

FISHERIES BIOLOGICAL EVALUATION
FOR THE
BLUE LEDGE MINE PROJECT

ROGUE RIVER-SISKIYOU NATIONAL FOREST
SISKIYOU MOUNTAINS RANGER DISTRICT

Prepared By: /s/ Steve Brazier
Steve Brazier
Fisheries Biologist

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Project Description Summary

Name of Project: Blue Ledge Mine Project

Administrative Unit: Rogue River-Siskiyou National Forest, Siskiyou Mountains Ranger District

Project location:

- HUC-4:** Applegate
- HUC-5:** Upper Applegate River
- HUC-6:** Elliott Creek – Dutch Creek

Biological Evaluation Background Information:

The Biological Evaluation process (FSM 2672.43) is intended to conduct and document activities necessary to ensure Proposed Actions will not likely jeopardize the continued existence or cause adverse modification of habitat for:

- A. Fish species listed or proposed to be listed as **Endangered** (E) or **Threatened** (T) or **Proposed** for Federal listing (P) by the National Marine Fisheries Service.
- B. Fish species listed as **Sensitive** (S) by USDA, Forest Service.

Threatened, Endangered, and Sensitive Fish Species (TES)

In compliance with Section 7 of the Endangered Species Act (ESA) and the Forest Service Biological Evaluation process for TES fish species, the list of species potentially occurring within the project area was reviewed. Lists for the Rogue River-Siskiyou National Forest (RRS-NF) and the Pacific Northwest Region (R-6) were reviewed in regard to potential effects on any of these species by actions associated with the Blue Ledge Mine project. Pre-field and reconnaissance results are summarized in the table below.

Species		Pre-field Review	Field Surveys
Common name	Scientific Name	Existing Sighting or Potential Habitat	Habitat or Species Present
<i>Threatened Species</i>			
Coho salmon	<i>Oncorhynchus kisutch</i>	No	No
<i>Sensitive Species</i>			
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	No	No
Inland redband trout	<i>Oncorhynchus mykiss</i>	No	No
Pit sculpin	<i>Cottus pitensis</i>	No	No
Western ridged mussel	<i>Gonidea angulata</i>	Habitat	No
Klamath rim pebblesnail	<i>Fluminicola sp.</i>	No	No
Highcap lanx	<i>Lanx alta</i>	No	No
Scale lanx	<i>Lanx klamathensis</i>	No	No
Robust walker	<i>Pomatiopsis binneyi</i>	No	No
Pacific walker	<i>Pomatiopsis californica</i>	No	No
Pristine springsnail	<i>Pristinicola hemphilli</i>	No	No

Summary of Effects determination:

Proposed activities will have **No Effect** for coho salmon and coho critical habitat and will **not affect** Essential Fish Habitat for coho salmon and Chinook salmon. Due to the no effect determination, no consultation with NOAA Fisheries Service is required. **No impact** was determined for effects on Southern Oregon California Coastal Chinook salmon, inland redband trout, pit sculpin, western ridged mussel, Klamath rim pebblesnail, highcap lanx, scale lanx, robust walker, pacific walker, and pristine springsnail.

Introduction

The purpose of the Blue Ledge Mine Project is to remove waste rock tailing piles from the Blue Ledge Mine site on the Siskiyou Mountains Ranger District. These mine tailing are actively eroding into Joe Creek, which has severely degraded the downstream water quality within Joe Creek and downstream portions of Elliott Creek. This degraded water quality condition has had substantial impacts on aquatic habitat within Joe Creek, and to a lesser degree Elliott Creek. Recent surveys have confirmed that Joe Creek does not support any self-sustaining populations of fish. Furthermore, aquatic macroinvertebrate communities downstream from the Blue Ledge Mine site are severely degraded.

Southern Oregon Northern California Coasts (SONCC) coho salmon was listed by the National Marine Fisheries Service (NMFS) under the Endangered Species Act (ESA) as threatened on May 6, 1997 (62 FR 24588). This status was reaffirmed on June 28, 2005 (70 FR 37160). Critical habitat for SONCC coho salmon was designated by the NMFS on May 5, 1999 (64 FR 24049). Interim protective regulations for SONCC coho were issued under section 4(d) of the ESA, on July 18, 1997 (62 FR 38479).

