural appearing landscape. Viewsheds will be managed primarily to meet the visual objectives of retention and partial retention. An attractive, natural appearing landscape will be created or maintained. One claim (Magnolia) is located in this area. It is not visible from the primary travel route.*

A4 – Viewshed 2 (Forest Plan p. 4-105 to 110): *Manage the area seen from a travel route, use area or water body where some forest visitors have a major concern for the scenic qualities (sensitivity level2) as a natural appearing to slightly altered landscape. No claims are located within this area.*

A8 – Scenic Area (Forest Plan p. 4-128 to 4-130): *Protect or enhance the unique natural characteristics of landscapes noted for their scenic beauty. This includes Greenhorn Mountain Roadless Area*

plus Lost Lake, Olive Lake, and north of the Greehorn Townsite and the Jumpoff Joe Roadless Area. No claims are located within this area.

A9 – Special Interest Area (Forest Plan p. 4-131 to 1-133): *Manage, preserve and interpret areas of significant cultural, historical, geological, botanical, or other special characteristics for educational, scientific, and public enjoyment purposes. Cultural-Historic Areas include Greenhorn and Olive Lake-Fremont Powerhouse. No claims are located within this area.*

B1 – Wilderness (Forest Plan p. 4-138 to 143): *Manage to preserve, protect and improve the resource and values of the forest wilderness, as directed by the Wilderness Act of 1964 ...will appear to be affected primarily by the forces of nature, with the imprint of human activities substantially unnoticeable. Natural processes, including fire, will continue to be the primary forces affecting the condition of wildernesses ...There will be some evidence of human influence due to the existence of valid mining claims and past use; however, mitigation techniques will be utilized which minimize the impact of these activities. The surrounding area will be managed so as to not adversely affect the wilderness resource... Portions of the North Fork John Day Wilderness are located within the analysis area. Republican Comeback 10 & 11 claims are located within this area.*

C1 – Dedicated Oldgrowth (Forest Plan p. 4-144 to 146): *Provide and protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature forest stands, and promote a diversity of vegetative conditions for such species. Oldgrowth areas will be characterized by stands of naturally appearing overmature trees. No claims within the analysis area are located in C1 designated oldgrowth.*

C7 – Special Fish Management Areas (Forest Plan p. 4-167 to 170): *Maintain and enhance water quality and produce high levels of anadromous fish habitat on an area-wide basis. In riparian areas, a natural to near natural setting and vegetation development will predominate, with a variety of plant communities, sizes and age classes.... Thirteen claims are located within this area.*

D2 – Research Natural Area (Forest Plan p. 175-177): *Preserve naturally occurring physical and biological units where natural conditions and process are maintained, insofar as possible. Vinegar Hill Research Natural Area is located within the Analysis area, but will not be affected by any of the proposed activities. No claims are located within this area.*

TREATY RIGHTS

The Forest Service, through the Secretary of Agriculture, is vested with statutory authority and responsibility for managing resources of the National Forests. No sharing of administrative or management decision-making power is held with any other entity. However, commensurate with the authority and responsibility to manage is the obligation to consult, cooperate, and coordinate with Indian Tribes in developing and planning management decisions regarding resources on National Forest system land that may affect tribal rights.

In 1855, three treaties that affect the Umatilla National Forest were signed between the United States Government and several Indian tribes. The treaty with the Walla Walla, Cayuse, and Umatilla tribes and bands of Indians in Washington and Oregon Territories (today referred to as the Confederated Tribes of the Umatilla Indian Reservation) was signed on June 9, 1855. On June 26, 1855, a treaty was signed with the Tribes of Middle Oregon (these groups are now known as the Confederated Tribes of the Warm Springs Indian Reservation).

In the treaty between the Confederated Tribes of the Umatilla Indian Reservation and the United States the Tribes reserved for themselves the following provisions:

....'That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations in common with citizens of the United States, and of erecting suitable buildings for curing the same; the privilege of hunting, gathering roots and berries and pasturing their stock on unclaimed lands in common with citizens, is also secured to them.

(Treaty with the Walla Walla, Cayuse and Umatilla, June 9, 1855)

The Granite mining EIS analysis area lies within the area ceded to the United States Government by the Warm Springs Indian tribe and Confederated Tribes of the Umatilla Indian Reservation (CTUIR), as a result of the 1855 Treaty. The Treaty was subsequently ratified by Congress and proclaimed by the President in 1859. As a result of the treaty, elements of the Tribes culture, such as tribal welfare, land and resources were entrusted to the United States government. Trust responsibilities resulting from the Treaty dictate, in part that the United States Government facilitate the execution of treaty rights and traditional cultural practices of the Tribes by working with them on a government to government basis in a manner that attempts a reasonable accommodation of their needs, without compromising the legal positions of the Tribes or the Federal Government.

After reviewing the proposed action for this project the CTUIR expressed concerns regarding the proposed project and outlined Treaty Rights resources that could be affected by the project. The concerns included:

- ❖ Potential impacts to Fish habitat and population
- ❖ Implementation of adequate measures to protect the fishery resource and production in the John Day Basin
- ❖ Potential impacts of the proposed projects on salmonids species listed as threatened and endangered under the Endangered Species Act
- ❖ Impacts of the proposed projects on PACFISH and water quality standards, and measures the Forest Service will implement to adhere to those standards.
- ❖ Impacts to wildlife in the CTUIR usual and accustomed use areas
- ❖ Project impacts on archaeological sites and Traditional Cultural Properties

In response to the concerns expressed by the CTUIR, Water Quality and Fish and Aquatic habitat in Granite Creek and it's tributaries have been identified as Key Issues and will be used to develop alternatives to the proposed action. Other concerns will be incorporated into the document as tracking issues.

Because tribal trust activities often occur in common with the public, the Umatilla National Forest will strive to manage tribal ceded land in favor of the concerns of the tribes, as far as is practicable, while still providing goods and services to all people.

DECISIONS TO BE MADE

This environmental Impact Statement documents results of the environmental analysis conducted for the proposed action and its alternatives. The North Fork John Day District Ranger will determine which alternatives best implements the Forest Plan at this time. Specific determinations to be made are:

- ❖ Whether Plans of Operation submitted by operators on 16 mining claims located within the Granite watershed should be approved.
- ❖ Which, if any mitigation measures are necessary for individual plans.
- ❖ Whether a reclamation bond is necessary for individual plans.
- ❖ What monitoring measures should be taken?

SCOPING

Scoping is used to identify major issues and determine the extent of environmental analysis necessary for an informed decision on a proposed action. The North Fork John Day Ranger District sought information, comments, and assistance from federal, state, and local agencies, local Tribes, and from other groups and individuals interested in or affected by the proposed action. The Notice of Intent to prepare an environmental impact statement was published in the Federal Register on March 9, 2000. On March 29, 2000, a scoping letter was mailed to over 150 groups and individuals who had previously shown interest in District projects. Letters were also sent to all mining claimants in the area who could potentially be affected by this analysis and decision. This project was included in the 2000 Winter, Spring and Summer quarterly issues of the Umatilla National Forest Schedule of Proposed Activities (SOPA).

KEY ISSUES

Water Quality

Past management practices have altered water quality throughout the Granite Creek Watershed. Mining has reduced the potential of the riparian areas. Shade has been removed along some streams, resulting in increased summer water temperatures. Historic mining is the overriding influence on morphology of the streams. Placer, hydraulic, and dredge mining affected many channels in this watershed and few have been able to repair their morphology. Past timber harvest and road building has also negatively affected water quality in the watershed. Stream flow, water quality and the timing of flows have been affected by changes in vegetative cover. Road density is high in many of the subwatersheds, and roads located within riparian areas are common. Roads can affect routing of water by intercepting precipitation, which would otherwise infiltrate, and by intercepting subsurface flows, directing this runoff into channels.

Most of the respondents to scoping expressed concern about the effects continued mining would have on the water quality in the Granite Creek watershed. They point out that

continued mining, in combination with other activities within the watershed, further degrade water quality. It was pointed out that Granite Creek and Clear Creek are on Oregon's 303(d) list of impaired waters, and their tributaries. It was suggested that any activities permitted in the area must be designed to improve water quality.

Others believe that the mining being proposed will have no effect on water quality. They state that existing State regulations, as well as Forest Service mandated mitigation are sufficient to protect water quality. They further point out that almost all the current and proposed mining activities are occurring on lands that have been disturbed by previous mining operations. No new roads are being proposed and few if any trees will be harvested.

Measurements used to compare each alternative's response to this issue include:

1. The numbers of Plans of Operation that include suction dredging.
2. The total estimated acres of disturbance per year.
3. Total miles of road decommissioning planned.

Fish and Aquatic Habitat

Both the Wallowa-Whitman and Umatilla Forest Plans recognized the importance of Granite Creek and its tributaries as an important fisheries resource. Granite Creek and its tributaries support runs of spring Chinook salmon and summer steelhead. Granite Creek is a major tributary to the North Fork John Day River. The John Day River is the last major stream in the Northwest to have free runs of Chinook and Steelhead, due to the lack of dams on the River itself. Historically, bull trout, redband trout and the anadromous fish species are believed to have occupied the entire watershed. Stream surveys for streams in the watershed indicate there is some good habitat, but other areas have poor to fair habitat. Stream cover, streambank stability, pool habitat, and stream temperatures are limiting spawning and rearing habitat for anadromous fish species and bull trout.

The long-term trend for average number of redds per mile has been declining since 1959 for spring Chinook. Historically the North Fork John Day River and the mouths of its tributaries have been used by steelhead for spawning and rearing habitat. Presently, fish populations are at a low level. Historically bull trout inhabited most of the North Fork John Day River drainage and its tributaries. Presently only small populations exist in isolated sections of the drainage. Bull trout are at moderate to high risk throughout this drainage and are at high risk in the upper North Fork.

There is little question that an overall decline in the fisheries resource within the Granite Creek watershed has occurred. However, there is disagreement over what factors are responsible for this decline. Many of the miners believe that the decline has more to do with ocean harvest, dams and Columbia River gill nets than mining operations. They point out that mining has occurred in the drainage for over 100 years, yet fish populations only started to decline within the last 20 years.

Others believe that mining, together with the cumulative effects of other activities managed by the Umatilla National Forest has caused significant watershed and fish habitat damage within the project area and downstream. They are concerned that mining activities could potentially degrade already impaired streams in the project area and point out the need to improve degraded conditions in those streams. Concerns focus on the potential for further

degrading Granite and Clear Creeks, streams on Oregon's 303(d) list of impaired waters and the potential impacts of mining on bull trout, steelhead, spring Chinook, and cutthroat trout and their habitats. Some go so far as to say that all mining should be prohibited within the John Day River Basin due to the critical importance of the river as essential habitat for salmon, steelhead and bull trout.

Local Indian tribes have pointed out that the project lies within ceded lands and to meet its federal trust responsibilities to protect Treaty Rights, the Umatilla National Forest is obligated to manage its lands consistently with efforts to rebuild anadromous fish runs.

Measurements used to compare the response of each alternative to this issue include:

1. The risk of contamination from suction dredging operations
2. Risk to aquatic species from project related sediments yields.

TRACKING ISSUES

Issues that were not considered key, but relate to existing regulation or which help to better understand the consequences of proposed activities, were considered as issues to be tracked throughout the document. These tracking issues are generally of high interest or concern to the public, or are necessary to understand the full extent of the alternatives. Tracking issues provide additional information for the analysis but do not drive the formulation of alternatives.

Recreation

The analysis area is a popular place for sight seeing, hunting, accessing wilderness trailheads, and snowmobile use is increasing during the winter months. The newly renovated Fremont Powerhouse complex, which now includes overnight rentals, is drawing an increasing number of visitors to the area each year. There is a potential for conflicts between recreation users and mining operations in the area.

Management Indicator Species

The National Forest Management Act requires the Forest Service to maintain the viability of wildlife populations. As a result, the Forest Plan selected management indicator species to represent the welfare of a larger group of wildlife species presumed to share the same habitat requirements. Rocky Mountain elk were selected to represent general forest habitat and winter ranges. Pileated woodpecker characterize dead/down tree habitat in mature and old growth mixed conifer stands, while northern three-toed woodpecker represent dead/down tree habitat in mature and old growth lodgepole pine stands. Pine marten were identified for mature and old growth stands at high elevation and the primary cavity excavator guild was identified for snag and down tree habitat. Steelhead and rainbow trout were selected to represent stream and riparian habitats. Planned mining operations could affect management indicator species.

Proposed, Endangered, Threatened, and Sensitive Species

Five documented Region 6 Sensitive *Botrychium* plant populations are present within the proposed analysis area.

Several “Sensitive”, “Threatened”, or “Endangered” fish and wildlife species or their habitats could be affected by proposed management activities. The Canada lynx, bald eagle, bull trout, and mid-columbia steelhead are listed as “Threatened” under the Endangered Species Act and the gray wolf is listed as “Endangered”. Mid-Columbia spring Chinook, Columbia spotted frog, and interior redband trout are on the Regional Forester’s “Sensitive” species list.

Interior redband trout, mid-Columbia steelhead, northern bald eagle, and Columbia spotted frog have been documented within the analysis area and mid-Columbia spring Chinook occur within streams in the area. Though their presence is not documented in the analysis area, some potential habitat components exist for California wolverine, Canada lynx, and gray wolf.

Noxious Weeds

Exposure of mineral soil caused by mining operations can create ideal conditions for the spread of noxious weeds. Dalmatian Toadflax, (*Linaria dalmatica*) has become established in the project area and mining operations have the potential to spread this plant. Precautions are needed when ground-disturbing activities occur near presently infested locations of this and other noxious weeds to prevent spread. Noxious weeds are easily spread by vehicular traffic and establish easily where mineral soil is exposed.

Heritage Resources

The National Historic Preservation Act and Executive Order 11593 require that areas be inventoried before any ground disturbing activity occurs. Because of the past mining activity, this area is rich in historic artifacts. The area is also a significant usual and accustomed area to the Confederated Tribes of the Umatilla Indian Reservation; so prehistoric sites are also present in the analysis area. All high probability terrain within the area has been inventoried for heritage resources. This resulted in the documentation of numerous historic and prehistoric properties. Mining activities have the potential to affect the integrity of these cultural properties, which could require avoidance or mitigation.

Economics

The project area is located in a rural area and monies generated from mining operations and spent by miners can benefit local communities. Unrealistic mitigation requirements could affect the viability of individual mining operations

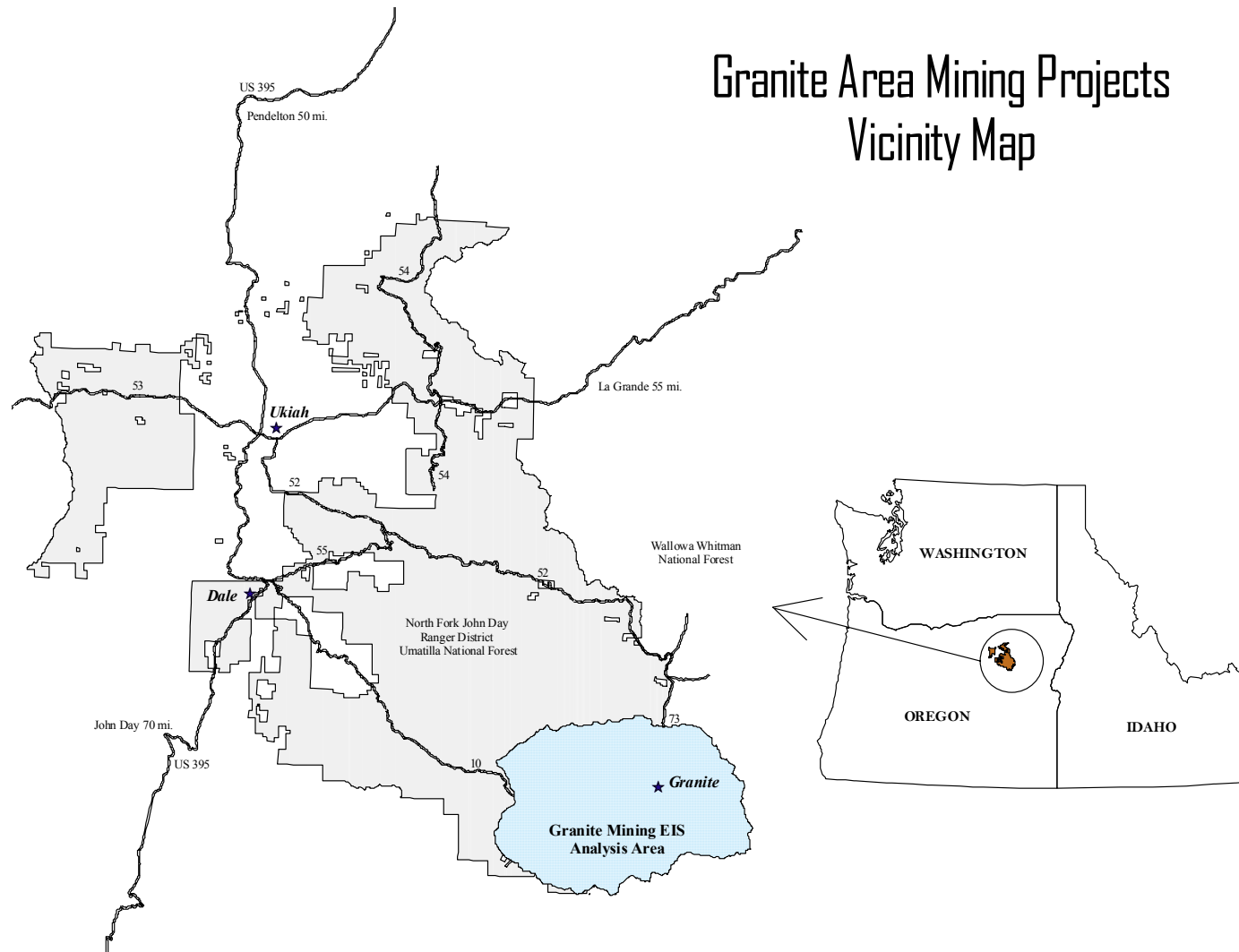
Miners Rights

Mining on National Forest System lands is a statutory right. There is a concern among some miners that regulation protecting forest resources from mining activities may prohibit prospecting or mining or could be so restrictive as to amount to prohibition.

Health and Safety

Mining operations can pose a safety risk to the general public. Uninformed recreationists may inadvertently travel onto active mining sites. Trucks and other vehicles used in the mining operation may pose a hazard to recreationists using the same roads. Pits and unguarded adits also pose a risk.

Figure 1.1. Vicinity Map.



CHAPTER 2: ALTERNATIVES

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CHAPTER 2: ALTERNATIVES

INTRODUCTION

This chapter describes and compares the alternatives considered for the Granite Mining Draft EIS. It includes a description of each alternative considered and presents them in a comparative form, displaying the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Topics discussed in this chapter include:

- ❖ the process used to formulate alternatives;
- ❖ alternatives considered but eliminated from detailed study (including the rationale for elimination);
- ❖ alternatives considered in detail;
- ❖ management requirements common to all action alternatives;
- ❖ specific mitigation and monitoring proposed for the project;
- ❖ alternative comparison; and
- ❖ a discussion of how each alternative addresses the significant issues identified for the project.



ALTERNATIVE DEVELOPMENT

Operators of the mining claims included in the analysis were contacted by the Forest Service in March of 2000 and asked to update their Plans of Operation. In some cases, the operators provided a revised plan and in other cases, they simply stated they intended to continue with the operations outlined in their existing plan. Two claims included in the analysis had been recently purchased by new owners and/or reclaimed and new plans submitted for these operations (PBGF and East Ten Cent). Several of the miners contacted indicated that they were only going to do assessment work in the foreseeable future and it was determined that the work did not require a plan of operation. These claims were dropped from the project. The Forest Mining Technician then reviewed each of the remaining plans and added the standard measures necessary to make the Plans legal. This included the addition of standard management requirements applicable to every claim, a reclamation plan and a calculation of a bond. The plans as submitted have been combined to form Alternative 2.

Next, the interdisciplinary team reviewed the updated plans. Using the key issues as a guide, they identified additional mitigation that could be added to the plans to reduce adverse environmental effects. The options were then reviewed by the team to determine if they were feasible and reasonable for the operator to implement. The additional selected mitigation was added to the plans to develop Alternative 3.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternative methods for achieving the purpose and need. Some of these alternatives may have been outside the scope of establishing terms and conditions supporting approval of plans of operation, duplicative of the alternatives considered in detail, or determined to be in conflict with state or federal law. Therefore, a number of alternatives were considered, but dismissed from detailed consideration for reasons summarized below.

Mining should be prohibited within the North Fork John Day River Basin due to the critical importance of the river as essential habitat for imperiled salmon, steelhead and bull trout. Forest Service regulations do not provide for denying a reasonable Plan of Operations. Thus, not responding to the need to act on the proposed Plans of Operation or denying them is not a viable option under the mining regulations. Denying the Plans of Operation would require a Congressional change in the current law, and is outside the scope of this proposal.

An alternative should be developed that requires an examination on each claim to assure the claim is valid before the Plan of Operation is approved. Many of the small-scale placer operations in the proposal were mined out long ago and are no longer economically profitable. There is no provision or direction in 36 Code of Federal Regulations (CFR) 228 A requiring that a discovery and valid existing rights be established on a claim prior to analysis and approval of a proposed Plan of Operations, with the exception of mining proposals in wilderness and other areas withdrawn from mineral entry (36 CFR 228.15). Other areas usually withdrawn from mineral entry include, but are not limited to, wild river corridors, Research Natural Areas, and municipal watersheds. The public laws that withdraw these areas from mineral entry include the provision that appropriation under the Mining Law will be subject to valid existing rights. The presence of a discovery of a valuable mineral, as defined in the 1872 Mining Law and subsequent 130 years of court cases, within the bounds of an unpatented mining claim is required to establish valid existing rights.

Although the statutes require the discovery of a valuable mineral deposit prior to the location of a claim, the courts and the Department of Interior have recognized a right of possession, in the absence of the discovery required by statute, if the claimant is diligently prospecting. The Forest Service recognizes this principle, and in keeping with the policy of encouraging bona fide prospecting and mining, will not discourage or unduly hamper these activities. Rather, the Forest Service will aid the legitimate activities of a prospector making bona fide efforts to obtain a discovery on a good prospect. On the other hand, the Forest Service will oppose attempts by prospectors to build permanent structures, cut timber, or build or maintain roads, unless authorized by

special use permit or approved operating plan. A mining claim may lack the elements of validity and be invalid in fact, but it must be recognized as a claim until it has been finally declared invalid by the Department of the Interior or Federal courts (FSM 2811.5).

Therefore, valid existing rights determinations are not required prior to approving mining operations on claims in areas opened to mineral entry under the Mining Law.

An alternative should be developed that not only includes the approval of Plans of Operations, but takes a holistic approach to improving degraded water quality in the Granite Watershed. The alternative needs to include a significant restoration component to address high temperatures and habitat modification presently found in the streams located in the watershed. This alternative is outside the scope of the project. Alternatives need to respond to the Purpose and Need identified for the project, which is to either: (1) respond to modify existing Plans of Operation to address listing of bull trout and steelhead trout as threatened under the Endangered Species Act 36 CFR 228.4(e), or (2) Approve Plans of Operations on other claims located within the watershed determined to likely cause significant disturbance 36 CFR 228.4(a). All activities incidental to the proposed mining activity are included in the analysis and management requirements and mitigations will be included to minimize adverse environmental impacts 36 CFR 228.8. However restoration activities not directly associated with the Plans of Operations being considered were not included because they do not meet the Purpose and Need established for the project.

A focused Water Quality Restoration Plan is being developed for the project area. The plan will address strategies and activities need for attainment of water quality standards. The plan will be completed before the Record of Decision for the Granite project is signed. The plan will be utilized by the State of Oregon when developing the Total Maximum Daily Load for the parameters causing beneficial use impairment. Specific restoration projects identified in the Water Quality Restoration Plan will be implemented under separate NEPA analyses when funding becomes available.

ALTERNATIVES CONSIDERED IN DETAIL

Three alternatives are considered in detail: the No Action, the Proposed Action, and one alternative to the Proposed Action. A map showing the location of the claims being considered in the analysis is provided at the end of chapter 1. Since the location of the claims will not change between alternatives, the same map is applicable to all alternatives.

Alternative 1 – No Action

The Interdisciplinary Team considered various approaches to meeting the legal requirements for a No Action Alternative. The 40 CFR regulations, which were developed to implement the National Environmental Policy Act, require that a No Action Alternative be analyzed to establish a baseline for the effects of alternatives. No mining was considered for the No Action Alternative, but the Team determined that no mining was an action, since it would represent a change from the current situation.

The No Action Alternative is defined as no change from the current situation. The Plans of Operation for the 16 operations included in the analysis would not change. This alternative maintains the current situation; it allows currently approved Plans of Operation to continue. No revised modifications to existing plans or proposed new plans would be implemented. This alternative cannot be implemented, since Forest Service Regulations in 36 CFR 228, subpart A, does not provide for denying a reasonable Plan of Operations.

Table 2.1, a summary of Alternative Descriptions, located at the end of this chapter includes a list of the operations included in this analysis and the activities proposed in Alternative 1.

Alternative 2 – Proposed Action

Alternative 2 is the Plans of Operation as submitted by the claimants. In some cases revised plans were submitted, but in most cases the proposed action includes the plan currently on file with the Forest Service. In addition to the Plan submitted by the claimant, applicable Management Requirements as well as reclamation plans and where necessary a reclamation bond were added to the Plan. The same requirements are incorporated in Alternative 3. Table 2.1 lists the changes between Alternative 1 and 2. A more detailed narrative description and outline of the activities proposed in Alternative 2, is located under Proposed Action on pages 1-5 thru 1-17 in chapter one.

Alternative 3 – Proposed Action with mitigations

The intent of alternative 3 is to minimize adverse environmental impacts on National Forest surface resources [36 CFR 228.8]. In addition to the management requirements identified for Alternative 2, mitigation will be added to individual Plans of Operation to address specific resource concerns related to those operations. A summary of this additional mitigation can be found in table 2.1 at the end of this chapter. In addition to this mitigation, the following other actions are incorporated into Alternative 3:

1. Forest Service Road 1035012 and the access road to Hopeful 2&3 will be gated and motorized access will only be available to the miners with claims along these roads. Although designated and signed as a closed road on the District Access and Travel Management Plan, the 1035012 road currently is not gated and has unauthorized use.
2. A focused Roads Analysis was completed for the area in and adjacent to the 16 mining operations in this analysis. The need for each existing road in the area was reviewed and because of that analysis the obliteration/decommissioning of 3 segments of roads, totaling 2.25 miles, will be included in Alternative 3.

Management Requirements Common to the Plans of Operations in Alternatives 2 and 3

Management Requirements are standard management practices that are designed to reduce the adverse effects on mining and associated activities. These measures will be included in all Plans of Operations.

General Requirements

- Operations where mechanized equipment is used will have reclamation bonds, operating plans and reclamation plans as required by PACFISH/INFISH.
- Sites are kept neat and orderly and garbage is regularly removed from the National Forest.

Hazardous Materials

- No waste storage occurs in riparian areas, floodplains, or spring areas.
- Hazardous materials are stored out of the floodplain.
- No chemicals are used in the operations.
- If on-site fuel storage is approved, operators are required to have a lined containment vat and a spill prevention plan will be made a part of the operating plan.
- All equipment will be checked for fluid leaks.
- Fuel for pumps will be stored off the ground in the bed of the pickup or on a trailer. Pumps will be refueled to prevent spillage. A funnel will be used to ensure fuel does not leak into the stream. Waste oil or other petroleum products may not be disposed of at the site and must be removed from National Forest.
- No fueling of equipment or routine maintenance will take place near streams, springs or wetlands.
- If there is a spill of petroleum products, the contaminated soil will be removed from the National Forest.

Noxious Weed Control

- All seed and straw used is certified free of noxious weeds.
- Areas of bare soil created by the operation are seeded using a Forest Service approved seed mix.

- Reclamation of excavations will be ongoing so only a minimum amount of ground is open at a given time.
- Forest Service will provide the minerals operator with weed identification material so that they might be better able to recognize the presence of noxious weeds.
- A copy of the known noxious weed infestations map will be included in the approved plan of operations for this project.
- All equipment to be operated on the project area will be cleaned in a manner sufficient to prevent noxious weeds from being carried on to the project area. This requirement does not apply to passenger vehicles or other equipment used exclusively on roads. Cleaning, if needed, will occur off National Forest System lands. Cleaning will be inspected and approved by the Forest Officer in charge of administering the project.
- Machinery moved into the mining area for testing will use one route in and the same route out. In this way, the disturbance of existing vegetation is limited, providing a smaller area, which is at a higher risk to infestation from noxious weeds, and providing a smaller area for noxious weed dispersal by equipment (even though the equipment is to be cleaned).

Erosion Control

- During ongoing mining activities all disturbed sites (road cut and fill slopes, camp site, ponds, dumps and stockpiles) are maintained in a stable condition.
- Roads are treated to prevent significant soil movement, rutting and sedimentation. Treatment may include spot rocking, installation of water bars, ditching and out-sloping of road surfaces where possible. The Forest Service will be contacted if work with mechanized equipment is needed to stabilize the road.
- Forest Service roads are protected from damage. Driving native surface roads during wet weather will be avoided where possible.
- If dust or rutting is a problem, roads will be rocked.
- Topsoil is scraped off the test/mining locations and replaced after testing/mining is complete. Washed gravel is returned to the mining excavation before topsoil is replaced.
- Where tree removal is approved, trees are spread over the reclaimed ground after reclamation.
- Grass, brush and trees are replanted to the current or greater densities.
- All mined areas are returned to normal or near normal contours.

- All mined areas are stabilized prior to seasonal shutdowns or extended equipment maintenance and before equipment removal.
- All stockpiled topsoil and/or other suitable fines such as silt from the settling ponds, are evenly spread back over disturbed areas on completion of the operation and/or in an ongoing restoration program. Areas are reclaimed to the pre-mining condition or better.
- Piles of wood or straw bales are available in case of erosion caused by storm events.
- Water will be contained in ponds with no discharge allowed. All ponds are left dry or at the normal water table during seasonal shutdowns.
- All mining excavations in the annual floodplain will be reclaimed before winter shutdown.
- Restoration activities, if approved in plan, take place throughout the mining season.
- If sediment is visible in the stream below the mining site, the operation will cease work, the cause of the sediment determined and the problem corrected before further mining or processing takes place.
- Process water will not be discharged.
- Vegetation providing essential shade and or bank stability to the stream will not be removed (includes brush and trees), unless approved by the Forest Service.
- The streams will not be dried up when make-up water is taken from the creek.
- There will be no damming of water in the streams.
- A zero discharge settling/recycling system is utilized.
- Surface run-off water is ditched around the operating site to ensure this run-off water does not become process water.
- The operator will avoid and/or protect any known or discovered threatened and endangered plants.
- All ground disturbing operations outside this plan will have prior written approval of the Forest Service. Proposals not in this plan will be submitted in writing and will be made an addendum to this plan.
- During close out reclamation, mine access roads are seeded, covered with wood and closed to vehicles.

