



# United States Department of the Interior



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**JUN 13 2016**

1792 (ORM070)

DOI-BLM-ORWA-M070-2016-0003-EA

Dear Interested Party,

The Grants Pass Field Office has completed the Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for the Stray Dog Mining Plan of Operations (Plan) within policies set forth in the National Environmental Policy Act. The EA discloses the environmental effects of the Proposed Action (Alternative 2) and No Action Alternative (Alternative 1). The Proposed Action is to allow the project proponent to mine three areas totaling approximately 3.4 acres within 20 feet of North Fork Galice Creek. The proponent submitted the Plan pursuant to 43 Code of Federal Regulations (CFR) 3809 surface management regulations.

It is the responsibility of the Bureau of Land Management (BLM) under the Federal Land Management and Policy Act (FLPMA) to ensure that this Plan conforms to the provisions of the 43 CFR 3809 surface management regulations. This includes ensuring that the Plan does not cause unnecessary or undue degradation to public lands, as defined at 43 CFR 3809.5.

The Plan must incorporate mitigation measures specified by the BLM that are consistent with the Medford District Resource Management Plan (1995). All operations must comply with all pertinent Federal and State Laws (43 CFR § 3809.420(a) (4) and 43 CFR § 3809.420(a)(6)).

The legal description for the Stray Dog Mining Plan of Operations is Township 35 South, Range 8 West, Section 3, Willamette Meridian, Josephine County, Oregon. An EA for the Plan does not authorize the start of operations. The Proponent must obtain all necessary Federal and State permits before beginning mining activities. Additionally, the Proponent must provide a reclamation bond sufficient to pay third party contractors for reclamation of the proposed disturbance area (43 CFR § 3809.412).

As the Grants Pass Field Manager, I am seeking public comment on the Stray Dog EA. The publication of a Legal Notice in the *Grants Pass Daily Courier* will initiate a 15-day comment period on June 16, 2016. Comments received will be considered in making the final decision. Written comments must be mailed or delivered by July 1, 2016 to the Grants Pass Interagency Office, 2164 NE Spalding Avenue, Grants Pass, OR 97526. Office hours are Monday through Friday, 8:00 A.M. to 4:30 P.M., closed on holidays. The Stray Dog EA can be viewed on the BLM's ePlanning website site at <http://tinyurl.com/BLMePlanning-StrayDog>. Hard copies of the EA are available at the address listed above. If you have any questions about this project, please contact Ferris Fisher, Planning and Environmental Coordinator, at (541) 471-6639.

Submitted comments will become part of the public record for this project. If you wish to withhold your personal information from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations, will be made available for public inspection in their entirety.

Thank you for your interest in the management of our public lands.

Sincerely,

A handwritten signature in blue ink, consisting of a stylized 'A' followed by a horizontal line.

Allen Bollschweiler  
Grants Pass Field Manager

# Environmental Assessment

DOI-BLM-ORWA-M070-2016-0003-EA

## Stray Dog Mining Plan of Operations

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June 2016

*Prepared by:*

U.S. Bureau of Land Management  
Medford District Office – Grants Pass Field Office  
2164 NE Spalding Ave  
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## Acronyms

<b>ACEC</b>	Area of Critical Environmental Concern
<b>ACS</b>	Aquatic Conservation Strategy
<b>AoI</b>	Area of Influence
<b>BiOp</b>	biological opinion
<b>BLM</b>	Bureau of Land Management
<b>BMP</b>	Best Management Practice
<b>BSS</b>	Bureau Special Status
<b>CAA</b>	Clean Air Act of 1990
<b>CCH</b>	Coho Critical Habitat
<b>CEQ</b>	Council on Environmental Quality
<b>CFR</b>	Code of Federal Regulations
<b>CoA</b>	Conditions of Approval
<b>CWA</b>	Clean Water Act of 1972
<b>CWD</b>	coarse woody debris
<b>DBH</b>	diameter at breast height
<b>DEQ</b>	Department of Environmental Quality
<b>EA</b>	Environmental Assessment
<b>ECA</b>	Equivalent Clearcut Area
<b>EIS</b>	Environmental Impact Statement
<b>ESA</b>	Endangered Species Act of 1973
<b>FEIS</b>	Final Environmental Impact Statement
<b>FLPMA</b>	Federal Land Policy and Management Act of 1969
<b>FONSI</b>	Finding of No Significant Impact
<b>FSEIS</b>	Final Supplemental Environmental Impact Statement
<b>GIS</b>	Geographic Information Systems
<b>GPFO</b>	Grants Pass Field Office
<b>HUC</b>	Hydrological Unit Code
<b>IDT</b>	interdisciplinary team
<b>IM</b>	Instruction Memorandum
<b>ISSSSP</b>	Interagency Special Status / Sensitive Species Program
<b>KLW</b>	Klamath West Critical Habitat Unit
<b>LSR</b>	Late Successional Reserve
<b>LUA</b>	land use allocation
<b>LWD</b>	large woody debris
<b>NAGPRA</b>	Native American Graves Protection and Repatriation Act of 1990
<b>NAIP</b>	National Agriculture Imagery Program
<b>NEPA</b>	National Environmental Policy Act
<b>NHPA</b>	National Historic Preservation Act of 1966
<b>NMFS</b>	National Marine Fisheries Service
<b>NOAA</b>	National Oceanic and Atmospheric Administration

<b>NRCS</b>	Natural Resources Conservation Service
<b>NRF</b>	nesting, roosting, and foraging
<b>NRHP</b>	National Register of Historic Places
<b>NSO</b>	northern spotted owl
<b>O&amp;C</b>	Oregon and California Railroad Revested Lands
<b>ODA</b>	Oregon Department of Agriculture
<b>ODFW</b>	Oregon Department of Fish and Wildlife
<b>OHV</b>	off-highway vehicle
<b>PA</b>	Project Area
<b>PDF</b>	project design feature
<b>Plan</b>	The Stray Dog Mining Plan of Operations
<b>PRPA</b>	The Paleontological Resources Protection Act, 2009
<b>RMP</b>	resource management plan
<b>RNV</b>	range of natural variability
<b>ROD</b>	Record of Decision
<b>ROW</b>	Right-of-Way
<b>RR</b>	Riparian Reserve
<b>RTV</b>	red tree vole
<b>S&amp;M</b>	Survey and Manage
<b>SDWA</b>	Safe Drinking Water Act of 1974
<b>SONCC</b>	Southern Oregon Northern California Coast
<b>T&amp;C</b>	Terms and Conditions
<b>T&amp;E</b>	Threatened and Endangered
<b>TMDL</b>	Total Maximum Daily Load
<b>USDA</b>	United States Department of Agriculture
<b>USDI</b>	United States Department of the Interior
<b>USFS</b>	United States Forest Service
<b>USFWS</b>	United States Fish and Wildlife Service
<b>UUD</b>	unnecessary or undue degradation
<b>WQRP</b>	Water Quality Restoration Plan

## **Preface**

The Medford District Bureau of Land Management (BLM) has received a proposed Plan of Operations from Clifford Tracy (proponent and operator) to placer mine alluvial material for gold on raised terraces adjacent to North Fork Galice Creek on the Stray Dog Mining Claim (ORMC 161269). The proposed Plan of Operations (from here on referred to as the Stray Dog Plan) is complete and was submitted in compliance with the General Mining Law of 1872, as amended; 43 Code of Federal Regulations (CFR) 3809 (Surface Management); and 43 CFR 3715 (Use and Occupancy Under the Mining Laws). The Stray Dog Plan provides the basis for the Proposed Action analyzed in this Environmental Assessment.

This Environmental Assessment (EA) analyzes the effects of the Stray Dog Plan alternatives on the human environment under the National Environmental Policy Act (NEPA) and will assist the Grants Pass Field Office Manager (Authorized Officer) in determining if an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) is appropriate for approval of the Stray Dog Plan.

The General Mining Law of 1872 grants citizens the right to locate and mine certain minerals on public lands. A claimant's statutory rights, consistent with other laws, include entry on open public lands for the purpose of mineral prospecting, exploration, development and extraction. Section 302 of Federal Land Management Policy Act (FLPMA) directs the Secretary of the Interior to manage public lands under the principle of multiple-use, which includes minerals.

Mr. Tracy submitted the Stray Dog Plan under 43 CFR 3809 (Surface Management) and 43 CFR 3715 (Use and Occupancy under the Mining Laws). The proposed mining operations under the Stray Dog Plan would occur on BLM-administered lands that are open to mineral entry. BLM has an obligation to prevent "unnecessary and undue degradation" of the public lands (43 CFR §3809.5). This is accomplished by adherence to the performance standards (43 CFR §3809.420) which include following applicable State and Federal laws. Occupancy must be "reasonably incident" (§3715. 0-5) to the mining operation.

# Chapter 1 Purpose and Need

## 1.1 Document Structure

The Grants Pass Field Office (GPFO) has prepared an Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This EA discloses the direct, indirect and cumulative impacts that may result from the action alternative. The EA provides the decision maker, the Grants Pass Field Manager, with information to aid in the decision making process. The document is organized into four chapters and Appendices:

- Chapter 1: Purpose & Need: This section includes information on the location of the project and the purpose and need for the project. This section includes details on how the BLM informed the public of the proposal and provides a synopsis of the issues raised.
- Chapter 2: Alternatives: This section provides a description of the action alternative for achieving the stated purpose and need. Alternatives were developed in light of substantive issues raised by the GPFO interdisciplinary team, the public and other agencies. Incorporated in this section are Best Management Practices (BMP), Project Design Features (PDF) and Terms and Conditions (T&C) that avoid or reduce impacts to resources.
- Chapter 3: Affected Environment and Environmental Effects: This section describes the environmental effects of implementing any of the alternatives. A description of the existing conditions for resources is provided in sub-sections. Effects of the alternatives are then described based on what is proposed in the No Action Alternative 1 and Alternative 2.
- Chapter 4: Consultation and Coordination: This section provides a list of the resource specialists that prepared the EA analysis, and information on consultation efforts with Tribal governments and regulatory agencies.
- Appendices: The Appendices provide information in support of the analysis presented in this EA.

## 1.2 Purpose and Need for Action

It is BLM's responsibility under the FLPMA to ensure that a Plan conforms to the provisions of the 43 Code of Federal Regulations (CFR) 3809 surface management regulations. The BLM is mandated to act timely in processing Plans submitted under the mining laws, including completion of an environmental review, which is the purpose of this EA. This EA will fulfill requirements of the NEPA with regard to the Stray Dog Plan. It is BLM's responsibility under FLPMA to ensure that the Stray Dog Plan's Proposed Action does not cause unnecessary or undue degradation (UUD) of the public lands, as defined at 43 CFR § 3809.5. The Plan was submitted pursuant to the 43 CFR § 3809 surface management regulations.

This EA analyzes the environmental effects of the alternatives and determines if the project

conforms to BLM's surface management regulation (43 CFR § 3809). BLM approval of the Stray Dog Plan may be subject to Conditions of Approval (CoA) including requirements of relevant state and federal agencies. The Stray Dog Plan incorporates mitigation measures that are consistent with the Medford District Resource Management Plan (1995), and must be conducted in a manner that complies with all pertinent federal and state Laws (43 CFR § 3809.420(a)(4) and 43 CFR § 3809.420(a)(6)).

A detailed Plan of Operation that outlines the information required in 43 CFR § 3809.401 allows the BLM to begin performing the NEPA process. The NEPA process may indicate the need for CoA. Operations shall not commence prior to obtaining all necessary Federal and State permits which will be a Condition of Approval. An acceptable financial guarantee sufficient to pay third party contractors for reclamation of the proposed disturbance must be adjudicated prior to beginning operations (43 CFR § 3809.412). A Plan shall commence operation following adjudication of the Bond, the successful implementation of the NEPA process and the receipt of the Plan of Operation, which may include any additional CoA.

### **1.3 Planning Area Vicinity**

The proposed Planning Area is located within Josephine County, Oregon. See Appendix 1, Project Map. The Stray Dog Plan is found within the following legal descriptions: Township 35 South, Range 8 West, Section 3, Willamette Meridian.

The Planning Area is within the Hellgate Canyon-Rogue River 10<sup>th</sup> field Hydrologic Unit Code (HUC) watershed which is analyzed within the Rogue-Recreation Section Watershed Analysis (BLM 1999). North Fork Galice Creek drains into the Rogue River. The proposed Planning Area is located on BLM managed land within the Late Successional Reserve Land Use Allocation (LUA). BLM lands are intermixed with private and county lands, creating a mosaic of ownership patterns.

### **1.4 Conformance with Law, Regulation & Policy**

#### ***1.4.1 Land Use Management Plans***

This EA tiers to the following land use planning documents:

- Final Supplemental Environmental Impact Statement and Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (Northwest Forest Plan FSEIS, 1994 and ROD, 1994)
- Final Medford District Proposed Resource Management Plan/Environmental Impact Statement, and Record of Decision and Resource Management Plan (EIS, 1994 and RMP/ROD, 1995)
- Final Supplemental Environmental Impact Statement: Management of Port-Orford-Cedar in Southwest Oregon (FSEIS 2004) and ROD (2004)

- Medford District Integrated Weed Management Plan Environmental Assessment (1998) and tiered to the Northwest Area Noxious Weed Control Program (EIS, 1985)
- Final Supplemental Environmental Impact Statement and Record of Decision and Standards and Guidelines for Amendment to the Survey & Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (FEIS, 2000 and ROD, 2001)

#### ***1.4.2 Relevant Statutes/Authorities***

This section is a summary of the relevant statutes/authorities that apply to this project. Alternative 2 is designed in conformance with the direction given for the management of public lands in the Medford District and the following:

- Oregon and California Lands Act of 1937 (O&C Act). Requires the BLM to manage O&C lands for permanent forest production. Timber shall be sold, cut, and removed in accordance with sustained-yield principles for the purpose of providing for a permanent source of timber supply, protecting watersheds, regulating stream flow, contributing to the economic stability of local communities and industries, and providing recreational opportunities.
- Federal Land Policy and Management Act of 1976 (FLPMA). Defines the BLM's organization and provides the basic policy guidance for the BLM's management of public lands. Section 302 directs the Secretary of the Interior to manage public lands under the principle of multiple-use.
- General Mining Law of 1872 as amended. Grants citizens the right to locate and mine certain minerals on public lands.
- National Environmental Policy Act of 1969 (NEPA). Ensures that information on the environmental impacts of any federal action is available to public officials and citizens before decisions are made and actions are taken.
- Endangered Species Act of 1973 (ESA). Directs federal agencies to ensure their actions do not jeopardize species listed as "threatened and endangered" or adversely modify designated critical habitat for these listed species.
- Clean Air Act of 1990 (CAA). Provides the principal framework for national, state, and local efforts to protect air quality.
- Safe Drinking Water Act (SDWA) of 1974 (as amended in 1986 and 1996). Protects public health by regulating the nation's public drinking water supply.
- Clean Water Act (CWA) of 1972 as amended. Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water.
- National Historic Preservation Act (NHPA), 1966 as amended. Consideration of the effects of federally funded undertakings on cultural resources is governed by the NHPA.

Regulations in 36 CFR 800 outline the process through which historic preservation is administered toward to the goal of avoiding, minimizing or mitigating impacts to historic properties that are eligible for the National Register of Historic Places.

- Paleontological Resources Protection Act (PRPA), 2009. PRPA directs federal agencies to coordinate the management and protection of paleontological resources on federal lands.
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. NAGPRA establishes procedures for inadvertent discoveries of cultural items on federal or tribal lands and a repatriation process to return NAGPRA items to lineal descendants and cultural affiliated Tribes.

## **1.5 Decisions Framework**

The Grants Pass Field Manager is the responsible official for deciding whether or not, and in what manner, to implement the action alternative analyzed in this EA.

Actions in this decision would include:

- Approve the Plan Alternative as submitted (43 CFR § 3809.411(d)(1))
- Approve the Plan Alternative that includes conditions, design features, or mitigations deemed necessary to prevent unnecessary and undue degradation(43 CFR § 3809.411(d)(2))
- Disapprove or withhold the approval of the Plan of Operations because the Plan (43 CFR § 3809.411(d)(3))
  - Does not meet applicable content requirements of 43 CFR § 3809.401
  - Proposes operations that are in an area segregated or withdrawn from operations of mining laws unless the requirement of 43 CFR § 3809.100 are met
  - Proposes operations that would result in unnecessary and undue degradation of public lands; or
  - The Plan would require an Environmental Impact Statement (EIS)

The decision will be based on a consideration of the environmental effects of implementing the action alternatives.

## **1.6 Public Involvement**

The Grants Pass Field Office accepts public comments on proposed projects through the quarterly BLM Medford Messenger publication. The Medford Messenger describes this project as a mineral material extraction project, identifies the location and provides a general vicinity map. The Messenger also contains a comment sheet for public responses. This project was included in this quarterly publication since the fall of 2014, and no public comments were received. The EA will be made available for a 30-day public comment period following

publication of a legal notice in the *Grants Pass Daily Courier* (43 CFR § 3809.411 (c)).

An interdisciplinary team (IDT) of BLM resource specialists conducted internal scoping through the project planning process. Internal scoping included record searches, field surveys, reviews of current literature and discussion by the IDT. In the planning process the IDT considered elements of the environment that are specific to this project.

Resource issues were considered by the interdisciplinary planning team during internal scoping. Primary resources present in the Planning Area are analyzed in Chapter 3. Other resources were eliminated from further analysis because they were not within the scope of the project or were determined to be irrelevant to the decision making process. Rationale for eliminating resources from further analysis is included in Appendix 2 Environmental Elements.

## **Chapter 2      Proposed Action and Alternatives**

### **2.1      Alternative 1: No Action**

The No Action Alternative is defined as BLM not authorizing the Stray Dog Plan. The No Action Alternative also serves as the baseline for evaluating the environmental effects of the Proposed Action.

### **2.2      Alternative 2: Proposed Action**

#### ***2.2.1    Disturbance Area***

There are 3 areas that are proposed for mining/excavation. The proposed areas to be mined are delineated on the map contained within Appendix 1. Areas 1 and 2 are on the north side of North Fork Galice Creek. Area 1 measures approximately 650 feet by 100 feet and comprises 1.5 acres. Area 2 measures approximately 400 feet by 100 feet and comprises 0.9 acres. The disturbance area on the north side of North Fork Galice Creek is atop a terrace set back 20 feet from the top of the slope break above the stream. There will be no disturbance between the stream and the 20-foot buffer from the slope break. This buffer strategy results in a setback that is at least 20 feet from the break in slope of the terrace of North Fork Galice Creek.

Area 3 on the south side of North Fork Galice Creek measures approximately 600 feet by 70 feet and comprises 1.0 acre. Mining on the south side of the creek would occur south of a paved road and be set back at least 60 feet from the ordinary high water mark of North Fork Galice Creek. The cumulative mining area would amount to approximately 3.4 acres.

The proponent would be required to provide a financial guarantee estimate for reclamation, to follow best management practices, utilize Project Design Features, CoA, and adhere to state and federal regulations, and obtain all necessary state and federal permits as a condition of BLM authorization of the Plan. The Plan could not be approved before all BLM related NEPA obligations are met. Operations cannot begin until the financial guarantee for reclamation is adjudicated.

A BLM resource specialist will perform regular inspections of the mining site and may conduct additional inspections in response to rain and other environmental events or as needed to ensure there is no UUD.

#### ***2.2.2    Mining Methods***

The Stray Dog Plan proposes to use two different mining methods. Each method makes use of the same equipment and has the same manpower requirements. The methods differ primarily in the use of a stationary versus a migrating settling pond. The basic equipment used by both mining methods includes a 55,000 pound-class excavator, two 10-yard dump trucks, an 8 inch floating suction dredge, and a 4 inch water pump. Fuel and maintenance would be provided with the use of a pick-up type truck and utility trailer.

## ***Mining Method 1***

Area 1 would be mined using mining method 1, see Map in Appendix 1.

A settling pond 30 to 50 feet in diameter (~2000 square feet) and approximately 8 to 10 feet deep is created using the excavator. The pond is dug into the overburden and if necessary into bedrock and material placed aside. Construction of small berms (less than 5 feet high) may be necessary to aid in impounding water. The pond is filled with water approximately 5 to 7 feet deep. The suction dredge is then placed in the pond and the intake hose would be allowed to hang loosely down to the bottom of the pond.

The excavator then begins the process of stripping overburden and stockpiling material for processing with the aid of the dump truck. Soil and overburden are hauled to the edge of the disturbance area for short term storage; gold bearing material (gravels, top foot of bedrock, and tails) are then hauled and placed adjacent to the settling pond. Once a sufficient amount of gold bearing material has been accumulated near the pond, the excavator moves over next to the pond to begin processing.

Processing involves changing the excavator bucket from a digging bucket to a bucket which contains many holes and functions like a sieve. The excavator thus equipped proceeds to grab material from the ore pile, place the bucket in the pond below the water and shake the bucket in a back and forth motion thereby washing out everything (< 2”) but large material into the bottom of the pond. The oversize material (> 2”) left in the bucket is placed in a dump truck which has been positioned nearby and hauled back to the site of excavation where it is used for backfill. Meanwhile the suction dredge is started and the intake hose that hangs down to the bottom sucks up the material from the bottom of the pond and washes it through the sluice on floats and is dumped back into the pond. The bottom of the pond is periodically cleaned out with the excavator and fine material also collected, hauled, and used for backfill.

## ***Mining Method 2***

Area 2 and 3 would be mined using mining method 2, see Map in Appendix 1.

Mining method 2 uses the same equipment as mining method 1; however it employs a migrating pond which reduces the amount of hauling required. In this method a 30-50 foot diameter pond is created as in method 1. The suction dredge is started and the intake hose that hangs down to the bottom sucks up the material from the bottom of the pond and washes it through the sluice on floats and dumps it back into the pond. The material for processing is derived from the side or the edge of the pond. Oversize material (> 2”) is placed on the opposite side of the pond using the dump truck. From repeated excavation, the pond gradually migrates in the direction of mining. Fine material (< 2”) from the bottom of the pond is cleaned out and placed over the coarser material completing the backfill.

### ***2.2.3 Season of Operation***

The Oregon Department of Fish and Wildlife (ODFW) in-stream work period begins June 15 and ends September 15. This operating window maybe extended through an ODFW operational

waiver.

Operations in Area 1 and 2 will only occur during the ODFW in-stream work period. The log stringer bridge construction and removal allows for portions of logs to temporarily enter North Fork Galice Creek. The bridge shall only be constructed and removed during the in-stream work period, however the bridge may be allowed to over-winter and then be removed the following year during the in-stream work period. Because there is no in-stream work associated with Area 3, operations may occur year-round.

#### **2.2.4 Access**

All access would use existing roads. No new roads would be constructed and no roadwork or maintenance is proposed. Heavy equipment (dump truck and excavator) would access the north mine sites via an unpaved road and ford located approximately ½ mile downstream on private land. Stream crossing would occur twice (once in and once out) and would only occur during ODFW guideline for timing of in-water work, June 15 through September 15, during the same calendar year. The mining proponent must ensure access across the private stream ford for BLM employees or contractors to ensure that any needed reclamation may be accomplished. No hazard trees are proposed for removal at the stream ford or along the access road although fallen trees may be cleared from the roadway.

The Plan proposes to temporarily establish a log stringer bridge to access the north side of North Fork Galice Creek. The stringer bridge would be constructed from logs obtained from the claim and would be used for daily access by the operators and as necessary for fueling and maintenance activities. The bridge would be built to support vehicles as large as a pick-up truck. The bridge would be constructed during the ODFW guideline for timing of in-water work. The bridge would remain in place until it is removed at the conclusion of mining and reclamation.