Coho salmon and Chinook salmon Essential Fish Habitat (EFH) was defined by the Pacific Fisheries Management Council (PFMC) in Appendix A to Amendment 14 of the Pacific Coast Salmon Plan (PFMC 1999). This designated EFH under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as amended by the Sustainable fisheries Act of 1996 (Public Law 104-267).

The USDA Forest Service Region 6 Sensitive Species List was updated on January 31, 2008. This update identified the following sensitive fish and aquatic mollusk species as potentially being affected by land management activities on the Rogue River-Siskiyou National Forest: Chinook salmon, inland redband trout, pit sculpin, western ridged mussel, Klamath rim pebblesnail, highcap lanx, scale lanx, robust walker, pacific walker, and pristine springsnail.

The Blue Ledge Mine site is located in the headwaters of Joe Creek within the Elliott Creek-Dutch Creek sub-watershed (6th Field HUC 171003090104). This location is upstream of Applegate Dam, which prevents upstream migration of anadromous fish (including coho salmon). Furthermore, coho salmon critical habitat is not present upstream of the Applegate Lake dam.

Description of the Proposed Action

The purpose of the Blue Ledge Mine project is to remove waste rock piles from the mine site. This

action would consist of the following primary elements:

- Construct access roads as needed to complete the removal action. Generally, an access road would be needed to some portion of each of the four wasterock areas.
- Excavate waste rock with dozers, excavators, and draglines. The specific method varies depending on the slopes and characteristics of the waste rock area.
- Construct an upland repository and prepare it for waste rock placement.
- Place the excavated waste rock in an upland repository. There are two sites being considered, both of which are located up the 1060-400 spur (one on USFS land, one on private land).
- Install ET cover including native revegetation, runoff diversion, grading and drainage on the repository to isolate the waste rock from the environment and inhibit leaching of acidity and metals. This design would effectively isolate the waste rock from the environment without the need for leachate collection and treatment.
- Place and stabilize reclamation fill and plant selected native vegetation on portions of the former waste rock areas.
- Install sedimentation basins and bioswales to control transport of contaminants from runoff, seeps, and erosion.
- Close adits with bat gates to allow access by wildlife, prevent human access, and minimize physical hazards from the mine shafts.

Existing Condition – Aquatic Biota

Fish populations and habitat upstream of the Applegate Lake are typical of southwestern Oregon montane aquatic habitats. Due to the presence of Applegate Dam, anadromous fish species are blocked from accessing aquatic habitat upstream of the dam. Resident fish populations upstream of the lake are dominated by rainbow trout and cutthroat trout.

2000-2001 Aquatic Surveys

In late summer 2000, extensive sampling (9 sites, figures 1-5) of the fish, aquatic macroinvertebrate, and amphibian populations within the Joe Creek drainage was conducted (Parker 2001, Parker 2000, and Reid 2000). Results from this effort indicate that the Blue Ledge Mine has and is continuing to severely degrade aquatic habitat condition and water quality within Joe Creek.

Fish

In 2000, six sites were surveyed along Joe Creek, to determine presence of fish. In conjunction with the Joe Creek sites, two survey sites were established within Elliott Creek (one upstream of Joe Creek, and one immediately below the Joe Creek confluence). This survey effort identified rainbow trout and unidentified sculpin within Elliott Creek. Further, these two species (i.e. rainbow trout, sculpin) were located within Joe Creek immediately upstream of the confluence with Elliott Creek (site JC1). No additional fish were located upstream of this survey location. All trout captured near the mouth of Joe Creek were young of the year. It is assumed that these fish had moved into Joe Creek from Elliott Creek as no adult fish were observed within Joe Creek. A 2001 Level II stream survey confirmed the findings from the 2000 fish survey, that fish are not present within Joe Creek. Furthermore, this survey concluded that there is “no physical reason Joe Creek could not support a resident trout population in the lower 2.04 miles” (Siskiyou Research Group

2001).

