BLM

Oregon State Office

GOAT MOUNTAIN HARDROCK PROSPECTING PERMIT APPLICATIONS ENVIRONMENTAL ASSESSMENT

June 28, 2012
Modified November 30 , 2012

ENVIRONMENTAL ASSESSMENT NUMBER:	DOI-BLM-OR-934-2012-0001-EA
APPLICANT NAME:	Ascot USA, Inc.
TYPE OF PROJECT:	Hardrock Prospecting Permit Applications
BLM OFFICE:	(The permit application site is located in the BLM Spokane District, Spokane, Washington)
PREPARING OFFICE:	BLM Oregon State Office, Portland, OR
CASE FILE NUMBER:	WAOR 066973 Case Type 350701 Acres 217.27 WAOR 066628 Case Type 356201 Acres 680.671
SUBJECT FUNCTION CODE:	3500 (specifically 3505)
BLM DOCUMENT CONTROL NUMBER:	BLM/OR/WA/AE-12/019+1792
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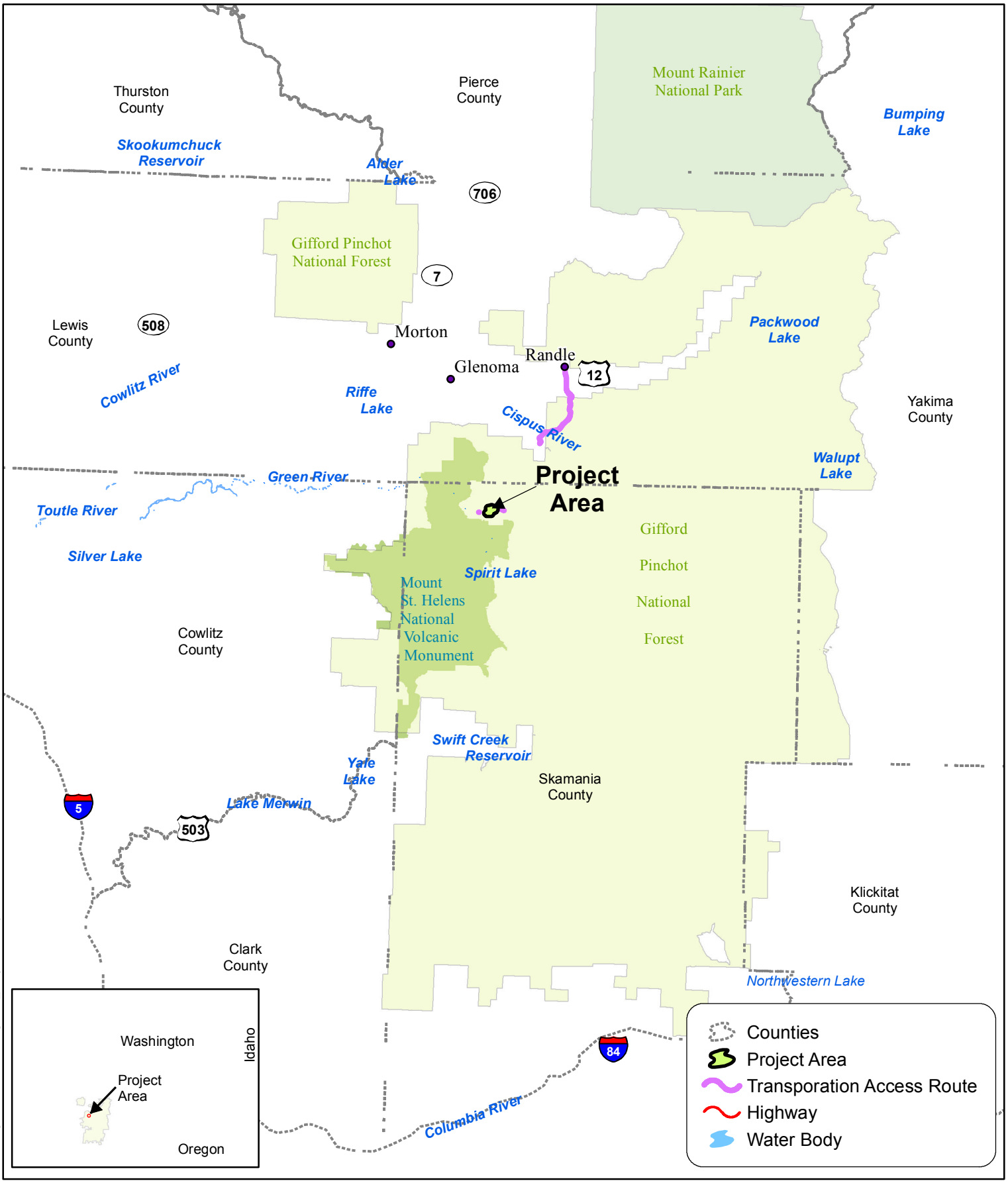

Figure 1
Project Vicinity

URS

0 5 10
Scale In Miles

SOURCE: USDA Forest Service

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

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Glossary

The following terms, denoted by *italicized* text, have the meaning stated below throughout this assessment:

- *Agencies* refer collectively to the Bureau of Land Management (BLM) and the U.S Forest Service (USFS).
- *Ascot* refers to Ascot USA, Inc., with certificate of incorporation issued by the State of Washington on March 8, 2010.
- *Acquired Lands* means lands or interest in lands, including mineral estates, which the United States obtained through purchase, gift or condemnation. It includes all lands BLM administers for hardrock mineral leasing other than public domain lands.
- *Adits* are nearly horizontal drifts, tunnels, or passages from the surface excavated into and sometime through a hillside.
- *Baffles* portable insulated screens that are set-up around drill pad platforms to help attenuate noise and light, protect from weather, and safety.
- *Casual Use* means activities that ordinarily result in no or negligible disturbance of the public lands or resources such as rock-hounding.
- *Cumulative Effects* - The Council for Environmental Quality (CEQ) regulations define cumulative effects as, "…the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions…" (40 CFR 1508.7). Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.
- *Effect* is synonymous with "impact". Direct effects are those effects, "…which are caused by the action and occur at the same time and place" (40 CFR 1508.8(a)); Indirect effects are those effects, "…which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." (40 CFR 1508.8(b)).
- *"Forest Plan"* relates to the GPNF Land and Resource Management Plan and is a different document than the U.S. Department of Agriculture Forest Service 1994 Northwest Forest Plan.
- *Fractional Interest Lease or Permit* is issued where the United States owns less than 100 percent of the mineral interests, and where it has been determined to be "in the public interest" with the consent of the surface managing agency. The regulatory framework defining "in the public interest" in § 3515.16 contains specific criteria for "public interest", all of which have been analyzed in this EA.
- *Full Fee* implies a simple 100 percent undivided ownership of both the surface and mineral estates in the specified parcel of land.
- *Hardrock Minerals* include solid minerals, as distinguished from oil and gas, such as base metals, precious metals, industrial minerals, and precious or semi-precious

gemstones, except commodities that the government sells such as common varieties of sand, gravel, stone, pumice, or cinders.

- *Inventoried Roadless Areas* exhibit features such as high quality or undisturbed soil, water, and/or; sources of public drinking water; diversity of plant and animal communities; habitat for threatened and endangered species; primitive, semi-primitive; non-motorized dispersed recreation; landscape with high scenic quality; and other locally identified unique characteristics (36 CFR §294 - Special Areas). Generally, no new temporary roads, permanent roads, road construction or reconstruction are allowed in Inventoried Roadless Areas unless authorized by the Secretary of Agriculture.
- *Kelley Humps* are water bars built or created on sloping trails or roads for erosion control. The bar is usually set diagonally across the trail to divert the water off the trail, thusly reducing the flow of water and subsequent erosion.
- *Late Successional Reserves* objective is to protect and enhance conditions of late successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl.
- *Lode* is a deposit of metalliferous ore that fills or is embedded in a fissure (or crack) in a rock formation or a vein of ore that is deposited or embedded between layers of rock.
- *"Make water"* is when a drill boring might encounter an artesian condition.
- *Matrix Lands* mean Federal lands within the range of the northern spotted owl, allocated by the Northwest Forest Management Plan for multiple uses, including timber harvest and other silvicultural activities.
- *Mineral Survey* is an official survey of a mining claim executed by a U.S. Mineral Surveyor under the direction of a BLM Cadastral Chief in the jurisdiction where the mining claim lies or is located and can be the basis of a mineral patent.
- *No Action* alternative is not approving the Proposed Action and/or denying the proponent's applications.
- *Nonsystem Roads* are old USFS access/logging roads that have been decommissioned/closed.
- *Partial Retention* is an area where management activities remain visually subordinate to the valued characteristic landscape. Scenery management refers to this as "high" appearing unaltered.
- *Permit Applications Area* is the area shown in Figure 1 encompassed by the five parcels of Mineral Survey lands designated MS-708, -708, -774, -779, -1329, and -1330.
- *Project Area* (also referred to as the *Project* or *Proposed Work Area*) is the area shown in Figure 4 wherein the mineral exploration encompassed by the Proposed Project would be carried out.
- *Project Record* is the indexed collection of documents and public comments used in preparation of this EA and maintained by the BLM.

- *Project Site* generally refers to the specific drill pad site and immediate area surrounding the pad location.
- *Proposed Project* is that described in the Goat Mountain Mineral Exploration Permit Applications and associated Exploration Plan.
- *Proposed Action* is that described in the Exploration Plan submitted together with the Prospecting Permit Applications.
- *Prospecting Permit* grants exclusive right to prospect on and explore lands available for leasing to determine if a valuable deposit exists of specified minerals including hardrock minerals on acquired lands.
- *Reasonably Foreseeable Future Action (RFFA)* is when a "future action" becomes "reasonably foreseeable" once it is "proposed"; until then it is "speculative" and need not be accounted for in the cumulative effects analysis in an EA or EIS. (*Wilderness Workshop v. U.S. Bureau of Land Management*, 531 F.3d 1220, 1229 (10th Cir. 2008)).
- *Roaded Natural* is an area characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of man. Opportunity for motorized and non-motorized forms of recreation is possible.
- *Riparian Reserves* are portions of watersheds required to maintain the hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing waterbodies where dependent resources receive primary emphasis and are regulated by special *standards and guidelines* which limit activities that would retard or prevent attainment of the Northwest Forest Plan's Aquatic Conservation Strategy. Related habitat conservation areas may extend outward to the extent necessary to achieve conservation objectives.
- *Seral* or *sere* - is an intermediate stage plant community found in ecological succession in an ecosystem advancing towards its climax community. In many cases more than one seral stage evolves until climax conditions are attained. A prisere is a collection of seres making up the development of an area from non-vegetated surfaces to a climax community. A seral community is the name given to each group of plants within the succession.
- *Sensitive Species* are those plants and animals identified by a Regional Forester for which population viability is a concern as evidenced by predicted downward trends in population or habitat capability.
- *Surface Managing Agency* refers to the USFS, Gifford Pinchot National Forest for purposes of this project.
- *Survey and Manage Species* include those that occur within or near the Northwest Forest Management Plan (NWFP) area closely associated with late-successional or old-growth forests that are not provided a reasonable assurance of persistence by the NWFP.

- *Unroaded Recreation Without Timber Harvest UD* Unroaded Recreation without Timber Harvest UD"; ("U" represents the Management Area Category (Retention); D represents the Visual Quality Objectives and Recreation Opportunity Spectrum classes (Semi-primitive/Non-Motorized).
- *Valuable Deposit* means an occurrence of minerals of such character that a person of ordinary prudence would be justified in the further expenditure of labor and means with a reasonable prospect of success in developing a profitable mine.
- *Water Bars* are built or created on sloping trails or roads for erosion control. The bar is usually set diagonally across the trail to divert the water off the trail, thusly reducing the flow of water and subsequent erosion (also known as "Kelly Humps").
- *Wetlands* are defined by this order as, ". . . areas inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds."

ACRONYM AND ABBREVIATION LIST

ACS	Aquatic and Riparian Conservation Strategy (also known as ARCS)
ADT	Average Daily Traffic
amsl	above mean sea level
ANSI	American National Standards Institute
APE	Area of Potential Effect
ARD	Acid Rock Drainage
Ascot	Ascot USA, Inc. (Incorporated in Washington State)
ATV	all-terrain vehicle
BLM	Bureau of Land Management
BMP	Best Management Practice
BMRR	Bureau of Mining Regulation and Reclamation
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CESA	Cumulative Effects Study Area
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO_2	carbon dioxide
DAHP	Washington State Department of Historic Preservation Office
DAHP	Washington State Department of Historic Preservation Office
dbh	Diameter-at-breast-height, in inches (for tree measurement)
DR	Decision Record
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FLPMA	Federal Land Policy and Management Act of 1976
FONSI	Finding of No Significant Impact
FSM	Forest Service Manual
GHG	greenhouse gas
GLO	General Land Office
gpm	gallons per minute
GPNF LRMP	Gifford Pinchot National Forest Land and Resource Management Plan or "Forest Plan"; (this document is different from the U.S. Department of Agriculture Forest Service 1994 Northwest Forest Plan.)
GPS	Geographic Positioning System
HQ	3.5-inch diameter drill rod; 3.78-inch diameter hole (outside).
HUD	United States Department of Housing and Urban Development
IGMI	Idaho General Mines Inc.
IRA	Inventoried Roadless Area
LSR	Late -Successional Reserves
LWM	Large Woody Material
MBTA	Migratory Bird Treaty Act

MIS	USFS Management Indicator Species
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MS	Mineral Survey
MSDS	Material Safety Data Sheets
MSHA	Mine Safety and Health Administration
NSA	National Sanitation Foundation
NEPA	National Environmental Policy Act
NFS	National Forest Systems
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
Np	Non-fish Perennial
NPDES	National Pollutant Discharge Elimination System (EPA)
NQ	2.75-inch diameter drill hole (outside); 2.5-inch core (inside)
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
Ns	Non-fish Seasonal
NWFP	Northwest Forest (Management) Plan
OHV	off-highway vehicle
OHWL	Ordinary High Water Level
RFFA	Reasonably Foreseeable Future Action
RM	River Mile
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
ROW	Right-of-Way
S&Gs	Standards and Guides
SCAA	Southwest Clean Air Agency
SHPO	State Historic Preservation Office(r)
SPCC	Spill Prevention Control and Countermeasures
S&M	Survey and Manage Species (USFS)
TPL	Trust for Public Lands
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VQO	Visual Quality Objective
VRM	Visual Resource Management
WAC	Washington Administrative Code
WC	Washington State Watercourse Hydrography
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

The subject of this National Environmental Policy Act (NEPA) Environmental Assessment (EA) is the Goat Mountain Hardrock Prospecting Permit Applications and associated exploratory drilling proposed by Ascot USA, Inc. (Ascot), on land within the Gifford Pinchot National Forest (GPNF). Figure 1, *Project Vicinity.* (Note – EA figures are presented in Appendix A). The Proposed Action (Action) includes a total of 63 rock core holes from 23 drill pads to collect rock core samples for analysis to obtain geological and mineralogical information. Inherent activities proposed by the Action are:

- Exploratory drilling within Mineral Survey (MS) parcels 708, 774, 779, 1329, and 1330 adjacent to existing and former logging and other United States Forest Service (USFS) decommissioned Non-system roads.
- When necessary for access, temporary reactivation of existing decommissioned roads, including removal of trees and other vegetation that have sprouted on the roads since reclamation. Approximately 1.69 miles (about 3.07 acres) of decommissioned roads would be used for access. This includes 1.35 miles (2.45 acres) of reactivated decommissioned roads from the 2010 drilling program; and 0.34 miles (0.62 acres) of decommissioned roads that would be newly reactivated.
- Implementation of runoff and sediment controls.
- Installation of drill pads.
- Installation of temporary sumps to contain drilling fluids.
- Use of drilling fluids that contain water and additives.
- Removal of rock core samples for off-site analysis.
- Site reclamation.

The information collected as part of the Proposed Action is essential to determining whether the mineral deposit is of such character that it would meet the criteria for a *valuable deposit* as defined by regulations at 43 Code of Federal Regulations (CFR) Subpart 3501.5. The exploration area for the Proposed Action is located approximately 15 miles south of Randle, Washington near the northwest corner of Skamania County. See Section 2 for a detailed description of the Proposed Action. The United States Forest Service (USFS) manages the surface of the lands and resources thereon, with below ground resources (mineral estate), including hardrock minerals, managed by the United States Bureau of Land Management (BLM).

This EA provides a background of the project, discussion of the need for the Action, description of the Action and Alternatives to the Action, the environmental impacts of the Action and Alternatives, and a listing of agencies and persons consulted in preparation of the EA. The EA was released for an extended 45-day public comment period on June 29, 2012 formally concluding at midnight on August 15, 2012. Written comments received during that period were given standing and made part of the Project Record. They are available for inspection in the Public Room at the Bureau of Land Management's Oregon and Washington State Office, 333 SW 1st. Avenue, Portland, Oregon, during normal weekday business hours. Comments received thereafter are also included, without standing, in the Project Record. All substantive comments were evaluated, as documented to the Project Record, and the EA was modified as appropriate to provide

requisite information and clarification. The nature of the revisions is summarized in Section 1.9, *Scoping and Public Involvement*.

1.1 Background

1.1.1 Location

The *Permit Applications Area* is within portions of Sections 7, 8, 9, 16, 17, 18, and 19 of Township 10 North, Range 6 East, Willamette Meridian, Skamania County, Washington, (Figure 1, *Vicinity Map*). The Project Area is located on and adjacent to the south facing slope of Goat Mountain. These lands are next to and extend northeast from the boundary of the 110,300-acre Mount St. Helens National Volcanic Monument. The Permit Applications Area is situated approximately 12 miles northeast of the volcanic crater, on the edge of the 1980 eruption blast zone, (Figure 2, *Mount St. Helens Blast Zone)*.

The Project Area can be accessed from east-west Highway US-12, from Randle, Washington located approximately mid-way between I-5 and Yakima, Washington, (Figure 3, *Project Area*). To reach the site from Randle, proceed south on SR-131, continue southwest onto FS-25 until it intersects FS-26, then southward along improved FS Road #26 (adjacent to Quartz Creek), to Ryan Lake then turn westward on FS Road 2612, terminating at the Project Area near the Green River Horse Camp.

1.1.2 History

The Project Area has experienced human activity for over 100 years; use has been dominated by logging and silvicultural activity, recreation, mineral prospecting, and limited mineral development. The property lies within the Saint Helens Mining District originally organized in 1892. Figure 4, *Mineral Survey Limits and Proposed Drill Sites*, presents patented mining claims in the Ryan Lake area of the Saint Helens Mining District. Mineralization of interest was discovered near the end of the 1800s, with the first mining claim locations being filed between 1901 and 1904. Sporadic development then occurred by various surface and subsurface workings. Adits, shafts, cuts, trenches, cabins, powder magazines and machinery were used to support these activities. Mineral Survey #774 (MS-774) was conveyed as a mineral patent (Number 43189) under the General Mining Law of 1872, as amended, to Germania Mining and Milling on November 20, 1905. This patent was followed by MS-779 on March 8, 1906 (Patent Number 43393); and MS-708 on March 3, 1910 (Patent Number 114944). Duval Corporation (Duval) acquired the mineral property in 1969 and located additional mining claims for which mineral Patent Number 46820016 was issued on August 6, 1982, including MS-1329, and MS-1330 (Patent Number 46820017).

Based on available information, the Permit Applications Area that encompasses these Mineral Survey lands appears to include a large portion of what is often referred to as the undeveloped "Margaret Deposit." Existing reports suggest that this might be a porphyritic calc-silicate deposit of Miocene age containing copper, molybdenum, silver, and gold. After acquisition by Duval in 1969, limited exploration programs and mine/metallurgical studies were conducted including diamond core drilling and surface sampling. Fieldwork was halted following the 1980 eruption of Mount St. Helens. Cessation of fieldwork,

however, occurred before an understanding of the Margaret Deposit sufficient for current economic resource evaluation was developed. Identified data gaps include:

- The geology of the porphyry system, controls on mineralization, and alteration patterns are not well understood or sufficient for modeling the quantity, grade, and/or metal or mineral content of the deposit. Without this understanding, defensible prediction of the limits and controls on mineralization, alteration and geologic controls is not possible.
- The limits of the porphyry system were not adequately defined and internal drill density was not sufficient for currently accepted reserve and resource classifications.
- Cores from pre-1980 exploration activities have been lost and are not available for confirmatory analysis using modern quality assurance and quality control.

Following acquisition by Pennzoil, Duval divested its hardrock mineral holdings in 1984. A portion of the subject lands were subsequently acquired by the USFS in June 1986 through donation and purchase, mostly from the Trust for Public Lands (TPL), with the exception of the privately held undivided 50 percent mineral right in MS-708, (Figure 4, *Mineral Survey Limits and Proposed Drill Sites*). In 1970, the surface estate of approximately 220 acres on a tract known as Mineral Survey #708 was acquired by the United States subject to a severed private mineral interest. In the 1980's the USFS was approached by some of the land and mineral owners in the Goat Mountain area about the possible Federal acquisition of their interests. The USFS pursued these offers to sell and/or donate certain interests, under the authority of the Weeks Act. One such offer was a donation of a portion for the private mineral estate beneath this parcel. In a USFS document from 1986, the Agency noted that Federal ownership of the surface estate along with only a portion of the mineral interest would still give the United States an advantage over the private purchasers, in the event the owner of the remaining severed and private mineral interest decided to sell sometime in the future.[1] The United States, at such time, could then consider purchasing the remaining private mineral estate, an undivided 50 percent interest, and attain full-fee title. At this time, the United States owns fee title to all the surface and mineral interests in the two applications, except for the remaining private fractional mineral right beneath MS-708.

Via quit claim deed dated September 28, 2004, Idaho General Mines, Inc. (IGMI)[2] obtained property title to the 50 percent undivided private mineral interests on the lands within MS-708 from the previous owner (Duval). The United States (U.S.) owns the other 50 percent interest in the mineral estate on this parcel and the entire surface estate, as well as 100 percent (i.e., full fee) of both the surface and mineral interests in the other Mineral Survey lands that are included in Ascot's applications. In March 2010, Ascot

[1] April 20, 2006 USFS Forest Supervisor Letter to Regional Forester R-6, Compatibility of GPNF LRMP to the IGMI Lease Application. Lavendel; and, subsequent letter of May 2, 2006 Bown (USFS Director of Lands and Minerals) to Mottice (Deputy State Director to BLM). USFS letter to BLM Deputy State Director; File Code 2820.

[2] On October 5, 2007 Idaho General Mines, Inc. was reincorporated as a Delaware corporation and changed its name to General Moly, Inc.

announced the signing of an Option Agreement to purchase IGMI's 50 percent private interest in the mineral estate within MS-708.

On April 7, 2010, along with clarifying documents and modifications submitted on June 13, 2010, and July 16, 2010, Ascot submitted a proposal to the USFS to drill up to 14 exploration core holes within MS-708. In coordination with the Cowlitz Valley District of the GPNF, Ascot included within their Exploration Plan environmental protection measures to safeguard National Forest System surface resources. In a letter dated August 6, 2010, the USFS provided concurrence with Ascot's drilling proposal. Following USFS concurrence in 2010, Ascot completed 11 exploratory drill holes.

On March 1, 2011, Ascot submitted Prospecting Permit Applications including an Exploration Plan to the BLM to drill 38 exploratory holes using 13 drill pad sites within MS-774, 779, 1329, and 1330. In addition, on March 18, 2011, Ascot submitted a proposal to the USFS to conduct a second phase of exploration in MS-708 that included drilling 30 exploratory holes using 12 drill pads. In a May 5, 2011, letter, the USFS concurred with Ascot's plan for the additional exploration contingent upon implementation of additional environmental mitigation measures related to stormwater and noxious weed control.

On April 11, 2011, the BLM provided Ascot with a completeness review of their Prospecting Permit Applications including specified revisions to the Exploration Plan. On May 26, 2011, Ascot responded with a Revised Exploration Plan for Prospecting Permit. Then on October 7, 2011, Ascot withdrew the original second phase exploration plan for MS-708, and amended their permit applications on November 29, 2011 by submitting a second Prospecting Permit Application to the BLM for the additional drilling on MS-708, and by combining all proposed exploration operations in one Revised Exploration Plan dated October 5, 2011. The combined plan proposed drilling a total of 63 NQ (2.75-inch diameter) with HQ diameter casing (3.78 inches, as needed) core holes from 23 pad sites.

In order to process the Prospecting Permit Applications, the BLM and the USFS jointly prepared this modified EA consistent with the December 2011, Memorandum of Agreement (MOA) in which Ascot, the USFS, and the BLM define procedures and responsibilities for completing the assessment.

1.2 Decision Framework

The authority to grant prospecting permits lies with the U.S. Department of Interior-Bureau of Land Management (lead agency). Where National Forest System lands are involved, the BLM and USFS work cooperatively to evaluate the project area for environmental impacts, consistent with the National Environmental Policy Act and the implementing regulations. The BLM prepared this Environmental Assessment (EA) based on the two Prospecting Permit Applications and the proposed Exploration Plan. The USFS participated as a cooperating agency throughout the process.

The BLM has the responsibility for management of the Federal mineral estate, and the responsibility to implement regulations for minerals available and subject to prospecting

and exploration (43 CFR 3505). A BLM decision to approve the applications and to issue prospecting permits for National Forest System lands is based on the following factors: 1) compliance with requirements at 43 CFR 3505; 2) compliance with applicable environmental requirements; 3) determination that issuance is *in the public interest*, and 4) consent of the USFS. The BLM decision will be documented in a Decision Record (DR) and a Finding of No Significant Impact (FONSI). (See Appendix B, for *sample Prospecting Permit Application*.)

The USFS must decide whether or not to consent to the BLM issuing the prospecting permits containing 898 acres of acquired National Forest System lands for exploration for hardrock minerals including copper, molybdenum, silver, gold, and associated minerals. If consent is given, the USFS will also specify certain required conditions within their regulatory authority for use and protection of the National Forest System lands.

Both Agencies based their respective decisions on the information, issues and effects analysis presented in this Environmental Assessment. As the surface management agency, the USFS used the analysis to determine if issuance of the prospecting permits and contemplated exploration activity would interfere with the primary purposes for which the lands were acquired. The proposed activity must also be consistent with the Gifford Pinchot National Forest Land and Resource Management Plan, as amended. The USFS decision will be documented in a Decision Notice and a FONSI.

1.3 Relationship to Federal, State, and Local Regulations, Plans, and Policies

In accordance with NEPA, this EA analyzed potential impacts that may result from the Proposed Action at the Goat Mountain Project Area. Other authorities that contain procedural requirements that pertain to treatment of elements of the environment when the BLM is considering a Federal action, and where additional consultation or regulatory compliance may be required are listed in Table 1.3-1. (See Appendix B for a summary explanation of each statute).

Table 1.3-1: Supplemental Authorities Consulted

Element	Authority	Addressed in the following EA document Sections:	Effects Y/N
Air Quality	The Clean Air Act as amended (42 USC 7401 et seq.)	Section 3.10, Air Quality	No
Cultural Resources	National Historic Preservation Act, as amended (16 USC 470)	Section 3.8, Heritage and Cultural Resources	No
Environmental Justice	E.O. 12898, "Environmental Justice" February 11, 1994	Section 3.13 Socioeconomics	No
Fish Habitat	Fish Habitat Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376)	Section 3.6, Fisheries; 3.3, Hydrology/Hydrogeology.	No
Floodplains	E.O. 11988, as amended, Floodplain Management, 5/24/77.	Section 3.3.1.1 Mapped Waters, Wetlands, Floodplains, and Riparian Reserves	No
Forests and Rangelands	Healthy Forests Restoration Act of 2003 (P.L. 108-148)	N/A	No

Element	Authority	Addressed in the following EA document Sections:	Effects Y/N
Migratory Birds	E.O. 131186, "Responsibilities of Federal Agencies to Protect Migratory Birds" January 10, 2001	Sections 3.5.1.2 and 3.5.2.2.1	No
Migratory Birds	Migratory Bird Treaty Act of 1918, amended (16 USC 703 et seq.)	Sections 3.5.1.2 and 3.5.2.2.1	No
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 USC 1996a)	Sections 3.8.1.4 American Indian Consultation; and 3.7.1.4 Plants of Cultural Importance.	No
Threatened or Endangered Species	Endangered Species Act of 1983, as amended (16 USC 1531)	Sections 3.5.1.3 Wildlife Species; 3.6.1.3 Special Status Fish Species; 3.7.1.2 Special Status Plant Species	No
Wastes, Hazardous or Solid	Resource Conservation and Recovery Act of 1976 (43 USC 6901 et seq.) Comprehensive Environmental Repose Compensation, and Liability Act of 1980, as amended (43 USC 9615)	N/A – There are no Federal hazardous or State dangerous wastes that would be generated from this Proposed Action.	No
Water Quality Drinking; and Ground	Safe Drinking Water Act, as amended (43 USC 300f et seq.) Clean Water Act of 1977 (33 USC 1251 et seq.).	Section 3.3, Hydrology/Hydrogeology	No
Wetlands-Riparian Zones	E.O. 11990 Protection of Wetlands 5/24/77.	Section 3.3, Hydrology/Hydrogeology	No
Wild and Scenic Rivers	Wild and Scenic Rivers Act, as amended (16 USC 1271)	Section 3.12.1 Recreation – Affected Environment	No
Wilderness	Federal Land Policy and Management Act of 1976 (43 USC 1701 et seq.); Wilderness Act of 1964 (16 USC 1131 et seq.)	Section 1.6 Activities within Inventoried Roadless Areas	No
Mineral Policy	Mining and Minerals Policy Act (1970), (30 U.S.C. §21a)	Section 1.4 Conformance with USFS Land and Resource Management Plan; Section 1.1 Federal Authority and Regulatory Context	No

National Environmental Policy Act Handbook - Appendix 1-140 H-1790-1 – BLM Manual Rel. 1-1710 Supersedes Rel. 1-1547 01/30/2008

1.4 Conformance with USFS Land and Resource Management Plan

The subject lands are located within and managed by the Cowlitz Valley Ranger District of the Gifford Pinchot National Forest, located in Randle, Washington. The National Forest Management Act (NFMA), 1976 (P.L. 94-588) requires each National Forest to develop and implement a Forest Plan prescribing management activities for the lands within that National Forest. In 1990, the Gifford Pinchot Forest published its first Land and Resource Management Plan (LRMP or simply, the "Forest Plan"), developed under the NFMA and NEPA. The USFS has made several amendments since 1990. In 1994, the Gifford Pinchot Forest Plan was amended with the completion of a comprehensive and long-term policy for the management of USFS and BLM lands within the range of the northern spotted owl. This is called the "Northwest Forest Plan" (NWFP). The Northwest Forest Plan amended 19 USFS and seven BLM plans within the range of the northern spotted owl. Based on the permit applications, the USFS must determine

whether issuance of the prospecting permits is consistent with the 1990 Forest Plan, which was amended with the completion of the NWFP.[3]

The Forest Plan designated the lands associated with the permit applications as *general forest*, with an emphasis on timber production. Management area categories in the larger permitted area also include *unroaded recreation*, *visual emphasis*, and eligible *Wild and Scenic Rivers* (Green River). Following the NWFP amendment, the lands were allocated as *matrix lands*, with a designation of a *riparian reserve* land use classification along the Green River and other streams, water bodies, wetlands and unstable areas. Two of the proposed drill pads (Pads 6 and 7) are within designated NWFP Riparian Reserves. The NWFP *Standards and Guidelines* for riparian reserves may limit or prohibit ground disturbing activities. These lands are further described in Section 3.3 of this EA. Neither the Forest Plan nor the NWFP prohibits mineral exploration within the Permit Applications Area. The NWFP includes environmental protection *standards and guidelines* that are required when implementing resource activities, including any proposed ground-disturbing activities.[4] More specific information on Standards and Guidelines for Minerals and Geology is in the Forest Plan, page IV-93.