Construction of the bridge would consist of approximately 6 to 8 logs with a span of at least 45 feet and an approximate 24 inch diameter. The trees may be obtained from any of the work areas located on the Map in Appendix 1. Logs would be placed across the span using the excavator from above either bank of the creek; portions of logs may temporarily enter the creek during the installation process. The logs would be laid on the existing road surface outside of the bankfull width. There would be no excavation of the existing earthen footings. Equipment will not enter the active channel of North Fork Galice Creek at the bridge crossing site, but will rather operate from above either side of the stream. The logs would be bound with 1/2 inch or larger steel cables and covered with a sediment barrier fabric followed by gravel (from the claim) to facilitate a drivable surface. Deconstruction of the bridge would occur using the excavator. Gravel would be scraped off using the excavator, the cloth would be removed, cables cut, and logs picked up or dragged away by the excavator. Small amounts of gravel and wood debris may enter the creek and portions of logs may temporarily enter the creek during the removal process. Every effort would be made to keep the logs out of the stream during removal; logs would not be dragged or pushed across the channel. The logs would be used in the reclamation landscape.

Pick-up truck crossings for fueling and maintenance would be necessary approximately every 2 days. This amounts to about 90 one-way crossings over the anticipated 3 months of operation

for Areas 1 and 2.

### **2.2.5 Occupancy**

The occupancy area is located south of the paved road, more than 150 feet south of North Fork Galice Creek and west of mining Area 3. For more details see Appendix 1. The occupancy area is already established and comprises approximately ¼ acre. There may be two camp trailers, a portable outhouse and maintenance vehicles stored in the occupancy area. Small amounts of fuel may be temporarily stored within the occupancy area.

### **2.2.6 Hazmat**

The overburden material that is created from placer operations are physically sorted but not fundamentally altered from their natural condition. The overburden material would be utilized in the reclamation process.

A pick-up truck would bring fuel and maintenance supplies to the occupancy area on a semi-daily basis. When not in use, the truck would be parked in the occupancy area, which as described above, is >150 feet from North Fork Galice Creek. Fuel would be brought to mining Areas 1 and 2 via the log stringer bridge. Refueling would occur at least 50 feet from the slope break above North Fork Galice Creek. At all times a fuel spill response kit would be contained on the fueling vehicles. Any wastes created from maintenance activities would be hauled away and disposed of in accordance with state law.

### **2.2.7 Water Source and Requirements**

The Plan would use North Fork Galice Creek as a water source and the proponent has submitted a copy of a valid water right certificate. The water right allows for a withdrawal of 2 cubic feet/second (cfs) (~ 900 gallons/minute). Water in the ponds would be recycled. Initial requirements to fill the ponds (assuming no groundwater contribution) would be approximately 100,000 gallons. This equates to about 1 ½ hours of filling at the maximum water right duty and rate. Evaporative and other water losses may require small amounts of additional water. The additional water requirement is expected be the greatest during the dry season because of increased evaporation and decreased groundwater contributions.

### **2.2.8 Reclamation**

Top soil overburden is saved and placed on top of the disturbed area after filling and re-contouring of the landscape. Reshaping of the disturbed area would occur concurrently with the application of the top soil. At the conclusion of operations, topsoil and re-vegetation would occur. Exposed areas of disturbance would be seeded and mulched with weed free seed as specified by the BLM. The proponent would replant trees in disturbed areas at a proposed density of 150 per acre consisting of equal quantities of bigleaf maple, Douglas-fir, and incense cedar.

The western portion of Area 3 contains variable but relatively thick overburden and would ultimately be placed in the lower, east portion of Area 3 resulting in a more evenly-contoured

landscape after reclamation. This overburden is estimated to represent approximately 3,000 to 5,000 cubic square yards of material.

Reclamation would be planned and conducted so that water flowing into the PA would be diverted away so as not to contribute to erosion. The settling ponds would be filled and re-contoured to blend with the landscape. The reclamation would adequately fill and mitigate the ponds but the area would not appear as undisturbed, rather it may appear flatter than the pre-operational landscape. There should be no disturbance within the 20 foot buffer on Mining Areas 1 and 2, this includes disturbance that may occur during reclamation activities; specifically no soil overburden shall enter this area during reclamation.

## **2.3 Best Management Practices, Project Design Features, and Conditions of Approval**

### **2.3.1 Best Management Practices**

Best Management Practices (BMPs) are required by the Federal Clean Water Act to reduce nonpoint source pollution to the maximum extent practicable. The BMPs are methods, measures, or practices established from Appendix D of the 1995 ROD/RMP, and the Oregon Department of Environmental Quality (DEQ) Erosion and Sediment Control Manual (April, 2005), and the Medford District Plan Maintenance (July 12, 2012) as per IM OR-2011-18. BMPs are essential for ensuring that water quality would be maintained at its highest practicable level. The following BMPs are applicable to the Plan:

1. The proponent must prepare a Spill Prevention, Control, and Countermeasure Plan for all hazardous substances to be used in the mining areas of operation, as directed by the Authorized Officer. Such plans must comply with the State of Oregon DEQ OAR 340-142, Oil and Hazardous Materials Emergency Response Requirements.
2. Hydraulic fluid and fuel lines on heavy mechanized equipment would be in proper working condition to minimize potential for leakage into streams. Refueling would occur **at least 50 feet from the slope break above North Fork Galice Creek**. Absorbent materials would be required to be onsite to allow for immediate containment of any accidental spills.
3. Spilled fuel and oil would be cleaned-up and would be disposed of per federal and state requirements. The proponent would inform the BLM immediately following any fuel or oil spill.
4. To prevent the potential spread of noxious weeds within the Medford District BLM and surrounding landowners, the operator would be required to clean all equipment prior to entry on BLM lands. Cleaning shall be defined as removal of dirt, grease, plant parts, and material that may carry noxious weed seeds onto BLM lands. Due to the stream ford, the undercarriage, tracks and wheels will be a priority. Cleaning prior to entry onto BLM lands may be accomplished by using a pressure hose.
5. The operator shall ensure that exposed surfaces (slope faces, stockpiles, and stripped overburden) shall be secured to prevent erosion, slumping, or subsidence into the stream

channel.

### **2.3.2 Project Design Features**

Project Design Features (PDFs) are measures included in the site-specific design of the project to meet the performance standards of the mining regulations which is to prevent UUD of the public lands and meet the requirements of NEPA which is intended to eliminate or minimize adverse impacts to the human environment. The PDFs are reiterations from the Stray Dog Plan of Operation and are meant to ensure the reader and the Authorized Officer that the Plan contains the needed site-specific design features to ensure UUD does not occur and to minimize adverse impacts to the human environment. Items not included in the Plan but required to accomplish the above-stated goals are incorporated as CoA and are listed below.

- Ingress/egress routes will not alter or destroy streambanks along any portion of North Fork Galice Creek or the main stem of Galice Creek.
- Silt fencing or other sediment retention devices will be installed prior to work commencement at all locations where the project has frontage to an aquatic resource regardless of size (Oregon DEQ Erosion and Sediment Control Manual, 2005). Aquatic resource is defined as all springs, wetlands, ditches, and streams regardless of size or season. Sediment barriers will be installed and maintained per the guidance of the manufacturer. Upon completion of reclamation, sediment barriers will be removed by the BLM when the site is deemed to be at a low risk for sedimentation.
- Ponds will be filled incrementally. If leakage occurs, filling would stop and would not resume until the leak is stopped. Any seeps/wet areas encountered will be directed around disturbed areas or filtered through fabric and/or hay before leaving the site.
- The flat terraced surface allows water to be drained away from the work site. This will prevent potential sedimentation and possible overflowing of the settling ponds. Dikes, berms, or fill used in settling pond construction will be compacted to resist infiltration. Overburden is rich in clay and will be used to line and seal ponds.
- Ponds shall only be filled to within 1 foot of the top of the ponds, which may include within 1 foot of the proposed berms.
- Exposed material (slope faces, stockpiles, and stripped overburden) will be stored and/or secured in such a way so that erosion, slumping, or subsidence does not enter streams or the 20 foot set-back buffer near streams or seeps/wet areas.
- Stream fording of heavy equipment on North Fork Galice Creek will occur twice (once in and once out). Fording will occur during the ODFW in-water work window (June 15-September 15).
- Equipment associated with installing the temporary bridge, at the temporary bridge site, will not enter stream channel. Timber may touch the stream, stream bottom, and stream bank, but will not be maneuvered in a manner that generates sedimentation or increases

turbidity. The bridge shall be installed during the ODFW instream work window (June 15-September 15).

- The bridge will be overlaid with a sediment barrier fabric to minimize sediment contributions to North Fork Galice Creek. Bridge overlay material shall be comprised of washed cobble and/or gravel. Bridge overlay material shall be minimized so as to prevent spilling into North Fork Galice Creek.
- The existing earthen bridge footings shall be utilized. The bridge shall remain in place until no longer needed (completion of reclamation).
- The equipment and site will be under the general care of a watch person. The bridge will have a well-marked barricade, sign, and cones to prevent general public use. Other hazardous areas will be signed or marked to alert the public to the hazard.
- Upon completion of use, bridge-building material shall be removed and distributed in mining Areas 1 and 2 as part of the Coarse Woody Debris (CWD) retention. Retention fabric and cables shall be removed from the site and properly disposed.
- CWD shall be left in mining Areas 1 and 2. The CWD shall be scattered randomly across the landscape and shall not be piled. The amount of CWD will be determined by BLM fish and wildlife specialists.
- Area 3 would have boulders placed around it to detour OHV access, followed by seeding and replanting.
- Fuel and lubricant storage will occur only in the camp location on the south side of the creek.
- In compliance with state and federal regulations, the re-fueling of fuel tanks and changing of all machine fluids will occur at least 50 feet **from the slope break above North Fork Galice Creek**. All fuel and lubricant containers that are temporarily within mining Areas 1, 2 and 3 shall be placed in a spill catchment device (plastic trays with absorbent pads). Fuel spills must immediately be contained and cleaned up to minimize environmental damage, and BLM authorities will be informed of the spill.
- Garbage waste will be hauled off site and disposed of in a local landfill. A self-contained outhouse will be brought on site and all sanitation waste will be hauled off site and disposed of in accordance with federal and state requirements.
- Disturbance on the north side of North Fork Galice Creek (mining Areas 1 and 2) will not occur within the 20 foot no-disturbance area which begins at the top of the slope break above the stream. No disturbance or vegetation removal will occur in this area. The result will be a variable setback that ranges from 20 to 30 feet from the Ordinary High Water mark. Area 3 occurs on the south of the paved road and will be at least 60 feet from the Ordinary High Water mark of North Fork Galice Creek.

- During reclamation, soils and tailings will be contoured to approximate previous hillside conditions.
- Prior to cutting and use of timber, the proponent shall apply for and adhere to the stipulations required in a free-use timber/forest products permit from the Grants Pass BLM.

### **2.3.3 Conditions of Approval**

Conditions of Approval (CoA) are stipulations that were not presented by the proponent in the Plan of Operation submitted to the Medford District Mining Group. They will allow the Stray Dog mining Plan of Operation to be approved subject to the conditions listed below. The proponent must conduct operations as described in the associated Plan of Operation and in accordance with the above listed BMPs and PDFs. All BMPs, PDFs and CoA are designed to prevent UUD and eliminate or minimize adverse impacts to the human environment.

#### **Pre-Operation Requirements**

- Proponent shall notify BLM prior to entry onto site.
- Prior to initial move-in of any equipment the BLM may inspect any/all equipment at an agreed upon location off federally managed lands.

#### **Continuing Operational Requirements**

- All subsequent move-ins of equipment from the Planning Area shall be treated the same as the initial move-in, as described above.

#### **Inspections**

- Approved sediment control features will be inspected on an approximately weekly basis by a BLM geologist, hydrologist, or fisheries biologist. Sediment control features shall remain in place and will be inspected until reclamation is deemed complete. Necessary maintenance will follow the manufactures recommendation and may include such practices as: altering the location of the sediment control feature, cleaning sediment build up on sediment control features, etc.
- In response to significant precipitation events a BLM hydrologist or fisheries biologist may perform an informal site investigation in addition to other more routine and formal site visits performed by BLM mining staff.

#### **Fuel Storage**

- Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less [29CFR1926.152(a)(1)]. A safety can is an

approved, closed container, of not more than 5 gallons capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure [29CFR1926.155(1)].

- All fuels, lubricants, petroleum products, and hazardous chemicals will be stored  $\geq$  150 feet away from the Ordinary High Water mark in impermeable and spill-proof containers that minimize the potential for accidental spillage.
- A fuel, lubricant, petroleum product, and hazardous chemical containment system must be used if storage within 150 feet of the Ordinary High Water mark is otherwise unavoidable. The containment system must be sufficient in size to completely accommodate the full volume of all fuel, lubricant, petroleum product, and hazardous chemicals without overtopping or leaking.

### **Water Diversion**

- The creation of a dam, weir, or other passage barriers which may cause concentrated stream flow or reduces the total wetted area of the stream is prohibited.

### **Timber**

- Woody material will not be used for other purposes beyond the mining and reclamation operations.
- Prior to the commencement of timber harvest operations, the miner shall obtain from the Authorized Officer written approval of a written operational and logging plan commensurate with the Terms and Conditions of the environmental analysis which shall include measures needed to assure protection of the environment and watershed. A pre-work conference between the miner and the Authorized Officer's representative must be held at a location designated by the Authorized Officer before the logging plan will be approved. All logging shall be done in accordance with the plan developed by this provision.
- All conifer trees 8 inches or greater at diameter breast height in Area 3 designated for cutting shall be cut so that the resulting stumps shall not be higher than 12 inches measured from the ground on the uphill side of the trees.
- All conifer trees 8 inches or greater at diameter breast height in Area 3 designated for cutting shall be topped, limbed, and cut into 18 or 35 foot log lengths prior to yarding.
- All conifer trees 8 inches or greater at diameter breast height in Area 3 that are cut shall be yarded and decked on the designated landing (existing landing west of Area 3 off an existing pull through road) within one week of being harvested. Yarding shall be done with tracked equipment that has the ability to fully suspend the log while transporting it to the landing without damaging the log. Logs shall be decked in a manner so that a self-loading log truck can access and load the logs.

- Within one week of cutting and decking logs, the proponent shall notify the BLM that the logs are decked.

## Cultural

- Analysis was completed to increase our understanding of land use patterns over time and to identify the nature and extent of cultural and paleontological resources within the PA. The scope of analysis included archival research, intensive field inventory, and assessment of potential effects to historic properties from project activities. One cultural resource, the Leipold Placer Mine (OR-11-1592), was identified within the PA. The site was evaluated for National Register of Historic Places eligibility, and determined to be *ineligible* with concurrence from the State Historic Preservation Officer. No protective measures or PDFs are required.
- If during project implementation, previously unidentified cultural or paleontological resources are encountered, work activities will cease immediately, and the Grants Pass BLM archaeologist will be contacted. Any additional evaluation that may be required, as well as development of appropriate project redesign to ensure that adverse effects to historic properties do not occur, would be completed in consultation with federally-recognized Tribes and the State Historic Preservation Office.

## Wildlife

### Northern Spotted Owl

- Activities (such as tree felling, brush clearing using chain-saws, temporary route construction and reconstruction and existing route re-construction) that produce loud noises above ambient levels would not occur within specified distances (Table 1) of any documented Northern Spotted Owl site between March 1 and June 30 (or until two weeks after the fledging period) – unless protocol surveys have determined the activity center to be unoccupied, non-nesting, or failed in their nesting attempt. The distances may be shortened if significant topographical breaks muffle sound traveling between the work location and nest sites.
- The restriction may be extended until September 30, based on site-specific knowledge (such as a late or recycle nesting attempt) if the project would cause a nesting spotted owl to flush. (See disturbance distance).

**Table 1: Harassment Distances from Various Activities for Spotted Owls**

Activity	Buffer Distance around Owl Sites
Heavy Equipment	105 feet
Chainsaws	195 feet

### Raptors

- Protect additional raptor species if located and apply the appropriate buffers and

seasonal restrictions (distance and season varies by species from ¼ - ½ mile).

### **Safety**

- Install safety berms along the outer lengthwise portion of the log stringer bridge that are sufficient to keep a pick-up truck on the bridge surface.

### **Reclamation**

- Any water remaining in the pond at the conclusion of mining activities would be dealt with in a manner that does not violate state and federal law. Water could both be pumped from the ponds and discharged on the ground away from any stream/wetland area or the pond could simply be filled in with reclamation material providing that overflow would not enter a stream or wetland.
- Upon completion of reclamation, mining Area 3 will be barricaded from motorized vehicle entry so as to minimize disturbance to replanted vegetation in an otherwise easily accessible and heavily used site. Boulders, logs and/or berms may be utilized to construct the barricade(s).
- The existing road through mining Areas 1 and 2, which was used in mining activities, will be decommissioned by re-contouring and distributing top soil once mining is complete.
- Reclamation activities shall not occur within the 20 foot no-touch buffer. This area should have no signs of disturbance, which includes soil used during the reclamation process.
- Trees planted during reclamation activities will be monitored until deemed established by the Grants Pass BLM silviculturist. The goal is to meet or exceed pre-mining trees per acre conditions. A portion of the bond will be retained until trees are deemed established.

## **Chapter 3      Affected Environment and Environmental Effects**

In accordance with law, regulation, executive order, policy and direction, an interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the Alternatives described in Chapter 2.0. Those elements of the human environment that were determined not to be affected are disclosed in the Environmental Elements Table in Appendix 2.

### ***Affected Environment***

The Affected Environment portion of this chapter describes the current conditions in the Stray Dog Plan of Operation Area. Each of the resources analyzed in Chapter 3 may have differing areas that define the Affected Environment which means that each resource may have a unique area of analysis. These areas are described as follows:

- Planning Area – This area refers to the two 14<sup>th</sup> field drainages (see Table 3) and encompasses all mining activities including the low-water stream ford. Approximately 20 acres.
- Area of Influence (AoI) – This area is specific to the soils analysis. All soils data attained from the Natural Resources Conservation Service (NRCS) requires a defined AoI. For this Plan of Operation, the AoI was defined as a single polygon encompassing the low-water stream ford, camping area, mining area, and non-paved access roads. Approximately 78 acres.
- Project Area (PA) – The footprint of the three Mining Areas including the camping area. Approximately 3 acres.
- Proposed mining area – The proposed mining pit locations, confined to the direct area of disturbance.

### ***Environmental Effects***

The Environmental Effects portion of this chapter provides the analytical basis for the comparison of the Alternatives (40 CFR § 1502.16) and the reasonably foreseeable environmental consequences to the human environment that each Alternative considered in detail. This analysis considers the direct impacts (effects caused by the action and occurring at the same place and time), indirect impacts (effects caused by the action but occurring later in time and farther removed in distance but are reasonably foreseeable) and cumulative impacts (effects caused by the action when added to other past, present and reasonably foreseeable future actions on all land ownerships). The temporal and spatial scales used in this analysis may vary depending on the resource being affected.

### ***Cumulative Effects***

Council on Environmental Quality (CEQ) guidance points out that the “Environmental Analysis required under NEPA is forward-looking.” Review of past actions is required only “to the extent that this review informs agency decision-making regarding the Proposed Action.” A description

of current conditions includes the effects of past actions and serves as a more accurate and useful starting point for a Cumulative Effects analysis than by “adding up” the effects of individual past actions. “Generally, agencies can conduct an adequate Cumulative Effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions” (CEQ 2005). The use of information regarding the effects of past actions may be useful in two ways according to CEQ guidance: 1) consideration of the Action Alternatives’ Cumulative Effects and 2) as the basis for identifying the Action Alternatives’ direct and indirect effects.

### Present site conditions

Galice Creek and the surrounding area have a long history of mining (BLM 1999). The Rogue Recreation Section watershed analysis states, mined areas along Galice Creek have been satisfactorily reclaimed either naturally or by the miners (page 66). This statement can be applied to the PA and is evident in the vegetation that has been re-established through natural means.

There are no foreseeable projects planned to occur within the Planning Area boundary. Although causal mining operations may occur within the Planning Area, the location, timing, and duration of such activities is speculative. It is assumed that such activities usually result in only negligible disturbance (BLM 1999). There are no known projects or activities to be considered within the cumulative effects analysis.

In the south west corner of the Stray Dog mining claim boundary there is a historic hydraulic mine site which is not currently in operation. This existing mining area is characterized by large quantities of old mine tailings on top of steep erodible slopes. During precipitation events mine tailings migrate down slope and have washed out an intermittent stream and breached an old mining ditch. The slide material is deposited in and adjacent to an old mining settling pond on the flat terraced surface east of the camping area (yellow crosshatch on map) and west of Mining Area 3. The slide from the past mining activities has diverted the stream out of its natural flow path and into a ditch where it is creating an unnatural wetland. The unnatural wetland is located south of Mining Area 3.

To ensure that water from the intermittent stream does not enter Mining Area 3 water will be diverted into an existing culvert which is located east of the camping area. This diversion will ensure that water from the intermittent stream does not enter Mining Area 3 which could cause overflowing of the temporary pond and sediment latent run off to cross the paved road. The proponent will only divert the water that could enter Mining Area 3. The proponent will not alter the historic hydraulic mining site. Any issues that currently exist with the historic hydraulic mining site are present regardless of the Stray Dog Project.

## **3.1 Vegetation**

### **3.1.1 Methodology**

All merchantable trees within the Stray Dog mining claim were flagged, cruised, and painted by

BLM staff. The vegetation was also evaluated during a site visit and walk-through of the claim.

### 3.1.2 Assumptions

The site of the proposed Plan of Operations has been mined throughout the last 100 to 150 years (BLM 2011, p. 4). It is our assumption that the vegetation on this site has been harvested for mining purposes throughout this timeframe. The cruised trees in this area are assumed to be cut for mining purposes. The reconstituted soil is likely sufficient for natural regeneration to occur as there are no records that this particular site has been re-planted. However, site productivity is assumed to be poor.

### 3.1.3 Affected Environment Vegetation Resources

The Stray Dog mining claim is located in the Hellgate Canyon-Rogue River 10<sup>th</sup> Field Watershed. It is classified as Late Successional Reserve and is within the Riparian Reserve of North Fork Galice Creek. Based upon the observed vegetation during the walk-through, the most representative plant association is Douglas-fir - Canyon live oak/Poison oak (PSME-QUCH2/RHDI6). This plant association typically occurs in rocky, dry areas (USFS 1996). Observed trees include: alder, big leaf maple, California black oak, canyon live oak, Douglas-fir, incense cedar, Oregon ash, Oregon white oak, Pacific dogwood, Pacific madrone, sugar pine, and willow. Observed ground cover is: blackberry species, bracken fern, sword fern, ninebark, ocean spray, Oregon grape, poison oak, tanoak, and vine leaf maple. Table 2 below shows the potential trees cut for mining operations. Observed coniferous seedlings and saplings are prevalent throughout the proposed mining area.

**Table 2: Potential trees cut during operation**

Number of trees 8" and greater	DBH range (inches)	DBH average (inches)	Height range (feet)	Number of snags 8" and greater
117	8-48	17	85-140	7

Merchantable trees were cruised for volume purposes by BLM staff. Trees smaller than 8" DBH were not recorded.

During the walk-through, one Douglas-fir 15.3" DBH was cored to get the age at breast height for the stand. This size of tree was selected as it was close to the approximate average DBH (17") for the stand. The age is 87 years old at breast height. It is estimated that the larger diameter trees could be 100 to 150 years old based on historic mining activity. Soil productivity is assumed to be poor due to the classification of soil in the Project Area as "Dumps" (USFS 1983, p. 30). According to the Soil Survey of Josephine County Oregon, "Dumps consist of mine tailings that are mainly on flood plains. The dumps were formed when excavated material was deposited after the valuable minerals had been removed." A more detailed explanation of the soils within the site can be found in Section 3.2.