- At the close of operations, all vehicles, trailers, structures and associated mining equipment are removed from National Forest system lands.
- For Pick & Shovel type work a site specific buffer at least three feet wide, measured horizontally from the annual bank full width of the stream, of vegetated ground, rock, or tailings will exist between the test site and the stream.
- Wood and straw bales certified free of noxious weeds may be used to establish a barrier along the banks to control sediment movement toward the creek.
- Placer gravel exposed in stream banks will not be sampled. Stream banks above the water line will not be impacted in any way that could destabilize the banks or cause sediment to be introduced into an adjacent stream.
- Highbankers, sluice boxes, and other small processing plants will be set up at least 20 feet from the stream or as determined on a site specific basis. Muddy water will be allowed to seep into rocky areas or ponds and depressions. The Forest Service will approve the area before process water is discharged. There will be no discharge into the stream.
- Straw bales and filter cloth may be used to provide an additional buffer agent along the stream (use in areas where vegetation is sparse or banks slope toward the creek).
- Forest Service personnel will check areas proposed for work at the beginning of each operating season. They will ensure stream buffers, straw bales, filter cloth, and other protective measures are being utilized as required for each site.
- For Pick & Shovel type work new areas of disturbance will not be contiguous in one season. If the first area is reclaimed during one season, an area at least 20 foot long running parallel with the stream will be skipped before a new area is opened up. Once vegetative cover is established on the first reclaimed area, the second area contiguous to the first may be opened up.
- Areas of disturbance in the annual floodplain will be reclaimed annually or as determined on a site-specific basis.
- Reclamation of disturbed areas will be ongoing within the RHCA. This will include refilling test holes, planting grass, brush, and trees to the original densities, and mulching with wood or straw certified free of noxious weeds.

Cultural Resources

The operator must protect all cultural resources identified by the Forest Service during the cultural resource compliance process.

This means the operator shall protect, in place, all cultural resources including, but not limited to:

- (1) historic sites, buildings, ruins of buildings or cabins, and other structures such as corrals, water troughs and fences
- (2) historic artifacts or relics such as coins, cans, bottles, tools and all other historic items
- (3) prehistoric sites, burial sites, rock art, Indian middens and all other evidences of prehistoric Indians
- (4) Indian artifacts or relics such as arrowheads, spear points, stone tools, beads, and all other prehistoric items. This responsibility includes the obligation to prevent operators' employees and guests from disturbing, injuring, destroying, looting or collecting any cultural resource.

In order to assist the mining operator, before approval of this operating plan, the Forest Service has obtained adequate cultural resource inventory data to insure compliance with Section 106 of the National Historic Preservation Act of 1966 as amended.

Camping

- Campsites will be located at least 300 feet from the stream wherever possible. Industrial camping will occur only during the time mining is taking place.
- Outhouses will be located at least 300 feet from the stream and will be constructed to DEQ regulations. Chemical outhouses may also be utilized and may be located closer to streams.
- Showers and all gray water will be disposed of outside the RHCA.
- All garbage will be removed regularly from the National Forest.
- Trailers will be removed from the National Forest seasonally.

Additional Management Requirements common to claims in Alternatives 2 and 3 where suction dredging is included in the Plan of Operation.

Some Plans of Operation include suction dredging as part of the proposed activities. The following measures will be added to all Plans of Operation where suction dredging is proposed.

Suction Dredging

- Dredging is not permitted during the periods of fish spawning or egg incubation. Therefore, operations are restricted to the following periods:

All Anadromous Watersheds

July 15 - Aug 15

- Dredging is permitted only within the wetted area of the active stream channel where the dredging spoils are relatively clean and will cause minimum turbidity when returned to

the stream. Mining of stream banks or upland areas is not authorized. Dredges will not be used in the dry gravel bars beside the stream.

- Dredging shall be performed such that in-stream turbidity will be minimized and localized to the general area of the dredge activity. If turbidity is visible 300 feet downstream from one or more working suction dredges, then turbidity exceeds allowable in-stream water quality standards and dredging must stop. Tailings shall not be discharged into any naturally occurring pool in the work area if it will reduce the volume or depth of the pool.
- Removal or disturbance of rooted or embedded woody plants in the stream including trees and shrubs is prohibited.
- Suction dredging shall be performed such that undercutting of stream banks and riparian vegetation does not occur.
- Care shall be taken by the operator during refueling of the dredge to prevent spillage. The suction dredge shall be checked for leaks prior to start of operation. The gas can used for refueling will contain slightly less fuel than the amount needed to fill the tank. A funnel will be used to ensure fuel does not leak into the stream. Waste oil or other petroleum products may not be disposed of at the site, and must be removed from the National Forest.

Spill kits (reabsorbing matter) must be available in case of an accidental fuel spill.

Fuel will be stored out of the floodplain so that spills into streams or rivers do not occur.

In the event soil is contaminated with spilled petroleum products, the soil will be excavated to the depth of saturation and will be removed from the National Forest.

- The operator shall provide a safe passage for fish around and through the active mining area.
- The suction dredging activity shall be conducted such that it will not result in the formation of a dam within the stream or divert a waterway.
- No suction dredging shall be allowed in streams designated by the State of Oregon, Department of Environmental Quality, as water quality limited for temperature if the activity would result in a measurable increase in temperature.
- When layers of clay, ash, or areas of heavy sediment are uncovered during dredging activities, causing visible sediment 300 feet downstream from the operation, activities will cease and the dredge will be moved.

- Rocks that are placed downstream from the dredge, which might stop fish passage during low flows, will be removed from the stream following dredging or spread around near the banks where they will not be barriers to fish passage.
- Whenever possible woody debris will be left in the stream and along the banks. If it is necessary to remove the wood to get the dredge into the stream, the wood will be replaced when dredging is finished.
- Riparian shrubs along stream banks will not be disturbed unless necessary. Ideally, dredges will be unloaded into streams where no vegetation exists and will be floated into place. However, if brush must be removed, it will be planted back to approximate current densities. A maximum five-foot opening will be cut in the riparian shrubs along the stream banks leaving the roots in place.
- If areas of bare soil result from camping or other incidental activities associated with this operation, these will be re-vegetated with a seed mixture which is certified free of noxious weeds.
- A site specific reclamation bond may be required to ensure reclamation takes place when surface disturbance results from the suction dredge operation (i.e. brush removal, areas of bare soil beside the stream, rocks placed in riparian areas, damage to stream banks).

MONITORING

The following monitoring activities will be implemented for both action alternatives. Activities and their effects, including adequacy of Management Requirements and specific mitigation measures, will be monitored for each specific Plan of Operations.

Mining Claim Administration

The Forest Minerals Technician is responsible for completing minerals inspections and review to determine if Forest Plan standards and guides, as well as the requirements in the Plans of Operation are being met. All active operations are visited weekly when operating to assure compliance. If operations are found not to be in compliance, the Minerals Technician is responsible for assuring corrective action is taken. The Minerals Technician is also responsible for reclamation reviews. These review assure that requirements in the reclamation plans are being properly implemented and completed in a timely manner.

The periodic inspections by the Minerals Technician also include monitoring for any new noxious weed infestation. Claimants are taught to recognize the most troublesome noxious weeds and with their help, newly established infestations can be controlled before they have a chance to grow or spread.

Information from the mineral inspections is summarized yearly in the “Monitoring and Evaluation Report for National Forests of the Blue Mountains”.

PACFISH/INFISH Implementation Monitoring of Minerals

In FY 2001, the Interagency Implementation Team (ITT) developed four new implementation monitoring modules to be tested in FY 2001. One of the modules included mineral activities. The modules have been designed to meet the implementation monitoring needs of the Forest Service PACFISH and INFISH and the legal requirements of the Biological Opinions for salmon (March 1, 1995) and steelhead (June 19, 1998) issued by the National Marine Fisheries Service, and for bull trout (August 14, 1998) issued by the U.S. Fish and Wildlife Service. This monitoring will continue to be expanded in the upcoming years.

All mineral activities areas are assigned to a Module Category. There are three categories: I includes activities within Riparian Habitat Conservation Areas (RHCA's) in subwatersheds having ESA-listed fish species; II includes activities within RHCA's in subwatersheds with no ESA-listed fish species; and III includes activities not within RHCA's. Most claims being analyzed in this project fall into Category I.

Currently, monitoring is focusing on whether or not PACFISH/INFISH direction has been included in minerals management activities. The initial screening is designed to determine:

- ❖ If applicable standards and guides and other regulations have been incorporated into plans of operation.
- ❖ If requirements developed during project specific consultation have been incorporated into plans.
- ❖ If the plans contain stipulations for modification including reclamation requirements and bond amounts.
- ❖ For surface disturbing activities, are reclamation requirements included, and is a bond in place.
- ❖ If reclamation requirements in the permit provide for needed short, or long-term monitoring and maintenance of the reclaimed project site
- ❖ If operations under this plan meet the PACFISH/INFISH riparian management goals and objectives and avoid adverse impacts to listed species and their habitat.

During the 2001 field season the draft-monitoring module for minerals was tested. Results of tests are being evaluated and a final protocol is expected in 2002. When finalized, this monitoring will be helpful in determining if PACFISH/INFISH requirements are being implemented properly on the District.

Water Quality

Mining and suction dredging, by their natures, mobilize sediment from stream channels, banks, floodplains, and possibly adjacent slopes. If funding is available, it will be necessary to establish a channel reference site downstream of activity in order to quantify this sediment. This site will be accessible by road before, during, and after the operating season, but does not need to be open all year. At this site, a valley and a channel cross section will be established. The channel cross section will be resurveyed after 1 year, then after 5 years, and then every 10 years, or as needed. A Wohlman pebble count and a discharge measurement will be conducted when the site is

established, and every year thereafter. The location of this site and timing of measurements may be adjusted to obtain an adequate scale to detect changes. Bedload sampling and turbidity sampling may also be employed. The Mining EIS project is adjacent to the Buck Creek Prescribed Fire project, and it may be necessary to locate the site downstream of both projects. If there are large or quick changes in cross section, sediment, or flow, wading surveys will be conducted to identify sources of sediment or diversions of water. The goal of this monitoring is to determine if the channel geometry of these streams changes and the quantity of sediment above baseline that is mobilized and re-deposited. If necessary, monitoring needs to identify the source of the sediment.

Fisheries

Current monitoring within the watershed includes redd counts by Oregon Department of Fish and Wildlife which is done each year. The Umatilla surveys all watersheds within the forest on a 10-year rotational basis. Current funding has reduced the amount of streams surveyed. Water temperature is taken on an annual basis from several locations within the watershed. Fishery and Hydrology specialists will accompany the Mineral Tech during site visits at least once a year to determine the effectiveness of management requirements. Information gathered during these visits will be documented.

OTHER ACTIVITIES IN THE AREA

A number of activities that occurred in the past still have residual effects on the resources in the Granite watershed. There are also a number of ongoing and foreseeable future activities within this area. A potential exists that any of the activities, together with the mining operations occurring in the area could result in an incremental increase in overall effects to resources. Such cumulative effects are discussed in Chapter 4 of this document. The past, ongoing, and foreseeable future activities that could contribute to cumulative effects are summarized here, with a more detailed description in Appendix A.

Past Activities

- ◆ dredge mining in Clear Creek and Granite Creek and some tributaries
- ◆ Fremont Powerhouse operation and restoration
- ◆ 477 miles of existing roads (Forest Service, State, County, Private) currently within the analysis area, of which 413 miles are open for public use
- ◆ 9,590 acres of commercial harvest (commercial thinning, clearcut, salvage)
- ◆ unknown acres of harvest on private lands within the analysis area
- ◆ 9,941 acres of re-planting in old harvest units and burned areas
- ◆ grazing of livestock on 7,559 acres within the watershed
- ◆ installation of numerous instream log weir aquatic habitat structures in Clear and Granite creeks
- ◆ planting of riparian shrubs and trees on portions of Clear and Granite creeks

- ◆ development of the Olive Lake Campground and trail, two individual trailheads

Ongoing Activities

- ◆ 61 placer mining operations, 31 lode operations, 6 combination Placer and Lode operations
- ◆ firewood gathering along open roads
- ◆ maintenance of system roads
- ◆ restoration of the Fremont Powerhouse Complex
- ◆ Fremont Powerhouse complex Cabin Rental Program
- ◆ recreational use equal to an estimated 8,100 recreation visitor days within the watershed (hunting, hiking and snowmobile use are the most frequent activities)
- ◆ operation and maintenance of trails, campgrounds, and trailheads
- ◆ restoration of the Clear Creek Dredge Tailings
- ◆ Greenhorn water use permit
- ◆ Pete Mann Ditch water diversion
- ◆ Powerline permit from Granite to Fremont

Foreseeable Future Activities in Addition to Proposed Actions

- ◆ new Plans Of Operation for 4 placer mines and 2 Lode mine are proposed
- ◆ pre-commercially thin 3,500 acres
- ◆ plant within the reclaimed flood plains of Clear Creek and Granite Creek
- ◆ harvest by commercially thinning 844 acres on the Umatilla and Wallowa-Whitman to reduce overstocking and move species composition toward a more historic mix
- ◆ understory burn about 5,280 acres (Buck Creek EIS) to reduce accumulated dead and down fuels, overstocking and move species composition toward a more historic mix
- ◆ restoration of a headcut on Bull Creek
- ◆ reconstruction of the water system for the town of Granite
- ◆ extension of the fiber optic telephone line from Buffalo mine to the Crane Flats area
- ◆ Maintenance and repair of the Pete Mann Ditch
- ◆ Replacement of pipes currently draining Bluebird and Blackjack Mines

COMPARISON OF ALTERNATIVES BY ISSUE

Chapter 1 presents in detail the Key Issues that are the focus of this DEIS. This section compares the alternatives in terms of these issues.

Key Issue 1: Water Quality

Mining operations can have a negative effect of water quality. Roads, placer mining, and vegetation removal in riparian Habitat Conservation Areas (RHCA) may reduce stream shade, resulting in higher water temperatures, while erosion of exposed and disturbed upland soils and stream bank can increase sediment load. Drainage from lode mines and mill tailings can introduce metals potentially toxic to aquatic biota into stream waters. The nature of the proposed action (mining) and the physical location of many of the mines in or adjacent to local creeks will in some cases introduce sediment into creeks. Suction dredging can adversely impact aquatic resources by destabilizing channels, at least locally, and by mobilizing sediments. Other impacts can include noise, competition for use of riparian areas, and chemical pollution by petroleum hydrocarbon fuels, lubricants, and remobilizing chemical contaminants (such as mercury) sequestered in bed sediments.

All action alternatives include a similar level of mining activities, so effects to water quality will not differ greatly between each alternative. In Alternative 1, six claimants propose to use suction dredging as well as various other mining activities. In Alternative 2 and 3, an additional two placer claims will have suction dredges operating in streams. However, a comprehensive set of management requirements will be added to each POO under Alternative 2 and 3. In addition, Alternative 3 will include additional mitigations as well as other restoration activities. Overall, the least effects to water quality will occur under Alternative 3.

Key Issue 2: Fish and Aquatic Habitat

Adverse impacts to fish habitat can be directly related to mining operations, including negative effects on water quality (see Key Issue 1: Water Quality). Mining operations have the potential to affect several sensitive and threatened fish species occurring in the watershed including steelhead trout, bull trout, westslope cutthroat trout, interior redband trout and chinook salmon.

Suction dredging can affect aquatic resources such as aquatic and riparian organisms. It can greatly alter stream channels and mobilize fine sediments. Other mining operations could diminish the quality of the fish habitat by removing streamside vegetation, which shields water from solar radiation, provides hiding cover and food sources for fish, and entraps low levels of sediment. Also, mining activities could result in increased erosion and sedimentation due to loss of soil cover and cohesion, and increase runoff and peak stream flows. Fry emergence and insects that provide food for fish could be reduced by an increase in fine sediment, further impacting fish populations. Differences in effects to the fishery resource by alternative, will be similar to those disclosed for water quality (see above).

COMPARISON OF ALTERNATIVES BY KEY ISSUES AND INDICATORS OF RESPONSE

Table 2.1. Response to Key Issues

Indicator of Response	Alternative		
	1	2	3
Key Issue 1 Water Quality			
No. of Plans with suction dredging	6	8	8
Total Acres of disturbance per year	<7	<7	<7
Miles of road decommissioning	0	0	2.25
Key Issue 2 Aquatic Habitat			
1) Risk of contamination from suction dredging	low	very low	very low
2) Risk to fish from project related sediment yields	low	low	very low

1) The use of modern equipment powered by internal combustion engines poses a risk of contamination by petroleum hydrocarbon fuels and lubricants. Alternative 1 has the lowest risk, since only six Plans include suction dredging. Alternatives 2 and 3 have two more operations that include suction dredging, however there are additional management requirements in these two alternatives to reduce the risk of contamination, so the risk is very low.

2) Overall, the management practice with the greatest potential for generating sediment is suction dredging. Other proposed mining activities also have potential for mobilizing sediment. Alternatives 1 and 2 will have similar outputs while Alternative 3 (with additional mitigation) will have the lowest output.

COMPARISON OF ALTERNATIVES

Table 2.2. Summary of the alternative descriptions

Project Name	Legal	Stream	Water Source	Equipment	ALTERNATIVE 1 (current POO)	ALTERNATIVE 2 (proposed POO)	ALTERNATIVE 3 (added mitigation)
Brice 1-3 (U-42)	T08S, R35E. Sec21	East Ten Cent Creek	East Ten Cent Creek	Suction dredge, hand tools, pickup, wash plant, pumps, sluice	Suction dredge and Pick & Shovel work	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2
Bunch Bucket (U-51)	T09S, R35E. Sec22	Clear Creek	Clear Creek and existing hole	Backhoe, trommel, crawler, pickups, pumps, handtools	Excavating and processing from test trenches with heavy equipment	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus silt fence along creek. No direct discharge into creek. Access to claim kept closed. Cabin for equipment storage only.
East Ten Cent Cr (U-32)	T09S, R35E. Sec22	East Ten Cent Creek	East Ten Cent Creek and existing hole	Backhoe, trommel, pumps, hand tools, pickups, suction dredge	Excavating and processing with heavy equipment. Including working stream bank. Cabin on claim near stream.	Same as described in Alternative 1 with the addition of suction dredging plus Management Requirements.	Same as Alternative 2 plus silt fence along creek.
Grubstake Placer (U-33)	T09S, R35E. Sec14	Clear Creek	Existing hole on claim	Trommel, high banker, backhoe, pickups, pumps, handtools	Excavation and processing using a trommel, high banker, and small tractor/backhoe. Working within about 50 feet of Clear Creek and progressing away from stream. Also includes suction dredging in Clear Creek.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2
Hopeful 2&3 (U-14)	T08S, R35E. Sec28	Granite Creek	Granite Creek	Backhoe, crawler, trommel, pickup, pumps, grader, handtools	A backhoe, crawler, trommel, truck, and devices for filtering water are used to excavate and process up to 300 cubic yards of material per year. Operators are exploring ideas on how to extract gold from spring water. The claim has two fords to cross Granite Creek. Claimant uses a grader to maintain their road.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus no direct discharge into creek. Improve function of settling pond on claim. Main access road to claim kept closed.
Hopeful Claim (U-40)	T08S, R35E. Sec29	Granite Creek	Granite Creek	Backhoe, trommel, handtools, pumps, pickup	Excavation and processing in a 30 by 30 foot hole. Equipment used is small tractor backhoe, wash plant and pump.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2
Lucky Strike (U-54)	T10S, R35E. Sec3	Lightning Creek	none	Backhoe, hand tools, pickups	Tunnel extension and exploratory work with heavy equipment plus pick & shovel and continued restoration of the mill building.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus waste material from tunnel cleanout will be dispersed in such a manner that sediment will not reach Lightning Creek.
Magnolia Mine (U-38)	T08S, R36E. Sec22	Lucas Gulch	none	Backhoe, dozer, dump truck, crawler	Work in existing tunnel with a backhoe, small cat, and hand tools. Granite creek is forded to access the claim. There are ponds on the claim; they are located about 15 feet from Lucas Gulch and eight feet higher than the creek.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus waste material from tunnel cleanout will be dispersed in such a manner that sediment will not reach Lucas Gulch. Improve function of settling ponds on claim.

Project Name	Legal	Stream	Water Source	Equipment	ALTERNATIVE 1 (current POO)	ALTERNATIVE 2 (proposed POO)	ALTERNATIVE 3 (added mitigation)
Old Eric 1&2 (U-47)	T0S, R351/2E. Sec4	Granite Creek	Existing hole on claim	Handtools, pickups, sluice plant, suction dredge	Excavation and processing by hand. Mining 100 feet from Granite Creek, processing 50 feet from creek.	Same as described in Alternative 1 with the addition of suction dredge work in Granite Creek, backhoe to deepen prospect hole plus Management Requirements.	Same as Alternative 2 plus move pond as far away from creek as possible. Improve function of pond used for processing water.
PBGF Placer 1-3 (U-22)	T08S, R35E. Sec25; T08S, R351/2E, Sec28	East Ten Cent Creek	Settling ponds	Wash plant, backhoe, pumps, generator, pickups, dump truck, ATV, hand tools, suction dredge, trommel, rock crusher, camp trailer	Excavation and processing of material from test holes. Water from existing ponds is used for processing. Suction dredge work during dredging season.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus silt fence and straw bales along creek. 10 foot undisturbed buffer along creek.
Republic Comeback #7 (U-08)	T08S, R35E. Sec29	Rabbit and Granite Creeks	Rabbit Creek	Backhoe, trommel, pumps, hand tools, pickups, suction dredge,	Equipment used on this claim is a backhoe, trommel, pumps, and pick & shovel type work. Some dredging could occur along with some hand panning. There is a ford on Granite and Rabbit creeks.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus improve drainage from existing ponds so no direct discharge into Rabbit and Granite Creeks occur.
Republic Comeback #10 (U-13) & Republic Comeback #11 (U-39)	T08S, R35E. Sec 19 S1/2 Sec 30 N1/2	Granite and Indian Creeks	Existing hole in dredge tailings	Backhoe, trommel, pumps, hand tools, pickups, suction dredge	Suction dredging, excavation and processing on site with heavy equipment. Granite and Indian creeks will be forded.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus move trailer to north side of Granite creek.
Rosebud 1-4 (U-49)	T09S, R35E. Secs 1&4	Granite Creek	Seeps	Hand tools, backhoe, pickups	Excavation by hand and backhoe in existing hole about 660 feet from Granite Creek.	Same as described in Alternative 1 with the addition of prospect work for rest of claim plus Management Requirements.	Same as Alternative 2.
SW St. Paul Claim (U-25)	T08S, R36E. Sec27	Granite Creek	none	Hand tools, pickups, backhoe	Pick and Shovel in established tunnels.	Same as described in Alternative 1 with the addition of backhoe use plus Management Requirements.	Same as Alternative 2 plus tailing pile location approved by FS. If affluent from adit appears a settling pond will need to be constructed.
Tar Hill/Ten Cent (U-46)	T08S, R35E. Sec19	East Ten Cent Creek	East Ten Cent spring flows (diverted into pond for later use)	Dozer, backhoe, dump truck, trommel, pumps, pickups, handtools	Excavate and process up to 10 cubic yards of gravel daily on up to one acre per operating season (June to October). Heavy equipment is used to excavate and transport material to an on-site processing area. Fines in settling ponds are reprocessed with a suction dredge.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2 plus silt fence and straw bales along creek. 10 foot undisturbed buffer along creek.
Troy D proposed (WW-104)	T09S, R35E. Sec9; T09S, R351/2E, Sec 1	Granite Creek	Existing ponds	Backhoe, pickups, pumps, hand tools, crawler	Excavation and processing of test holes and tailing piles. Water from existing ponds is used for processing.	Same as described in Alternative 1 plus Management Requirements.	Same as Alternative 2.

CHAPTER 3: AFFECTED ENVIRONMENT

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CHAPTER 3: AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing condition of resources within the Granite Watershed. These conditions can be used to compare the consequences of the alternatives (which are described in Chapter 4). This information is generally organized in the same order as the issues listed in Chapter 1. Bolded sections are associated with the Key Issues identified in Chapter 1 and as such, are most relevant to the decision.



- ❖ WATER QUALITY (Covers Key Issue and the soils resource)
- ❖ FISH AND AQUATIC HABITAT (Covers Key Issue 2 and the Proposed, Endangered, Threatened and Sensitive species as well as Forest Plan required Management Indicator Species tracking issue)
- ❖ RECREATION (Covers the Recreation Use tracking issue as well as Wilderness Resources)
- ❖ WILDLIFE (Covers Wildlife Habitat and the Proposed, Endangered, Threatened and Sensitive species and Management Indicator Species tracking issues)
- ❖ SOCIO-ECONOMICS (Covers Economics as well as the Health and Safety and “Miners Rights” tracking issues.
- ❖ NON-FOREST VEGETATION (Covers Proposed, Endangered, Threatened and Sensitive plant species and the Noxious Weed tracking issues)
- ❖ HERITAGE RESOURCES (Covers the Heritage Resources tracking issue)
- ❖ TRANSPORTATION SYSTEM (Covers the Transportation tracking issue)

WATER QUALITY

The analysis area consists of the Granite Creek watershed (93), which comprises 15 subwatersheds (93A through 93O). Subwatersheds for which specific mining claims have received current Plans of Operation (POO) include the Lower Granite Creek subwatershed (93A), the Ten Cent Creek subwatershed (93B), the Upper Granite Creek subwatershed (93C), the Rabbit Creek subwatershed (93E), the Middle Clear Creek subwatershed (93J), and Lightning Creek subwatershed (93K).

The Granite Creek watershed (93) encompasses 94,052 acres, 95.5 percent of which are Federal lands managed by the Forest Service. The remaining 4,345 acres are privately owned, many of them as patented mining claims. Land ownership information for the subwatersheds that are the subject of this report is summarized in Table 3.1, below.

Table 3.1 – Land ownership within affected subwatersheds (acres)

	Subwatershed	Total Area	National Forest	Private	% National Forest Ownership in SWS
93A	Lower Granite Creek	9,675	9,134	541	94.4
93B	Ten Cent Creek	4,169	3,533	635	84.7
93C	Upper Granite Creek	10,786	10,282	504	95.3
93D	Lake Creek	12,043	11,993	49	99.6
93E	Rabbit Creek	4,868	4,868	0	100
93F	Lower Clear Creek	2,650	2,273	377	85.8
93G	Upper Clear Creek	6,372	6,277	95	98.5
93H	Ruby Creek	3,046	3,046	0	100
93I	Congo Gulch	1,478	1,397	81	94.5
93J	Middle Clear Creek	2,117	1,988	128	93.9
93K	Lightning Creek	4,826	4,453	373	92.3
93L	Olive Creek	4,725	3,921	804	83.0
93M	Beaver Creek	8,351	8,165	187	97.8
93N	Lower Bull Run Creek	10,120	9,672	448	95.5
93O	Upper Bull Run Creek	9,298	9,113	185	98.0
	Total	94,526	90,119	4,407	95.3

Past activities such as mining, timber harvest, road construction, and livestock grazing have affected the existing condition of the watershed to varying degrees. The residual effects of these activities are discussed in the following sections of this report.

Sedimentation and water temperature are the primary water quality parameters that may be affected by the proposed action. Water chemistry is discussed in this section because past lode mining practices have locally affected water quality, potentially contributing to cumulative effects. Each of these water quality factors is discussed separately in the following subsections.

Sedimentation

Rainfall intensity, which plays an important role in the rate of soil erosion, is low in this area. Sediment levels in Forest streams vary significantly with flow, and are highest during periods of spring snowmelt. However, isolated high intensity thundershowers do occur in the study area. These high intensity storms can result in high runoff events and attendant heavy pulses of sediment transport, especially in disturbed areas such as roads, burns, and recently mined areas.

Sediment can be mobilized and introduced into stream systems through three primary mechanisms within the analysis area. First, sediment can be mobilized by overland flow across mineral soils exposed or compacted by fire, logging, or other disruptive activities such as prescribed burning, road building, and grazing. Second, placer mining can expose mineral soils in riparian areas and/or destabilize stream banks, and thus mobilize sediments. Finally, increased

peak discharge from logged, mined, or otherwise disturbed areas can increase channel scour in first order channels.

Past timber harvesting has almost certainly contributed to increased sediment yield from the analysis area. The collection of quantitative data regarding this potential increased sediment yield has been precluded by the high cost and complexity of such data collection as well as the high temporal and spatial variability of sedimentation within the analysis area. While Helvey's 1995 study (Helvey and Fowler, 1995) at High Ridge documents the direct effects of logging on sediment yields, mining-related impacts were not studied.

Mining has and continues to produce sediment periodically. The seasonal operation of suction dredges in creeks mobilizes fine sediments, which are transported downstream in plumes. Past and current excavation on upland placer deposits and lode mines loosens soils and removes vegetation that can serve to catch mobilized sediments.

Monitoring changes in sediment yield that result from management activities is challenging at the watershed scale due to high spatial and temporal variability. In addition, sediment data information is sparse and incomplete. Monitoring on the Umatilla Barometer Watershed showed that annual sediment yield varied by an order of magnitude during an 8-year period (Harris and Clifton 1999). Intensive monitoring of sediment yield also was conducted in the High Ridge Evaluation Area prior to and following the second ground based logging treatment. Watersheds 1 and 2 were clearcut and a shelterwood prescription conducted on Watershed 4. Unfortunately, the changes in sediment yield cannot be compared to determine statistical significance because the one pretreatment year of data does not account for natural temporal variation. During the first year after logging (including harvest within riparian areas), sediment yield from Watershed 4 experienced a 34 percent decrease in sediment yield (Helvey et al. 1995). Watershed 3, which was untreated, increased 168 percent. The authors concluded that the pulse of sediment from Watersheds 1 and 2 were probably caused by logging related soil. A comparison of sediment yields from the logged and unlogged watersheds showed that during the year prior to logging sediment yields from watersheds 1 and 2 were 5.5 and 7.4 times greater than Watershed 3, respectively. During the 5-year period after logging, sediment yield from watersheds 1 and 2 was 2.6 and 9.8 times greater than the unlogged watershed, respectively. With only one year of pretreatment data it is not possible to conclude how much spatial variability in sediment yield existed before logging occurred. Also, watersheds 1, 2 and 4 were logged 7 years prior to the initiation of sediment monitoring, so these watersheds may have experienced some effect prior to monitoring. Six to 11 years after treatment sediment yield was 10 percent (watershed 1) and 51 percent (watershed 2) lower than the amount from the untreated watershed. The authors concluded that the decrease in sediment yield resulted from the dense riparian vegetation that became re-established with the riparian area after the forest canopy was removed and that much of the loose material was scoured from the stream during the previous years of elevated sediment levels.

Equivalent clearcut acre (ECA) percent approaches 15 percent in the Lower Granite Creek (93A) subwatersheds and exceeds 15 percent in the Ten Cent Creek (93B), Upper Granite Creek (93C), Lower Clear Creek (93F), Middle Clear Creek (93J), Olive Creek (93L), Beaver Creek (93M), Lower Bull Run (93N) and Upper Bull Run (93o) subwatersheds.

Perceptible changes in hydrology occur when a threshold percentage of vegetation within a given watershed is altered or disturbed. The threshold as stated in the Umatilla Forest Plan (pg 4-77) is reached when 30 percent or more of a subwatershed is composed of timber in the 0 to 30 year age class. Since less than 30 percent of the analysis area is currently in the 0 to 30 year age class, as shown in Table 3.2 below, hydrology has probably not been greatly affected by past timber management activities. With the exception of the Upper Granite Creek (93C) subwatershed, the subwatersheds in which mining activities are proposed (named in bold type) fall into the “Low” risk category. Upper Granite Creek (93C) falls into the low end of the “Moderate” risk category, exceeding the category limit of 15 percent by 1.9 percent.