A number of laws guide the overall USFS mission to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations." These laws include the Multiple-Use-Sustained-Yield Act (1960), which require (NFS) lands to be administered considering the values of various resources in management decisions and provides that nothing in the Act affects the use or administration of mineral resources on NFS lands; the National Forest Management Act (1976), which requires the Forest Service to keep a detailed inventory of lands and resources, and to consider the physical sciences in interdisciplinary planning for use of NFS resources; and the Mining and Minerals Policy Act (1970), that states it is the continuing policy of the Federal Government to encourage development of economically sound and stable domestic mining and minerals industries and the orderly development of domestic mineral resources. Consistent with these and other statutes, Forest Service Manual 2802 on Minerals and Geology establishes an agency objective to "*Ensure that exploration, development, and production of mineral and energy resources are conducted in an environmentally sound manner and that these activities are integrated with the planning and management of other National Forest resources."*

In 1982, Congress established the 110,300-acre *Mount St. Helens National Volcanic Monument (*P.L. 97-243), and prescribed in part that: "Nothing in this Act shall be construed as authorizing or directing the establishment of protective perimeters or buffer zones around the Monument for the purpose of precluding activities outside the Monument boundary which would otherwise be permitted under applicable law."[5] In a related report dated July 15, 1982, it was noted that the nearby Monument boundary was specifically drawn to exclude what was believed to be the *"...most potentially productive*

[3] http://www.Forest Service.usda.gov/main/giffordpinchot/landmanagement/planning
[4] Ibid
[5] H.R. 1659 (105th): Mount St. Helens National Volcanic Monument Completion Act. Approved August 26, 1982 (Public Law 97-243).

of the [former] copper mining claims on Goat Mountain and its slopes above the [Green] river.[6]" The Goat Mountain Prospecting Permit Applications have been submitted for an area specifically excluded from and outside the boundary of the *Mount St. Helen's National Volcanic Monument.*[7]

1.5 Primary Purpose for Which the Lands were Acquired

To comply with the applicable legal framework, the USFS must determine whether issuing prospecting permits and subsequent exploration activity will interfere with the primary purposes for which the lands were acquired. In order to make this determination, the USFS uses information contained in this EA, including the project description, the affected lands, and the environmental effects considering the mitigation measures identified. The subject lands were acquired by the United States under the statutory authority of the Weeks Act of 1911. According to the Act of March 1, 1911, as amended, Congress authorized the Secretary of Agriculture to purchase lands for the purposes of regulating the flow of navigable streams or for the production of timber. The Mineral Resources on Weeks Law Lands, 1917, established that the Secretary of Agriculture could also authorize mineral activities on lands acquired under the Weeks Act of 1911. The National Forest System lands within the permit applications area were acquired in several transactions and from different entities that owned either surface or mineral interests and sold or donated them to the United States. In a letter from the USFS to some Congressional Representatives and the local County Commissioners, the Agency then acknowledged that the acquisition of certain lands and interests in the Goat Mountain area "will aid in the preservation of the integrity of the Green River prior to its entering the National Volcanic Monument, and will also aid in the preservation of the scenic beauty of this area which is to become an important Monument portal."

The acquisition records for the lands involved in the permit applications are included in the Project Record and provide some background on the intent of the Agency as to the management of these lands as National Forest System lands. In 2006, the USFS responded to BLM's request for consideration of an application for a hardrock mineral lease for the same lands. The USFS conducted an evaluation, including analysis and evaluation of the purposes for which the lands were acquired in order to reply to BLM. This information is included in the Project Record for the subject applications.

1.6 Activities within Inventoried Roadless Areas

During the past three decades, the USFS has conducted various local, regional, and national "inventories" of roadless areas, including the nationwide Roadless Area Review and Evaluation (RARE II) inventory in 1979. According to the USFS, "Inventoried Roadless Areas are National Forest System undeveloped areas typically exceeding 5,000 acres that meet the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the USFS Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or lands currently inventoried for planning

[6] House Report 97-636, Part 2 at 14, July 15, 1982.
[7] Ibid.

purposes as roadless areas."[8] The final map of IRAs came from the Roadless Area Conservation Rule (2001). This inventory is based on individual forest plans, or other assessments that are completed and adopted by the agency, (Figure 3, *Project Area* and Figure 4, *Mineral Survey Limits*). A small portion of the permit applications area falls within the boundary of the Tumwater Inventoried Roadless Area shown in Figure 4, however, activities within IRAs are subject to the regulations at 36 CFR 294 regarding construction and other surface disturbing activities. All contemplated or future activities would be consistent with the Roadless Rule.

1.7 Federal Authority and Regulatory Context

The subject lands were acquired as National Forest System lands under the authority of the Weeks Act of 1911 (P.L. 61-435; 36 Stat. 961). Federally owned mineral resources on these lands are managed in accordance with Mineral Resources on Weeks Law Lands of 1917 (39 Stat.1150, as supplemented; 16 U.S.C. 520), pursuant to the President's Reorganization Plan No.3 of 1946 Section 402 (60 Stat. 1097; 1099, 5 U.S.C. Appendix).

In the Act of March 1, 1911 Congress authorized the Secretary of Agriculture to purchase lands for the regulation of the flow of navigable streams or for the production of timber. In the Act of March 4, 1917 Congress authorized the Secretary of Agriculture to permit the prospecting, development, and utilization of the Federal mineral resources of the lands acquired under the Act of March 11, 1911. This mineral resource activity and utilization includes such terms and for specified periods as the Secretary may deem to be for the best interests of the United States.

In 1946, Congress transferred the authority to manage the Federal mineral estate on NFS lands acquired under the Weeks Act for hardrock minerals, from the Secretary of Agriculture to the Secretary of the Interior (Reorganization Plan No. 3, of July 16, 1946; 43 CFR 3501.1(b)). The Reorganization Plan established a cooperative relationship between the Departments of Agriculture and Interior and also provided that the Secretary of Interior shall allow mineral development of these lands "only when he is advised by the Secretary of Agriculture that such development will not interfere with the primary purposes for which the land was acquired and the proposed activity is in accordance with such conditions as may be specified by the Secretary of Agriculture in order to protect such purposes".

Under the guidance of the Mining and Minerals Policy Act of 1970, the agencies fulfill the Federal government's overall policy to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security and environmental needs" (Mineral Policy Act, 1970).

The USFS considers mineral exploration and development to be important parts of its management program and cooperates with the Department of Interior in the development of federally owned leasable mineral resources. The USFS recognizes that mineral

[8] www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_000250.pdf

exploration and development are ordinarily in the public interest and with appropriate operating conditions, are compatible with the purposes for which the National Forest System lands are managed (USFS Manual 2822.03); "Encourage and facilitate the orderly exploration and production of mineral and energy resources within the National Forest System in order to maintain a viable, healthy minerals industry, and to promote self-sufficiency in those mineral and energy resources necessary for economic growth and the nation defense" (Forest Pan, p. IV-4).

The applicable statutes and their implementing regulations, orders, and notices authorize the BLM to issue prospecting permits and leases and to approve and administer any subsequent operations regarding exploration, development, production, and transportation of federally owned leasable minerals, including those within the National Forest system. The BLM's leasing authority and USFS consent are discretionary actions and must comply with NEPA; the Forest and Rangeland Renewable Resources Planning Act, PL 93-378, as amended by the National Forest Management Act, PL 94-588; and other applicable statutes, regulations, Executive Orders, and Agency directives.

Applicable regulations governing permitting are found at 43 CFR 3505 for *Prospecting Permits* and Subpart 3509 for *Fractional Interest Prospecting*. By construct of regulation, the BLM has full discretion regarding issuance of a prospecting permit subject to the written consent of the USFS consistent with the President's Reorganization Plan No. 3 of 1946.

1.8 Purpose and Need of Action

The purpose of this action is for the USFS to consent to BLM for issuance of two Hardrock Prospecting Permits submitted and applied for by Ascot to carry out mineral prospecting within MS- 708, 774, 779, 1329, and 1330. The BLM, in cooperation and with the consent of the USFS must deny the permits, or issue the permits as proposed in the applications and Exploration Plan, or issue the permits with additional stipulations

Ascot applied for two prospecting permits to determine the existence, grade, and extent of the popularly described Margaret Deposit for hardrock minerals, through the recovery of rock cores for geological, mineralogical, and geotechnical evaluation. Data generated through prospecting would allow Ascot to develop reasonably accurate estimates of potential hardrock mineralization including quality and quantity.

To address this need, the BLM, in cooperation with the USFS, complied with statutes and related regulations at 43 CFR 3505, as well as with the processes required by NEPA, in this case, by preparation of an environmental assessment. The EA was used by the USFS to determine whether or not to consent to issuance of the requested prospecting permits. Neither agency will consent to issuance of the prospecting permits unless it conforms to the decisions, terms, and conditions of the applicable land use and resource management plans, specifically the GPNF Forest Plan, as amended. The selected action must also comply with other applicable environmental requirements.

If the USFS consents to issuance of the requested prospecting permits, they will prepare a Decision Notice and FONSI with specified terms, conditions and recommendations. Before the BLM can approve the applications for prospecting permits on acquired lands within the project area, the USFS needs to make a finding that the Proposed Project would not interfere with the primary purpose(s) for which the land was acquired, including specifying any conditions required to protect such purpose(s). In turn, the BLM would develop a Decision Record and FONSI stating the proposed Action as being in the public interest inclusive of appropriate terms and conditions. Both decisions will be based on this EA and the Exploration Plan of October 5, 2011, submitted concurrently with the prospecting permit applications. The decision will be released by legal notice and posted to the BLM Website at < http://www.blm.gov/or/programs/minerals/ >.

1.9 Scoping and Public Involvement

The purpose of the public scoping process carried out in February and March of 2012 was to determine the nature and range of issues to be addressed in this EA, including alternatives. Scoping involved notification of the public, Tribes, other agencies, organizations, and local and state governments. Scoping was used to identify coordination with other entities; refine issues through public, tribal and agency feedback on the preliminary issues; and to identify new issues and reasonable alternatives. Tribal input was also achieved through government-to-government consultation.

Following receipt of Ascot's applications the BLM sent an official Project announcement and notification of the public scoping meetings to local, state, and tribal government officials; established non-government organizations; newspapers of general circulation encompassing the proposed Project Area; and to individuals and groups who directly participated during consideration of a previous lease application. Organizations who submitted comments on behalf of individuals (petitions and form letters) were provided notice; however, the individuals they represented were not contacted. The Agencies then held scheduled public scoping and open house meetings at the following locations and dates:

- Longview, Cowlitz County, Washington on February 15th, 2012. This location was chosen due to its more central location to potential attendees within the vicinity of the proposed Project Area.
- Morton, Lewis County, Washington on February 16th, 2012. This location was chosen due to its proximity to the Proposed Action site and nearby population centers at Randle and Morton.
- Stevenson, Skamania County, Washington on March 13th, 2012. This location was chosen in response to a request by local government officials in Skamania County, within which the Proposed Action site is physically located.

At these meetings, attendees were asked to sign the attendance roster, fill out a comment form that was attached to a Project fact sheet, and to listen to an illustrated presentation by the BLM, USFS, and URS (Contractor) staff. Display boards were placed around the meeting room where agency staff was available to answer questions. The slide presentation included maps and graphics showing the location of the Proposed Action,

images of the proposed drilling equipment, a discussion of Agency review and permitting processes, and general information regarding the public scoping process. Afterwards, questions from the floor were responded to. All of the meetings were well attended and some participants submitted comment forms before leaving. Table 1.3-2 summarizes the attendance and comment forms received at, or subsequent to, each of the three meetings.

Table 1.3-2. Public Scoping Meetings

Open House Location	Date 2012	Attendees	Comment Forms Received at the Meetings	Comments Received via the BLM Website or USPS (through March 23rd)
Longview, Cowlitz County, WA	February 15	84	21	**189**
Morton, Lewis County, WA	February 16	400+	11	
Stevenson, Skamania County, WA	March 13	135+	10	
Total		**619+**	**42**	

Attendees were also informed about the BLM Project information website. The website included a description of the Proposed Action and Exploration Plan, along with various maps of the area, and other related documents for the public to review. The website also provided an opportunity for submission of electronic comments. Scoping comments were accepted until midnight March 16, 2012, when the formal comment period closed. Subsequent comments were accepted although there was no assurance that they would be addressed during preparation of this EA nor would the commenter gain standing. By March 23, 2012, 189 comments were received either via the website or by mail posted to the BLM or USFS.

The public scoping comments addressed a wide range of requests and concerns, which are broadly summarized below. All comments were made part of the Project Public Record and are available for inspection at the BLM Oregon/Washington State Office, 333 SW 1st Avenue Portland, Oregon.

Key issues derived from the public scoping comments included:

- Impacts to jobs and local economy.
- Environment
  - Impacts on threatened and endangered and otherwise protected wildlife species.
  - Impacts on other wildlife including elk and deer wintering and calving/fawning grounds.
- Water Quality
  - Changes in water quality that might affect resident fish near the Project or salmon and steelhead downstream.
  - Impacts to groundwater quality; spills of petroleum products, contamination from drilling products that would degrade quality.

- Contamination or alteration of aquifer capacity from potentially acid generating mineralization encountered during drilling or upon abandonment.
- Impacts to the routing of groundwater and its interface with surface water.
- Impacts on streams and wetlands.

- Recreation
  - Impacts to horse and hiking trails and use of recreation sites.
  - Concern with Mount St. Helens view shed.
- Effects of dust, traffic, and noise on local flora, fauna, and streams.
- Adequacy of information to analyze impacts (surveys needed).
- Public safety.
- Better understanding of the subsurface geology.

Scoping comments reflected both concern and support for the proposed exploration drilling and the potential for possible mine development. Because the Proposed Action considered is limited to exploratory drilling, potential concerns related to mine development lie beyond the scope of this EA.[9] It is important, however, to note that if the results of exploratory drilling lead Ascot, or another entity, to apply for a Hardrock Mineral Lease, the environmental consequences of that action will be evaluated by the Agencies as a separate action and NEPA process.

The primary subject of comments submitted during public scoping included jobs and the general impacts to the environment, water quality, and recreation. Approximately one-third of the comments related to jobs and the general environment. About 90 percent of these comments noted that the Project would bring needed employment and improve economic conditions to the area, while 10 percent noted that the Project would not improve the job market. Approximately 10 percent of the comments showed concern that the Project would negatively impact water quality, and about 10 percent were concerned with the impacts to recreation, (Appendix C, Public Scoping Comment Matrix).

Other subjects that were mentioned in less than 10 percent (each) of the scoping comments are summarized as follows:

- That development will not interfere with the primary purpose for which the lands were acquired.
- The range of alternatives evaluated in the EA, specifically suggesting trucking water to the Site.
- Effects on compaction of soil.
- Bond requirements of the Project Proponent.
- Consistency with the Tumwater *Inventoried Roadless Area* (IRA).

[9] Because a mine is not currently being proposed at Goat Mountain, and is only speculative, there is no requirement for a mine to be accounted for in the cumulative effects analysis. See Appendix D, NAEP NEPA Review: Wilderness Workshop v. U.S. Bureau of Land Management, 531 F.3d 1220, 1229 (10th Cir. 2008); O'Reilly v. U.S. Army Corps of Eng'rs, 477 F.3d 225, 236 (5th Cir.2007) (citing 40 C.F.R. § 1508.23).

- Consistency with the 1990 GPNF Forest Plan as amended by the Northwest Forest Management Plan (NWFP) of 1994.
- Concern that exploration would result in a mine.
- Concern regarding Green River eligibility for Wild and Scenic River status.

This EA was publically announced and released for an extended 45-day comment period on June 29, 2012. Concurrently it was posted on the BLM Oregon/Washington Mineral Program Webpage at < http://www.blm.gov/or/programs/minerals/ >, along with a number of related documents and an e-form for submitting comments. The public comment period formally ended at midnight on August 15, 2012. Over 6,000 individual comment documents were received and are on file at the BLM Oregon/Washington State Office along with a summary matrix. All substantive comments were taken into consideration in modification of this EA with requisite information and clarification. None of these modifications changed the scope of the assessment. The nature of the revisions are generally summarized below:

1. Additional information identified during government to government consultation with the Cowlitz Tribe regarding resources of cultural concern.
2. Alternative 3, *Alternative Based on Scoping Comments*, was modified to add the following additional stipulations and mitigation measures:
   a. Scheduling proposed Action activities around wildlife and recreation concerns.
   b. Balancing water use between on-site sources, re-use of drilling fluids and water from off-site sources.
   c. Drilling fluid management to improve re-circulation and minimize subsurface impacts.
   d. Monitoring the quality of existing water resources during drilling activities.
   e. Require that all drill holes be sealed after completion.
3. The USFS consent decision was clarified in each alternative as to the required specified conditions for the permit area that will not interfere with the primary purpose for which the lands were acquired under authority of the Weeks Act, and for protection of NFS lands.
4. The BLM decision regarding administrative action on the prospecting permit applications was further clarified to apply only to the exploration plan for the specified parcels consistent with the actions analyzed in this EA.
5. Appendix A, Figure 4 was revised to show the boundaries of the MS units and appended to show the permit boundaries of the two prospecting applications.

2 ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Alternatives

The NEPA at 40 CFR 1508.9(b); 42 USC § 4332, Section 102(2)(E), states that agencies of the Federal Government shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts

concerning alternative uses of available resources." Proposed Action Alternatives for the Ascot Hardrock Prospecting Permit Applications include:

- No Action Alternative: A USFS decision to withhold consent and a subsequent BLM decision not to issue the proposed prospecting permits would result in no direct/indirect effects or changes to the existing environment. An analysis of the *no action* alternative, however, provides a basis for comparison of the two action alternatives.
- Proposed Action Alternative*:* The Proposed Action is that presented in Ascot's permit applications and associated Exploration Plan for prospecting on the south face of Goat Mountain within the GPNF. Alternative 2 provides for USFS consent, with specified conditions necessary to protect the lands from interference with the primary purpose for which the lands were acquired. Alternative 2 provides for a subsequent BLM decision to issue the permits with mitigation measures to address certain resource issues associated with the Exploration Plan.

- Alternative 3 - Alternative Based on Scoping Comments: For the USFS, Alternative 3 provides for USFS consent, with specified conditions described in Alternative 2 and a subsequent BLM decision to issue the prospecting permits, along with alterations from the *Proposed Action Alternative* and mitigation measures to address changes in water use where the use of water from on-site sources would be balanced with the re-use of drilling fluids and the use of water from off-site sources; drilling fluid management to improve recirculation to minimize aquifer impacts; monitoring water quality of on-site sources during drilling activities; additional requirements related to drill hole abandonment; timing restrictions to protect habitat of the northern spotted owl and recreational resources; using a drill shack/baffling/insulation; and directional lighting at the drill sites.

2.1.1 No Action Alternative (Alternative 1)

Under the No Action Alternative, no prospecting permits would be issued and the currently proposed Exploration Plan would not be implemented. Decommissioned roads would not be temporarily reactivated, drill pad sites would not be prepared, and no drilling or associated activities would occur. The No Action Alternative does not foreclose or preclude future applications for mineral prospecting or leasing in the Project Area.

2.1.2 Proposed Action Alternative (Alternative 2)

Ascot applied to the BLM for two prospecting permits for lands in Skamania County in southwest Washington State as listed in Table 2.1-1 below. The lands are located within portions of Sections 8, 9, 16, 17, 18, and 19 of Township 10 North, Range 6 East, Willamette Meridian, Skamania County, Washington. Minerals applied for include copper, molybdenum, silver, and gold and associated minerals. This alternative provides for consent of the USFS, with specified conditions required to protect NFS lands. The alternative further provides for BLM issuance of the permits and the approval of the proposed Exploration Plan.

Table 2.1-1. Parcels Included in Prospecting Permit Applications

Name	Serial #	Patent Date	Acres	Lot#
Index Group	43393	March 8, 1906	247.93	MS-779
Earl Group	43189	November 20, 1906	266.15	MS-774
Judy/April Group	46820016	August 6, 1982	163.90	MS-1329
Wendy Group	46820017	August 6, 1982	2.70	MS-1330
Germania Group	114944	March 21, 1910	217.27	MS-708
Total acres under application:			**897.94**	

The permit application areas are located on surveyed parcels MS-708, 774, 779, 1329, and 1330, (Figure 4, *Mineral Survey Limits and Proposed Drilling Sites*). The accompanying Exploration Plan proposed includes accessing sites for 23 drill pads and drilling 63 small diameter diamond NQ core holes (with HQ casing as needed) to collect samples for analysis to establish the geology, mineralogy, and mineral value of the deposit.

All drill sites would be accessed using current or previously constructed and subsequently decommissioned logging and/or mineral exploration (old) roads. Of the 23 drill sites, nine (Pads 1–7, 14, and 15) would be accessed directly along existing and currently active roads (FS Road 2612 and a campground road). The remaining 14 sites would be accessed from currently decommissioned roads that would be temporarily reactivated.

Of the 14 sites on existing decommissioned roads to be temporarily reactivated, seven (Pads 10, 11, 12, 20, 21, 23, and 24) would be along roads that were decommissioned in the 1980s and may now have small tree seedlings and saplings growing on them. Note that the pad number sequence is not continuous, as Pads 8 and 9 were eliminated by Ascot from the Proposed Action because they would cause too much disturbance including a substantial amount of grubbing and tree removal to gain access for drilling and support equipment. The proposed drill pads and associated roads are shown on Figure 4 in Appendix A. No new roads would be constructed to access any of the drill sites which are all located on or adjacent to the existing roads.

The Proposed Exploration Plan includes the following major elements:

- Reactivation of decommissioned roads for access. This includes removal of trees and other vegetation that may have sprouted since their closure; grubbing, brushing, removal of sloughing, and limbing of over-hanging vegetation as necessary for safe passage of equipment, all of which the USFS considers maintenance.
- Clearing for drill pads to create a safe worksite.
- Implementation of runoff, sediment, and other environmental controls.
- Installation of temporary sumps to contain drilling fluids.
- Exploratory drilling with one to two rigs using fluids to lubricate the drill and remove cuttings that consist mostly of water and non-hazardous additives.
- Removal of rock core and samples for off-site analysis.

- Drill hole abandonment, and reclamation of the drill pad sites and reactivated roads. This would include complete abandonment of each hole with sealing material (bentonites) or cement if artesian flow is encountered, and is further described in Section 2.1.2.
- Installation of temporary signage and traffic controls to maintain public safety.

The following section provides specific information related to elements of the Proposed Exploration Plans.

2.1.2.1 Access

Access to the Project Area is from FS Road 2612 as described in Section 1.1.1, *Location*. As part of the Exploration Plan Proposed Action, approximately 0.34 miles (0.62 acres) of existing decommissioned roads (USFS Nonsystem Roads), would be temporarily reactivated with the minimum disturbance possible. These roads were constructed in the 1980s and were not reactivated for the 2010 exploration program. This Action would also utilize 1.35 miles (2.45 acres) of existing decommissioned roads that were reactivated during the 2010 exploration program. The area of disturbance for restored decommissioned roads is based on a 10-foot wide Nonsystem Road and a 5-foot cast area. Drill sites within MS-774 would be located on existing decommissioned roads reactivated for Ascot's 2010 MS-708 drilling program. A total of approximately 1.69 miles (3.07 acres) of decommissioned roads would be used for access.

A local logging contractor would be used to reactivate the existing decommissioned roads using a mid-size excavator and a small "Kubota" brushing excavator. The brushing excavator would be used for removal of vegetation, and for building sumps and pads. One to two self-propelled track-mounted diamond drill rigs would be used to drill the explorations core holes. Drilling rods would be moved between sites with six-wheel all-terrain vehicles (ATV) equipped with rod carrier beds. Drillers would use two or more four wheel drive pickup trucks for site access, and for movement of small equipment, and mobile fuel supply.

For safety reasons, public access to drill sites in the northern portion of the Project Area would be limited during active drilling through the use of a temporary locking gate. All equipment, when not in use, would be parked along existing roads that are located beyond the access gate, (Figure 5, *Proposed Security Gate*). There are numerous turn-around locations along these roads and no additional sites would need to be cleared for mobilizing, storage, or turn-arounds.

Figure 5. Proposed Security Gate off FS Road 2612 (similar to gate used in 2010, as shown).

During implementation of the project, project personnel would not be allowed to travel off designated routes in motorized vehicles. Typically, Nonsystem Roads are narrow, have restricted vision, steep grades, and pose a safety hazard for the general public. With irregular Project traffic and equipment activity on these roads, the general public would be warned about accessing them during active exploration operations primarily for safety reasons. Temporary signage would be posted, gate installed/maintained, and security personnel utilized to protect public safety and provide equipment security.

Temporary improvements to decommissioned roads would require some tree removal, minor surface grubbing, removal and side casting of sloughed soil, and removal of logs and installation of small berms to deter public vehicle access, (Table 2.1-2, *Tree Removal*). The USFS considers this type of activity as maintenance.

The drill pads would be located largely within the road prism. In most cases, temporary improvement or grading to prepare drill pads is not planned as the proposed drilling equipment is both self-propelled and self-leveling.

The Exploration Plan proposes 23 drill pad locations for an affected area of approximately 0.23 acre, (the area of each pad would be about 20 feet by 20 feet, or roughly 400 square feet), (Figure 3, *Project Area*). During the 2010 drilling program, vegetation encountered along old logging and drill roads was not as dense as anticipated. This enabled the decommissioned roads to be reactivated and reclaimed to nearly original (pre-reactivation) condition, using salvaged sloughed and cast material. Trees growing on the roads would be removed and saved for reclamation to be placed as downed woody debris, while trees along road edges would be limbed only to the extent necessary to avoid job hazards. If hazard trees are noted in the area and are deemed dangerous by the Agencies, they would be removed on a selective basis.

As was the case for roads that were reactivated for the 2010 exploration program, no trees greater than a 12-inch diameter-at-breast-height (dbh) would be removed (with the possible exception of hazard trees that developed because of wind or other factors since 2010); and the road footprint would be almost identical to the 2010 footprint, (Table 2.1-2). In all cases, trees requiring removal would be marked for approval by the Agencies before action is taken. Up to 68 trees would be removed in the entire Project Area. Their size and location are described below.

Table 2.1-2. Tree Removal

Road Segment or Location	Number of Trees Removed	Diameter at Breast Height (dbh) in inches	Type of Stand
Road segments to Pads 13, 22, and 25	5	< 12	Mature Timber
Road between Pad 22 and Pad 23	1 4	10 < 4	Mature Timber
Pad 22	2	10-12	Mature Timber
Road between Pad 23 and Pad 25	2 25	< 10 4-7	Mature Timber
Pad 25	1 2	12 6	Mature Timber
Road between Pad 25 and Pad 13	2 4	12 < 4	Mature Timber
Pad 13	20	< 4	
Total Trees Removed	**68**	**All < 12dbh**	Mature Timber

In areas where soil is present, it would be removed from the reactivated decommissioned roads and drill pad sites, and stockpiled for use during reclamation. Soil stockpiles would probably not be required within the MS-1329, as the terrain in this area is much flatter and soil removal/disturbance can be largely avoided.

Water bars would be established along roads in the Project Area in accordance with Table 2.1-3 to prevent erosion and would be subsequently retained during reclamation as recommended by the USFS. Temporary culverts would be installed in areas with seasonal drainages shown on Figure 6, *Surface Waters in the Project Area*, and as recommended by Agencies. Silt screens would be installed at the outfall of the culverts along with weed-free straw bales for filtration. As recommended by the USFS, weed free straw would also be placed on the road to minimize erosion. During reclamation, culverts and silt screens would be removed and the original drainage channels and slope configuration would be re-established. Water bars would be required at the intervals shown in Table 2.1-3.