### ***3.1.4 Environmental Consequences Vegetation Resources***

#### Alternative 1: No Action

##### *Direct/Indirect Effects*

Under the No Action Alternative, the existing condition of the PA would not be altered; there would be no direct or indirect effect to vegetation.

##### *Cumulative Effects*

Cumulative effects to vegetation under the No Action Alternative would be a result of the previous 100 to 150 years of mining activity on this claim. This previous activity has altered soil composition and structure, therefore effecting the growth and productivity of vegetation. What is not known is how long and to what extent the reduction in soil productivity affected the growth of natural regeneration.

#### Alternative 2: Proposed Action

##### *Direct/Indirect Effects*

The Stray Dog Plan could remove all vegetation from the Project Area (3.4 acres). This does not include the 20 foot no-disturbance area which begins at the top of the slope break above the stream in Areas 1 and 2. Area 3 has a buffer of at least 60 feet from the Ordinary High Water mark. The top soil will then be removed and stockpiled while the first 12 inches of bedrock, gravels and tails are processed. This process is further described in Section 2.2.1. Remaining trees are not guaranteed to survive as heavy equipment could potentially compact the soil around the bases of trees during mining operations. The indirect effects are assumed to be reduced soil productivity after the stockpiled top soil is re-distributed on the site. More information about the soil is described in Chapter 3.2: Hydrology & Soils. The area of operation will be replanted at 150 trees per acre (meeting the minimum stocking standards in the BLM Forest Survey Handbook H-5250-1) and will be monitored for establishment success. A portion of the claimant's restoration bond will be retained by the BLM until the project silviculturist deems the seedlings are established and free to grow.

##### *Cumulative Effects*

The cumulative effects of the Stray Dog Plan are largely unknown. What we know from historical mining practices is that there is enough soil to regenerate the trees that are currently present. This soil in the Project Area has been classified as "Dumps" due to the number of times the soil has been moved and processed for mining activities. According to Bernell et al. (2003), there are inadequate numbers of studies available for determining cumulative effects for dredging in the same area over and over (p. 70). Therefore, it is appropriate to assume based upon historical natural regeneration that this site will again be productive to a level at which trees and vegetation grow.

## 3.2 Hydrology & Soils

### 3.2.1 Methodology

- For analysis purposes, unless otherwise noted, the scale of analysis shall include two 14<sup>th</sup>-field hydrologic units totaling 2,203 acres (3.4 mi<sup>2</sup>) in the Hellgate Canyon – Rogue River Watershed (see Table 3).
- Stream temperature monitoring relies on protocol established by the Oregon Department of Environmental Quality (DEQ) for which the BLM produces, by their definition, grade-A data. A rolling seven-day average maximum temperature is the statistic used when stream temperatures are compared to the DEQ threshold of 64.4°F.
- BLM corporate data was relied on to provide transportation and hydrography layers. Both layers were analyzed using Geographic Information Systems. Both layers were current and up-to-date at the time of analysis (mid-February 2016).
- Soils were assessed using existing (NRCS) data publicly available via Web Soil Survey and verified through field surveys.
- Mean monthly flows in North Fork Galice Creek were modeled at the Stray Dog Mining Claim (42.5536 latitude by -123.6342 longitude) using US Geological Survey Oregon StreamStats Version 3.0.
- Equivalent Clearcut Area (ECA) was determined by manual digitization of all canopy openings in the Planning Area with  $\leq 30\%$  canopy cover. 2014 National Agriculture Imagery Program (NAIP) – most recent available aerial photography was used during the assessment and digitization. Because it was not modeled and was instead manually digitized, ECA in the Planning Area is exceptionally accurate.
- Canopy cover and effective shade was determined throughout the proposed mining areas on North Fork Galice Creek July 30, 2014. Assessment began > 200 feet downstream from the proposed mining areas and proceeded upstream to the proposed bridge location. Every 50 feet a high quality digital photograph<sup>1</sup> was taken at the stream elevation, facing directly upwards, using a 4.5mm wide-angle “fisheye” lens (see Figure 1). Each digital photograph was rendered using HemiView Image Analysis software capable of pixel classification and calculating solar radiation indices including effective shade. Each photograph from each site was analyzed in such a way that effective shade would error on the side of being too low rather than too high. Approximately half of the photographs had features (white alder bark, bright rocks, etc.) that when classified, registered as “open sky.” It was decided that it would be better to include these features as open sky because to exclude them would mean that darker areas of open sky, commonly found in underexposed photographs, could be counted as closed canopy. Photographs with low effective shade values results in a more risk-averse product by presenting the worst-case

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<sup>1</sup> Digital photographs were taken in quadruplicate to ensure that only the clearest photograph was used in analysis.

scenario by overestimating open sky rather than underestimating it. Five stations were re-photographed on September 30, 2014; original photographs from these stations were underexposed because the sun was prominent in each picture's field-of-view and the HemiView Image Analysis software was unable to effectively separate open sky from closed canopy.

**Figure 1: Example of hemispherical photography**



This particular photograph was taken at Site 26 on North Fork Galice Creek where the effective shade (canopy cover) is 74.7%.

- In establishing and documenting the cross sectional profiles, Level II field surveys were conducted on July 30 and August 6, 2014 using widely accepted protocols published by Dave Rosgen (Rosgen 1996, 5-6).
- Substrate analysis was conducted through field surveys performed on July 30 and August 6, 2014 using widely accepted protocols published by M. Gordon Wolman (1954).

### **3.2.2 Assumptions**

- All state and federal permits, rules, and regulations would be attained and abided by.
- All roads in the Planning Area are accounted for in the BLM transportation records and are accurately mapped.
- All streams in the Planning Area are accounted for in the National Hydrography Database and are accurately mapped.
- The non-system access road to the west and north of Galice and North Fork Galice

Creeks respectively and low-water ford would only be utilized by the mining claimant and/or operator while the Plan of Operation is active. No work would be done to improve this road except for the removal of fallen or hazard trees to facilitate vehicle access.

- Average road clearing widths are 40 feet, regardless of ownership and surface type.
- Canopy cover over North Fork Galice Creek has remained unchanged since hemispherical photography was taken in summer 2014. Informal field observations since then have confirmed this.
- All vegetation of any size would be removed beyond the 20-foot buffer on North Fork Galice Creek. These effects would be most prominent on the north side of North Fork Galice Creek where mining could occur up to the edge of this no-treatment buffer. To the south side of North Fork Galice Creek, the Galice Access Road (already devoid of vegetation) separates most potential mining effects from the stream.
- The angle of the sun (zenith) would be directly above the stream during the time of peak solar radiation (10am-2pm). In reality, this scenario is impossible since North Fork Galice Creek is within the northern hemisphere, giving the sun a larger zenith angle in favor of southern exposure during the time of peak solar radiation.
- For the purpose of the effective shade analysis it was assumed that solar radiation from canopy openings on the north side of the stream would have an equal effect to canopy openings on the south side of the stream. In reality, canopy openings on the south side of the stream could allow much more solar radiation to contact the stream and openings on the north side would contribute very little. Assessing effective shade in this way is a conservative approach assuming that all possibilities for solar radiation are equal.
- When assessing effective shade, all riparian vegetation was assumed to play an equal role in shading the stream. In reality, only vegetation in the primary shade zone ( $\leq 85$  feet of the stream) effectively shades the stream (USFS/BLM 2012). Vegetation beyond that distance is at such a high zenith angle that its role in providing effective shade during the hours of peak solar radiation is negligible. Again, assessing effective shade in this way is a conservative approach assuming that all possibilities for solar radiation are equal.
- The only effects to canopy cover would come from mining. While mining is the only activity slated to occur here, the proximity of the paved road lends itself to the possibility that an unforeseen road maintenance activity of unknown magnitude could occur to the south of North Fork Galice Creek and could potentially alter effective shade. These unforeseen effects will not be discussed further in this analysis. This analysis also assumes that a natural event such as a wildfire or a landslide will not occur, subsequently altering canopy cover.
- Mitigation activities – specifically silt fencing or other similar sediment retention device(s) – would be installed correctly and maintained.

- Reclamation activities – specifically re-planting efforts – would be successful in restoring a canopy cover once maturation is reached.

### 3.2.3 Affected Environment

#### Water Quality

The proposed project is located in the Hellgate Canyon – Rogue River 10<sup>th</sup>-field watershed. For analysis purposes, unless otherwise noted, the scale of analysis shall include the following 14<sup>th</sup>-field hydrologic units (drainages):

**Table 3: Hydrologic units comprising the PA**

Watershed	Sub-watershed	Drainage	Area (acres)
Hellgate Canyon – Rogue River	Galice Creek	Galice Creek below Forks, above Rogue River	1,836
		North Fork Galice Creek above Forks, below Quartz Creek	367

North Fork Galice Creek was first assessed by DEQ in 1998 for potential inclusion on the Clean Water Act 303(d) List. As of 2010, the most current 303(d) List still had North Fork Galice Creek as “attaining”<sup>2</sup> stream temperature data for potential listing for exceeding stream temperature standards. Also in 2010, the mainstem of Galice Creek downstream from the Stray Dog Mining Claim was not included on the 303(d) List; stream temperature was mentioned as being a “potential concern,” but there was not sufficient data to support 303(d) listing. Even if North Fork Galice or mainstem Galice Creek had been included on the 303(d) List with stream temperature as a pollutant, they would have been delisted in 2008 with the publication of the Rogue Basin TMDL. Following the publication of the TMDL, the BLM published the Hellgate Canyon – Rogue River Watershed Water Quality Restoration Plan (WQRP) in 2011. DEQ approved this WQRP which granted the BLM the latitude to authorize land management actions detailed in the Medford BLM Resource Management Plan. Such actions include the implementation of Best Management Practices and Project Design Features meant to buffer or mitigate impacts to water quality.

BLM stream temperature monitoring on North Fork Galice Creek immediately upstream of its confluence with Mill Creek (less than three miles upstream from the Stray Dog Mining Claim) occurred between 1994 and 1999. During these six seasons, the 7-day rolling average maximum temperature never exceeded the DEQ-established threshold; the average 7-day statistic was actually 58.9°F. Mill and Quartz Creeks are both tributaries to North Fork Galice Creek upstream of the Stray Dog Mining Claim. Mill Creek contributes slightly warmer water than North Fork Galice Creek, but Quartz Creek inputs are cooler than North Fork Galice Creek.

<sup>2</sup> Attaining status does not necessarily imply that the stream is impaired, only that data is lacking to make a listing call

BLM stream temperature monitoring on both streams shows that both are well below the DEQ stream temperature threshold.

Stream temperature is heavily influenced by canopy cover. Although canopy cover plays a significant role in the stability of stream temperatures in the PA, due to cool stream temperatures and relatively constant flow of water in the main tributaries, groundwater clearly plays an equally important role. The incision of North Fork Galice Creek – approximately 25 feet – also plays a large role in shading the stream. Nonetheless, canopy cover was assessed in North Fork Galice Creek where it flows through the proposed mining area. The results are below in Table 4 where Site 1 is > 200 feet downstream from the nearest proposed mining activity and Site 30 is at the proposed bridge crossing.

**Table 4: Effective Shade in North Fork Galice Creek where it flows through the proposed Stray Dog mining areas**

Site	% Effective Shade	Site	% Effective Shade
1	96.0	16	89.0
2	97.3	17	93.8
3	95.4	18	84.3
4	97.0	19	94.5
5	96.7	20	92.5
6	94.9	21	87.8
7	96.0	22	80.9
8	96.0	23	83.5
9	94.4	24	85.1
10	94.5	25	81.5
11	93.4	26	74.7
12	94.0	27	91.0
13	87.1	28	86.9
14	83.5	29	86.5
15	91.9	30	62.3

The Planning Area does not contain any municipal drinking water sources. Within the PA, there are 14 water rights filed with the Oregon Department of Water Resources. Only three water rights are downstream and hydrologically connected to the Stray Dog Mining Claim as shown in Table 5:

**Table 5: Certified water rights hydrologically connected to the Stray Dog Mining Claim**

Stream	Distance from project (mi)	Water Right Certificate Number	Beneficial Use
Galice Creek	0.2	72671	Instream flow for fisheries
Galice Creek	2.1	5488	Mining <sup>3</sup>
Galice Creek	2.3	8653	Power generation

<sup>3</sup> This water right is restricted to use between November 1<sup>st</sup> and July 20<sup>th</sup> of the succeeding year.

Whether or not a road is surfaced and the nature of surfacing can affect drainage, erosion, runoff and subsequent water clarity, and turbidity levels. Road surfaces are highly compacted which affects water infiltration rates and drainage patterns. The existing road network in the Planning Area totals 13.3 miles. Approximately 8.6 miles of these roads are surfaced with rock or asphalt. The remaining 4.7 miles were constructed with onsite material. Some roads, including non-system roads have no inventory, are not mapped, and are likely overgrown due to lack of use and maintenance. These non-system roads, including the access road west and north of Galice and North Fork Galice Creeks respectively are generally stable, but are compacted and subject to drainage and erosion problems. Compacted soils increase the risk for greater runoff which can lead to erosion problems elsewhere.

Within the Planning Area there are approximately 38 stream crossings. Roads that cross streams represent potential sources for sediment delivery depending upon road surface condition, road drainage systems, and the volume of water passing the road at a given time. Road segments linked to the channel network also increase flow routing efficiency and provide a mechanism for peak flow increases (Wemple et al. 1996). Roads under federal ownership are generally in better condition and comprise 89% of the total road mileage.

Two roads<sup>4</sup> provide access to the Stray Dog Mining Claim which are of specific hydrologic concern due to their proximity to and the greater water quality concern for perennial streams. The Galice Access Road generally has a well-vegetated ditchline capable of filtering out any road-related sediment and generally has adequate cross-drain spacing and size so as to minimize standing or flowing water in its ditchline. On the Stray Dog Mining Claim, across the Galice Access Road, there exists a poorly routed intermittent stream. Landslide material and past mining has routed the stream through a ditch and several old settling ponds before crossing the Galice Access Road. Because the flowpath is unnatural, the stream has abandoned its channel in several locations and actively contributes to erosion and sedimentation to North Fork Galice Creek.

The non-system road providing access to the west and north of Galice and North Fork Galice Creek respectively is narrow and steep in locations. Originally the main road in the valley, it has been abandoned and not driven in several years. Despite its disposition and proximity to aquatic resources, the road is stable and does not show signs of erosion potential. There are several points of hydrologic connectivity along the access road which include the low-water ford across Galice Creek and several intermittent streams which were historically channelized to facilitate mining. The later intermittent streams are dry in all but the heaviest precipitation events. The low-water ford across Galice Creek represents a low risk to erosion and sedimentation due to low bank angles and its cobble substrate.

To better assess stream-bed composition and to be able to better quantify potential effects to the stream bed and banks, cross sectional profiles and substrate analyses were surveyed at four strategic locations:

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<sup>4</sup> **Galice Access (34-8-36.0) Road** to the east and south of Galice and North Fork Galice Creeks respectively; a **non-system road** from its intersection with the Galice Access Road on private property to its intersection with the Galice Access Road on BLM-managed land.

- 1) 20 feet downstream from the proposed low-water ford site
- 2) at hemispherical photo site 1
- 3) at hemispherical photo site 11
- 4) 25 feet downstream from hemispherical photo site 30

A brief summary of findings at each of these locations is detailed in Table 6.

**Table 6: Summarized results of cross sectional profiles and substrate analysis  
Profile and analysis conducted July 30 and August 6, 2014**

Site	Entrenchment Ratio	Stream Gradient	Width-to-Depth Ratio	Rosgen Channel Classification	Dominant Substrate Class (mm)
20 feet below low-water ford	1.31	4.0	14.11	A3	Cobble (64-256)
Hemispherical photo site #1	1.56	10.0	8.51	A3	Cobble (64-128)
Hemispherical photos site #11	1.36	6.0	6.14	A3	Cobble (90-180)
25 feet below hemispherical photo site #30	1.11	2.5	12.07	G1	Bedrock <sup>5</sup>

### *Water Quantity*

Average annual precipitation in the Planning Area is approximately 47 inches occurring primarily between October and April. Elevation in the Planning Area ranges from 700 feet at the mouth of Galice Creek up to 3,120 feet at the headwaters of Blanchard Gulch.

Stream flows are dependent upon the capture, storage and runoff of precipitation. Vegetation clearing through any means can alter the amount and timing of peak flows by changing site-level hydrologic processes. Evapotranspiration, snowmelt, forest canopy interception of water and snow, road interception of surface and subsurface flow, soil infiltration rates, and soil structure are all processes that can contribute to peak flow enhancement.

The Planning Area is part of a rain-dominated hydroregion where some snow accumulation is expected to transiently occur, but not develop into a significant snow pack. Without a snow pack, there is little risk of a rain-on-snow event affecting peak flows in the PA. Canopy openings, or ECA, in a forest canopy can affect precipitation, snow melt, and peak flows. Within the PA, there are 52.7 acres of ECA (2.39% of the PA). Peak flows in a rain-dominated hydroregion are not observed until the ECA exceeds 29% of the catchment (Grant, et al. 2008). Much of the proposed mining areas are already ECA.

Perennial stream channels pass some volume of water throughout the year, including potentially warm water during the warmer months of summer and fall. Conversely, at a point in a year, flow ceases in intermittent stream channels and potentially warm water is no longer transported downstream. In the Planning Area there are approximately 7.7 miles of perennial streams and

<sup>5</sup> Bedrock by definition isn't measurable. However, there was a secondary substrate class at this site: gravel (11-64mm).

another 9.4 miles of intermittent streams. Groundwater exposed in past mining efforts near the proposed location of the stationary settling pond in Mining Area 1 was observed during field surveys at the Stray Dog Mining Claim. The outflow of this groundwater has since been channelized away from disturbed soils. Riparian vegetation has begun to re-establish itself in the new channel and the groundwater re-infiltrates before reaching North Fork Galice Creek.

Along the channelized intermittent stream in Mining Area 3 mentioned as being problematic from a water quality standpoint, there are a series of historic settling ponds which were improved by BLM staff as remediation when the site was vacated by miners. The settling ponds were re-purposed to capture landslide sediment transported by the intermittent stream. At present, these settling ponds have filled with fine sediment and no longer serve their intended purpose. However, the fine sediment is saturated on an annual basis thus creating a seasonal wetland complex. Because the ponds have filled with sediment, the artificial wetland complex no longer functions and is of low ecological and biological value.

The average road density, an index of the relative amount of road in the PA, is 3.85 miles per square mile. Based on average road clearing widths, roads cover 64.2 acres and represent 2.9% of the PA. Increases in peak flow can be found when the roads and other impermeable areas contained within occupy more than 12% of a catchment scale watershed (Harr, et al. 1975).

### *Soils*

Primary sources of accelerated erosion in this watershed are forest management, rural development, mining, roads, and wildfires. Soil displacement and compaction generally occurs when heavy equipment is driven over poorly vegetated, weak, bare, or wet soils. When soil displacement occurs, soil horizons become mixed, essential soil nutrients, water, and soil organisms may be rearranged or removed, and topsoil may become rutted. These alterations to the soil profile or soil characteristics can decrease productivity and may result in accelerated erosion.

All roads contribute to accelerated erosion at different levels depending on the surface type, location, design features, maintenance timing and frequency, and moisture levels of the road surface during use. Poorly located roads that channelize stream flow on hillslopes are recurrent sources of accelerated surface erosion, and in some cases mass wasting.

Soil distribution and composition within the Area of Influence<sup>6</sup> (AoI) are unique as shown in Table 7. Because of the high degree of historic human manipulation at the site, soils either do not exist or are highly mixed making them unsuitable for classification on a portion of the project site acreage.

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<sup>6</sup> All proposed mining areas, non-paved access roads, and the lands adjacent to both (approximately 78 acres)

**Table 7: Soil distribution and classification at the proposed mining areas**

Soil Symbol	Soil Classification	Percent of the Area of Influence
1D	Abegg gravelly loam, 12-20% slopes	24
30	Dumps	31
80G	Vermisa-Beekman complex, 60-100% north slopes	18
81G	Vermisa-Beekman complex, 60-100% south slopes	27

The Abegg gravelly loam is generic and derived from a wide assortment of parent material that has washed down streams or fallen down hillslopes and now comprises stream terraces throughout the AoI. Typically this soil has a very shallow organic overlay (O-horizon) as it is often and easily disturbed by floods and erosional processes. These soils are very well drained and deposits of clay, gravel, and sand are typically not seen above a depth of 18 inches.

Dumps in the PA are the result of historic mining which involved dredging, removal, stacking, and washing of riverine sediment. Due to the high level of mixing, these sites today are seen throughout the AoI as piles of boulder, cobble, and gravel which were sorted decades ago and now have only a moss covering and no soil profile to speak of. These “soils” are highly unproductive and would remain as such absent a large disturbance.

The Vermisa-Beekman complex is also low-quality soil with typically no O-horizon. Gravels from weathered metavolcanic and metasedimentary bedrock contribute to the highly erodible, very well-drained nature of the soil. This soil is relatively shallow due to its low productivity and bedrock overlay.

For all of the soil types seen at the proposed mining areas, limiting factors for road building and excavations are few with slope being the greatest factor (i.e. greater increase for landslides). While generally poor for growing vegetation, these sites are well-suited for roads and excavations with only a slight risk for soil rutting. Like most soils, the ones at the project site are prone to compaction which reduces pore space and can lead to pooling of water, erosion, and other water quality issues.

Timber harvest, rural development, and mining on all lands within the Planning Area have been occurring for decades. Interpretation based on aerial photography and field verification surveys revealed widespread soil compaction from these activities. Many of the historic mining sites, skid trails, and primitive roads are partially or wholly re-vegetated with grasses, brush, trees, and other vegetation. In areas where new vegetation has not established due to compacted or disturbed soils, accelerated erosion was also visible during field surveys. The area south of Mining Area 3, for example, experienced hydraulic mining and water impoundment decades ago. These land management techniques left the landscape vulnerable to mass soil movement, erosion, poor re-vegetation, and an abundance of water quality issues seen today.

### 3.2.4 Environmental Consequences

#### Alternative 1: No Action

##### *Water Quality*

Stream temperature would be maintained as these areas are generally well shaded, often with dense stands of conifers and hardwoods. Because stream temperatures are below thresholds, it is unlikely that Galice and North Fork Galice Creeks would be 303(d) listed in the foreseeable future. It is possible, however unlikely, that either of these streams could be listed for some other water quality impairment (e.g. sedimentation). However, at the time this EA was written, no studies or monitoring were being performed to suggest that such a listing was pending.

Throughout the proposed mining areas on North Fork Galice Creek, canopy cover and effective shade would remain unchanged. No vegetation would be removed from within the 20-foot buffer which would leave the stream adequately shaded (see Table 4). Beyond the 20-foot buffer, much of the riparian area is already void of vegetation owing to either roads and/or past mining.

Existing water rights in the Planning Area would remain unaffected absent any management activity. An instream water right for fisheries guarantees flows in Galice Creek as regulated by the State of Oregon (see Table 5). This instream water right is a junior water right with a priority date of 1990 which means all senior water rights must first be fulfilled.

**Table 8: Instream flow guarantee provided by Water Right Certificate 72671**

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Allotment (cfs)	60	60	60	60	24.1	10.3	3.28	1.48	1.09	2.45	22.2	60

Routine road maintenance would not fully correct existing sediment problems associated with culvert failures, erosion from natural surface roads, failure of road cuts and fills, etc. This lack of road maintenance would be most prominent on roads that are infrequently used or have been blocked. As they age, existing roads and drainage structures are subject to ongoing degradation or failure, typically occurring during winter storms. Most road or culvert failures would result in direct inputs of sediment to the stream network. The amount of introduced sediment would vary depending on the size of the storm event and condition, stability, and proximity of the roads or culverts to a stream.