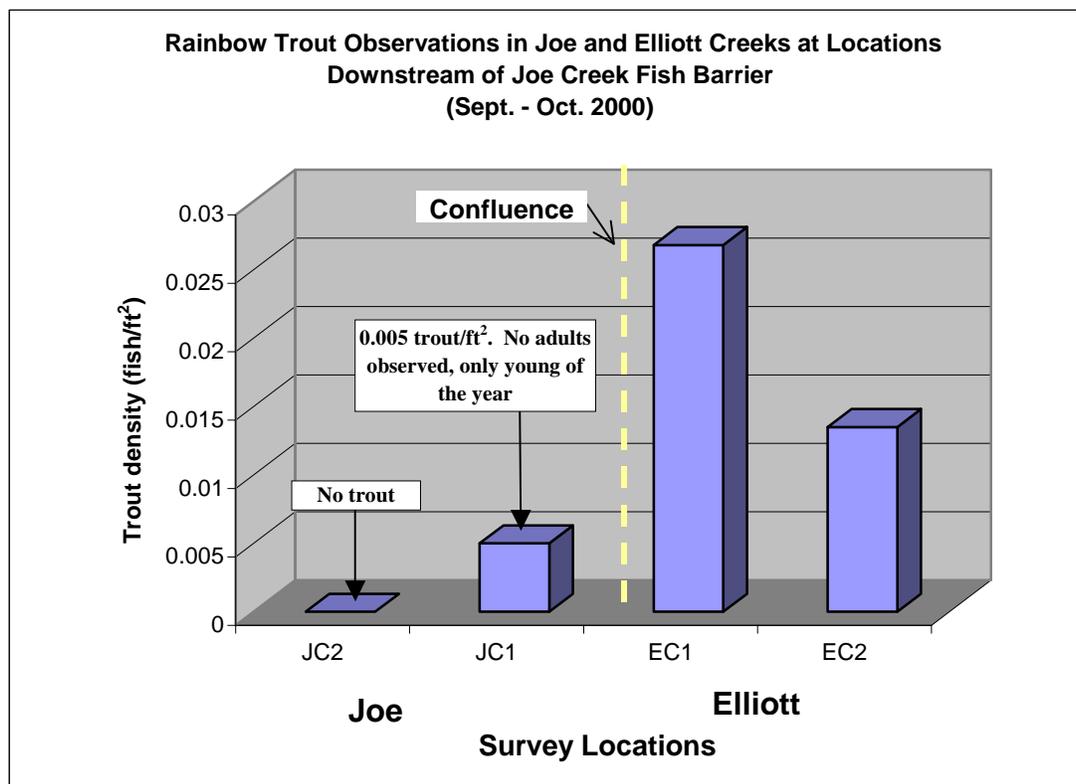


Figure 1. Rainbow Trout Observations in Joe Creek and Elliott Creek, Sept./Oct. 2000

Macroinvertebrates

Macroinvertebrate samples were collected in both Joe Creek and Elliott Creek in September 2000, and May 2001 (See figure 5 for map of locations). These replicate samples were conducted to determine what effect Acid Mine Drainage (originating at the Blue Ledge Mine site) was having on the aquatic macroinvertebrate community within Joe Creek and downstream portions of Elliott Creek. The September survey was completed during the dry season when no surface water drainage was flowing off of the mine site. Conversely, the May survey was conducted during spring runoff when surface flow was actively entering Joe Creek from the mine site.

The September 2000 survey indicated that macroinvertebrate community diversity and density was appreciably reduced, when compared to community structure upstream of the mine site, from the mine site to 3 km downstream (see Figure 2)(Parker 2000).

The May 2001 survey showed even more dramatic impacts to the macroinvertebrate community than did the September 2000 survey (Figure 3). At the time of the May survey, surface flow from the mine site was entering Joe Creek via a tributary that flows through the main waste rock pile (i.e. #1). From this confluence to over 2 km down stream, macroinvertebrates were largely absent within Joe Creek, and their densities were substantially reduced within the downstream remainder of Joe Creek (Parker 2001).