Table 2.1-3. Road Grades and Water Bars

Road Grade (%)	Distance (feet)
2	250
5	135
10	80
15	60
20	45
25	40
30	35

Water bars would be installed at an approximate 30-degree angle downslope across, but not perpendicular to the road. The outflow end of the water-bar would be kept open to keep water from accumulating. Outflow would also be directed away from any nearby natural drainages and streams. At the direction of the Agencies, water bars would be left as a supplement to road closure once Project operations are completed.

2.1.3 Proposed Design Features and Environmental Protection Measures

Implementation of the proposed Exploration Plan would result in the temporary installation of 23 drill pads (0.23 acre) located on reactivated existing decommissioned roads: 1.35 miles (2.45 acres) of existing decommissioned roads reactivated for the 2010 drilling; and 0.34 miles (0.62 acres) of newly reactivated decommissioned roads, for a total impacted area of approximately 3.3 acres, (See Table 2.1-4 *Acres Disturbed for Proposed Project*). Directional drilling would consist of 63 NQ (2.5-inch) diameter drill holes that would yield approximately 110,000 feet of core. Hand samples and drill cores would be removed from the site to an off-site location for further analysis. The majority of the proposed directional holes would yield core samples and related geological and mineralogical information needed to fill gaps in the historic data largely gathered by the previous mineral patent owner, Duval. Some of the holes would be twinned along old drill holes to verify historic information in order to complete an up-to-date geological model.

Table 2.1-4 Acres Disturbed for Proposed Project

	Quantity	Miles	Acres	Newly Disturbed Acres
Drill Pads	23	-	0.23	0.23
Existing decommissioned roads reactivated for the 2010 drilling	-	1.35	2.45	0
Newly reactivated decommissioned roads for current Proposed Action	-	0.34	0.62	0.62
Total Disturbed Area/Acres:		**1.69**	**3.30**	
Total Newly Disturbed Area/Acres:		**0.34**		**0.85**

Service equipment would include four wheel drive service pickup trucks for drillers and support personnel, two six-wheel ATVs with a drill rod carrier bed, a standard 3,000-

5,000 gallon water truck, and a small track excavator (Kubota 290) for pad and sump installation when required. A larger track mounted excavator (JD690 Size) may be needed in limited areas for road clearing and pad installation. The small track excavator with a chipper head for barking and small tree reduction would be used for removal of woody debris and for minor grubbing jobs such as drill sump installation. The track-mounted drill rig, owned by Ascot, is self-propelled and can move between sites without the use of a dozer or excavator.

Ascot would use one or two small track-mounted, self-propelled hydraulic diamond drill rigs. As needed, the drilling equipment would be surrounded by a framed and tarpaulin-covered drill shack with an area of approximately 16 feet by 16 feet. The drill shack would be installed to attenuate noise, shade light, and protect drill operators from inclement weather. Several pieces of smaller equipment including a diesel generator and various pumps and tools would be housed within, or positioned next to the drill shack within a separate baffled structure. All components of the drill rig lock onto a steel base, and all engine and fuel tanks have oil and fuel containment systems, (Figure 7, *Drill Equipment*.)

Approximately 300 gallons of fuel and lubricants would be temporarily stored on site. Secondary containment will be utilized under all fuel storage tanks, generators and drill fluids. All materials will be stored properly and site will be monitored and inspected for compliance with the Spill Plan. Spill kits and enviro-mats for fuel and petroleum products would be located at each drill site along with first-aid kits, fire-fighting equipment, and satellite phones for off-site communications. Pumps used to convey water from natural sources or tanks include self-contained fuel containment systems, with attached fuel and oil spill kits. Ascot would adhere to the Spill Prevention Control and Countermeasures (SPCC) Plan submitted to and approved by the Agencies. Any spills or leaks of hazardous substances would be promptly cleaned up in accordance with the SPCC. The Agencies, the National Response Center (1-800-424-8802), and the Washington State Emergency Management Division (1-800 258-5990) would be immediately notified of any spills or leaks.

The mast on each drill rig is approximately 14 feet long/high. While being moved, the track-mounted drill rigs would be folded up to about 10 feet wide by 12 feet long. When unfolded, the drill rigs have an outside dimension of about 16 feet by 16 feet. The tracks can turn independent of the decking so a turning radius of 14 feet can be obtained. The operating noise level is similar to a small bulldozer or skidder with a distinctive higher pitch when the drill is turning. This can be heard on a calm day for several hundred feet, but the intensity varies with forest cover and slope aspect. Noise generated during drilling would diminish with distance as shown in Table 2.1-5. While ear protection is required within the drill shack, the shack muffles noise to the outside. Similarly, the drill shack shades light extrusion at night. Drills would generally be operational 24-hours a day, seven days a week, including holidays, subject to Agency directed schedule changes. Drilling is conducted with NQ diamond drill rods with an outside diameter of 2.75 inches. If casing is required, HQ diameter rods would have a diameter of 3.5 inches.

Table 2.1-5. Drill Rig Noise

Distance from Drill Rig	Maximum Decibel (dB) Level (approximate)		Decibel levels[1] equivalent to:
	During Idle (2500 RPM)	During Drilling	
10 feet	76 dB	93 dB	90 dB = jackhammer at 50 feet
50 feet	60 dB	76 dB	80 dB = heavy truck at 50 feet
100 feet	55 dB	68 dB	70 dB = vacuum cleaner at 10 feet

[1] http://www.osha.gov/SLTC/noisehearingconservation/

These decibel levels are based on measurements obtained with the equipment placed between two buildings and are more intense than would be experienced in an open forest setting. The tarpaulin cover over the drill shack, open terrain, and surrounding vegetation would aid in attenuating noise levels.

To the extent possible, each drill pad is located within the road width so that additional disturbance would not be required. The drill is equipped with hydraulic-powered leveling equipment to reduce the amount of ground leveling required at each site.

During drilling, fluids would be introduced to keep the holes open, cool the drill bit, and be circulated to the ground surface to remove drill cuttings. These fluids would consist primarily of water with bentonite and polymer drilling additives to increase the density of the fluid and to increase efficiency of drill cutting removal. Bentonite is an earthen product comprised of ash and clay, similar to materials expected to be present naturally in the area due to nearby volcanic activity. According to the Exploration Plan, drill fluid additives are minimally used and the polymers are environmentally safe. Material Safety Data Sheets (MSDS) for the drilling fluid additives have been provided to the BLM and USFS.

Returned drilling fluids would be contained within the immediate vicinity of the drill hole. A small temporary sump averaging 4 feet by 6 feet in width and 2 feet by 4 feet in depth would be installed at each drill site to collect drill cuttings and fluids. The sump would be installed within the existing road prism and next to the drill hole, and lined with a permeable material (enviro-mat) to capture the drill mud and cuttings, but allow water to infiltrate into the ground. Soils at the drill sites generally consist of unconsolidated material with a large component of volcanoclastic material, such as pumice and ash, which is very permeable. The sumps would allow water to infiltrate into the existing overburden, minimizing surface runoff and erosion, while safely disposing of return water.

Drilling spoils collecting in the sumps are a mix of drill muds and rock cuttings that are generally very fine in grain size. Between 2 and 10 gallons of mud and drill cuttings are

anticipated to remain at the completion of drilling at each pad site. This material would be allowed to gravity drain and air-dry to facilitate removal and off-site disposal. Once dried, the sumps (after the dried enviro-mat, muds and cuttings have been removed) would be reclaimed by backfilling with locally stockpiled or borrow material. Drill pads would then be reclaimed by re-contouring as closely as possible to the original grade. Topsoil and vegetation would then be returned from separate stockpiles to promote revegetation and to mitigate erosion.

2.1.3.1 Drilling Operations and Hole Abandonment

The schedule for drilling would be on a 24-hour, seven day a week basis, although some scheduling flexibility is possible consistent with direction by the Agencies. Drilling would advance with a geologist logging the recovered rock core until the target depth of each drill hole is reached.

Upon completion of each drill hole, the drill casing would be removed and small wooden post placed in the well collar to mark the hole location. Over time, the drill hole would naturally cave-in and close. Drill holes that produce water would be abandoned by pressure filling with a cement sealant from the bottom to surface. The sealant would consist of material meeting the requirements of WAC 173-160-221 such as either Portland Concrete Cement types I, II, III, or high-alumina cement mixed with at least six gallons of water per sack. The plugging procedure would be to insert a grouting plug following completion of the hole and to introduce the prescribed sealant into the hole while the drill rig remains on-site. Once the grout is set and it has been determined that the plugging and capping have sealed off the flow of water, the site would be fully reclaimed.

2.1.3.2 Water Requirements

Water would be locally obtained from Duval drill hole 06 or MM-10-10 on MS-708 (Pad 20); and would be supplied to drill sites by gravity feed or by a small diesel pump placed near the water source, with pressure hoses supplying water to drill sites up to 1,000-2,500 feet away. Total water use from local sources would not exceed 5,000 gallons per day, and will be measured with a flow rate gauge. The Washington State Department of Ecology (Ecology) allows up to 5,000 gallons per day of water to be withdrawn from groundwaters of the State without a water right or use permit. Supplemental water, if needed, would be obtained off-site and delivered to the drill site by a water truck. If on-site storage of water is required, location of a water storage tank will be mutually agreed upon by the USFS, BLM, and Ascot. Under the Proposed Action, most water required for drilling would be obtained from on-site sources.

Water usage at each drill site would average between 2 and 20 gallons per minute (gpm) during the drilling with down hole loss to the formation of generally less than 5 gpm, although this would vary based on the actual subsurface conditions encountered. Water usage would average approximately 5-10 gpm during an eight hour period over a 24-hour work cycle. Water usage at this rate would exceed the 5,000 gallons per day limit and supplemental water would be required, as mentioned above. At depths below the water

table and in tight un-fractured formations, less water would be used. In highly fractured areas above the water table, or if the boring intercepts a dry fault, water use would increase. Recirculation of water is not practical considering space and equipment limitations.

2.1.3.3 Reclamation

Pads and reactivated decommissioned roads would be reclaimed by restoring them to an uneven stable surface as close to original grade as is practical. Cast piles would be pulled back from the outside fill slopes and spread irregularly over the surface to recreate natural contours. In areas of steeper grades, water bars conforming to the natural drainage pattern would be built at the interval frequency noted in Table 2.1-3. Temporary culverts would be removed and natural drainage slopes would be re-established with forest cover placed as natural silt barriers and as wildlife habitat features.

Sites on existing active USFS roads would be reclaimed to as close to original condition as possible. Topsoil and vegetation removed during Project activities would be stockpiled and returned as remediation to promote regeneration and to mitigate erosion. Trees and stumps would be placed on reactivated decommissioned roads scheduled for re-closure. Reclamation would be conducted on a site-by-site basis as drilling and related activities are completed in each area. This would avoid maintaining long-term topsoil or vegetation stockpiles. Re-seeding would be done with a native seed mix, woody vegetation and other amendments prescribed by the USFS.

Topsoil, which is generally minimal in this pumice-rich area, and vegetation debris would be selectively piled in local cast piles. These materials would be re-distributed on the final reclaimed surface. Most of the proposed drill sites would be located on existing decommissioned roads. As such, they are often constructed with rock ballast introduced as road bed material ranging from 1 to 8 feet in thickness and compacted from prior logging and USFS activities. These road areas would be scarified during reclamation to relieve compaction as would all areas affected by drilling activities, although additional compaction at pad sites as a result of the Proposed Action would be relatively minimal considering the size and weight of equipment that would be used.

The amount of material left as residue in drilling fluid sumps would normally be between 2 and 10 gallons of mud and cuttings. Use of enviro-mat to line sumps would allow removal and off-site disposal of most of this material. The sump would then be reclaimed as part of the pad reclamation by backfilling with cast material once the sump has become dry.

2.1.3.4 Timetable of Operations

The snow-free season in this area is generally from late-May until early November. The Proposed Action would take approximately five months to complete with the proposed equipment. To accommodate seasonal access limitations, drilling would start as early as late May and be completed, including reclamation, by late October 2013. A USFS Road Use Permit would be required for commercial use, over-weight/over width, special maintenance, snow plowing, or other activities and would be provided upon request and

under the appropriate terms and conditions, pursuant to 36 CFR 261.54 (c). This permit may be obtained from the USFS prior to drilling operations.

At the discretion of the Agencies, drilling may begin earlier or continue later depending upon weather conditions. If drilling activities are conducted during inclement and/or unpredicted weather conditions, a snow plow permit may be required, and would be subject to permit conditions. Operations will cease if ruts in the road are greater than two inches deep and/or agency representatives determine that use of the road during wet conditions is causing excessive resource damage. Depending on when the prospecting permits would be issued, the drilling program may have to be split into two phases, with drilling of the southern area separated from drilling of the northern steeper areas. No drilling would take place during the peak use period of the Green River Horse Camp, including Labor Day weekend. Regardless of timing, the road to the Horse Camp would remain open during exploration activities.

2.1.3.5 Employee Accommodations and Security

Housing of employees and contractors would be in the local communities of Randle and Morton. The Project would require a crew of approximately eighteen people with half of the personnel on the job site and the others working at the core facility established in Randle (See Table 2.1-6). Some of the required work is specialized, but Ascot typically attempts to hire local residents for staffing crews as much as possible, and attempts to rent local motels and facilities for core storage and equipment.

Table 2.1-6. Job Types Associated with Exploratory Drilling and Anticipated Number (#) of Positions

	Drill Foreman	Driller	Drill Assistants	Geologists	Core Technicians	Road/Pad Contractor	Security	Water Truck Operator
#	1	4	4	2-3	2-3	2	1	< 2

To ensure security, a local security employee would stay on-site at the staging/storage location as shown on Figure 5 (Page 16). Security is required to prevent theft and vandalism of equipment at the job sites, and to control public access to areas of active exploration for safety reasons. Appropriate temporary signage would be posted at the job site and at the gate to help control public access to the job site. Warning signs would also be placed at entrance to the site off FS Road 2612, where heavier traffic occurs.

2.1.4 Alternative 3 - Alternative Based on Scoping Comments.

This alternative provides for consent of USFS with specified conditions required to protect NFS lands. Alternative 3 also provides for issuance of the prospecting permits by BLM, with required terms and conditions on actual operations associated with exploration activities described in the proposed Exploration Plan. Alternative 3 is based on scoping comments and provides alterations from the *Proposed Action Alternative*, including changes in drilling and abandonment operations and procedures, drilling fluid management to protect surface and groundwater resources; timing restrictions to protect

the spotted owl habitat and recreation resources, and the use of a drill shack/baffling/insulation to reduce noise and light intrusion into surround environs.

Under Alternative 3, drilling fluid additives would be required to meet NSF/ANSI 60-2003 standards, or as approved by the agencies, for use in potable water supply wells to protect human health and the environment should drill holes encounter permeable zones and groundwater systems. Source water used for drilling would emphasize the use of on-site sources, including Duval Hole 06 and/or MM-10-10, supplemented as necessary by purchase from regulated potable water source(s) that are periodically tested and documented. On-site sources would be tested prior to use for pH, temperature, salinity, and at a minimum arsenic, cadmium, copper, lead, mercury, and zinc. Salinity testing is required to assist in selection of drilling fluid additives (bentonite). A temporary water storage tank would be placed at the Project site and filled with water purchased off-site, possibly from the town of Randle or other local community. The on-site tank would provide surge storage and/or compensation storage during times when uses of at-site sources are administratively restricted, or additional water is needed for road maintenance, dust suppression, and emergency fire control. Use of a water storage tank on-site for drilling operations would increase water truck traffic on local roads. The location of a water storage tank would be agreed upon by the USFS, BLM, and Ascot's field representative.

Use of on-site water from Duval Hole 06 and/or MM-10-10 would be limited to 5,000 gallons of groundwater per day, unless an appropriate water right or use permit is obtained from the Washington State Department of Ecology (Ecology). Other unforeseen conditions may arise that could result in further use restrictions by decisions from the Agencies. No local surface water would be used for project water needs. Daily on-site water use would be recorded using a totalizing flow meter. Duval Hole 06 and MM-10-10 would be abandoned in accordance with Washington Administrative Code (WAC) 173-160-381 following the cessation of the drilling program, unless directed otherwise by the Agencies.

Drilling operations would be optimized to promote return of drill cuttings to minimize cutting distribution into adjacent formations, and to seal water bearing and porous formations to reduce cross-aquifer flow of groundwater. If loss of circulation is encountered during drilling, steps would be taken to re-establish circulation by sealing the formation causing the loss prior to continued drilling; if circulation is not re-established the drill hole would be abandoned by sealing.

Drilling fluid would be reused to the extent possible to minimize water use. Appropriately sized sumps lined with impermeable liner and/or tanks would be used to contain recyclable drilling fluids. Sumps and/or tanks would be required to be placed within currently defined drill pads, or at an alternate location approved by the Agencies. Remaining drilling fluid decant water, at the completion of drilling, would be infiltrated through an enviro-mat at the ground surface within the respective drill pad; solid materials such as cuttings would be appropriately disposed of off-site.

To verify that groundwater is not negatively being impacted by drilling activities, groundwater from Duval Hole 06 and MM-10-10 would be sampled prior to drilling activities and monthly during drilling. Samples would be analyzed for temperature, pH, salinity, and at a minimum arsenic, cadmium, copper, lead, mercury, and zinc. If significant changes in water quality are observed, drilling would be suspended until appropriate measures to protect groundwater are determined and implemented, or the cause ascribed to natural conditions.

Drill holes advanced through overburden would be over-cased with a temporary casing extending into underlying bedrock to prevent near surface groundwater from flowing into the annular space of the exploratory drill hole and to prevent fluids from discharging out of the annular space to soil.

Upon completion of drilling at each exploratory drill hole, the drill hole would be sealed generally as described in Washington State Department of Natural Resources' (DNR) fact sheet "Mineral Exploration Well/ Drill Hole Plugging and Abandonment". Sealing would include a ten-foot cement surface plug placed within the top twenty feet of each drill hole to help ensure an adequate surface seal. Portland concrete cement mixed with clean water and aggregates, or cement mixed with clean water, would be used for the surface plug. The top of the surface plug would be completed one to two feet lower than the post-reclamation surface of the drill pad to prevent future trip hazards and address aesthetic concerns. The DNR fact sheet recommends the use of cement sealing material for abandonment of drill holes and provides specifications. Alternate drill hole abandonment/sealing methods and materials would be considered for use with prior agency review. Alternate abandonment methods could include drill-string tremie placement of sealing materials, and use of high-solids bentonite grout and/or bentonite/cement mixtures, as described in Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160), providing the sealing methods and materials ensure a seal that would prevent vertical water flow into or within the abandoned drill hole.

To verify that Ascot is prepared to address artesian flow of groundwater, an emergency sealing plan would be provided to the Agencies in advance of drilling that would include instructions and contact information for getting equipment and supplies to the drill site in a timely manner and provide reasonable plans for controlling and stopping flow.

Drilling at Pads 6 and 7 in close proximity to the Horse Camp would be controlled to reduce seasonal use conflicts with recreation. Drilling at these sites would be restricted to daytime hours during the week prior to Labor Day and would not occur after Labor Day.

Drilling at Pads 10, 11, 12, 13, 22, 23, 24 and 25, which are located near spotted owl nesting sites, would be restricted to occur after the nesting season, which occurs between March 1 to June 30. Drilling may proceed after July 1 until February 28.

To reduce impacts to surrounding areas due to equipment noise a drill shack with baffles and/or insulation would be used. Baffling would also minimize intrusion to areas surrounding each drill site. To reduce the impacts from operating lights, lighting would be shielded and directed toward the drill. Sump use would be monitored by agency personnel to ensure they adequately hold drill cuttings.

2.1.5 Alternatives Considered but Eliminated from Detailed Analysis

Several alternatives to the Proposed Action were considered, but found to be either infeasible or resulting in effects that would not differ measurably from the alternatives analyzed in detail. These alternatives were, therefore, eliminated from detailed analysis in this assessment.

The first alternative considered, but eliminated, was the use of overland travel to avoid reactivation of existing decommissioned roads. This alternative was rejected because it would be physically impossible to traverse most of the Project Area without constructing new roads due to the steepness of the terrain and/or density of the forest.

The second alternative considered but eliminated was Ascot's initial exploration plan that included completing the drilling program using all 25 drill pads. Pads 8 and 9 were eliminated from the Proposed Action because their installation would cause too much disturbance, including a substantial amount of grading and tree removal to gain access to the drill sites, and road use by supporting equipment. Ascot concurred with the revised plan during the permit application process.

The third alternative considered, but eliminated, was limiting access along FS Road 2612, to use of the existing road in its current condition, rather than permitting road improvements and maintenance. Such improvements and maintenance are planned under the Proposed Action to ensure the safety of project personnel and the traveling public. Additionally, this route is the primary access to the north-eastern portion of the Goat Mountain area, including associated recreation. This alternative was eliminated as it would be infeasible due to safety concerns and would limit access to the drill sites needed to carry out the proposed exploratory drilling activities.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This section describes the affected environment for each resource and addresses the anticipated effects from each alternative on that resource. Cumulative effects of the Project are addressed following the environmental consequences for each resource. The cumulative effects analysis area encompasses the upper Green River watershed. The analysis considers related past activities, current activities, Proposed Action, and other reasonably foreseeable activities in the area associated with the proposed exploration program that might result in cumulative effects. Reasonably Foreseeable Future Actions (RFFAs) are defined by what may be in the management or development plans that typically look forward a few years. No specific plans for management or development activities in or near the Project Area are known at this time. [10]

The scope of the Proposed Action does not encompass future mining as reasonably foreseeable. No mining is currently proposed and any future mining proposal would require separate administrative actions by the USFS and BLM, including a NEPA analysis and review process. No timber sales are currently being proposed in the Project Area. A RFFA is when a "future action" becomes "reasonably foreseeable" once it is "proposed"; until then it is "speculative" and need not be accounted for in the cumulative effects analysis in an EA or EIS. (*Wilderness Workshop v. U.S. Bureau of Land Management*, 531 F.3d 1220, 1229 (10th Cir. 2008)). (See Appendix D, *NAEP NEPA Review*).

Furthermore, hardrock mineral prospecting of the type being proposed does not mean a mine is reasonably foreseeable, as a mineral deposit of sufficient magnitude and value must first be discovered before consideration can be given to the feasibility of mine development. It is possible that such a deposit does not exist in the Project Area, in which case mining would not be feasible. Mineral exploration, in most cases does not indicate the presence of a valuable deposit. The same is true for the reasonable foreseeing of the type of mine, as it would not be possible to foretell at the prospecting stage what mining methods, if any, would be viable.

Past activities in the vicinity of the Proposed Project include mineral exploration, limited development, and timber harvest. Current or on-going activities present in the area include recreational use and timber management, both of which include road use and maintenance.

[10] Because a mine is not currently being proposed at Goat Mountain, and is only speculative, there is no requirement for a mine to be accounted for in the cumulative effects analysis. See Appendix D, NAEP NEPA Review: Wilderness Workshop v. U.S. Bureau of Land Management, 531 F.3d 1220, 1229 (10th Cir. 2008); O'Reilly v. U.S. Army Corps of Eng'rs, 477 F.3d 225, 236 (5th Cir.2007) (citing 40 C.F.R. § 1508.23).

3.1.1 Geologic and Mineral Resources

3.1.2 Affected Environment

The Project lies within the Cascade Mountain Range in southern Washington State. These mountains are generally Cenozoic-aged (65.5 million years ago) to Holocene (present era) consisting of volcanic and intrusive igneous rocks and associated mineralization. In Washington State, the Cascade Mountains are bordered by Columbia Basin basalt flows to the east and the Puget Sound Lowland to the west. The mountain range is bisected along the Oregon/Washington border by the Columbia River Gorge, created by the Columbia River Gorge, created by the antecedent Columbia River.

Goat Mountain is located approximately 12 miles northeast of Mount St. Helens, which is an active stratovolcano that in historic times has erupted in 1800, 1854, and 1980. Mount St. Helens continues to experience eruptive and/or up lift sequences associated with its current cone-building phase. Historic and prehistoric eruptive cycles have deposited ash, pumice, and scoria forming tephra throughout the area. During the May 18, 1980 eruption, a massive landslide occurred along a horseshoe shaped slip-plane that lowered Mount St. Helens' summit by approximately 1,300 feet. Debris from the eruption-induced landslide material was largely deposited to the northwest of the volcano and west of Goat Mountain. Effects of the 1980 eruption are believed to have affected land near the proposed Project Area and are mapped as "blowdown area" in the recent United States Geological Survey (USGS) 7.5-minute "East Spirit Lake" topographical map that includes the proposed Project Area.

Goat Mountain has an approximate peak elevation of 4,921 feet above mean sea level (amsl). To the south, the headwaters of the Green River flow west along the toe of Goat Mountain, at an approximate elevation of 2,600 feet amsl. The Green River valley along the southern toe of Goat Mountain likely owes its shape to alpine glacial scour from sources originating near the summit of Mount St. Helens and possibly other peaks in the area.

Surficial geologic deposits in the proposed Project Area likely include drift resulting from alpine glaciations and pyroclastic materials from eruptions of nearby Mount St. Helens. Observations by the URS field geologist of road cuts in the Project Area identified tephra deposits, including ash and pumice deposits overlying bedrock. Other volcanic debris resulting from lahar deposition might be present in the proposed Project Area.

Bedrock comprising the southern Washington State Cascades Mountains formed primarily during volcanic activity that began during the Oligocene (23 to 34 million years ago). Bedrock formed during this period includes andesite, dacite, and rhyolite. Later during the Miocene (5 to 23 million years ago), these formations were intruded by granitic magma comprising the Spirit Lake Pluton. Rock formations that comprise the proposed Project Area include eastern portions of the Spirit Lake Pluton which in the vicinity of the site is comprised of quartz diorite, monzodiorite, granodiorite, monzogranite, and granite. Contact metamorphic and other transitional and altered rocks associated with intrusion of the Spirit Lake Pluton into the early Cascade Mountain volcanic rocks are also found in the area of the Project. The copper porphyry in the

Project Area is also associated with the Spirit Lake Pluton. In the general area, most bedrock fractures exhibit a northwest and east direction or strike (Moen 1977).

Past exploration activities in the general area of the proposed Project have identified possible economic mineralization within fractures of the bedrock; ranging in size from less than one inch to as much as 4 feet in thickness (Moen 1977). Vein materials in the fractures consist of quartz, calcite, gouge and wall rock fragments containing disseminated cubic pyrite grains. Pyrite within the veins is also accompanied with chalcopyrite (copper), sphalerite (zinc), galena (lead), pyrrhotite (nickel, copper, platinum), arsenopyrite (arsenic), and gold. These minerals generally occur in small lenses and stringers, and are generally discontinuous (Moen 1977).

3.1.3 Environmental Consequences

3.1.3.1 No Action Alternative

Under the No Action Alternative, none of the proposed activity including drilling would be conducted. Current timber management, equestrian activities, and other recreational activities would continue throughout the Project Area. No surface or subsurface geologic samples would be collected by the Project proponent, and the rock to be extracted as drill cores would remain in place.

3.1.3.2 Proposed Action Alternative

The Proposed Action involves USFS consenting to and BLM issuing the prospecting permits and BLM approving the Exploration Plan which includes 63 exploratory drill holes at 23 separate pad site locations to collect geologic samples. Eight of the drill holes would be completed to duplicate historic borings needed to verify historic results for incorporation into a current resource evaluation.

3.1.3.2.1 Direct Effects

The Proposed Action would include the removal of a small quantity of rock core material from the Project Area for geologic analysis. Approximately 108,200 linear feet of drilling would be performed using NQ diamond drill rods (2.75 inches) and HQ diameter casing (3.78 inches) as needed. In addition to rock core, hand-samples would be removed by project geologists from surrounding outcrops. Rock core and hand samples would be analyzed by standard geologic and geochemical analytical methods.

Proposed drilling may encounter veins of increased mineralization. As noted earlier, historic documents indicate that the veins in the general site area are small, ranging from one-inch to 4 feet in thickness. The amount of non-mineralized and mineralized material that would be removed from the Project Area as part of the Proposed Action is considered to be negligible compared to the total quantity in place.

3.1.3.2.2 Indirect Effects

Extraction of the drill core geologic samples for analysis and study would provide information needed to make sound decisions regarding possible future exploration and/or

the economic value and viability of the mineral resources within the Project Area. The analysis and study of the Project Area's subsurface will help better define the current geology, including faults, physical stability, mineralization, and potential for generation of Acid Rock Drainage (ARD). Geologic information obtained from the Project also would provide a better understanding of the unique geology surrounding Mount St. Helens.

3.1.3.2.3 Cumulative Effects

The collection and analysis of geologic samples, which is the basis of the Proposed Project, would cumulatively enhance existing information regarding the economic viability of mineral resources in the Goat Mountain area.

The Proposed Action including drill holes, removed rock core, and collected geologic samples would not have a detectable or cumulative effects on the current geologic and mineralogical environment of the site. The Proposed Action would have negligible geological impacts at the site which has experienced historical prospecting, limited mineral development, logging, and other human directed activities.

3.1.3.3 Alternative Based on Scoping Comments

Under this alternative, USFS would consent to BLM issuing the prospecting permits and furthermore, BLM would approve the Exploration Plan which includes exploratory drilling. Alternative 3 is distinguished from Alternative 2 in that changes in drilling and hole abandonment operations and procedures would be required to protect surface and groundwater resources; use of water from on-site sources would be balanced by use of off-site sources and re-use of drilling fluids, additional requirements related to, and operational changes related to timing as well as light and noise attenuation.

3.1.3.3.1 Direct Effects

The direct effects to Geologic and Mineral Resources would be similar to those stated in the Proposed Action Alternative. No adverse direct effects are anticipated.