The Galice Access Road is heavily utilized by the general public and therefore maintenance activities here are a priority for the BLM. Barring an unforeseen catastrophic road failure, it is likely that any smaller failures would be repaired in short order. However, the non-system access road west and north of Galice and North Fork Galice Creek respectively would likely receive no maintenance if it were to fail at any level. At present the BLM does not have vehicular access to this road<sup>7</sup> and therefore no ability to easily repair the road. If the road were to fail it would almost certainly contribute sediment directly to the perennial streams located

<sup>7</sup> No bridge installed at one end and no access through private property at the other

beneath its grade due to its close proximity. However, failure of this non-system road is unlikely because of its construction on relatively stable soils. The road has been in its current location for decades without any evidence of failure or even significant erosion. Even if the road were to fail, because of the small footprint it occupies, sediment contributions would be relatively minor and within the range of natural variability (RNV).

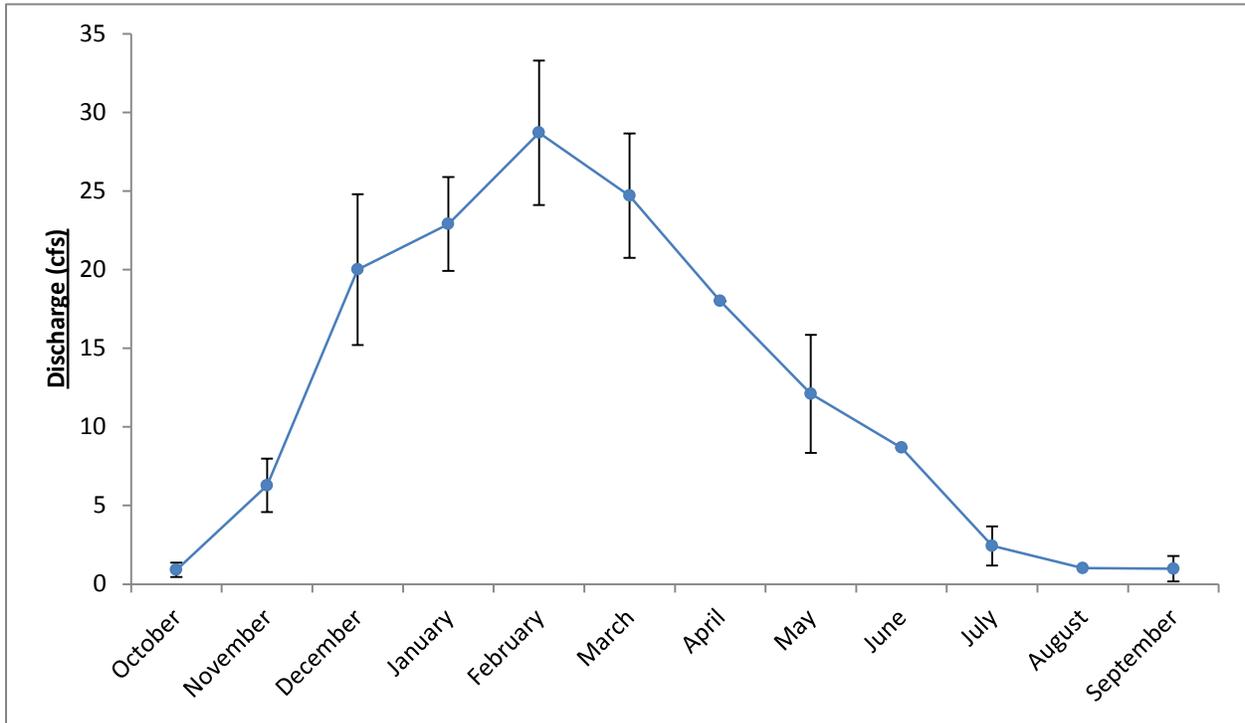
The perpetually eroding hillslope south of the proposed Mining Area 3 will continue to worsen. Here, the exposed hillslope saturates on an annual basis due to rainfall and natural drainage patterns. The intermittent tributary flowing through the middle of the disturbed area will continue to erode and transport sediment. Where the tributary has been diverted into a ditch, embankments would continue to fail resulting in further road erosion, posing a threat to the Galice Access Road and providing a direct and unmitigated source of sediment-laden pollution to North Fork Galice Creek.

The cross sectional profiles and substrate analyses (see Table 6) would remain unchanged absent any activity. Both Galice and North Fork Galice Creeks are naturally flashy systems in a confined channel. These characteristics lend themselves to a highly erosive stream. However, these factors when coupled with historic mining lend themselves to a stream system largely devoid of fine sediment for the stream to erode. Stream conditions are likely to remain armored, confined, and stable with cobble-sized substrate and only small pockets of sand and gravel.

#### *Water Quantity*

At present, due in large part to significant groundwater inputs, both Galice and North Fork Galice Creeks experience a reliable and stable annual water supply. Absent any change in the PA, the annual hydrograph of North Fork Galice Creek (see Figure 2) would also remain unchanged.

**Figure 2: Annual hydrograph of North Fork Galice Creek at the Stray Dog Mining Claim**



Note that the water year begins in October and that the hydrograph peaks in the winter months when rainfall and snowmelt are greatest. These flow measurements represent a modeled monthly average; hence the use of error bars to depict declared variability in the model. Also note that the monthly *mean* is displayed, not minimum or maximum values.

The potential for peak flow effects varies for different stream types (Grant, et al. 2008). Within high gradient cascade and step-pool stream types there is little potential to affect sediment transport and peak flow enhancement as these reaches are sediment supply limited and have a high transport capacity (Montgomery and Buffington 1997). All of the streams in the Planning Area fall into these categories. Although additions to ECA are inevitable through natural and anthropogenic causes, it is also inevitable that existing ECA would recover in the same time period. With a relatively unchanged ECA, there would be no change in the magnitude or rate of surface or groundwater runoff delivery to the stream network.

Existing roads and landings may modify storm peaks by reducing infiltration, allowing for more rapid surface runoff (Ziemer 1981). Roads may also intercept subsurface flow and surface runoff and channel it more directly into streams (Ziemer 1981). Statistically significant increases in peak flows have only been shown when roads occupy at least 12% of the watershed (Harr, et al. 1975). Roads in the Planning Area occupy an estimated 2.9% of the land base, and no perceptible increase in peak flows would be expected.

### *Soils*

Under Alternative 1, erosion from land management actions across all ownerships within the PA

would be expected to remain similar to current levels over the long-term, but may vary from year to year. Areas of short-term erosion could potentially occur as a result of road maintenance. While some new roads could be constructed, erosion from roads is likely to remain at current levels because of improved road construction and maintenance technology. Right-of-way agreements with private landowners would continue to allow for maintenance. Regular passenger and all-terrain vehicle use of road systems within the PA by the public and corresponding erosion would be expected to continue at current rates. The extent of soil erosion from non-federal timber harvest and related actions is unknown. Rural development on private lands is expected to continue, along with road building to support this development. More impervious surfaces would be created that would be unlikely to recover due to continuous use.

Where compacted areas from past activities are not associated with actively maintained road systems, soils would continue to improve slowly over time with new vegetative growth, eventually resulting in a reduction of erosion on these acres. Soil recovery time in the PA varies greatly. If an O-horizon exists, recovery from soil disturbance and compaction may be as “quick” as a few decades. If an O-horizon does not exist, the area is subject to frequent and natural disturbances (Abegg soils), or the “soil” is in poor condition (Dump soils), recovery from disturbance and compaction may take centuries.

The area of historic hydraulic mining south of proposed Mining Area 3 would remain a risk for erosion and debris flows. This site has likely been active since disturbance first occurred here nearly a century ago. Past efforts to stabilize the hillslope through planting trees and shrubs have been largely unsuccessful. Erosion and sedimentation occurred as recently as winter 2015-2016.

Alternative 2: Proposed Action

*Water Quality*

Vegetation that could provide primary stream shading on North Fork Galice Creek would be entirely removed beyond the 20-foot buffer. Cool, moist, riparian microclimate could be affected. However, the incised nature of North Fork Galice Creek and the riparian corridor that provides nearly all of the current stream shade would be largely preserved. Table 9 details effective shade before and after the implementation of Alternative 2.

**Table 9: Baseline and post-Alternative 2 effective shade on North Fork Galice Creek**

Site	Existing Effective Shade (%)	Post-mining Disposition	Post-mining Minimum Effective Shade (%)
1	96.0	Outside of Project Area - no affect	96.0
2	97.3	Outside of Project Area - no affect	97.3
3	95.4	Outside of Project Area - no affect	95.4
4	97.0	Outside of Project Area - no affect	97.0
5	96.7	Outside of Project Area - no affect	96.7

Site	Existing Effective Shade (%)	Post-mining Disposition	Post-mining Minimum Effective Shade (%)
6	94.9	6% canopy cover reduction	88.9
7	96.0	17% canopy cover reduction	79.0
8	96.0	12% canopy cover reduction	84.0
9	94.4	10% canopy cover reduction	84.4
10	94.5	8% canopy cover reduction	86.5
11	93.4	8% canopy cover reduction	85.4
12	94.0	6% canopy cover reduction	88.0
13	87.1	8% canopy cover reduction	79.1
14	83.5	6% canopy cover reduction	77.5
15	91.9	8% canopy cover reduction	83.9
16	89.0	9% canopy cover reduction	80.0
17	93.8	6% canopy cover reduction	87.8
18	84.3	5% canopy cover reduction	79.3
19	94.5	4% canopy cover reduction	90.5
20	92.5	10% canopy cover reduction	82.5
21	87.8	7% canopy cover reduction	80.8
22	80.9	9% canopy cover reduction	71.9
23	83.5	8% canopy cover reduction	75.5
24	85.1	8% canopy cover reduction	77.1
25	81.5	6% canopy cover reduction	75.5
26	74.7	4% canopy cover reduction	70.7
27	91.0	7% canopy cover reduction	84.0
28	86.9	Outside of Project Area - no affect	86.9
29	86.5	Outside of Project Area - no affect	86.5
30	62.3	Outside of Project Area - no affect	62.3

Areas with the highest level of current effective shade stand to lose the greatest amount of shade. However, even the site with the lowest resulting effective shade would remain above thresholds; there is no detectable solar radiation gradient where riparian canopy is at least 70% (Brosofske, et al. 1997). In other words, if riparian canopy remained  $\geq 70\%$ , despite the potential for direct solar radiation to the stream, the riparian microclimate and stream itself would not experience a resulting measurable increase in temperature. Between the baseline conditions and the post-mining activities, all sites would retain  $\geq 70\%$  canopy cover. In fact, on average, the entire reach running through the Stray Dog Mining Claim would retain its stream temperature regime with 83.7% effective shade.

Mining Area 1 would utilize a stationary settling pond. The pond would be lined with fine sediment found onsite and be ringed by a small berm to prevent piping, seeping, and overflow. The pond would be located at least 20 feet back from the upper terrace edge above North Fork

Galice Creek. The groundwater encountered at this site is already routed away from the pond location, although if it changes course back to the settling pond location, it would have to be routed away again. Sediment generated from excavation would be prevented from entering North Fork Galice Creek by way of silt fence or other similar sediment-control device(s). Once the ore has been processed, both overburden and finer sediment would be returned and spread out at the excavation site.

Mining Area 2 would be mined with the use of a “migrating pond.” At all times this migrating pond would be farther than 20 feet from the upper terrace edge above North Fork Galice Creek. Mining Area 2 is more hydrologically disconnected from North Fork Galice Creek than Mining Area 1 because the proposed mining area is isolated from the stream by old mine tailings. Regardless, sediment retention device(s) between any mining and any aquatic resource<sup>8</sup> frontage would be installed.

Mining Area 3 is the most isolated from North Fork Galice Creek because the Galice Access Road separates the two. Mining here would also utilize a migrating settling pond. The intermittent stream currently flowing through Mining Area 3 would be routed back to its historic stream channel to prevent it from entering the mining site. Re-routing this intermittent stream would improve hydrologic form and function and benefit the Galice Access Road and North Fork Galice Creek by not furthering erosion and contributing road-related sediment. Work in Mining Area 3 could occur at any time during the year including the wet season. Regardless of the season of operation sediment retention device(s) between any mining activity and any aquatic resource frontage would be installed.

Seepage and to a lesser degree, piping, of water through the soils is a concern, but only in Mining Area 1 and would be monitored closely during mining. Mining in Areas 1 and 2 would only occur during the summer which should greatly reduce the risk to piping. The use of the settling ponds would immediately be stopped if seepage is observed in any location. Settling ponds would be filled incrementally so as to watch for seepage. If seepage is observed fine sediment (i.e. silt and clay) and/or hay would be used to stop seepage.

Forest roads can be a major contributor of fine sediment to streams, through down cutting of ditch lines and erosion of unprotected road surfaces by overland flow. During the dry season there are few mechanisms for sediment transport from roads to streams. During the wet season, total sediment inputs from roads would be expected to be negligible. Only the non-system access road to the west and north of Galice and North Fork Galice Creek would have the potential to generate road-related sediment. The low-water stream ford’s contribution to stream turbidity should be minimal as its use would only be once at entry and once at exit. The proposed bridge on this access road represents a potential source for stream sedimentation. During its construction, logs may be placed in the stream and rested on the stream banks; however, every effort would be made to prevent the logs from dragging. Nonetheless, a small amount of sediment may be generated during construction. A barrier fabric would be used as a separation between gravels placed on the bridge and the bridge itself to prevent loss into the creek, but a small amount is again expected to enter the creek during both the construction and

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<sup>8</sup> Including, but not limited to springs, wetlands, ditches, and streams regardless of size, flow, or volume

de-construction phases. Regardless, this small amount of sediment would not travel far in the short term and be quickly washed away in the first seasonal precipitation event.

With the first seasonal rain there could be a small pulse of sediment at stream crossings including the low-water stream ford and bridge site, having the potential to temporarily increase turbidity. However, sediment inputs would not exceed levels of naturally occurring erosion and runoff. By the time the first fall rains begin, mining in Areas 1 and 2 would be complete, equipment would be removed, the bridge would be dismantled, and sediment retention devices would remain installed. All streams are expected to stabilize and sediment delivery is expected to be indistinguishable from background levels after a short distance. Project Design Features ensure that this project would have no measurable change in stream bed and bank composition; post-mining monitoring would be conducted to verify.

Campsite and hazardous material storage would all be in excess of 150 feet from North Fork Galice Creek and would therefore be hydrologically disconnected. Nonetheless, a Spill Prevention, Control, and Countermeasure Plan would be in place and any spills would be reported immediately.

Post-mining reclamation work would not only mitigate mining activities, but improve the overall form and function of the site. Piles of historic and newly-generated mine tailings would be leveled out and re-contoured to match the natural hillslope. Fine material would be placed on top of the washed gravel and cobbles so as to encourage re-vegetation which itself would be augmented by the planting of equal quantities of bigleaf maple, Douglas fir, and incense cedar at a density of 150 trees per acre. Trees which were cut to facilitate mining would be scattered randomly across Mining Areas 1 and 2. The non-system road where it currently runs through Mining Areas 1 and 2 would be decommissioned to facilitate mining and the road would not be re-built. Mining Area 3 would be blocked to vehicular access through the placement of boulders uncovered on site or other approved material which would allow replanted vegetation the opportunity to grow without being damaged. The intermittent tributary currently running through Mining Area 3 which would be routed into its historic stream channel would not be re-routed into its ditch post-mining. Silt fencing and/or other sediment retention device(s) would be left in place to be maintained and eventually removed by BLM hydrology staff once overland flow no longer carries significant amounts of fine sediment.

### *Water Quantity*

In order to initially fill and occasionally top-off the settling ponds, the proponent would utilize an existing Point of Diversion<sup>9</sup> upstream from the Stray Dog Mining Claim which allows for a 2 cubic feet per second (cfs) diversion. At this maximum rate, the 100,000 gallon settling ponds would be filled in approximately 1.5 hours. During this time, the flow of North Fork Galice Creek could drop by up to 2 cfs.

Reduced stream flows can result in slower velocities and a subsequent increase in stream temperature due to prolonged solar radiation. However, depending on the discharge of the

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<sup>9</sup> Water Right Certificate 11079 with a beneficial use of mining and a priority date of October 6, 1931

stream and the rate of diversion, groundwater can negate these potential stream increases (Oki, Wolff and Perreault 2006). North Fork Galice Creek is rich in groundwater inputs, the nearest, noted input is in Mining Area 3. Effective stream shade would also not decrease to a point where solar radiation could appreciably increase water exposure.

Changes to stream temperatures are highly dependent on flow volume as larger bodies of water require more solar energy to heat. North Fork Galice Creek has a great enough summer discharge (see Figure 2) and high enough levels of effective shade (see Table 4) that a temporary diversion of 2 cfs would likely go unnoticed. A quantification of the effects to stream temperature relied on the QUAL2K Model which show that for a stream the size of North Fork Galice Creek, when 2 cfs are diverted, an increase of 0.05°F resulted over a distance of 500 feet from the diversion and an increase of 0.14°F resulted over a distance of 1,500 feet from the diversion (Cristea and Janisch 2007). Typically, streams gradually warm while flowing downhill, but the aforementioned stream temperature increases are above these levels. With the rolling seven day average maximum stream temperature being 58.9°F in North Fork Galice Creek, it is plausible that while stream temperature may increase by a tenth of a degree, it would be only temporary, and the rolling seven day average maximum would remain unchanged.

Downstream water rights holders would not be harmed by potential turbidity and stream temperature increases which would both be small and completely dissipated by the time flow reaches their points of diversion/use. Because of the priority date of the proponent's water right, he would get his water needs met before the fisheries, but not until after the needs of the water right holders 2.1 and 2.3 miles downstream have their needs fully met. The regulation and administration of all these water rights would be performed by the Josephine County Watermaster.

Peak flows in a rain-dominated hydroregion are not observed until the ECA exceeds 29% (Grant, et al. 2008). As mentioned previously, some of the proposed Planning Area is already in ECA. Up to an additional 2.2 acres would be added to the ECA of the Planning Area from tree clearing and mining bringing the new total for the Planning Area up to 54.9 acres (2.49%).

There is no new road construction proposed, but approximately 0.3 miles of non-system road would be decommissioned when the ground it occupies is mined and then reclaimed. Through the decommissioning efforts, roaded area in the Planning Area would drop 1.6 acres with the new roaded area for the Planning Area being 62.6 acres (2.8% of the PA). Total roaded area would decrease and is currently well below the 12% threshold for risk of peak flow enhancement (Harr, et al. 1975). Stream morphology of the high gradient cascade and step-pool stream types would remain unchanged and resistant to peak flow enhancement.

### *Soils*

Regular passenger and all-terrain vehicle use of roads and trails within the Planning Area and their corresponding erosion and stream sedimentation would be expected to continue at current rates. Field surveys were used to identify and mitigate all areas that have the potential to result in chronic erosion, excessive soil displacement, or landslides. Heavy use at the project site during dry periods would displace soils in the form of dust. When dust directly enters the stream, it would settle in isolated pockets until washed away in the first fall precipitation event.

Where soils are disturbed, they would exhibit short term, localized erosion, but would not mobilize offsite to stream systems due to sediment control device(s) and other PDFs.

With reclamation, soils would recover relatively quickly – much faster than they would in their existing conditions left to their own unhindered recovery. All mining would be mitigated (e.g. returned, without compaction, after processing) or reclaimed (e.g. planted). These mitigation and reclamation activities would reduce bulk soil density, provide soil aeration, improve water infiltration, allow for natural reseeding of vegetation, and provide better substrate for planted vegetation.

All but the Abegg soils are poor soils to use in reclamation activities and even the Abegg soils only have a “fair” rating as determined by the NRCS. Soils in the proposed mining areas are xeric, do not hold water well, have a low organic component, have a high percentage of rock fragments, have a shallow depth to bedrock, and are somewhat acidic. Fortunately, all of the soil types at the project site have high restoration potential. In other words, the soils in the proposed mining areas can only be improved upon.

All areas which will be mined, including approximately 0.3 miles of non-system roads are slated for reclamation, which equates to soils which would have improved productivity and functionality. Cross drain spacing and sizing improvements may be inadequate at various locations in the PA, but are not slated to be corrected in Alternative 2. However, the intermittent tributary flowing through Mining Area 3 would be addressed by routing it back to its historic stream channel. Although required for mining to proceed in Area 3 during the winter, “restoring” the stream back to its ditch location after mining is complete would not be done. Keeping the stream in its channel therefore becomes part of the reclamation of the project.

Despite all soils in the proposed mining area having a very limited ability to create and manage ponds, dikes, embankments, and levees, the proponent’s plan to create a stationary settling pond in Mining Area 1 would not be problematic because the soils would be augmented by fine sediment brought in and washed from ore material. In Mining Areas 2 and 3, soils not well-suited for construction and management of ponds, dikes, embankments, and levees would be augmented by fine sediment as in Mining Area 1, but would be less concerning because of the greater distance from aquatic resources and lack of hydrologic connectivity.

### Summary and Conclusions

- Galice and North Fork Galice Creeks are highly resistant to change.
- Stream incision, confinement, and substrate show that geomorphology is unlikely to be influenced by the Proposed Action.
- A 20-foot buffer from the top of the terrace above North Fork Galice Creek is adequate to retain effective shade.
- Stream diversion of 2 cfs would temporarily increase stream temperature by approximately 0.1°F, but would not cause the rolling seven day average maximum stream

temperature to rise above thresholds.

- Downstream water rights holders would not be affected by water quality or water quantity effects.
- Existing roads occupy a small percentage of the Planning Area and would be reduced further through reclamation.
- The low-water stream ford on Galice Creek is well-armored, has low bank angles, and is capable of supporting one-time ingress and egress of heavy equipment.
- The low-water stream ford on Galice Creek may contribute an immeasurable amount of fine sediment that would quickly be transported away during the first fall precipitation event.
- The proposed bridge may contribute some fine sediment to North Fork Galice Creek, but it too would quickly be transported away during the first fall precipitation event.
- ECA in the Planning Area would increase by 2.2 acres, but would remain below peak flow enhancement thresholds.
- The intermittent tributary flowing through Mining Area 3 would be routed back to its historic stream channel which would reduce erosion of road infrastructure and sedimentation in North Fork Galice Creek.
- Reclamation activities would improve soil productivity while reducing erosion, compaction, and sedimentation.
- Although soil disturbance would increase in the short term, reclamation activities would improve the riparian vegetation community which would have a stabilizing effect to the soils.
- Blocking off Mining Area 3 with boulders would limit future vehicular access which would allow the site to recover as plantings take root and prevent future soil compaction.
- The campsite and hazardous material storage would have no effect to aquatic or soil resources.

### **3.3 Fisheries**

#### **Assumptions**

- Fish distribution limits are based on Geographic Information System (GIS) coverage, Oregon Department of Fish and Wildlife (ODFW) survey information, STREAMNET (<http://www.streamnet.org>), and available site-specific information.
- The geographical scale of analysis for the Planning Area is adjacent to North Fork Galice

Creek and contains the proposed mining areas (See Appendix 1: Map).

### ***3.3.1 Affected Environment***

Within the Rogue River Basin, Galice Creek and its tributaries are important spawning and rearing habitats for both anadromous and resident salmonids. According to the Final Southern Oregon Northern California Coast (SONCC) Coho Recovery Plan 2014, there are 603 intrinsic potential (IP) kilometers in the Middle Rogue-Applegate sub-basin in which the PA is located. Western tributaries important for coho salmon are Taylor, Galice, and Limpy Creeks (NMFS 2014).