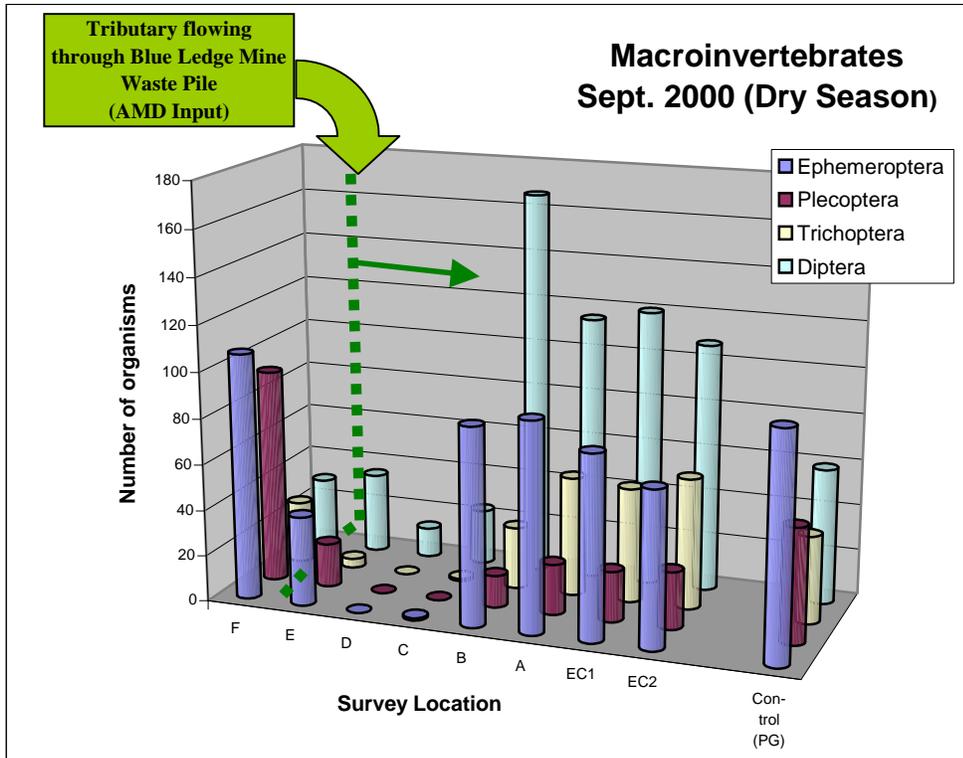


Figure 2. September 2000, Aquatic Macroinvertebrate Abundance

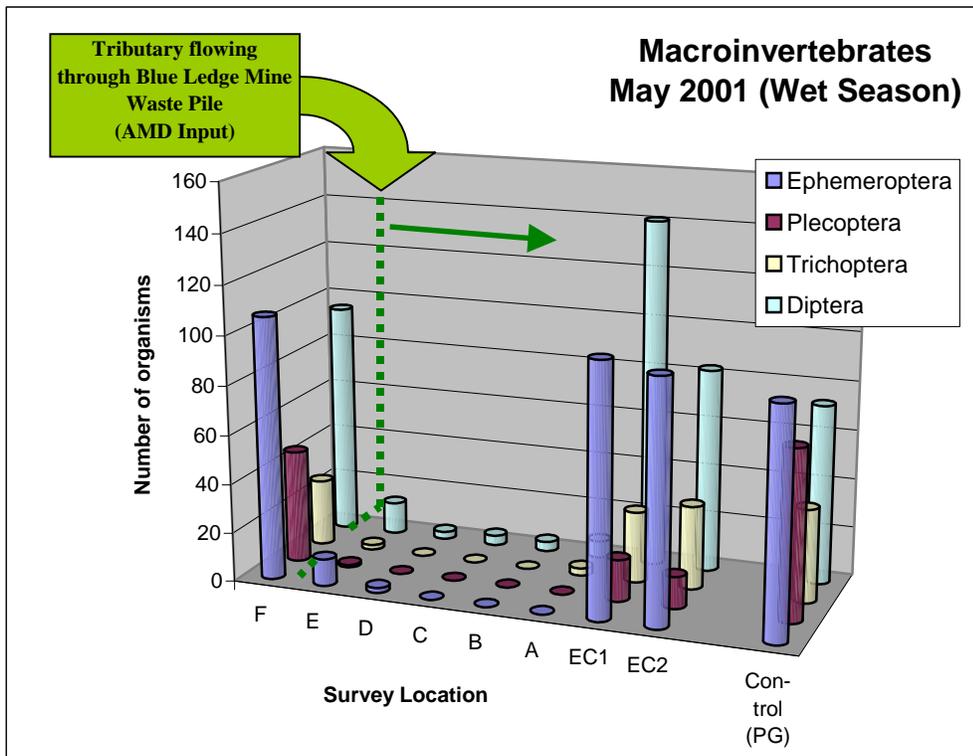


Figure 3. May 2001, Aquatic Macroinvertebrate Abundance

The depauperate macroinvertebrate community composition within Joe Creek is attributed to the acid mine drainage and associated elevated metal concentrations from the Blue Ledge Mine site. The sulfide deposits, for which the area was developed, are a continuing source of AMD, which results from weathering that oxidizes the mineralized sulfide deposits resulting in sulfate and acidity (including sulfuric acid). Elevated metal concentrations (attributed to the Blue Ledge Mine site) within Joe Creek include: arsenic, cadmium, copper, iron, lead, and zinc. A comparison of the September 2000 and May 2001 macroinvertebrate surveys clearly show that adverse effects to macroinvertebrate community and water quality are most pronounced during spring runoff, when surface flow is present at the mine site and actively contributing flow to Joe Creek (Environment International Ltd. 2002, Parker 2001).