3.1.3.3.2 Indirect Effects

Under Alternative 3, the indirect effects to geologic and mineral resources would be similar to those described in the Proposed Action Alternative. No adverse indirect effects are anticipated.

3.1.3.3.3 Cumulative Effects

Under Alternative 3, the cumulative effects to geologic and mineral resources would be similar to those described in the Proposed Action Alternative. No adverse cumulative effects are anticipated.

3.1.4 Geologic Impact Avoidance and Minimization Measures

Acid Rock Drainage (ARD) forms in both aerobic and secondary anaerobic conditions when water in contact with sulfide minerals (such as pyrite) reacts with oxygen (in the

air), leading to generation of an acidic discharge. If sufficient contact time is afforded with reactive minerals, water can also acquire concentrations of deleterious and possibly toxic metals. The proposed core drilling, however, would not result in conditions conducive to generation of measurable or significant quantities of ARD for the following reasons:

- The amount of surface area in each drill hole that may contain sulfide mineralization would be limited due to the small drill hole diameter (< 3.78-inch), and vertical area available for air and moisture contact.
- Sealing drill holes with cement or grout would prevent sulfide minerals from being exposed to water and oxygen. This is a conservative solution since drill holes filled with stable groundwater would also limit atmospheric oxygen contact with the sulfide minerals, preventing ARD production.
- ARD reaction in drill holes that are not sealed with cement or grout would likely be self-limiting once the free oxygen is consumed through mineral oxidation. Anaerobic ARD processes would also be limited since oxidation of the sulfide minerals, a prerequisite for secondary anaerobic ARD production, would be incomplete.

See Appendix F, *Mitigation Measures* for additional geologic impact avoidance BMP's.

3.2 Hydrology and Hydrogeology

This section describes the existing surface water and groundwater resources within and adjacent to the Project Area. Analysis of surface water hydrology includes stream distribution, water temperature, flow regimes, riparian habitat, wetland potential, and floodplains. It also considers the potential for impacts to surface waters as a result of the Proposed Project, including road crossings, erosion, and sediment delivery to streams.

The analysis of groundwater resources includes likely occurrence and nature of the groundwater, potential impacts as a result of the Proposed Project, and mitigation measures to minimize those impacts.

3.2.1 Affected Environment

The Proposed Action is located within the upper Green River Watershed (HUC No. 170800050401), which is located in the Cowlitz Watershed Resource Inventory Area (WRIA) No. 26, as defined by the Washington State Department of Ecology. The Green River is a tributary of the Toutle River, which drains to the Cowlitz River near the town of Castle Rock. The proposed Project Area is located on the south facing slope of Goat Mountain, which is situated above the north bank of the Green River at elevations that place the proposed drill sites at between 2,880 and 3,780 feet amsl. (Note: Elevations will vary throughout this report depending on the location of the topic of discussion). Slopes are stabilized by Douglas fir and western hemlock forest cover, which intercept precipitation and provide groundwater uptake through evapotranspiration.

The Spirit Lake Ranger Station is the closest official weather gauging station to the Proposed Action site located at a comparable elevation of 3,240 feet amsl. Data from this station indicate that the area receives an average annual rainfall of 93.31 inches, and an average total snowfall of 311.2 inches. Most of the precipitation falls between the months of November and March (WRCC 2012). No staff gauges are known to exist near the Project vicinity, but a staff gauge on the Green River located approximately 4.5 river miles (RM) upstream of the confluence with the North Fork of the Toutle River documents general flow trends in the river. At the staff gauge, the river discharges an annual low monthly mean flow volume of 80 cubic feet per second (cfs) during August with the annual high of 752 cfs occurring in February.

The physical properties of the area are largely influenced by local volcanism, most recently by the 1980 eruption of Mount St. Helens, which covered much of the Project Area in ash and pyroclastic materials associated with lateral blast deposits (USACE 2007). The Project Area includes five soil units mapped by the Skamania County Area Soil Survey (NRCS 2008) as discussed in Section 3.4 *Soils*. Generally, the soil units are described by the Natural Resources Conservation Service (NRCS) as "well drained" and lacking any restrictive soil layer that would prevent deep infiltration. The soils are also listed as having relatively low soil erosion K Factor (0.15).[11] A K factor of 0.15 indicates that the area's soils have a low risk of erosion from surface water flows. Additional discussion of the geology of the Project Area is presented in Section 3.2, *Geologic and Mineral Resources*.

3.2.1.1 Mapped Waters, Wetlands, Floodplains, and Riparian Reserves

Waters mapped within or adjacent to the Project Area include portions of the Green River within the upper Green River watershed and associated headwaters tributaries of the river that cross through or adjacent to the proposed drill pad sites or associated reactivated decommissioned roads, (Figure 3, *Project Area*). Mapped surface waters include perennial and intermittent drainages mapped by the National Hydrography Dataset (NHD) and additional minor ephemeral drainages mapped by the Washington State Watercourse Hydrography (WC) layer[12].

The NHD is a model that predicts stream flow duration and alignment based on contributing drainage area, precipitation, and detailed surface elevation data. It is intended to capture intermittent and perennial surface waters. The WC layer was developed by the State of Washington to support the implementation of the Forest Practices Fish Habitat Water Type Map. The WC data include additional potential ephemeral or minor seasonal drainages that are not mapped by the NHD.

[11] Factor K is one of six factors used in the Revised Universal Soil Loss Equation to predict the average annual rate of soil loss by sheet and rill erosion. The K Factor is based on the percentage of silt, sand, and organic matter, soil structure, and saturated hydraulic conductivity.

[12] Originators: Washington State Department of Natural Resources
Title: Washington State Watercourse (WC) Hydrography
Publication date: 03/01/2006; Geospatial data presentation form: vector digital data.

Based on these mapping sources, the Project Area is located between the Green River to the south and two unnamed perennial tributaries to the east and west. An intermittent drainage mapped by the NHD and several minor ephemeral tributaries mapped by the WC layer are located within the Project Area, (Figure 6, *Surface Waters within the Project Area*). All surface waters within the Project Area drain to the Green River.

No wetlands or floodplains have been mapped within the Project Area. However, there are small areas associated with relatively flat spots along the intermittent or seasonal streams that may have wetland characteristics, and Project-related activity will be avoided at such locations. No wetlands were observed at the proposed drill pad locations. Because the Project is located on moderate to steep slopes with pumice gravel dominating the composition of surface materials, wetlands are unlikely to be present. Existing decommissioned roads cross some intermittent and/or seasonal streams. Most streams crossings have been equipped with culverts, but locations that are near headwater seeps that were dry at the time of road reactivation may not have been so augmented.

Under the NWFP, USFS Riparian Reserves[13] are mapped along perennial and intermittent drainages in the NHD, and can be viewed as dotted lines around these drainages in Figure 3, *Project Area*. Riparian reserves were established as part of the Aquatic and Riparian Conservation Strategy (ACS) to support the NWFP (USFS 2008). These planning areas, which is the designated width on either side of the stream where restrictions are placed on what can be done in order to protect the functions of the land and water in that reserved area around the stream, are intended to be protective of water quality and aquatic habitat. Because some of the pads and portions of the roads scheduled to be reactivated are within riparian reserves, road rebuilding and drilling activities in riparian reserves would comply with the applicable guidelines established for Minerals Management and Road Building outlined in the ACS, and which are described further in Section 3.3.3.1.

3.2.1.2 Surface Water Characteristics

The Project Area is within the Green River's headwaters near River Mile (RM) 32. The river in this portion of the watershed is moderately entrenched within a valley bottom dominated by gravel/cobble or bedrock substrate. The river gradient is approximately two percent with moderate sinuosity. The river provides habitat for native trout, but upstream fish passage is blocked to salmonids by natural gradient barriers downstream at the confluence of the Green River with Falls Creek at RM 24.95 and at RM 31.3, as noted on a 1993 final reach identification data form provided by the USFS. Tributaries within the Project Area drain to the river down steep-gradient channels (>10%) with gravel and silt substrates. Intermittent and perennial tributaries average 4-6 feet wide at the ordinary high water level (OHWL). Smaller, ephemeral, or short seasonal drainages tend to be 1-4 feet wide at the OHWL.

[13] ROD for Amendments to USFS and BLM Land and Resource Management Plan within the Range of Northern Spotted Owl. Standard and guidelines for management of Habitat for Late Successional and Old-Growth Forest Related Species within the Range of Northern Spotted Owl. (April, 1994). See B-12-B-13 for Riparian Reserves definition with in the matrix lands of FS. And page C-32-C-33 for Standards and Guidelines for Roads Management and Mineral Activities.

Water quality samples collected by Ecology in 2002 indicate that relatively high amounts of copper appear to be naturally present in the Project Area drainage system. Background water quality samples taken at the upper end of the unnamed tributary located just east of the proposed drill pads contained relatively high amounts of copper, as did samples collected lower in elevation along the unnamed tributary (Ecology 2002). This same area is registered twice on the 2008 303(d) list for copper in WRIA 26. This means that the area has been identified as an area with water quality issues.

3.2.1.3 Existing Hydrologic System Constraints

Human activity in the area has been dominated by logging and silvicultural activity, recreation use, and mineral prospecting, resulting in a supporting network of roadways which are now either decommissioned or active. All historic and current uses have the potential to impact water resources in the Project Area. A 2002 report by Ecology notes that there are three mine adits along the perennial drainage located adjacent to the eastern edge of the Project Area; data presented in the 2002 report indicates that there are increases in surface water and sediment copper concentrations downstream of these features within the unnamed tributary associated with this drainage. The Polar Star mine, located downstream (west) of the Project Area, is reported to discharge low pH water with high conductivity. The Green River Horse Camp is located at the south edge of the Project Area, which attracts recreational equestrian uses and hikers. It has been reported that water from a hose located east of the proposed security gate on FS Road 2612 is non-potable water, and has not been approved for potable use by the USFS. The Proposed Project would not limit access to this water source.

Within the Project Area existing logging roads cross all of the drainages, often at two or three separate locations. These crossings were/are managed by the installation of culverts and subsequent removal following timber harvests. Seasonal drainage on decommissioned roads is managed by water bars, or notches dug diagonally across the road to draw off surface water without eroding the road. Where the road gradient is steep, water bars were placed more frequently. Stream crossings along the main access road, FS Road 2612, are managed by existing culverts.

3.2.1.4 Hydrogeological Conditions

Specific hydrogeologic information related to the site was not identified during completion of this EA. Therefore, presented information is based on evidence from sites in similar environments. Groundwater within the affected area is likely found in unconfined and confined conditions. Phreatic (unconfined) groundwater is likely present within alluvial, tephra, and drift deposits overlying bedrock in the vicinity of the Project Area. If present, unconfined groundwater aquifers in the Project Area are likely recharged primarily through local precipitation including rain and snow-melt, although some recharge is suspected through bedrock seeps and springs. Unconfined groundwater is likely discharged through evapotranspiration, seeps and springs, and directly to surface water.

Flow of unconfined groundwater generally follows the topography. Occurrence and depth to unconfined groundwater within the Project Area is variable, with thin to non-existent saturated intervals lying immediately above bedrock in steep portions of the site and thicker saturated intervals, likely within 10 feet of the ground surface, in valley bottoms. Groundwater within the unconfined aquifer along the southern portion of Goat Mountain is generally assumed to flow towards the Green River at the valley bottom. High hydraulic conductivities are suspected in soil materials expected to comprise the ground surface in the proposed Project Area. The saturated hydraulic conductivities of these materials likely range from 0.1 to 1,000 centimeters per second (cm/s) (Driscoll, 1986). Lower hydraulic conductivities are suspected in materials consisting primarily of ash.

Confined groundwater conditions are reportedly present within bedrock beneath the Project Area. Groundwater flow within bedrock is likely along fractures/faults and within brecciated rock formations. A rock core drilled in 2010 reportedly encountered artesian conditions, which is an indicator of confined conditions. An exploration drill hole located in the northeast portion of the site reportedly flowed water following drilling. This drill hole was reportedly capped after completion to stop the flow of water to the surface. Two additional former drill holes (MM-10-10 and Duval hole 06 near Pad 20) reportedly encountered artesian conditions. These holes will be plugged and abandoned according the Washington State well abandonment procedures at the end of this exploration drilling program. It is possible this condition exists in other areas of the Project Area. Hydraulic conductivities of bedrock in the area are unknown. However, hydraulic conductivities of moderately fractured igneous bedrock can range from 0.001 to 0.00001 cm/s (Driscoll, 1986).

Discharge of the confined bedrock aquifer is assumed to occur into the overlying unconsolidated materials and along seeps and springs in the lower elevations of the Project Area. Recharge of the confined aquifer likely occurs in the higher elevations of Goat Mountain through precipitation (snow melt and rain) that drains through overlying unconsolidated deposits and seeps into bedrock fractures and through seepage from several cirque lakes on the north and east sides of Goat Mountain.

No mapped springs were identified in the Project Area. Groundwater possibly discharges to the two small perennial tributaries of the Green River located on the east and west side of the Project Area. During field reconnaissance conducted by URS on November 11, 2011, a small seep was noted immediately west of Pad 19. As previously mentioned, a spring or abandoned drill hole located along FS Road 2612 east of the proposed security gate is reportedly used as a non-USFS approved/non-potable water source by recreational users of the Project Area. No water wells are documented in the Washington State Department of Ecology Well Log Database within five miles of the Project Area.

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be done. The need to reactivate decommissioned roads, remove vegetation, install culverts, install erosion

control (including but not limited to installation of silt fencing, water bars or re-vegetation at the completion of drilling) would not be necessary. There would be no changes to existing runoff patterns or to resulting erosion patterns or volumes following precipitation events. Likewise, there would be no use of groundwater for drilling and no discharge of drilling fluid. Nor would there be direct, indirect or cumulative effects to surface water or groundwater as a result of this alternative. Furthermore, potential stormwater improvements to reactivated roads, (leaving water bars in place at the completion of the Proposed Action) also would not occur.

3.2.2.2 Proposed Action Alternative

All activities conducted under the Proposed Action would avoid direct drilling within mapped surface waters. However, proposed improvements to existing road crossings would involve placement of temporary culverts at existing ephemeral or seasonal drainages that currently cross the roads via water bars.

The Proposed Action potentially includes advancing exploratory drill holes through unconfined and confined aquifers at the project site. The Proposed Action would use up to 5,000 gallons of water per day (gpd) obtained from previously drilled exploratory drill hole (MM-10) or Duval hole 06 (Pad 20) under artesian (flowing) groundwater conditions. Groundwater consumption would be between 2 and 20 gpm during the drilling process, but it would average approximately 5 gpm during an eight-hour period over a 24-hour work cycle. Water use during drilling is dependent on geologic and hydrogeological subsurface conditions. Zones of higher rock fracturing or dry faults would require the use of additional water. Conversely, more competent rock and encountering groundwater within the drill hole would require less water use. Water used for drilling would be combined with a non-toxic standard drilling additive, and the resulting mixture (drilling fluid) would be used to cool the drill bits and to return drill cuttings to the surface. A limited amount of water would also be used to mix cement grout during the drill hole abandonment. Most of the water used for drilling activities would infiltrate back into the ground during drilling or through the drilling fluid sump installed at the drill pad. A small percentage (less than one percent) would be lost through evaporation.

3.2.2.2.1 Direct Effects

Elements of the Proposed Action that could directly affect surface waters include road and drill pad improvements, movement of equipment, vehicle traffic, parking equipment on gravel roads above perennial drainages, and riparian impacts associated with tree removal, drilling, and management of produced water. Road improvements would result in loose, side cast soil staging. However, the erosion K factor of 0.15 indicates that the area's in-place soils have a low risk of erosion from surface water flows, therefore, any direct effect is likely to be negligible. Side cast soil, where the soil's natural structure has been disturbed, would have a higher possibility for erosion. The Project, however, would implement all practicable sedimentation controls consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion. The applicable erosion control measures that would be

required in a prospecting permit are described in Section 2.1.2.1, and in Appendix F, *Mitigation Measures*.

Riparian impacts would be minor. Some tree clearing, (<12-inch dbh) and minor brush removal may occur in association with drill Pads 6 and 7. Road reactivation and drilling would be consistent with the ACS Objectives, (see Table 3.3-1); and also comply with the Minerals and Road Management Standards and Guidelines established for Riparian Reserves in the GPNF Forest Plan. However, the limited impact to upland vegetation and the few trees cleared relative to the existing forest cover would have minimal potential to alter temperature conditions or otherwise affect nearby streams.

Elements of the Proposed Action that could directly affect groundwater include drilling operations, drilling fluid management, and drill hole effects. Drilling operations would include introduction of drillings fluids into the drill holes which would be circulated to the ground surface to remove drill cuttings, and lubricate and cool the drill bit. Drilling fluids are primarily water, to which bentonite and polymer products would be added to increase the density of the fluid to facilitate removal of drill cuttings and enhance bit cooling. Bentonite is an earthen product comprised of sodium montmorillonite, which is naturally formed during weathering of volcanic ash.

Bentonite is generally similar to natural materials expected to be present in the area due to nearby volcanic activity. Polymer products would be added in small amounts and include anionic polyacrylamides, polysaccharide, anionic water soluble polymer, and polymer salt chemical classes. In addition, assembly lubricants and anti-seize compounds would be used on drill steel and casings. While these polymer products and lubricants are generally considered environmentally safe, the Proposed Action does not specify environmentally protective performance criteria or industry standards. Therefore, there is potential that toxic drilling fluid additives and lubricants would be used.

During drilling, the drill core string would be extended into the ground producing an approximately 2.98-inch diameter drill hole using an NQ drill bit to an approximately 3.75-inch diameter drill hole using HQ casing. The core itself would be about 1.87 inches in outside diameter. The difference in diameter between the core and the NQ and HQ drill hole diameters represents the volume of formation material that would be pulverized into drill cuttings (possibly as fine as rock flour). Approximately 110,000 feet of total exploratory drilling would be conducted while completing 63 drill holes with an average drill hole length of about 1750 feet. Generation of drill fines, based on the volume of formation displaced, would range from about 40 to 100 cubic feet per drill hole. Under the Proposed Action, less than 10 gallons of cuttings would be expected based on returns observed during 2010 drilling. Therefore, most of the formation displaced during drilling would remain in the ground. Drill cuttings that are not removed from the drill hole would be combined with drilling fluids by the drilling action, and a portion of the cuttings would be forced into the surrounding formation through hydrostatic pressures introduced by the drilling fluid.

This zone around a drill hole penetrated by drilling fluid and rock flour is called the "invasion zone". The invasion zone is characterized as an area of reduced porosity around a drill hole resulting from drilling fluid and rock flour filling natural voids in the formation. As the drilling fluid and rock flour moves outward into the formation near the drill bit, the surrounding rock filters the bentonite, additives, and rock flour from the drilling fluid. By definition, drilling fluids and rock flour would be contained within the invasion zone, and once the formation is sufficiently invaded a "mudcake" forms on the drill hole wall significantly limiting the introduction of additional drilling fluids. Studies of invasion phenomena have found that invasion distances range from less than a foot outwards in high porosity formations to 10 to 15 feet outward in lower porosity formations[14]. According to the proposed Exploration Plan, drilling additives would be used as little as possible which would likely increase the size of the invasion zone, potentially allowing more sulfide mineral containing rock flour to be present in the invasion zone. The presence of rock flour potentially containing sulfide minerals and metals that invades adjacent formation material poses risk to groundwater quality since the geochemical characteristics of the adjacent formation might be different than the invading rock flour, especially if the rock flour is from another zone in the drill hole.

Returned drilling fluids would be directed to sumps dug within the drill pads and lined with a permeable matting material to settle the returned drill cuttings. Decanted drilling fluid, which is primarily water, would then be allowed to infiltrate into the subsurface beneath and adjacent to the sump. Exploration activities completed in 2010 suggest that the hydraulic conductivity of native soils is sufficient to allow complete infiltration of the fluid. Following the completion of drilling activities, the matting material would be removed along with accumulated sediment for off-site disposal.

Drilling operations may encounter unconfined groundwater in surficial (overburden) soils and confined conditions in bedrock. During drilling, there would be a potential for water from one aquifer cross-flowing into another aquifer since drilling fluid additive use under the Proposed Action would be minimized, limiting formation of a drill hole wall "mudcake" that prevents outward flow of water from the drill hole. Also, because drill holes that do not "make water" would not be sealed, and because no attempt to isolate deeper aquifers from the near surface aquifer would be performed, the Proposed Action would have the potential to open pathways between unconfined near surface groundwater and deeper confined groundwater. Drill holes that "make water" would be sealed with grout to prevent release of water to the ground surface, and would serve to limit movement of groundwater within the drill hole. However, changes in groundwater elevation could create situations where drill holes that did not make water during drilling could periodically flow water in the future.

The Proposed Action would use groundwater available from previous drill holes within the Project Area as a source of water for drilling fluids. The Project Area is located entirely within the Green River watershed. According to on-line information from

[14] Quantification of the Depth and Volume of Mud Filtrate Invasion in Boreholes Drilled with the Mud Rotary Drilling Method, Hughbert Collier, Tarleton State University

Ecology, two users have water rights on the Green River, including the Washington Department of Fish and Wildlife and Weyerhaeuser. Two other users are listed; however, their status is listed as inactive. Accounting for only the active water users, a total of 48.5 cfs, or 21,800 gallons per minute (gpm), is allocated for use. Water requirements for the Proposed Action are estimated to average approximately 5 gpm with a potential peak use of 20 gpm. Actual water use may average lower based on conditions experienced in 2010 (possibly as little as 2,400 gpd or approximately 360,000 gallons over the five month project). Most water used, with the exception of a negligible amount lost to evaporation, would be returned to the subsurface during drilling or through infiltration in the drill sump. Assuming conservatively that the peak water use is consumed during drilling; only 0.09 percent of the allocated water would be used on a per minute basis. This is a negligible amount of water that would not affect allocated uses.

A USGS gauging station is located along the Green River downstream from the Project Area. Flow data records were available from September 8, 1980 through September 30, 1994. Average flow recorded at the station for this period was 476 cfs (213,630 gpm), with maximum and minimum flow rates of 7,310 and 32 cfs (3,281,000 and 14,360 gpm) respectively. Low flows were generally observed in July through September while higher flows were observed during the spring melt. Maximum (peak) estimated water use for the Proposed Action (20 gpm) would be approximately 0.1 percent of the minimum and 0.01 percent of the average flows recorded for the gauging station (on a per minute basis). Estimated average water use of the Proposed Action (5 gpm) is 0.03 percent, and 0.002 percent of the minimum and average recorded flows (on a per minute basis). Given that water use for the project represents fractions of a percent of allocated and available water within the watershed; and since most water used during drilling would be discharged back into the watershed, the effects of water withdrawal are expected to be negligible. Furthermore, if additional water is needed, it has been proposed that groundwater be supplemented by hauling it by truck from off-site sources. Off-site water, following use in drilling fluid, would be returned to the watershed, further mitigating local groundwater water use.

Groundwater use would be allowed under a Washington State Department of Ecology groundwater withdrawal exemption where up to 5,000 gpd could be withdrawn for industrial purposes, including mineral exploration. Use of groundwater by the Project from on-site sources would be limited to 5,000 gpd. If more than 5,000 gpd per day were to be used an Ecology groundwater water right permit would be required.

3.2.2.2.2 Indirect Effects

The long term anticipated effects to surface waters would be minimal due to the small scale and short duration of the Proposed Action. Potential indirect effects include changes to groundwater elevation within saturated soil and rock horizons. Such changes could affect the location, duration, and frequency of groundwater discharge at various locations along the slopes within the Project Area. This potential would be minimized at drill hole locations that make water and would be sealed.

Operation of mechanical equipment, such as the drilling equipment, generators, pumps, and other support equipment and vehicles, presents a potential risk to surface water and groundwater at the site through leaks and spills of petroleum-based fuels, lubricants, and hydraulic fluids. Deleterious effects, however, would be mitigated by placing spill containment kits in operation areas to allow site workers to respond to spills and releases as they occur.

3.2.2.2.3 Cumulative Effects

Goat Mountain is within the St. Helens Mining District, Ryan Lake area (WDNR, 1977). The majority of limited mineral development in the area was conducted in the early 1900s, and little (if any) has occurred since then. The inactive Polar Star Mine is located less than one mile west of the Proposed Action; and an unnamed stream less than one-quarter mile to the east of the Project Area has three historic mine adits (small tunnels) nearby. Acidic water has reportedly been documented at the Polar Star Mine and surface water samples collected by Ecology both upstream and downstream in the unnamed stream east of the area of the site have indicated elevated copper levels which exceed state water quality standards (Ecology 2002). It is unknown whether elevated copper in upstream samples is related to past exploration/mining activities or naturally occurring copper. However, the cumulative effects of the Proposed Action on surface water and groundwater quality are considered minimal relative to existing surface water and groundwater quality.

Local road history indicates that FS Road 2612 has been in place since well before the eruption of Mount St. Helens. On-going use of the road for recreation and forest management requires periodic maintenance during which fine sediment maybe mobilized, however, all practicable sedimentation controls will be implemented consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion. Recreational use including trail building and use have increased since the Green River Horse Camp was built. Where trails intersect with streams, some fine sediment is likely entering the watercourse.

Cumulative effects on streams are mostly related to additional small increments of the same kinds of effects as have occurred in the past and will continue to occur based on current uses. The re-growth of vegetation that serves to prevent erosion and sedimentation would be impacted in areas that are disturbed. However, the soils in the disturbance areas are relatively low in fine sediment content, and the locations of disturbance are far enough upstream on small tributaries that additional sediment is not likely to reach downstream. In addition, the placement of silt fences, mulch on roads, culverts at stream crossings, and water bars would further mitigate sedimentation. The collective consequences of these small incremental impacts would be minor and are considered negligible.

3.2.2.3 Alternative Based on Scoping Comments

Under this alternative, exploratory drilling would be performed with operational, drilling fluid management, monitoring, and drill hole setting and abandonment changes as

described in EA Section 2.1.4, *Alternative Based on Scoping Comments*. Exploration drilling would be performed with emphasis on use of water from on-site sources up to 5,000 gpd or greater if appropriate Washington State Department of Ecology water right/use permits are obtained, maintenance of return circulation throughout drilling of each bore hole, and complete abandonment of each hole with sealing material (bentonites) or cement if ground water or artesian flow is encountered, and operational changes related to timing, and light and noise abatement.

3.2.2.3.1 Direct Effects

The direct effects to surface waters, riparian habitat, stream distribution, water temperature, flow regimes, wetland potential and floodplains would be similar to those stated for the Proposed Action Alternative. Project work including road improvements could increase the potential for erosion and sedimentation. The Project, however, would implement all practicable sedimentation controls consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion. The applicable erosion control measures that would be required in a prospecting permit are described in Section 2.1.2.1, and in Appendix F, *Mitigation Measures*.

Potential groundwater quality impacts would be mitigated to negligible levels. Drilling fluid additives used under Alternative 3 would meet NSF/ANSI approval standards for drinking water wells, which would reduce the potential for toxics compounds entering groundwater. Source water not obtained from a regulated water system with periodic source water testing would be tested for potential contaminants; this would further reduce the potential for inadvertent introduction of potential contaminants into groundwater at the site.

To reduce effects of sulfide minerals and metals contained in drilling fines from entering formation water bearing zones through invasion processes, drill cutting return would be optimized by using drilling methods that increase return of drilling fluids. Under the Proposed Action, about 10 gallons of drill cuttings would be expected to be returned. Under Alternative 3, return of drill cuttings to the ground surface would increase reducing the volume of drill cuttings remaining in the ground. Also, the optimized drilling method would tend to promote reduced invasion of the surrounding formation, replacing rock flour with drilling fluid additives that would meet drinking water well standards, and would promote better drill hole wall "mudcake" formation. This would help to seal adjacent formations to groundwater migration and would prevent cross-aquifer environmental impacts. In instances where drill fluid circulation is lost, the formation causing the loss would be sealed prior to continued drilling and the drill hole would be abandoned if circulation could not be re-established.

In addition to better return of drilling fluids, drilling fluids would be collected in an appropriately sized containment and recirculated, reducing the water quantity requirements of drilling activities. Drilling muds settled from the drilling fluid, enviro-matting, and impermeable liners would be disposed off-site.

Transient effects to groundwater resulting from drilling operations would be monitored by periodic testing of groundwater samples collected from MM-10-10 and Duval hole 06 prior to and during drilling. Sharp or significant changes in groundwater chemistry would be evaluated relative to drilling operations and natural processes. Upon completion of drilling activities MM-10-10 and Duval hole 06 would be permanently sealed by grouting, unless directed otherwise by the Agencies.

Where overburden is present at a drill hole location, a temporary casing would be extended through the overburden and sealed into the underlying bedrock. This would eliminate risk of subsurface drilling fluid loss to near surface groundwater and soils, and would prevent near surface groundwater from cascading down the drill hole annular space.

Following completion of drilling, all drill holes would be abandoned by sealing the full well column by methods and materials that are appropriate to prevent movement water within, into, and around the abandoned drill hole. Bentonite/cement mixtures such as described in Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160 would be used to abandon any drill hole that encountered artesian flow. This would eliminate risk from ARD and future post-drilling risk of groundwater contamination from surface sources or from migration between aquifers. This also would eliminate potential for changing groundwater flow patterns effecting surface water seeps and springs.

Impacts to groundwater would include less use from confined site aquifer(s) since recirculation of water would diminish the demand on either on-site sources or for importation from other areas. While this EA does not consider impacts to water purveyor systems outside the Project Area, it is unlikely that the quantity of water imported for drilling would significantly impact a municipal source under normal conditions.