While this area is important to fisheries, the Galice Creek area has been heavily modified due to human use:

The Rogue-Recreation Section Watershed Analysis (BLM 1999) states:

The remoteness of the Rogue River basin delayed widespread forest harvest until railroad lines made it possible to export timber. Profound changes in watershed and streams associated with timber harvest occurred after World War II, when availability of heavy equipment and the high demand for wood led to extensive timber harvest in the Rogue River basin. Channel damage and erosion from the 1964 flood was widespread, exacerbated by timber harvest activities (including using stream channels for skidding logs) and road building activities (USFS 1999).

Additionally, the Final SONCC Coho Recovery Plan (NMFS 2014) states:

For example, gravel beds were scoured down to bedrock on Steves Fork and Sturgis Fork (upper Applegate River tributaries now above Applegate Dam) and Galice Creek (tributary to the Rogue River) (Thompson and Fortune 1970), and large alluvial fans formed at the mouth of Middle Rogue tributaries Billings, Foster, and Shasta Costa creeks (USFS 1999b). Clear-cut timber harvest continued on public lands into the 1970s and 1980s and although harvest technology improved, this activity resulted in another pulse of sediment that further degraded water quality and coho salmon habitat in downstream reaches (BLM 1996a, USFS 1999b). The USFS and BLM manage their lands more conservatively since the adoption of the Northwest Forest Plan (U.S. Department of Agriculture (USDA) and U.S. Department of the Interior (USDI) 1994, USFS and BLM 1995a). The eastern portion of the Middle Rogue sub-basin has a checkerboard pattern of BLM and private ownership. Timber harvest is the most common activity on private land.

Riparian areas are one of the most heavily used habitats found in the watershed, both by humans and by wildlife. Many animals require Riparian areas to complete their life cycles. Aquatic and amphibious species are intrinsically tied to these habitats, as are all of the species that feed on these animals. Riparian habitats have been heavily impacted by mining, road building and logging. The riparian zone on private lands varies from mature stands of conifers to bare streambanks. Most of the riparian areas on private lands are dominated by hardwoods and young conifers. The riparian area on federally-managed lands are generally in better condition than

private but still have been negatively impacted by past practices such as mining and timber harvest. During low flow periods water withdraws can determine the absence/presence of many aquatic species. Many native aquatic and amphibious species are no longer as prevalent as they historically were and are less capable of supporting that historic species diversity.

Cutthroat trout, steelhead, Coho and Chinook salmon are found in the Rogue-Recreation Section Watershed. Each are a cold water species that require complex habitats, especially in the early life stages. Quantitative abundance estimates are absent. Based on BLM fisheries specialist professional observations a qualitative analysis depicts a low abundance of coho and low-to-moderate abundance of cutthroat trout, steelhead, and chinook. Cutthroat and steelhead typically have a wider range of distribution and are found higher in the tributaries than Coho and Chinook salmon. Factors limiting salmonid production include:

- Inadequate stream flows in the summer months,
- high water temperatures,
- erosion/sedimentation to streams,
- low levels of large woody material in the stream and riparian area,
- lack of rearing and holding pools for juveniles and adults, respectively,
- channelization of streams in the canyons and lowlands, and
- blockages of migration corridors.

The Medford District RMP (BLM 1995, p. 50) identifies Galice Creek as a priority for potential fish habitat improvement projects, indicating a low-to-moderate potential for increasing fish production capability in a cost-effective manner. BLM placed fish habitat improvement structures (boulders) in Galice Creek in the early 2000s to improve habitat for Coho Salmon and steelhead.

## **Fish Species**

Anadromous salmonids present within the Planning Area include: SONCC Coho Salmon (*Oncorhynchus kisutch*), fall Chinook Salmon (*O. tshawytscha*), and winter steelhead (*O. mykiss*). Additionally, anadromous Pacific lamprey (*Entosphenus tridentatus*) are present in the PA.

Resident salmonids within the Planning Area consist of rainbow trout (*Oncorhynchus mykiss irideus*), and cutthroat trout (*Oncorhynchus clarki clarki*). Other resident fish species include native reticulate sculpin (*Cottus perplexus*) and Klamath smallscale sucker (*Catostomus rimiculus*).

SONCC Coho Salmon are federally listed as threatened. Klamath Mountain Province steelhead and the SONCC Chinook are BLM sensitive species. BLM is required to address impacts to Threatened and Endangered Species in mining operations (43CFR3809.411(a)(2)(ii) and (iii) and 43 CFR §3809.420 (b)(7)). While the mining claimant, "...shall take such action as may be needed to prevent adverse impacts to threatened or endangered species, and their habitat which may be affected by operations," 43 CFR 3809.420 (7), it is policy that the BLM would protect, manage, and conserve sensitive species and their habitats such that any BLM-approved action

would not contribute to the need to list any of these species (Bureau Manual 6840.02 and IM OR-2003-054).

Galice Creek and North Fork Galice Creek contain federally designated SONCC Coho Critical Habitat (Table 10). Critical habitat is defined in Section 3(5)(A) of the ESA as “the specific areas within the geographical area occupied by the species ... on which are found those physical or biological features: (I) essential to the conservation of the species and (II) which may require special management considerations or protection.” Critical habitat was designated (64 FR 24049, May 5, 1999) to include all river reaches accessible to listed Coho Salmon between Cape Blanco, Oregon, and Punta Gorda, California. Critical habitat consists of the water, substrate, and adjacent riparian zones of estuarine and riverine reaches (includes off-channel habitats). On June 28, 2005, the NOAA Fisheries Service published a final determination to list SONCC Coho Salmon as a threatened species under the ESA (Federal Register Vol. 70, No. 123).

**Table 10: Miles of Coho Critical Habitat in Potentially Affected Creeks**

Stream Name	Coho Habitat (mi)
Galice Creek	2.19
North Fork Galice Creek	3.77

### **Aquatic Habitat**

The description of aquatic habitat conditions is based on an aquatic habitat survey conducted in 1999 by the Oregon Department of Fish and Wildlife (ODFW) and on information obtained from the Rogue-Recreation Section Watershed Analysis (BLM 1999). The existing habitat is compared to the ODFW habitat benchmark standards which define the current conditions of the streams contained within the PA.

The ODFW has identified fish habitat benchmarks (Moore 1997) used to determine if a component of fish habitat is a limiting factor in trout or salmon production or survival. Pools must comprise >35% of the total stream area to reach the ODFW benchmark standard for pool habitat. Adequate riparian canopy coverage (stream shade) affecting water temperature is identified as >70%. Adequate levels of Large Woody Debris (LWD) exist when there are more than 20 pieces of large wood per 100 meters of stream. Gravel in riffles functioning as salmonid spawning material should include no greater than 15% fine sediment.

ODFW conducted physical habitat surveys in 1999 on 3 reaches of Galice Creek and 6 reaches of North Fork Galice Creek (Table 11). Reach 3 of Galice Creek includes the low water crossing. Reach 1 of North Fork Galice Creek is adjacent to the proposed mining site and current PA (claim site downstream of Blanchard Gulch). The average gradient for Reach 3 of Galice Creek was 1.6% and for Reach 1 of North Fork Galice Creek was 3.3%. See Table 6 for results of a more recent, site-specific cross sectional profile and substrate analysis.

### **Spawning substrate**

The availability and quality of spawning substrate is an important factor in fish productivity and spawning habitat. Gravel and small cobble substrate relatively free from embedded fine

sediment provides ideal spawning substrate for resident and anadromous salmonids (Bell 1990). During incubation of eggs and alevins, survival and emergence rates can be reduced when sediment exceeds 15% of the area (Bjornn and Reiser 1991).

According to ODFW Aquatic Habitat Inventory Surveys, sand and fine organics made up a minimal portion of riffle units, as illustrated in Table 11. About 10.0% of riffles comprised of sand and fines for Galice Creek while no riffle units identified within Reach 1 of North Fork Galice Creek. The percentage of spawning gravel was desirable. Gravel substrate made up an average of 48% of riffle units.

**Table 11: Stream Habitat Conditions for Galice Creek and North Fork Galice (ODFW)**

HUC 10	Stream Name	Percent Sand and Organics	Percent Gravel	Percent Pool Habitat	Volume of LWD (m <sup>3</sup> /100)	Average Key Pieces (per 100m)
Hellgate Canyon-Rogue River	Galice Creek Reach 3	10.0%	48.0%	24.0%	1.7	0.1
	North Fork Galice Creek Reach 1	NA	NA	6.8%	1.9	0.1

### Pool quality

Pools are important habitat features for juvenile rearing during summer months when lower water levels and higher stream temperatures add to stress, and during high flow events when off-channel habitat provides refuge. Salmonids are typically larger in size and found in greater numbers in deeper pool habitats (Rosenfeld et al. 2000). Galice Creek Reach 3 (see Table 11) had 24% pool habitat by area and Reach 1 of North Fork Galice Creek had 6.8% pool habitat.

### Large Woody Debris

Large woody debris is important in the formation of deep scour pools and off-channel habitat, and retention of gravel substrate (Bilby and Ward 1989). The pools and off-channel habitat provide refuge for salmonids during high flow events and reserves of cool water during low flow months when water temperatures may become elevated (Swanston 1991).

Galice Creek and North Fork Galice Creek have low levels of large woody debris within the PA. There are 0.1 key pieces for both Galice Creek and North Fork Galice Creek and 1.7 and 1.9 m<sup>3</sup> respectively of large woody debris per 100 meters of stream. Foster et al. (2001) describe key pieces as those greater than 33 feet in length and 24 inches in diameter.

### Habitat access

According to the Rogue-Recreation Section Watershed Analysis, North Fork Galice Creek has a series of log dams at river mile 0.7 which builds up the water level for a mining ditch diversion. The highest drop is four feet and acts as a migration barrier to adult and juvenile steelhead and cutthroat trout passage.

### 3.3.2 Environmental Consequences

The following analysis considers the likelihood that the No Action and the Proposed Action Alternatives would affect fisheries and aquatic resources, and then assesses the potential magnitude, duration, and nature of effects. The Proposed Action is evaluated on how it would change fish habitat, and for this reason, the fisheries analysis is linked closely to the soil and hydrology effects analysis. The potential effects on habitat are in turn used to evaluate the potential effects to production and survival of fish populations.

#### Alternative 1: No Action

Fish-bearing streams of the Planning Area have poor quality rearing habitat which limits salmonid growth and survival. Land use practices have removed riparian vegetation, straightened channels, and removed LWD from streams, resulting in loss of pool habitat which is essential for salmonid rearing. The trend toward removal of older trees along streams has decreased the recruitment of large logs to channels and increases erosion that deposits sediment in downstream spawning gravels. These become embedded and are less desirable for use by spawning salmon. In Galice Creek, the amount of fine sediments in the gravels of riffles is 10% by area identified as a lowest threshold for not properly functioning substrate as spawning material for salmonids.

The area of disturbance south of the proposed Mining Area 3 would continue to worsen. Here, the exposed hillslope will saturate on an annual basis. The intermittent tributary flowing through the middle of the area will continue to erode and transport large volumes of sediment. Where the tributary has been diverted into a ditch, embankments will continue to fail resulting in further road erosion which poses a threat to the Galice Access Road and provides a direct and unmitigated source of sediment-laden pollution to North Fork Galice Creek.

The trend toward decreasing riparian shade on private land is expected to continue as streamside vegetation is removed through land-use practices such as logging, agriculture, and development. Shade loss results in continued elevated stream temperatures. Low summer flow exacerbates the high stream temperatures, and this is not expected to improve as more demands are made on available water through private land use. Under Alternative 1, primary shade would not change on BLM managed stream segments, leaving stream temperatures unchanged.

Small-scale suction dredging is reasonably certain to occur within the project reach, including the use of small floating dredges ( $\leq 4$  inch intake) within North Fork Galice Creek and Galice Creek. On BLM lands, use of a small ( $\leq 4$  inch diameter) suction dredge by a claimant is classified as “casual mining” and does not require permission or authorization by the BLM. Operations are limited to daylight hours and occur between June 15 and September 15, unless a variance is obtained. Up to 25 cubic yards of substrate may be moved annually by each operation before requiring an individual removal/fill permit. The turbidity plume resulting from the dredging must not extend more than 300 feet downstream. Instream and bank LWD cannot be removed from the channel. Because the BLM does not authorize small-scale suction dredging, the extent of its occurrence on BLM managed stream reaches is unknown. The BLM assumes that casual level mining adheres to all state laws and any permits needed are obtained.

## *Cumulative Effects*

Under the No Action Alternative, the BLM would not approve the Mining Plan of Operation; no direct or indirect effects are expected thus there are no cumulative effects of the No Action Alternative.

### Alternative 2: Proposed Action

#### **Site access**

The claimant would use an existing ford across Galice Creek and build a bridge over North Fork Galice Creek to access his claim. The operator proposes to build a bridge over North Fork Galice Creek using trees found within the mining claim. This bridge once completed would be located outside the Ordinary High Water mark and bankfull width. During placement of the bridge (instream period), logs may contact stream bed and banks but dragging would be minimized. The addition of filter cloth on top of the bridge will keep road material from entering the creek. Yet the placement of road material on top of filter cloth and bridge may allow small amounts of material with fines to enter the creek. These small amounts of road material with fines would be transported no more than 25 feet where it would settle until flushed by the first fall rains for both placement and removal of bridge. This bridge would accommodate refueling and supplies for mining equipment in Mining Areas 1 and 2 by using ATVs and a utility truck on a semi-daily basis.

Turbidity and disturbance of fine sediment would occur with each of the crossing locations. The largest pulse would come from an excavator and a dump truck crossing once to enter and once to exit at the low water crossing of Galice Creek. Based on observations at this ford, turbidity would not be expected to extend more than 25 feet downstream before it dissipates, and fines would settle within 15 feet of the ford. These crossings would produce a pulse effect each time and would remain localized. The amount of fines in the ford would decrease over time because they would be redistributed downstream with each crossing. The crossings (once in and once out) would occur during the six months within one calendar year of the project, with the exception of high water events which make the ford unusable for heavy vehicles. Heavy equipment crossings would take place during the instream window (June 15<sup>th</sup> to September 15<sup>th</sup>), the turbidity and fines would only affect juvenile fish directly and adults indirectly. Because of the very small magnitude and pulse duration, there would not be any noticeable change in feeding or migration behavior. It is unlikely that redds would be affected by deposition of fines in this area because it would be so localized. Direct disturbance of redds would not be expected for the same reason; suitable spawning material is not located in the ford.

#### **Occupancy**

The claimant proposes to use two camp trailers as temporary living quarters, along with a portable outhouse and maintenance vehicles during mining operations. The camp site is located west of the proposed mining area and south of North Fork Galice Creek in a level area. Fuel and oil will be stored away from the North Fork Galice Creek and according to State requirements for minimum distance from a watercourse. There would be no delivery mechanism for petroleum products and other hazardous materials to enter the stream during occupancy. Also,

onsite spill kits would eliminate the spread of any potential contamination.

### **Site preparation**

Activities proposed in Alternative 2 to clear the PA for mining would not affect the stream temperature because of the incised nature of North Fork Galice Creek. During site preparation, nearly all vegetation could be removed, except in a 20 foot buffer along the top of bank. Within this strip, no additional trees or shrubs would be removed, and any grass/forbs if existing would remain in place. The removal of vegetation beyond the 20 foot buffer would not increase the stream temperature.

Five trees have been identified as LWD trees within the Planning Area. The analysis within this EA did not consider the removal of vegetation outside of the PA, which appears as a red crosshatch on the Stray Dog map (Appendix 1). Of these five LWD trees, four are within Mining Areas 1 and 2 and are expected to be removed and utilized during the mining operation to construct the bridge. One LWD tree is near the edge of Mining Area 1 and the root system may be damaged during mining operations, this tree is not expected to be removed but may perish due to the damaged to the root system, this tree would remain on site and become CWD. There is one LWD tree located outside of the PA but within the Mining Claim Boundary, this tree is expected to remain standing in an undamaged condition. The rest of the forested stands within Mining Area 1, 2, and, 3 don't contain trees with LWD characteristics or are too great of a distance to contribute LWD to North Fork Galice Creek.

The water diversion point is located approximately 1,000 feet upstream of Mining Areas 1 and 2 on North Fork Galice Creek. The diversion is for 2 cubic feet per second (for a maximum of 1.5 hours) which will not affect fisheries due to only juveniles being present during diversion. Due to low diversion rate and volume, stream levels will not fluctuate dramatically allowing juveniles to leave the area if necessary and then return when diversion is complete. The water diversion would be screened to 3/32-inch in accordance with ODFW and NMFS regulations.

The hydrology analysis predicts no increase in stream temperature stemming from vegetation removal. However, water diversion upstream of the mining claim will increase stream temperature 0.14°F over a period of 1.5 hours. This temporary stream temperature increase would only last while the diversion is occurring and will return to base levels immediately. The temporary stream increase will not be above Oregon DEQ thresholds.

This stream reach does not currently meet ODFW LWD benchmark standards. Although four trees with LWD potential will be removed or damaged from the PA, through mitigation the site will be improved through replanting at densities of 150 trees per acre which will set the site on a positive trajectory.

Refueling would occur **at least 50 feet from the slope break above North Fork Galice Creek.**

The intermittent stream currently flowing through Mining Area 3 will be routed back to its historic stream channel to prevent it from entering the mining site. Re-routing this intermittent stream will improve hydrologic form and function and benefit the Galice Access Road and North Fork Galice Creek by not furthering erosion and contributing road-related sediment into North

Fork Galice Creek and CCH.

## **Mining**

To process the placer deposit, the floating dredge will be used in an excavated pit which would, at times, extend to within 20 feet of the banks of North Fork Galice Creek.

A settling pond outside of the 20 foot buffer would not allow fine sediment into North Fork Galice. Although the water level in the existing pit is above the level of North Fork Galice Creek, and therefore does not exchange water with the creek, excavation of the stationary pit and the migrating pit would not disturb the bank material and would not allow sediment to leak into the North Fork Galice.

Because mining could potentially occur year-round in Mining Area 3, it would occur at a time when juvenile and adult fish are present in adjacent North Fork Galice Creek. However, Mining Area 3 has no hydrologic connectivity to North Fork Galice Creek and therefore any mining-generated turbidity would not be conveyed to North Fork Galice Creek. Absent the conveyance of turbidity, there would not be any change in feeding or migration behavior of the juvenile or adult salmonids. Additionally, there would be no changes or modifications to Coho Critical Habitat.

Due to buffers, seasonal restrictions, and low usage of crossings, there will be immeasurable amounts of turbidity generated immediately following the first fall rains. Also, due to the timing of the first fall flushing event, suspended sediment will be within the RNV and not be distinguishable from background levels. Exposed soils within all Mining Areas during all seasons would be secured in order to prevent water quality issues from entering North Fork Galice Creek. Additionally, within Mining Areas 1 and 2, silt fencing would be placed above North Fork Galice Creek and removed upon completion of reclamation (potentially several years).

Spawning areas that are farther downstream would not be affected by disturbance from mining. Fine sediments which can have a negative effect on spawning gravels and redds would dissipate as they are transported and would not have a substantial effect on the spawning areas downstream of the project site because they are far enough away.

## **Reclamation**

Reclamation would affect fish habitat because a measurable amount of large woody debris (LWD) recruitment potential would be created through the planting of trees within the 3.4 acres adjacent to North Fork Galice Creek. The replacement of the recruitment potential would take place over a period of up to 87 years, matching the average age of trees currently on site. Depending on the number of trees which die from root disturbance and subsequently fall in the creek (as a result of site preparation and mining), there could be an increase in LWD compared to what would have been recruited naturally.

Channel function and dynamics which depend on wood recruitment (e.g., pool formation) would improve, resulting in improved stream complexity and water quality. This would occur at a

faster rate than under the No Action alternative. Adult holding areas and gravel retention would increase as channel function improves, resulting in increased salmonid production. Increased stream complexity would improve rearing habitat, resulting in an increase in juvenile survival.

The only reclamation activity that could affect fisheries is the pulling of the bridge over North Fork Galice Creek. Although, reclamation activities such as pulling the road surface material off the bridge, removal of filter cloth, and removal of logs is not intended to cause sediment to enter North Fork Galice Creek, it is possible that small amounts may, yet would be negligible and localized. Any road surface material accidentally deposited in the stream, during the instream work period, would travel no more than 25 feet and be completely flushed during the first fall rains.

Settling ponds used in both mining methods and in all three Mining Areas would be filled and re-contoured which would eliminate future water quality issues if left open.

#### Cumulative effects OR Summary/Conclusions

- Small amounts of road material with fines would be transported no more than 25 feet where they would settle until flushed by the first fall rains at both the bridge and ford sites.
- There would be no delivery mechanism for petroleum products and other hazardous materials to enter the stream during site preparation, occupancy, mining, and reclamation activities. Removal of vegetation beyond the 20 foot buffer would not increase stream temperature because effective shade would not drop below threshold levels. Low diversion rate and volume, stream levels will not fluctuate dramatically allowing juvenile salmonids to leave the area if necessary and then return when the diversion is complete.
- The temporary stream temperature increase associated with the stream diversion would only last while the diversion is occurring and will return to undisturbed base levels immediately.
- Although four trees with LWD potential will be removed from the site, through mitigation the site will be improved by replanting at densities of 150 trees per acre which will set the site on a positive trajectory.
- Re-routing the intermittent stream in Mining Area 3 will improve hydrologic form and function and benefit the Galice Access Road and North Fork Galice Creek by not furthering erosion and contributing road-related sediment into North Fork Galice Creek and CCH.
- A settling pond outside of the 20 foot buffer would not allow fine sediment into North Fork Galice.

Absent the conveyance of turbidity, there would not be any change in feeding or migration behavior of the juvenile or adult salmonids.

Because of all of the mitigating measures described above, the BLM does not anticipate any cumulative effects from the project if it is implemented as described.

There are no other BLM projects anticipated within the Action Area. Thus there are no cumulative effects.

### **3.4 Wildlife**

Only Special Status Species (Federally Listed, Federal Candidate, Bureau Sensitive, and Survey and Manage wildlife species) known or suspected to be present within the PA or adjacent BLM lands and potentially impacted by the Proposed Actions are addressed in this EA.

BLM is required to address impacts to Threatened and Endangered Species in mining operations (43 CFR 3809.411(a)(2)(ii) and (iii) and 43 CFR §3809.420(b)(7)). While the mining claimant, "...shall take such action as may be needed to prevent adverse impacts to threatened or endangered species, and their habitat which may be affected by operations" (43 CFR 3809.420(b)(7)), it is the BLM's policy to protect, manage, and conserve sensitive species and their habitats such that any Bureau action would not contribute to the need to list any of these species (Bureau Manual 6840.02 and IM OR-2003-054).

#### ***3.4.1 Affected Environment***

##### **Northern Spotted Owl (Federally Threatened)**

Northern spotted owls (NSOs) are closely associated with older forests for nesting, foraging, and roosting throughout most of their range (Forsman et al. 1984; Carey et al. 1990; and Solis and Gutierrez 1990). Suitable spotted owl nesting, roosting, and foraging habitat (NRF habitat) is characterized by forested stands with older forest structure, multiple canopy layers, and a canopy closure of 60% or greater. The best quality NRF habitat has large old trees with cavities, broken tops or mistletoe platforms, large branches, dead standing and fallen decayed trees, and multiple canopies of shade tolerant hardwoods and conifers that support prey base. NRF habitat can also function as dispersal habitat. Dispersal-only habitat for spotted owls is defined as stands that have a canopy closure of 40% or greater and provides cover, food, and protection on a temporary basis to non-nesting owls moving between patches of NRF habitat.