Table 3.2 – ECA, Stands younger than 30 years, by subwatershed.

Subwatershed (SWS)		Forested Acres (1)	ECA % (1)	Harvest/ Plant Acres (2)	Wildfire Acres (2)	Stands < 30 years (acres) (2)	Percent Stands < 30 years	Watershed Risk Rating (3)
93A	Lower Granite	9,069	14	433	337	770	8.4	Low
93B	Ten Cent	3,471	26*	240	17	257	7.4	Low
93C	Upper Granite Creek	9,556	45	1616	0	1616	16.9	Moderate
93D	Lake Creek	11,649	9	676	0	676	5.8	Low
93E	Rabbit Creek	4,846	4	21	0	21	0.4	Low
93F	Lower Clear Creek	2,208	29*	365	0	365	16.5	Moderate
93G	Upper Clear Creek	6000	6	0	0	0	0	Low
93H	Ruby Creek	3,046	6	69	0	69	2.2	Low
93I	Congo Gulch	1,396	9	305	0	305	21.8	Moderate
93J	Middle Clear Creek	1,918	16*	7	0	7	0.3	Low
93K	Lightning Creek	4,826	5*	0	0	0	0	Low
93L	Olive Creek	4,724	18*	371	0	371	7.8	Low
93M	Beaver Creek	7,896	31	1514	0	1514	19.1	Moderate
93N	Lower Bull Run Creek	9,885	32*	1907	0	1907	19.2	Moderate
93O	Upper Bull Run Creek	8,902	31	2063	0	2063	23.1	Moderate

Source: (1) North Fork John Day River Subbasin Draft Biological Assessment, 1999.

(2) Communication, North Fork District Silviculturist, 2002.

(3) From Chart, p.7, USDA 1993.

* 15% - 33% forested acres with no data, may be private land

Common sediment measuring parameters include percent fines and cobble embeddedness. Available data for the analysis is summarized in Table 3.3. The names of subwatersheds in which the proposed action(s) will occur are highlighted in bold text. The Umatilla Forest Plan standard for fines is less than 20 percent, and for cobble embeddedness is less than 35 percent embedded.

Table 3.3 – Sediment Parameters

Subwatershed		Percent Fines (<6mm) (Standard = <20%)	Cobble Embedded-ness (Standard = <35%)	Number Reaches >35% Embedded
93A	Lower Granite Creek	NA	>35%	NA
93B	Ten Cent Creek	NA	<35%	2
93C	Upper Granite Creek	NA	>35%	3
93D	Lake Creek	NA	NA	NA
93E	Rabbit Creek	>20	NA	NA
93F	Lower Clear Creek	NA	NA	NA
93G	Upper Clear Creek	7-13	NA	NA
93H	Ruby Creek	>20	NA	NA
93I	Congo Gulch	NA	NA	NA
93J	Middle Clear Creek	NA	NA	NA
93K	Lightning Creek	NA	NA	NA
93L	Olive Creek	NA	R 1 & 5 < 35%	2
93M	Beaver Creek	NA	>30%	4
93N	Lower Bull Run Creek	NA	NA	4
93O	Upper Bull Run Creek	NA	NA	1

Source: NFJDRS BA (1999), and FS Communication

The fines content of stream sediments in Rabbit Creek (93E) and Ruby Creek (93H) exceed the Umatilla Forest Plan goal of not more than 20 percent. Cobble embeddedness exceeds the 35 percent standard in both Lower Granite Creek (93A) and Upper Granite Creek (93C), and is relatively high (>30%) in Olive Creek. This suggests that at least some of the creeks in the Granite Creek watershed are carrying more sediment than desired to meet Forest Plan goals. More data would be required to fully assess sediment issues in the Granite Creek watershed.

Water Temperature

Water temperatures in the Granite Creek watershed are controlled primarily by the local climate, drainage aspect, and elevations. High temperatures coinciding with low rainfall and low stream flow during the summer months cause stream water temperatures within the area to increase to high levels. South-facing aspects and lower elevations tend to create drier and hotter conditions, which serve to further elevate temperatures.

Aside from natural conditions, past uses and management activities have created conditions conducive to raising water temperatures above what would have been their normal range. Placer mining and past livestock management practices reduced the riparian vegetative canopy through removal of riparian hardwood vegetation. Past regeneration-type harvest practices, which often impacted perennial streams have also reduced stream canopy cover. Research of the effects of the riparian logging in the H.J. Andrews Experimental Forest (western Oregon) showed water temperature increases between 0° F and 1.2 F per 300 feet of channel after clearcutting. In other studies (Helvey, et al, 1995) (Brown and Kygier, 1967; and Brown and Kygier, 1970) water temperature increases after clear-cutting ranged from “small” to 16° to 18°. Similar temperature increases could be expected from placer mining activities in which equivalent areas of riparian vegetation were disturbed.

Review of the available data summarized in Table 3.4, below, suggests that riparian shading in many areas is significantly less than the Umatilla Forest Plan goal of no less than 80 percent.

Table 3.4 – Riparian Shade

SWS	Reach	Percent Shade
93A	Lick Creek	57
93D	Lake Reach 1	51
93D	Lake Reach 2	46
93D	Lake Reach 3	54
93D	Lake Reach 5	55
93D	Lake Reach 6	33
93D	Lake Reach 7	56
93D	Lost Reach 1	66
93D	Lost Reach 2	46
93F	Clear Reach 1	16
93G	Clear Reach 4	81
93G	Clear Reach 5	77
93G	East Fork Clear Creek	81
93G	West Fork Clear Creek	66
93G	Wolsey Creek	77
93H	Ruby Reach 1	32
93H	Ruby Reach 2	35
93H	North Fork Ruby Creek	33
93J	Clear Reach 2	42
93J	Clear Reach 3	60
93L	Spring Creek	79
93L	Salmon Creek	71
93L	Dry Creek	78
93L	Lightning Reach 1	59
93L	Lightning Reach 2	65
93L	Lightning Reach 3	69

Source: NFJD River Subbasin Draft BA, 1999

State water temperature standards stipulate that the seven (7) day average of the daily maximum temperature is not to exceed the following values unless specifically allowed under a Department-approved basin surface water temperature management plan:

- 64°F maximum 7-day average stream temperature for Chinook and steelhead
- 55°F during times and in water that support salmon spawning, egg incubation, and fry emergence from eggs and gravels
- 50° in waters that support Oregon Bull Trout.

Water temperature data for the Granite Creek basin are sparse at this time. Review of available data, summarized in Table 3.5, below, suggests that water temperatures in much of the Granite Creek basin clearly do not conform to current water temperature guidelines.

Table 3.5 – Seven-Day Average of Daily Maximum Temperature

Creek Name	TRS	1993	1994	1995	1996	1997	1998	1999	2000	2001
Clear Cr. below Ruby Cr. (1)	T9S R35E S22		65	63	64					
Granite Cr., Site 2 (1)		64	71	65	68	66				
Lower Granite Cr. (2)				>64	>64	>64	>64	>64	>64	>64
Upper Granite Cr. (2)		63.5	70.6	66.7						
Ten Cent Cr. (1)	T8S R35E S35	64	72	65						

Sources: (1) NFJD River Subbasin Draft BA, 1999 (2) NFRD Umatilla Fisheries Biologist

Since there are no basin-specific ODEQ-approved water quality management plans in place at this time, all streams in the project area are subject to the general guidelines.

Water Chemistry

Chemical impacts to streams and rivers can occur in a variety of ways, some of them natural. As an example, the natural weathering, exposure and subsequent erosion of mineral deposits can introduce a variety of toxic metals such as arsenic into local stream systems. As there is much native cinnabar (USDA, 1997) reported in the area, mercury may be present in low concentrations in some areas. Cyanide can be produced in very low concentrations by the natural decay of vegetation, as well.

Impacts created by the development of lode mineral deposits can be significant, especially in instances in which sulfide minerals come into contact with large volumes of oxidizing surface or groundwater. Exposure of sulfide rocks to oxidizing water, both *in situ* and in mine dumps (tailings piles), can create acid rock drainage (ARD). ARD consists of low pH water that contains elevated concentrations of various metals, many of which are harmful to aquatic life if present in high enough concentrations. Placer mining, however, creates little if any chemical impact in watersheds, except when mercury is used to amalgamate fine particulate gold. If released into streams, the liquid mercury can collect in depressions in stream beds, and be mobilized by subsequent placer mining activities. Adverse environmental impacts from placer mining, however, are typically more morphological rather than chemical.

Previous lode mining has resulted in the creation of ARD in some locations in the Granite Creek watershed. While there are over 100 prospects and lode mines in the Granite Creek watershed, the actual number of prospects and mines generating ARD is unknown. A study of water quality in and near 12 relatively large lode mines in the Granite Creek watershed was completed for the Environmental Protection Agency (EPA) in 1997 (Weston, 1997). The mines studied appear to represent local mines from which the most significant volumes of ARD is generated, and as such may be considered “worst” cases for the purposes of this report. Data is summarized in Table 3.6, below. Note that the Magnolia Mine (in bold type) is the only lode mine of the 12 listed that is the subject of this report.

Table 3.6 – Lode mine water compliance violations.

Mine Name	Creek	SWS	TRS	Water Quality Compliance Violation(s)
Ajax	Lucas Gulch	93C	T8S R351/2E Sec22	None
Buffalo	Chipman Gulch	93C	T8S R351/2 Sec14	Arsenic (pond)
Cougar	E. Ten Cent Creek	93B	T8S R351/2E Sec22	None
Independence	China Gulch	93C	T8S R351/2E Sec22	Arsenic (portal)
New York	Upper Granite Cr.	93C	T8S R351/2E Sec27	Arsenic (portal)
Magnolia	Lucas Gulch	93C	T8S R351/2E Sec 22	Arsenic (portal)
Blackjack	Clear Creek	93J	T9S R35E Sec 14	None
Bluebird	Clear Creek	93F	T9S R35E Sec11	None
Pride of Oregon	Clear Creek	93I	T9S R35E Sec 10	None
Red Boy	Congo Gulch	93I	T9S R35E Sec 10	None
Pyx	McWillis Gulch	93L	T10S R35E Sec 1	None
Rabbit	Olive Creek	93L	T10S R35E Sec 10	Arsenic (outlet)

Source: Weston, 1997

Review of data presented in Weston’s 1997 report suggests that while the concentrations of some metals exceed both EPA Ambient Water Quality Criteria, and Oregon State Ambient Water Quality Criteria in water samples collected from mine portals, drainage ditches, and/or settling ponds (as noted in the right hand column of Table 3.6), concentrations of these same metals approach background levels in water samples collected from locations several hundred feet downstream from the point of infraction. In many instances, dilution has reduced concentrations to less than laboratory detection limits in the samples collected from these downstream locations. In addition, according to the 1997 Granite Creek Watershed Analysis, “water samples taken in 1993 and 1994 indicate heavy metals are not a problem in this watershed.” Based on this information, it would appear that adverse impacts to water chemistry resulting from past lode mining activities are localized, and ARD generated on lode mine properties does not appear to significantly impact the overall water chemistry in the Granite Creek watershed. Impacts are, therefore, expected to be immeasurable.

Hydrology

Most of the total water yield in the area occurs during the snowmelt season of May and June. Except for periodic and localized thunderstorms, which may create locally heavy runoff for short periods, rainfall in the area is generally sparse July through September. Water yields drop once water that was stored as snow has melted, and as groundwater stored in upland aquifers is depleted during the dry summers. Summer base flows are, therefore, low relative to the spring snowmelt period. Highest peak flows occur during rain-on-snow events and during unusually warm winter weather such as Chinooks.

There are no gaging stations in the analysis area. Review of data from nearby Desolation Creek (approximately 4 miles to the west of the analysis area) suggests that maximum flows occur in the spring, reflecting the contribution of melting snow to overall water yields. It is likely that stream flows in the analysis area are similarly affected by seasonal patterns of winter precipitation accumulation and low temperatures, spring runoff peaks, and low fall baseflows.

The hydrologic functioning of Granite Creek (93A and 93C) and many of its tributaries has been highly impacted by historical placer mining, which has significantly altered stream channel morphology, stream bank stability, and vegetative potential along many subwatershed reaches.

Dredge mining in the Granite Creek watershed has greatly affected floodplain function and water quality. Much of the alluvial material in the 6-mile long reach of Granite Creek between Squaw Creek and China Gulch was excavated, sieved for gold, and piled behind the dredges. The flood plains of Bull Run Creek (93N) and Clear Creek (93F and 93J) were similarly affected by large dredges. Other smaller watersheds such as Ten Cent Creek (93B) and Lightning Creek (93K) were locally impacted by hydraulic mining.

Table 3.7, below, summarizes available information regarding streambank conditions. The Umatilla Nation Forest Plan goal is for no less than 80 percent of streambanks to be in stable condition. Based upon available information, stream banks appear to be in generally good condition in the areas surveyed. However, stream bank condition for many of the most heavily disturbed placer-mined creeks is not currently available. In many instances, stream banks in heavily disturbed creeks are armored with large cobbles and boulders, which tend to stabilize stream banks rather than destabilize them.

Table 3.7 – Streambank Condition

SWS	Reach	Percent Stable Banks
93A	Lick Creek	96
93A	Squaw Creek	95.4
93D	Lake Reach 1	100
93D	Lake Reach 2	100
93D	Lake Reach 3	100
93D	Lake Reach 5	100
93D	Lake Reach 6 (upper reservoir)	98.2
93D	Lake Reach 7	99.6
93D	Lost Reach 1	98.2
93D	Lost Reach 2	92.5
93E	Rabbit Reach 1	97.5
93E	Rabbit Reach 2	96.2
93E	Rabbit Reach 3	83.5
93F	Clear Reach 1	99.1
93G	Clear Reach 4	100
93G	Clear Reach 5	99.4
93G	East Fork Clear	96.7
93G	West Fork Clear	97.8
93G	Wolsey Creek	96.1
93H	North Fork Ruby	97.5
93H	Ruby Reach 1	90
93H	Ruby Reach 2	80
93J	Clear Reach 2	92
93J	Clear Reach 3	83
93K	Dry Creek	99.5
93K	Lightning Reach 1	97.1
93K	Lightning Reach 2	99.3
93K	Lightning Reach 3	99.8

SWS	Reach	Percent Stable Banks
93K	Salmon Creek	100
93K	Spring Creek	99

Source: NFJDRS BA, 1999

Other human activities such as road building and timber harvesting have also impacted hydrologic functioning. Fires, both natural and human caused, have affected hydrologic functioning as well. Increased peak discharge from logged, mined, or otherwise disturbed areas can increase channel scour in first order channels which may lead to channel destabilization and changes in channel morphology. This may in turn damage aquatic habitat.

Geology and Geomorphology

The area is characterized by broad summits and ridges. Elevations in the analysis area range from approximately 3900 at the confluence of Granite Creek and the North Fork of the John Day River, to 8120 feet at the summit of Vinegar Hill on the south end of the watershed. Canyon wall slopes range from 20 percent to 35 percent or more in localized areas.

The study area is located in the Blue Mountains physiographic province. The province, a complex of mountain ranges and plateaus comprising the Ochoco-Blue Mountains Uplift, has been dissected by broad inter-montane valleys and steep-sided canyons. The analysis area is underlain by the broad Dooley Anticline and Dixey Anticline, which trend southeast to northwest. There is local evidence of normal faulting, with fault strikes roughly paralleling SE-NW trending fold axes. (Walker, 1977).

The study area is underlain primarily by Tertiary andesites and Triassic metasediments such as argillites, phyllites, and cherts. Based on field observations, argillite and andesite appear to be the most prevalent lithologies in the area of the 16 claim groups considered in the report. Cretaceous granodioritic rocks underlie approximately 11 percent of the Granite Creek basin, and are exposed near the headwaters (SWS 93C) and lower reaches (SWS 93A) of Granite Creek. Widespread areas within the Granite Creek (93) watershed are mantled by Mazama Ash, a poorly consolidated, fine-grained, easily eroded deposit of volcanic ash ranging from a few inches to 18 inches thick.

Stream morphology varies throughout the Granite Creek basin, although Rosgen (Rosgen, 1996) “B” and “C” types dominate. Lucas Gulch and the upper reaches of East Ten Cent Creek, on which the Magnolia and Brice 1-3 claims are located, appear to be “A” type streams. “A” type streams are characterized by gradients greater than 10.0 percent, low sinuosity, and are well entrenched and confined. “B” type streams are characterized by gradients ranging from 2.0 to 4.0 percent, low sinuosity, and are moderately entrenched. “C” type streams have gradients of less than 2.0 percent, meander, are slightly entrenched, and are not confined.

Soils and Erodability

Soils within the analysis area are of three general types: (1) alluvial soils formed along creeks (2) residual soils which form from underlying bedrock, and (3) ash soils which form from the

volcanic ash deposits that mantle underlying bedrock and the older residual soils. Thirteen (13) of the 16 claim groups, all placer claims, are situated on alluvial soils. The remaining three (3) claims are lode claims, and are located on residual and/or ash soils developed on bedrock.

Alluvial soils have developed from a mixture of alluvium deposited by local creeks and the colluvium that collects at the bottoms of slopes. The texture and composition of alluvial soils varies greatly, being dependent upon a variety of factors including the local sediment carrying capacity of streams, flooding dynamics, floodplain morphology, and upslope geology. In many instances, soil characteristics have been profoundly altered by historic placer mining, which removed fines leaving coarse-grained deposits of gravel- to boulder-sized “soil” behind. Given the coarse textures of processed alluvial soils along impacted creeks, these soils are not easily eroded nor do they support riparian vegetation well.

Residual soils are exposed in areas from which volcanic ash deposits have been eroded. Residual soils typically occur in upland areas and on south-facing slopes because such aspects are drier, subject to a higher fire-frequency, and support less soil-stabilizing vegetation. Residual soils are characterized by a clay-loam texture, high bulk density (0.9 to 1.2 gm/cm²), and lower water-holding capacity than ash soils (Geist, et. al., 1989). The erosion potential of residual soils is low to moderate.

In contrast, ash soils have very high water-holding capacity (0.31 cm/cm), which allows them to absorb and store precipitation, thus reducing the intensity of hydrologic response to precipitation events. The bulk density of ash soils range from 0.6 to 0.7 g/cm², and ash soils are highly productive and promote lush forest vegetation. Although the silt-loam texture of ash soils makes them highly susceptible to surface soil erosion when disturbed, their high infiltration rate can counteract, to some extent, their high erodability by reducing overland flow.

It is not known how current soil erosion and sedimentation rates quantitatively differ from historical rates, but some observations about changes can be made. Prior to Euro American settlement, periodic fires frequently consumed vegetation, which protected the soil from erosion. Although the past century of fire suppression would have slowed erosion, other management activities would have caused erosion. For instance, roads can account for 90 percent of the management-induced soil erosion, though only a percentage of the sediment gets transported to the stream system. Erosion related to construction of roads typically produces a relatively high amount of fine sediment initially, which declines to a persistent low level within several years. Extremely large amounts of sediment can enter streams from mass wasting of road fill material or hillslopes undercut by roads. Failures of culverts during floods can introduce large quantities of sediment from the road fill into streams.

Timber harvest and grazing also have contributed historically to management-induced erosion which has varied depending upon the amount of vegetation removed and area compacted, particularly within riparian zones and steep slopes. Since 1990, standards prescribed in the Umatilla Forest Plan have reduced such management-related erosion by placing limits on soil disturbance. The District Motorized Access and Travel Management Plan has also reduced management-related erosion by closing or obliterating unnecessary roads. In some areas, activities to suppress fires (such as the construction of tractor fire lines) have affected the rates of

infiltration and soil erosion, primarily through the compaction of soil and removal of vegetative cover.

FISH AND AQUATIC HABITAT

Since 1982 Forest Service teams have conducted stream surveys within the analysis area and each of the streams has been found to support fishes⁶. Results of these surveys suggest that the watersheds contain reaches (portions of streams) and entire streams that do not meet established criteria associated with healthy⁷ streams. For example, North Fork John Day River/Bear, Granite and East Ten Cent Creeks exceed Oregon State water quality standards for maximum 7-day average stream temperature (Table 2.1).

Water temperature data for the analysis area is sparse at this time. Review of available data, summarized in Table 3.8, suggests that water temperatures in much of the North Fork John Day River/Bear, Lower Granite Creek basin currently do not conform to current water temperature guidelines during the summer months.

Table 3.8. Seven-day maximum temperatures, sub-watersheds 93A, 93B, and 94A.

Subwatersheds/Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Granite Cr. @ mouth ¹	88	X		70	71	71	72	70	74	74
Granite Creek, near East Ten Cent Creek ¹				70						
Granite Creek, near Lick Creek ¹				71						
Granite Creek #1	X									
Granite Creek #3						71				
Granite Creek #4						77				
Granite Creek #5						77				
Granite Creek #6						77				
NFJD above Big Cr. ¹	74	71			74	72		72	78 (est.)	77
Clear Creek	X									
Clear Creek #3	X									
Clear Creek #4	X									
Clear Creek >Lightning									63	63
Clear Creek <Ruby				X		62	65	56	66	66
East Ten Cent Creek ¹		64	72	65						
Lick Creek ³								47-53 ³		
Lightning Creek >Clear Creek										
Lightning Creek at Claim										

6 Class 1 streams support Anadromous Fishes, Class 2 streams support native inland fishes, Class 3 streams are perennial non-fish bearing streams, and Class 4 streams are intermittent or ephemeral streams based on historical records and orthographic analysis.

7 “Healthy” refers to a stream’s ability to support fishes native to the stream and region.

Subwatersheds/Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Rabbit Creek										
Squaw Creek ³								51-61 ³		

Source: 1 - USFS Data Tables; 2 – Hydro Processes Reports; 3 – Opportunistic observations, not 7 day maximums; X - Instantaneous measurements available

Riparian zones in the analysis area range from “Properly Functioning” to “Functioning at Risk” to “Functioning at Unacceptable Risk” depending on the extent of historic activities and catastrophic fires in the watershed (Table 3.9). Riparian zones on the smaller streams (i.e., Indian, Lick, Buck and Squaw Creeks) can be classified as properly functioning where as East Ten Cent Creek and Granite Creek can be considered as functioning at risk with some reaches functioning at unacceptable risk as a result of historic mining activities. J.A. Hawkin (1965) conducted stream surveys of important streams (Granite, Clear, Beaver, Olive, North Fork Clear, Ruby, Lightning, Bull Run, Corral, Boundary, Deep and Boulder Creeks) within the Granite Creek Sub-watershed. However, because of the age of the data and because little quantitative data was collected, results of these surveys are not included in this analysis. Summaries of contemporary stream survey results follows.

Table 3.9 – Current status of streams in the analysis area for which current stream survey data is available.

Watershed	Riparian Zone Health ¹	Stream Functionality ²	Stream Temperature ³ Meets standards	Sediment Load ⁴ Meets standards
North Fork John Day River/Bear	Functioning at Risk	Functioning at Risk	No	Yes
Lower Granite Creek	Functioning at Risk	Functioning at Risk	No	NI
Upper Granite Creek	Functioning at Risk	Functioning at Risk	No	NI
Ten Cent Creek	Functioning at Risk	Functioning at Risk	No	NI
Lick Creek	Functioning	Functioning	NI	Yes
Squaw Creek	Functioning	Functioning	NI	Yes
Rabbit Creek	Functioning at Risk	Functioning at Risk	NI	No
Boulder Creek	Functioning at Risk	Functioning at Risk	NI	NI
Lightning Creek	Functioning at Risk	Functioning at Risk	Yes	NI
Ruby Creek	Functioning at Risk	Functioning at Risk	NI	No
Clear Creek	Functioning at Risk	Functioning at Risk	Yes	Yes
Olive Creek	Functioning at Risk	Functioning at Risk	Yes	Yes
Beaver Creek	Functioning at Risk	Functioning at Risk	No	No
South Fork Beaver Creek	Functioning at Risk	Functioning at Risk	NI	No
Congo Gulch	Functioning at Risk	Functioning at Risk	NI	No

1. Based on level of historical habitat disruption.
 2. Meets or exceeds PACFISH or ICBEMP criteria for pools/mile (for streams less than 5 feet wide, classification is based on a site examination by the author, these streams are expected to have lower numbers of pools/mile.
 3. Yes = Meets Oregon Department of Environmental Conservation 7-day average maximum summer stream temperatures; No = Does not meet criteria.
 4. Yes = Meets or exceeds PACFISH or ICBEMP criteria for suspended sediments using sediment embeddedness as a proxy; No = Does not meet criteria
- NI = No Information

Riparian Management Objectives developed for PACFISH for key and high priority watersheds used seven parameters for stream habitat. The seven parameters are pool frequency, water temperature, large woody debris, substrate sediment, bank stability and width to depth ratio. Data are available for most streams on the Wallowa-Whitman portions of the Granite Creek Watershed, but much information is missing from streams on the Umatilla portion. Information was collected on the following stream parameters.

Pool Frequency - The Riparian Management Objective (RMO) for pool frequency is different for each stream. The RMO for the pools per mile of stream is a function of the channel wetted width with the frequency increasing with channel width. Within the analysis area, the number of pools per mile ranges from 9 to 96 pools/mile.

Water Temperature - The RMO for stream temperature is to maintain 7-day maximum water temperatures below 64° F for migration and rearing habitats and below 60° F for spawning habitats.

Large Woody Debris - The RMO for large woody debris is 20 pieces per mile. Large woody debris is defined as debris greater than 12 inches in diameter and greater than 35 feet in length.

Substrate Sediment - The RMO for fine substrate sediment is less than 20 percent for spawning habitat, or less than 35 percent in rearing habitat.

Width/Depth Ratio - The RMO for the width/depth ratio (mean wetted width divided by mean depth) is less than 10.

North Fork John Day Watershed

Much of the North Fork John Day River is managed as a Wild and Scenic River, a portion of the watershed adjacent to the project area is managed as Wilderness, and a small portion includes an inactive grazing allotment⁸. In terms of Riparian Zone Health, this watershed is considered functioning at risk due to historic mining activities and recent catastrophic forest fires.

In addition, the river is not fully functional with respect to gradient, sinuosity, pool riffle ratio, and pools per mile of stream. Stream temperatures (maximum 7-day average stream temperatures) do not meet established standards, and sediment transport processes appear to be functioning considering the low percentage of cobble embeddedness.

The North Fork John Day River and its tributaries support runs of spring chinook salmon and summer steelhead. Historically, bull trout, redband trout, and westslope cutthroat trout occupied the watershed. Populations of these fishes are currently below historic levels. Although species-

⁸ Trout Meadows Range Allotment

specific surveys have not been conducted, the system appears to meet the habitat requirements for California floater and margined sculpin.

Granite Creek Subwatershed

The Granite Creek subwatershed includes the following minor watersheds that are included in the Analysis area: Lower Granite Creek; Upper Granite Creek, East Fork Ten Cent Creek, Squaw Creek, Lick Creek, Rabbit Creek, and Boulder Creek. The subwatershed includes other small creeks such as Indian and Buck Creeks that are included in the analysis area but have not been surveyed and upon which mining claims have not been filed.

Lower Granite Creek

Granite Creek is a major tributary of the North Fork John Day River. Granite Creek has been heavily impacted by past management activities, most notably by placer and hydraulic mining. As a result of these activities, the riparian zone has been radically altered and therefore, is considered functioning at risk with some reaches that could be considered functioning at unacceptable risk. As a result of historic habitat modifications, the creek has less than 10 pools/mile compared to the standard of 28 to 59/mile. However, the creek contains a few reaches that are fully functional, but overall, stream surveys indicate that stream cover, stream bank stability, pools per mile and stream temperatures are limiting spawning and rearing habitat for anadromous fish species and bull trout.

The stream has failed to meet Oregon State water quality standards because of high summer temperatures. The elevated stream temperatures suggest that the creek no longer provides prime fish habitat. The creek appears to suffer from excessive sediment loads as suggested by elevated cobble embeddedness, probably resulting from historic mining activity. Early dredging operations (1920-1954) altered the natural stream systems and riparian areas. Historic mining combined with high road densities along riparian corridors have degraded the aquatic habitat, particularly in the lower reaches. Mining activities removed shade-producing riparian vegetation, lowered the water table, increased sedimentation rates and reduced stream bank stability. Much of the fish habitat has not recovered from this dredging activity. A portion of the area has been removed from mineral entry, but active mining is still present, but at a much reduced level of effort. There is also an elevated sheet/rill/gully erosion hazard rating in this watershed.

Spring chinook, steelhead, and bull trout annually spawn in this portion of the watershed. Redband trout are also found within this watershed as are westslope cutthroat. The creek appears to contain the habitat potential for supporting California floater and margined sculpin, although surveys have not been conducted in this watershed for these species.

A 5.5-mile portion of Granite Creek is surveyed annually for spawning chinook salmon. The upper headwaters of Granite Creek are steep (30%+) and have limited spawning habitat, but this area supports high populations of juvenile chinook salmon.

Upper Granite Creek

A portion of the town of Granite is located in this subwatershed, the Scenic Byway bisects this subwatershed north to south and access to the Baldy Lake trail head is via Forest Road 654. There is a very high fire occurrence, including human-caused. Some mining restoration is taking place and road densities are high. There is an increase in the sheet/rill/gully erosion hazard rating and this is a high recreation use area. Historic mining activities and numerous road crossings in the area have changed stream characteristics.

The riparian zone in this subwatershed ranges from fully functional to dysfunctional due in large part to historic mining activities. In general terms, the habitat improves up valley in direct proportion to the intensity of past mining activities. Again, on average, the riparian zone within this sub-watershed can be classified as functioning at risk.

A Hankin and Reeves Stream Inventory was conducted in 1990 and 1991 for Granite Creek on approximately 6.5 miles of stream. The stream was surveyed from the confluence (T 08S, R 35E, Sec 18) to the headwaters. Granite Creek is a class 1 stream and a tributary to the North Fork of the John Day River.

Inventory results for this stream indicate the riparian habitat is in fair/good condition. However, it would be rated as dysfunctional to functioning at risk because of the long term effects of placer mining, road building, and logging activities. The streambed's dominant substrate is sand/gravel, the subdominant substrate is small boulders. There was cobble embeddedness present in one reach of the stream. Stream temperatures recorded during the survey were 59 degrees F on August 15, 1991. 7 day maximum average stream temperatures of 63° F were recorded in 1993, 71° F in 1994 and 67° F 1995.

Upper Granite Creek supports Chinook, steelhead, redband, and bull trout. Granite Creek has annual spawning surveys conducted for Chinook salmon by the ODF&W. The 5-year average for Granite Creek is 11.7 redds per mile.

Ten Cent Creek

Approximately one-third of the Ten Cent subwatershed is within the North Fork of the John Day River Wilderness (NFJD Unit). East Ten Cent Creek consists of four reaches, the lower eastern reach borders the project area and the remaining three reaches are included in the analysis area. Much of the East Ten Cent Creek watershed has been heavily impacted by past management activities, most notably by placer and hydraulic mining. As a result of these activities, the riparian zone has been radically altered and therefore is considered functioning at risk with some reaches that could be considered Functioning at Unacceptable Risk. For example, the creek averages less than 35 pools/mile compared to the standard of 39/mile, however, a few reaches are fully functional. In addition, the stream has failed to meet Oregon State water quality standards because of high summer temperatures. The elevated stream temperatures suggest that the creek no longer provides prime fish habitat. The creek appears to suffer from excessive sediment loads as suggested by elevated cobble embeddedness, probably resulting from historic mining activity.