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3.2.2.3.2 Indirect Effects

The indirect effects to surface waters, riparian habitat, stream distribution, water temperature, wetland potential and floodplains would be similar to those for the Proposed Action Alternative. Indirect effects to groundwater would include increased understanding of groundwater chemistry by sampling of MM-10 and Duval hole 06. Also, these flowing historic drill holes will be sealed with grout, unless directed otherwise by the Agencies, eliminating risk of erosion or groundwater loss should existing pressure valves/caps fail in the future.

3.2.2.3.3 Cumulative Effects

Cumulative effects on streams would be similar to those stated in the Proposed Action Alternative. Cumulative effects on groundwater would be positive since Alternative 3 is protective of groundwater and could well become a model for future exploration activities within the Permit Area.

3.2.3 Surface Water Impact Avoidance and Minimization Measures

As outlined in Section 2, a number of environmental protection measures would be implemented during reactivation/installation, operation, and reclamation of the Proposed Project to minimize sedimentation or erosion resulting from runoff or precipitation events. A Project SPCC plan would be implemented to control drilling fluids and petroleum products. All containers of hazardous substances would be labeled and handled in accordance with Mine Safety and Health Administration (MSHA) regulations. Impacts would be minimal due to the use of environmentally safe drilling fluid additives meeting NSF/ANSI Standards and adherence to Chapter 173-162 WAC.

At intermittent stream crossings, where culvert placement along existing, inactive Forest Service roads is required, there will be in-stream work (Figure 6). Due to the likelihood for in-water work, a water delineation should be performed and submitted to the USACE for boundary concurrence and jurisdictional determination. Work in waters that are regulated under Section 404 and 401 of the Clean Water Act may require a permit from the USACE and Ecology. This may be authorized under a Nationwide Permit, which would speed up the permit review process. In addition, any work in intermittent or perennial streams may require a Hydraulic Project Approval permit from WDFW. Because the proposed work area is located entirely on federal lands, it is not regulated under Skamania County's Shoreline Master Program or Critical Areas Ordinance. If the project would result in more than one acre of soil disturbance it should apply for coverage under Washington's Stormwater Construction General Permit.

3.2.3.1 Aquatic and Riparian Conservation Strategy Guidelines

By implementing and maintaining impact avoidance and minimization measures consistent with the Aquatic and Riparian Conservation Strategy (ACS) guidelines, and the Forest Service National Core Best Management Practices (BMPs) for Water Quality Management in Minerals Management Activities (USFS 2012), impacts to surface water would be minimized to the point of being negligible.

The 1994 Northwest Forest Plan (NWFP) requires that proposed projects on Federal lands must be consistent with the Aquatic Conservation Strategy (ACS) Objectives. A finding must be reached that a project "meets" or "does not prevent attainment" of the ACS objectives. Findings relative to the nine ACS objectives are included in Table 3.3-1.

Table 3.3-1. Aquatic and Riparian Conservation Strategy Objectives

Objective #	Objective	Proposed Action Finding

Objective #	Objective	Proposed Action Finding
Objective 1	Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.	The Proposed Action would maintain the distribution, diversity, and complexity of the watershed's aquatic systems by retaining the overall character of existing landscape and watershed-scale features. The Proposed Project's potential negative effects would be temporary and at the local scale. There would be no direct or cumulative negative effects from the Proposed Action (Alternative 2) at the landscape scale.
Objective 2	Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include flood plains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.	The Proposed Action would maintain hydrologic connectivity within the upper Cowlitz River watershed by retaining the existing drainage networks. This project would not result in any substantial development within the floodplain and therefore would not result in alterations to the frequency or duration of flood events, nor would it diminish the functions that floodplains provide such as flood storage and conveyance, infiltration, aquifer recharge, and reduction of peak flows and velocities. In addition, the Proposed Action would not increase impervious surfaces or create any hydrologic obstructions or crossings.
Objective 3	Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.	The Proposed Action would maintain the distribution, diversity, and complexity of the watershed's aquatic systems by avoiding water bodies, sensitive areas, unstable slopes and highly erosive soils to the extent practicable.
Objective 4	Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.	The Proposed Action would maintain water quality necessary to support healthy riparian, aquatic, and wetland ecosystems by using applicable BMPs to minimize erosion and storm water discharge from ground disturbance at exploration sites; and avoiding or minimizing long-term impacts to soil, water quality and riparian resources to the extent permitted by the geologic target when selecting locations for exploration activities.

Objective #	Objective	Proposed Action Finding
Objective 5	Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.	The Proposed Action would maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems by using applicable BMPs to minimize erosion and storm water discharge from ground disturbance at exploration sites; and avoiding or minimizing long-term impacts to soil, water quality and riparian resources to the extent permitted by the geologic target when selecting locations for exploration activities.
Objective 6	Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.	Not Applicable, as no in-stream work would occur. The Proposed Action would 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 by avoiding water bodies, sensitive areas, unstable slopes and highly erosive soils to the extent practicable.
Objective 7	Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.	The Proposed Action would maintain water quality necessary to support healthy riparian, aquatic, and wetland ecosystems by using applicable BMPs minimize erosion and storm water discharge from ground disturbance at exploration sites; and would properly abandon, plug, and cap all drill holes or cores per industry standards. Holes which are found to make water would be grouted in accordance with WAC 173-160. Groundwater use would be limited to an amount that is negligible to watershed allocated use and water availability, and most of the water used would be infiltrated back into the substrate, further minimizing the loss of water from the area.
Objective 8	Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.	The Proposed Action would maintain the distribution, diversity, and complexity of the watershed's aquatic systems by avoiding water bodies, sensitive areas, unstable slopes and highly erosive soils to the extent practicable.

Objective #	Objective	Proposed Action Finding
Objective 9	Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.	The Proposed Action would avoid or minimize long-term impacts to soil, water quality and riparian resources to the extent permitted by the geologic target when selecting locations for exploration activities; and use applicable practices of BMP Min-9 (Minerals Extraction Site Reclamation) to reclaim the Project site once exploration activities are completed.

Source: Gifford Pinchot National Forest – Northwest Forest Plan

ACS boundaries within the Project Area are mapped on Figure 6, *Surface Waters*. See Appendix F, *Mitigation Measures* for additional surface water impact avoidance BMP's.

3.2.4 Groundwater Impact Avoidance and Minimization Measures

Sealing drill holes with high-solids bentonite grout and/or bentonite/cement mixtures such as described in Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160) would prevent groundwater discharges from drill holes, and would prevent flow of water between zones of differing water pressures. Grout sealing would prevent water loss and further prevent ARD generating reactions with sulfide minerals from occurring. By limiting on-site groundwater use to 5,000 gallons per day (as required), groundwater use is limited to an amount that is negligible to watershed allocated use and water availability. Most of the water used would be infiltrated back into the substrate either through down-hole loss or infiltration into drill sumps, further minimizing the loss of water from the area. Use of non-toxic drilling fluid additives would prevent impacts to groundwater and surface water. Spill containment kits would be kept at fuel storage areas and with the drill, water pump and in the service trucks. A Spill Prevention Plan submitted to the USFS would be followed, and any spills or leaks would be immediately reported and promptly cleaned up. See Appendix F, *Mitigation Measures* for additional groundwater impact avoidance BMP's.

3.3 Soils

3.3.1 Affected Environment

Soils in the Project Area are typical of mountain slopes in the north Cascade Range, and are formed in layers of aerially deposited volcanic ash and pumice, and are mainly deep and well drained. Slopes are gentle to steep in gradient with slopes of 3 to 35 percent in grade. No Prime and Unique Farmland soils are located in the Project Area as defined by 7 CFR 657.5[15]. Soils in the Project Area were mapped by the NRCS as part of preliminary surveys of Skamania County.

Based on the NRCS Web Soil Survey, the soils within the Project Area consist of approximately 64 percent Colter cindery sandy loam, approximately 24 percent Minnepeak loamy sand, approximately 6.0 percent Colter loamy sand, approximately five percent Rock outcrop-Cattcreek complex, and less than one percent Elkprarie loamy

[15] Title 7: Agriculture: Subtitle B: Regulations of the US Department of Agriculture

sand. In general, the soils within the Project Area consist of sandy loam and loamy sand with varying amounts of gravel. The soils are within the hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. The soils are characterized by a moderate to severe erosion hazard by water, and a high erosion potential by wind. However, the area has an estimated K factor of 0.15, indicating that area soils have a low risk of erosion from surface water flows. Similar soil is anticipated at each drill pad location based on widespread blanketing deposition of ash and pumice that occurs in volcanic areas. A summary of the survey findings is presented below:

- The Colter cindery sandy loam soil is found on slopes of 0 to 90 percent in grade. The parent material consists of volcanic ash and pumice. The depth to a root restrictive layer is greater than 60 inches. The shrink-swell potential is low. The soil is well drained, and does not meet hydric criteria. This soil consists of gravelly sandy loam at depths of 0 to 6.0 inches; extremely gravelly sand, very gravelly loamy sand, and very gravelly sand at depths of 6 to 33 inches; sandy loam, gravelly sandy loam, and gravelly loamy sand at depths of 33 to 54 inches; and extremely gravelly sand at depths of 54 to 60 inches. The soils are made of 69 percent of sand, 24 percent of silt, and 7.0 percent of clay. The soil is within the soil hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. This soil is characterized by a moderate erosion hazard by water on 0 to 30 percent slopes, severe on 30 to 65 percent slopes, and severe to very severe on 65 to 90 percent slopes, and by a moderate erosion potential by wind.
- The Minniepeak loamy sand, overblown soil is found on 5 to 30 percent slopes. The soil is on ridges and mountain slopes. The parent material consists of volcanic ash and pumice. The depth to a root restrictive layer is greater than 60 inches. The shrink-swell potential is low. The soil is well drained, and does not meet hydric criteria. The soil consists of loamy sand at depths of 0 to 15 inches; gravelly sandy loam at depths of 15 to 18 inches; loamy sand and sandy loam at depths of 18 to 23 inches; and extremely gravelly sand, very gravelly sandy loam, and extremely gravelly coarse sand at depths 23 to 60 inches. It is made of 82.4 percent of sand, 16.6 percent of silt, and 1.0 percent of clay. The soil is within the hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. The soil is characterized by a moderate to severe erosion hazard by water, and a high erosion potential by wind.
- The Colter loamy sand, overblown soil is found on 0 to 95 percent slopes. The soil parent material consists of volcanic ash and pumice. The depth to a root restrictive layer is greater than 60 inches. The shrink-swell potential is low. The soil is well drained, and does not meet hydric criteria. The soil consists of loamy sand at depths of 0 to 15 inches; gravelly sandy loam at depths of 15 to 21 inches; extremely gravelly sand, very gravelly loamy sand at depths of 21 to 48 inches; and sandy loam, gravelly sandy loam, and loamy sand at depths of 48 to 60 inches. The soil is made of 81.1 percent of sand, 16.4 percent of silt, and 2.5 percent of

clay. It is within the hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. This soil is characterized by a severe erosion potential by water, and a high erosion potential by wind.

- The Rock Outcrop and Cattcreek soil association consists of approximately 60 percent rock outcrop and 30 percent Cattcreek soil and is found on 65 to 90 percent slopes. The soil parent material consists of volcanic ash and pumice. The depth to a root restrictive layer is 40 to 60 inches. The shrink-swell potential is low. The soil is well drained, and does not meet hydric criteria. The Cattcreek soil component consists of very gravelly loamy sand at depths of 0 to 6 inches; very gravelly sand and very gravelly loamy sand at depths of 6 to 15 inches; extremely gravelly sand and very gravelly sand at depths of 15 to 30 inches; extremely gravelly loam and very gravelly sandy loam at depth of 30 to 54 inches, and unweathered bedrock at depths of 54 to 58 inches. The soil component includes 79.2 percent of sand, 15.8 percent of silt, and 5.0 percent of clay. The soil is within the hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. The Rock Outcrop consists of unweathered bedrock, and is within the hydrologic group D, characterized by very slow infiltration rates and a high runoff potential. The soils are shallow over nearly impervious material and have a very slow rate of water transmission. The Rock Outcrop-Cattcreek complex is characterized by a severe to very severe erosion hazard by water, and by a high erosion potential by wind.
- The Elkprairie loamy sand soil is found on 5 to 90 percent slopes. The parent material consists of volcanic ash and pumice. The depth to a root restrictive layer is greater than 60 inches. The shrink-swell potential is low. The soil is well drained, and does not meet hydric criteria. The soil consists of loamy sand at depths of 0 to 6 inches; gravelly coarse sand, sand and gravelly sand at depths of 6 to 17 inches; very gravelly loamy sand, gravelly loamy sand, and loamy sand at depths of 17 to 23 inches; gravelly loam, gravelly sandy loam, and fine sandy loam at depths 23 to 36 inches; and loam at depths of 36 to 60 inches. It is made of 80.7 percent of sand, 16.3 percent of silt, and 3.0 percent of clay. The soil is within the hydrologic group B, which is characterized by moderate infiltration rates, a moderate rate of water transmission, moderate fine to moderate coarse soil texture, and a moderate runoff potential. The soil is characterized by a moderate to severe erosion hazard by water, and a high erosion potential by wind.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be done. The need to reactivate decommissioned roads, remove vegetation, install culverts and other erosion controls (including but not limited to silt fencing, water bars, and re-vegetation at the completion of drilling) would not be necessary. There would be no changes to existing runoff or erosion patterns or to flow volumes following precipitation events. No direct, indirect or cumulative effects from this alternative are anticipated.

3.3.2.2 Proposed Action

Total surface disturbance associated with the Proposed Project could impact up to 3.3 acres, including reactivated existing decommissioned roads from the 2010 drilling pad sites, and newly reactivated existing decommissioned roads. The total new surface disturbance associated with the Proposed Project could impact up to 0.85 acres. Activities conducted under the Proposed Action would also result in improvements to reactivated existing decommissioned road crossings. This would involve grubbing, temporary side cast soil staging, and placement of temporary culverts at existing ephemeral or seasonal drainages that currently cross the roads via water bars. The work would be performed in areas with grades of 3.0 to 35 percent.

3.3.2.2.1 Direct Effects

Reactivating existing decommissioned roads required for the proposed exploration, especially in steep terrain, would increase the erosion potential by wind and water of disturbed soils until reclamation was successfully completed. Removal of vegetation during preparation of access road would expose soils on slopes. Disturbed areas on hill slopes would be especially susceptible to erosion and subsequent impacts to soil quality due to steepness and long slope length.

The proposed drilling schedule for the Proposed Action is described in Section 2.1.3.4. These impacts would be reduced by measures incorporated in the Project design, including the use of water bars and culverts, installation of erosion control material and growth media, and implementation of BMPs listed in Appendix F, *Mitigation Measures*. Impacts would also be reduced by concurrent reclamation of drill pad sites, sumps, trenches, and drill roads no longer needed for access. Reclamation activities, such as re-grading, ripping, and re-vegetation of disturbed areas would also minimize soil loss.

Compaction of the soils would occur along reactivated decommissioned roads and in the area of the drill pads due to vehicular traffic. The compaction of the soil until reclamation is completed may temporarily increase the storm runoff potential and increase the velocity of runoff water. This effect of the Proposed Action is expected to be relatively minor considering that FS Road 2612 is already well compacted by historical and current use. Impacts would also be reduced by concurrent reclamation of drill pad sites, sumps, trenches, and roads no longer needed for access, as well as the use of water bars and the installation of erosion control material.

Road improvements would result in loose, side cast soil staging, which has the potential to erode into downslope waters. The erosion K factor of 0.15 indicates that the area's in-place soils have a low risk of erosion from surface water flows, therefore, any direct effect is likely to be negligible. However, side cast soil where the soil structure is disturbed would have a higher potential of erosion. The Proposed Action would implement all practicable sedimentation controls consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion.

3.3.2.2.2 Indirect Effects

The indirect effects to soils that could occur later in time, but are reasonably certain, would be minimal due to the small scale and short duration of the Proposed Action. These indirect effects include impacts that would be caused by alteration of standing vegetation which may increase erosion. These effects would be reduced by measures incorporated in the Project design, including the use of water bars and culverts, installation of erosion control material and growth media, and implementation of other BMPs listed in Appendix F, *Mitigation Measures*.

3.3.2.2.3 Cumulative Effects

On-going use of the roads for recreation, forest management, and other purposes would require road maintenance during which fine sediment maybe mobilized, however, all practicable sedimentation controls will be implemented consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion. Recreational use and trail building/usage have increased since the Green River Horse Camp was built. In places where trails intersect with streams, some fine sediment is likely already entering the streams.

Cumulative effects on streams are mostly related to additional small increments of the same kinds of effects as those that have occurred in the past. In areas that are re-disturbed, regrowth of vegetation that serves to prevent erosion and sedimentation would be temporarily hindered. However, the soils in the disturbance areas are relatively low in fine sediment content, and the locations of disturbance would be far enough upstream on small tributaries that additional sediment is not likely to reach into new areas downstream. In addition, the use of BMPs, including placement of silt fences, mulching on road, culverts and water bars, would largely mitigate sedimentation. The collective consequences of these small incremental effects are minor and considered negligible.

3.3.2.3 Alternative Based on Scoping Comments

Under this alternative, exploratory drilling would be performed balancing water use between on-site and off-site sources, re-use of drilling fluids a much as possible, additional drill hole abandonment requirements, phasing of drilling at specific locations, and operational changes related to light and noise. The same area of soil disturbance would occur, although potentially during periods with higher precipitation to minimize recreational impacts.

3.3.2.3.1 Direct Effects

The direct effects to soil would be similar to those stated in the Proposed Action Alternative. However, the drilling schedule in the area of the Horse Camp would be adjusted to limit recreational conflict; the adjusted schedule might require drilling be performed during periods when higher precipitation is anticipated. Therefore, the work could increase the potential for erosion. Elements of the Proposed Action and Alternative 3 that have the potential to directly affect surface waters include road improvements, vehicle traffic and parking on roads above perennial drainages, erosion impacts associated with tree removal, drilling, and management of erosion. Road improvements

would result in temporary loose, side cast soil staging, which has the potential to erode and deposit material down slope of the work area. Soil piles would be managed to prevent erosion. Discharge from temporary culverts due to road improvements has the potential to create a rill at the outfall of the culvert that can deliver sediment to the tributaries, which drain to Green River. The balancing of the use of on-site water sources and off-site water sources and re-use of drilling fluids may result in an increase in truck traffic. In addition, the hole abandonment requirements will also result in the increase of truck traffic due to the delivery of additional drilling supplies. An increase in water truck traffic might increase airborne-related erosion of soils along roads, although this might be partially off-set by the revised drilling schedule near the Horse Camp when precipitation would reduce airborne-related erosion. Based on the local soil characteristics and the proposed mitigation efforts described above, and the limited Project timeframe, the likelihood of soil erosion and resulting deleterious sedimentation is low.

3.3.2.3.2 Indirect Effects

The indirect effects to soils would be similar to those stated in the Proposed Action Alternative.

3.3.2.3.3 Cumulative Effects

Cumulative effects on soils are mostly related to additional small increments of the same kinds of effects as have occurred in the past. In areas that are re-disturbed, regrowth of vegetation that serves to prevent erosion and sedimentation would be temporarily impacted. However, the soils in the disturbance areas are relatively low in fine sediment content, and the placement of silt fences and mulch on roads would largely mitigate sedimentation. The consequences of this incremental effect would be equivalent to those stated in the Proposed Action Alternative and are minor and considered negligible.

3.3.3 Mitigation

Erosion of soils would be mitigated by BMPs such as silt fences, mulch on roads, culverts and water bars, and adherence to all practicable sedimentation controls consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion.

3.4 Wildlife

The Proposed Action has the potential to affect existing wildlife resources in the Project Area, including birds, mammals, reptiles, and amphibians, species listed under the Federal ESA, and/or USFS Sensitive Species, Management Indicator Species (MIS), and Survey and Manage Species (S&M). Analysis of the Proposed Project (access, operations, and reclamation), identified potential sources of wildlife impacts, impacts avoidance options, and recommended mitigation measures designed to minimize unavoidable impacts. The following reports were used to identify wildlife resources that may be present in the Proposed Project vicinity:

- Listed and Proposed Endangered and Threatened Species and Critical Habitat; Candidate Species; and Species of Concern in Skamania County (USFWS 2012a).

- Washington Department of Fish and Wildlife Priority Habitats and Species data (WDFW 2012).
- Gifford Pinchot National Forest Geospatial Data (USFS 2012).
- USFS Region 6 Regional Forester Special Status Species List, December 1, 2011. Includes Region 6 Regional Forester Sensitive Species.
- Gifford Pinchot National Forest Land and Resource Management Plan Management Indicator Species (MIS) List.
- Gifford Pinchot National Forest Survey and Manage Species (S&M) List.
- U.S. Fish and Wildlife Service Northern Spotted Owl designated critical habitat data (USFWS 2008; USFS 2012).
- Checklist of the Birds of Skamania County (Vancouver Audubon Society 2008).
- Washington State Herp Atlas (WDNR et al. 2012).

In addition, the Proposed Project Exploration Plan (Ascot USA 2011) was used to identify project related activities which have the potential to impact wildlife. It is important to note that the Cowlitz Indian Tribe has indicated that they view wildlife as a natural resource of cultural value. (Source: William Iyall, Chairman, Cowlitz Indian Tribe, from a letter dated March 16, 2012.)

3.4.1 Affected Environment

This section identifies the existing wildlife habitat types in the Project Area, and the wildlife communities which may occur there. The wildlife communities are categorized as GPNF T&E, Sensitive, MIS and S&M species.

3.4.1.1 Habitat Types

The Project Area is located in the Southern Washington Cascades Province, within the Pacific silver fir (*Abies amabilis*) vegetation zone (Franklin and Dyrness 1988). It is located on the south facing slope of the east-west trending Goat Mountain, situated in the area north of the Green River between about 2,800 and 4,000 feet, on the fringe of the area deforested by the 1980 eruptive blast of Mount St. Helens. A portion of the northern part of the Project Area is covered by mature forest that escaped the effects of the 1980 eruption. Areas devastated by the eruption were salvage logged in 1982 and reforested by 1985 or 1986.

The current vegetative structure within the proposed Project Area is uniform conifer forest. Younger stands less than 30 years of age (replanted after the eruption) dominate the lower elevation southern two-thirds of the Project Area. Stands up to 127 years of age are located on the higher elevation slopes of the northern third of the Project Area, (See Appendix E, *Biological Assessment*; Figure 5, *Habitat*). The habitat adjacent to and in the vicinity of the Proposed Project, consists of the same uniform conifer forest habitats in a broad mosaic of very few, very large patches (hundreds of acres each). Sparsely vegetated alpine zones occur along the ridge of Goat Mountain upslope and several hundred yards beyond the Project Area. No forest stands in or adjacent to the Project Area contain any appreciable amount of deciduous trees or deciduous forest habitat.

Riparian Reserves are the designated widths on either side of the stream where restrictions are placed on what can be done in order to protect the functions of the land and water in that reserved area around the stream. See Section 3.3.1.1 Hydrology and Hydrogeology for a discussion on NWFP Riparian Reserves.

Human activity in the Project Area and vicinity has been dominated by logging and silvicultural activity, recreation use, and mineral prospecting. The Project Area has active and decommissioned roads, with previous drill pads established either directly on decommissioned roads or on slightly widened roads. Limited mineral development has occurred in the area for nearly 100 years. The Mount Margaret Deposit has been investigated for decades by various mineral development interests, and some exploratory drilling was conducted in 2010. The Green River Horse Camp is located at the edge of the Project Area. Additionally, several USFS system trails skirt the area providing access for equestrian and hiker use.

3.4.1.2 Wildlife Communities

This section describes wildlife communities typical of mid-elevation Douglas fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) forests on the western slopes of Washington's Cascade Mountain Range. The Project Area provides habitat for both resident and migratory wildlife.

3.4.1.3 Wildlife Species

This section includes species which are listed on the Federal Endangered Species Act (ESA) and/or USFS Sensitive Species, MIS or S&M lists.

The ESA was established to conserve, protect, and restore Threatened and Endangered species and their habitats. Section 7 of the ESA (50 CFR 402) requires Federal agencies to ensure their actions do not jeopardize the continued existence of listed species, and do not result in adverse modification to designated critical habitats. Besides ESA-listed species, this section also considers USFS Sensitive Species, USFS MIS, and bald and golden eagles which are protected under the Federal Bald and Golden Eagle Protection Act (USFS 2011, 1995, USFWS 2012a, WDFW 2012).

Table 3.5-2 contains 39 species listed under the Federal ESA and USFS Sensitive Species, MIS and/or S&M lists. All of these species are considered documented or suspected to occur in the GPNF. Analyses were conducted to determine which species have habitat present within or adjacent to the Project Area. Of those 39, 13 species (including one critical habitat designation), have potential to occur within the Project Area or immediate vicinity:

- Northern spotted owl (*Strix occidentalis caurina,* Federal ESA Threatened, USFS MIS),
- Northern spotted owl, Federal Designated Critical Habitat,
- Pine marten (*Martes americana*, USFS MIS),
- Roosevelt elk (*Cervus elaphus*, USFS MIS),
- Blacktail deer (*Odocoileus hemionus*, USFS MIS),

- Mountain goat (*Oreamnos americanus*, USFS MIS),
- Wolverine (*Gulo gulo luteus,* Federal ESA Candidate; USFS Sensitive),
- Townsend's big-eared bat (*Corynorhinus townsendii townsendii*, USFS Sensitive),
- Van Dyke's salamander (*Plethodon vandykei*, USFS Sensitive and MIS),
- Cascade torrent salamander (*Rhyacotriton cascadae*, USFS Sensitive),
- Larch Mountain salamander (*Plethodon larselli*, USFS Sensitive and S&M),
- Bald eagle (*Haliaeetus leucocephalus*, USFS Sensitive Species, Bald and Golden Eagle Protection Act*)*,
- Pileated woodpecker (*Dryocopus pileatus*, USFS MIS), and
- Tree cavity excavating birds (USFS MIS).

Species Eliminated from Further Analysis

Only those species that were identified above as having a potential to be affected by this project will be discussed further. Those 26 with no habitat present, and no documented presence in the Project Area are eliminated from further analysis. They are: gray wolf, grizzly bear, marbled murrelet, marbled murrelet critical habitat, peregrine falcon, common loon, harlequin duck, great gray owl, sharptail snake, Cope's giant salamander, Oregon spotted frog, Barry's hairstreak, Johnson's hairstreak, golden hairstreak, mardon skipper, Great Basin fritillary, Puget Oregonian, Columbia Gorge Oregonian, Evening fieldslug, western ridged mussel, warty jumping slug, Burrington's jumping slug, Malone's jumping slug, panther jumping slug, barren juga, Oregon megomphix, crowned tightcoil, shiny tightcoil, and blue-gray taildropper.

The following species are found in habitat that does not occur in the project area, or do not occur in habitat that would be affect by the project. As such, they would not be affected by either of the alternatives: **gray wolf** and **grizzly bear,** because the high active road density in the project area, (more than 1.7 miles per square mile), makes it unlikely that these species would occur there (Jenson et al. 1986, Mech 1988, Thiel 1985); **Keen's myotis** because the Project Area is outside its known distribution; **marbled murrelet** because the project area is too far from the Pacific Ocean (Ralph, et al. 1995); **common loon** because the project area does not contain water bodies suitable for this species (Richardson, et al. 2000); **harlequin duck** because none of the proposed units are near suitable nesting streams, so there would be no loss of likely nesting habitat, and Project mitigations designed to maintain water quality in the tributary streams within and near the proposed units would maintain macroinvertebrate populations in the large streams, thereby protecting the food source for adults as well as hatchlings; **great gray owl** because the analysis area does not contain open grassy habitat including bogs natural meadows, and open forests that constitute foraging areas (Quintana-Coyer et al. 2004); **peregrine falcon** because the analysis area does not include rocky outcrops; **Oregon spotted frog** because the project area does not contain large ponds that would be suitable habitat, and because of the distance to known occupied habitat; **sharptail snake** because of no known occurrences; **Cope's giant salamander** because of no known occurrences; **Mardon skipper butterfly** because there are no grassland meadows in the project area where this species could be found; **Barry's hairstreak** because the larvae of this butterfly appear to require juniper upon which they feed (Robert Pyle 2002), and juniper does not grow in the analysis area; **Johnson's hairstreak** because there are no old-

growth stands located within the Project boundary, which is where this butterfly is most likely to be found, and commercial thinning in the units may increase foraging opportunities for butterflies since increased sunlight reaching the understory would likely result in more flowers on the shrubs and forbs, (Pyle 2002; www.butterfliesandmoths.org); **golden hairstreak** because the larvae of this butterfly are dependent on golden chinquapin upon which they feed (Robert Pyle 2002) and this plant does not grow in the analysis area; **Great Basin fritillary** because this butterfly inhabits mountain meadows, forest openings, and exposed rocky ridges and, in Washington, are known from sites east of the Cascades (www.butterfliesandmoths.org, and Robert Pyle 2002); **Columbia Gorge Oregonian** because this snail in known from sites in the eastern Columbia River Gorge, and from the Clackamas and Hood River Districts on the Mount Hood National Forest. The Management Recommendations for this snail (1999) reports that there is no reason to expect it to occur on the Gifford Pinchot National Forest; and **shiny tightcoil snail** because, although there is little known about this snail, known sites are east of the Gifford Pinchot National Forest, and are generally in Ponderosa pine/Douglas-fir plant associations at moderate to high elevations (http://web.or.blm.gov/mollusks/). This plant association does not occur in the analysis area. For all other butterflies and mollusks, too little is known about the distribution and habitat requirements to make definitive statements about their occurrence.

These 25 species have no suitable habitat or have not been documented in the Project Area and are eliminated from further discussion in this EA.

For species with a potential to occur in the Project Area, a brief description of each is provided below. The primary source of information is listed in parentheses.