NRF habitat can be further divided into two habitat categories: roosting and foraging (RF) habitat and nesting habitat (N). RF habitat has an average canopy cover greater than 60% and canopy structure is generally single layered. Overstory trees are generally greater than 16 inches in diameter, and the presence of snags and down wood are not considered a requirement. Nesting habitat has high canopy cover (> 60%), a multilayered structure, and large overstory trees >21 inches in diameter. Deformed, diseased, and broken-top trees, as well as large snags and down logs, are also present. Nesting habitat meets all NSO life requirements, including providing for roosting and foraging. These two habitat types are generally combined into the overall NRF category.

The proposed mining operation would occur in spotted owl NRF habitat (RF). The project is located outside of the provincial home-range (1.3 mile radius of the site center or nest tree) of

any known NSO sites.

### **NSO Critical Habitat**

The Proposed Mining area occurs within Critical Habitat for the NSO, specifically a portion of the K LW 2 Subunit of the Klamath West Habitat Unit. This subunit is expected to function for demographic support to the overall population and for north-south and east-west connectivity between subunits and critical habitat units (Federal Register 2012). This subunit is approximately 148,929 acres in size, and facilitates NSO movements between the western Cascades and coastal Oregon and the Klamath Mountains.

### **Fisher (Federal Candidate)**

Fishers are associated with low to mid-elevation forests with a coniferous component, large snags or decadent live trees, large fallen trees for denning and resting, and complex physical structure near the forest floor that provides habitat for fisher prey (Aubry and Lewis 2003). Suitable NSO NRF habitat also adequately describes suitable fisher denning and resting habitat because there is a direct correlation of key habitat features captured in the rating system and fisher habitat (high canopy cover, multi-storied stands, large snags, and large down trees on the forest floor). The proposed mining operation is located in suitable denning and resting fisher habitat.

Forest carnivore surveys using bait stations with motion and infrared detection cameras have been conducted throughout the Grants Pass Resource Area and have detected fishers within 5 miles of the proposed mining area. The extent to which fishers utilize the proposed mining area is unknown, but the general area is occupied by fisher as documented by camera surveys.

### **Survey and Manage Species**

The proposed mining operation would occur in suitable red tree vole (RTV) habitat. RTV surveys were conducted following the Survey Protocol as described in Huff et al. (2012) and no RTV nests were found in the proposed mining area. Because RTV nests were not found, no further analysis of effects to this species is considered here.

### **3.4.2 Environmental Consequences**

#### Alternative 1: No Action

Under the No Action Alternative, future foreseeable actions within the Galice Creek area listed in the introduction of Chapter 3 would alter wildlife habitats. However, special status wildlife species on BLM lands would continue to be protected and conserved following policy and management guidelines. On privately owned lands, predicting future foreseeable actions is difficult due to the multitude of individual landowners. Industrial timber lands are likely to remain in an early to mid-seral rotation, with the vast majority already qualifying as unsuitable habitat across the watershed. Wildlife populations on non-federal lands would most likely remain undetected and unprotected.

Stand conditions within the proposed mining location would remain the same and no habitat modifications would occur. There would be no effects to special status wildlife species or their habitats.

## Alternative 2: Proposed Plan of Operations

### **Northern Spotted Owl (Federally Threatened)**

The proposed mining activities are expected to result in the loss of three acres of NSO NRF habitat. The 3 acres are bisected by the main Galice Creek Road and Galice Creek, and each potential area of impact is the lower portions of a larger NRF stand that continues upslope on either side of the proposed mining area.

Where the mining occurs, the complete loss of NSO habitat is expected. Re-establishment of the new forest stand may be slow to develop because long-term site productivity may be adversely affected due to the mixing, sorting, and displacement of the soils during the mining operation. Even though reclamation would occur on the site by planting native vegetation, the recovery of the site to current NRF conditions could take at least 100 years.

The proposed mining area is located outside of the provincial home-range (1.3 mile radius of the site center or nest tree) of any known NSO sites. This small amount of NRF removal would not preclude new owls from occupying or using the adjacent stands in the future because the Proposed Action would not impact the large block of contiguous NRF habitat upslope from the Planning Area.

### **NSO Critical Habitat**

The proposed mining activities are expected to remove up to three acres of NRF habitat within the Klamath West Critical Habitat Unit. The impacted area constitutes 0.002% of the overall K LW 2 subunit. While the proposed mining activities would remove a few individual large conifer trees (30-42 inches DBH) the overall impact to the function of the Critical Habitat subunit would be insignificant because of the miniscule footprint of the impacts in relation to the total size of the Critical Habitat Subunit.

### **Fisher (Federal Candidate)**

Approximately 3 acres of fisher denning and resting habitat would be removed as a result of the Proposed Action. However, the loss of habitat from the Proposed Action would be negligible and would not preclude fishers from using the BLM lands within the larger, adjacent stands or the watershed as a whole.

Project activity disturbance effects to fishers are not well known. Fishers may avoid roaded areas (Harris and Ogan 1997) and humans (Douglas and Strickland 1987; Powell 1993). Disturbance from the proposed action would be temporally and geographically limited. Fishers have large home ranges and would be able to move away from the Action Area while the disturbance is occurring, without impacting their ability to forage and disperse within their home range. Habitat features, such as large snags and coarse wood, as well as untreated late-

successional forest habitat, would be retained in the adjacent BLM stands and would continue to provide denning and resting habitat within the larger watershed.

## **Summary and Conclusions**

Even when the three acres of potential habitat removal from the mining operation is added with the future foreseeable actions, it is unlikely the project will have cumulative impacts to wildlife species in the Galice Creek Sub-watershed. While, the Proposed Actions may potentially adversely affect local individuals of sensitive wildlife species due to the loss of habitat, this project is not expected to affect long-term population viability of any T&E, Bureau Sensitive, or Survey and Manage wildlife species known to be in the area. Additionally, this project combined with other actions in the watershed would not contribute to the need to federally list any Bureau Sensitive or Survey and Manage wildlife species because of the small scope of the Proposed Action and the presence of a diversity of habitat within the larger Sub-watershed. This project would result in a reduction of less than 0.04% of the late-successional habitat (NRF) within Galice Creek Sub-watershed.

### **3.5 Noxious Weeds**

#### ***Methodology***

- GIS and past survey reports were utilized to query BLM-managed acreage and weed species reported within the PA.
- The PA boundary was determined, for this resource, to be the area of disturbance, which is approximately 3.4 acres according to the mining Plan of Operations.
- Noxious weed population calculations include populations located within the PA, and along the roads.

#### ***Assumptions***

BLM assumes that there are noxious weeds present on private lands within the immediate vicinity (less than 1 mile) of PA, and that although industry is treating a subset of noxious weeds within selected areas, other private landowners are not.

#### ***3.5.1 Affected Environment***

A general description of the Affected Environment for the Stray Dog Plan is located at the beginning of this chapter. In addition to the general description, the affected environment as it specifically relates noxious weeds is described below.

Over the last 150 years activities such as motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and natural processes have introduced and transported noxious weeds into the Rogue Valley. Noxious weeds are defined as plants that are “considered by a governmental agency to be injurious to public health, agriculture, recreation, wildlife, or property” (ODA, 2013). Noxious weeds are spread by the wind and by seed via

attachment to vehicles and vectors such as humans, animals, and birds, and are able to grow on suitable habitat - generally considered as any newly disturbed ground and/or an influx of light due to canopy removal.

Since the 1970's, a recognition that weeds were causing environmental damage resulted in the passage of State noxious weed laws, the Carson-Foley Act of 1968 – Plant Protection Act of 2000, and Presidential executive orders like Invasive Species E.O. 13112, which directs federal agencies to combat noxious weeds on federal lands. Additional direction is provided by the Medford District RMP, which states the district is to “contain and/or reduce noxious weed infestations on BLM-administered land...(p. 92),” and “...survey BLM-administered land for noxious weed infestations...(p. 93).” However, these activities are funding dependent.

The RMP directions for weed management are intended to be met at a landscape level; whether the direction is achieved is not intended to be measured at the site specific level nor with the implementation of each project. Thousands of acres of weed treatments have occurred on federal (and non-federal) lands over the last decade across the Medford District with the RMP-driven objective of containing or reducing – not eradicating - noxious weed populations (Budesza, 2006). In an effort to continue to contain and/or reduce noxious weeds on federal land, the BLM annually treats known weed populations within the Grants Pass Resource Area.

Due to the checkerboard nature of land ownership in the planning area, noxious weed management is challenging because seed sources are scattered throughout the area and across all ownerships. Although BLM treats several hundred acres per year (depending on funding), sources of noxious weeds on private lands surround most of the O&C public lands, and not all private landowners treat noxious weed populations occurring on their respective land(s). In 2014, over 500 acres of BLM land in the Grants Pass RA were treated. Some roadsides within the vicinity (within 5 miles) of the Stray Dog Plan area have been treated for noxious weeds, and some are scheduled for monitoring/re-treatment in 2016.

### ***Pre-Project Clearance – Noxious Weed Survey Results***

The Stray Dog Plan area was surveyed for noxious weeds in 2015. Documented sites within the PA include *Cirsium vulgare* (Bull thistle) *Rubus armeniacus* (Himalayan blackberry), *Centaurea solstitialis* (yellow starthistle), and *Hypericum calycinum* (Aaron's beard).

Based on population sizes observed within the Stray Dog Plan area, the Grants Pass botanist estimated that approximately .10 ac, or 3% (using 3.4 acres as final acreage) of the Plan acreage harbors noxious weeds. One of the species reported, Himalayan blackberry, is commonly found throughout our region and although small, isolated patches might be treated, it is not practical to target for priority treatment due to its predominance across the landscape.

### 3.5.2 Environmental Consequences

#### Alternative 1 (No Action)

##### Direct and Indirect Effects

Under the No Action Alternative, noxious weeds within the Stray Dog Plan area would continue to spread into suitable habitat at an unknown rate. The rate at which noxious weeds spread is impossible to quantify, as it depends on a myriad of factors including, but not limited to, logging on private lands, motor vehicle traffic, recreational use, rural and urban development, and natural processes (Northwest Area Noxious Weed Control Program EIS, p. 59). Table 12 below illustrates how each of these activities affects noxious weed dispersal.

**Table 12: Factors Affecting the Determination of the Rate of Noxious Weed Spread**

Activity	Role in Potential Noxious Weed Seed Dispersal
Private Land	Private lands host a perpetual source for noxious weed seed, which can be dispersed when seeds attach to tires, feet, fur, feathers or feces, or when natural processes such as wind and/or flooding events transport the seed from its source to another geographical vicinity.
Logging on Private Lands	Logging activity presents a key dispersal opportunity for noxious weed seeds per 1) attachment to tires/tracks of mechanized logging equipment, tires of log trucks, and various other logging-related substrates which subsequently transport the seed from its source to another geographic vicinity, 2) creation of openings for potential noxious weeds colonization and 3) a lack of PDFs – such as equipment/vehicle washing, etc. - which attempt to reduce the activity's spread of noxious weed seeds.
Motor Vehicle Traffic (including Log Trucks)	Roads on public land include public use, which results in a plethora of seed-dispersing activities occurring on a daily basis. Private landowners use public roads to haul logs, undertake recreational pursuits, and/or access their properties. This transportation often occurs along BLM-administered roads, which are situated within a checkerboard ownership arrangement. How or when seed detachment occurs is a random event could take place within feet or miles from the work site/seed source, presenting a high likelihood of detachment on public lands.
Recreational Use	The public often recreates on BLM-managed public lands, and can spread seed from their residences to public land in a variety of ways such as attachment to vehicle tires, hikers' sox, shoes, or other clothing, the fur of domesticated animals, etc.
Rural and Urban Development	Rural development occurring within the checkerboard land arrangement often requires public landowners to acquire a Right-of-Way (ROW) from the BLM to legally access their parcel(s). These ROWs, or use of BLM-administered roads is often granted. Please refer to 'Motor Vehicle Traffic' and 'Private Land,' for clarification of how this affects the spread of noxious weeds from private to public lands.
Natural Processes	Wind, seasonal flooding, and migration patterns of birds/animals are a few natural processes that potentially spread noxious weeds, especially from private land to public land. Wind carries seeds, and deposits them at random intervals. High water caused by flooding reaches vegetation (often harboring a noxious weed component) growing on the banks of rivers/creeks/streams, and deposits seeds downstream.

The abovementioned activities would contribute to noxious weed spread, which could degrade some elements of the environment. To predict the rate of this degradation would be highly speculative, as the extent of weed expansion is dependent on so many factors that it is considered impossible to quantify. The degree of degradation would depend on the noxious weed species, as some, such as scotch broom and meadow knapweed, are more intrusive and/or have a higher tolerance to heat generated from wildfires, than others.

Across the Grants Pass Resource Area, the more aggressive species are prioritized and slated for

treatment under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14* under a separate project. However, the success of implementing the weed management plan would be temporary, as logging on non-federal lands, recreational use, rural and urban development, natural processes and vehicle traffic – coupled with the open, previously-disturbed environment where the Stray Dog Plan may occur - will continue to spread noxious weed populations into the Plan Area regardless of activities proposed in this document.

### *Cumulative Effects*

Cumulative indirect effects of noxious weed spread include the potential degradation of wildlife habitat (Rice et. al. 1997, Harris and Cranston 1979), a decline in natural diversity (Forcella and Harvey 1983; Tyser and Key 1988; Williams 1997), and decline in water quality (Lacey et al. 1989); however, a very small amount of the Stray Dog Plan area unit acreage (approximately 3% of unit acreage under Alt. 2) harbored noxious weeds prior to the project, making it difficult to quantify any potential decline in ecosystem health related to existing noxious weed populations, or to quantify the potential decline in ecosystem health related to any additional noxious weed populations potentially established by the activities described in Table 12.

## **Alternative 2 Proposed Action**

### *Direct and Indirect Effects*

In the short term (approximately 1-5 years), proposed activities within the Plan Area –could result in spreading noxious weeds. However, the rate at which this potential spread would occur is unknown due to the indistinguishable causal effect of other activities and factors listed in Table 12 on the spread of noxious weeds. The outcome of the following activities would provide suitable habitat and/or plausible vectors associated with noxious weed colonization;

- Openings caused by mining activities
- Increased vehicle traffic which could increase, or at least perpetuate, weed infestations along road systems via seed dispersal.

Openings and disturbance provide the greatest opportunity for the establishment of noxious weeds. In an effort to address the potential for project activities to increase the rate of spread of noxious weeds, Project Design Features (PDFs) have been included in the project to decrease the potential spread of weeds associated with the Proposed Action. Project Design Features include washing equipment prior to moving it on-site, mulching with certified weed-free straw, and seeding and/or planting newly created openings with native/approved vegetation to reduce the potential establishment of noxious weeds. These PDFs are widely accepted and utilized as Best Management Practices (BMPs) in noxious weed control strategies across the nation (Thompson, 2006). Table 13 delineates the PDFs and their expected implementation results.

**Table 13: Project Design Features and Expected Implementation Results**

Project Design Feature (PDF)	Result of Implementing PDF
Washing vehicles / equipment	Removes dirt that may contain viable noxious weed seeds, thereby reducing the potential for noxious weed spread.
Operating vehicles/equipment during the dry season	Reduces the potential for viable noxious weed seed to be transported and dispersed via mud caked on the undercarriages/tires/tracks of logging equipment.
Seeding and/or planting newly created openings with native/approved seed.	Introduces native/approved vegetation to the site prior to noxious weed seed recruitment, allowing native/desirable plants an advantageous jump-start in reestablishment, which reduces the potential for noxious weed infestation.
Covering disturbed soil with certified weed-free straw	Reduces the potential for erosion and suppresses potential annual weed invasion by covering soil to prevent soil/seed contact needed for germination (UC-IPM, 2014). When combined with seeding with native/approved species, increases the potential for desirable vegetation to germinate and outcompete noxious weeds.

Implementing the suite of PDFs that reduce the potential spread of noxious weeds associated with the Proposed Action, and using native species for seeding/planting newly disturbed openings is expected to result in a similar potential of noxious weed expansion as associated with the No Action Alternative.

In the long term (5-100 years), tree canopies would eventually expand and reduce light levels, creating a less desirable growing site, thus discouraging weeds from growing and expanding within treated areas, because populations typically decline as the amount of light reaching the plants diminishes. Consequently, in the long term, remaining weed populations would be confined to the road prism and adjoining (private) disturbed land as canopy is re-established in treated areas over time.

The effect of implementing Alternative 2 could possibly result in the establishment of new noxious weed populations. Although the *immediate* potential for weed spread would be less with the No-Action Alternative than for the Proposed Action, the potential for the spread of existing noxious weeds and the introduction of new species is considered similar for both Alternatives, because of the inclusion and implementation of all PDFs in Alternative 2, and the fact that under the “No Action” Alternative, populations would continue to establish and spread due to seed transport by vehicular traffic, wildlife, and other natural dispersal methods listed in Table 12.

Indirect effects associated with noxious weed population enlargement are similar to those mentioned in the No Action Alternative, and are known to include, generally, declines in the palatability or abundance of wildlife forage (Rice et al., 1997), declines in native plant diversity (Forcella and Harvey, 1983; Tyser and Key, 1988; Williams, 1997), reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey et. al, 1989), and an overall decline of ecosystem health.

However, considering implementation of Alternative 2, there are three main reasons why potential weed establishment that might be caused by the Proposed Action is not expected to

result in a detectable effect to overall ecosystem health. First, surveys indicate that a very small percentage - 3 % of acreage within the Plan Area - is affected by noxious weeds. Second, these sites located in units proposed for treatment have been reported during pre-disturbance surveys, and some (depending on how aggressive the species is) will receive treatment in 2016 under Medford District's *Integrated Weed Management Plan and Environmental Assessment OR-110-98-14*, which means that the acreage in the Plan Area affected by noxious weeds would approach 0% until ongoing activities listed in Table 12 would potentially re-introduce weeds into the Planning Area (coupled with new sprouts from the established on-site seed bank resulting from the existing populations). Third, as aforementioned, Project Design Features (PDFs) have been established to minimize the rate at which project activities might potentially spread noxious weed seed from outside/adjacent sources.

### *Cumulative Effects*

In order to address the cumulative effects of the Proposed Action on the spread of noxious weeds, the condition of non-federal lands must be considered. However, there is limited available or existing data regarding noxious weed occurrence on local non-federal lands. Therefore, for purposes of this analysis, BLM assumes that 1) there is a perpetual source of noxious/invasive weeds on non-federal lands that can spread to federal lands, especially when the land ownership is checkerboarded, as within the Planning Area, and 2) conversely, that noxious weeds are not established on these lands, and therefore there is a need to reduce the risk of spread of noxious weeds from the federal lands to the adjoining non-federal lands. Seeds are spread by the wind, by animal/avian vectors, natural events, and by human activities - in particular through soil attachment to vehicles. BLM's influence over these causes of the spread of noxious weeds is limited to those caused by human activities. Additional human disturbance and traffic would increase the potential for spreading noxious weed establishment, but regardless of human activity, spread of these weeds would continue through natural forces. Thus, the BLM cannot stop the spread of noxious weeds; it may only reduce the risk or rate of spread.

Given the unpredictable vectors for weed spread, such as the vehicle usage by private parties, wildlife behavior, and wind currents, it is not possible to quantify with any degree of confidence the rate of weed spread in the future, or even the degree by which that potential would be increased by the Proposed Action.

Foreseeable activities within the Planning Area are listed under the No Action Alternative, and are expected to be similar to past and current activities: motor vehicle traffic, recreational use, rural and urban development, timber harvest, road construction, and firewood collection. These types of activities could result in new disturbed sites available for colonization by existing noxious weed populations, and they do offer the possibility of introduction of new noxious weed species to the PA under any Alternative, including the No-Action Alternative. As stated above, there is no available or existing data concerning the rate of weed spread occurring on either federal or non-federal lands as a consequence of these specific types of activities. Also, as discussed above, there is no information on what, if any, increase in the rate of weed spread the Proposed Action would cause, and hence, it is not possible to quantify with any degree of confidence what the incremental effect of the Proposed Action on the spread of noxious weeds would be when added to the existing rate of weed spread caused by past, present, and future

actions.

PDFs exist to reduce the potential that the Proposed Action would contribute to the spread of weed seed and establishment of new populations. PDFs are not intended or expected to completely eliminate any possibility that the Proposed Action would contribute to the spread of weed seed and establishment of new populations; however, PDFs ensure that any incremental contribution of the Proposed Action to the spread of weeds, when added to the rate of weed spread caused by past, present, and future actions, would be so small as to be incapable of quantification or distinction from background levels.

As described above, PDFs for this project include washing vehicles/equipment, mulching openings with certified weed-free straw, and seeding/planting newly created openings with native vegetation. BLM, and other federal and nonfederal organizations involved in combating noxious weed spread, routinely utilize these PDFs in noxious weed control strategies. These PDFs are widely accepted as Best Management Practices (BMPs), as they are inexpensive to implement, easily attainable, and accomplish the objective of reducing the potential of spreading noxious weeds as a result of project-oriented activities.

Data collection would not reduce the inherent speculation in predicting incremental effects of the Proposed Action on the spread of weeds because of (1) the unpredictable natural factors that largely determine whether weeds would spread after project activities, (2) the unlikelihood that future data collection would be able to detect or measure any difference between background rates of weed spread and the rate of weed spread as affected by the Proposed Action and correspondingly reduced by PDFs, and (3) the included PDFs that would reduce, if not eliminate, any project effects on the rate of weed spread that would make the already undetectable effects of the Proposed Action even more undetectable. Finally, further data collection on the rate of spread would not alter the PDF techniques already being applied to reduce that rate of spread. It cannot be over emphasized that under the “No Action” Alternative, noxious weeds are likely to spread over time regardless of whether or not the Stray Dog project occurs, and that rate would not be altered to any detectable degree by the Proposed Action.

### **3.6 Special Status Plant and Fungi Species**

#### ***Methodology***

- Information pertaining to T&E, S&M, and ISSSSP plant sites was obtained from the Medford District BLM Geographic Biotic Observation (GeoBOB) database.
- The PA boundary was determined, for this resource, to be the area of disturbance, which is approximately 3.4 acres according to the mining Plan of Operations.

#### ***Assumption***

- Mining activities will continue to occur on public lands not withdrawn from mineral entry.

### 3.6.1 Affected Environment

#### *Threatened and Endangered (T/E) Plants – NOT PRESENT, NOT AFFECTED*

Of the four federally listed plants on the Medford District (*Arabis macdonaldiana*, *Fritillaria gentneri*, *Limnanthes floccosa* ssp. *grandiflora*, and *Lomatium cookii*), only *Fritillaria gentneri* has a range – as determined by the 2004 US Fish and Wildlife Service (USFWS) Biological Opinion (BiOp) – which extends into the Stray Dog Planning area. The area was surveyed in 2002 to the USFWS's protocol in the course of conducting surveys for Bureau Special Status species for a similar project. No new *Fritillaria gentneri* sites were found. There would be no anticipated effect from the Proposed Action on any federally listed plant.

#### *Bureau Special Status (ISSSSP/BSS) & Survey and Manage (S&M) Plants and Fungi – PRESENT, NOT AFFECTED*

##### ISSSSP Policy – Vascular, Nonvascular, and Fungi

Per BLM Manual 6840 regulations, the agency must not trend a Sensitive species toward federal listing under the Endangered Species Act (ESA). Sensitive species require a pre-project clearance and, if found as a result of pre-disturbance surveys, site management must prevent them from trending toward federal listing. It should be noted that the objective of protecting any ISSSSP species is to prevent discretionary actions from contributing toward the need to list an ISSSSP species; this is achieved at the landscape level.

There is no pre-project clearance or management required for the Strategic Species at the BLM District level, thus Strategic Species will not be analyzed in this document.

##### Background and S&M Standards and Guides – Vascular, Nonvascular and Fungi

Survey and Manage requirements have been re-instated as of April 2013. Proposed activities encompassed in the Stray Dog project do not fit the criteria of any of the Pechman exemptions. However, the project is consistent with the Medford District Resource Management Plan/Forest Land and Resource Management Plan as amended by the 2001 *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (2001 ROD).