Historic mining combined with high road densities in riparian corridors have degraded the aquatic habitat, particularly in the lower reaches. Mining activities removed shade-producing riparian vegetation, lowered the water table, increased sedimentation rates and reduced stream bank stability. The upper portion of the subwatershed, which has not been mined, shows the habitat restoration potential for the drainage.

Ten Cent Creek historically supported steelhead and chinook salmon spawning (at the mouth) during years of high stream flow, but does not appear to support redband trout. East Ten Cent Creek appears to have the habitat potential for supporting bull trout, westslope cutthroat trout, redband trout, California floater, and margined sculpin.

Squaw Creek

Squaw Creek is a small creek (<4' wide at the mouth) and drains directly into Granite Creek. The creek shows few signs of past management activities (mining, timber harvest, grazing, etc.), but signs of past fires are evident. A survey of this stream was conducted in 1998. The riparian area associated with this creek appears to be fully functional. The stream appears to be functioning properly as suggested by its gradient, pool riffle ratio, pools per mile⁹ and cool stream temperatures. Although data on cobble embeddedness was not collected during the stream surveys, information on the proportion of fine sediments does not suggest excessive sediment loading of the stream.

The stream is classified as Class 1, and the 1998 survey revealed the presence of redband trout near the creek mouth. The physical size of this creek suggests that it can support a few rearing juvenile and adult fish but not large spawning populations. This subwatershed appears to meet habitat requirements for supporting margined sculpin, although a survey for this species has not been conducted.

Lick Creek

Lick Creek, like Squaw Creek, is a small creek (<4' wide at the mouth) that drains directly into Granite Creek. The creek shows few signs of past management activities (mining, timber harvest, grazing, etc.), but signs of past fires are evident. A survey of this stream was conducted in 1998. The riparian area associated with this creek appears to be fully functional. The stream appears to be fully functional as suggested by its gradient, pool riffle ratio, pools per mile and cool stream temperatures. Although information on cobble embeddedness was not collected during the stream surveys, information collected on the proportion of fine sediments does not suggest excessive sediment loading of the stream.

The stream is classified as Class 1, and the 1998 survey revealed the presence of redband trout near the creek mouth. The physical size of the creek suggests that it can support a few rearing

⁹ Considering the small size of the stream, this evaluation is somewhat subjective because existing criteria pertain primarily to larger streams.

juvenile and adult fish but not large spawning populations. This subwatershed appears to meet habitat requirements for supporting margined sculpin, although a survey for this species has not been conducted.

Rabbit Creek

Rabbit Creek, like Squaw and Lick Creeks, is a small creek (<4' wide at the mouth) that drains directly into Granite Creek. The watershed shows signs of past management activities (mining, timber harvest, etc). The riparian area associated with this creek appears to be functioning at risk to fully functional. The stream appears to be functioning at risk near the mouth as suggested by past management actions and high level of fine sediments and appears to be fully functional further up stream as suggested by its gradient, pool riffle ratio, pools per mile and cool stream temperatures. Although data on cobble embeddedness was not collected during the stream surveys, information on the proportion of fine sediments suggests excessive sediment loading. The stream is classified as Class 1 and a tributary of Granite Creek. Stream surveys have documented the presence of steelhead, and westslope cutthroat and redband trout. The physical size of the creek suggests that it can support a few rearing juvenile and adult fish but not large spawning populations. This subwatershed appears to meet habitat requirements for supporting margined sculpin, although a survey for this species has not been conducted.

Boulder Creek

Boulder Creek, like Rabbit Creek, is a small creek (<4' wide at the mouth) that drains directly into Granite Creek. In 1993, a Stream Inventory was conducted on approximately 5.2 miles of stream. The stream was surveyed from the confluence (T 08S, R 35.5E, Sec. 34) towards the headwaters. Boulder Creek is a class I stream and a tributary of Granite Creek.

The stream has a history of mining, road building and grazing, however, the inventory report indicated that the riparian habitat was in fair/good condition (Table 2.1). Due in part to past management activities, as suggested by moderate level of large woody debris (15.3/m), moderate number of pools per mile (15.2) and presence of stream embeddedness, the stream is considered to be functioning at risk. Also, stream temperatures (7-day maximum average) ranged from 57 degrees F in 1994 and 69 degrees F in 1995. Results of stream surveys have revealed the presence of redband trout, and the stream appears capable of supporting margined sculpins, bull trout and westslope cutthroat trout.

Indian Creek and Buck Creek

Indian Creek and Buck Creek drain into Granite Creek. The creeks are small, less than 4 feet wide at their mouths, and for the most part show few signs of past management activities (mining, timber harvest, grazing, etc.). Signs of past fires are evident. Stream surveys have not been conducted on these two creeks; however, because they appear (based on anecdotal information) similar to the adjacent Squaw and Lick Creeks, they are assumed to share the same attributes as these creeks, i.e., functional riparian zones, functional streams, cool stream temperatures and appropriate sediment loads.

Clear Creek Subwatershed

The Clear Creek subwatershed includes the following minor watersheds that are included in the analysis area: Upper Clear Creek, Ruby Creek, Middle Clear Creek and Lower Clear Creek. A small portion of the NFJD Wilderness Unit overlaps this subwatershed's northern boundary. The subwatershed includes other small creeks such as Spring, and Salmon Creeks are included in the analysis area but have not been surveyed and upon which mining claims have not been filed.

Clear Creek

Historical mining activities on Clear Creek have changed the stream flow channel morphology and stream/riparian habitat. Historically, drainage from abandoned lode mines in the subwatershed drained into Clear Creek, thereby creating a chemical barrier to fish migration. In the 1980's, the US Forest Service channeled the effluent into side channels and ponds bordering the Creek. These efforts have removed the chemical barrier and fish are now migrating above the mines to spawn. In addition, Been & Nelson reported that a placer mining ditch across the stream diverted nearly all the flow from the creek. The authors reported that the stream above the ditch appeared to provide good fish habitat. The ditch has since been filled in and flow returned to the Creek.

As a result of historic management actions, the stream is considered to be functioning at risk. Clear Creek is a class 1 stream that supports populations of Chinook salmon, steelhead, redband trout, westslope cutthroat trout, dace, mountain whitefish, and sculpins. ODF&W conducts an annual Chinook salmon spawning survey up the first 4.0 miles of Clear Creek. ODF&W also report that bull trout have been recorded in 2.0 miles of the upper headwaters and cutthroat trout inhabit 4.25 miles of the Creek.

Lightning Creek

Lightning Creek is located in the upper watershed of Clear Creek. The Pete Mann Ditch diverts water from the stream, including Spring and Salmon Creeks, into the North Fork Burnt River. This suggests that anadromous fish from Lightning Creek could be diverted into the North Fork Burnt River. However, the creek has been screened at Lightning Creek to prevent this from happening.

Historic management actions indicate that this stream is functioning at risk with the upper reaches fully functioning.

Survey results indicate the presence of steelhead, redband trout, westslope cutthroat trout, bull trout and chinook salmon. In addition, the stream appears to contain the habitat necessary for margined sculpins.

Ruby Creek

Ruby Creek is a tributary to Clear Creek. The North Fork and South Fork of Ruby Creek are in the NFJD Wilderness. As a result of historic road construction, mining, and timber removal, the

stream is considered functioning at risk. This is further supported by stream survey results that indicate high sediment loads (high levels of fine sediments in the stream) little large woody debris (9.3/mile) and few pools (17/mile). ODF&W has surveyed Ruby Creek for bull trout, steelhead, and rainbow trout.

Ruby Creek is a Class 1 stream and supports steelhead, spawning and rearing of redband trout and westslope cutthroat. In addition, the stream appears to contain the habitat necessary to support margined sculpins.

Olive Creek

Olive Creek is a tributary of Clear Creek. A stream survey was conducted on approximately 3.3 miles of Olive Creek in 1990. The stream was surveyed from the confluence (T 093.5 R 35E, Sec. 23) towards the headwaters. The stream has been impacted by past management activities including mining and road building and maintenance. The low level of instream cover (6-20%) along with a pool average of 19 per mile and a large woody debris average of only 2.05/mile and cobble embeddedness present in just two reaches suggest that the stream is functioning at risk

Olive Creek is a class 1 stream and supports steelhead and redband trout and appears to have the habitat necessary to support westslope cutthroat trout and margined sculpins.

Beaver Creek

Beaver Creek is a tributary of Clear Creek. A stream survey was conducted on approximately 5.5 miles of stream from its confluence (T 095, R35E, Sec. 24) towards the headwaters. The stream has been impacted by past management activities including road building and maintenance and grazing suggesting that the stream is functioning at risk. However, the system has moderate levels of in-stream cover (40-100 %), the number of pools per mile, 45.8 exceeds the standard of 39/mile, but there were only few pieces of large woody debris, 3.3/mile, in reach 1, the rate of cobble embeddedness exceeded 30 percent and maximum 7-day average stream temperatures (67 degrees F in 1993, 75 degrees F in 1994, 70 degrees F in 1995, and 67.0 degrees in 1996) exceeded established standards.

This is a class 1 stream that supports steelhead and redband trout and appears to offer the appropriate habitat to support margined sculpins, bull trout, chinook salmon, and westslope cutthroat trout. The ODF&W surveys the stream each year for steelhead.

South Fork Beaver Creek

The south fork of Beaver Creek merges with Beaver Creek, and about 2.8 miles (from the confluence at T 093, R 35.5E, Sec.21 towards the headwaters) have been surveyed for fish. The stream has been impacted by past management activities including road building, maintenance, and grazing suggesting that the stream is functioning at risk. The system offers little in stream cover (21-40 %), a moderate number (15.4) pieces of large woody debris per mile, a moderate number of pool per mile (19.34), and in reach 1, the rate of cobble embeddedness exceeded 30

percent. Potential migration barriers include a wooden, wire-wrapped culvert (NSO # 70 just inside of Forest boundary) and locations where the stream flows sub-surface (NSO #149).

This is a class 1 stream that supports redband trout and appears to offer the appropriate habitat to support margined sculpins, bull trout and westslope cutthroat trout.

Congo Gulch

Congo Gulch is a tributary to Clear Creek and flows through the Red Boy Mine claim. The headwaters are located on land occupied by the historic Fremont Power House. The headwaters have several springs that feed the main channel. Up until the late 1980s the Red Boy Mine was contributing mine waste into Congo Gulch. The stream was literally “red” from iron and other minerals. The Umatilla National Forest installed a pipe in the adit to capture seepage from the mine and divert the runoff into a pond. Since the pipe was installed, water quality has improved in Congo Gulch, and mineralized water is no longer being discharged into Clear Creek. However, because of past management activities, including mining, road building and maintenance, the stream is considered to be functioning at risk.

Congo Creek is a class 1 stream and supports steelhead and redband trout and appears to include habitat to support margined sculpins. However, a detailed survey of the stream has not been conducted.

Threatened, Endangered, and Sensitive Fish Species and Species of Concern

Important fish species occurring in the North Fork John Day River and Granite Creek watersheds include spring run chinook salmon (*Oncorhynchus tshawytscha*), Middle Columbia River steelhead (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), interior redband trout (*Oncorhynchus mykiss gairdneri*), and westslope cutthroat trout (*Oncorhynchus clarkii lewisi*). Other fishes occurring in the watershed include torrent sculpin (*Cottus rhythmus*), margined sculpin (*Cottus marginatus*), dace (*Rhinichthys sp.*) and mountain whitefish (*Prosopium williamsi*). Of these species, Middle Columbia River steelhead and bull trout (Columbia River population) have been listed by the US Fish and Wildlife Service as Threatened Species and interior redband trout and westslope cutthroat trout have been listed as Species of Concern by the FWS and as Sensitive by the Forest Service. Two additional Species of Concern listed by the US Fish and Wildlife Service are the California floater (*Anodonta californiensis*), a fresh water mussel and the Blue Mountains cryptochian caddisfly (*Cryptochia neosa*). Results of a 1992 survey of potential cryptochian caddisfly habitat, including the analysis area, revealed the presence of large numbers of cryptochian caddisflies. Therefore, this species was eliminated from the Regional Forester’s list of sensitive species and consequently has not been included in this analysis.

ODFW conducts annual chinook spawning surveys on streams in the analysis area. These data, along with historic annotations and habitat information were used to determine species occurrence. Definitive data are not available for all species in all stream systems.

Historically, salmon and steelhead were abundant (presumably so were bull, cutthroat and redband trout) in the analysis area. The John Day River is the last major stream in the Northwest to have free runs of chinook salmon and steelhead trout, presumably due to the lack of dams on the river itself. Anadromous fish have only to migrate past three hydroelectric dams on the Columbia River to reach spawning grounds within the analysis area. In spite of this, their numbers are greatly reduced from historic levels.

Chinook salmon-spring run

The John Day basin, including Granite Creek, supports the largest remaining stocks of native anadromous fish in eastern Oregon. The North Fork John Day River produces 70 percent of the spring chinook salmon returning to the John Day River. Spring chinook enter the drainage in early spring and reach resting pools near spawning grounds on the North Fork by late June. Spring chinook spawning occurs in late August and early September. Downstream smolt migration occurs the following spring from mid-April to mid July. Annual spawning surveys have documented the occurrence of spawning chinook salmon at the mouth of East Ten Cent Creek, Granite Creek, and in the North Fork John Day River. Their numbers have decreased from historic levels. Results from annual stream surveys (redd counts) made during the last few years show an increase in the number of spawners.

Salmon and trout habitat considerations include a stable and diverse (functional) riparian system that provides adequate cover for refuge and a diverse food source and spawning habitat that includes cool, well oxygenated water up-welling through larger sized gravel (1.3-10.2 cm) that is free of fine sediments. Good water quality is harder to achieve during late summer months due to low stream flow and higher stream temperatures associated with Functioning at Risk and Functioning at Unacceptable Risk riparian zones.

Redband Trout and Steelhead

Redband trout and steelhead are different life history forms of the same species, and share many similar life history attributes and habitat requirements; however, there are subtle life history and habitat differences between the two. For example, steelhead tends to be associated with larger streams and larger spawning gravel size (0.6-10.2 cm) than redband trout (0.6-5.2cm). Summer run steelhead, an anadromous fish, are known to spawn and rear in the North Fork John Day River and the mouths of its tributaries, including Granite and East Ten Cent Creek. Important habitat considerations include a stable and diverse riparian system that provides adequate cover for refuge and a diverse food source and spawning habitat that includes cool, well oxygenated water up-welling through medium sized gravel that is free of fine sediments.

Presently, fish populations are at low levels. Their numbers have been declining at a rate of about 15 percent a year since 1985. Since optimum steelhead spawning and rearing habitat coincides with fully functional riparian habitats, this reduction is assumed to be the result of the loss of quality habitat within the analysis area. For example, reduced riparian zone functionality in the larger streams (North Fork John Day River, Granite and Ten Cent Creeks), has likely led to high summer stream temperatures. The distribution of these fish within the analysis area will likely be limited until riparian conditions improve.

Redband trout is the interior (inland) resident form of this species. They are known to spawn and rear in the analysis area, but numbers have been reduced from historic levels. They currently exist within the analysis area as small, isolated populations. Detailed information on population status is not available due to lack of current survey data.

As with steelhead, redband trout habitat considerations include a stable and diverse riparian system that provides adequate cover for refuge and a diverse food source and spawning habitat that includes cool, well oxygenated water up-welling through medium sized gravel that is free of fine sediments. Redband trout, however, seem to tolerate higher stream temperatures than steelhead.

Based on historic information and habitat requirements, redband trout are expected to be found in reaches with fully functional riparian zones. It is assumed that population numbers have been reduced by the loss of quality habitat, i.e., reduced riparian zone functionality, as suggested by high summer stream temperatures in Granite and Ten Cent Creeks. However, because redband trout appear to be more tolerant of high water temperatures than steelhead it is assumed that they will occur more frequently in degraded aquatic habitat with higher stream temperatures related to Functional at Risk or Functioning at Unacceptable Risk riparian habitats than steelhead.

Bull trout

Bull trout were once widespread in the John Day River system, but now are restricted to about 25 percent of their former range (Buchanan and Gregory, 1997), occurring primarily in the higher elevation and upper headwater streams. Bull trout have been reported from the headwaters of the North Fork John Day River, and Granite and East Ten Cent Creeks in what appears to be less than optimum habitat. Adult bull trout habitat is normally associated with larger streams (6 to 30 feet wide) with fully functional riparian zones, abundant woody debris, overhanging banks, and debris jams and low water temperatures. Water temperature is one of the most important factors in limiting bull trout distribution.

The bull trout has been recently identified as the non-anadromous (interior) form of Dolly Varden. The bull trout exhibits a longer, broader head than does the coastal Dolly Varden, but otherwise, the two forms are similar in appearance. In Oregon, the Cascade Mountains separate the range of the coastal Dolly Varden from the interior bull trout.

Westlope cutthroat trout

Westslope cutthroat trout (distinct mid-Columbia Basin populations) occur in the John Day River (Behnke, 1992). Cutthroat trout occurring in the upper reaches of the analysis area are probably resident, whereas those found in the lower reaches are probably fluvial fish that move into the area to feed and spawn.

Westslope cutthroat tend to occupy cooler headwater streams than other trout species. Preferred westslope cutthroat trout habitat are those streams with medium (2-75 mm) sized gravel with little fine sediment, little embedded substrate, moderate stream flow (0.1 to 0.3 m/s), and

numerous small pools. In the analysis area, streams with fully functional riparian zones meet these criteria. The number of fish found in a stream appears to be related to the number of pools in the watershed.

California floater

California floater, a fresh water mussel, has been reported from the Blue Mountains of Washington and Oregon; however, little is known about its life history and distribution. No surveys of the analysis area have been conducted. For the purposes of this evaluation, it is assumed, but not known for certain, that its habitat requirements are similar to other freshwater mussels (Margaritifera) found in the region.

Freshwater mussels are usually found in cold, well-oxygenated waters with small to large gravel substrate. They prefer areas with stable bottoms free of silt. Water velocity appears to be an important habitat variable. Mussels were found in streams with an average gradient of 1.4 percent but were absent from streams with an average gradient of 2.4 percent (or fully functional mid-slope riparian zones) (Altnoder, 1926). Because these portions of East Ten Cent Creek and Granite Creek are functionally at risk or functioning at unacceptable risk, the mussel is expected to be absent from the project area or present only in very low numbers.

Margined Sculpin

Margined sculpin are found in the Blue Mountains of Washington and Oregon, (Tucannon, Walla Walla, and Umatilla Rivers); however, its historic distribution is unknown. According to McPhail and Lindsey (1986), the margined sculpin is the only fresh water fish species whose distribution is restricted to the Middle Columbia River drainage. The sculpin is locally common, but due to habitat degradation, its habitat appears to be restricted.

Systematic surveys for this species have not been conducted within the analysis area; however, considering the habitat requirements of this species, it is expected to be associated with fully functional riparian zones. These conditions tend to predominate in the upper reaches of the streams and, therefore, the sculpin is expected to be absent or in very low numbers in the reaches with Functioning at Risk and Functioning at Unacceptable Risk riparian zones, (the lower reaches of Ten Cent and Granite Creeks).

RECREATION

Non-Wilderness Recreation

Olive Lake Campground is the only developed campground within the planning area. It is a popular, high-use fee campground during the summer months and early fall. There are 26 campsites, 2 day use sites, a fishing platform, boat ramp/dock and a 2.5 mile hiking trail around the perimeter of the lake. Fishing, boating, picnicking, overnight camping, and hiking are popular activities at this site. Olive Lake was dammed in the early 1900's to supply water to the

Fremont Powerhouse. Portions of the wooden pipeline can still be seen while traveling along FS Road 10, between Olive Lake and the Fremont Powerhouse.

The Fremont Powerhouse Complex is located within the project area. The site consists of a turn-of-the-century powerhouse and caretaker house, three additional residences, numerous outbuildings and an interpretive sign. Although the powerhouse has not been operational since the 1960's, the site is used intermittently for administrative purposes and is currently under the last phase of a renovation project with the Oregon National Guard. Two of the residences are open to the public for cabin rental use and the site is also a popular location for visitors to learn more about the area's early mining history. Anticipated future plans will likely include on-site interpretive tours during the summer months and the inclusion of an additional residence into the cabin rental program. The site will continue to have occasional administrative use as well.

There are numerous dispersed camps, estimated at 40-50 sites, located along or near the open roads. This is a popular area for deer and elk hunters, and receives a lot of dispersed camping use during the fall season, along with some use during the summer months. A generic description of a dispersed campsite consists of a user-made area that is generally adjacent to a developed road. The site often has a meat pole in the tree, a rock fire ring and a hardened parking/camping surface for one to three families. In addition to dispersed camping and hunting activities, mushrooming, firewood gathering and sight seeing are other popular recreational pursuits in the area. The analysis area occurs within the Desolation Big Game Management Unit of Oregon Department of Fish and Wildlife. Hunting season typically begins in October and extends through November.

A portion (3,021 acres) of the Vinegar Hill/Indian Rock Scenic Area lies within the planning area. There are four non-motorized trails in this area; including: #3173 Ben Harrison Trail (.5 miles), #3022 Lost Creek Trail (1 mile), #3035 Saddle Camp Trail (2 miles), and #6141 Blue Mountain Trail (1.5 miles). The Saddle Camp/Lost Creek Trailheads is the only developed trailhead accessing the scenic area within the planning area. The trailhead is part of the Northwest Forest Pass fee system. Facilities include a graveled parking pad, signing and a bulletin board. The Scenic Area is managed for its recreation and scenic values with no motorized access within the planning area. Primary use occurs during the fall big game hunting seasons, but summer recreational use continues to slowly increase due to outstanding scenic values. Sight-seeing, hiking and horseback riding are some of the most popular activities for this area.

There are no designated OHV (Off Highway Vehicle) trails in the area. However, OHV activity is permitted and does occur on open roads in the analysis area. This includes riding motorcycles (Class III) and four-wheelers (Class I) on these roads. With the exception of FS Road 10, all open roads within the planning area are open to OHV travel, per the 2001 Interim Program for ATV/OHV Strategy on the Umatilla National Forest. Additionally, the 1000460, 1000520, 1010370, 1035060, 1035080, 1038060, 7350050, 7350052 and 7350070 are forest road systems open seasonally to OHV use but closed to other motorized travel.

FS Road 10 is groomed for snowmobile use from the junction of Rd. 13 and Rd. 10 to Desolation Guard Station. All of FS Rd. 10 within the planning area serves as a groomed snowmobile trail during the winter months. A local snowmobile club grooms the trail (Rd. 10) when there is adequate snow coverage; typically between the months of December and March.

Wilderness Recreation

Legislative guidance for management of the wilderness resource administered by the Umatilla National Forest is contained in the Wilderness Act of 1964 (PL 88-577), which directs that the land be managed so it “generally appears to have been affected primarily by the forces of nature, with the imprint of human activity substantially unnoticeable.” Wilderness is further defined as “...in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled”. Untrammelled means “not subject to human controls and manipulations that hamper the free play of natural forces.”

The following trails are located within the North Fork John Day Wilderness: #3022 North Fork John Day River Trail (.2 miles), #3173 Ben Harrison (4.5 miles), #3018 Lake Creek Trail (2.5 miles), #3022 Lost Creek (4.1 miles), #3035 Saddle Camp (2.5 miles), and #3016 Granite Creek Trail (2.4 miles and 1 mile in general forest area). The Granite Creek Trailhead is the only developed wilderness trailhead in the planning area. Features include a graveled parking pad, signing and a bulletin board.

While trail use is heaviest during the fall big game hunting seasons, there has been an increase in summer-time use by recreationists. Some of these activities include camping, hiking, horseback riding, huckleberry picking, sightseeing, fishing, and viewing remnants of the area’s rich mining history. There are several high-use traditional campsites located along these trails within the planning area. These sites are monitored and encouraged for use due to the topography, river location and Leave No Trace principles, which encourages use at existing sites in order to minimize impacts to vegetation and stream banks.

Most of the wilderness within the project area is classified as semi-primitive (using the Wilderness Resource Spectrum), with a small portion to the north designated as primitive.

Although visitors are increasing every year, the North Fork John Day Wilderness gets relatively low use in comparison to other wilderness areas nearby, including the Eagle Cap Wilderness on the Wallowa-Whitman N.F. and the Wenaha-Tucannon Wilderness on the north half of the Umatilla N.F.

Trail locations are primarily in canyon bottoms, which coincides with most placer mine activity within the wilderness area.

WILDLIFE

Habitats within the analysis area include ponderosa pine, lodgepole pine, mixed conifer, and spruce – fir forest; a diversity of riparian habitat; shrub grasslands and meadows. Portions of the North Fork John Day Wilderness, the Vinegar Hill Scenic Area, and a Backcountry area (MA-6) occur within the watershed. Mining activity is a prominent fixture in the area, with evidence of extensive historic lode and dredge mining visible on the landscape. Examples of recent management efforts to reduce the effects of past mining activity include removal of dredge tailings, riparian planting, and creation of settling ponds at the Red Boy mine. Past, ongoing, and future foreseeable projects in the watershed include: other mining, roads, timber harvest, wildfires, underburning, riparian restoration, grazing, hunting, and other recreational use.

Management Indicator Species

Management Indicator Species were identified by the Forest Plan to represent a larger group of wildlife species presumed to share similar habitat requirements:

Rocky Mountain elk: Elk were selected to represent general forest habitat and winter ranges. Elk are common within the analysis area and numbers are above the desired population level, or “management objective” set by Oregon Department of Fish and Wildlife. The management objective is 1300 head in the Desolation Wildlife Management Unit, and the 2001 winter population was estimated at 1,890 elk.

Big game security can be measured by evaluating the density of open roads and the availability of hiding cover. Hiding cover is relatively plentiful throughout the area due to the understory regeneration and the rolling topography. Open road densities are low on the Umatilla portion of the watershed due to closures implemented over the last 10 years; most subwatersheds are within the desired condition of 2 miles per square mile forest wide (USDA 1990a). Open road densities on the Wallowa-Whitman National Forest portion are considerably higher and generally not within the desired condition of 1.5 miles per square mile (for MA 18, Fish Emphasis, which comprises the majority of the watershed) (USDA 1990b). Open road densities exclusive of wilderness and other roadless acres are presented in the last column (Table 3.10).

Table 3.10 – Road Densities

	Subwatershed	Square miles	Open road miles	Open road miles per square mile	Roaded square miles*	Open road miles per roaded* square mile
93A	Lower Granite Creek	15.1	10.8	0.7	8.3	1.3
93B	Ten Cent Creek	6.5	5.3	0.8	4.4	1.2
93C	Upper Granite Creek	16.9	77.5	4.6	15.9	4.9
93D	Lake Creek	18.8	11.9	0.6	8.7	1.4
93E	Rabbit Creek	7.6	5.6	0.7	3.5	1.6
93F	Lower Clear Creek	4.1	10.1	2.4	3.4	3.0
93G	Upper Clear Creek	10.0	0.1	0.0	0.2	0.6
93H	Ruby Creek	4.8	1.4	0.3	0.7	2.1
93I	Congo Gulch	2.3	5.0	2.2	2.3	2.2
93J	Middle Clear Creek	3.3	5.0	1.5	3.2	1.6
93K	Lightning Creek	7.5	7.7	1.0	2.5	3.0
93L	Olive Creek	7.4	50.8	6.9	7.4	6.9
93M	Beaver Creek	13.0	73.4	5.6	13.0	5.6
93N	Lower Bull Run Creek	15.8	61.6	3.9	14.9	4.1
93O	Upper Bull Run Creek	14.5	86.3	5.9	14.5	5.9

*Square miles in watershed exclusive of management areas designated as scenic, backcountry, and wilderness.

American marten: This species represents mature forests and riparian areas. Habitat is present along Granite, Clear, and other creeks, and particularly within the North Fork John Day Wilderness.

Pileated woodpecker represents dead/down tree habitat in mature and old growth mixed conifer stands, and other **primary cavity excavators** represents nearly 100 vertebrate species that depend upon dead standing trees and down logs for reproduction and/or food gathering. Dead standing tree and down wood densities vary within the analysis area. Wilderness areas and stands affected by insect or disease have relatively high snag densities. Private land and areas that have been harvested in the past have fewer large snags and down logs. Pileated woodpeckers have been observed in the analysis area. There appears to be adequate pileated woodpecker reproductive habitat in Dedicated Old Growth, in the North Fork John Day Wilderness, and in additional scattered patches in managed areas.

Northern three-toed woodpecker: This species represents dead/down tree habitat in mixed conifer stands dominated by mature and old growth lodgepole pine stands. This habitat type is somewhat uncommon in the analysis area, and no three-toed woodpecker observations have been recorded in this area.

Northern goshawk: This species represents mature to old conifer stands. Northern goshawk are present in the Granite Watershed. Surveys during the breeding season have not been done on the Umatilla NF portion of the watershed, and no known nesting territories are currently known. Habitat for goshawk is similar to that discussed above for pileated woodpecker and marten. A considerable amount of habitat occurs in the North Fork John Day Wilderness and in dedicated Old Growth areas.

Threatened, Endangered and Sensitive Wildlife Species

Threatened and Endangered species are managed under the Endangered Species Act to ensure that federal actions do not result in a downward population trend. Sensitive species are those recognized by the Pacific Northwest Regional Forester as needing special management to prevent being placed on Federal or State endangered species lists. Based on local studies, surveys and monitoring, as well as published literature regarding distribution and habitat use, the following Threatened, Endangered, and Sensitive wildlife species have the potential to occur in or adjacent to the analysis area:

Gray wolf (Endangered): The gray wolf could occur in the area, although use has not been documented. A radio-collared gray wolf dispersed to the Blue Mountains from Idaho in March 1999, and was captured on the District for relocation to Idaho. Another wolf was killed in October 2000, north of Ukiah. Other wolves have been reported in the Blue Mountain region. The Idaho wolf population has been increasing steadily, and dispersion into the Blue Mountains will likely continue. The Blue Mountains offer relatively high prey densities, large tracts of publicly owned land, and low human populations.

Northern bald eagle (Threatened): Bald eagles are occasionally seen in the Granite and Clear Creek areas, but are not resident. Winter use has not been documented in the analysis area, but does occur in outlying, lower elevation areas. Winter bald eagle use of the uplands would be limited to periods of low snow depths or snow-free periods, usually early fall. When present they likely feed on big game carcasses (hunting mortalities) and spawning chinook salmon. Nesting by the bald eagle is not known to occur on the District.

Canada lynx (Threatened): The Blue Mountains are considered to be on the fringe of the range of Canada lynx. Lynx are known to have occurred in the area historically, and several recent but unconfirmed sightings have been reported in the Blue Mountains. Surveys have been ongoing and to date no lynx have been detected. The majority of potential lynx habitat is found at higher elevations (>5000') in cool, moist habitat types. The only mining claim included in this EIS that occurs within mapped lynx habitat is the Magnolia claim; this area is classified as lynx foraging habitat. Work at the Magnolia claim involves occasional use of a backhoe or small cat to muck out the tunnel portal, and hand work in the tunnel.