Amphibians

Observations of stream-dwelling amphibians were noted during macroinvertebrate surveys conducted in September 2000 and May 2001. During both of these surveys, tailed frog (*Ascaphus truei*) and Pacific giant salamander (*Dicamptodon tnebrosus*) were found upstream of the mine site. However, no amphibians were observed at the JC4 site (nearest downstream site to the mine) in either survey, with reduced numbers of individuals (when compared to sites upstream of the mine) being found at other downstream survey locations (See figure 4) (Environment International Ltd. 2002, Parker 2000, 2001).

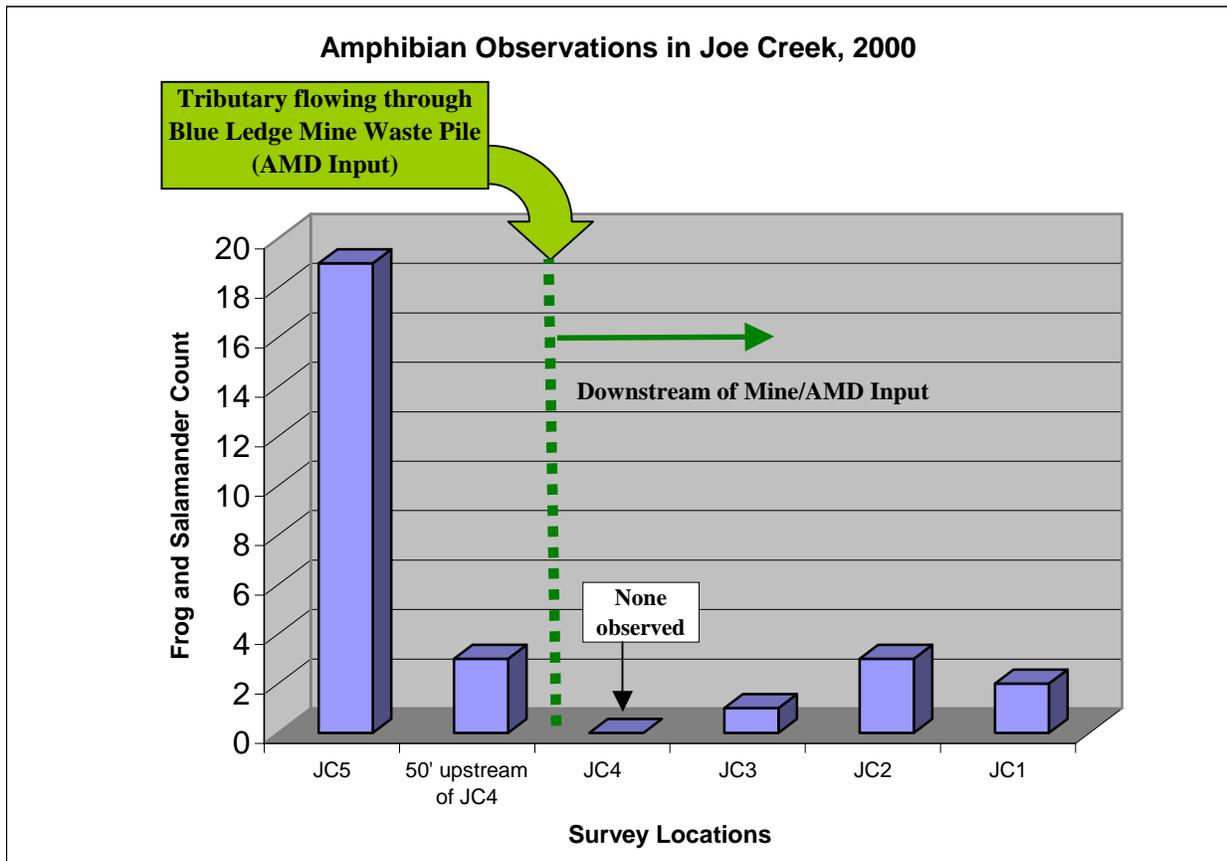


Figure 4. Amphibian Observations in Joe Creek, September 2000

Blue Ledge Mine

April 18 to April 25, 2001

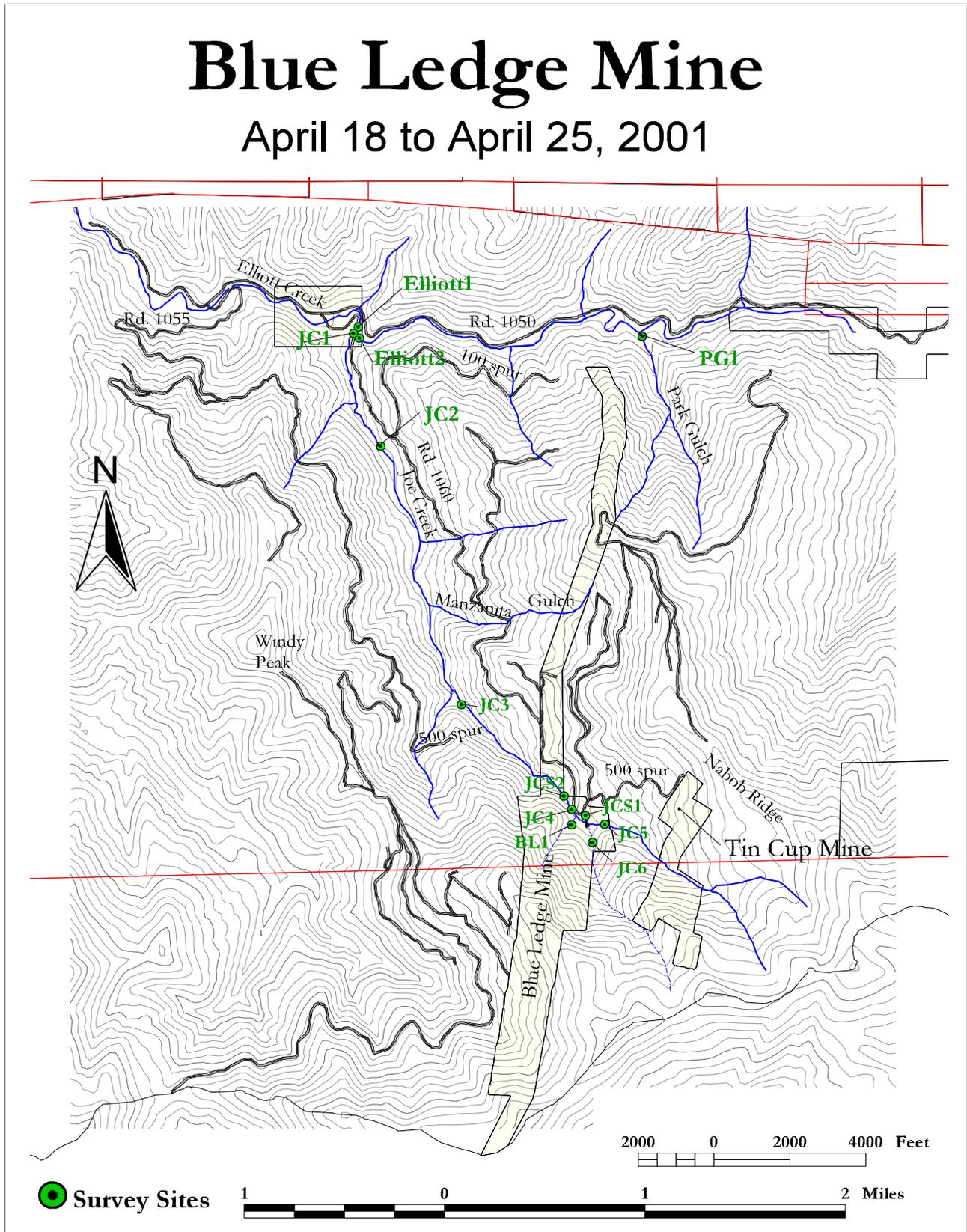


Figure 5. Blue Ledge Mine Project, 2000-2001 Aquatic Monitoring Sites

2008 Aquatic Macroinvertebrate Survey

Aquatic macroinvertebrates were collected at four sites on September 9, 2008. The four sample sites were:

- Elliott Creek downstream of the confluence with Joe Creek
- Elliott Creek upstream of the confluence with Joe Creek
- Joe Creek downstream of mine runoff contribution
- Joe Creek upstream of mine runoff contribution

Similar to the macroinvertebrate samples collected in 2000 and 2001, the 2008 surveys indicated that the macroinvertebrate community with Joe Creek was severely degraded downstream of the waste rock piles, when compared to macroinvertebrate communities upstream of the mine site. Further, these differences are primarily related to differences in species specific tolerances of dissolved metals and water temperature. Given that water temperature is similar between sites, the results are indicative that metal contamination is the causative factor for decreased density and diversity of macroinvertebrates within Joe Creek downstream of the Blue Ledge Mine (Bollman 2008).

Within Elliott Creek, variation between the upstream and downstream site was not substantial enough to indicate that the macroinvertebrate community composition is being influenced by metal contamination. At both sites, macroinvertebrate density and composition are typical of montane streams (Bollman 2008).

Fish Tissue Samples

In 2008 fish tissue samples were collected in Elliott Creek, Applegate River (upstream of Applegate Reservoir), and Applegate Reservoir. In all three water bodies, elevated levels of arsenic (above Oregon DEQ standards) were found within fish tissue samples. However, the arsenic levels did not appear to be related to the mine or the tributary associated with the Acid Mine Drainage (AMD), but were potentially related to naturally occurring arsenic within the watershed. Fish tissue did not exceed thresholds for other tested metals (cadmium, copper, iron, lead, zinc), although other environmental monitoring methods found these metals to be present at high levels related to Blue Ledge Mine and AMD (URS 2009).

Consistency with ACS objectives

The Aquatic Conservation Strategy was designed to facilitate the management and restoration of aquatic ecosystems within lands covered by the Northwest Forest Plan (1994). Specifically, the strategy is intended to protect anadromous fish habitat on federal lands within the range of Pacific Ocean anadromy. It is assumed that implementation of the ACS provides protection for all fish species present on the Rogue River-Siskiyou National Forest.

Objective 1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

Removal of the waste rock piles at the Blue Ledge Mine would contribute to increased water quality within Joe Creek and downstream portions of Elliott Creek. Further, this improved

condition would facilitate increased diversity within the aquatic macroinvertebrate community and result in conditions favorable for increased distribution of resident fisheries.

Objective 2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Currently, Acid Mine Drainage (AMD) originating at the Blue Ledge Mine is chemically altering the water quality of Joe Creek. This condition is severe enough that it is presumed to be the chief causative factor for the absence of self-sustaining fish populations with Joe Creek, and the decreased abundance of stream dwelling amphibians. Removal of the waste rock piles, and the subsequent curtailment of AMD flowing off of the Blue Ledge Mine site would provide for appreciable improvements to water quality within Joe Creek and downstream portions of Elliott Creek and foster expansion of resident fish and stream-dwelling amphibian occupied habitat within Joe Creek.

Objective 3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

The proposed removal of waste rock piles at the Blue Ledge Mine would have no long-term effect on the physical condition of the Joe Creek, as project activities would not alter stream banks or channel morphology. In the short term, elevated levels of sediment influx may result from project implementation activities, including road construction. However, these sedimentation effects would not result in any measurable effects to resident fish, as Joe Creek is currently devoid of self-sustaining fish populations.

Objective 4. Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Water quality within Joe Creek is currently very poor downstream of the Blue Ledge Mine. Implementation of the proposed action would dramatically decrease AMD from the mine site. This decrease would result in appreciable improvement to water quality and fish habitat within Joe Creek and downstream portions of Elliott Creek, and is expected to produce conditions within Joe Creek that are suitable to support self-sustaining fish populations.

Objective 5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Short-term sediment influx associated with road construction and usage during project implementation would occur. In the long-term, implementation of the proposed action would be

expected to decrease sediment generated from the Blue Ledge Mine site as the former waste rock piles are removed and vegetation is established.

Objective 6. *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*

Implementation of the proposed action would have no effect on in-stream flows or timing, magnitude, duration, or spatial distribution of peak, high, or low flows.