Northern Spotted Owl and Designated Critical Habitat (Shohet et al. 2008)

The northern spotted owl is a relatively long-lived bird (average life span approximating eight years), with a naturally low reproductive rate. Spotted owls do not reach sexual maturity until after two years; once an adult, females lay an average of two eggs per clutch (range 1-4 eggs). Nest sites are usually located within stands of old-growth and late-successional forests dominated by Douglas-fir, and consist of existing structures such as cavities, broken tree tops, or mistletoe (*Arceuthobium* spp.) brooms.

Spotted owls rely on older forested habitats because they contain the structures and characteristics required for nesting, roosting, foraging, and dispersal. These characteristics include the following: a multilayered, multi-species canopy dominated by large over story trees; moderate to high canopy closure; a high incidence of trees with large cavities and other types of deformities; numerous large snags; an abundance of large, dead wood on the ground; and open space within and below the upper canopy for owls to fly. Critical habitat for the spotted owl was designated in 1992, revised in 2008, and again in 2012 (USFWS 2012b). A draft revised recovery plan was published in 2010. There is no designated critical habitat in the Project Area. (See Appendix E, *Biological Assessment* for more detail.)

Northern spotted owls are documented to occur in the project vicinity (USFS 2012). According to USFS GIS data, the nearest northern spotted owl observation record from surveys in 2003 is located approximately 2.5 miles north of the project site[16]. According to the same data, the nearest observed "activity polygon" for northern spotted owl is approximately 3.75 miles northeast of the project. (See Appendix E, *Biological Assessment* for more detail.)

Northern spotted owl suitable habitat is present within the Project Area for all stages of spotted owl life history, in the northern portion of the Project Area, (see Appendix E, *Biological Assessment*). Spotted owl habitat is often subdivided into distinct components (USFWS 2011, 1992).

- Nesting / Roosting Habitat – forested areas used for nesting, roosting, foraging, and dispersal by spotted owls that usually have more late-seral forest characteristics than "foraging" or "dispersal" habitats.
- Foraging Habitat – forested areas largely used for foraging, dispersal, and other nocturnal activities, but *not* nesting or roosting.
- Dispersal Habitat – forested areas predominantly used for dispersal, but *not* nesting, roosting, or foraging.

These categories are not absolutes, but instead, represent generalizations. Nesting-roosting habitat is generally considered to provide all or most habitat requirements, whereas foraging and dispersal habitats are considered to provide only a subset of the spotted owl's habitat requirements (USFWS 2011).

The early nesting season for the northern spotted owl in the GPNF has been identified as the period from March 1 through June 30. Northern spotted owls are sensitive to disturbance caused by noisy machinery during certain times of the year. If sound-generating activities occur within close proximity to a nest or un-surveyed suitable habitat during the early breeding season (March 1 to June 30), spotted owls may be disturbed by the sound, potentially causing missed feedings or the adults to flush, leaving young susceptible to predation and weather. After July 1, spotted owlets are no longer completely dependent upon the adults and are able to thermo-regulate, fly, and forage on their own, reducing their susceptibility to disturbance-related effects.

Pine Marten (Shohet et al. 2008)

The pine marten, a USFS MIS, represents species that inhabit mature coniferous forest habitats. Pine martens occur in forests containing snags and down logs, which provide suitable denning sites. They tend to avoid areas that lack overhead protection and the young are born in nests within hollow trees, stumps, or logs. Martens do not tolerate concentrated human use or habitat modification. Pine martens spend a great deal of time

[16] NSO are protected with the Limited operating period (no drilling or loud noises until after July 1); this was concurred by US F&WS.

in trees and can even leap from branch to branch between trees. They eat a variety of small mammals, particularly squirrels, as well as voles, mice, pika, and rabbits.

The pine marten is fairly common in higher elevation (silver-fir zone) mature and late-successional forests on the GPNF.

Roosevelt Elk and Blacktail Deer (Shohet et al. 2008)

These two species occur throughout the GPNF. There are several established herds of Roosevelt elk that reside in the GPNF as year-round residents, as well as many that are migratory. Deer occur throughout the forest. Both species use a mosaic of cover and forage habitats that are minimally fragmented by road systems.

Extensive winter range for these species occurs throughout the GPNF below 2,400-feet in elevation; (the peak elevation of Goat Mountain is 4,921 feet; the mountain toe is 2,600 feet amsl). A few elk calving areas are located mainly adjacent to small ponds and wetlands below 3,500-feet in elevation and scattered widely. In the Cowlitz Valley Ranger District, hundreds of elk forage in private fields and pastures throughout the winter, although the Proposed Project does not lie within this wintering habitat boundary.[17] The Proposed Project vicinity may provide migratory routes for elk moving between more suitable patches of winter foraging habitat.

The GPNF Forest Plan has a Limited Operating Period restriction for projects in deer and elk winter range from December 1 to April 1. However, available information, including mapped data from the USDA Forest Service, indicates Goat Mountain does not offer suitable winter range habitat for foraging elk due to high elevation and snow depth. (Eder 2002). No Limited Operating Period restrictions would apply to the proposed Action.

Mountain Goat

The Mountain goat's range extends from Alaska, south through Canada, and into Washington's Cascade and Olympic Mountains (Eder 2002). In 1980 eruptions of Mt. St. Helens, mountain goats may have survived on the south side of the volcano where the eruption had a minimal impact. The first reliable sighting of mountain goats on Mount St. Helens, however, occurred seven years after the eruption. Since then, they have repopulated suitable habitat in the area (http://www.fs.fed.us/pnw/mtsthelens/faq/q7.shtml). Suitable habitat is considered treeless steep slopes and rocky cliffs in alpine or subalpine areas, where deep snow is common. During the summer this species may be seen in lower elevations, in meadows.

Wolverine

In 2008, a wolverine was thought to be identified near Mount St. Helens, but could not be confirmed (http://cascadescarnivoreproject.blogspot.com/2009/08/aug172008-wolverine-

[17] USDA Forest Service GIS Roosevelt elk and blacktail deer Wintering Habitat Map.

sighting-reported.html). In 2009, a wolverine was photographed near Mt. Adams, east of the Project Area. (http://www.gptaskforce.org/conservation/wolverine-photographed-on-mount-adams). The wolverine is a mammal and a carnivore related to weasels. It is thought to require large tracts of wilderness habitat, in forested and mountainous areas, and has a home range of 25 square miles. The USFS considers this species to be documented in the GPNF.

Townsend's Big-Eared Bat (Bat Conservation 2012)

Townsend's big-eared bats are found throughout western North America, from British Columbia south to Oaxaca, Mexico. Their most typical habitat is arid western desert scrub and pine forest regions. These agile fliers venture out to forage only after dark, using their keen echolocation to hunt moths and other insects. In the spring and summer, females form maternity colonies in mines, caves, or buildings, while males roost individually. In winter, these bats hibernate in caves and abandoned mines.

Van Dyke's Salamander (DNR 2012, Shohet et al. 2008)

Van Dyke's salamander is endemic to Washington and is strongly correlated with certain key features in stream segments at a micro- and macro-habitat scale. Stream features most predictive of Van Dyke's salamander occurrence are the presence of non-forested areas on the valley wall, exposed bedrock, and deeply incised valley morphology. On a micro-habitat scale, the key variables were an absence of trees, presence of seeps or tributary streams, and areas of accumulated, small cobbles. Van Dyke's salamander has been found in upland forests, near lake shores, cave entrances, and using seeps and streamside habitat. Large decaying conifer logs near streams appear to be important habitat for nests. In addition to being a USFS Sensitive species, the Van Dyke's salamander is also a Survey and Manage species for the GPNF. It is at risk due to its limited distribution and apparently small, isolated assemblages of populations. Van Dyke's salamander may be harmed by alterations to the riparian habitats where it resides.

Cascade Torrent Salamander (DNR 2012, Shohet et al. 2008)

The Cascade Torrent salamander lives in the Cascade Mountains of southern Washington and northern Oregon, with another known disjunct population in the southern Oregon Cascades. This salamander lives on and near rocks bathed in a constant flow of cold water such as cool rocky streams, alpine lakes and seeps, and in areas that are in or amongst conifer or alder forests, typically in areas with a thick canopy cover.

Cascade torrent salamanders may be active year-round at lower elevations. Adults are strongly associated with water and individuals are almost always found in contact with either free water or saturated substratum. During rainy wet periods, individuals may be found in wet terrestrial forest settings away from streams or seepages.

The relatively small range and narrow habitat requirements contribute to the species' current status. Mature forests, the optimal habitat for this species, have been greatly reduced by frequent harvest intervals over much of the species' range.

Larch Mountain Salamander (DNR 2012, Shohet et al. 2008)

This species is a Washington and Oregon endemic. In Washington, the species occurs in the West and East Cascades Ecoregions. The main distribution is along a 36-mile stretch of the Columbia River Gorge with additional, isolated populations in the Cascade Range. They have been documented in Clark, Skamania, Lewis, King, Klickitat and Kittitas Counties.

Larch Mountain salamanders are associated with talus, scree, gravelly soils and other areas of accumulated rock where interstitial spaces exist. Steep slopes are also an important habitat feature. They inhabit a diverse range of forested and non-forested habitats. In some areas of the Cascade Mountains, Larch Mountain salamanders inhabit old-growth coniferous forests without significant exposed rocky areas. In all of these habitats, important microhabitats include woody debris, leaf litter and rocks.

Bald Eagle

The bald eagle is considered a winter resident of the GPNF. They are most commonly seen near riparian areas, associated with rivers.

Pileated Woodpecker (Shohet et al. 2008)

The pileated woodpecker represents a species that inhabit mature coniferous forest habitats. The pileated woodpecker is the largest woodpecker species in the western United States and nests in cavities of large trees or snags. It is a denizen of mature forests, relying on dead and decaying trees for foraging and nesting. Pileated woodpeckers can act as a keystone habitat modifier by excavating large numbers of cavities that are depended upon by several other species, and by influencing ecosystem processes such as decay and nutrient cycling. Pileated woodpeckers would return to areas after timber harvesting. However, past forest management in the Pacific Northwest has led to relatively few snags and downed logs, especially of large diameters, remaining in many watersheds. The pileated woodpecker is common throughout the GPNF in mature and late-successional forest.

Tree Cavity Excavating Birds (Shohet et al. 2008)

A large number of species rely on cavities in trees for shelter and nesting. The GPNF Plan designated the hairy woodpecker as the representative cavity excavator for this Management Indicator category. The hairy woodpecker is distributed from Alaska to Panama, across Canada and the U.S., and south from Newfoundland to Bahamas. Preferred habitat consists of mixed conifer and ponderosa pine and adjacent deciduous stands. They nest in snags with light to moderate decay. The main diet is beetles and ants obtained by foraging on mature and old-growth conifers. They may also forage on deciduous trees during breeding. Hairy woodpeckers are common on the GPNF.

3.4.2 Environmental Consequences

This section identifies the potential impacts to wildlife resulting from the proposed Project Action.

3.4.2.1 No Action Alternative

Under the No Action Alternative, no road building or exploratory drilling would be done. Timber management, equestrian activities, and other recreational activities could still occur within the Proposed Project boundary, which would continue to affect vegetation and potentially facilitate the spread of weeds.

3.4.2.2 Proposed Action Alternative

3.4.2.2.1 Direct Effects

Wildlife Habitat

Almost no wildlife habitat would be removed as part of the Proposed Action. All work would occur on or immediately adjacent to existing road prisms or, on existing drill pads created during previous prospecting actions (Ascot USA 2011). In total, approximately 1.69 miles (about 3.3 acres) of decommissioned roads would be used for access. This includes 1.35 miles (2.45 acres) of reactivated decommissioned roads from the 2010 drilling program; and 0.34 miles (0.62 acres) of newly reactivated decommissioned roads for the Proposed Action. Sites for MS-774 are located on reconditioned decommissioned roads activated in 2010 for exploration drilling by Ascot on MS 708. The area of disturbance for reactivated roads is based on a 10-foot wide existing road. This Plan proposes 23 drill pads for an affected area of approximately 0.23 acre. Vegetation along old logging roads and previously reactivated roads, was not as dense as anticipated in 2010, so access roads were reactivated to nearly original condition, with sloughed material removed to the side as cast material, and saved for reclamation. Trees growing on the road would be removed and saved for reclamation, while trees on road edges would only be limbed to avoid job hazards. Pads and reactivated roads would be reclaimed by providing an uneven stable surface as close to original grade as is practical. Sites on existing active USFS roads would be reclaimed to as close to original conditions as possible.

Hazard trees were noted in the area, and if deemed dangerous by the company and USFS, would be removed on a selective basis. On the roads that were reactivated for the 2010 exploration program, the footprint for this Proposed Action would be almost identical to the 2010 footprint, and no trees would be removed (with the possible exception of new danger trees that developed because of wind or other factors since 2010). The number of trees with the potential to be removed as a result of the Project was calculated for the northern portion of the Project Area, which is considered mature forest. This includes reactivated roads and pad sites for Pads 13, 22, 23, and 25, where a total of up to 68 trees would be removed. Tree removal is not planned at Pads 10, 11, 12 and 24 which are located along the upper roads. Their size and location are described in Table 3.5-1.

Table 3.5-1. Tree Removal

Road Segment or Location	Number of	Diameter at Breast	Type of Stand

	Trees Removed	Height (dbh) in inches	
Road segments to Pads 13, 22, and 25	5	< 12	Mature Timber
Road between Pad 22 and Pad 23	1 4	10 < 4	Mature Timber
Pad 22	2	10-12	Mature Timber
Road between Pad 23 and Pad 25	2 25	< 10 4-7	Mature Timber
Pad 25	1 2	12 6	Mature Timber
Road between Pad 25 and Pad 13	2 4	12 < 4	Mature Timber
Pad 13	20	< 4	
Total Trees Removed	**68**	**All < 12dbh**	Mature Timber

Downed woody debris and young regenerating trees and shrubs would be pushed temporarily to the edges along decommissioned roads and at drill pads. Some trees and shrubs along the decommissioned roads and at drill pads may be partially de-limbed to provide access and safety at each drill site. Upon completion of the project, the drill pads and reactivated roads would be reclaimed. Debris created during the vegetation clearing action would be scattered back across the roads and drill pads to provide cover and shelter for ground dwelling wildlife. Grubbed/graded areas would also be reseeded using a native seed mix developed by the GPNF, which includes blue wild rye, California brome, and slender hairgrass. Reclamation, including reseeding and adding woody vegetation would restore the habitat conditions existing prior to the Proposed Action. The effects of vegetation removal are considered a temporary loss of wildlife habitat because the reclamation would be expected to regenerate into forest as it did after the 1980 eruption. In areas other than the mature forest, the existing vegetation is estimated to be less than 40-years old. Therefore, it can be estimated that regrowth may take up to 40 years.

Wildlife Species

Direct impacts to wildlife (including Federal ESA and/or USFS Sensitive, MIS, S&M, and others such as migratory and resident birds and mammals), resulting from the proposed Project Action is expected to be minor due to the nature and minimal extent of the action at each individual pad site, scheduling, and the temporary duration of the Proposed Action. Impacts may include tree removal, noise, presence of workers and equipment, and lighting at one drill site at a time. These impacts are considered minor because where the proposed Project may temporarily impact individuals or habitat; it will not contribute to a trend towards listing of any species under the Federal ESA, or cause a loss of viability to the population or species, or a permanent loss of habitat. Juvenile birds or other low-mobility or slow-moving wildlife species (salamanders, small mammals), have the potential for direct mortality as a result of the movement of equipment if they are occupying the space where the equipment is moving. However, the old roadbed and pad locations and edges of active roads are not highly attractive habitats for any of the species likely to be there. Adult birds and other mobile wildlife would be

expected to temporarily vacate habitat adjacent to the areas where equipment is operating because of noise and activity, but are expected to return after the activity ceases.

Animal response to sound levels depends on a number of complicated factors, and has not been well studied in many species of wildlife (WSDOT 2010). It may be reasonably assumed that most wildlife would detect noise from heavy equipment associated with drilling pad installation when within an estimated 400 feet. Disturbance of mobile wildlife is most likely to occur within 100 feet of installation, and injury only likely in adjacent range. The severity of disturbance and injury to wildlife would further vary by the duration and timing of the noise. During the non-breeding season, birds and other wildlife are less likely to be tied to a certain location like a nest or burrow. Therefore, impacts from noise may be less during the non-breeding season when an individual can fly or otherwise relocate to a foraging or resting site without noise.

The visual presence of drillers and their equipment could also affect wildlife in the Project Area. Project actions could cause additional disturbance to wildlife if they travel by foot in and around the Project Area during work activities or on breaks. This would increase the area of habitat that may be subject to temporary disturbance.

Virtually all species of small- and medium-sized mammals, with the exception of most squirrels, are nocturnal. Possible effects from artificial night light on mammals may include disruption of foraging behavior, increased risk of predation, disruption of biological clocks, and disruption of dispersal movements and corridor use (Rich and Longcore 2006). Lighting may also affect an animal's willingness to move through an area, such as a corridor. Migrating birds may be disoriented by nighttime illumination.

The Proposed Action is not anticipated to increase the general public's use of the area, which could disturb wildlife patterns. Ascot is proposing that the general public be kept from accessing these roads for safety reasons as indicated within Section 2.1.2. Access signage would be posted and gates installed where appropriate, to temporarily restrict public access. Drill pads and reactivated decommissioned roads would be reclaimed by providing an uneven surface as close to original grade as is practical and stable, which would mimic adjoining wildlife corridors and use areas. Sites on existing active USFS roads would be reclaimed to as close to original condition as possible.

Many of the other Federal ESA and/or USFS sensitive, MIS, and S&M have a low likelihood of being affected because they have a low likelihood of occurring near the work areas. The likelihood of occurrence of each indicator species is based on availability of suitable habitat and key habitat elements such as tree cavities. This likelihood, along with effects from the Proposed Action are discussed below. A summary of effects to species is presented in Table 3.5-2

Northern Spotted Owl: Impacts to northern spotted owls are addressed in the project-specific Biological Assessment (URS 2012, Appendix E) and summarized here. There is potentially suitable habitat in the mature timber stand around or adjacent to drill Pads 10, 11, 12, 13, 22, 23, 24, and 25. The exploration activities would occur at the edge of the

suitable habitat along existing decommissioned roads to be reactivated. It is estimated that approximately 68 trees would be removed along the edge of suitable habitat. However, no trees greater than a 12-inch dbh would be removed; therefore, the suitability of the habitat would be unchanged. While there have been no surveys to indicate whether spotted owls occur nearby, it may be assumed that the habitat is occupied. Equipment noise, lights, and activity may affect, but not likely to adversely affect northern spotted owls. The young second-growth habitat lower in elevation in the Project Area is not suitable habitat for northern spotted owls. USFWS concurred with the determination that the biological effect of potential noise or visual disturbance that occurs during the late nesting season is considered to be insignificant. (USFWS Concurrence Letter August 21, 2012.)

Northern Spotted Owl Critical Habitat

There would be no impact to designated critical habitat for northern spotted owls based on ESA designations from 1992 and revised in 2008; nor from a draft revised recovery plan published in 2010; nor from another ESA revision being proposed in 2012 (USFWS 2012b). USFWS concurred with the determination that tree removal from the spotted owl habitat would be insignificant; and that there would be no loss of suitable spotted owl nesting, roosting or foraging habitat as a result of the proposed Action. (USFWS Concurrence Letter August 21, 2012.)

Pine Martin: The habitat that is suitable for northern spotted owls is also suitable for pine martens. The noise, activity, and removal of tree cover along roadways associated with the project might affect individual animals, causing them to move away from exploration activity areas. However, individuals would be expected to return when activity ceases following reclamation, including placement of woody debris on roadways offering shelter.

Roosevelt Elk: The habitat in the Project Area is suitable as general forage and cover habitat for Roosevelt elk, but it is not particularly suitable for use for calving, nor for winter range (elevations are marginal and forage is not abundant). There is a small marsh within about 900 feet of drill sites 6 and 7 but is located outside the Project Area. Animals could be displaced from this area. The noise and activity associated with the project would be expected to displace elk from the Project Area while the exploration is occurring, but they would be expected to return to the area after the exploration activities cease.

Blacktail Deer: The habitat in the Project Area is suitable as general forage and cover habitat for blacktail deer, but it is not particularly suitable for winter range (elevations are marginal and forage is not abundant). The noise and activity associated with the project would be expected to displace the deer from the Project Area while the exploration is occurring, but they would be expected to return to the area after the exploration activities cease.

Mountain goat: The forested habitat in the Project Area is not preferred by Mountain goat. They are known to occur in the vicinity, on the rocky slopes Mt. St. Helens.

Wolverine: Although wolverine may occur in the vicinity of Mount St. Helens, none have been recorded in the immediate vicinity of the Project Area. Wolverines are thought to require large expanses of relatively undisturbed "wilderness" type habitat, which does not occur in the Project Area. They are extremely unlikely to occur in the Project Area, and habitat may not be suitable for all stages of their life. Impacts are considered minor because where the Proposed Project may temporarily impact individuals or habitat; it will not contribute or cause a loss of viability to the population or species, or a permanent change to or loss of habitat.

Townsend's Big-Eared Bat: The edge of the mature timber at the upper elevations of the Project Area have trees more than 100 years old and may provide suitable habitat for the Townsend's big-eared bat. Abandoned adits, if present, may also provide roosting habitat. The Proposed Action does not include disturbance of adits, abandoned mines, caves, or unoccupied buildings in the Project Area. They may potentially be found in the mature forest habitat. If present, they may avoid the immediate vicinity during the exploration activities due to noise and disturbance. Individuals of this species may also be attracted to nighttime illumination while hunting for insect prey which gathers around light, which may be a temporary benefit to individuals.

Van Dyke's Salamander: The Project Area is missing the key habitat elements for this species. Specifically, bedrock outcrops and cobbly stream substrate are both missing. It is very unlikely that the Van Dyke's salamander would be found in the Project Area, and therefore, no impact to species by the Project.

Cascade Torrent Salamander: The Project Area is missing the key habitat elements for this species. Specifically, rocks bathed in a constant flow of water or rocky stream substrate are both missing. It is very unlikely that the Cascade torrent salamander would be found in the Project Area, and therefore, no impact to the species by the Project.

Larch Mountain Salamander: The Project Area is missing the key habitat elements for this species. Specifically absent are talus, scree, gravelly soils and other areas of accumulated rock where interstitial spaces exist. It is very unlikely that the Larch Mountain salamander would be found in the Project Area, and therefore, no impact to species by the Project. Any ground-disturbing activity or land use that changes the moisture regimes and permeability of inhabited rocky substrates, such as over story tree removal and gravel removal, may threaten populations.

Bald Eagle: The Project Area has no riparian habitat associated with large rivers which would provide habitat for bald eagle. It is very unlikely that bald eagle would utilize the habitat in the Project Area for anything other than transiting between other areas with suitable habitat. No impact to species by the Project

Pileated Woodpecker: The habitat that is suitable for northern spotted owls is also suitable for pileated woodpeckers, and the effects would be similar to the effects on northern spotted owls.

Tree Cavity Excavators: The habitat that is suitable for northern spotted owls is also suitable for tree cavity excavators, and the effects would be similar to the effects on northern spotted owls.

Table 3.5-2. Summary of Effects to USFS Threatened, Endangered, Proposed, and Sensitive Species

SPECIES NAME	SPECIES STATUS D: Documented S: Suspected	Species habitat present within or adjacent to the analysis area?	Species documented in analysis area?	Affect/Impact Summary
Mammals				
Gray Wolf *Canis lupus*	Threatened (D)	No	No	No Affect
Grizzly Bear *Ursus arctos*	Threatened (S)	No	No	No Affect
Townsend's Big-eared Bat *Corynorhinus townsendii*	USFS Sensitive (D)	Yes	Yes	MIIH
Wolverine *Gulo gulo*	USFS Sensitive (D)	Yes	Yes	MIIH
Pine marten *Martes americana*	USFS MIS (D)	Yes	Yes	MIIH
Roosevelt Elk *Cervus elaphus*	USFS MIS (D)	Yes	Yes	MIIH
Black-Tailed Deer *Odocoileus hemionus*	USFS MIS (D)	Yes	Yes	MIIH
Mountain goat *Oreamnos americanus*	USFS MIS (S)	Yes	No	No Impact
Keen's Myotis *Myotis keenii*	USFS Sensitive (S)	No	No	No Impact
Birds				
Marbled Murrelet *Brachyramphus marmoratus*	Threatened (D)	No	No	No Effect
Critical Habitat for the Marbled Murrelet	Designated	No	No	No Effect
Northern Spotted Owl *Strix occidentalis caurina*	Threatened (D)	Yes	Yes	NLAA
Critical Habitat for the Northern Spotted Owl	Designated	Yes	Yes	No Effect
American Peregrine Falcon *Falco peregrinus anatum*	USFS Sensitive (D)	No	No	No Impact
Common Loon *Gavia immer*	USFS Sensitive (D)	No	No	No Impact
Bald Eagle *Haliaeetus leucocephalus*	USFS Sensitive (D)	Yes	Yes	No Impact

SPECIES NAME	SPECIES STATUS D: Documented S: Suspected	Species habitat present within or adjacent to the analysis area?	Species documented in analysis area?	Affect/Impact Summary
Harlequin Duck *Histrionicus histrionicus*	USFS Sensitive (D)	No	No	No Impact
Great Gray Owl *Strix nebulosa*	USFS Sensitive (S)	No	No	No Impact
Pileated Woodpecker *Dryocopus pileatus*	USFS MIS	Yes	Yes	MIIH
Tree Cavity Excavating Birds	USFS MIS	Yes	No	No Impact
Reptiles & Amphibians				
Sharptail Snake *Contia tenuis*	USFS Sensitive (D)	No	No	No Impact
Cope's Giant Salamander *Dicampton copei*	USFS Sensitive (D)	No	No	No Impact
Larch Mountain Salamander *Plethodon larselli*	USFS Sensitive, S&M (D)	Yes	No	No Impact
VanDyke's Salamander *Plethodon vandyke*i	USFS Sensitive, S&M (D)	Yes	No	No Impact
Oregon Spotted Frog *Rana pretiosa*	USFS Sensitive (D)	No	No	No Impact
Cascade Torrent Salamander *Rhyacotriton cascadae*	USFS Sensitive (D)	Yes	No	No Impact
Butterflies				
Barry's Hairstreak *Callophrys gryneus barryi*	USFS Sensitive (S)	No	No	No Impact
Johnson's hairstreak *Callophrys johnsoni*	USFS Sensitive (D)	No	No	No Impact
Golden Hairstreak *Habrodais grunus*	USFS Sensitive (D)	No	No	No Impact
Mardon Skipper *Polites mardon*	USFS Sensitive (D)	No	No	No Impact
Great Basin Fritillary *Speyeria egleis*	USFS Sensitive (S)	No	No	No Impact
Mollusks				

SPECIES NAME	SPECIES STATUS D: Documented S: Suspected	Species habitat present within or adjacent to the analysis area?	Species documented in analysis area?	Affect/Impact Summary
Puget Oregonian *Cryptomastix devia*	USFS Sensitive, S&M (D)	No	No	No Impact
Columbia Gorge Oregonian *Cryptomastix hendersoni*	USFS Sensitive, S&M (S)	No	No	No Impact
Evening Fieldslug *Deroceras hesperium*	USFS Sensitive, S&M (S)	No	No	No Impact
Western Ridged Mussel *Gonidea angulata*	USFS Sensitive (S)	No	No	No Impact
Warty Jumping Slug *Hemphillia glandulosa*	USFS Sensitive, S&M (D)	No	No	No Impact
Burrington's Jumping Slug *Hemphillia burringtoni*	USFS Sensitive, S&M (D)	No	No	No Impact
Malone's Jumping Slug *Hemphillia malonei*	USFS Sensitive, S&M (D)	No	No	No Impact
Panther Jumping Slug *Hemphillia pantherina*	USFS Sensitive, S&M (D)	No	No	No Impact
Barren Juga *Juga hemphilli hemphilli*	USFS Sensitive (S)	No	No	No Impact
Oregon Megomphix *Megomphix hemphilli*	USFS Sensitive (S)	No	No	No Impact
Crowned Tightcoil *Pristiloma pilsbryi*	USFS Sensitive (S)	No	No	No Impact
Shiny Tightcoil *Pristiloma wascoense*	USFS Sensitive (D)	No	No	No Impact
Blue-gray Taildropper *Prophysaon coeruleum*	USFS Sensitive, S&M (D)	No	No	No Impact

Source: URS Biologist

LAA: Likely to Adversely Affect.
NLAA: May affect, Not Likely to Adversely Affect.
MIIH: May Impact Individuals or Habitat but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

3.4.2.2.2 Indirect Effects

Indirect effects to wildlife are defined as those which would be later in time but are reasonably certain to occur. No indirect effects are anticipated from the Proposed Action.

3.4.2.2.3 Cumulative Effects

Cumulative effects are to be considered from past activities, current activities, Proposed Action, and other reasonably foreseeable activities. Reasonably foreseeable future actions are defined by what may be in management or development plans that typically look forward for a few years (perhaps ten years for specific projects). No specific plans for management or development activities are known at this time. Past activities in the vicinity of the proposed exploration include previous limited mineral development, previous timber harvest, and previous mineral exploration. Current or ongoing activities would include recreational use and timber management, both of which also include road and trail use and maintenance. Cumulative effects on wildlife and habitat are mostly related to additional small increments of the same kinds of effects as have occurred in the past. The collective consequences of these small incremental impacts are negligible.

3.4.2.3 Alternative Based on Scoping Comments

Under Alternative 3, USFS consent and BLM issuance of the prospecting permits would occur, along with BLM approval of the proposed exploratory drilling. This work would be performed with restrictions related to on-site water use, additional drill hole abandonment requirements, and phasing of drilling and operational modifications at specific locations. Drilling at Pads 10, 11, 12, 13, 22, 23, 24 and 25, which are located near potentially suitable habitat for spotted owl, would be prohibited during the nesting season March 1-June 30. To reduce impacts to surrounding areas due to noise, a drill shack with baffles and/or insulation would be used. To reduce the impacts due to operating lights, lighting is to be directed toward the drill.