The analysis area falls within the Granite Lynx Analysis Unit (LAU) on the Umatilla NF and within the Granite Creek LAU on the Wallowa-Whitman NF. Existing lynx habitat conditions in these LAUs are displayed below (Table 3.11). About 74 percent of the potential lynx habitat in the Granite LAU is currently suitable for foraging and denning. About 81 percent of the potential lynx habitat in the Granite Creek LAU is currently suitable for foraging and denning.

Table 3.11 – Current condition of lynx habitat in the Granite Watershed (acres).

LAU	Potential	Denning	Foraging	Unsuitable ¹	% Suitable	% Unsuitable ²
Granite	38,033	12,854	15,165	10,015	74%	26%
Granite Creek	17,117	4670	9145	3302	81%	19%

California wolverine (Sensitive): Wolverines are wide-ranging carnivores that could be present in the analysis area at any time. Wolverines have not been detected on the District despite extensive surveys conducted in the last decade, but there have been unconfirmed reports of wolverine within the Granite Watershed. Wolverine habitat is primarily found in the North Fork John Day Wilderness and the Vinegar Hill Scenic Area.

Peregrine falcon (Sensitive): This species is not known to occur within the analysis area, but has been observed foraging on the district during the non-breeding season. Potential nesting habitats have been surveyed since 1991, and no peregrine nesting has been found.

Columbia spotted frog (Sensitive): Columbia spotted frogs (*Rana luteiventris*) are known to occur in upper Granite Creek and also in the far western portion of the watershed near Olive Lake. No spotted frogs have been observed at the mining claims included in the proposed action, although comprehensive surveys have not been done. Suitable habitat for spotted frogs occurs along creeks, wet meadows, springs and ponds throughout the watershed.

Other Species of Concern

The U.S. Fish and Wildlife service requested that we consider additional wildlife species of concern. These include the olive-sided flycatcher and the following bat species: big-eared bat, small-footed myotis, long-eared myotis, fringed myotis, long-legged myotis, and Yuma myotis. Neotropical migratory birds are also discussed in this section.

Olive-sided flycatcher: Breeding bird surveys conducted over many decades indicate that this species may be in decline throughout the West (Csuti et al. 1997). In the Blue Mountains, an increase in source habitat has occurred (Wisdom et al. 2000). It is particularly known to use tall snags left over from fires, and more open canopy forest. Considered “common” for the area, it likely occurs in the Granite watershed. Management recommendations in the Conservation Strategy for Landbirds (Altman 2000) focus on broad-scale landscape treatments such as prescribed burning. Mining activities may have altered a small percentage of olive-sided flycatcher habitat, but past fire suppression, livestock grazing, and timber management practices are of more concern.

¹ Lynx potential habitat in currently unsuitable condition.

²If more than 30% of potential habitat is currently unsuitable, the Lynx Conservation Assessment Strategy requires that no further reduction of suitable habitat shall occur as a result of vegetation management activities.

Bat species: The U.S. Fish and Wildlife Service consider these bats species of concern for this area: pale western big-eared bat, small-footed myotis, long-eared myotis, long-legged myotis, and Yuma myotis. The pale western big-eared bat was formerly referred to as the Pacific western or Townsend's big-eared bat. The pale subspecies generally occurs east of the Cascade crest, and the Pacific subspecies occurs west of the Cascade crest. The long-legged and long-eared myotis are considered relatively abundant, but the Yuma myotis is relatively scarce in eastern Oregon, and very little is known about the small-footed myotis (Verts and Carraway 1998). All of these bat species could occur in the watershed.

Potential habitat in the analysis area consists of mine adits for winter roosting, and hollow trees, snags, or rock crevices for temporary day or night roosts. A survey in the summer of 1995 near an abandoned adit mine revealed the possible presence (80-90 percent certainty) of a big-eared bat. Myotis species were also detected. However, these bats were not seen entering or exiting the adits, and so were thought to be coming from elsewhere. Only a few lode mines in the Granite watershed may be suitable for roosting bats. Two lode mines with tunnels or adits are included in this EIS: Magnolia and SW St. Paul. Magnolia has been inspected for potential bat use, and no evidence of bat use was found. The adits at SW Saint Paul are currently caved in and therefore unavailable for use by bats.

Neotropical Migratory Birds: Neotropical migratory birds occupy a wide variety of habitats. Most birds in eastern Oregon ponderosa pine forest are “foliage-gleaners”, which forage primarily by collecting insects or fruit from vegetation rather than from the ground (Sallabanks et al. 2001). Riparian vegetation is particularly important to Neotropical migratory songbirds (Sallabanks et al. 2001), and is the most impacted type of bird habitat with regards to these mining plans. Some of the larger creeks such as Granite, Clear, Lightning, Ruby, Olive, Beaver, and Lake Creeks comprise the bulk of the riparian habitat, but many smaller creeks, seeps, springs, and ponds are also important. Riparian habitat conditions are poor where mining, roads, and other activities have degraded it, and good in the wilderness and some other areas. Historic large scale dredge operations have caused a great deal of damage to riparian habitat in the watershed.

SOCIO-ECONOMIC

The placer mines of the North Fork John Day watershed have been worked since 1862. Following the gold rush in California, European and other immigrants prospected this area and established mines and settlements in accessible places within the North Fork John Day watershed where there was potential for economic growth based on mineral extraction. Early mining practices by both white and Chinese miners, use of water from ditches, hydraulic mining methods, installation of hardrock mills and later use of bucket line dredges and doodlebugs in the streams were conducted without much concern for environmental quality and the resource needs of further generations.

Placer mining in the North Fork John Day River watershed was the first type of mining practice. Placer production by both white and Chinese miners was at its peak during the period 1863–1866. Placer mining began to decline about 1890 as the richest placers were worked out. But placering had uncovered many rich veins, and about that time lode mining began in earnest. Ore

was first milled using primitive mills like arrastas. Later, stamp mills were erected and ore was pulverized using the heavy stamps, the gold was separated using gravity means and finally gold was amalgamated using mercury. By 1911, lode mining was on the decline, but a new gold rush bargain with the advent of bucket line dredges. Smaller streams were worked using “doodlebug” washing plants mounted on skids and operated on dry land. In Granite Creek, the Oro Plata Mining Company operated a floating washing plant with a capacity of 3000 yards daily. The company mined Granite and Clear creeks beginning in 1938. The Porter Dredge Company mined Granite, Clear, and Olive creeks. Their dredge had a capacity of 3800 cubic yards daily and operated beginning in 1939. Electrical power for this dredge and the Sumpter dredges was obtained from the Fremont Power plant.

The critical point in the downfall of gold mining was the onset of World War II. The U.S. Government ordered the shutdown of mining operations and many of the men working in such mines either enlisted or were drafted into the service. Also, the Administrative Order L-208, which was designed to stop the mining of gold, forced gold miners to seek employment in base-metal mines, especially copper, in which there was supposed to be a shortage of miners. The order failed essentially to accomplish its objective, but the final result was to deal a crushing blow to gold mining. Shutdowns, always a serious operating matter in an underground mine because of the maintenance problem, compounded the gold miners’ difficulty. At the close of the wars, the several mines, which had been in operation prior to shutdown, were found in ruin. Many of the building structures had been destroyed by fire, the machines dismantled and sold for scrap metal. Water had filled many of the tunnels, which would be costly to remove. Large bucket dredge operations shut down in 1957. Between 1852 and 1964, Oregon produced an estimated 136 million dollars in gold and silver. Approximately 73 percent came from the mines of Baker and Grant counties.

Although inflation and high gold prices in the early 1980’s caused a renewed interest in gold mining, currently there is little active mining activity occurring within the Granite watershed. The current income generated by mining in the area is unknown, but thought to be quite low.

NON-FOREST VEGETATION

Region 6 “Sensitive” Species

The Pacific Northwest Regional Forester has identified these species as needing special management to prevent being placed on Federal or State endangered species lists. An updated plant sensitive species list was released in May of 1999. The following sensitive species have the potential to occur or are documented within or near the analysis area.

Botrychium sp., Currently, within the Granite Mining Project EIS analysis area, five documented Region 6 Sensitive *Botrychium* populations exist. These five populations are represented by *Botrychium minganense*, *B. montanum*, *B. lunaria*, and *B. pinnatum*. No documented sensitive *Botrychium* populations are located within or adjacent to EIS proposed mining/exploration sites

Carex crawfordii and *Carex interior* are two species of sedges added to the Regional Forester's Sensitive Species List for Oregon in May 1999. Both species are suspected to occur on the District. Since these species were not sensitive at the time, surveys before 1999 may have not been optimal for locating and documenting these two sedges. Both *Carex* species grow in perennially wet clearings, usually with surface water present 6-8 months of the year.

Silene spaldingii, this species is listed as "Sensitive" and is being considered by the Fish and Wildlife Service for listing as "Threatened" under the Endangered Species Act. This species is known to occur on the Umatilla and Wallowa Whitman National Forest. *Silene spaldingii* primarily occurs in open areas of deep Palousian soils, often on north aspects.

Species of Concern

Additionally five species of concern have been identified by the U.S. Fish and Wildlife service. The USFW service has requested that the District consider these five species.

1. *Botrychium ascendens*, is not known to occur on the Umatilla National Forest. The nearest documented site occurs on the Wallowa-Whitman National Forest. *B. ascendens* is suspected to occur on the Umatilla due in large part to similar habitat requirements and sympatric nature with present *Botrychium* species. Habitat does not exist within proposed mining/exploration sites or immediately adjacent. Potential habitat does exist within the analysis area.
2. *Botrychium crenulatum*, occurs on the North Fork District but is located well outside of the proposed analysis area. Habitat does not exist within proposed mining/exploration sites or immediately adjacent. Potential habitat does exist within the proposed analysis area.
3. *Botrychium paradoxum*, occurs on the North Fork District but is located well outside of the proposed analysis area. Habitat does not exist within proposed mining/exploration sites or immediately adjacent. Potential habitat does exist within the proposed analysis area.
4. *Botrychium pedunculatum*, occurs on the North Fork District but is located well outside of the proposed analysis area. Habitat does not exist within proposed mining/exploration sites or immediately adjacent. Potential habitat does exist within the proposed analysis area.
5. *Pleuropogon oregonus*, is not known to occur on the Umatilla National Forest. This species is known only from two areas in Union and Lake Counties, Oregon. Described as growing on perennially wet-swampy ground, generally emergent in perennial flowing streams. Due to past mining activities (dredging) good condition habitat does not exist within proposed mining/exploration sites. Limited disturbed habitat exists adjacent to proposed activities in less heavily disturbed areas. Potential habitat does exist within the proposed analysis area.

Noxious Weeds

Several categories are used in prioritizing treatments for the weed species on the Forest list: 1) "Potential Invaders" are noxious weed species that occur on lands adjacent to the Umatilla National Forest but which have not been documented on lands administered by the Forest; 2) "New Invaders" are noxious weed species that occur sporadically on the Umatilla National Forest and which may be controlled by early treatment; and 3) "Established" species are widespread across the Forest in large populations and containment strategies are used to prevent their further spread. In the last 2 years several species of noxious weeds have shown dramatic increases in distribution and population sizes across the Forest. This has necessitated splitting the "New Invader" category into two sub-categories: 1) Species of the "New Invaders/Established" subcategory are those species that are presently controllable but which are approaching "Established" infestation levels and which are prioritized for early treatment; and, 2) Species in the "New Invader" subcategory are of limited distribution and can probably be eradicated if early treatment can be implemented.

Weeds of the Granite mining analysis area and their respective treatment prioritizing categories on a Forest-wide level are presented in Table 3.12:

Table 3.12 – Granite area noxious weeds.

Noxious Weed Species	Treatment Prioritizing Category	Remarks
<i>Centaurea diffusa</i> (diffuse knapweed)	New Invader/Established	An annual or short-lived perennial; spread by animals, wind, vehicles; highly competitive.
<i>Centaurea biebersteinii</i> (was <i>Centaurea maculosa</i>) (spotted knapweed)	New Invader/Established	A short-lived perennial; tolerates shade; spread by animals, wind, vehicles; highly competitive.
<i>Cynoglossum officinale</i> (hound's tongue)	New Invader/Established	A biennial; tolerates shade; invades disturbed sites; spread by animals, clothing, water, logging equipment; persistent in clearcuts.
<i>Cardaria draba</i> (Whitetop)	New Invader	A creeping perennial; reproduces from root segments and seeds; highly competitive once established; often spread through hay and livestock; forms dense monocultures.
<i>Linaria vulgaris</i> (Yellow toadflax)	New Invader/Established	A creeping perennial; difficult to control because of extensive rhizomes; occupies moist to dry soil types; displaces desirable grasses; spread by water, animals, vehicles.
<i>Euphorbia esula</i> (Leafy spurge)	New Invader	An extremely persistent deep rooted perennial; spread by animals (including birds), water; vigorous rootstalks that readily produce new shoots; large nutrient reserves; extremely difficult to control.
<i>Hypericum perforatum</i> (St. Johnswort)	Established	A perennial; well established on roadsides; very slow in spreading off of roadside; difficult to control; currently under biological control on district.
<i>Cirsium arvense</i> (Canada thistle)	Established	A creeping perennial; established slowly; difficult to control because of rhizomes; prolific seed producer; seeds dispersed by wind/water in late summer and fall.

Noxious Weed Species	Treatment Prioritizing Category	Remarks
Cirsium vulgare (Bull thistle)	Established	Common in harvest units; persistent for about 2 years; not considered problematic by the silviculturists of the district.

There are 28 noxious weed sites within the general project area. There are six mining claims within the project area that are within close proximity to inventoried high priority “new invader/established” weed sites. There is one established weed of high priority, yellow toadflax, that has not yet been sufficiently inventoried, and undiscovered sites may be in or adjacent to project claims. Whitetop was recently discovered in the town of Granite and the possibility of undiscovered populations throughout the project area is a concern. A leafy spurge site is located along Clear Creek 1.5 to 2.5 miles above the project area in the Beaver Creek Meadows. Potential for this site to spread is very high. Leafy Spurge is an extremely adaptable plant with seed dispersal mostly by birds and water and invasion of this weed on the disturbed soil/gravels of the project area is a paramount concern as leafy spurge is documented as very difficult to control and virtually impossible to eradicate once established.

With the exception of the low priority weeds and yellow toadflax, the noxious weeds within the project area are small sites, usually occurring along roads. Though small, from these points of initial infestation, weed species become (opportunistic) in invading suitable microhabitats adjacent to the initial infestation site. Most of the noxious weed species of the Umatilla National Forest thrive in open full sunlight in disturbed soils in which native species have been diminished or displaced. As all claim activity involves at least some soil/gravel disturbance and some removal and movement of soil/gravel, there is definitely a likelihood of noxious weed invasion and further spread in these areas of disturbance.

With the exception of two of the mining claims, only the roads and a portion of the streams have been surveyed in the project area. No off road upland areas have been surveyed so there is a potential for invasion of undiscovered populations. However, the highest risk of infestation occurs along the streams and travel routes. Yellow toadflax is well established along Granite Creek with some spread occurring along the 1035 road and the mining road spur and continued spread is a concern. Treatment of the existing noxious weed sites has been effective within the treatment area and with the exception of the low priority weeds and yellow toadflax; these sites will receive continued effective treatment throughout the length of the project. Yellow toadflax will be treated as soon as a viable treatment is discovered.

HERITAGE RESOURCES

Within the Granite watershed, one large and several smaller cultural resource inventories have been completed in the past 12 years. These surveys were conducted in an effort to identify and gather sufficient information to evaluate historic properties listed on or determined eligible for listing on the National Register of Historic Places (NRHP) that may be affected by current and future proposed undertakings.

The earliest formal cultural resource inventories in the Granite area were conducted in the later part of the 1980's. Two cultural surveys were conducted on proposed timber sale areas. As a result of these earlier inventories, 13 Euroamerican sites, 1 historic and 1 prehistoric isolate were identified. All of the sites are manifestations of the historic mining area. Later surveys found an additional 133 Euroamerican sites, 8 American Indian sites as well as 16 American Indian isolate finds and 14 Euroamerican isolate finds.

Most of the Euroamerican sites are associated with early gold prospecting within the Granite drainage and its associated tributaries. Site types include the remains of cabins and stamp mills, trash concentrations, numerous collapsed adits and mineral test pits, and tailing piles that attest to past placer and lode mining that occurred in the early 20th century. During the 1930's to 1950's, several dredges operated in the Granite, Clear, and Bull creek drainages, resulting in the large tailings piles that are visible today. The most noted structure associated with mining in the Granite area is the Fremont Powerhouse and its associated complex of features that was constructed by owners of the Red Boy Mine. Historic sites that are not associated with mining relate to early Forest Service administrative improvements including: stock driveways, telecommunication lines, and several blazed trail segments. All of the prehistoric sites consist of small, discrete, low-density lithic scatters. The predominant artifact of these sites is the waste flake indicative of stone tool manufacturing or maintenance that suggests short-term camping associated with upland resource utilization.

In addition to the above inventories, a review of two documents that contain information pertaining to areas of cultural interest were also reviewed for this project. Each of these documents is briefly described in the following narrative.

In 1974, Robert Suphan compiled an ethnographic report pertaining to the sociopolitical organization and land use patterns of the Umatilla Indians that occupied the Blue Mountains of northeast Oregon. Suphan used material published by several ethnographers and information gathered from Umatilla, Cayuse, and Walla Walla elders who participated in oral interviews and field survey trips undertaken in 1941. Also, in 1994, the Umatilla Indian Reservation (CTUIR) worked with the Umatilla and Wallowa-Whitman National Forests to produce Mits Qooi Nux Sa Kin Na Noon Im Watus Pa: A Partial Traditional Use Area Inventory of the Umatilla National Forest and the Wallowa-Whitman National Forest (Minthorn 1994). A review of these documents indicates that there are areas of cultural interest identified by CTUIR that are in close proximity to the area included within the Granite Area Mining Projects EIS.

TRANSPORTATION SYSTEM

There are approximately 477 miles of open and closed roads (Federal, State, County, and Private) within the Granite Creek watershed. Of this total, 412 miles (112 miles on Umatilla NF, 365 miles on Wallowa-Whitman NF) are open to motorized use and 59 miles are closed but maintained for administrative access (such as fire suppression, fence maintenance, etc.). The North Fork John Day District Motorized Access and Travel Management Plan, which was signed in 1990, discusses in detail management objectives and access needs for those roads located on the district.

Grant County maintains just over 14 miles of paved, two lane roads within the watershed. These are high standard roads having wide paved surfaces, good sight distance, and have no problem handling two-way traffic.

Forest Road 1000 and 7300 are the main arteries to access the watershed. They are high standard roads having wide surfaces, good sight distance and have no problem handling two-way traffic. They both contain ditches with relief culverts. The surface on the 1000 road is crushed gravel and the surface on the 7300 is asphalt. No problems with mass failures have occurred on these roads in the past. Most of the other Forest Service roads within the watershed that are opened for motorized use are maintained to class 2 standards. These roads are usually graveled and have a driving surface that is 1 to 1 1/2 lanes wide. They usually contain ditches with relief culverts although some are out-sloped.

A roads analysis was done on those roads within the watershed that are located in the North Fork John Day District since most of the claims are located there. This analysis indicated that the access needs and management objectives as stated in the Access and Travel Management Plan are still valid. However, there are a couple of road sections that are not needed and could be decommissioned. Both sections are currently closed and are located within the North Fork John Day wilderness. They total about 2.25 miles in length. In addition, the roads that currently access the Lower Granite Creek mining claims should be gated. The road is closed under the Access and Travel Management plan but enforcement of this closure is spotty at best. Gating the road and using it only for approved activities would eliminate this problem.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

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Figure 4-1. Stream Map

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter discloses the potential effects of each of the alternatives described in Chapter 2, including the scientific and analytical basis for the comparison of the alternatives. The chapter includes brief discussion of incomplete and unavailable information, the process used to determine cumulative effects, the potential effects of the proposed action and its alternatives on area resources, and compliance with other laws and regulations. The sections in bold type are particularly important to the decision-maker. The effects discussion is generally organized in the same order as the issues listed in Chapter 1:



- ❖ WATER QUALITY (Covers Key Issue and the soils resource)
- ❖ FISH AND AQUATIC HABITAT (Covers Key Issue 2 and the Proposed, Endangered, Threatened and Sensitive species as well as Forest Plan required Management Indicator Species tracking issue)
- ❖ RECREATION (Covers the Recreation Use tracking issue as well as Wilderness and Visual Resources)
- ❖ WILDLIFE (Covers Wildlife Habitat and the Proposed, Endangered, Threatened and Sensitive species and Management Indicator Species tracking issues)
- ❖ SOCIO-ECONOMICS (Covers Economics as well as the Health and Safety and “Miners Rights” tracking issues.
- ❖ NON-FOREST VEGETATION (Covers Proposed, Endangered, Threatened and Sensitive plant species and the Noxious Weed tracking issues)
- ❖ HERITAGE RESOURCES (Covers the Heritage Resources tracking issue)
- ❖ TRANSPORTATION SYSTEM (Covers the Transportation tracking issue)
- ❖ TREATY TRUST RESPONSIBILITIES (Covers Indian Treaty Trust Responsibilities)

Effects are shown as being direct (occurring at the same time and place as the triggering action), indirect (separate in time and space from the action that caused them), or cumulative (the incremental effect of the project when added to effects from other past, present, and reasonably foreseeable actions). These effects are described in terms of increases or decreases, intensity, duration, and timing. The discussion of these effects also provides a

comparison of the trade-offs associated with each alternative. The chapter ends with a discussion of compliance with the Forest Plan, various laws, and executive orders. For more detailed information, see the individual resource reports found within the analysis file for this proposal.

Data and information collected for the various analyses in the EIS, as well as the resulting estimates of effect and conclusions, vary in precision and accuracy. Environmental effects are reasonably well understood. However, the uncertainty associated with estimating the magnitude of an environmental effect is due to the (often great) inherent variability and diversity associated with the natural environment. By using assumptions based on available research and professional field experience, effects of actions can be reasonably estimated with confidence. Such assumptions used for analysis are listed under each resource heading, along with the scale at which the analysis was conducted. While no estimate of effects for a given alternative is absolute, the interdisciplinary team believes there is sufficient information with regard to environmental effects to provide a clear basis for choice among the alternatives. These estimated effects are presented as the heart of this chapter.

WATER QUALITY

Suction Dredging

Since the activity that probably will have the greatest impact on stream hydrology is the use of suction dredges in stream beds, a general discussion of the potential impacts of suction dredging is incorporated here. The potential impacts of suction dredging were reviewed and evaluated for the National Forest system by Bret Harvey, Thomas Lisle, Tracy Vallier, and David Fredley in 1995 (Harvey et al, 1995). Information presented in this section of the report is derived entirely from their report, “Effects of Suction Dredging on Streams: A Review and Evaluation Strategy”, which consisted of extensive review of at least 35 technical papers.

A number of the claimants plan to use suction dredges in the creeks encompassed by their placer claims during the July 15 to August 15 dredging season. The State of Oregon has issued a National Pollution Discharge Elimination System (NPDES) General Permit for suction dredges smaller than 40 hp. Claims within the study area on which suction dredges may be used in creeks include the Old Eric #1 and #2; East Ten Cent; Brice #1, #2, and #3; Tarhill of Ten Cent Creek; PBGF Placer #1, #2, and #3; Republican Comeback #7; and Republican Comeback #10, and Grubstake. All suction dredge operators are required to obtain an NPDES 700-J permit prior to use.

Suction dredging can adversely impact aquatic resources by destabilizing channels, at least locally, and by mobilizing sediments. Other impacts can include noise, competition for use of riparian areas, and chemical pollution by petroleum hydrocarbon fuels, lubricants, and remobilizing chemical contaminants (such as mercury) sequestered in bed sediments.

Harvey et al reported that in steep mountain channels (>2%), natural spawning areas for salmonids are rare because stream beds are armored with cobbles and boulders too large to be moved by spawning fish during redd building. As dredge tailings consist of looser and more suitable particles, dredge tailings may provide deposits attractive to spawning fish. However, the long-term improvement of spawning habitat may be rare as gold-bearing pockets would be mined out and thus the annual renewal of spawning gravels non-renewable.

Dredging commonly includes the excavation of holes in stream beds and deposition of tailings consisting of boulders, cobbles, and finer substrate materials along the banks and in the stream bed. This frequently results in significant changes in the depth and/or volume of geomorphic channel units such as pools and riffles, especially in smaller streams, which may result in a net increase or decrease in preferred habitat by salmonids.

Stream fishes can be affected by the types of changes that occur during dredging, even in the absence of significant changes in habitat depth and/or volume. Species that live on or in the substrate during the summer appear to be most at risk from dredging. The removal of large substrate elements during dredging can affect salmonids, particularly in winter when they occupy microhabitats beneath and among cobbles, boulders, and logs. In contrast, moderate deposition of fine sediment probably has limited impacts on fish while they occupy the water column. Behavioral responses to active dredges had not been qualified at the time the paper was written.

One of the most obvious effects of dredging on downstream habitat is the increase in suspended sediment. High levels of suspended sediment is sometimes lethal, and can have a variety of adverse impacts on the growth, survival, and behavior of stream biota. For salmonids, even slightly elevated levels of suspended sediment can reduce prey capture success. In contrast, some species may actually benefit because of reduced risk of predation, and actually appear to seek out moderately turbid waters. While the substrate in stream channels in Oregon is unlikely to yield high loads of suspended sediment during dredging, local conditions or the excavation of stream bank material could create problems.

With regard to biota, the downstream effects of dredging include the transport and deposition of fine bedload sediments. While sand and gravel are typically deposited within meters of the dredge and gradually dispersed downstream, silt may remain suspended for tens or hundreds of meters, even during low flows. Infiltration of silts into redds can impede the inter-gravel water flow, reducing oxygen available to salmonid eggs and alevins. It may also prevent fry from emerging from gravel. Neither the deposition nor the responses of aquatic biota have been well-investigated.

Available data suggest that individual dredges need not create significant impacts on downstream biota, and that significant impacts occur in instances where closely-spaced dredges create potential for cumulative effects.

In some streams, earlier mining practices have left behind pollutants that are stored in sediments. As mercury was widely used to amalgamate fine gold by early placer miners, mercury is a potential contaminant of stream bed sediments. Suction dredging can mobilize

such contaminants, although impacts are likely to be localized. The use of modern equipment powered by internal combustion engines poses some risk of contamination by petroleum hydrocarbon fuels and lubricants, as well. Common sense practices such as fueling equipment away from water courses and storing fuel containers away from streams can reduce potential risks significantly.

Suction dredging can decrease channel stability and alter stream morphology by changing the local size composition of bed materials, disturbing stream banks, removing large objects such as boulders and LWD, and disrupting the coarse surface layer that armors the surface of the stream bed. Imposed changes in bed material size created by dredging can increase local scour or fill in portions of the stream that were not directly disturbed by dredging. However, channel topography and texture may quickly readjust during high flow, which may approximately restore the stream bed to conditions similar to those of before dredging. Piles of large rocks, such as those common along Granite and Clear Creeks, can persist through high flow events and alter the distribution of hydraulic forces, causing changes in nearby channel morphologies. This can change the course of the path of deepest, fastest flow (thalweg) causing the stream to migrate into stream banks thus increasing bank erosion and destabilization.

Dredging near riffle crests can create special problems, as spawning areas are typically immediately upstream of riffle crests. Dredging causes riffle crests to erode, thus destabilizing spawning areas. Upstream pools may become more shallow, and the downstream reach may destabilize as well. Dredging downstream of riffle crests can create migrating nickpoints or headcuts during high flow, and lead to eroding riffles.

Dredging can also destabilize stream banks when riparian vegetation is disturbed, or where stream banks consist of easily eroded materials like alluvium. Dredging may artificially deepen channels along stream banks, as well.

Sedimentation

Sedimentation is the water quality factor that is most likely to be affected by the proposed action. Suction dredging in stream channels and the excavation and/or disturbance of streambanks and nearby areas will loosen soils, making them more mobile. The proximity of the placer mine claims and two of the three lode claims (Magnolia Group, and SW Saint Paul) to stream channels will serve to minimize the potential for ground covering vegetation to capture mobilized sediment, as well.

Alternative 1

Alternative 1 comprises the plans of operation described in the 1999 North Fork John Day River Subbasin (NFJDRS) Biological Assessment (BA). Four (4) claimants propose to use suction dredges in creeks under Alternative 1.

Direct and Indirect Effects

Direct effects could include the short-term mobilization of fine-grained sediment through the use of small suction dredges operating in streambeds. Reworking old placer tailings will produce significantly less fine-grained sediment, since fines were washed from the deposits when they were originally processed in the 1930s. Harvey (Harvey et al, 1995) suggests that channel morphology and texture, may quickly readjust during high flow restoring streambed conditions to those similar to those before dredging and, by inference, similar impacts resulting from small scale mining of nearby stream bank deposits.

Placer mining of upland placer deposits and overlying soils will increase the potential for the mobilization of surficial sediment. Since washing plants on such sites will reportedly recycle their wash water through ponds located away from streams, the potential for the introduction of significant quantities of sediment, if any, into nearby streams from wash plants will be minimized.

The use of suction dredges in streams will mobilize fine-grained streambed substrates, and create short-lived plumes of sediment. Use of suction dredges along stream banks could destabilize banks, creating potentially long-lived sources of sediment. Sediments mobilized by suction dredging will settle out downstream, potentially degrading spawning and rearing habitat, at least temporarily. Harvey (Harvey et al, 1995) concluded that the effects of individual suction dredging operations tend to be localized, although offsite impacts are not well understood. With regard to the operation of small suction dredges in the study area, dredge sizes appear to be small, precluding the ability to process large volumes of material. Potential long-term impacts appear to be minimal, and are probably immeasurable except in the short term.

Harvey noted, however, that data suggests that individual dredges need not create significant impacts on downstream biota, and that significant impacts occur in instances in which closely-spaced dredges create potential for cumulative effects. As this will not be the case under alternative 1, sediment created by the proposed action probably has limited impacts on habitat.

Excavated and disturbed areas around both placer and lode mines will constitute a potential source of sediment. Reclamation efforts, including recontouring and reseeding disturbed areas as cited in the BA for several of the claims, will serve to minimize long-term sediment mobilization.

Cumulative Effects

Review of the available, incomplete data regarding cobble embeddedness and fines (Table 3.3) suggests that Upper and Lower Granite Creeks (93A and 93C), Rabbit Creek (93E) and Ruby Creek currently do not meet standards (percent fines and cobble embeddedness) used to measure sediment. This is not surprising in the instance of Granite Creek, given the widespread disruption of the streambeds from past placer mining operations.

Table 4.1, below, summarizes (by area) the most likely significant sources of sediment in the subwatersheds in which the subject mining claims are located. Significant sediment sources include roads, timber stands less than 30 years old (burned or harvested), and mining operations. Comparison of the acreage to be disturbed by mining each year with total acres of roads plus timber stands less than 30 years old reveals that the acreage to be mined is insignificant in comparison to other sources of sediment in the six subwatersheds in which the subject mines are located.

Table 4.1 – Comparison of mining-disturbed areas to road and other disturbed areas.