Objective 7. *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.*

Refer to Objective 6.

Objective 8. *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.*

Implementation of the proposed action would contribute towards creating conditions that are suitable for supporting self-sustaining populations of fish and diverse communities of aquatic macroinvertebrates. These improved conditions would be a response to improved water quality within Joe Creek and downstream portions of Elliott Creek.

Objective 9. *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.*

Active restoration of aquatic habitat within Joe Creek is not included within the proposed action. However, implementation of the proposed action would result in improved water quality within Joe Creek and downstream portions of Elliott Creek, which could contribute towards expansion of fish distribution and the potential establishment of self-sustaining resident fish populations within Joe Creek.

Effects of the Proposed Action

The project area is located upstream of Applegate Dam. Thus no anadromous fish habitat exists within the project area, or within potentially effected downstream habitats. Consequently, No effect to coho salmon, coho salmon Critical Habitat, or Essential Fish Habitat (coho, Chinook) would occur from the implementation of the Proposed Action. Additionally, there are no R-6 Sensitive aquatic species within or downstream (i.e. upstream of Applegate Dam) of the project area; therefore, there would be “no impact” to R-6 Sensitive fish species.

In the short-term, effects of the proposed action would include increased sediment influx originating from road construction, road usage, and physical removal of the waste rock piles at the mine site. This sediment influx is expected to effect aquatic biota habitat within Joe Creek. Given that Joe Creek is currently fishless; this sedimentation would primarily influence aquatic macroinvertebrate habitat and community composition. Increased sedimentation can result in the loss of habitat for both aquatic macroinvertebrates and fish, through the elimination of the interstitial spaces in the streambed and the filling of pools (Waters 1995). These effects can lead to decreased abundance, diversity, and species composition within the aquatic biota community. After project completion, soil settlement, and establishment of vegetation, sedimentation would decrease. This decrease would result in improved aquatic habitat in stream systems that were affected by the project implementation.

Long-term, implementation of the proposed action would result in beneficial impacts to resident aquatic biota and their associated habitat, as water quality within Joe Creek and downstream portions of Elliott Creek are improved. It is expected dissolved metal leachate and AMD originating at the mine site would dramatically decrease, resulting in appreciable improvements to the water quality and aquatic habitat within Joe Creek, and to a lesser degree downstream portions of Elliott Creek. This water quality improvement would likely contribute towards expanded resident fish distribution and increased diversity and density of aquatic macroinvertebrates within Joe Creek.

Construction of the waste rock repository would have no measurable effect on aquatic biota populations or habitat as it would not occur within proximity of occupied habitat.

Literature Cited

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Waters, T. F. 1995. Sediment in streams: sources, biological effects, and control. American Fisheries Society Monograph 7.

Dichotomous Key for Making Section 7 Determination of Effects

Rogue River-Siskiyou National Forest
Siskiyou Mountains Ranger District
Project Name: Blue Ledge Mine Project

1. Are there any proposed/listed anadromous salmonids and/or proposed/designated critical habitat in the watershed or downstream from the watershed?

NO..... No Effect
YES..... **May affect, go to 2**

2. Will the proposed action(s) have any effect whatsoever* on the species and/or critical habitat?

NO..... **No Effect**
YES..... Go to 3

3. Does the proposed action(s) have the potential to hinder attainment of relevant properly functioning indicators from checklist?

NO..... Go to 4
YES..... Likely to adversely affect

4. Does the proposed action(s) have the potential to result in “take”** of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat?

NO. There is a negligible (extremely low) probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat..... Not likely to adversely affect

YES. There is more than a negligible probability of take of proposed/listed anadromous salmonids or destruction/adverse modification of proposed/designated critical habitat..... Likely to adversely affect***

*"Any effect whatsoever" includes small effects that are unlikely to occur, and beneficial effects, i.e. a "no effect" determination is only appropriate if the proposed action will literally have no effect whatsoever on the species and/or critical habitat, not a small effect, an effect that is unlikely to occur, or a beneficial effect.

**"Take" – The ESA (Section 3) defines take as "to harass, harm, pursue, hunt, shoot, wound, trap, capture, collect or attempt to engage in any such conduct". The USFWS further defines "harm" as "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering" and "harass" as "actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering".

***Document expected incidental take on appropriate form.

Name of Biologist: /s/ Steve Brazier Date: August 20, 2009