

## **CHAPTER 4: ENVIRONMENTAL CONSEQUENCES**

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## 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.

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### 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
<b>Lower Granite Creek (93A)</b>	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%
<b>Ten Cent Creek (93B)</b>	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%
<b>Upper Granite Creek (93C)</b>	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%
<b>Clear Creek (93J)</b>	Grubstake Bunchbucket	<0.25 <1	<1.25	4.4	19.6	7	4%
<b>Lightning Creek (93K)</b>	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.

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## 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 flow<sup>10</sup> 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

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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
<b>Lower Granite Creek (93A)</b>	Republican Comeback #7 Republican Comeback #10 & #11 Hopeful #2 & #3 Hopeful	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>
<b>Ten Cent Creek (93B)</b>	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	<b>1</b>	<b>2</b>	<b>1</b>	<b>3</b>
<b>Upper Granite Creek (93C)</b>	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>
<b>Clear Creek (93J)</b>	Grubstake Bunchbucket	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Lightning Creek (93K)</b>	Lucky Strike	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

**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
<b>Lower Granite Creek (93A)</b>	Republican Comeback #7 Republican Comeback #10 & #11 Hopeful #2 & #3 Hopeful	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>Ten Cent Creek (93B)</b>	PBGF #1 - #3 East Ten Cent Creek Tarhill Ten Cent Brice #1 - #3	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>
<b>Upper Granite Creek (93C)</b>	SW ST. Paul Magnolia Group Old Eric #1 - #2 Rosebud #1 - #4 Troy D	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
<b>Clear Creek (93J)</b>	Grubstake Bunchbucket	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Lightning Creek (93K)</b>	Lucky Strike	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

**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,

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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 <sup>1</sup>	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.

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## **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

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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.

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## **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

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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.