Subwatershed (SWS)	Mining Claim(s) With Current POO	Expected Disturbed Area (ac/yr) (1)	Total Acres By SWS	Miles of Road in SWS RHCA (2)	Acres of Road in SWS RHCA (3)	Acres Seral Class < 30 Years by SWS (4)	Ac. Mined/ Total Ac. Road + Ac. Seral Class < 30 years
Lower Granite Creek (93A)	Republican Comeback #7 Republican Comeback#10,#11 Hopeful #2 & #3 Hopeful	<0.5 <0.5 <1 <0.25	<5	37.5	136.3	770	0.5%
Ten Cent Creek (93B)	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	1 <1 1 <0.25	<3.25	18.3	66.5	257	1%
Upper Granite Creek (93C)	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	0.25 <1 0.25 0.25 0.25	<2.0	12.7	46.1	1616	0.1%
Clear Creek (93J)	Grubstake Bunchbucket	<0.25 <1	<1.25	4.4	19.6	7	4%
Lightning Creek (93K)	Lucky Strike	<1	<1	6.3	15.6	0	10%

Sources: (1) Draft Biological Assessment, North Fork John Day River Sub-Basin, 1999
 (2) Granite Creek Watershed Analysis, 1997
 (3) Assume average road width of 30 feet
 (4) North Fork GIS Database

Harvey (Harvey et al, 1995) indicated that the cumulative effects of dredging are difficult to predict and evaluate, and recommended that dredging be managed on a scale approaching that of a watershed. Processing upland placer deposits and/or stream bank deposits through closed systems in which wash water is recycled would have even lesser impacts than dredging, making the cumulative impacts even more difficult to assess.

Given the short-term (seasonal) duration of proposed mining activities, as well as the small scales and proposed modes of operation of the 16 mining claims, it appears that the volume of additional sediment added to local stream loads by the proposed action will be small, if not immeasurable. Potential adverse impacts upon sedimentation will be minimal, except in the short term when suction dredges are operating in streams. The increased volume of sediment that will be added to local streams as a result of the alternative 1 proposed action will not significantly contribute to cumulative sedimentation impacts.

With regard to the Clean Water Act, the proposed action will not measurably exacerbate noncompliance with current sediment guidelines.

Alternative 2

Under alternative 2, an additional two placer claims will have suction dredges operating in streams. The POOs for the 16 mining claims, otherwise, remain for all practical purposes, the same as reported for alternative 1.

Direct and Indirect Effects

Operation of two additional suction dredges, one on Ten Cent Creek (93B) and one on Upper Granite Creek (93C), will temporarily mobilize stream sediments, as discussed under Alternative 1. Direct and indirect impacts are expected to be similar, and equally insignificant on a watershed scale.

Cumulative Effects

Cumulative impacts for alternative 2 are expected to be similar to those described under Alternative 1.

Alternative 3

Under alternative 3, a number of additional mitigations will be implemented on selected claims to further minimize the potential for sediments to be introduced into nearby creeks. These measures include construction of silt fences along nearby creeks, prohibiting direct discharge of wash water to creeks, keeping mine tailings away from creeks, and improving settling ponds that are used to capture both process water and mine drainage.

Direct and Indirect Effects

Implementation of the mitigating measures included under alternative 3 will serve to further minimize potential adverse effects of sediment mobilization due to mining activities. Since the direct and indirect effects are expected to be minimal to immeasurable under the less stringent alternatives 1 and 2, sediment-related impacts under alternative 3 will also be minimal to immeasurable. That benefit of alternative 3 will be that it will further minimize the already small, very localized impacts of sediment upon biota and habitat.

Cumulative Effects

Cumulative impacts for alternative 3 are expected to be similar to those described under alternatives 1 and 2, except that localized impacts will be further minimized.

Water Temperature

Water temperature is another water quality factor that can be affected by mining, especially placer mining since the removal of riparian, shade-producing vegetation along stream banks can serve to increase stream temperatures. Riparian shade is already less than the Umatilla Forest Plan goal of no less than 80 percent along many of the creeks in the Granite Creek watershed, and Seven-Day Average Maximum temperatures exceed the ODEQ guidelines in the few creeks (Upper and Lower Granite, Clear Creek, and Ten Cent Creek) for which data are available and on which most of the mining claims considered herein are located.

Alternatives 1, 2, and 3

Alternatives 1, 2, and 3 are similar enough with regard to the removal of shade-producing riparian vegetation, and hence their potential to raise water temperatures, that direct and indirect effects on stream temperatures are addressed together in this report.

Direct and Indirect Effects

Little riparian vegetation would be removed under any of the three proposed alternatives. In many instances, especially along Lower Granite Creek and East Ten Cent Creek, riparian vegetation is either already virtually non-existent or operating practices will be such that only one or two trees might be removed over a period of several years to provide access to placer deposits. Certainly nothing approaching the 300 feet of channel threshold for causing a 1.2° F increase in stream temperatures described by Helvey (Helvey et al, 1995) will occur on any of the mining claims considered in this report. On some claims (SW Saint Paul, Grubstake, Bunchbucket, and Lucky Strike) the ground to be mined is sufficiently distant from creeks that the removal of vegetation would have little if any measurable effect on stream temperatures. Direct and indirect effects on stream temperatures are expected to be immeasurable, and thus insignificant.

Cumulative Effects

The proposed actions under alternatives 1, 2, and 3 are not expected to measurably alter the already elevated stream temperatures in the Granite Creek (93) watershed. Cumulative impacts, therefore, appear to be insignificant. With regard to the Clean Water Act, the proposed action will not measurably exacerbate noncompliance with current stream temperature guidelines.

Hydrology/Stream Morphology

Hydrology and stream morphology can be adversely impacted in instances in which large volumes of stream channel bottoms and banks are disturbed, as is readily evident along the reaches of Lower Granite Creek (93A), East Ten Cent Creek (93B), Upper Granite Creek (93C), Lower Bull Run Creek (93N), Lower Clear Creek (93F), Middle Clear Creek (93J), and Olive Creek (93L). For the proposed actions under alternatives 1, 2, and 3, the only activity likely to significantly impact hydrology and stream morphology is suction dredging.

Direct/Indirect Effects

As discussed earlier in Section 4, potential impacts of suction dredging include decreasing channel stability, changing the local size-composition of bed materials, disturbing stream banks, and disrupting the coarse surface layer that armors the surface of the stream bed. Imposed changes in bed material size created by dredging can increase local scour or fill in portions of the stream that are not directly disturbed by dredging. Dredging near riffle crests can create special problems, as spawning areas are typically immediately upstream of riffle crests. Dredging causes riffle crests to erode, thus destabilizing spawning areas. Upstream pools may become more shallow, and the downstream reach may destabilize as well. Dredging downstream of riffle crests can create migrating nickpoints or headcuts during high flow, and lead to eroding riffles. Harvey, however, noted that channel topography and texture may quickly readjust during high flow which may approximately restore the stream bed to conditions similar to those of before dredging.

Given the small scale of suction dredging proposed by the claimants, potential direct impacts to stream flow appear to be minimal. The ability of small suction dredges to significantly alter streambed morphology to the extent that the potential indirect effects described in the preceding paragraph will occur is limited as well. Given that subsequent peak flows may restore topography and texture to normal conditions (Harvey et al, 1995), long-term effects are anticipated to be negligible.

Cumulative Effects

The cumulative effects of alternatives 1, 2, and 3 on hydrologic functioning and stream morphology are expected to be small, short-lived, and insignificant, especially in light of current conditions. Any short-term alterations of streambed morphology will be erased during annual periods of peak runoff, according to Harvey.

Chemical Water Quality

Alternatives 1, 2, and 3 are similar enough with regard to the potential to adversely impact chemical water quality parameters, that direct and indirect effects on chemical water quality are addressed together in this report.

Direct/Indirect Effects

Placer operations do not adversely impact chemical water quality because the alluvial materials being processed typically do not contain environmentally harmful chemical components. As noted earlier, some gravel may contain small collections of mercury used to amalgamate fine particulate gold during earlier placer mining efforts. No data are available to indicate whether streambed gravels in the analysis area actually contain any mercury. Given the relatively small volumes of material to be processed in the analysis area, significant mobilization of mercury (even if it is present in local gravels) is unlikely to occur. The effects of placer mining on chemical water quality are, therefore, expected to be immeasurable and insignificant.

The greatest potential adverse impact to water quality is presented by the potential for fuel and/or lubricant spills in suction dredging operations, due either to the improper storage of fuels and lubricants, or improper fueling practices. Release of fuels or lubricants from dredges and heavy equipment operating in or near creeks or nearby stream banks could create localized, transitory toxic conditions that would be harmful to fish and other stream biota. Fortunately, the relatively small quantities of fuels/lubricants to be used on each claim along with easily implemented spill prevention measures will minimize potential adverse impacts. Furthermore, spilled fuels would be rapidly flushed away and diluted by flowing creeks, as well as volatilized, further minimizing potential adverse impacts.

Excavation and stockpiling of sulfide-containing bedrock in lode mines can create acid rock drainage (ARD), which contains various toxic metals such as arsenic, mercury, lead, and copper. Evaluation of available data (Weston 1997) suggests that adverse impacts are localized and immeasurable several hundred feet downstream from known sources of ARD. Given the small volume of rock to be produced at the three lode mines (Magnolia, Lucky Strike, and SW Saint Paul) considered in this report, direct and indirect effects are expected to be immeasurable and insignificant.

Cumulative Effects

The proposed action is not expected to have any measurable impact on the cumulative effects of management activities in the Granite Creek watershed.

Soils

Alternatives 1, 2 and 3

All placer mining will occur on alluvial soil that has formed along creeks. In most cases this material has already been disturbed from past mining activity. The amount of soil disturbance from mining activities will not vary greatly between alternatives. On claims that include placer mining, surface material is removed and gold bearing (paydirt) is removed and processed through a trommel or similar equipment. However, the scope of proposed activity varies greatly between claims. Each claim has a specific reclamation plan; designed to restore the site after mining is completed. Generally, topsoil is removed and stocked piled. After mining is complete, excavated areas are refilled with the processed material and recontoured. The stored topsoil is spread over the surface and grass is seeded. Although the mined sites will be returned to near normal contours and stabilized by seeding, soil structure will be damaged by the operations. It is unknown how long it will take for these soils to return to natural conditions.

FISH AND AQUATIC HABITAT

This section discusses the potential effects of each of the project alternatives on fish habitat, water quality, and TES species. Potential effects associated with this project are direct (occurring at the same time and place as the triggering action), indirect (separate in time and space from the action that caused them), or cumulative (the incremental effect of the project when added to effects from other past, present, and reasonably foreseeable actions).

ALTERNATIVE 1

The following table shows the effects to each of the elements that have been analyzed. The numbers represent the degree of change that could occur if the alternative were implemented.

Table 4.2 – Comparison of effects for Alternative 1

Subwatershed (SWS)	Mining Claim(s) With Current POO	Riparian Zone Health	Stream Functionality	Water Temperature	Sediment Load
Lower Granite Creek (93A)	Republican Comeback #7 Republican Comeback #10 & #11 Hopeful #2 & #3 Hopeful	2	2	2	3
Ten Cent Creek (93B)	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	2	2	1	3
Upper Granite Creek (93C)	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	2	1	2	2
Clear Creek (93J)	Grubstake Bunchbucket	1	1	1	2
Lightning Creek (93K)	Lucky Strike	1	1	1	2

1 – low probability of change from current condition

Low probability means that the actions may have an effect that could change the current condition but no measurable change is expected

2 – moderate probability of change from current condition

Moderate probability suggests that the actions, while having an effect that will cause an increase in measured conditions, they would not be discernable from existing conditions.

3 – high probability of change from current condition

High probability means that the actions will more then likely have an effect and they may be measurable.

Lower Granite Creek

Direct/Indirect Effects:

Riparian Health

Planned mining activities may have an effect on the riparian habitat by removing a limited amount, less then one-quarter of an acre, of vegetation occurring within the RHCA, but this should not be enough to directly affect stream temperature. These activities may mobilize

fine sediments near the job site and may reduce the future availability of large woody debris on the claim. However, these disturbances are expected to be minor and should not further degrade riparian habitat. Heavy equipment use may cause compaction, which will increase runoff rate and reduce vegetative growth on the part of the claim where equipment is used. Use of petroleum products within the RHCA has the potential of affecting the area if a spill should occur. Use of the existing outhouses may affect riparian habitat by increasing the chance of contamination of ground water.

Stream Health

Proposed placer activities should not affect stream gradient, sinuosity, pool, riffle glide ratio or the number of pools per mile. Suction dredging may affect the riffle glide ratio and/or the number of pools per mile, but this effect should be short term and not be noticeable after the following spring runoff. Older juvenile fish may be moved out of the general area where suction dredging is taking place or may be removed by sediment plume, but this would be short term because the time for suction dredging is only 30 days (July 15 – August 15). Use of petroleum products has the potential of affecting the area if a spill should occur.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Existing design of settling ponds may allow pond water to escape during periods of heavy rain. However, this should be of short duration, localized, and will not permanently increase the stream temperature.

Sediment Load

Proposed placer work should not mobilize sufficient sediments to directly affect the creeks. However, design of the existing settling ponds may permit fine sediments to be carried into the creeks during periods of heavy rain and high flow. Planned suction dredging may resuspend fine bottom sediments that will settle out further down stream and may affect that area of the stream. However, since these activities will be taking place while anadromous fish eggs are not incubating in stream gravels, no direct effects are expected. Rearing fry and fingerlings may not be able to avoid the dredge and may be directly affected because of limited mobility. Repeated use of the fords across Granite and Rabbit Creeks may cause a minor increase in suspended sediments and compaction of stream gravels in the ford and may affect fry and fingerlings, the effects are expected to be localized. Dredging operations may affect California floaters, if present, by direct removal and increased turbidity. Potential indirect effects may include reduced cobble embeddedness and improved bed flow by reducing the amount of fine sediments in stream gravels through resuspension of fine sediments during dredging operations. In addition, dredging may uncover small invertebrates residing in stream sediments for foraging juvenile anadromous fishes. However, these potential impacts are expected to be of short duration and affect only a limited amount of the available habitat.

Ten Cent Creek

Direct/Indirect Effects:

Riparian Health

Placer activities may displace a limited amount of vegetation, less than one-half acre, occurring within the RHCA, but this should not be enough to directly affect stream temperature. These activities may mobilize fine sediments near the job site and may reduce the future availability of large woody debris on the claim. However, these disturbances are expected to be minor and should not further degrade the Ten Cent Creek riparian habitat. Heavy equipment use may cause compaction, which will increase runoff rate and reduce vegetative growth on the part of the claim where equipment is used. Use of petroleum products within the RHCA has the potential of affecting the area if a spill should occur.

Stream Health

Proposed placer activities should not affect stream gradient, sinuosity, pool, riffle glide ratio or the number of pools per mile. Suction dredging may affect the riffle glide ratio and/or the number of pools per mile but this effect should be short term and not be noticeable after the following spring runoff. Older juvenile fish may be moved out of the general area where suction dredging is taking place or may be removed by sediment plume, but this would be short term because the time for suction dredging is only 30 days (July 15 – August 15).

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation since most of the vegetation within the claims is less than 20 feet tall and the proposed work sites are, for the most part, more than 20 feet from the wetted stream course.

Sediment Load

Due to the location of, duration of, and number of planned placer mining activities, unknown amounts of fine sediments may be mobilized and carried (water or air born) into East Ten Cent Creek. The amount is expected to be minor, but could be sufficient to result in a measurable change in sediment load parameters. Proposed pick and shovel work should not mobilize sufficient sediments to directly affect the creek. Planned suction dredging may resuspend fine bottom sediments that will settle out further down stream and may affect that area of the stream. However, since these activities will be taking place while anadromous fish eggs are not incubating in stream gravels, no direct effects are expected. Rearing fry and fingerlings may not be able to avoid the dredge and may be directly affected because of limited mobility. Potential indirect effects may include reduced cobble embeddedness and improved bed flow¹⁰ by reducing the amount of fine sediments in stream gravels through resuspension of fine sediments during dredging operations. In addition, dredging may uncover small invertebrates residing in stream

10. Bed flow refers to the flow of water through sand and gravel under lying a stream. This is also referred to as percolation and is important to incubating anadromous fish eggs.

sediments for foraging juvenile anadromous fishes. However, these benefits are expected to be localized and of short duration. Dredging operations may affect California floaters, if present by direct removal and increased turbidity. However, these potential impacts are expected to be of short duration and affect only a limited amount of the available habitat.

Upper Granite Creek

Direct/Indirect Effects:

Riparian Health

Planned activities may displace a limited amount of vegetation, less than one-half acre, occurring within the riparian zone but not enough to directly affect stream temperature. These activities may mobilize fine sediments near the job site and may reduce the future availability of large woody debris on the claim. However, these disturbances are expected to be minor and should not further degrade the riparian habitat since proposed test areas and processing sites are more than 20 feet from the wetted stream area and the vegetation currently on site is less than 20 feet tall. Heavy equipment use may cause compaction, which will increase runoff rate and reduce vegetative growth on the part of the claim where equipment is used. Use of petroleum products within the RHCA has the potential of affecting the area if a spill should occur.

Stream Health

Proposed Placer activities should not affect stream gradient, sinuosity, pool, riffle glide ratio or the number of pools per mile. Existing design of settling ponds may allow pond water to escape during periods of heavy rain.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation since proposed test areas, processing sites are more than 20 feet from the wetted stream area, and the vegetation currently on site is less than 20 feet tall. Existing design of settling ponds may allow pond water to escape during periods of heavy rain.

Sediment Load

While planned placer activities may mobilize additional amounts of fine sediments that may be carried (water or airborne) into Granite Creek, the amount is expected to be minor and should not result in a measurable change in sediment load parameters because of the proposed location of the work site in relation to the wetted stream area. However, design of the existing settling ponds on a couple claims may permit fine sediments to be carried into the creeks during periods of heavy rain and high flow. In addition, design and placement of the tailing piles removed from the adits may permit fine sediments to be carried into Lucas Gulch and Granite Creek during periods of heavy rain. Repeated use of the ford across Lucas Creek may cause a minor increase in suspended sediments and compaction of stream gravels in the ford, the effects are expected to be local and minor.

Clear Creek

Direct/Indirect Effects:

Riparian Health

Planned activities will displace a limited amount of vegetation, less than one-quarter acre, occurring within the riparian zone but not enough to directly affect stream temperature since the proposed activity is over 100 feet from the wetted stream course and the surrounding vegetation is of a size and distribution that shade will not be changed. These activities may mobilize fine sediments near the job site and may reduce the availability of large woody debris on the claim. However, these disturbances are expected to be minor and should not further degrade the Clear Creek riparian habitat. Use of petroleum products within the RHCA has the potential of affecting the area if a spill should occur.

Stream Health

Proposed placer activities will not affect stream gradient, sinuosity, pool, riffle glide ratio or the number of pools per mile. Suction dredging may affect the riffle glide ratio and/or the number of pools per mile but this effect should be short term and not be noticeable after the following spring runoff. Older juvenile fish may be moved out of the general area where suction dredging is taking place or may be removed by sediment plume, but this would be short term because the time for suction dredging is only 30 days (July 15 – August 15).

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation.

Sediment Load

While planned activities may mobilize additional amounts of fine sediments that may be carried (water or airborne) into Clear Creek, the amount is expected to be minor and should not result in a measurable change in sediment load parameters because of the location of the work sites. Planned suction dredging may resuspend fine bottom sediments that will settle out further down stream and may affect that area of the stream. However, since these activities will be taking place while anadromous fish eggs are not incubating in stream gravels, no direct effects are expected. Rearing fry and fingerlings may not be able to avoid the dredge and may be directly affected because of limited mobility. Potential indirect effects may include reduced cobble embeddedness and improved bed flow by reducing the amount of fine sediments in stream gravels through resuspension of fine sediments during dredging operations. In addition, dredging may uncover small invertebrates residing in stream sediments for foraging juvenile anadromous fishes. However, these benefits are expected to be localized and of short duration.

Lightning Creek

Direct/Indirect Effects:

Riparian Health

Planned activities will not displace any vegetation occurring within the riparian zone. These activities may mobilize fine sediments near the job site, however, these disturbances are expected to be minor and should not further degrade the Lightning Creek riparian habitat.

Stream Health

Proposed activities should not affect stream gradient, sinuosity, pool, riffle glide ratio or the number of pools per mile.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation.

Sediment Load

While planned activities may mobilize additional amounts of fine sediments that may be carried into Lightning Creek from mine tailings, the amount is expected to be minor and should not result in a measurable change in sediment load parameters because disposal area are more than 500 feet from wetted stream area.

Cumulative Effects for Alternative 1:

Cumulative effects would still be expected to occur within the Granite Creek watershed due to past and present activities (historic mining operations, timber harvests, road construction, road maintenance, fire management activities, etc.) in the area. With implementation of alternative 1, in the short term (<3-years), there would be no measurable changes in stream flows, shading may be reduced in limited areas, and stream morphology may be changed due to suction dredging operations within the wetted stream area. In addition, there may be measurable localized changes in the distribution of fine sediments that may affect down stream sediments loads. However, in the long term (> 5 years), as mining activity lessen due to depletion of minerals and ongoing reclamation continues, the riparian habitat would tend to improve through natural riparian processes, i.e. accumulation of large woody debris, changes in stream morphology, soil accumulation, plant community succession, etc. In other words, it is expected that natural riparian processes would tend to improve habitat quality from dysfunctional and functional at risk to functional with the passage of time. However, many of the existing impacts to riparian conditions would continue due to poor road conditions and/or road locations and other human activity. These conditions will not be corrected under this alternative.

ALTERNATIVE 2

The following table shows the affects to each of the elements that have been analyzed. The numbers represent the degree of change that could occur if the alternative were implemented.

Table 4.3 – Comparison of effects for Alternative 2

Subwatershed (SWS)	Mining Claim(s) With Current POO	Riparian Zone Health	Stream Functionality	Water Temperature	Sediment Load
Lower Granite Creek (93A)	Republican Comeback #7 Republican Comeback #10 & #11 Hopeful #2 & #3 Hopeful	1	2	1	3
Ten Cent Creek (93B)	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	1	2	1	3
Upper Granite Creek (93C)	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	1	2	1	2
Clear Creek (93J)	Grubstake Bunchbucket	1	1	1	1
Lightning Creek (93K)	Lucky Strike	1	1	1	1

1 – low probability of change from current condition

Low probability means that the actions may have an effect that could change the current condition but no measurable change is expected

2 – moderate probability of change from current condition

Moderate probability suggests that the actions, while having an effect that will cause an increase in measured conditions, they would not be discernable from existing conditions.

3 – high probability of change from current condition

High probability means that the actions will more than likely have an effect and they may be measurable.

Lower Granite Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Stream Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1. Suction dredging effects will be the same as alternative 1.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Implementation of the standard management requirements does not allow the removal of vegetative material that is contributing to shade cover of the stream.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1. Suction dredging effects will be the same as alternative 1.

Ten Cent Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Stream Health

With the additional suction dredging on East Ten Cent claim the effects would be greater than what was described in alternative 1. However, implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects to what was described in alternative 1.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Implementation of the standard management requirements does not allow the removal of vegetative material that is contributing to shade cover of the stream.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1. However, the additional suction dredging may negate the reduction.

Upper Granite Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Stream Health

With the additional suction dredging the effects would be greater than what was described in alternative 1. However, they would be minor in the amount of change and would be localized within the claim boundaries.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Implementation of the standard management requirements does not allow the removal of vegetative material that is contributing to shade cover of the stream.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1. However, the additional suction dredging may negate the reduction.

Clear Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Stream Health

Same as alternative 1.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Implementation of the standard management requirements does not allow the removal of vegetative material that is contributing to shade cover of the stream.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Lightning Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Stream Health

Same as alternative 1.

Water Temperature

Proposed mining activities should not affect stream temperatures by reducing shade providing riparian vegetation. Implementation of the standard management requirements does not allow the removal of vegetative material that is contributing to shade cover of the stream.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1.

Cumulative Effects for Alternative 2:

Cumulative effects would still be expected to occur within the Granite Creek watershed due to past and present activities (historic mining operations, timber harvests, road construction, road maintenance, fire management activities, etc.) in the area. With implementation of alternative 2, in the short term (<3-years), there would be no measurable changes in stream flows or shading. Stream morphology may be changed due to suction dredging operations within the wetted stream area. In addition, there may be measurable localized changes in the distribution of fine sediments that may affect down stream sediments loads, but the amount should be less than alternative 1 because the management requirements from Chapter 2 will be included. However, in the long term (> 5 years), as mining activity lessens due to depletion of minerals and ongoing reclamation continues, the riparian habitat would tend to improve through natural riparian processes, i.e. accumulation of large woody debris, changes in stream morphology, soil accumulation, plant community succession, etc. In other words, it is expected that natural riparian processes would tend to improve habitat quality from dysfunctional and functional at risk to functional with the passage of time.

However, many of the existing impacts to riparian conditions would continue. Poor road conditions and/or road locations and other human activities will not be corrected under this alternative. Existing road systems would continue to produce sediment and would continue to have localized impacts on streams such as maintaining existing channelization. Sediment currently being delivered from road maintenance, poorly located or constructed roads would remain unchanged. Other human impacts resulting from activities such as hiking, hunting, etc., would remain unchanged.

ALTERNATIVE 3

The following table shows the affects to each of the elements that have been analyzed. The numbers represent the degree of change that could occur if the alternative were implemented.

Table 4.4 – Comparison of effects for Alternative 3

Subwatershed (SWS)	Mining Claim(s) With Current POO	Riparian Zone Health	Stream Functionality	Water Temperature	Sediment Load
Lower Granite Creek (93A)	Republican Comeback #7 Republican Comeback #10 & #11 Hopeful #2 & #3 Hopeful	1	1	1	2
Ten Cent Creek (93B)	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	1	2	1	2
Upper Granite Creek (93C)	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	1	2	1	1
Clear Creek (93J)	Grubstake Bunchbucket	1	1	1	1
Lightning Creek (93K)	Lucky Strike	1	1	1	1

1 – low probability of change from current condition

Low probability means that the actions may have an effect that could change the current condition but no measurable change is expected

2 – moderate probability of change from current condition

Moderate probability suggests that the actions, while having an effect that will cause an increase in measured conditions, they would not be discernable from existing conditions.

3 – high probability of change from current condition

High probability means that the actions will more than likely have an effect and they may be measurable.

Lower Granite Creek

Direct/Indirect Effects:

Riparian Health

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described in alternative 1. In addition, the functioning of the settling ponds on Republic Comeback #7 and Hopeful 2&3 will be improved so that the risk of sediment reaching Granite Creek and Rabbit Creek is reduced. Also, the roads going to the claims will be gated to keep vehicle traffic at a minimum. This should make the effects less than those described in alternative 2.

Stream Health

Improvement of the settling ponds and implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described in alternative 2.

Water Temperature

Same as alternative 2.

Sediment Load

Implementation of the standard management requirements as shown in Chapter 2 has the potential to reduce the effects as described under alternative 1. Improvement of the settling ponds on Republic Comeback #7 and Hopeful 2&3 will further reduce the potential for increasing sediment into the creek. In addition, moving the trailer, used for housing on Republic Comeback #10 and #11, to the north side of the creek will reduce the number of times Granite Creek will need to be forded. Suction dredging effects will be the same as alternative 1.

Ten Cent Creek

Direct/Indirect Effects:

Riparian Health

Same as alternative 2.

Stream Health

Same as alternative 2.

Water Temperature

Same as alternative 2.

Sediment Load

Same as alternative 2 with the addition of at least a 10-foot buffer between the creek and operations on Tar Hill/Ten Cent and PBGF 1-3 claims and a silt fence is placed between the creek and East Ten Cent, Tar Hill/Ten Cent, and PBGF 1-3 claims. Implementation of these measures and the management requirements listed in Chapter 2 should reduce the effects as described in alternative 2.

Upper Granite Creek

Direct/Indirect Effects:

Riparian Health

Same as alternative 2.

Stream Health

Same as alternative 2.

Water Temperature

Same as alternative 2.

Sediment Load

Same as alternative 2 with the addition of improving the settling ponds on Old Eric 1&2 and Magnolia claims. In addition, the waste material from tunnel cleanout on Magnolia and SW St. Paul will be located in such a manner that sediment, if it should occur, will not reach Lucas Gulch or Granite Creek. Implementation of these measures and the management requirements listed in Chapter 2 should reduce the effects as described in alternative 2.

Clear Creek

Direct/Indirect Effects:

Riparian Health

Same as alternative 2.

Stream Health

Same as alternative 2.

Water Temperature

Same as alternative 2.

Sediment Load

Same as alternative 2 with the addition of a silt fence along a small intermittent stream located next to the Bunch Bucket claim. Also, the access to Bunch Bucket will be gated to minimize traffic. Implementation of these measures and the management requirements listed in Chapter 2 should reduce the effects as described in alternative 2.

Lightning Creek

Direct/Indirect Effects:

Riparian Health

Same as alternative 2.

Stream Health

Same as alternative 2.

Water Temperature

Same as alternative 2.

Sediment Load

Same as alternative 2 with the addition that waste material from tunnel cleanout will be dispersed so that sediment will not reach Lightning Creek. Implementation of these

measures and the management requirements listed in Chapter 2 should reduce the effects as described in alternative 2.

Cumulative Effects :

Cumulative effects would still be expected to occur within the Granite Creek watershed due to past and present activities (historic mining operations, timber harvests, road construction, road maintenance, fire management activities, etc.) in the area. With implementation of alternative 3, in the short term (<3-years), there would be no measurable changes in stream flows or shading. Stream morphology may be changed due to suction dredging operations within the wetted stream area. In addition, there may be measurable localized changes in the distribution of fine sediments that may affect down stream sediments loads but, the amount should be less than alternative 2 because the management requirements from Chapter 2 will be included in all plans of operations along with specific requirements associated with certain claims in the watershed. However, in the long term (> 5 years), as mining activity lessens due to depletion of minerals and ongoing reclamation continues, the riparian habitat would tend to improve through natural riparian processes, i.e. accumulation of large woody debris, changes in stream morphology, soil accumulation, plant community succession, etc. In other words, it is expected that natural riparian processes would tend to improve habitat quality from dysfunctional and functional at risk to functional with the passage of time.

A moderate increase in sedimentation is possible as a result of this project, but is expected to be of short duration and is not expected to exceed existing RHCA sediment transport processes. Therefore, there should be no measurable increase in sediment transport parameters, i.e. percent of fines, cobble embeddedness, etc.

Many of the existing impacts to riparian conditions would continue due to poor road conditions and/or locations and other human activity. Existing road systems would continue to produce sediment and would continue to have localized impacts on streams such as maintaining existing channelization. Sediment currently being delivered from road maintenance, poorly located or constructed roads would remain unchanged. Other human impacts resulting from activities such as hiking, hunting, etc., would remain unchanged.

RECREATION

Non-Wilderness Recreation

Analysis Tools: Recreation experience in the management, operations and use of recreation facilities and opportunities were used to determine potential effects of alternatives on recreation use, facilities and visitor experience within the planning area. Incidental and anecdotal responses from recreationists, relating to past visitor use in the area, were used to predict potential response to alternatives.

Alternative 1

This alternative is predicted to have little to no effect, adverse or positive, on the existing recreation use patterns and opportunities in the planning area. Mining and recreation activities have co-existed in the Granite area for years with little conflict to either user.

Alternative 2

Same as Alternative 1.