The Stray Dog Plan is consistent with the 2001 ROD and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines, as incorporated into the District Resource Management Plan.

For vascular and nonvascular surveys, this project utilizes the 2003 species list.

For vascular and nonvascular surveys, this project utilizes the 2003 species list.

##### Special Status (ISSSSP) – Specific to Fungi

The Stray Dog project occurs in a previously disturbed area, and stands are less than 180 years old. As such, the PA was not surveyed for ISSSSP sensitive fungi. Pre-disturbance surveys for

Special Status fungi are not practical, nor required per BLM – Information Bulletin No. OR 2004-121, which states “If project surveys for a species were not practical under the Survey and Manage standards and guidelines (most Category B and D species), or a species’ status is undetermined (Category E and F species), then surveys will not be practical or expected to occur under the Special Status/Sensitive Species policies either (USFS/BLM 2004a, p.3).” Current special status fungi were previously in the aforementioned S&M categories which did not consider surveys practical, and are therefore exempt from survey requirements (See Table 14). According to the Interagency Special Status Species policy (ISSSP), 14 species of fungi were designated as Sensitive; 10 are suspected to occur on Medford District, while the remaining 4 have been documented (Table 14). As mentioned above, none of these species require surveys.

**Table 14: Bureau Sensitive (ISSSP) Fungi Documented or Suspected on Medford BLM**

Species	S&M	BSS	Suspected or documented on Medford BLM
<i>Arcangeliella camphorata</i>	B	SEN	S
<i>Boletus pulcherrimus</i>	B	SEN	D
<i>Chamonixia caespitosa</i>	B	SEN	S
<i>Dermocybe humboldtensis</i>	B	SEN	S
<i>Gastroboletus vividus</i>	B	SEN	S
<i>Gymnomyces fragrans</i>	B	SEN	S
<i>Helvella crassitunicata</i>	B	SEN	S
<i>Phaeocollybia californica</i>	B	SEN	D
<i>Phaeocollybia oregonensis</i>	B	SEN	S
<i>Psuedorhizina californica</i>	B	SEN	S
<i>Ramaria spinulosa</i> var. <i>diminutiva</i>	B	SEN	S
<i>Rhizopogon chamaleontinus</i>	B	SEN	S
<i>Rhizopogon ellipsosporus</i>	B	SEN	D
<i>Rhizopogon exiguus</i>	B	SEN	D

Of the 4 documented species, 2 (per the Oregon/Washington Geographic Biotic Observation (GeoBOB) database), *Phaeocollybia californica* (PHCA40) and *Rhizopogon ellipsosporus* (RHEL3), have been found in the Grants Pass Resource Area. The closest *Phaeocollybia californica* site exists approximately 6 miles southeast of the closest unit in the Stray Dog area, and the closest *Rhizopogon ellipsosporus* site is approximately 1 mile northeast of the Planning Area. Although these sites and the Planning Area reside within the same HUC 10 watersheds (the Planning Area and both the PHCA40 and RHEL3 sites are in the Hellgate Canyon-Rogue Watershed), dispersal via spore transport and/or mycelia network are improbable, given the degree to which the Planning Area has been previously disturbed by past mining practices, coupled with the terrain (steep ridges, several ravines, and perennial streams) which separates the Planning Area from the closest aforementioned fungi sites.

### ***Survey and Manage – Specific to Fungi***

Because there was no habitat or stand age that triggered S&M Survey protocol, the Stray Dog PA

was not surveyed for fungi. For NEPA decisions signed in fiscal year 2011 and beyond for habitat-disturbing activities in old-growth forests, the 2001 S&M ROD (USFS/BLM 2001, p. 9) gives direction to conduct equivalent effort surveys for category B fungi species if strategic surveys have not been completed for the province encompassing the project. The S&M Standards and Guidelines define old growth forest as an ecosystem distinguished by old trees and related structural attributes that are usually at least 180 to 220 years old (USFS/BLM 2001).

Strategic surveys have not been completed for category B fungi for the province containing the Stray Dog Planning Area, and equivalent effort surveys have not been completed because units were not over 180 years of age (the age triggering fungi surveys if suitable habitat exists).

Based on this information, activities proposed within the Stray Dog project would not jeopardize persistence (S&M species) or contribute toward the need to list (ISSSSP species).

Based on the above information, the likelihood of a sensitive fungi occurring within the 3.4 acre PA is low. As such, BLM asserts that the likelihood of contributing toward the need to list is not probable.

#### Pre-Project Clearance – Vascular and Nonvascular – ISSSSP and S&M species

Vascular and nonvascular plant surveys were conducted in the spring of 2012, and no sites were found.

#### Recommended Plant Site Protection

None, as no sites were located.

### ***3.6.2 Environmental Consequences***

#### **Alternative 1 – No Action**

##### *Direct and Indirect Effects*

#### T&E, ISSSSP Sensitive, and S&M Plants (Vascular and Nonvascular)

There would be no direct or indirect effects to ISSSSP Sensitive or S&M vascular or nonvascular plants, or fungi under Alternative 1 because no physical disturbance would occur that could impact them.

##### *Cumulative Effects*

Alternative 1 would not contribute additional cumulative effects to ISSSSP or S&M vascular, nonvascular, or fungi species. The amount of mid-seral and late-successional forest on BLM-managed lands would remain unchanged.

There are no present or reasonably foreseeable activities within the Stray Dog Plan Planning Area.

## **Alternative 2 – Proposed Action**

### *Proposed Action summary*

Activities outlined within the proposed Stray Dog Plan include the disturbance of approximately 3.4 acres adjacent to (within 700 feet of) Galice Creek. Details of these mining activities are outlined in Chapter 2 of the EA.

### Direct and Indirect Effects of the Proposed Action on ISSSSP/S&M

#### Vascular, Nonvascular, and Fungi Species

#### T&E, ISSSSP Sensitive, & Survey and Manage Vascular and Nonvascular Plants

Under Alternative 2, there would be no direct or indirect effects that would jeopardize the presence or persistence of ISSSSP or S&M vascular plants because no sites requiring protection were located within the Plan area.

#### *ISSSSP Sensitive & Survey and Manage Fungi*

#### ISSSSP Sensitive Fungi

Addressing direct and indirect effects to ISSSSP fungi species is complicated, as no official fungi surveys were performed for ISSSSP sensitive fungi within the Stray Dog Plan area because 1) the area has been heavily disturbed in the past century, and 2) the Plan area includes trees less than 180 years old and do not exhibit stand complexities typically associated with ISSSSP fungi.

Potential habitat for many of the 20 Sensitive species exists in portions of the PA, as much of it exhibits a predominant Douglas-fir component (generally considered an indicator species, but recorded sites commonly have white fir as well). However, predicting presence of Sensitive fungi is difficult because habitat requirements are poorly understood. Because of their rarity, it is unlikely that ISSSSP fungi populations are present in the final treatment units. However, if present, they could be directly or indirectly adversely impacted by the proposed actions in Alternative 2, detailed after the Survey and Manage Fungi Direct/Indirect effects discussion.

#### Survey and Manage Fungi

Addressing Direct and Indirect effects to S&M Fungi species is complicated because no formal fungi surveys have been conducted in accordance with Survey and Manage protocol in the Stray Dog Plan area. Surveys were not completed because 1) the area has been heavily disturbed in the past century, and 2) the area includes trees which are less than 180 years old and do not exhibit the stand complexities as described in the 2001 Survey and Manage Standards and Guidelines, and therefore do not trigger fungi surveys.

While the effects of soil disturbance (resulting from mechanized equipment and green tree removal) to above-ground plants have been well documented, much less information pertaining to below-ground fungi and their associated mycelial network is available.

Given the degree to which the Stray Dog Plan area was previously disturbed by mining activities, potential habitat for many of the 20 Sensitive species does not exist in the PA. However, predicting presence of Sensitive fungi is difficult because habitat requirements are poorly understood. Because of their rarity, coupled with the level of mining disturbance within the past century, it is highly unlikely that populations of Sensitive or S&M fungi are present in the PA. However, if present, they could be directly or indirectly adversely impacted by the Proposed Actions in Alternative 2, as detailed in the Survey and Manage Fungi Direct/Indirect effects discussion in Section 3.6.2.

In the short term (0-3 years), proposed mining actions would cause soil displacement and erosion, potentially affecting fungi species recolonization efforts within the immediate area and along roads.

### ***Commodity Extraction – ground based***

Harvest activities and the related removing, disturbing, and compacting of organic material and mineral, can cause varying degrees of adverse impacts to fungi. The main and most extensive part of the fungus consists of a below-ground mycelia network that resides in the top few inches of mineral soil. Mycelia networks are often connected to multiple trees through their root systems. In one study, fungal mycelia networks ranged in size from 1.5 - 27 square meters (Dahlberg and Stenlid 1995). Disruption of mycelia networks could occur during mining activities, and could include timber removal, construction or ripping of roads or landings, removal of host trees that sustain the ectomycorrhizae, or burning post-harvest slash piles.

Although the effect of these activities on fungi is a short term loss of species diversity and abundance (Amaranthus et al. 1996), more recent studies indicate fungi species persist under a variety of management regimes (Gordon, 2012). In addition, a study conducted on a timber harvesting project by Jennings et al. (2011), suggests “that nutrients critical to soil productivity were reduced by mechanical applications used in timber harvesting, yet soil bacteria and fungi, essential to mediating decomposition and nutrient cycling, appeared resilient to mechanical disturbance.”

Alternative 2 presents a potential short term (0-3 years) risk of impacting Sensitive/S&M fungi, if present, because it proposes temporary roads and the harvesting of trees. These activities would involve soil disturbance, and therefore, mycelium disturbance, if mycelium are present. However, green trees will be left intact, and root systems associated with green trees serve as refugia for many ectomycorrhizal (EM) fungi mycelia (Luoma et al. 2006). Thus, the BLM assumes that although a Sensitive/S&M species may incur a short term setback, the species would re-colonize the area over the long term (4-100 years).

### ***Road / Landing Construction***

Potential direct and indirect effects to fungi resulting from road/settling pond construction are similar to the effects of logging, albeit on a smaller scale. While roads do not typically involve as much affected acreage as timber units, they have a period of heavy use by log trucks and logging equipment, resulting in concentrated soil compaction.

A recent study has demonstrated that roads that are sub-soiled after use are colonized by EM fungi which, in addition to other findings, suggests that disturbance on the forest floor has less of an effect to soil microbial communities (including mycelial networks) than overstory removal (Jennings et al 2011). This would pertain to the proposed reclamation activities proposed in the Plan. In addition, green trees are present and are typically within 10 feet of the roadside. Therefore, a refugia likely exists for fungi mycelia – including ISSSSP and S&M fungi species, if present. Although there may be short term (0-3 years) effects to mycelia networks, no long term (4-100 years) effects that threaten persistence of ISSSSP/S&M are expected.

Considering this information and the existing status of this site, it is unlikely that ISSSSP Sensitive Status or Survey and Manage vascular, nonvascular, or fungi species would trend toward listing (ISSSSP) or cease persisting (S&M) as a result of implementing the activities proposed in Alternative 2.

### ***Cumulative Effects for ISSSSP Sensitive/S&M Vascular, Nonvascular, and Fungi***

Information is not available for rare plant populations in the Stray Dog Plan area prior to BLM botanical surveys, which began within the last 35 years. However, past activities such as mining, logging, road building, and other present and foreseeable activities in the Stray Dog PA likely affected Sensitive / S&M vascular, nonvascular and fungi species by damaging or destroying individuals / populations, or reducing or degrading suitable habitat.

Rare populations of Sensitive fungi on 3.4 acres would potentially be cumulatively affected by the proposed project activities. However, because of their rarity, it is unlikely that ISSSSP Sensitive fungi are present in the Stray Dog Plan PA. Therefore the risk is low that ISSSSP fungi would be impacted; the same holds true for Survey and Manage A & C fungi. Protection of species at the landscape level ensures Sensitive species will not trend toward listing and that S&M species will persist. The assumption is made that protecting known sites (current and future found) of these Sensitive and S&M (categories A-E) fungi, in addition to conducting large-scale inventories throughout the Pacific Northwest, will be adequate in ensuring that this project and future projects would not contribute to the need to list them or jeopardize their persistence (USFS/BLM 2001, p. 3).

### **3.7 Cultural and Paleontological Resources**

For purposes of this analysis, cultural resources are defined as the physical remains of past human activities including objects, features, sites and landscapes, as well as historic buildings and structures. Elements of natural landscapes which may be associated with the cultural practices or beliefs of Native Americans are also considered cultural resources. Humans relate to their environment through their culture. Because of this, cultural uses of the natural environment, the built environment and human social institutions are an important part of any NEPA analysis. Paleontological resources are defined as the fossilized remains or imprints of past organisms. They provide information about the history of life on earth, and teach us about the interrelationships between ecosystem components over time.

## ***Methodology***

NEPA requires the federal government to preserve important historic, cultural, and natural aspects of our national heritage. To accomplish this, federal agencies use the Section 106 process set forth in National Historic Preservation Act as a framework for identifying and evaluating historic properties and assessing effects to these properties. The linkage between the Section 106 process and the mandate to preserve our national heritage under NEPA is well understood and is formally established in 36 CFR 800.3b and 800.8.

The BLM Medford Districts is party to the *State Protocol between the Oregon-Washington State Director of the Bureau of Land Management and Oregon State Historic Preservation Office* (Protocol). The Protocol provides a streamlined Section 106 review process for most undertakings, including the proposed project.

## ***Assumptions***

- Activities associated with the Proposed Action are not expected to directly or indirectly affect cultural resources that are eligible for the National Register of Historic Places (NRHP).
- Activities associated with the Proposed Action are not expected to directly or indirectly affect properties of traditional religious and cultural significance to contemporary Native American groups.
- Activities associated with the Proposed Action are not expected to directly or indirectly affect paleontological resources as defined by the Paleontological Resources Protection Act (PRPA).

### ***3.7.1 Affected Environment***

For a broad historical overview of the human or cultural mechanisms that have influenced the Planning Area see the Cultural and Paleontological Resources Specialist Report contained in the Administrative Project Record.

For the purpose of analysis, cultural resources are divided into three categories: prehistoric and historic archaeological sites and culturally significant resources. While this division does not necessarily alter the way in which the BLM manages a given tract of land, it does provide a better understanding of properties that require protection.

Archaeological sites, primarily historic, are expected to occur within the Planning Area. The cultural resource sensitivity of lands therein is considered to be high due to the area's rich mining history. Paleontological resource sensitivity within the Planning Area is considered to be low, and to date, no known paleontological resources are known to exist in the area.

### **3.7.2 Environmental Effects**

#### **All Alternatives**

While many intact features were observable, the site has been subject to extensive modern disturbances including contemporary mining activities. Although documentary information provides some context for the mine, the site cannot be directly associated with any people, places or events that are historically significant at the national, regional or local levels. Nor does the site exhibit unique design. The integrity of the site has been greatly compromised, and in some instances destroyed. Based on the heavy disturbance and the lack of diagnostic artifacts, the site is unlikely to yield significant information regarding the history and archaeology of southern Oregon. The site was therefore determined to be ineligible for the National Register of Historic Places. The project will have no effect on historic properties as defined by the NHPA.

Because of the information stated above, none of the proposed Alternatives would have direct or indirect effects on cultural resources, there are no eligible properties located within the Area of Potential Effect as defined by Section 106 of the NHPA.

## Chapter 4 List of Preparers

Name	Discipline	Primary Responsibility
Kirby Bean	Geology	Project lead
Jonas Parker	Hydrology & Soil Science	Hydrology & Soils
Mike Crawford	Fisheries	Fisheries
A.J. Donnell	Fisheries	Fisheries consultation
Rachel Showalter	Botany	Noxious weeds/sensitive species
Jason Reilly	Wildlife	Wildlife
Erica Freeman	Engineering	Engineering
Sarah Davison	Silviculture	Port-Orford-cedar
Julie Arwood	Archeology	Cultural resources
Sarah Queen-Foster	Forester	Timber Resources
Brian Lawatch	Writer/Editor	Document preparation
Ferris Fisher	NEPA Planner	Document preparation/NEPA compliance

## **Chapter 5      Agencies and Persons**

### **5.0      Public Comment Period**

A formal 15-day public comment period will be initiated when the legal notice is published in the *Grants Pass Daily Courier*. If you would like a hardcopy of the EA, one may be obtained at the Grants Pass Interagency Office or by contacting Ferris Fisher, Planning and Environmental Coordinator at (541) 948-5864. You may also access the project information on the BLM ePlanning website at <http://tinyurl.com/BLMePlanning-StrayDog>. Written comments should be addressed to Allen Bollschweiler, Grants Pass Field Manager, at 2164 NE Spalding Avenue, Grants Pass, OR 97526. For comments to be considered, they must be received within the 15 day public comment period following publication of the legal notice in the *Grants Pass Daily Courier*.

### **5.1      Consultation**

#### ***5.1.1    United States Fish and Wildlife Service (USFWS)***

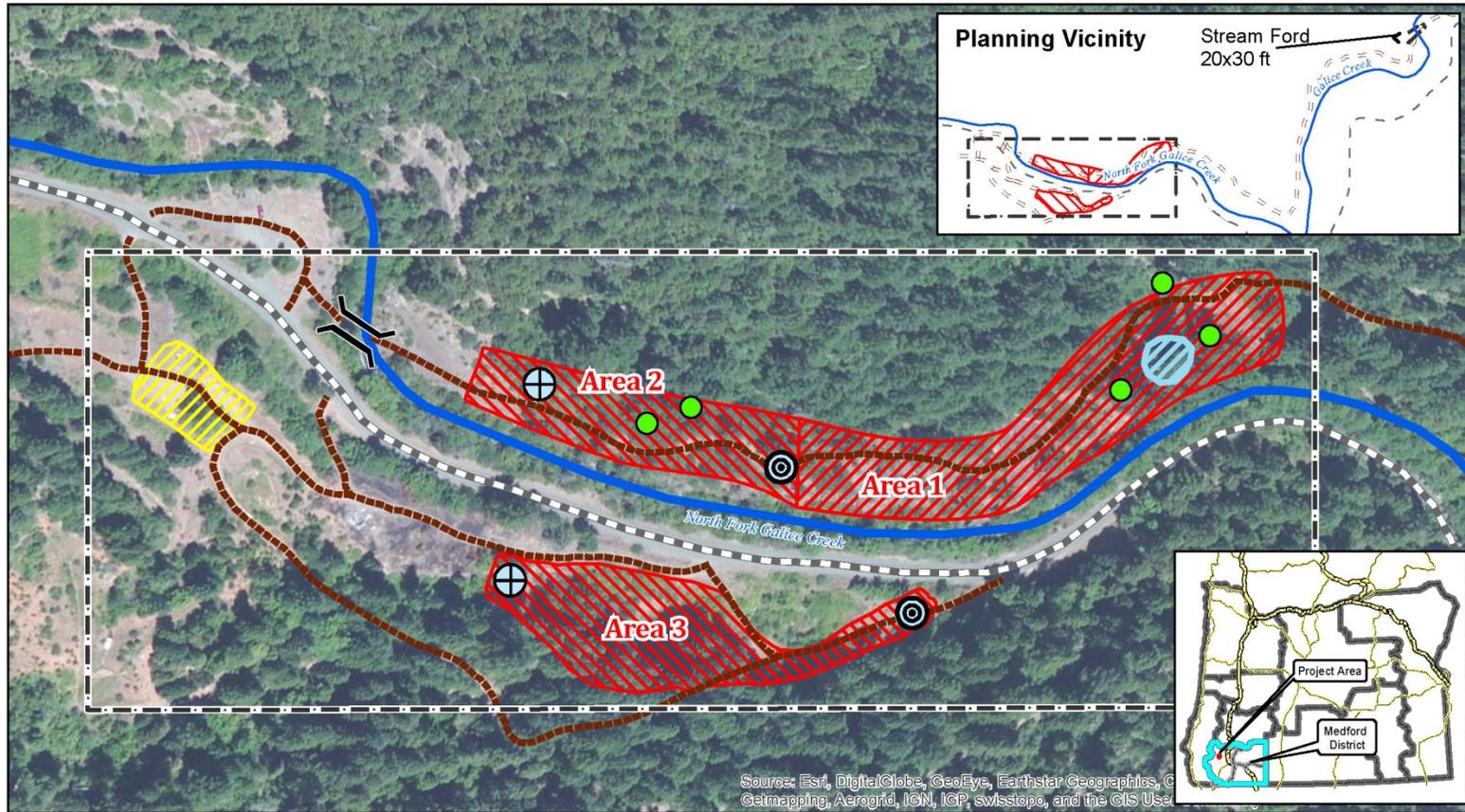
The Planning Area occurs in spotted owl roosting/foraging habitat which is a component of nesting, roosting, and foraging habitat. The project is located outside of the provincial home-range of any known NSO sites. The Planning Area occurs within NSO critical habitat. The Proposed Action may affect NSO habitat, therefore consultation with the USFWS is required. The results of consultation will be reflected in the Decision Record for this project.

#### ***5.1.2    National Marine Fisheries Service (NMFS)***

Consultation with the National Marine Fisheries Service is required for the Proposed Action because there may be possible effects to Endangered Species Act listed fish and their critical habitat. Southern Oregon Northern California Coast Coho Salmon (SONCC) and SONCC critical habitat is present within the Planning Area. With the implementation of applicable BMPs, PDFs and CoA the effects from the Proposed Action on SONCC and its critical habitat are expected to be greatly reduced. The Decision Record for this project will reflect any recommendations in the NMFS consultation document.

# Appendix 1 Project Map

## Stray Dog Mining Plan of Operations Environmental Assessment Map (OR66961)



Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/Airphoto, IGN, IGP, swisstopo, and the GIS User Community



- |  |                                   |  |                                 |
|--|-----------------------------------|--|---------------------------------|
|  | temporary pond (initial location) |  | camping/ equipment staging area |
|  | temporary pond (final location)   |  | stationary pond                 |
|  | Large Woody Debris Trees          |  | Mining Method 1                 |
|  | unpaved road                      |  | Mining Method 2 and 3           |
|  | paved road                        |  | Stray Dog Mining Claim Boundary |
|  | N. Fork Galice Creek              |  | log bridge                      |



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

## Appendix 2 Environmental Elements

In accordance with law, regulation, executive order and policy, the interdisciplinary team reviewed the elements of the human environment to determine if they would be affected by the Proposed Action described in Chapter 2 of the EA. The following table summarizes the results of that review. Those elements that are determined to be important to the decision making process will define the scope of environmental concerns analyzed in Chapter 3 of this EA.

Table 15 contains supplemental authorities that may apply to the Proposed Action. Table 16 contains other environmental elements that may be pertinent to the Proposed Action. Both tables include the interdisciplinary team’s analysis of environmental impacts for each element in the table assuming the Proposed Action was implemented.

**Table 15: Supplemental Authorities to be considered (BLM Handbook 1790-1 Appendix 1)**

This table lists some of the other authorities that may apply if the Proposed Action (Alternative 2) described in the Environmental Assessment was implemented.