3.4.2.3.1 Direct Effects

The direct effects to wildlife and wildlife habitat would be similar to those stated in the Proposed Action Alternative with the exception that the potential effect to northern spotted owl habitat is changed. There is potentially suitable habitat in the mature timber stand around or adjacent to drill Pads 10, 11, 12, 13, 22, 23, 24, and 25. Restricting the drilling at sites in the vicinity of the potential habitat to after July 1 would mitigate the potential effects to the northern spotted owl. In addition, by reducing the effects of lighting and reduction in noise would further reduce the possible adverse effect to northern spotted owls if they were present. USFWS concurred with the determination that the biological effect of potential noise or visual disturbance that occurs during the late nesting season is considered to be insignificant. USFWS also concurred with the determination that tree removal from the spotted owl habitat would be insignificant; and that there would be no loss of suitable spotted owl nesting, roosting or foraging habitat as a result of the proposed Action. (USFWS Concurrence Letter August 21, 2012.)

3.4.2.3.2 Indirect Effects

The indirect effects to wildlife and wildlife habitat would be similar to those stated in the Proposed Action Alternative.

3.4.2.3.3 Cumulative Effects

The cumulative effects to wildlife and wildlife habitat would be similar to those stated in the Proposed Action Alternative.

3.4.3 Wildlife Mitigation Measures

- The project would have a limited operating period from March 1 to June 30 in the northern portion of the project area where mature forest is located to protect suitable owl habitat. No surface disturbing activities will occur from March 1 to June 30. No road reactivation or drilling activities in or immediately adjacent to the late successional older forest stands in the upper elevation section of the Project Area until after July. Road reactivation or drilling would occur only between July 1 and February 28 for the northern portion of the Project Area where suitable Northern Spotted Owl habitat is present.
- To the extent practicable, a qualified employee would clear each drill pad site of wildlife prior to setting up the drill rig and beginning operations. Low mobility wildlife, such as salamanders or frogs would be carefully removed from the Project site. All appropriate permits for collection and relocation of wildlife and amphibians will be obtained by the contractor..
- Lighting used for construction and operation of the project would be limited to the minimum needed for safety and reasonable functionality; in certain instances, lighting would be further managed by directing operational lighting inward; sound baffles would also limit noise intrusion into the area surrounding an active work site.
- Drilling equipment and generators will be outfitted with noise muffling devices when feasible to reduce the level of disturbance to wildlife from noise.
- If listed species or critical habitats not identified in the EA are encountered, they will be appropriately identified and project activities appropriately adjusted to avoid or minimize impacts.

3.5 Fisheries

This section describes the existing fisheries resources within and adjacent to the Project. This section considers the potential for impacts to resident fish as a result of the Project, including road crossings and erosion and sediment delivery to streams. It also addresses mitigation measures designed to minimize those impacts, including observance of the Aquatic Conservation Strategy Objectives (USFS 2008). It is important to note that the Cowlitz Indian Tribe has indicated that they view fish as a natural resource of cultural value. (Source: William Iyall, Chairman, Cowlitz Indian Tribe, from a letter dated March 16, 2012.)

3.5.1 Affected Environment

3.5.1.1 Habitat Types

A portion of the northern part of the area is covered by mature forest that escaped the effects of the 1980 Mount St. Helens eruption. Areas devastated by the eruption were salvage logged in 1982 and replanted within four years.

Two perennial streams and several intermittent streams drain the proposed Project Area, (Figure 6, *Surface Waters*). Tributaries within the Project drain to the Green River down steep-gradient channels (>10%), with gravel and silt substrates. Intermittent and perennial tributaries average 4 to 6 feet wide at the ordinary high water level (OHWL). Smaller, ephemeral or short seasonal drainages tend to be 1 to 4 feet wide. The site hydrology and riparian habitats are explained in detail in the previous Section 3.3, *Hydrology and Hydrogeology*. The Washington Department of Natural Resources (WDNR) has typed the small perennial and seasonal tributaries/drainages streams as "N", meaning "Non-Fish". However, WDNR commonly types fish-bearing streams as Non-Fish based on the model used and in the absence of site-specific data. For example, the Np or Ns (non-fish perennial or non-fish seasonal) determination appears not to have been made on these drainages indicating that there is no adequate information available on these streams, or they have not been sampled (WDNR 2012). The presence of fish is assumed for all small perennial and seasonally intermittent streams for the purpose of this EA.

3.5.1.2 Fisheries Communities

Expected fish species within the Project Area are typical of small streams on the western slopes of Washington's Cascade Mountain Range. The Project streams provide habitat for resident fish species.

Some of the unnamed streams flowing near or through the Project Area have fish-bearing stream characteristics and may provide habitat for resident species such as cutthroat, brook and rainbow trout, and sculpin. The 1993 GPNF stream surveys (Haapala 1993) documented the likely presence of cutthroat, brook trout, and resident rainbow trout in the Green River and its tributaries within the Project Area. As such, all perennial streams within the Project are considered to be fish bearing.

Pacific lamprey (*Lampetra tridentata*), river lamprey (*L. ayresi*) and western brook lamprey (*L. richardsoni*), are known to historically occur in major rivers throughout the lower Columbia River basin including in the Lower Cowlitz and Lower Toutle River reaches. Information and documentation of current distribution and abundance of lamprey is sparse, incomplete and based on anecdotal observation. USFS fish surveys in the project area have not observed or recorded the presence of lamprey in recent decades and are not believed to occur in the project reaches due to lack of observation and fish passage barriers downstream at the confluence of the Green River with Falls Creek at RM 24.95 and at RM 31.3 that currently limit all other anadromous fish species in the project area. For the purposes of this project, the potential presence of lamprey in the project action area cannot be discounted and as such are treated with the same considerations and

conclusions as other resident and anadromous fish. As such, due to project design features that will minimize any risk of impact to fish resources or water quality, the project will have no effect to lamprey species.

Eulachon (*Thaleichthys pacificus*) are known to inhabit the lower Cowlitz River and Critical Habitat for Columbia River populations of eulachon has been recently listed under the Endangered Species Act for the lower Cowlitz River. Eulachon and their critical habitat are limited in extent to the lower sand or gravel reaches of the Lower Cowlitz River where they migrate upstream to spawn. As such, due to large distance and project design features that will minimize any risk of impact to fish resources or water quality and this project will have no effect to eulachon or eulachon critical habitat.

3.5.1.3 Special Status Fish Species

The Endangered Species Act (ESA) was established to conserve, protect, and restore Threatened and Endangered species and their habitats. Section 7 of the ESA (50 CFR 402) requires Federal agencies to ensure their actions do not jeopardize the continued existence of listed species and do not result in adverse modification to designated critical habitats. Besides ESA-listed species, this section considers USFS Sensitive Species, USFS Management Indicator Species (MIS) (USFS 2011, 1995, USFWS 2012, WDFW 2012), and Essential Fish Habitat (EFH) as noted in the Magnuson-Stevens Act[18].

There would be no anadromous fish issues to address as a result of this Project due to distribution-limiting barriers downstream at the confluence of the Green River with Falls Creek at RM 24.95 and at RM 31.3. The Project Area occurs around RM 32, which is approximately seven miles upstream from the first anadromous barrier, and far enough upstream from the anadromous barrier for any ESA-listed salmonid species to not be affected by the Proposed Project activities, (and is also consequently beyond EFH). For example, sedimentation of surface water at the site is not likely to occur, as discussed in Section 3.3. However, if sediments were released they would likely settle out or be diluted prior to reaching the first anadromous barrier. This Project would therefore have no effect on listed or candidate fish species including Lower Columbia River (LCR) Chinook, LCR Coho, LCR steelhead and LCR bull trout; or on Critical Habitat for Chinook salmon, steelhead trout, and bull trout. Considering that these candidate species are not expected to exist within seven miles of the Project Area, they are eliminated from further discussion in this EA.

A wild fish management zones, also known as wild stock gene bank, has been established by the Washington Department of Fish and Wildlife for the Green River steelhead population. The purpose of this wild stock gene bank is to manage this population of wild fish to minimize interactions with hatchery-produced fish to preserve genetically diverse wild stocks by reducing interbreeding or competition for food or habitat by planted hatchery stocks. Project related impacts to steelhead are discussed in anadromous and resident fish sections. As this project does not affect or is otherwise related to

[18] NOAA, 2002. Fish Habitat Magnuson-Stevens Act Provision: Essential Fish Habitat (EFH): Final Rule (50 CFR Part 600; 67 FR 2376).

management or planting of fish in the project area, it will have no effect to the genetic integrity of anadromous or resident wild fish stocks.

3.5.1.4 USFS Management Indicator Species (MIS) for Fisheries

A combined indicator species generally represents trout, steelhead, and salmon habitat. These indicator species are set at the forest level and used forest-wide. The "cutthroat/steelhead" indicator represents habitat capability for resident and anadromous fish species which are sensitive to in-stream habitat modifications and angling pressure, are economically important, and require relatively high-quality habitat.

The 1990 GPNF Forest Plan designated the following fish species as MIS. The species selected represent associated habitats forest-wide. The GPNF Forest Plan currently has two Management Indicator Species for fisheries:

- Indicator 1: Cutthroat/Steelhead (a combined indicator to represent habitat capability for resident and anadromous fish species).
- Indicator 2: Bull Trout (represents cold water fish species).

Resident cutthroat is the only MIS species present in the Project Area, and thus the only MIS species that could be affected by the Project. Bull trout are not present in the Project Area.

In addition to resident fish that may occur in the project action area other life forms associated with aquatic ecosystems, such aquatic insects and arthropods, have the potential to be affected by changes to water quality or quantity. These species have evolved upon and are dependent on areas of suitable water quality and quantity, including those in the project action area. Potential project-related effects to water quality and quantity have been addressed under the water quality section. As the project will not affect nor change any water parameters, the project will have no effect to these aquatic invertebrate or arthropod resources.

3.5.2 Environmental Consequences

The Proposed Project has the potential to affect existing fisheries resources in the area, including resident fish species. Analysis of the Project (access, operations, and reclamation), identified potential sources of fisheries impacts, impacts avoidance options, and recommended mitigation measures designed to minimize unavoidable impacts. This section identifies the potential impacts to fisheries as the result of both installation and operation, and reclamation of the Project.

3.5.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling and associated activities would occur. Timber management, equestrian activities, and other recreational activities could still occur within the proposed Project boundary, which would continue to affect vegetation, and potentially some sedimentation into the streams would continue.

3.5.2.2 Proposed Action Alternative

3.5.2.2.1 Direct Effects

By implementing and maintaining impact avoidance and minimization measures consistent with the ACS guidelines and the USFS National Core BMPs for Water Quality Management in Minerals Management Activities (FS-990a), impacts to surface water should be minimized to the point of being negligible. The ACS Guidelines and FSM Minerals Management BMPs that are particularly relevant are discussed in Section 3.3 *Hydrology,* and are included in Appendix F, *Mitigation Measures*.

Fish Habitat

The Proposed Action would require the removal of vegetation in some areas to accommodate road reactivation and improvement, and installation of the drill pads. The impacts from the Project would not differ substantially from customary USFS maintenance and/or forestry activities on the site. Assuming a 20-foot by 20 foot (400 square feet) area for each of the 23 pads, then approximately 9,200 square feet (0.23 acres) would be cleared of vegetation for drill pads. This is likely an overestimate of the amount of vegetation clearing because some of the pads are located on roads that have already been disturbed and cleared of vegetation. Based on visual inspection of drill pad sites, it is anticipated that most roads and pads would have only seedlings, small shrubs, and herbaceous vegetation removed; if trees need to be removed along edges, only a few trees, all less than a 12 inch dbh, would be removed.

Road reactivation would be required during the installation phase of the Project. However, the temporary modifications of habitat types from these actions are anticipated to be minor. Installation of temporary culverts on reactivated roads would affect intermittent streams in up to six locations. At each location, a length of 16 to 20 feet of channel would be temporarily placed in culverts. Channels are typically about one foot wide at these locations where previous culverts were removed when the road was reclosed following a previous reactivation.

Riparian impacts are minimal. Trees growing on the road would be removed and saved for reclamation, while trees on road edges would only be limbed to avoid job hazards. Trees in danger of falling on the drill sites would be removed for safety. Only small (< 12dbh) trees would be affected. The effects of vegetation removal are considered a temporary loss of riparian habitat due to reclamation activities that are part of the Project. At the completion of the Project, the drill pads and reactivated roads would be reclaimed, and would be expected to regrow into forest over a period of decades.

Minor displacement of soil may result from the Proposed Action ground disturbing activities (e.g., equipment operation) but should not manifest itself as sediment in fish bearing water. A small volume of soil (< 1 yd^3) may be mobilized but is expected to be retained as surface soil and/or captured in intermittent channels. Studies have shown that sediment entrained in creeks during culvert removals attenuate to background levels approximately ½-mile downstream of the removal (Foltz 2008). Because of the distance of the crossings of the small tributaries from the Green River, and the distance

downstream to the anadromous fish barriers (7 miles), the small quantity of fine sediment that might get into any streams would be immeasurable above baseline conditions, and would have no adverse effects to any life stage of fish or aquatic life, including downstream fish habitat in the Green River.

Resident Fish Species

No impacts to resident fish are anticipated from the Proposed Action because the BMPs and preventative actions associated with the Action should prevent impacts. The installation of culverts would occur when the perennial drainages that cross the reactivated roads are at their lowest flow and when the intermittent drainages are dry. This would reduce to the maximum state possible potential impacts from sediment.

Proposed drilling activity and vegetation clearing that would occur near the Green River Horse Camp on the lower segment of the easternmost stream has the potential to directly affect resident fish if they are present in the stream. Adult fish may be temporarily displaced due to the vibrations from the drilling equipment. BMPs would not allow any work to occur in the stream or to discharge anything into it.

- USFS Management Indicator Fish Species
  - Cutthroat/Steelhead: the Proposed Action has the possibility of affecting the estimated 2.4 miles of cutthroat and steelhead habitat in the project analysis area. However, these effects, namely to turbidity/sediment, substrate embeddedness, and large woody material, are expected to be short-term, localized, intermittent and below background levels at the sub-basin scale. Any cumulative effects to this indicator from other management actions are expected to be insignificant and discountable. Therefore, no effect is expected from Project actions on Forest-wide viability for this indicator.
- USFS Sensitive Fish Species
  - No USFS sensitive fish species are present.

3.5.2.2.2 Indirect Effects

Indirect effects to fish are defined as those which will be later in time but are reasonably certain to occur. No indirect effects on fish or fish habitat from the Proposed Action are expected.

- USFS Management Indicator Fish Species
  - Same effect as resident trout species.
- USFS Sensitive Fish Species
  - No USFS sensitive fish species are present.

3.5.2.2.3 Cumulative Effects

Cumulative effects on fish and aquatic habitat are mostly related to additional small increments of the same kinds of effects as have occurred in the past, such as timber

management, road maintenance, equestrian activities, and other recreational activities. In areas that are to be disturbed, re-growth of vegetation that serves to prevent erosion and sedimentation may be affected. However, additional sediment is not likely to reach areas with fish because of the low fines content of the soil and the distance from disturbance sites to fish habitat. The collective consequences of these small incremental impacts are minor and considered negligible.

3.5.2.3 Alternative Based on Scoping Comments

Under the Alternative 3, exploratory drilling would be performed with restrictions to on-site water use, additional requirements related to drill hole abandonment, phasing of drilling at specific locations, and operational modifications related to light and noise.

3.5.2.3.1 Direct Effects

The direct effects to fish and aquatic habitat would be similar to those stated in the Proposed Action Alternative. A small increase in the quantity of water delivered to the local watershed would be realized through the importation of some drilling water, although the amount would not alter fish habitat.

3.5.2.3.2 Indirect Effects

The indirect effects to fish and aquatic habitat would be similar to those stated in the Proposed Action Alternative.

3.5.2.3.3 Cumulative Effects

The cumulative effects to fish and aquatic habitat would be similar to those stated in the Proposed Action Alternative.

3.5.3 Mitigation

Design criteria and mitigation measures specifically developed to ease some of the potential short-term aquatic impacts that the Project may cause to resident fish are discussed below.

3.5.3.1 Aquatic Design Criteria/BMPs

In addition to the proposed aquatic mitigation in Appendix F, the following Best Management Practices (BMPs) expand and supplement the basic guidelines and minimum requirements of the BLM:

1. Applicable — General Water Quality BMPs shall be adhered to (USDA Pacific Northwest Region 1988).
2. Within seven days after Project completion, any disturbed sites adjacent to streams would be protected from erosion through approved seeding (native seeds) and weed-free mulching and other erosion control devices necessary to mitigate movements of sediment into stream waters. If initial erosion control measures are inadequate, a new erosion control plan would be required and implemented as soon as possible. If seasonally late, then ensure that within one year of Project

completion stream banks would be vegetated with native grasses or woody species that have been approved by the district hydrologist and botanist.

3. Develop and carry a BLM approved Spill Prevention Control and Countermeasures (SPCC) plan before operations begin. The containment plan should include but not be limited to possessing a spill containment kit on-site and having pre-identified containment locations. A spill containment kit would be located where equipment is stored or operated. Equipment would be scrubbed so it is free of external petroleum-based products and invasive plant seeds or biomass. Hydraulic/oil/fuel leaks would be repaired prior to operating on National Forest System lands. Equipment would be checked daily for leaks and any necessary repairs would be completed prior to commencing work activities along the stream. Equipment storage locations would be approved by the Project administrator. Equipment would not be stored adjacent to or in stream channels when not in use, which would avoid potential effects of vandals, accidents, or natural disasters. Any accidental spills of a hazardous material (e.g., oil, fuel, transmission fluid) from any operating equipment or in place of storage on land or in water must be reported to GPNF personnel.
4. Service and refueling areas would be located at least 100 feet from stream courses or wet areas (including chainsaws and other hand powered tools).

3.5.3.2 Fisheries Design Criteria/BMPs

In addition to the proposed fisheries mitigation in Appendix F, the following Best Management Practices (BMPs) expand and supplement the basic guidelines and minimum requirements of the BLM:

1. Road segments treated within riparian areas should be re-contoured to mimic natural floodplain contours and gradient to the greatest degree possible.
2. For those road segments immediately adjacent to the stream or where the road fill is near the wetted stream, install sediment control barriers between the Project and the stream.
3. Drainage features (drain dips) should be spaced to hydrologically disconnect road surface runoff from stream channels.
4. Dispose of excavated waste material in stable locations out of the flood prone area. Waste material other than hardened surface material may be used to restore natural or near-natural contours.
5. Minimize disturbance of existing vegetation in ditches and at stream crossings to the greatest extent possible.
6. Conduct activities during dry-field conditions with low to moderate soil moisture levels.
7. Roads Management: Project activities should restore natural drainage patterns (e.g., channel geometry, substrate and flow) and when possible promote passage of all fish species and life stages present in the area.
8. All applicable NWFP S&Gs would be followed, as well as applicable administrative unit BMPs and Washington State findings and recommendations, (Washington State Hydraulic Codes).

9. Road stabilization and decommissioning would retain LWM typically accumulated on culvert structures and channel margins. Material should be repositioned on-site or integrated into stream restoration projects as identified by a USFS Fish Biologist to the benefit of aquatic species.
10. Remove rip-rap or other hard structures currently used in culvert protection, (e.g., rock armoring at the inlet and outlet of the culvert), on decommissioned crossings at all unnamed creeks.
11. Any stream bank stabilization deemed necessary following culvert removal would use bioengineered solutions, (such as root wads, log toes, coir logs, woody and herbaceous plantings).
12. Use effective and appropriate erosion controls as necessary to ensure that the likelihood of sediment delivery to streams or other water bodies is negligible.

3.6 Vegetation

This section describes the existing vegetation at the project site, including forest resources, special status plant species, and invasive species. It also considers the potential for impacts to vegetation as a result of the project, and mitigation measures designed to minimize those impacts. It is important to note that the Cowlitz Indian Tribe has indicated that they view plants as a natural resource of cultural value. (Source: William Iyall, Chairman, Cowlitz Indian Tribe, from a letter dated March 16, 2012.)

3.6.1 Affected Environment

The Proposed Project Area is located in the Southern Washington Cascades Province, within the Pacific silver fir (*Abies amabilis*) vegetation zone (Franklin and Dyrness 1988). It is located on the south facing slope of the east-west trending Goat Mountain situated in the area north of the Green River between 2,800 and 4,000 feet, on the fringe of the area deforested by the 1980 eruptive blast of Mount St. Helens. A portion of the northern part of the Project Area is covered by mature forest that escaped the effects of the 1980 eruption. Areas devastated by the eruption were salvage logged around 1982 and replanted by 1986. The current vegetative structure stage on the land where the Proposed Action would occur varies from young forest plantations 27 years of age, to forests up to 127 years of age.

3.6.1.1 Forest Resources

Most of the Project Area is comprised of young forest plantations. These trees were planted in 1985 and 1986 after salvage logging occurred. However, a mature stand, which is 127-years old according to the USFS' Geographic Information System (GIS) data, is located in the northern part of the Project Area. The majority of the site is dominated by Douglas fir (*Pseudotsuga menziesii*), with some western hemlock (*Tsuga heterophylla*), and western white pine (*Pinus monticola*). A small "old-growth" patch is present outside the western border of the Project Area that is estimated to be over 150 years old.

Lands within the Project Area have one designation under the Northwest Forest Plan. This area is under the "matrix" designation, which are forest lands outside reserves and

withdrawn areas, and available for regularly scheduled timber harvests. Within the matrix lands in the Project Area are the "riparian reserves", which lie within a designated boundary width on either side of a given stream; where restrictions are placed on what activities can occur within that boundary in order to protect the functions of the land and water within those riparian reserve areas. These are further discussed in Section 3.3, *Hydrology and Hydrogeology*.

Roadless areas and Late-Successional Reserves (LSRs) are present north of the Project Area, but no work is proposed in these lands. LSRs are managed to protect and enhance habitat for late-successional and old-growth-related species including the northern spotted owl. Management actions are allowed to benefit late-successional characteristics or reduce the risk of catastrophic loss.

3.6.1.2 Special Status Plant Species

The GPNF tracks species on the Region 6 Sensitive List and on the Survey and Manage List. Several sources were used to identify special-status plants that have been documented or have the potential to occur within the vicinity of the Proposed Project, including:

- Listed and Proposed Endangered and Threatened Species and Critical Habitat; Candidate Species; and Species of Concern in Skamania County (USFWS 2011).
- A Washington Natural Heritage Program (WNHP) record search of known special status plant locations in the vicinity of the project site (WNHP 2012).
- Rare Plant List for Skamania County (WNHP 2010).
- USFS Special Status plant location data for Project Area.

After review of the data sets noted above, it was determined that no Federal ESA-listed plant species occur on the GPNF. In addition, no Federal ESA-listed plant species occur in Skamania County. There are also no USFS records of special plant species within three miles of the Project Area. However, no specific special status plant surveys have recently been conducted in the project vicinity.

There is potential habitat for some special status plant species. Most of the ground disturbing activity would occur within the disturbed and compacted area of existing road prisms. The proposed drill sites for the project are located on or adjacent to a previously constructed USFS spur road system. This road system and the drill pad sites date to the Duval Corporation period of use in the 1970s, or timber salvage following the 1980 eruption of Mount St. Helens.

These disturbed and compacted areas are unlikely to support many special status plant species. However, some special status species are known to grow in these conditions. An example of a Region 6 Sensitive plant that is sometimes found on old road beds is adder's tongue (*Ophioglossum pusillum*), which may be found in ditches. However, probability is considered low to find sensitive vascular plants such as adder's tongue in the Project Area. Most non-vascular species on the Survey & Manage List are old-

growth associates. The highest probability for these species is in the older stand at the northern portion of the Project Area. Approximately 174 acres (13 percent) of the Project Area is located within this habitat type according to USFS GIS data.

3.6.1.3 Invasive Species

Non-native plants include those species introduced intentionally or unintentionally to areas where they do not naturally occur. An "invasive species" is defined as a species that is not native to the ecosystem under consideration, and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). Invasive non-native species are highly competitive, highly aggressive, and easily spread. They include plants designated as "noxious" by federal, state, or other legally responsible authority.

The Washington State Noxious Weed Control Board identifies three classes of noxious weeds. Class A noxious weeds have limited destruction within the state; Class B are regionally abundant, but may have limited distribution in some counties; and Class C are already widely established. There are an estimated 2,000 invasive and noxious weed species in the U.S and 143 noxious weeds listed in Washington State in 2012 (WSNWCB 2012).

The USFS has records for two noxious weed species in the Project Area: Scot's broom (*Cytisus scoparius*) and tansy ragwort (*Senecio jacobaea*). Additional noxious weed species have been observed at the nearby Ryan Lake Interpretive Site. All the invasive plants recorded in the Project vicinity are listed in Table 3.7-1.

Table 3.7-1. Noxious Weed Observations in Project Area

Scientific Name	Common Name	Washington State Status
Centaurea stoebe	Spotted knapweed	Class B - Designate
Cirsium arvense	Canada thistle	Class C
Cytisus scoparius	Scot's broom	Class B - Designate
Hypochaeris radicata	Hairy cat's-ear	Class B
Leucanthemum vulgare	Ox-eye daisy	Class B
Senecio jacobaea	Tansy ragwort	Class B

3.6.1.4 Plants of Cultural Importance

The Project Area is in the traditional and accustomed use area of the Yakama, Puyallup, and Cowlitz Tribes. It is likely that several plant species of cultural importance are located in the Project Area. However, information about traditional plant use is often sensitive in nature and cannot be shared without permission of the Tribes.

3.6.2 Environmental Consequences

This section identifies the potential impacts to vegetation as the result of the Proposed Project.

3.6.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be done. Timber management, equestrian activities, and other recreational activities could still occur within the Proposed Project boundary, which would continue to affect vegetation and potentially increase the spread of weeds.

3.6.2.2 Proposed Action Alternative

3.6.2.2.1 Direct Effects

3.6.2.2.1.1 Forest Resources

The project would require the removal of vegetation in some areas to accommodate road reactivation and installation of 23 drill pads. All of this work would be done on "matrix" lands. Ground disturbing activities would only occur in early and mid-seral vegetative types established by the previous disturbances (mineral exploration, eruption, and timber salvage).

Each drill pad would measure approximately 400 square feet, for a total disturbance of 0.23 acre for all 23 pads. Approximately 1.69 miles of road would be reactivated, which covers approximately 3.3 acres. Approximately 1.35 miles (2.45 acres) of these roads were previously reactivated in 2010 and have not had time to recover with large woody plants. However, 0.34 mile (0.62 acre) of these decommissioned roads have not been recently used and would require some vegetation removal for new reactivation. No large trees are growing on these roads. For drill Pads 1 to 7 and 14 to 21, the surrounding vegetation has been established for less than 40 years.

The number of trees with the potential to be removed as a result of the project was calculated for the northern portion of the Project Area, which is considered mature forest. This includes reactivated roads and pad sites for Pads 13, 22, 23, and 25, where a total of up to 68 trees would be removed. Their size and location are described in Table 3.7-2.

Table 3.7-2. Tree Removal

Road Segment or Location	Number of Trees Removed	Diameter at Breast Height (dbh) in inches	Type of Stand
Road segments to Pads 13, 22, and 25	5	< 12	Mature Timber
Road between Pad 22 and Pad 23	1 4	10 < 4	Mature Timber
Pad 22	2	10-12	Mature Timber
Road between Pad 23 and Pad 25	2 25	< 10 4-7	Mature Timber
Pad 25	1 2	12 6	Mature Timber
Road between Pad 25 and Pad 13	2 4	12 < 4	Mature Timber

Pad 13	20	< 4	
Total Trees Removed	**68**	**All < 12dbh**	Mature Timber

Tree removal is not planned at Pads 10, 11, 12 and 24 which are located along the upper roads. The small trees growing on the roads would be removed and saved for reclamation, while larger trees on road edges would only be limbed to avoid job hazards. Trees in danger of falling on the drill sites would be removed for safety.

The Proposed Project would not impact future use of the area for timber production.

3.6.2.2.1.2 Special Status Plant Species

No Federal ESA-listed plant species occur on the GPNF. In addition, no known locations of any special status species are known from the project vicinity. There is potential for special status plant species listed on the R6 Sensitive Species List or Survey & Manage Species List to be present in the Project Area (See Section 3.7.1.2, *Special Status Plant Species*). However, it is less likely that any of them would be growing on the road. Given the limited ground disturbance proposed, it is very unlikely that any sensitive vascular plant species would be impacted.

Non-vascular species, such as lichens and mosses, often grow on trees and are old-growth associates. The highest probability for these species is in the 127-year-old stand at the northern end of the Project Area. Although the roads proposed for project action are cleared and compacted by previous use, there would be fresh ground disturbance, tree removal, and soil displacement from reactivation and pad installation. Because the project scope and area is small relative to the landscape, there would be little to no impact upon the species and associated habitat.

3.6.2.2.1.3 Invasive Species

Invasive species and noxious weeds can dominate a site and alter ecosystem balance. The results may include changes in biodiversity, fire frequency, soil erosion and hydrology of a site. Other effects include reducing the quality of recreational experiences. While no Class A weeds have been observed in the project vicinity, several Class B and C weeds are present. Under the Proposed Action, there would be ground disturbance, which exposes an available seedbed for noxious weeds. These areas would be susceptible to noxious weed and invasive plant colonization, particularly since there are already invasive species growing along decommissioned roads. Roads function as "pipelines" for weed spread by providing continuous corridors of increased light levels and repeated disturbance, and for weed transport.