Alternative 3

This alternative proposes to gate and enforce the road closure of FS Road 1035012. A high-use dispersed site is located at the termini of this road. Although the District's Access and Travel Management Plan states this road has been closed since 1990, there has been motorized vehicle use of this road for administrative and recreation purposes. The road closure has not been enforced. Gate closure of this road would close off motorized entry on the road and displace traditional users of the dispersed camp located at the road's terminus. However, users will still be able to access the trail and dispersed site via non-motorized use of the road. The Granite Creek Trailhead and other dispersed campsites are located at the proposed gate installation site.

Other effects of the alternative on recreation use, opportunities and facilities would be the same as alternative 1.

Wilderness Recreation

Analysis Tools: GIS mapping of trail systems and professional field-going experience with the trail systems were used to determine potential effects of alternatives within the wilderness. Incidental and anecdotal responses from users relating to visitor use within the North Fork John Day Wilderness area were used to predict potential response to alternatives.

Alternatives 1,2 and 3

Effects on wilderness recreation would not vary between the three alternatives. Any mining activity within the North Fork John Day Wilderness, especially with motorized and mechanized equipment, would have an effect on wilderness users. The use of heavy equipment, suction dredging and pumps along Granite Creek would have a direct impact on wilderness trail users along Granite trail #3016. This trail is one of the more popular trails into the wilderness and most mining activity would occur during the heavy use period. The visual impacts of the mining equipment on the wilderness user would be short term, however the sound of this equipment could impact users over a much larger area than just the immediate boundary of the mining claim.

Impacts from Republican Comeback #10 and #11 North of Granite Creek could have a detrimental effect on the Granite Creek trail. Past mining activity has encroached within several feet of the existing trail tread. Any further activity to the North would compromise the use of the trail and could result in closure of the trail.

WILDLIFE

The quantity and quality of wildlife habitat was assessed using aerial photographs, district records, and field reconnaissance. Where quantitative information is available, it is presented. The scale of analysis is the entire Granite watershed, including those sub-watersheds occurring on the Wallowa-Whitman National Forest (NF), however, the majority of information concerning wildlife populations and habitats reflects conditions on the Umatilla portion of the watershed. There is only one proposed placer claim administered by the Wallowa-Whitman NF included in this document, and it is within 1 mile of the Umatilla NF boundary.

The ongoing and proposed activities could have an effect on Threatened, Endangered, and Sensitive wildlife species and their habitats, as well as Management Indicator Species (MIS) and their habitats. The U.S. Fish and Wildlife Service also provided a list of “species of concern”. Mining activities could result in disturbance to these species by altering habitat and/or causing individuals to avoid the area.

Management Indicator Species

The degree of difference between alternatives with regards to wildlife habitat is virtually immeasurable; as such the effects to wildlife and wildlife habitat are considered the same for all alternatives unless otherwise noted.

Alternative 1, 2 and 3

The activities proposed under these alternatives would slightly affect wildlife management indicator species and their habitats (American marten, pileated woodpecker, primary cavity excavators, three-toed woodpecker, Rocky Mountain elk, and northern goshawk).

Activities such as excavation, road access, and processing areas would generally involve less than 1 acre of disturbance per claim, which totals 16 acres for the mining claims addressed. Most involve recreational weekend operations that are family endeavors involving two or three people. Activities at the claims occur primarily in the summer and are limited in duration. Human disturbance could cause short-term movements of these species, but populations would not be negatively affected. Reclamation of excavated areas and the associated portion of access road would occur concurrently with new excavation to keep disturbance to a minimum. Reclamation upon completion of activities would include all areas of disturbance.

Activities at the Grub Stake mine and the SW Saint Paul claim detract from the integrity of two Dedicated Old Growth stands and may deter use by goshawk, marten and pileated woodpecker. Past timber harvest and associated activities have changed the habitat for

northern goshawk in the area. Proposed and reasonably foreseeable future projects in the area would maintain habitat conditions for goshawk since Forest Plan guidelines, as amended to promote late and old forest structure and riparian habitat (USDA 1995), would be followed.

The proposed activities in combination with past, ongoing, and future foreseeable projects would not adversely impact management indicator species because of the limited duration and intensity of activities, and the small percentage of area affected. A reasonable estimate of actual acres impacted by active claims in the watershed is about 1500 acres, or 2 percent of the total watershed area. The North Fork John Day Wilderness comprises 27 percent of the watershed and serves as a buffer for human activities. Again, considering the type of proposed activities (generally short duration and low intensity), management indicator species populations will not likely be affected.

Threatened, Endangered, and Sensitive Wildlife Species

Alternatives 1, 2, and 3

Since **gray wolves** are not known to currently inhabit the District, and no activities would have any effect on grey wolf habitat, the activities proposed in all alternatives would have **no effect** on individuals, nor the quality or quantity of habitat. Wolves are not known to be in the area, and no denning or rendezvous sites are known. Cumulatively, the proposed activities in combination with other ongoing activities and future foreseeable projects will not affect wolves or their habitat because of the small percentage of area impacted, and the current lack of wolf sightings in this area.

Although no direct effects to **bald eagles** are expected, alternative 3 would have the least impact to prey resources, since the risk of mobilized sediment would be slightly reduced and therefore fish habitat could be slightly improved. Currently bald eagles seldom use the area, therefore, no direct effects are expected. Large pine and fir trees near waterways will not be affected by mining activity. Other prey resources such as small mammals and big game carrion will not be impacted to the extent that eagles would be affected. Cumulatively, the proposed activities in combination with past, ongoing, and future foreseeable projects will not affect bald eagles or their habitat because of the limited duration and intensity of activities, and the small percentage of area impacted. Therefore, these alternatives will have **no effect** on bald eagles or their habitat. <>

The quality and availability of habitat for **Canada lynx** in the Granite LAU will not change under any alternative. The proposed actions comply with the Canada Lynx Assessment and Strategy (USDA 2000). No alteration of lynx habitat is expected at the Magnolia mine. All of the other mining claims being considered in this analysis are outside of potential lynx foraging and denning habitat. In the event that lynx happen to be present in the area where mining activities were occurring, a brief disturbance could result in animals moving elsewhere. The ongoing and proposed mining activities will not adversely affect habitat conditions or prey resources, nor cause long-term animal movements. The proposed activities in combination with past, ongoing, and future foreseeable projects will not adversely impact Canada lynx because of the small percentage of area affected. Therefore,

the ongoing and proposed activities would have **no effect** on individuals, nor the quality or quantity of habitat.

The quality and availability of habitat components for **wolverine** would not change. While it is possible for short-term disturbance to occur, the likelihood is relatively low. If a wolverine happened to pass through the area where mining activities were occurring, a brief disturbance could result in animals moving elsewhere. The proposed mining activities would not adversely affect habitat conditions or prey resources, nor cause long-term animal movements. The proposed activities in combination with past, ongoing, and future foreseeable projects would have **no impact** to wolverine because of the small percentage of area affected relative to the habitat distribution.

Peregrine falcon would not be negatively impacted under any alternative. Peregrine falcons may pass through the area, but because of the small percentage of area affected, no impacts are expected. The proposed mining activities will not adversely affect habitat conditions or prey resources, nor cause long-term animal movements. The proposed activities in combination with past, ongoing, and future foreseeable projects will have **no impact** to peregrine falcon because of the small percentage of area affected.

Alternatives 1, 2 or 3 would have no negative impact on spotted frogs. Ongoing and proposed activities are expected to maintain the quality and quantity of spotted frog habitat, such as warm, slow flowing or freestanding water. It is possible that human disturbance could cause short-term movements of spotted frogs. The ongoing and proposed activities in combination with past and future foreseeable projects will not adversely impact spotted frogs because of the limited duration and intensity of activities, and the small percentage of area affected.

Other Species of Concern

Alternatives 1, 2, and 3

The ongoing and proposed mining activities would not directly or indirectly affect the olive-sided flycatcher. The mining activities in this area generally do not affect habitat components used by this species. The proposed activities in combination with past, ongoing, and future foreseeable projects will not adversely impact the olive-sided flycatcher for the same reason. The planned Buck Creek Underburn will benefit this species by creating a patchy mosaic of burned forest (Altman 2000).

None of the ongoing and proposed activities would negatively impact the **bat species** of concern (big-eared bat, small-footed myotis, long-eared myotis, long-legged myotis, and yuma myotis). No suitable hibernacula or colonial roosting habitat are known in the area. Bats are not using the adits at the Magnolia and the SW St. Paul claims. An abundance of snag habitat is currently providing temporary roosting habitat for foraging bats and this would not be altered by the proposed actions.

The current level of mining activity does not likely measurably impact **neotropical birds** or their habitat in the forest. The ongoing and proposed mining activities affect a very small percentage of terrestrial habitat in the watershed. Disturbance associated with mining (noise

and motion) could result in reduced foraging and nesting success for some species; however, due to the small amount of area involved, there would be no measurable impacts. The proposed activities in combination with past, ongoing, and future foreseeable projects would have no impact to neotropical migratory birds because the incremental increase of this project would be small. Several ongoing management activities in the watershed meet objectives in the Conservation Strategy for Landbirds (Altman 2000); for example the ongoing restoration of hydrological regimes, the creation of riparian shrub habitat, and the use of prescribed burning to reduce fuel loads, all benefit neotropical migratory birds.

SOCIO-ECONOMIC

Economic Analysis

The affected area or impact zone for the area around the Granite watershed is rural in nature. Grant County, the county in which the project area is located, is 4,528 square miles, but was populated by only 8,000 people in 1999. The major local economic sectors include forest products, agriculture, hunting, livestock and recreation.

Employment

Alternatives 1, 2 and 3

Actual statistics on the amount of employment generated by the mining activities associated with the 16 claims in this analysis is not available. Jobs in mining in Grant County are reported only for those who are actually on the payroll of an employer, not those who are self-employed. In 1990 the U.S. Bureau of Census reported 24 jobs associated with mining in Grant County. However, it is impossible to determine specifically where these jobs are located or what type of mining they represent. Oregon Employment Department reports that the employment trend in the mining industry in the region has been flat for the past 15 years. It is assumed that all of the claims in the analysis are operated either by the owner or designated representative and none hire outside employees, and thus contribute little to the local economy. Most of the miners in the Granite Creek watershed have other jobs or pensions and do not rely solely on revenues from mining for their livelihood. The number of jobs or employment provided by operations on the 16 claims in this analysis will not differ by alternative

Economic Viability of Operations

Alternatives 1, 2 and 3

All three alternatives require the operator to follow the standard management requirement incorporated into each Plan of Operation. These requirements are designed to minimize adverse environmental impacts on National Forest surface resources as provided in 36 CFR [228.8]. Alternative 3 will require some additional mitigation, which will add to the operating expense. All operations that require Plan of Operations are also required to post a reclamation bond. The amount of the bond is determined by the estimated cost of stabilizing, rehabilitating, and reclaiming the area of operations if the claimant fails to complete this

work. The reclamation bond amount has been updated for each claim and the revised bond amounts have been incorporated into alternatives 2 and 3.

Table 4.5 - Economic Information

Name of Claim	Type of Claim	Scope of Operation ¹	Annual Gross Output (estimated \$)	Proposed Reclamation Bond (\$)
Magnolia Group	Lode	Seasonal Part Time	0-500	4,000
SW St. Paul	Lode	Seasonal Part Time	0-500	2,500
Old Eric 1 & 2	Placer	Seasonal Part Time	0-500	500
Troy D	Placer	Seasonal Part Time	0-500	500
Rosebud 1-4	Placer	Recreational	0-500	500
Tarhill Ten Cent	Placer	Seasonal Part Time	0-500	1,600
Brice 1, 2, 3	Placer	Recreational	0-500	500
PBGF 1, 2, 3	Placer	Seasonal Part Time	0-500	1200
East Ten Cent	Placer	Seasonal Part Time	0-500	1,200
Hopeful 2&3	Placer	Seasonal	0-500	4,000
Republican Comeback #7	Placer	Recreational	0-500	2,500
Hopeful	Placer	Recreational	0-500	1,000
Republican Comeback #10 & 11	Placer	Seasonal Part Time	0-500	2,500
Grubstake	Placer	Recreational	0-500	1,700
Bunch Bucket 1 and 2	Placer	Recreational	0-500	1,000
Lucky Strike	Lode	Recreational	0-500	800

- 1— Full Time – Operates all year
Seasonal – Operates full time during the summer operating season.
Seasonal Part Time – Operates during a portion of the summer operating season.
Recreational – Operates only on weekends or a limited period during the summer season.

Support to Local Communities

Alternatives 1, 2 and 3

Due to the seasonal nature of mining, many miners, especially those who do not live in the area, spend only a few weeks on their claims each year. The level of mining activity as indicated by the Plans of Operations is generally small-scale exploration testing based on industry standards. Small operators often supplement their exploration capital by high-grading sample pits that exhibit good paying values. Large equipment purchases are generally made outside the county, except for those used pieces sold within the mining community. Although expenditures and revenues from the mining operations in the Granite area are not readily available, all alternatives will have similar affects on the local economy. Effects of the increase or decrease of mining activity on the local economy are equivalent to increase or decreases in tourism or recreation.

Health and Safety

Mining operations can pose a safety risk to the general public. Uninformed recreationists may inadvertently travel onto active mining sites. Trucks and other vehicles used in the mining operation may pose a hazard to recreationists using the same roads. Pits and unguarded adits also pose a risk.

36 CFR [228.9] (Maintenance during operations, public safety) states during all operations operator shall maintain structures, equipment and other facilities in a safe, neat and workmanlike manner. Hazardous sites or conditions resulting from operations shall be marked by signs, fenced or otherwise identified to protect the public in accordance with Federal and State laws and regulations. Management requirements have been incorporated in the Plans of Operation included in alternatives 1, 2 and 3. All alternatives will include provisions to protect the general public from the hazards of mining operations.

Miners Rights

The 1872 Mining Law declares that “all mineral deposits in land belonging to the United States are free and open to exploration and the lands in which they are found are open to occupation and purchase”. The law incorporates the basic doctrines that discovery of valuable minerals entitles the claimant to rights of ownership of the mineral and title to the land and that continued development is necessary to protect this ownership. It is true that a mining claim has definite geographic boundaries and involves a particular piece of land. However, in a more precise sense a mining claim is an assertion of a right. It is a claim being made by an individual against the government. The individual is claiming certain rights by virtue of his compliance with the mining laws—specifically by complying with the requirement for finding a valuable mineral deposit. The mining claimant has the right to go upon any public land, which is open to prospecting and mineral location and search for valuable minerals. Once a valuable mineral deposit is found, the claimant has the right to locate a mining claim, and by doing so, acquires the right to mine and remove the mineral and market it.

Conversely, the miner also has a responsibility to operate in a reasonable and prudent manner. CFR 36 [228.8] (Requirements for environmental protection) states: All operations shall be conducted so as, where feasible, to minimize adverse environmental impacts on National Forest surface resources. The rule then goes on to state that these resources include air quality, water quality, solid waste disposal, scenic values, fisheries and wildlife habitat, roads and reclamation after mining activities have been completed. The management requirements and mitigations that are incorporated into the Plans of Operation for each of the claims are designed to assure environmental protection is included in the mining operation. A reclamation plan and bond are required to each claim to assure that the area is, where practicable, reclaimed after operations have been completed. Both alternative 2 and 3 incorporate the same standard management requirements into each Plan of Operation. Alternative 3 includes some additional mitigation to further reduce the effects of the operations on water quality.

NON-FOREST VEGETATION

Threatened, Endangered, or Sensitive Plants

A biological Evaluation was completed for “Sensitive” species in May 1999. This evaluation covered all mining claims located on the Umatilla National Forest. An additional survey was completed for the Troy D claim, which is located on the Wallowa-Whitman National Forest.

Silene spaldingii was proposed for federal listing as “Threatened” on December 3, 1999. This project will have “No Effect” on *Silene spaldingii*. *Silene spaldingii* primarily occurs in open areas of deep Palousian soils, often on north aspects.

Five documented Region 6 Sensitive *Botrychium* plant populations are present within the proposed analysis area. All *Botrychium* populations are located well away from any proposed mining activities. Associated mining related activities will in no way directly or indirectly impact current documented sensitive plant populations within the proposed mine analysis area.

Carex crawfordii and *Carex interior* are suspected to occur on the District. Both *Carex* species grow in perennially wet clearings, usually with surface water present 6-8 months of the year.

This project should have “no impact” on currently listed sensitive plant species.

Noxious Weeds

Alternatives 1, 2 and 3

Alternative 1 (No Action) is defined as no change from the current situation, the Plans of Operation for the 16 claims included in the analysis would not change. Alternative 2 includes revised Plans of Operations submitted by the claimants. In most cases these plans are the same as those in alternative 1. Alternative 3 includes the plans in alternative 2 with additional mitigation added to individual plans to address specific resource concerns related to the operations.

The potential for noxious weed establishment and spread is related to the amount of ground disturbance associated with the mining operations on each claim. Since all alternatives will cause approximately the same amount of disturbance, the potential for infestation differs only slightly between alternatives. Mitigation measures described under Prevention Strategies in Appendix E of the Umatilla National Forest Management of Noxious Weeds EA would reduce the possibility of noxious weed establishment and spread under both action alternatives. Additional prevention measures are included in the management requirements section of each Plan of Operation. In addition to the normal District noxious weed surveys, monitoring will be conducted yearly by the minerals technician as part of his normal inspection program. Noxious weed identification material will be given to the miners and they will be asked to report any infestation they discover. Existing sites will continue to be

monitored and treated. Detection and subsequent treatment of new sites will occur on each of the 16 mining claims, as needed.

HERITAGE RESOURCES

National Historic Preservation Act

As identified in Chapter 3, heritage properties exist within the analysis area. Prior to project implementation, State Historic Preservation Office consultation will be completed under the *Programmatic Agreement among the United States Department of Agriculture, Forest Service, Pacific Northwest Region (Region 6), The Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon*, dated March 10, 1995, pursuant to stipulated Forest Archaeologist review dated November 15, 1996. Sites, which have been identified, will be protected by prohibiting any disturbance within 300 feet of the site's perimeter. This mitigation resulted in a determination of no effect on cultural heritage sites.

TRANSPORTATION SYSTEM

Analysis displayed here was based on field reconnaissance of road conditions and known maintenance costs.

Alternatives 1 and 2

Direct/Indirect Effects: Roads would remain in their current condition and status. Sediment would continue to occur due to poor road locations. Unauthorized use would continue on the road accessing the claims located on Lower Granite Creek.

Alternative 3

Direct/Indirect Effects: Proposed road obliteration/decommissioning projects would occur only as funding becomes available. This alternative would gate the 1035012 road at the trailhead parking area at the end of road 1035010. It would also gate the road that accesses the Hopeful 2 & 3 claim. The portions of roads 1038070 and 1035080 that are located within the North Fork John Day wilderness would be obliterated/decommissioned and removed from the road inventory. In addition to the above numbered roads the 1030080 road located in the Congo Gulch area would be obliterated/decommissioned and removed from the district road inventory. Direct effects of gating the 1035012 road would be the discontinued use of a couple of dispersed camps that are used during hunting season. Indirect effects would be less sediment produced during the unauthorized use of the road.

Cumulative Effects: The open or closed status of roads within the watershed would not change. Reductions in sediment production through the proposed treatments of 2.25 miles of road would reduce long-term, cumulative sediment yield caused by past road construction.

TREATY TRUST RESPONSIBILITIES

In this analysis, the primary focus of the Federal Government Trust Responsibility is the protection of the treaty rights and interest that tribes reserve on land included in this project. Both the Confederated Tribes of the Warm Springs Reservation and the Confederated Tribes of the Umatilla Indian Reservation have treaty rights and interests in the Granite Creek watershed. The Confederated Tribes of the Umatilla Indian Reservation identified the rights they believe most at risk in the proposal. Of major concern are the potential impacts on fish habitat and populations, water quality, which is a key component of aquatic habitat and the protection of archaeological sites and Traditional Cultural Properties.

Cultural Resource surveys were conducted to locate cultural sites and gather the information necessary to evaluate historic properties. Since all mining activities will occur on well-defined claims, the protection of specifically identified prehistoric sites can be protected successfully. Specific requirements in each POO, will assure any new site, discovered during operations will be protected.

Mining activities clearly have the potential to affect fisheries habitat and water quality. Alternative 2 incorporates management requirements into each POO designed to mitigate the effects of the mining activity on aquatic habitat. Alternative 3 not only incorporates these requirements, but also adds additional mitigation to each POO to further protect water quality and aquatic habitat. Road restoration work associated with alternative 3, as well as additional restoration prescribed in the Water Quality Restoration Plan that will be prepared before the Record of Decision is signed, will further mitigate the effects of the mining proposals. An explanation of the potential effects on fish and their habitat is located in the “Fish and Aquatic Habitat” section of this chapter.

COMPLIANCE WITH OTHER LAWS, REGULATIONS, AND POLICIES

This section describes how the action alternatives comply with applicable State and Federal laws, regulations, and policies.

Endangered Species Act and Regional Forester’s Sensitive Species

The Endangered Species Act requires protection of all species listed as “threatened” or “endangered” by federal regulating agencies (Fish and Wildlife Service and National Marine Fisheries Service). The Forest Service furthermore maintains through the Federal Register a list of species which are proposed for classification and official listing under the Endangered Species Act, species which appear on an official State list, or that are recognized by the Regional Forester as needing special management to prevent their being placed on Federal or State lists. This section identifies the actions taken to comply with the Endangered Species Act. Details regarding the actual species found within the analysis area and the potential

effects of proposed activities on those species and their habitat are contained under the Non-Forest Vegetation, Wildlife Habitat, and Fish and Aquatic Habitat sections.

Plants

There are no known populations of “Threatened” or “Endangered” plant species within the analysis area. See the Non-Forest Vegetation section of this chapter for more detailed discussion of the predicted effects on “Sensitive” plant species.

Terrestrial Wildlife

Effects of the proposed activities to wildlife are not considered significant in the context of the analysis area, the Umatilla National Forest, and the Blue Mountains. Wildlife species and habitat will not be significantly impacted by activities that are limited in duration and intensity and affect a relatively small area. No adverse effects are expected for any wildlife species listed as Sensitive by the Forest Service, nor those listed as Threatened or Endangered by the U.S. Fish and Wildlife Service. **A determination has been made that the proposed activities would have NO EFFECT to grey wolf, northern bald eagle, and Canada lynx, therefore consultation with the U.S. Fish and Wildlife Service is not required for listed wildlife species.**

Aquatic Wildlife

A Biological Assessment (BA) for listed fish species has been presented to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, and consultation is pending. Preliminary determinations for Mid-Columbian Steelhead Trout for the 16 Plans of Operation are that 10 Plans “May Affect, and are Likely to Adversely Affect” (LAA) and six plans “May Affect, but are Not Likely to Adversely Affect” (NLAA). Preliminary determinations for Columbian River Bull Trout for all 16 Plans are that they “May Affect, but are Not Likely to Adversely Affect” (NLAA). In addition, the 16 plans may impact sensitive redband trout and chinook salmon-spring run, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the populations or species. The Record of Decision for this EIS will not be signed, and the proposed Plans of Operation will not be approved until concurrence and/or a Biological Opinion from the above-mentioned regulatory agencies is received. See the Fish and Aquatic Habitat section for more detailed discussion of the predicted effects on fish species. The following shows in tabular form the preliminary determinations for each of the Plans of Operation that are discussed in this document.

Table 4.6 – ESA Preliminary Determinations for Listed Species

Claim	Columbia River Bull Trout	Mid-Columbia Steelhead Trout	Mid-Columbia Steelhead Trout Designated Critical Habitat	Chinook Salmon – spring run	Interior Redband Trout
Republican Comeback #7	NLAA	LAA	NLAM	NLAA	NLAA
Republican Comeback #10 & #11	NLAA	LAA	NLAM	NLAA	NLAA
Hopeful #2 & #3	NLAA	LAA	NLAM	NLAA	NLAA
Hopeful	NLAA	NLAA	NLAM	NLAA	NLAA
PBGF #1 - #3	NLAA	NLAA	NLAM	NLAA	NLAA
East Ten Cent	NLAA	LAA	NLAM	NLAA	NLAA
Tarhill Ten Cent	NLAA	LAA	NLAM	NLAA	NLAA
Brice #1 - #3	NLAA	LAA	NLAM	NLAA	NLAA
SW ST. Paul	NLAA	NLAA	NLAM	NLAA	NLAA
Magnolia Group	NLAA	LAA	NLAM	NLAA	NLAA
Old Eric #1 - #2	NLAA	LAA	NLAM	NLAA	NLAA
Rosebud #1 - #4	NLAA	NLAA	NLAM	NLAA	NLAA
Troy D	NLAA	NLAA	NLAM	NLAA	NLAA
Grubstake	NLAA	LAA	NLAM	NLAA	NLAA
Bunchbucket	NLAA	LAA	NLAM	NLAA	NLAA
Lucky Strike	NLAA	NLAA	NLAM	NLAA	NLAA

NLAA - may affect, not likely to adversely affect
 LAA - may affect, likely to adversely affect
 NLAM - may affect, not likely to adversely modify

Clean Air Act

This project would have no impact on air quality. There are no fuel treatments planned so there would be no smoke emissions from the burning of fuels. Mining activity could create a limited amount of dust, but this would be confined to the project area and would not affect any areas designated for protection under the State of Oregon’s Smoke Management Program.

Clean Water Act

The Clean Water Act of 1977 was enacted to facilitate the restoration and maintenance of the chemical, biological, and physical integrity of the waters of the United States. The Act was amended in 1987 to protect national waters from pollution from point and non-point sources. As a part of the implementation of this Act, the State of Oregon maintains an inventory of water quality limited streams, which is based upon standards developed by the Oregon Department of Environmental Quality (ODEQ). Determination of a Total Maximum Daily Load (TMDL) standard for the North Fork John Day Subbasin, which encompasses the Granite Creek watershed, is anticipated for the state of Oregon by 2003.

Table 4.7, below, lists the beneficial uses of water in the analysis area and lists the water quality criteria used as standards for assessing water quality for the John Day River Basin.

Table 4.7 - Beneficial Uses and Water Quality Criteria for the North Fork John Day Subbasin

Beneficial Use	Associated Water Quality Criteria
Anadromous Fish Passage	Biological Criteria, Dissolved Oxygen, Flow Modification, Habitat Modification, pH, Sedimentation, Temperature, Total Dissolved Gas, Toxics, Turbidity
Salmonid Fish Rearing	Dissolved Oxygen, Flow Modification, Habitat Modification, Sedimentation, Temperature
Salmonid Fish Spawning	Same as Salmonid Fish Rearing
Resident Fish and Aquatic Life	Same as Anadromous Fish Passage
Wildlife and Hunting	None
Water Contact Recreation	Aquatic Weeds or Algae, Bacteria, Nutrients, pH
Aesthetic Quality	Aquatic Weeds or Algae, Chlorophyll a, Nutrients, Turbidity

Oregon State water quality temperature criteria vary by beneficial use. No measurable surface water temperature increase (based on a 7-day moving average of daily maximum temperature) resulting from human activities is allowed.

Turbidity criteria for the watershed limit cumulative activity caused increases in turbidity to 10 percent or less above background levels.

Table 4.8 - Waterbodies within the Granite watershed and their parameters.

Waterbody Name	Parameter(s)
Beaver Creek	temperature
Clear Creek	temperature
Crane Creek	temperature
Bull Run Creek	temperature, habitat
Crawfish Creek	temperature, habitat
Davis Creek	temperature, habitat
Granite Creek	temperature, habitat, sediment
Olive Creek	habitat
Onion Creek	temperature
Trail Creek	temperature, habitat
North Trail Creek	habitat
Deep Creek	habitat
South Trail Creek	temperature, habitat
South Fork Beaver Creek	habitat
Bull Creek	habitat

Figure 4-1 at the end of this chapter shows the location of the streams listed in Table 4.8.

A draft Water Quality Restoration Plan, for the Granite Watershed, focusing on the claims analyzed in this analysis, will be developed before the Final Environmental Impact Statement is completed. The plan will be shared with the Confederated Tribes of the Umatilla Indian Reservation and will be submitted to the State of Oregon. A Total Maximum Daily Load, or TMFL, is scheduled by the State of Oregon for the North Fork John Day subbasin in 2003.

Several actions proposed under the Granite Mining EIS would contribute to improved water quality in the Granite watershed, specifically the road closure and road decommissioning. Forest Service Best Management Practices (BMPs) as well as other required management requirements and mitigations BMPs will, at a minimum, serve to maintain current water quality in analysis area streams.

Executive Orders 11988 and 11990: Floodplains and Wetlands

Executive Order 11988 requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Some mining projects will occur within 100-year floodplains, however, the identified mitigation measures are sufficient to comply with the requirements of this executive order.

Executive Order 11990 requires that government agencies take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Streams-side riparian areas, seeps, springs, and other wet habitats exist within the analysis area and some activities will occur within these areas. Management requirements and site-specific mitigation will reduce the effects of mining operations on wetlands.

Executive Order 12898: Environmental Justice

Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns within the context of agency operations. With implementation of any of these alternatives, there would be no disproportionately high and adverse human health or environmental effects on minority or low-income populations. The action would occur in a remote area, and nearby communities will not be affected by the operations.

Forest Plan Consistency

The Granite Mining Projects EIS is consistent with the Umatilla National Forest Land and Resource Management Plan, including the clarifying direction of Plan Amendment #10, "The Interim Strategies for Managing Anadromous Fish Producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH). The Forest Plan specifies that mineral activities will be conducted in as compatible a manner as possible with other resource uses and environmental standards. The overall objective is to ensure that no unnecessary or undue degradation of the environment occurs, while ensuring that environmental protection stipulations and reclamation objectives are reasonable, enforceable,

economical, and successful. When necessary, reclamation objectives will be ensured by adequate bonding.

Some mining activities will occur in Riparian Habitat Conservation Areas (RHCA's), however PACFISH Minerals Management Standards and Guidelines have been incorporated into applicable Plans of Operation (POO). In alternatives 2 and 3, all the proposed POOs include a reclamation plan and require a revised reclamation bond. No new roads or structure will be built in RHCA's. Where possible roads and structures currently located in RHCA's will be obliterated or moved. No wastewater (water used to wash gravels in placer mining operations) will be allowed to flow into any stream. Settling ponds will be required on all operations using water to process gravel.

Other Jurisdictions

There are a number of other agencies responsible for management of resources within the project area. The Oregon Department of Fish and Wildlife is responsible for management of fish and wildlife populations, whereas the Forest Service manages the habitat for these animals. The USDI Fish and Wildlife Service and National Marine Fisheries Service are responsible for the recovery of species listed under the Endangered Species Act. Any Forest Service activities which have the potential to affect such species must be approved by the responsible agency. Consultation with those agencies regarding the proposed mining projects is ongoing and would be completed before any activities related to this EIS could be implemented.

The Environmental Protection Agency is responsible for enforcement of environmental quality standards, such as those established for water resources, while the Oregon Department of Environmental Quality sets standards, identifies nonpoint sources of water pollution, and determines which waters do not meet the goals of the Clean Water Act. The Environmental Protection Agency has certified the Oregon Forest Practices Act as Best Management Practices. Fifteen streams or stream segments located within the Granite Creek Watershed were listed by Oregon Department of Environmental Quality as water quality limited in 1998. A water quality restoration plan is being developed concurrently with this EIS to satisfy State requirements for such waters. Miners will be required to obtain any necessary permits before beginning operations. Depending on the type of operations planned, various permits may have to be obtained from the U.S. Army Corps of Engineers, Oregon Department of Environmental Quality, Oregon Department of Geology and Mineral Industries, the Oregon State Fire Marshall, the U.S. Department of Alcohol, Tobacco and Firearms, or Oregon State Department of Lands.