Critical Elements of the Human Environment	Status 1) Not Present 2) Not Affected 3) Affected	Interdisciplinary Team Remarks
Air Quality (Clean air Act)	Not Affected	No burning is associated with the Proposed Action.
Areas of Critical Environmental Concern (ACEC)	Not Present	The Planning Area is not located within an ACEC
Cultural, Historic, Paleontological	Not Affected	The Proposed Action will have No Effect to cultural resources. See Section 3.7. No known Paleontological resources exist within the Planning Area.
Energy (Executive Order 13212)	Not Present	
Prime or Unique Farm Lands	Not Present	
Flood Plains (Executive Order 11988)	Not Affected	The Planning Area is located within a flood plain but this element is not affected due to the incised nature of Galice Creek. The historic flood plain has been altered by mining practices and no longer functions as a flood plain.
Hazardous or Solid Waste	Not Affected	BMPs, PDFs, and CoA are incorporated into the Proposed Action which will prevent any effects to this element.
Native American Religious Concerns	Not Affected	Consultation with Tribes has not identified cultural resource concerns within the Planning Area.
Threatened or Endanger Fish Species or Habitat	SONCC Present	See Chapter 3.3
Threatened or Endanger Plant Species or Habitat	Not Present	See Chapter 3.6
Threatened or Endanger Wildlife Species, Habitat, and/or Designated Critical Habitat	Present	See Chapter 3.4

<b>Critical Elements of the Human Environment</b>	<b>Status</b> 1) <b>Not Present</b> 2) <b>Not Affected</b> 3) <b>Affected</b>	<b>Interdisciplinary Team Remarks</b>
Water Quality (Surface and Ground)	Temperature: Affected	Although shade would be removed from the primary shade zone, there will be no net increase of stream temperature. The stream diversion would increase stream temperature by a maximum of 0.14°F, but only for the time it takes the settling pond to be filled.
	Chemical/Nutrient Contamination: Not Affected	Refueling and storage of hazardous material will occur away from streams and will therefore be hydrologically disconnected from the stream network.
	Sediment: Not Affected	Although some sediment may enter the stream network (associated with the bridge and stream ford), it would be immeasurable and quickly flushed following the first fall rain.
Wetlands (Executive Order 11990)	Affected	There is a seasonal wetland complex in Mining Area 3. However, these wetlands are artificial and non-functional due to human manipulation (stream routing). These “wetlands” may be excavated during mining activities and not reclaimed. Instead, the stream which has been artificially routed to fill the wetlands will be returned to its historic path, ultimately improving hydrologic form and function in the area.
Wild and Scenic Rivers	Not Present	There are no eligible, suitable, or designated Wild and Scenic Rivers within the Planning Area.
Wilderness	Not Present	

**Table 16: Other Elements of the Environment.**

This table lists other elements of the environment which are subject to requirements specified in law, regulation, policy, or management direction and the interdisciplinary team’s predicted environmental impact per element if the Proposed Action (Alternative 2) described in the EA was implemented.

<b>Critical Elements of the Human Environment</b>	<b>Status</b> 1) <b>Not Present</b> 2) <b>Not Affected</b> 3) <b>Affected</b>	<b>Interdisciplinary Team Remarks</b>
Essential Fish Habitat (Magnuson-Stevens Fisheries Conservation and Management Act)	Present	See Chapter 3.3: Fisheries
Recreation	Not Affected	There are no developed recreation sites in the Planning Area. There are no impacts anticipated to dispersed recreation used by hikers, campers, hunters, and off-highway vehicle use.
Rural Interface Areas (RMP, Map 13)	Not Present	
Special Areas (not including ACEC)	Not Present	
Special Status Species (Not including T/E): Plant Species/Habitat	Not Present	See Chapter 3.6: Special Status Plant and Fungi Species

Critical Elements of the Human Environment	Status 1) Not Present 2) Not Affected 3) Affected	Interdisciplinary Team Remarks
Special Status Species (Not including T/E): Fish Species/Habitat	Not Affected	See Chapter 3.3: Fisheries.  There is one federally threatened fish species that occurs in the Planning Area, the Southern Oregon Northern California Coast (SONCC) Coho Salmon. North Fork Galice Creek contains federally designated SONCC Coho Critical Habitat. BLM sensitive species include Klamath Mountain Province (KMP) steelhead and the SONCC Chinook.  The main mechanism for erosion and sediment delivery is disturbed, bare soil, steepness of slope, and water routing the sediment to the stream. Due to the small scale of disturbed soil and the implementation of BMPs, PDFs, and Conditions of Approval (such as the minimum 20 foot no-entry vegetative buffer between Mining Areas 1 and 2, rerouting the historic stream channel in Mining Area 3, seasonal restrictions, and limited use of stream crossings) there would be no causal effect to coho critical habitat and essential fish habitat in North Fork Galice Creek.
Soil Productivity	Affected	Currently, soils have low productivity and in some instances are classified as “dumps” due to historic manipulation. Mining and subsequent reclamation activities will actually improve long-term soil productivity.
Soil Erodibility	Not Affected	The proposed project is located on gently sloping to flat terrain. Access roads are stable and will be only lightly used. Mining areas will be reclaimed and therefore risk of erodibility will be reduced. Stream bed and banks won't be manipulated.
Soil – Mass Wasting	Not Affected	All proposed activities will not increase the risk of landslides or debris flows.
Bird Species of Conservation Concern (BCC) 2008 – Bird Conservation Region 5	Not Affected	Due to the small area of disturbance, BCC species are not expected to be affected by the Plan activities.
Special Status Species (Not including T/E): Species/Habitat	Not Present/ Not Affected	
Water Resources (Not including water quality)	Not Affected	Downstream water right holders will not be affected because of their distance from the project and the temporary nature of the proponent's water diversion. Sediment inputs to the stream will be immeasurable and within the RNV.
Greenhouse Gases and Carbon Storage	Not Affected	Due to the small area of disturbance and to the small scale of the project, carbon dioxide emissions resulting from the project is minuscule when compared to a typical timber sale, which itself is extremely minuscule when compared to the 2016 worldwide and United States emissions estimates.
Water Quantity	Not Affected	ECA and roaded area are both well below peak flow enhancement thresholds. The water diversion (2cfs) is temporary in nature and will immediately return to base flows.
Late-successional Forest	Not Affected	Due to the small area of disturbance, the larger Late-successional Forest would not be disturbed/affected.
Fire Risk	Not Affected	During mining activities, the Proponent would be required to follow all applicable PDFs/BLMs/CoA. During reclamation activities, vegetative material would be dispersed across the site, reducing the fire hazard.
Port-Orford-cedar	Not Present	See the Port-Orford-cedar Risk Key Analysis in Appendix 4.

Critical Elements of the Human Environment	Status 1) Not Present 2) Not Affected 3) Affected	Interdisciplinary Team Remarks
Visual Resources	Not Affected	The proposed Plan is located in VRM Class IV lands. VRM Class IV lands are managed “for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention” (BLM 1995, p. 70). All applicable PDFs/BMPs will be used to limit impacts to visual resources.

## Appendix 3 Aquatic Conservation Strategy Assessment

The Aquatic Conservation Strategy (ACS) was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The ACS must strive to maintain and restore ecosystem health at watershed and landscape scales to protect habitat for fish and other riparian-dependent species and resources and restore currently degraded habitats. This approach seeks to prevent further degradation and restore habitat over broad landscapes as opposed to individual projects or small watersheds (USFS/BLM 1994, p. B-9).

### ACS Components:

#### *Riparian Reserves (ACS Component #1)*

Riparian Reserves (RRs) were established. The ROD/RMP (BLM 1995, p. 26) specifies RR widths equal to the height of two site potential trees on each side of fish-bearing streams and one site-potential tree on each side of perennial or intermittent non-fish bearing streams, wetlands greater than an acre, and constructed ponds and reservoirs. RR widths were developed using the Regional Ecosystem Office approved methodology in determining site potential tree heights. This methodology uses average site index computed from inventory plots throughout the fifth field watershed. The proposed project is located in Hellgate Canyon-Rogue River HUC 10 watershed. The site potential tree height for the Hellgate Canyon-Rogue River is 185 feet. The proposed project is located within a Late Successional Reserve (LSR) and therefore does not have designated RRs as LSRs are typically managed the same as RRs. For the purpose of this proposed project, all BLM managed lands within one or two site potential tree heights will be managed the same as if the lands had RR designation.

#### *Key Watersheds (ACS Component #2)*

Key Watersheds were established “as refugia . . . for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species [ROD/RMP, p. 22].” Hellgate Canyon-Rogue River, 93,316 acres, is not a Tier 1 Key Watershed.

#### *Watershed Analysis (ACS Component #3) and other pertinent information:*

In developing the project, the Hellgate Canyon-Rogue River Watershed Analysis was used to evaluate existing conditions, establish desired future conditions, and assist in the formulation of appropriate alternatives. The Hellgate Canyon-Rogue River Watershed Analysis is available for public review at the Medford District office or can be viewed under “Plans & Projects” on the Medford District website at <http://www.blm.gov/or/districts/medford/plans/inventas.php>.

#### *Watershed Restoration (ACS Component #4)*

Route reconstruction and route decommissioning of non-system access routes would occur under the proposed project. The objectives of decommissioning include: improve water quality by reducing short and long term road related sediment; restore hydrological

processes modified by water routing and compaction; reduce road maintenance cost; and reduce impacts to aquatic and wildlife resources.

Numerous stream enhancement projects have been implemented in the Hellgate Canyon-Rogue River Watershed by both the USFS and BLM. These include LWD and boulder placement to promote channel complexity and creation of spawning habitat.

### **Range of Natural Variability within the Watershed:**

Based on the dynamic, disturbance-based nature of aquatic systems in the Pacific Northwest, the range of natural variability (RNV) at the site scale would range from 0-100 percent of potential for any given aquatic habitat parameter over time. Therefore, a more meaningful measure of natural variability is assessed at scales equal to or greater than the watershed scale. At this scale, spatial and temporal trends in aquatic habitat condition can be observed and evaluated over larger areas, and important cause/effect relationships can be more accurately determined.

Natural disturbance events to aquatic systems in the Pacific Northwest include wildfires, floods, windstorms, and landslides. “Historic fire frequency in this area can be as low as 15-30 year intervals for ponderosa pine and mixed conifer types (Agee 1993). Most of the areas in this watershed have not had any fire events in the last 70 years, and often much longer than that, resulting in stands that have an abnormally high fire hazard.

“Fire has also greatly affected the vegetation patterns in the watershed. Frequent, low intensity fires were the rule in this area, caused by both lightning and Native American ignitions. Effective fire suppression has allowed many areas to develop a higher level of stocking of small Douglas fir, hardwoods or brush. This shift in plant species composition and density in some areas has generated concerns for long-term forest health. The high density of small trees and brush may result in large, intense fires or widespread disease or insect damage. The extent and locations of these conditions are not well documented, but are known to exist.

The Planning Area is located within the Klamath geomorphic province. Soils in the project area are primarily derived from metavolcanic and metasedimentary rock types from the Specker, Josephine, Vermisa, and Beekman Series – most of which is now highly weathered and eroded.

Timber harvesting, mining, and road construction over the past 100 years have increased the frequency and distribution of landslides above natural levels in the Hellgate Canyon – Rogue River Watershed. Since implementation of the Northwest Forest Plan, there has been a downward trend in landslide incidence that is associated with improved management practices such as better road building and timber harvest techniques, road maintenance, and implementation of RRs on BLM managed lands. Additionally, mining occurs far less today than historically. On BLM-managed land, future landslides, occurring mostly during large storm events, are expected to deliver large wood and rock fragments to lower-gradient streams. This is expected and is a direct result of RR protection and the recognition of their role as critical source areas for large wood and sediment to downstream habitats. As a result, these events more closely resemble landslides within relatively unmanaged forests. These disturbance events are the major natural sources of sediment and wood to a stream system and are very episodic in

nature.

Due to the dynamic nature of these disturbance events, stream channel conditions vary based on the time since the last disturbance event. This results in a wide range of aquatic habitat conditions at the site level. Site level habitat conditions have been summarized by Oregon Department of Fish and Wildlife (ODFW) habitat surveys. ODFW Survey data exist for many of the stream reaches in the Hellgate Canyon – Rogue River Watershed including Galice and North Fork Galice Creek.

### **Planning Area Habitat Summary**

Surveys within Galice Creek indicated approximately 10.0% fines and 48.0% gravel in riffle units (see Table 11), while ODFW surveys found no riffle units with North Fork Galice Creek. These levels would receive ratings of *adequate* and *desirable* for sediment using the ODFW Habitat Benchmark rating system. Pool habitat components accounted for 15.4 percent of overall habitat units and were rated as *adequate*. Surveyors counted an average of 0.1 pieces of wood and 1.8 cubic meters of wood per 100 meters of stream. Both of these levels received ratings of *undesirable*.

### **Changes to Aquatic Habitat**

Changes in stream flow can result from water withdrawals and various land use activities affecting storm water runoff, infiltration, storage, and delivery. In this watershed, factors such as placer mining, water diversion, and conversion of forest land to agricultural use are significant (BLM 1999). Additionally, many tributaries within the Hellgate Canyon-Rogue River Watershed have been cleaned (had large wood removed) or were salvage logged.

**Table 17: Individual Aquatic Conservation Strategy Objective Assessment**

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
	<p><u>Scale Description:</u> The proposed mining area identified in this project is located in two HUC 14 drainages totaling 2,203 acres in size. The BLM manages approximately 1,516 acres in these drainages (69%). The proposed mining area (3.4 acres) represents a maximum of 0.15% of the Planning Area, and 0.22% of the BLM-managed lands in the combined drainages.</p>	<p><u>Scale Description:</u> This project is located in the Hellgate Canyon-Rogue River HUC 10 watershed. This watershed is 93,316 acres in size. The BLM manages approximately 37,678 acres in this watershed (40%). The proposed mining area (3.4 acres) represents far less than 1% of the total watershed area and far less than 1% of the BLM-managed lands in the watershed.</p>
<p><b>1.</b> 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.</p>	<p>The distribution, diversity, and complexity of features in and adjacent to the proposed mining site contain few features of unique value. However, a riparian buffer of at least 20 feet will be maintained and seasonal restrictions will be observed so as to better protect aquatic resources. This buffer will protect stream bed and banks from disturbance.</p> <p>While mining will effectively eliminate complexity within the riparian area, existing conditions are not desirable based on ODFW benchmark standards. And in fact, reclamation activities following mining will set the affected 3.4 acres on a positive trajectory; a trajectory which will improve the distribution, diversity, and complexity of the site.</p>	<p>Owing specifically to the reclamation activities proposed at this site, the treatment would also speed attainment of this objective at the watershed scale.</p>
<p><b>2.</b> Maintain and restore spatial and temporal connectivity within and between watersheds</p>	<p>At the scale of the project, riparian buffers will allow for connectivity up and down the stream corridor. While 3.4 acres within the two project drainages will be mined, the small footprint of the project will not impede spatial and temporal connectivity within and out of the drainages.</p>	<p>Within the watershed, the proposed project would have no influence on aquatic connectivity. Therefore this treatment would maintain the existing connectivity condition at the watershed scale.</p>

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
<p><b>3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations</b></p>	<p>Up to 3.4 acres of Riparian Reserve will be mined and reduced to zero canopy cover. However, the effective shade provided by the stream buffer will remain adequate for the primary shade zone. Removal of vegetation beyond the 20-foot buffer will reduce canopy cover in the stream by up to 17 percent, but never below 70 percent.</p> <p>In addition, stream buffers established on North Fork Galice Creek would prevent disturbance to stream channels and stream banks. All other aquatic resources including intermittent tributaries, springs, and wetlands will either be directed away from disturbance or not be affected due to lack of proximity and hydrologic connectivity. ECA will increase, but even at the scale of the two drainages, ECA thresholds will not be crossed. Therefore, the proposed treatments would maintain the physical integrity of the aquatic system at the site scale.</p>	<p>The proposed project would eliminate canopy cover and increase ECA; however it would essentially go unnoticed at the larger watershed scale. Therefore, this project would also maintain the physical integrity of the aquatic system at the watershed scale.</p>
<p><b>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.</b></p>	<p>A minimum twenty foot No Touch buffer along North Fork Galice Creek. Any stream or groundwater entering the project area will be routed away so as to prevent erosion and sedimentation. Stream canopy would remain in excess of 70% in North Fork Galice Creek. Silt fences or similar sediment control devices will be installed between all mining activities and any aquatic resources. The low water stream ford across Galice Creek and the bridge across North Fork Galice Creek will be installed and used only during the dry season. In both cases, stream channels and banks will not be altered. The intermittent tributary flowing through mining area #3 will be routed back into its historic stream channel thus minimizing erosion, sedimentation, and bank failure. Camping and hazardous material storage will be at an excess of 150 feet from North Fork Galice Creek. Water diversion will be temporary (maximum 1.5 hours) in nature and will only increase stream temperature by a degree or two and quickly return to baseline conditions as soon as the diversion stops; stream temperatures will never exceed thresholds.</p> <p>This treatment would maintain the existing water quality at the site scale.</p>	<p>Due to small footprint of the proposed project and lack of significant effects to water quality to the project level, this project would also maintain water quality at the watershed scale.</p>

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
<p><b>5. Maintain and restore the sediment regime under which aquatic ecosystems evolved.</b></p>	<p>As mentioned above, twenty foot buffers established on North Fork Galice Creek and sediment retention devices would prevent disturbance to stream channels and stream banks and intercept surface run-off allowing any sediment transported by overland flow to settle out before reaching active waterways. Additionally, the intermittent tributary flowing through mining area #3 would be routed back into its historic channel thus improving its sediment regime. This project would maintain the existing sediment regime.</p>	<p>Due to small footprint of the proposed project and lack of significant effects to the sediment regime at the project level, this project would also maintain sediment regimes at the watershed scale.</p>
<p><b>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.</b></p>	<p>The project would involve removal of vegetation beyond 20-feet from the upper terrace above North Fork Galice Creek. Canopy cover and effective shade would be reduced, but not to an extent that could potentially influence in-stream flows.</p> <p>Water diversion on North Fork Galice Creek will temporarily reduce summer stream flows by up to a maximum of 2cfs. Once the proponents settling ponds have been filled (after approximately 1.5 hours), the diversion will be stopped and flows will return to normal. In this way, instream flows will only be temporarily altered and not permanently changed.</p> <p>The intermittent stream flowing through Mining Area 3 will be routed back into its historic stream channel which will effectively cut off the largest water contributions to an artificial wetland complex. However, these wetlands have filled in with fine sediment and are of low value. Groundwater at the wetland complex will be adequate to maintain soil moisture and site ecology.</p> <p>Large wood routing will not change at the site level for the worse – in fact it may actually improve because site reclamation calls for recontouring the hillslopes which are currently covered with cobble tailings. Although several LWD trees capable of reaching North Fork Galice Creek will be removed, they will be replaced by planted seedlings at a higher and more diverse density which will eventually replace the lost pieces and improve the riparian vegetation community. This project would maintain stream flows within the RNV at the site scale.</p>	<p>While flow regimes may be temporarily decreased at the project scale, at the scale of the Watershed, they would go unnoticed. The summer contributions to the Rogue River which is regulated by dam releases are miniscule and a reduction of 2cfs for 1.5 hours would not be measureable. Therefore, at the larger watershed scale, the effects of these activities would also be maintained.</p>

ACS Objective	Site/Project Scale Assessment	Fifth-Field Watershed Scale Assessment
<p><b>7.</b> Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and woodlands.</p>	<p>Based on field surveys and personal observations, North Fork Galice Creek has no floodplain through most of its course. The stream is heavily incised and armored.</p> <p>In Mining Areas 1 and 2, the proponent would be operating &gt;20 feet from the stream channel and also at an unknown elevation above the stream surface and water table.</p> <p>In Mining Area 3, the artificial wetlands will lose their primary water input, but that intermittent tributary will be restored to its historic condition which is more desirable. Therefore, this project would maintain existing floodplain conditions, however impaired, at the site scale.</p>	<p>At the watershed scale, this project would also maintain stream interactions with the floodplain and respective water tables within the RNV.</p>
<p><b>8.</b> 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.</p>	<p>While this project would disturb the species composition of adjacent degraded riparian and wetland communities, upon project completion reclamation will serve to restore both communities and set them on a better trajectory.</p> <p>Surface and bank erosion will be arrested with sediment control devices. Channel migration will not be affected by the proposed project because North Fork Galice Creek is heavily incised, armored, and resistant to change.</p> <p>Although this project would have short term losses to riparian and wetland communities, these areas are currently degraded, artificially placed, and of low value. Reclamation will improve both communities at the site scale.</p>	<p>The proposed reclamation activities are designed to return riparian stands to a more natural density and growth trajectory. Therefore these activities would serve to restore plant species, composition, and structural diversity at the larger watershed scale as well.</p>
<p><b>9.</b> Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.</p>	<p>While this project would disturb the habitat of adjacent degraded riparian and wetland communities, upon project completion reclamation will serve to restore habitats and set them on a better trajectory.</p> <p>Although this project would have short term losses to riparian habitat, these areas are currently degraded, artificial, and/or of low value. Reclamation will improve habitat at the site scale.</p>	<p>The proposed reclamation activities are designed to return riparian habitats to a more natural condition and growth trajectory. Therefore these activities would serve to restore habitats and structural diversity at the larger watershed scale.</p>

## Appendix 4 Port-Orford-cedar Risk Key Analysis

### Port Orford Cedar Risk Key Analysis for Stray Dog Placer Mine FY 2015

(Risk Key is from Alternative 2 of the FSEIS for Management of Port Orford Cedar in Southwest Oregon, and the Record of Decision)

QUESTION		Mining Claim OR66961						
1a.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	N						
1b.	Are there uninfected POC within, near <sup>1</sup> , or downstream of the activity area that, were they to become infected, would likely spread infections to trees whose ecological, Tribal, or product use or function measurably contributes to meeting land and resource management plan objectives?	N						
1c.	Is the activity area within an uninfested 7 <sup>th</sup> field watershed <sup>2</sup> as defined in Alternative 6	N						
		If the answer to all three questions, 1a, 1b, and 1c, is no, then risk is low and no POC management practices would be required.						
If the answer to any of the three questions is yes, continue.								
2.	Will the proposed project introduce appreciable additional risk <sup>3</sup> of infection to these uninfected POC?							
		If no, then risk is low and no POC management practices are required.						
		<b>**Management Practices by Road/Road System</b>						

<p><i>If yes, apply management practices from the list below [within FSEIS] to reduce the risk to the point it is no longer appreciable, or meet the disease control objectives by other means, such as redesigning the project so that uninfested POC are no longer near or downstream of the activity area. If the risk cannot be reduced to the point it is no longer appreciable through practicable and cost-effective treatments or design changes, the project may proceed if the analysis supports a finding that the value or need for the proposed activity outweighs the additional risk to POC created by the project.</i></p>	<p>N1/2SE1/4SW1/4 and N1/2SW1/4SE1/4 of T35S, R8W, Sec 3</p>						
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1 - In questions 1a and 1b, "near" generally means within 25 to 50 feet downslope or 25 feet upslope from management activity areas, access roads, or haul routes; farther for drainage features; 100 to 200 feet in streams.

2 - Uninfested 7th field watersheds are listed on Table A12-2 [of FSEIS] as those with at least 100 acres of POC stands, are at least 50% federal ownership, and are free of PL except within the lowermost 2 acres of the drainage.

3 - Appreciable additional risk does not mean "any risk." It means that a reasonable person would recognize risk, additional to existing uncontrollable risk, to believe mitigation is warranted and would make a cost-effective or important difference (see Risk Key Definitions and Examples for further discussion.)

\*Activities within these sections should incorporate management activities regardless of POC occurrence within the individual stand due to access routes containing POC

\*\*Management practices: 1) project scheduling, 2) utilize uninfested water, 3) unit scheduling, 4) access, 5) public information, 6) fuels management, 7) incorporate POC objectives into prescribed fire plans, 8) routing recreation us, 9) road management measures, 10) resistant POC planting, 11) washing project equipment, 12) logging systems, 13) spacing objectives for POC thinning, 14) non-POC special forest products, 15) summer rain events, 16) roadside sanitation, and 17) site-specific POC management

## Appendix 5      References

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