The Umatilla National Forest has filed cultural resource site reports conducted within the Granite area with the State Historic Preservation Officer.

Urban Quality, Historic, and Cultural Resources

The Granite watershed contains no urban areas. The goal of the Forest Service's cultural resource management program is to preserve significant historic and cultural resources in their field setting and ensure they remain available in the future for research, social/cultural

purposes, recreation, and education. The proposed activities could inadvertently expose prehistoric cultural resources through ground disturbance. This possibility is addressed through mitigation described in Chapter 2. The cultural resource report determined that there are adequate standards, guidelines, and procedures to protect cultural resources and to meet the goals of the cultural resource management program. This is discussed further in the “Cultural Resource” section of this chapter.

Prime Farmland, Rangeland, and Forestland

No prime farmland, rangeland, or forestland occurs within the analysis area.

Consumers, Minority Groups, & Women

The effects on civil rights, including those of minorities and women, is expected to be minimal to none.

Unavoidable Adverse Effects

Implementation of any of the alternatives would inevitably result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the direction in the management prescriptions and Standards and Guidelines in Chapter IV of the Forest Plan and additional mitigation proposed in Chapter 2 of this document. These adverse environmental effects are discussed at length under each resource section.

Irreversible and Irretrievable Commitment of Resources

Irreversible resource commitments are those that cannot be reversed (loss of future options), except perhaps in the extreme long-term. It relates primarily to nonrenewable resources, such as minerals or cultural resources or those resources that are renewable only over long periods of time, such as old-growth forest. A mining operation removes minerals from the ground, this results in an irreversible loss of the mineral resource.

Irretrievable resource commitments are those that are lost for a period of time. Examples are: the loss of production, harvest, or use of natural resources, such as the lost of timber production and harvest until the project area is reclaimed and revegetation success is achieved.

Irreversible Resource Commitment

The irreversible commitment of resources would include the consumption of nonrenewable energy or materials, such as diesel fuel and gasoline, and effects to topography, mineral resources, and cultural resources.

Fossil fuels used during the operation and transportation of mining claims would result in irreversible commitments.

The mining of ore deposits would be an irreversible use of a precious metals reserve. On the other hand, however, the extraction and processing of the gold would make this resource available for use by society.

Any soil or subsoil materials not salvaged prior to disturbance at the pit site or covered by waste rock or tailings material would result in an irreversible commitment.

Irretrievable Resource Commitments

Timber and other vegetation would be removed in areas of proposed facilities. Once this timber is removed any future harvest would be delayed for many decades.

Proposed mining could displace wildlife within the direct area of disturbance (e.g. loss of habitat), and some wildlife within the larger area (e.g. reduced habitat effectiveness due to noise). These effects could cause a minor reduction in wildlife population.

Unavoidable Adverse Effects

There are unavoidable impacts, which could occur as a result of implementing an action alternative. Some of these effects would be short term, while other could be long term. These unavoidable effects could include:

- ❖ The generation of dust (short term);
- ❖ The loss of vegetation and wildlife habitat (short and long term);
- ❖ Increases in noise levels which would effect human aesthetics and wildlife use and effectiveness (short term);
- ❖ Soil productivity (long term); and
- ❖ Timber production (short and long term).

Short-Term Use Versus Long-Term Productivity

Short-term uses are those that generally occur on a year to year basis. Examples are wildlife and livestock use of forage, timber management, other wood harvesting, recreation, and uses of the water resource. Long-term productivity is the capability of the land to provide resources, both market and non-market, for future generations.

Relationships between short-term uses of the environment and long-term productivity occur in all action alternatives. Short-term uses such as mining (vegetation removal) may be said to represent irretrievable commitments of resources. As an example: The removal of timber and vegetation from a site certainly prevents the vegetation from serving as forage for livestock or as hiding cover for wildlife for a certain period of time. However, after a period of time, which would vary from site to site based on reclamation objectives, trees and other vegetation would again re-establish and serve the desired purpose. This would occur because basic long-term productivity would not be destroyed by the short-term use; therefore, no irreversible damage would occur.

Granite mining projects operations would be short-term use, with mining and initial reclamation expected to last from 6 to 30 years or until deposits are panned out.

Long-term productivity refers to the basic capability of the land to produce according to the desired future levels (e.g., timber, wildlife habitat, water quality). Long-term productivity would depend on the reclamation measures applied, the ability to retain soil productivity, and the desired long-term management objectives.

Any impacts on fish and wildlife habitat due to sedimentation and the introduction of toxics into the environment can have both short and long-term impacts on these habitats, and to populations of fish and wildlife species.

CHAPTER 5: SUPPORTING INFORMATION

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LIST OF PREPARERS AND CONTRIBUTORS

The Umatilla National Forest, John Day Ranger District prepared this Draft EIS. The Interdisciplinary team developed the Range of Alternatives and Prepared the EIS. The following coordinators, resource specialists, consultants and other agencies participated or assisted in the overall preparation of the draft EIS.

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Scott Riley, Botanist
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Federal, State, and Local Agencies

Oregon Department of Environmental Quality
National Marine Fisheries Service
U.S. Fish and Wildlife Service

DISTRIBUTION LIST

This draft environmental impact statement has been distributed to individuals who specifically requested a copy of the document and those who submitted substantive comments during scoping. In addition, copies have been sent to the following Federal agencies, federally recognized tribes, State and local governments, and organizations representing a wide range of views and interests regarding mining in the Granite area.

Agencies

Oregon Department of Environmental Quality
Oregon Department of Fish & Wildlife
Oregon Department of Geology & Mineral Industries
Oregon Department of Land Conservation & Development
Oregon Division of State Lands
Oregon Governor's Forest Advisor
Oregon Parks and Recreation Department
Oregon Rural Development Section
Oregon State Economist
Oregon Water Resources Department

Federal Aviation Administration
Federal Energy Regulatory Commission
Federal Highway Administration
Federal Railroad Administration, Office of Transportation & Regulatory Affairs
National Marine Fisheries Service
National Resource Conservation Service
US Advisory Council on Historic Preservation
US Army, Engineers Division
US Department of Agriculture, Forest Service
US Department of Agriculture, Malheur National Forest
US Department of Agriculture, Wallowa-Whitman National Forest
US Department of Agriculture, National Agricultural Library
US Department of Agriculture, OPA Publication Stockroom
US Department of Commerce, Ecology & Conservation Office
US Department of Housing & Urban Development
US Department of Interior, Bureau of Land Management
US Department of Interior, Office of Environmental Policy & Compliance
US Department of Transportation, Thirteenth Coast Guard District
US Environmental Protection Agency
US Fish & Wildlife Service
US General Services Administration
US Northwest Power Planning Council
US Surface Transportation Board

Elected Officials

Baker County Commissioners
Grant County Commissioners

Tribes

Columbia River Inter-Tribal Fish Commission
Confederated Tribes of the Umatilla Indian Reservation
Confederated Tribes of the Warm Springs Indian Reservation

Organizations

Alliance for the Wild Rockies
American Wildlands
Blue Mountain Biodiversity Project
Center for Environmental Equality
Eastern Oregon Mining Association
Hells Canyon Preservation Council
Oregon Independent Miners

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GLOSSARY

A

Acid mine drainage (AMD): Drainage with a pH of less than 4.5 from sulfur-bearing rock materials. Acid rock drainage is predominantly present when these rocks have been exposed to air and water through natural (i.e., landslide) or man-induced (i.e., mining) processes. The reaction with air and water over time can produce sulfuric acid and sulfate salts. Sulfuric acid can also dissolve metals, if present in the rock, and release the metals into the environment.

Activity: An action, measure of treatment undertaken that directly or indirectly produces, enhances, or maintains forest and rangeland outputs, or achieves administrative or environmental quality objectives (FSM 1309, Management Information Handbook). An activity can generate multiple outputs.

Adit: An underground mining term. A horizontal or nearly horizontal access opening into an ore deposit with a single opening to the surface. Different from a tunnel which has both ends opening to the surface.

Affected environment: A physical, biological, social, and economic environment within which human activity is proposed.

Affects (ESA): Includes both direct and indirect effects to the listed species and/or its habitat.

<u>May Affect</u>	Any action that would result in a beneficial effect or could result in an adverse impact to a listed species. A “may effect” determination would necessitate the need for informal (or formal) consultation with the U.S.D.I. Fish and Wildlife Service.
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<u>No Effect</u>	A proposed action would not have any impact on a listed species or its habitat.
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Alluvium: Unconsolidated sedimentary material (including clay, silt, sand, gravel, and mud) deposited by flowing water.

Alternatives: The different means by which objectives or goals can be attained. One of several policies, plans, or projects proposed for decision making.

Ambient: The environment as it exists at the point of measurement and against which changes (impacts) are measured.

Anadromous: Those species of fish that mature in the sea and swim up freshwater rivers and streams to spawn. Salmon, steelhead, and searun cutthroat trout are examples.

Analysis area: A delineation of land subject to analysis of: 1) responses to proposed management practices in the production, enhancement, or maintenance of forest and rangeland outputs and environmental quality objectives, and 2) economic and social impacts (FSM 1905). Tracts of land with relatively homogeneous characteristics in terms of the outputs and effects that are being analyzed.

Aquatic: Growing, living in, frequenting, or taking place in water; in this EIS, used to indicate habitat, vegetation, and wildlife in freshwater.

Artifact: An object made or modified by humans.

B

Best management practices (BMP): Management actions that are designed to maintain water quality by preventative rather than corrective means.

Big game: Large animals hunted, or potentially hunted, for sport. These include animals such as deer, bear, elk, moose, bobcats, and mountain lions.

Biological Assessment (BA): Refers to the information prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitat that may be present in the action area and the evaluation of potential effects of the action on such species and habitat.

Biological Evaluation (BE): Refers to the information prepared by or under the direction of the Forest Service concerning listed and Regional Forester Sensitive Species that may be present in the action area and the evaluation of potential effects of the alternatives on such species and habitat.

Biological Opinion (ESA): A document that states the opinion of the U.S.D.I. Fish and Wildlife Service as to whether or not the Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

C

CFR: Code of Federal Regulations. A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

cfs: Cubic feet per second; 1 cfs equals 448.33 gallons per minute.

Closure: An administrative order restricting either location, timing, or type of use in a specific area.

Criteria: Data and information which are used to examine or establish the relative degrees of desirability among alternatives or the degree to which a course of action meets an intended objective.

Cultural resources: The remains of sites, structures, or objects used by humans in the past, historic or prehistoric. More recently referred to as heritage resources.

Cumulative effects or impacts: Cumulative effect or impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taken place over a period of time (40 CFR 1508.7 – these regulations use effects and impacts synonymously). For example, the impacts of a proposed timber sale and the development of a mine together result in cumulative impacts.

Cyanide: A naturally occurring organic compound composed of carbon and nitrogen (CN); a solid chemical compound (sodium or calcium cyanide) is dissolved in water to form a solution which is suitable for the extraction of precious metals from ore by using a leaching process.

D

DBH: Diameter of a tree at breast height (four feet, six inches from ground level).

Decommissioning: Suspension and/or closure of operations and possible removal of facilities.

Deposit: A natural accumulation, such as precious metals, minerals, coal, gas, oil, etc. that may be pursued for its intrinsic value; gold deposit.

Desired future condition (DFC): A portrayal of the land or resource conditions which are expected to result if goals and objectives are fully achieved (30 CFR 219).

Discharge: The volume of water flowing past a point per unit time, commonly expressed as cubic feet per second, million gallons per day, gallons per minute, or cubic meters per second.

Diversity: An expression of community structure. High if there are many equally abundant species; low if only a few equally abundant species. The distribution and

abundance of different plant and animal communities and species within the area covered by a land and resource management plan (36 CFR 219.3).

Draft Environmental Impact Statement (DEIS): The draft statement of environmental effects which is required for major federal actions under Section 102 of the National Environmental Policy Act, and released to the public and other agencies for comment and review. Under the State Environmental Policy Act (SEPA), a DEIS is required for proposals which may have probable significant adverse impacts.

Drift: An underground mining term. a primary or secondary horizontal or nearly horizontal mine passageway driven off the adit or other drifts to access the ore body and provide haulage ways.

E

Ecosystem: An interacting system of organisms considered together with their environment; for example aquatic, marsh, watershed, and lake ecosystems.

Effects: “Effect” and “impact” are synonymous as used in this document. Environmental changes resulting from a proposed action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Environmental impact statement (EIS): An analytical document prepared under the National Environmental Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA) that portrays potential impacts to the environment of a Proposed Action and its possible alternatives. An EIS is developed for use by decision makers to weigh the environmental consequences of a potential decision.

Environmental Protection Agency (EPA): An agency of the Executive Branch of the Federal Government which has responsibility for environmental matters of national concern.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geologic agents, including gravitation creep.

ESA: Endangered Species Act

Essential habitat (ESA): Those areas designated by the Regional Forester of the Forest Service as possessing the same characteristics as critical habitat without having been declared as critical habitat by the Secretary of the Interior. The term includes habitat

necessary to meet recovery objectives for endangered, threatened, and proposed species, and those necessary to maintain viable populations of sensitive species.

F

Final environmental impact statement (final EIS): Means a detailed written statement as required by Section 12(2)(C) of the National Environmental Policy Act (40 CFR 1508.11). It is a revision of the draft environmental impact statement to include public and agency comments to the draft.

Floodplain: The lowland and relatively flat area adjoining inland waters, including, at a minimum, that area subject to a 1% or greater chance of flooding in any given year.

Forage: All browse and non-woody plants that are available to livestock or game animals for grazing or harvestable for feed.

G

Goal: A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms and can be timeless if it has not specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed.

Grade: A slope stated as so many feet per mile or as ft/ft (%); the content of precious metals per mall of rock (oz/ton).

Grass/forb: An early forest successional stage where grasses and forbs are the dominant vegetation.

Ground water: Water found beneath the land surface in the zone of saturation below the water table.

H

Habitat: The natural environment of a plant or animal, including all biotic, climatic, and soil conditions, or other environmental influences affecting living conditions. The place where an organism lives.

Haul road: A road used by large (typically off-highway) trucks to haul ore and overburden from a mine to other locations, such as a mill facility or waste rock disposal area.

Hazardous waste: A waste is considered hazardous by the EPA if it exhibits one or more of these characteristics: ignitability, corrosively, reactivity, and/or toxicity. These are listed in 40 CFR 261.3 and 40 CFR 171.8.

Hydrologic system: All physical factors, such as precipitation, stream flow, snowmelt, ground water, etc., that effect the hydrology of a specific area.

I

Impermeable: Property of a substance that inhibits passage of fluids through its mass.

Incidental take (ESA): Refers to takings that result from, but are not for the purpose of, carrying out an otherwise lawful activity conducted by an agency or applicant.

Indirect impacts: Impacts which are caused by the action but are later in time or farther removed in distance, although still reasonably foreseeable.

Infiltration: The movement of water or some other fluid into the soil through pores or other openings.

Informal consultation (ESA): An optional process that includes all discussions, correspondence, etc. between the U.S.D.I. Fish and Wildlife Service and another Federal agency or the designated non-Federal representative prior to formal consultation, if required.

Interdisciplinary team (IDT): The interdisciplinary team is comprised of a group of personnel with different training assembled to solve a problem or perform a task. The team will consider problems collectively, rather than separate concerns along disciplinary lines. This interaction is intended to insure systematic, integrated consideration of physical, biological, economic environmental design arts and sciences.

Intermittent stream: A stream that runs water in most months, but does not contain water year-round.

Irretrievable: Applies to losses of production, harvest, or commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use changes, timber production can be resumed. The production lost is irretrievable, but the act is not irreversible.

Irreversible: Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options.

Issue: A point, matter, or question of public discussion or interest to be addressed or decided through a planning process.

J

Jeopardy or jeopardize the continued existence of (ESA): Means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. A jeopardy opinion would result in the U.S.D.I. Fish and Wildlife Service developing reasonable and prudent alternatives for the proposed action.

L

Landform: Any physical, recognizable form or feature on the earth's surface having a characteristic shape, and produced by natural causes. Landforms provide an empirical description of similar portions of the earth's surface.

Land use allocation: The assignment of a management emphasis to particular land areas with the purpose of achieving the goals and objectives of some specified use(s) (e.g. campgrounds, wilderness, logging, mining, etc.)

Listed species (ESA): Species that are listed as threatened or endangered under the Endangered species Act of 1973 (as amended).

Locatable minerals: Generally refers to hardrock minerals on Public Domain lands or National Forest System lands reserved from the Public Domain that are mined and processed to recover metals, such as gold and copper, chemical grade limestone, and asbestos.

Lode: A mineral deposit that is contained in consolidated rock, as opposed to a placer deposit.

Long-term impacts: Impacts that normally result in permanent changes to the environment. An example is a topographic change resulting from tailings disposal in a drainage. Each resource by necessity may vary in its definition of long-term.

M

Management area: An area with similar management objectives and a common management prescription.

Management indicator species: A species selected because its welfare is presumed to be an indicator of the welfare of other species using the same habitat. A species whose conditions can be used to assess the impacts of management actions on a particular area.

Management requirements (MR's): Standards for resource protection, vegetation manipulation, silvicultural practices, even-aged management, riparian areas, soil and water diversity, to be met in accomplishing National Forest System goals and objectives.

Mesic: Characterized by, relating to, or requiring a moderate amount of moisture.

Mineral entry: The filing of a mining claim upon Public Domain or related land to obtain the right to any minerals it may contain. Valid mining claims may be purchased in full (patented) under the 1872 mining law, as amended.

Mining claim: A portion of the Public Domain or related lands which is held, for mining purposes, in accordance with mining laws.

Mitigation: Mitigation includes (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or elimination of the impact over time by preservation and maintenance of operations during the life of the action; and, (e) compensating for the impact by replacing or providing substitute resources or environments (40 CFR Part 1508.20).

N

National Environmental Policy Act (NEPA): An act declaring a National policy which encourages productive and enjoyable harmony between humankind and the environment, promotes efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, enriches the understanding of the ecological systems and natural resources important to the Nation, and establishes a Council on Environmental Quality. (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.)

National Forest Management Act (NFMA): A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of Regional Guidelines and Forest Plans and the preparation of regulations to guide development on Forest lands.

Non-game species: Animal species which are not hunted, fished, or trapped.

Nonpoint air pollution: Pollution caused by sources that are non-stationary. In mining, nonpoint air pollution results from such activities as blasting and hauling minerals over

roads, as well as dust from ore and topsoil stockpiles, tailings, and waste rock disposal areas.

Ore: A mineral or group of minerals present in sufficient value as to quality and quantity which may be mined at a profit.

P

Particulates: Small particles suspended in the air or generally considered pollutants.

Patented claims: Private land which has been secured from the U.S. Government by compliance with the mining laws relating to such lands.

Perennial stream: A stream that flows year round.

Performance bond: See reclamation guarantee.

Plan of operations: A description presenting the methods, timing and contingencies to be used during the operation of a project. A document required from any organization and/or person proposing to conduct mineral related activities on federal land while utilizing earth moving equipment and which will cause disturbance to surface resources or involve the cutting of trees.

Pollution: Human-caused or natural alternation of the physical, biological, and radiological integrity of water, air, or other aspects of the environment producing undesired effects.

POO: Plan of operations.

Portal: The entrance to a tunnel or underground mine.

R

Range allotment: An area designated for use of a prescribed number and kind of livestock under one management plan.

Reclamation: Returning disturbed land to a productive form, usually in conformity with a predetermined land management plan or a government approved plan or permit.

Reclamation guarantee: A binding commitment payable to a governmental agency in the event that decommissioning and reclamation of an operation is not completed according to an approved plan or permit. See bond.

Reclamation Plan: A document that details the measures to be taken by a project proponent (permit holder) to reclaim the project lands; such a document can contain reclamation measures to be employed during mining operations but typically describes measures to be used after mining and milling have been completed.

Record of Decision (ROD): A document separate from the associated with an Environmental Impact Statement which states the decision, identifies alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not (40 CFR 1505.2).

Resident: A species, which is found in a particular habitat for a particular time period (i.e. winter resident, summer resident, year-round) as opposed to those found only when passing through on migration.

RHCA: Riparian Habitat Conservation Area.

Riparian: A type of ecological community that occurs adjacent to streams and rivers and is directly influenced by water. It is characterized by certain types of vegetation, soils, hydrology, and fauna and requires free or unbound water or conditions more moist than that normally found in the area.

S

Sediment: Earth material transport, suspended, or deposited by water; also, the same material once it has been deposited.

Sensitive species: Plant or animal species which are susceptible or vulnerable to activity impacts or habitat alternations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on an official State list, or that are recognized by the Regional Forester as needing special management to prevent placement on Federal or State lists.

SHPO: State Historic Preservation Office.

Short-term impacts: Impacts occurring during project construction and operation, and normally ceasing upon project closure and reclamation. Each resource, by necessity, may vary in its definition of short-term.

Significant: Requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts. The severity of an impact should be weighted along with the likelihood of its occurrence.

Special Use Permit: A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of Federal or State lands for some special purpose.

Standards and guidelines. Principles specifying conditions or levels of environmental quality to be achieved.

Stream gradient: The rate of fall or loss of elevation over the physical length of a segment or total stream usually expressed in ft/ft (%).

Succession: The progression of plant communities that occurs on a site that previously contained a plant community that was removed by disturbance such as fire or logging. An orderly process of biotic community development that involves changes in species, structure, and community processes with time.

T

Take (ESA): To harass, harm pursue, hunt, shoot, wound, trap or collect, or attempt to engage in any such conduct.

Tailings: The non-economic, ground rock material that remains after the valuable minerals have been removed from the ore by milling or washing.

Terrestrial: Of or relating to the earth, soil, or land; an inhabitant of the earth or land.

Threatened species: Those plants or animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future.

Topography: A configuration of a surface including its relief, elevation, and the portion of its natural and human-created features.

U

USDA: United States Department of Agriculture.

USFWS: United States Fish and Wildlife Service – United States Department of Interior.

USGS: United States Geological Survey – United States Department of Interior.

W

Watershed: The entire land area that contributes water to a particular drainage system or stream.

Water quality: The interaction between various parameters that determines the usability or non-usability of water for on-site and downstream uses. Major parameters that affect water quality include: temperature, turbidity, suspended sediment, conductivity, dissolved oxygen, pH, specific ions, discharge, and fecal coliform.

Wilderness: Land designated by Congress as a component of the National Wilderness Preservation System.

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APPENDICES



Appendix A:

PAST ACTIVITIES THAT ARE STILL EVIDENT

Past mining activities within the watershed took three forms. Lode mining, which involved tunnel operations, Placer mining, which used water to process gravels and hydraulic mining which was a form of Placer.

Lode Mining

Lode mines and prospects are scattered widely across a north-south oriented mineralized belt beginning near the headwaters of Upper Granite Creek and terminating at the south end at the Greenhorn Mining. The total number of lode mines and prospects is unknown. Although many veins were explored underground, most of them produced little if any ore of economic value. The working of these mineralized areas directly exposed and/or brought to the surface substantial volumes of mineralized rock which was deposited on the surface in tailings dumps. Oxidation of the sulfide minerals remaining underground in veins and on tailings dumps has in the past and continues to this day to release iron, arsenic, copper, lead, zinc, and silver into the environment.

Placer Mining

A significant portion of the Granite Creek watershed was placer mined beginning in the 1860s. Early in the 1900's bucket-line dredges, draglines, and doodlebugs were used to mine. Capable of moving large volumes of alluvial material, operation of these processing plants significantly altered stream morphology, flow, and riparian areas. Operation of the plants as well as earlier placer mining efforts, resulted in the relocation of channels, redistribution of channel deposits, lowering stream beds, bank destabilization, removal of fines, and channelization between banks armored with dredge tailings consisting of cobbles, boulders, and large rocks. In these areas, vegetative potential is reduced, as is riparian habitat.

Almost all the sub-watersheds in Granite Creek have headwaters and/or channel segments that have been impacted in this way. Widths of disturbed areas range from several hundred feet to as much as 1000 feet at the confluence of Granite Creek and Clear Creek. Since natural geomorphic and fluvial processes would probably require several thousand years or more to restore the most highly impacted areas to "normal", these changes may be considered permanent.

Smaller watersheds were mined hydraulically. This method of placer mining involved directing streams of water under high pressure at hillsides and banks (highbars), and processing the loosened gravels through washing plants. Water was brought to the highbar areas in ditches, one of which (Pete Mann ditch) continues to divert water from the tributaries of Clear Creek to the Burnt River

watershed. While the extent and degree of damage caused by historic hydraulic mining is less than that caused by the operation of bucketline dredges and doodlebugs, impacts are locally significant.

An out growth of all this mining was the construction of the Fremont Powerhouse in 1906. It supplied power to several mines within the watershed and started to supply power to the town of Granite in 1938. Power production was stopped in the mid 60's and it was deeded over to the Forest Service. For the last couple of years the North Fork John Day district has been restoring the Powerhouse with the help of the State of Oregon Historical Preservation Office.

Within the watershed, there are 477 miles of roads that are used for vehicle traffic of some sort. These roads range from privately owned one lane two tracks to a state maintained two-lane asphalt paved road with turnouts. A majority of the Forest Service maintained roads were constructed in the late 60's through the 70's. Since the mid 90's, no new Forest Service road construction has taken place. Some small reconstruction or heavy maintenance has been completed but nothing on the scale of what was done in the 70's. In 1993 the North Fork John Day Ranger District completed an Access and Travel Management plan for the district. Within the Granite Creek watershed 59 miles of road located on the district was closed to vehicle traffic. Grant County re-constructed and paved the 13 road from Granite to the intersection of Forest Service Road 10 in the late 90's. The county also replaced the bridge that crosses Congo Gulch during the same period.

Approximately 9,590 acres of timber harvest has occurred in the Granite Watershed. All silvicultural treatments have been implemented which include clearcuts, individual tree cuts, salvage and commercial thinning. Most of the harvest was done in the 70's and 80's with some salvage completed in the 90's. More then 9,900 acres have been planted in the watershed.

Livestock grazing began with the arrival of miners and settlers during the last half of the 19th century. Overstocking of the available ranges during the late 1800's and overgrazing in the early 1900's caused widespread damage, altering riparian habitat structures. The growth of the livestock industry in eastern Washington and Oregon increased the number of animals beyond the area's carrying capacity, so by the 1920's overgrazing of National Forest system lands and drought conditions caused the range to further deteriorate to the extent that Congress passed the Taylor Grazing Act in 1934 to improve public rangeland.

Throughout the 1960's and 70's the Forest Service, Bureau of Land Management, Soil Conversion Service, and private landowners changed grazing practices by using a variety of management strategies. One pasture (Beaver Meadow Unit) of the Camp Creek Allotment falls within sub-watershed 93M and a small portion of 93L. Prior to 1954 this area was grazed by both sheep and cattle. Before 1932, information is sketchy but it is believed that grazing was quite heavy. From 1954 to the present, the amount of grazing

has slowly decreased to a season of 1½ to 2 months for 295 head of cattle (Beaver Meadow Unit only).

During the late 80's the North Fork John Day district constructed and placed numerous log structures in Clear Creek and Granite Creek with assistance from the Bonneville Power Administration (BPA). BPA also started to fund floodplain restoration work along Clear Creek and Granite Creek in the mid 90's. Riparian planting has taken place within the restored floodplain areas also.

Within the last 10 years there have been four large fires (over 100 acres) within the Granite Creek Watershed, compared with none in the preceding 15 years; all Wilderness fires on the Umatilla NF. In addition, there have been several large fires adjacent to the watershed but not within the boundaries of the watershed.

ONGOING ACTIVITIES

Currently there are 120 mining claims located within the Granite Creek watershed and around 98 of these have had some sort of activity done on them. Of these, 61 are placer claims, 31 are lode claims and 6 claims are a combination lode and placer. A majority of these claims are small in nature and are owned by individuals. They may use equipment in a limited setting and move up to 100 cubic yards of material in a year. Claimants usually occupy the claims when they are working by pulling in a camper trailer or staying in an old cabin located on the claim.

Firewood gathering is taking place along open roads within the watershed along with routine road maintenance. Road maintenance is done under an annual contract and is inspected by the Forest Service. Specifications for this work are included in the contract. Firewood is to be removed only on open roads, not more than 300 feet from the road or from any live water.

Restoration of the Fremont Powerhouse Complex started in 1999 and continues to this day. While work on the Powerhouse is complete there is still work being done on a couple of the homes. Of the four houses within the complex, two are included in the Cabin Rental program.

Recreational use of the watershed is estimated at 8,100 recreational visitor days. A recreational visitor day (RVD) is equal to twelve visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. Most of the recreational use within the watershed centers on hunting. Fishing is not a large use since Clear Creek and Granite Creek are closed to all fishing. Some fishing occurs on Olive Lake. Camping at Olive Lake Campground starts around the middle of June and ends around the middle of November. The North Fork John Day Wilderness covers a large percentage of the east half of the watershed. Three trailheads service this portion of the wilderness. During snow season snowmobiling is the predominate recreational activity. A local snowmobile club maintains at least 60 miles of trail within the watershed.

Restoration of the dredge tailings located along Clear Creek is nearing completion. This work is removing the piles of rock left over from the dredge work done in the 30's and 40's and restoring the flood plain to its past elevation. Along with the tailing removal, riparian planting is being done.

A number of Special Use permits are present within the watershed. The Greenhorn water use permit allows the town of Greenhorn to draw up to 1 cubic foot per second of water from Lighting Creek above the Pete Mann Ditch diversion. A powerline from the town of Granite to the Fremont Powerhouse is permitted to the local power company. Pete Mann Ditch is currently not under a Special Use permit. The Umatilla and Wallowa-Whitman National Forests are currently working with the Office of General Council to determine who has existing water rights, where those rights are located, and if a special use permit is needed. Once an answer is found additional NEPA will be required for this permit.

FORESEEABLE FUTURE ACTIVITIES

In addition to the Claims included in this EIS the Wallowa-Whitman National Forest is currently working on 6 Plans of Operations located within the watershed. These plans are currently approved. The Forest is updating the NEPA since changed conditions have occurred.

The Umatilla National is proposing to non-commercially thin around 3,500 acres within the next 10 years. This work is located outside of wilderness, roadless, RHCA's, and LAV's for lynx. In addition, both Forests have plans to commercially thin around 844 acres that is also located outside the above areas.

Restoration work of the Clear Creek and Granite Creek flood plains will continue as long as funding is available. The planting of riparian habitat species is included in this work. Replacement of 8" PVC pipe that is draining the Bluebird and Blackjack mines with 18" corrugated plastic drainpipe.

The North Fork John Day Ranger District is completing an EIS that analyzes the effects that would occur during a 5,280-acre understory burn that is scheduled to be completed when funds become available.

The Wallowa-Whitman National Forest is analyzing the restoration work needed to fix a head cut on Bull Creek. They are also working with the City of Granite to improve the town's water system and looking at an extension of a fiber optic telephone line from Buffalo mine to the Crane Flat area. The Umatilla and Wallowa-Whitman will also be looking into the requirements needed for the use of the Pete Mann Ditch in the future.