USFS Manual direction requires that noxious weed risk assessments be prepared for all projects involving ground-disturbing activities. For projects that have a moderate to high risk of introducing or spreading noxious weeds, recent USFS policy requires that decision documents must identify noxious weed control measures that would be undertaken during project implementation (FSM 2081.03, 11/29/95).

There is a high risk of spreading noxious weeds with this project. Six noxious weed species were found in the Project Area. Roads that have not been surveyed are assumed for purposes of this analysis to have weed populations similar to those on nearby surveyed roads. Scot's broom is the most widely distributed recorded weed.

Scot's broom is of particular concern in areas managed for timber. The seeds are long-lived and can remain dormant in the soil for over 50 years, to sprout at the next disturbance. Scot's broom can be highly competitive with conifer seedlings. There is no effective control for seeds lying dormant in the soil, so the most effective management is to prevent spread and control seed production. Control requires consistent treatment and follow-up for many years once plants have been allowed to go to seed.

Noxious weeds would be managed within the project site. By implementing BMPs and mitigation measures, (Appendix F, *Mitigation Measures*), weeds are not anticipated to spread further as a result of the development of the project. Many of these invasive plant prevention and treatment/restoration standards come from the Guide to Noxious Weed Prevention Practices (USDA 2001); the Pacific Northwest Region Invasive Plant Program Record of Decision for Preventing and Managing Invasive Plants (USDA 2005); and the Forest Plan Amendment #20 for GPNF and CRGNSA (Washington Portion) March, 2008.

3.6.2.2.1.4 Plants of Cultural Importance

Plants of cultural importance are often common species that are widely distributed across the landscape. A list of cultural plant species has not been made for the Project Area. However, the impacts from the Project reactivation/installation activities would involve a very limited amount of vegetation disturbance that is restricted to either existing road prisms or small areas immediately adjacent to roads. The loss of native plants from these modifications is anticipated to be minor and would not occur in areas where any culturally significant plant is abundant enough to be harvested.

3.6.2.2.2 Indirect Effects

3.6.2.2.2.1 Forest Resources

No indirect effects to vegetation communities are anticipated from the Project.

3.6.2.2.2.2 Special Status Plant Species

No indirect effects to special status plant species are anticipated from the Project.

3.6.2.2.2.3 Invasive Species

The spread of noxious weeds is not anticipated to occur as a result of the Project with BMPs in place.

3.6.2.2.3 Cumulative Effects

Cumulative effects on vegetation and plant species are mostly related to additional small increments of the same kinds of effects that have occurred in the past. In areas that are

re-disturbed, plant succession is set back a few years. The collective consequences of these small incremental effects are minor and negligible.

3.6.2.3 Alternative 3 – Based on Scoping Comments

Under Alternative 3, exploratory drilling would be performed with emphasis on minimizing water use through further actions to limit loss to the formation, additional requirements related to drill hole abandonment, phasing of drilling at specific locations and modifications related to light and noise.

3.6.2.3.1 Direct Effects

The direct effects to vegetation habitat would be similar to those stated in the Proposed Action Alternative.

3.6.2.3.2 Indirect Effects

The indirect effects to vegetation would be similar to those stated in the Proposed Action Alternative.

3.6.2.3.3 Cumulative Effects

The cumulative effects to vegetation would be similar to those stated in the Proposed Action Alternative.

3.6.3 Vegetation Mitigation Measures

In addition to the proposed vegetation mitigation listed in Appendix F, *Mitigation Measures*, the following BMPs and Project plans expand and supplement the basic guidelines and minimum requirements of the BLM:

- To the extent possible, new road reactivation and associated habitat impacts have been minimized by reactivating existing roads instead of constructing new roads. Locating the Project within and near matrix lands means that a substantial road network is already in existence within the site.
- Pre-reactivation/installation invasive plant surveys will be conducted.
- To prevent the introduction of noxious weeds into the project area all heavy equipment will be cleaned prior to entering National Forest System lands. An inspection by the USFS will be required to ensure that equipment is clean before work can begin.
- Use weed-free straw and/or mulch for all projects conducted on National Forest System Lands.
- Native plant materials are the first choice in revegetation for restoration and rehabilitation where timely natural regeneration of the native plant community is not likely to occur. Under no circumstances would non-native invasive plant species be used for revegetation.
- Minimize road reactivation clearing zones, as much as safety regulations will allow.
- The Pacific Northwest Region Invasive Plant Program Record of Decision for Preventing and Managing Invasive Plants (USDA 2005).

3.6.4 Heritage and Cultural Resources

Heritage and cultural resources consist of locations of human activity, occupation, or use identified through field inventory, historic documentation, or oral evidence. The term encompasses historic properties as defined by the National Register of Historic Places (NRHP), including archaeological and architectural properties, as well as sites or places of traditional cultural or religious importance to American Indian Tribes or other social or cultural groups. Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that activities requiring Federal permits or using Federal funds undergo a review process to consider historic properties that are listed in or may be eligible for listing in the NRHP. The State Historic Preservation Office (SHPO) and Tribes are the Federal agency's primary Section 106 partners. Because Section 106 is a process by which the Federal government assesses the effects of its undertakings on historic properties, it is the primary regulatory framework used in the NEPA process to determine impacts on cultural resources.

This section describes the existing heritage and cultural resources at the Project Area. It also considers the potential for impacts to such resources as a result of the Proposed Action, and mitigation measures designed to minimize those impacts.

3.6.5 Affected Environment

Recent human activity in the area has been dominated by logging and silvicultural activity, recreation use, and mineral prospecting. The Project Area has active and decommissioned roads, and some of the latter would be temporarily reactivated. The Green River Horse Camp is located at the southern edge of the Project. Additionally, USFS system trails skirt the area providing access for equestrian and hiker use. A small "old-growth" patch of forest is present outside the western border of the Project Area that is estimated to be over 150 years old.

Current uses of the Goat Mountain and headwaters of the Green River are primarily for recreation and timber management. The area is also important for camping, picnicking, fishing, hunting, hiking, equestrian riding, and huckleberry and mushroom picking, among other recreational activities.

3.6.5.1 Ethnographic and Historic Context

The Proposed Project is located in an upland setting along the Green River, within the traditional territory of the Taitnapam, a Shahaptian group speaking the Klickitat dialect. Many independent bands occupied contiguous territory in south central Washington State including the Yakama, Kittitas, Klikitat, Wanapam, and Taitnapam (Schuster 1998:327). The Taitnapam often intermarried with Salishan-speaking Cowlitz residing to the west, and the Taitnapams have been thought by some ethnologists to be Upper Cowlitz whose original band, through absorbing a sufficient number of Western Klickitats, formed a new group that retained the Shapatian language and Cowlitz culture (Ruby and Brown 1992:234). Taitnapam villages and camps were located along the headwaters of the Cowlitz and Lewis rivers (Schuster 1998:329); one band of Taitnapam lived on the

southern flank of Mount Rainier, and another on the southern flank of Mount St. Helens. Their homeland was characterized by hilly and mountainous terrain, and hunting of big game like elk, deer, and sheep was of primary importance, along with root digging and berry picking (Schuster 1998: 329).

Widespread epidemics, Euro-American settlement, and the establishment of reservations had devastating effects on traditional lifeways by the 1850s. Although Cowlitz groups were among those attending the Chehalis River Treaty Council of 1855, they refused to sign because it did not provide a reservation in their own territory. A presidential proclamation in 1863 offered Cowlitz lands for public sale, even though the Tribe had never relinquished them, and some Cowlitz Tribal members were forcibly removed to the Yakama Reservation. A later attempt in 1872 to establish the Chehalis Reservation for all non-treaty Indians of southwestern Washington Territory was not recognized by the Cowlitz Tribe, and many remained in the general area of their ancestral homelands (Ruby and Brown 1992). The Cowlitz Tribe was officially recognized by the Federal Government in 2000, a "belated acknowledgement of a cohesive culture spanning centuries. In 1973, the Indian Claims Commission found that the presidential proclamation of 1863 had deprived the Cowlitz Indian Tribe of exclusive aboriginal title to approximately 1.66 million acres of southwest Washington State (including the present project Area of Potential Effects), without compensation." (The Cowlitz Indian Tribe 2012).

Many areas of traditional use continue to be of importance to modern tribal peoples. The Cowlitz Indian Tribe has stated that goats are an important element of their cultural heritage and as the name implies, Goat Mountain was a dispersal or travel corridor for this animal (William Iyall, Chairman, Cowlitz Indian Tribe, in a letter dated March 16, 2012). Goats were hunted in the fall for their wool, which was used in the production of blankets that served as indicators of wealth and status in pre-contact communities.

Trails near the Project, including those along the Green River, Quartz Creek, and the Strawberry Mountain ridgeline probably originate from pre-contact period Indian trails tied to resource gathering activities. These same trails were likely adapted by the early miners during the late 1800s. Also, burned areas within the Project Area, as depicted on the earliest historic General Land Office (GLO) maps, may reflect purposeful burning by Indians to manage huckleberry and strawberry production (Iyall 2012 citing Mack 2003). Pre-contact archaeological sites would be expected near the Green River, south of the Area of Potential Effect (APE) based on these past activities. The upper Green River fork of the Toutle River is considered a culturally significant landscape by the Cowlitz Indian Tribe (William Iyall, Chairman, Cowlitz Indian Tribe, in a letter dated March 16, 2012).

Due in part to its remote setting, the Project Area was not intensively utilized by Euro-Americans until mineral exploration and limited mining within the area began in the late nineteenth century. The Project Area falls within the St. Helen's Mining District, which was designated in 1892 as a 156-square mile area along the flanks of Goat Mountain and headwaters of the Green River (McClure 1984). Over 400 mining claims were filed between 1892 and 1911, with copper, gold, and silver being the most sought-after

minerals. Specifically, the Germania Mining and Milling Company filed historic mining claims circa 1900, including the Germania, Germania Jr., Germania Secundus, and Adamantine No. 2 lodes of Mineral Claim 708, which overlap the Project Area.

The Germania consisted of 12 patented claims and was one of the first mineral development groups opened in the St. Helens Mining District; it was so named because of association with a group of Germans from Wisconsin who initially worked the claims in the summer season via pack trains (St. Helens Mining District 1934). A trail along Green River from near its confluence with the North Fork of the Toutle River was initially used to transport equipment to the mines. Resources associated with these claims included at least two tunnels created to intersect gold veins, one near the bottom of Goat Mountain and one near the top. The Germania lodes, like others in the St. Helens Mining District, appear to have been generally abandoned in the 1910s as lack of improved transportation networks made operation costs prohibitive.

Though a small amount of exploration re-occurred in the 1930s, most mineral development activity was suspended until larger mining corporations re-filed many old claims in the 1960s and 1970s (McClure 1984:4-5). Previous drilling was conducted in the same location as the Proposed Project by Duval Corporation in the 1970s and 1980s, who suspended operations following acquisition by Pennzoil, and the 1980 eruption of Mount St. Helens. The Proposed Project drill sites are all located on a previously constructed spur road system on drill pad sites dating to the Duval Corporation period of use, or salvage logging following the 1980 Mount St. Helens eruption.

3.6.5.2 Identification of Historic Properties

The USFS as the lead Federal agency for the Section 106 process has delineated the Area of Potential Effect (APE) for the Project as approximately 3.3 acres, including reactivated portions of decommissioned roads, and drill pads. The 3.3-acre APE is considered to be identical for both above-ground (architectural) and archaeological resources.

Efforts to identify historic properties initially included a desktop review of archival materials, including data on file at the SHPO and USFS; aerial photographs; and historic maps. A field visit was initiated in January 2012, and the Project was reviewed by a URS Archaeologist, qualified under the *Secretary of the Interior's Professional Qualification Standards* (36 CFR Part 61) for archaeology.

A review of records on file at the Washington SHPO office, available online via the restricted-access Washington Information System for Architectural and Archaeological Records Database, and at the USFS GPNF office at Trout Lake, Washington, was undertaken to determine the presence or absence of previously recorded historic properties, and the extent of cultural resource survey coverage in and near the APE. In order to protect archaeological resources from vandalism, location information is restricted under the Archaeological Resources Protection Act. Previously documented archaeological resources are considered as part of the Cultural Resources Inventory Report for the Project (McDaniel and Stegner 2012, forthcoming).

Several previously documented archaeological resources are located within approximately one mile of the APE - nearly all historic mining-related sites; though peeled cedars associated with American Indian use have also been documented. Two previously recorded historic archaeological resources are located near but outside of the APE. Archaeological site 45SA90, consisting of the circa 1904 Earl Claims cabin, mineshaft, and powder house, was identified during surveys for a salvage timber sale. The site, which dates to circa 1904, is located near but outside of the APE along a developed forest access road. As part of Henry Coe's St. Helens Mining District Earl Claim, the site, unlike most other mineral development sites in the area, is considered potentially eligible for the National Register of Historic Places (NRHP). Another archaeological Site, 45SA89, the Germania Secundus mineral exploration-related cabin, is found about 656.17 feet west of the APE and consists of structural remains of a collapsed miner's cabin dating to circa 1902. This site was determined by SHPO to be ineligible for the NRHP in 1982.

Portions of three prior investigations overlapped the APE. In 1981, shortly following the eruption of Mount St. Helens, USFS personnel conducted cultural resource inventories for salvage timber sales which appear to have examined at least half of the APE (McClure 1982a, 1982b). Several resources found outside the APE were documented as part of these inventories, including historic mining-related sites such as collapsed cabins, tunnels, debris scatters, and other features, all dating to the early twentieth century. Most of these resources were determined by SHPO at that time to be ineligible for the NRHP. Because of the number of historic mining-related sites determined to be ineligible, the St. Helens Mining District has not been nominated as an NRHP historic district.

In 2010, USFS conducted a field inventory for exploratory drilling activities proposed by Ascot, including drill pad locations, roads to be reactivated, and a gate, all within the same area as the current Proposed Project (Flores 2011; Taber 2010a, 2010b). Using a metal detector, a 25-foot radius around each drill pad site was examined, and decommissioned roads, including roads used to skid equipment, were also surveyed. No cultural resources were identified.

Mining features have been identified on historic General Land Office (GLO) plat maps and assigned resource numbers by the USFS. Several are noted near the Project APE, but have not been field verified to date, including: Germania No. 1 Tunnel (USFS #10060806), Germania No. 2 Tunnel (USFS #10060807); Ardentine No. 1 Tunnel (USFS #10060808), Ardentine No. 2 Discovery Cut (USFS #10060809); Germania Jr. No. 2 Discovery Cut (USFS #10061706); Adamantine No. 2 Discovery Cut (USFS #10061708) (as cited in Taber 2010a).

Historic trails near the APE include the Goat Mountain Trail No. 217, which appears on forest maps beginning in 1933 to the present. The trail follows the ridgeline of Goat Mountain, typically at least 0.5 mile to the north of the APE. The Green River Trail No. 213, which appears on maps as early as 1908, trends along the north side of the Green River in this area and is approximately 200 feet from the nearest proposed drill pad. Previous surveys along the Green River Trail identified a historic mining-related cabin

site, but this is more than one mile from the APE. Previous small inventories along the Goat Mountain Trail 217 and in the Green River Horse Camp did not identify cultural resources.

3.6.5.3 Field Investigation

A field visit was conducted by URS cultural resource personnel in January 2012. Only about half of the Proposed Project drill pad sites were surveyed at that time due to the presence of snow cover on higher elevation pads, which precluded visual examination of the ground surface. A second field visit was conducted in July 2012 as soon as the snow melted, by URS staff archaeologists. All drill pads were revisited at that time. No cultural resources were observed during either the January or July 2012 field visits.

Following the same field methods utilized in 2010 by USFS (Taber 2010a), individual drill pad sites were inventoried using a 25-foot diameter radius around the outer dimensions of each pad site. Decommissioned roads where reactivation is planned were also surveyed, along with a buffer of 15 feet on each side of the road prism, unless precluded by steep slopes. A metal detector was used to search for potential buried historic materials, since the results of a record search indicated the potential for such site types to be found in the general vicinity. Older trees, where present, were examined for cultural scarification.

Negative findings of the 2010 (Taber 2010a, 2010b), and 2012 (McDaniel and Stegner, 2012), field surveys indicate that there is a low potential for as-yet-unidentified cultural resources to be affected by the Project. Prior disturbances associated with timber harvesting and mineral exploration have extensively altered the ground surface.

3.6.5.4 American Indian Consultation

In addition to public scoping meetings, USFS and BLM have jointly initiated consultation with local tribes. Letters were sent to the Confederated Tribes and Bands of the Yakama Indian Nation, the Cowlitz Indian Tribe, the Nisqually Indian Tribe, and the Squaxin Island Tribe discussing the Project.

To date, the Cowlitz Indian Tribe has responded in a letter dated March 16, 2012, requesting formal consultation with the BLM and USFS. Several concerns were expressed, including: the need for completion of a cultural and archaeological resources survey; the need for known historic mining resources to be better characterized so that impacts can be avoided; the likely association of trails near the APE with pre-contact period Indian trails tied to resource gathering; the presence of wild goats at Goat Mountain, which were and are an important element of the Cowlitz Indian Tribe cultural heritage; and the importance and presence of berries, for which the Project Area would also have been utilized. Additionally, the upper Green River fork of the Toutle River is considered a culturally significant landscape by the Cowlitz Indian Tribe (William Iyall, Chairman, Cowlitz Indian Tribe, in a letter dated March 16, 2012).

A formal government-to-government consultation meeting was held with the Tribal Chairman, Tribal Historic Preservation Officer, and other staff of the Cowlitz Indian

Tribe on March 30, 2012, with Agency officials from both BLM and USFS attending. At this meeting, the Cowlitz Indian Tribe stated that the Toutle River and Green River systems are of importance for restoration activities, and that any action in this area is a cause for concern to the Tribe. The Tribe noted that natural resources, such as first foods, are considered cultural resources. The Washington State fish hatchery on the Green River is important as it provides salmon for the fish distribution program to tribal members. The Tribe observed that geotechnical borings have the potential to impact archaeological resources. The Cowlitz Indian Tribe requested having a voice in possible conditions or stipulations of permit issuance for this Project.

The Agencies held a second meeting via conference call on May 30, 2012 to brief the Cowlitz Tribe on the EA prior to its release for public comment. A third government-to-government meeting with the Tribe occurred on August 28, 2012 at Toledo, Washington regarding status of the EA process, cultural features, and the nature of the action alternatives being considered. A forth government-to-government meeting occurred on November 16, 2012 to present the revised EA to the Tribe prior to its public release.

3.6.6 Environmental Consequences

This section identifies the potential impacts to heritage and cultural resources as the result of both reactivation/installation and operation associated with the Proposed Project.

3.6.6.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would occur. Timber management, equestrian activities, and other recreational activities could still occur within the proposed Project Area. Cultural resources would continue to be identified and managed by the USFS following Section 106 of the NHPA.

3.6.6.2 Proposed Action

3.6.6.2.1 Direct Effects

The Project would require temporary road reactivation, and drilling a small diameter (< 3.78-inch) hole from an approximately 20 foot by 20 foot (400 square feet) drill pad. Impacts would not differ substantially from prior drilling activities conducted during the 1970s to 1980s, as the Proposed Project is located entirely within a previously constructed spur road system of rocked and graveled roads, and drill pads associated with the modern period of mineral exploration.

Some vegetation may need to be removed to reactivate roads and install drill pads. Harvesting of timber occurred within the Project Area in the 1980s, and thus the potential for certain resource types typically associated with old-growth trees, such as arborglyphs or peeled cedar trees is limited, except within a small section of the APE. The ground surface has also been previously disturbed by past timber harvesting, further indicating there is a low probability of encountering intact cultural resources.

Given the negative findings of past and current field investigations (Taber 2010a, 2010b; McDaniel and Stegner 2012 forthcoming; also, McClure 1982a, 1982b), combined with

the extent of prior disturbance related to previous road building and drill pad installation within the APE, the Project is not anticipated to have direct impacts to currently known archaeological resources. It is possible, but unlikely, that the Project would result in impacts to as yet unidentified archaeological resources during reactivation/installation.

Natural resources are of traditional and contemporary importance to American Indians. Berry plants, fish, and goats are of specific concern in the Project Area based on consultation that has occurred to date with the Cowlitz Indian Tribe. Effects of the Project on these natural resources that are also of cultural value are considered within the Wildlife, Fisheries, and Vegetation sections of this EA. Impacts to wildlife are discussed in Section 3.5. Almost no wildlife habitat would be disturbed as a result of the Proposed Action. Direct impacts to wildlife resulting from Project actions may include tree removal, temporary noise, presence of workers and equipment, and lighting. These impacts are considered minor because, although some individuals may be temporarily affected, populations would not.

Impacts to fisheries are discussed in Section 3.6. Impacts to fish habitat are expected to be minimal, and no impacts to resident fish species are anticipated from the Project. By implementing and maintaining impact avoidance and minimization measures, impacts to surface water would be negligible.

Impacts to plants are discussed in Section 3.7. Plants of cultural importance are often common species that are widely distributed across the landscape. A list of cultural plant species has not been made for the Project Area. However, the impacts from the Project would involve a very limited amount of vegetation disturbance that is restricted to either existing road prisms or small areas immediately adjacent to existing roads.

The loss of native plants from these modifications is anticipated to be minor, and would not occur in areas where any culturally significant plant is abundant enough to be harvested.

Based on these findings, the Project would not directly impact natural or archaeological resources of the upper Green River fork of the Toutle River that contribute to its being considered a culturally significant landscape by the Cowlitz Indian Tribe.

3.6.6.2.2 Indirect Effects

Some archaeological sites in the vicinity (e.g., 45KL90, the Earl Claims Cabin), have reported occurrence of surface artifact materials. Other mining features are expected to be present near the Project Area, but have not been field verified to date. The Proposed Action could make these sites vulnerable to inadvertent disturbance during drilling activities although all reasonable efforts will be made to identify and appropriately safeguard and/or conserve such features. Prompt site reclamation would reduce vulnerability to disturbance or vandalism after completion of the Action.

3.6.6.2.3 Cumulative Effects

Previous survey and exploratory drilling activities have not discovered archaeological resources to date. Therefore, cumulative effects to archaeological resources are not likely to result from the Project.

3.6.6.3 Alternative Based on Scoping Comments

Under Alternative 3, exploratory drilling would be performed with an emphasis on minimizing water use through further actions to limit loss to the formation, additional requirements related to drill hole abandonment, phasing of drilling at specific locations, and modifications related to light and noise.

3.6.6.3.1 Direct Effects

The direct effects to archaeological resources would be similar to those stated in the Proposed Action Alternative. No effect is anticipated.

3.6.6.3.2 Indirect Effects

Under Alternative 3, the indirect effects to archaeological resources would be similar to those stated in Alternative 2, the Proposed Action. No effect is anticipated.

3.6.6.3.3 Cumulative Effects

Under Alternative 3, exploratory drilling would be performed with restrictions on on-site water use, phasing of drilling at specific locations and modifications related to light and noise. The cumulative effects to archaeological resources would be similar to those stated in Alternative 2. No effect is anticipated.

Note: On July 30, 2012, the Forest Archaeologist for the Gifford Pinchot National Forest concurred with the *No Effect* determination made in the Cultural Resources Inventory Report dated July 2012.

3.6.7 Mitigation Measures

All project employees would be instructed regarding the type and nature of archaeological and cultural features that might be encountered during Project construction, including the proper steps for protecting and reporting such features before further ground disturbing activities are undertaken.

Ascot and its agents would be required to adhere to protocol outlined in an Inadvertent Discovery Plan, which details actions to be followed by Ascot and its agents in the unlikely event unanticipated cultural resources or human remains are encountered during implementation of the Project. Ascot would be advised of state and federal regulations and laws protecting cultural resources and human remains, both orally and as documented in the Inadvertent Discovery Plan, which would be developed by the USFS GPNF archaeologist, who will be responsible for ensuring that the plan is adhered to throughout the duration of the Project. Should any cultural resources or human remains

be encountered, further ground disturbing activities would be curtailed until the site has been properly investigated and cleared.

In the case that a designated member of an associated Tribe(s) requests to monitor the Project Site during drilling, this activity would be included as a permit condition and coordinated through the BLM/USFS. The designated tribal member will be required to adhere to all on-site safety measures.

3.7 Visual/Scenic Resources

3.7.1 Affected Environment

Scenic quality is a measure of the visual appeal of a parcel of land. Visual resources influence the public's experience of the National Forest. Section 101(b) of NEPA requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans. The GPNF Forest Plan Visual Quality Objectives (VQOs) must also be considered for view sheds from campgrounds, viewpoints and other developed sites, as well as those seen from designated travel routes such as roads and rivers. Figure 8, *Project Area Outline on Photo*, shows the Project Area looking northwest viewed from the southeast.

The lands encompassed by the Project Area are located on the south-facing slope of the east-west trending Goat Mountain, situated in the area north of the Green River between 2,880 and 3,780 feet amsl, on the fringe of an area deforested by the 1980 Mount St. Helens eruption, (described in Section 3.2.1). The project area is visible as you drive into the Green River Horse Camp, but not visible from other campgrounds, picnic areas or other developed sites in the vicinity. Portions of the Project Area are visible from one section on FS Road 2612 just past Ryan Lake traveling north along FS Road 2612. There are no geologic or botanic features, waterfalls, cultural sites determined to be visually significant within the project area.

The Visual Quality Objectives (VQOs) for the proposed Project Area are Retention and Partial Retention in the *foreground*, and Modification in the *middle ground* viewing zones. The desired Visual Conditions are moderately altered changes possibly noticed by the average visitor; would not attract attention; and/or disturbances are not apparent. This objective corresponds to the VQO of Partial Retention and Modification, (GPNF Forest Plan Figure IV-7 page 4-23). Figure 9, *Visual Quality and Proposed Drill Pad Locations*, shows the drill pad area for proposed Pads 2, 12, and 20, which are representative of the Project Area.

Figure 9. Visual Quality and Proposed Drill Pad Locations

Proposed Drill Pad 2 Location

Proposed Drill Pad 12 Location and access to other Drill Pad Sites

Drill Pad 20 Location

GPNF Forest Plan Visual Quality Objectives (VQO's) relating to the Project include:

- Preservation VQO: Forest management activities cannot be visible from designated viewpoints.
- Retention VQO: Forest management activities may be discernible but not clearly visible to the average viewer. Disturbances must appear to be from natural causes.
- Partial Retention VQO: Forest management activities may be noticeable, but must blend well with the natural appearance of the landscape.
- Modification VQO: Forest management activities must have natural appearing characteristics, and blend in with existing landforms.

Distance zones are measured from the viewpoint and are divided into five categories:

- Immediate foreground: 0 – 300 feet
- Foreground: 300 feet to 0.5- mile
- Middle ground: 0.5-mile to 4 miles
- Background: 4 miles to horizon
- Seldom Seen: areas not normally viewed due topography and lack of access

The Project Area as seen from Route 26 is in the middle ground (0.5 to 4 miles). The Project Area as seen from FS Road 2612 is in the immediate foreground to middle ground (0 feet to 300 feet).

A total of five drill sites are within the immediate foreground of FS Road 2612 (Pads 1, 2, 3, 14, and 15). All of the remaining drill sites and reactivated decommissioned roads would be screened from the public view from FS Road 2612 and Route 26 because of the existing vegetative cover.

No drill sites nor the drill rig and ancillary equipment could be seen from Mount St. Helens. There are several tall mountains/ridgelines that are located between Mount St. Helens and Goat Mountain, which is a distance of 12 miles. Mount Margaret is 5,858 feet amsl, and Mount Whittier and Bear Pass are above 5,800 feet amsl. These mountains and nearby ridgelines, including Whittier Ridge, block the view of Goat Mountain from the Mount St. Helens Volcanic Monument, so drilling operations and equipment on Goat Mountain would not be visible from the Monument. Additionally, there is a ridge line immediately southwest of Goat Mountain that blocks the view between Goat Mountain and Mount St. Helens. Also, the 14-foot tall drill mast would be further obscured by the 20+ foot tall tree canopy.

Based on guidelines in the NWFP and the proposed Exploration Plan, any disturbed areas are to be rehabilitated within one year of completion of the proposed Action as required. Revegetation for visual quality and erosion control are to be completed within one season after the final exploration is completed; and existing roads would be utilized as to not alter the existing dominant natural form, line and texture.

After drilling is completed, roads and pad areas would be reclaimed, and would return to their original condition. There would be some visible impacts for approximately one season until the vegetation becomes established. Until vegetation becomes established, this disturbance may be visible along existing roads, but would not attract attention, nor

would it be apparent to the casual observer. There would be no long-term visual effects from the Proposed Action.

The Green River Horse Camp is located near the southern boundary of the subject area. The site has eight developed camp sites for horse and trailer. Additionally, several USFS system trails skirt the area, with the camp providing access for equestrian and hiker use. There are no geologic or botanic features, waterfalls, cultural sites determined to be visually significant within the Project Area.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be done. The need to reactivate decommissioned roads, remove vegetation, install culverts, install erosion control, (including but not limited to installation of silt fencing, water bars or revegetation at the completion of drilling), would not be necessary. There would be no changes to existing Visual/Scenic Resources. There would be no direct, indirect or cumulative effect to Visual/Scenic Resources as a result of this alternative.

3.7.2.2 Proposed Action Alternative

The Proposed Action generally involves the reactivation of previously decommissioned roads. Established vegetation, brush and fallen trees would be removed from previously decommissioned roads during road reactivation. Drilling operations occurring at nine locations, (and occurring at single intervals), along FS Road 2612 and the road leading to the Green River Horse Camp would be seen by recreational users. Operations along other road segments would be visually obstructed by the existing vegetation, enhanced by restricted access to these reactivated roads located north off FS Road 2612.

3.7.2.2.1 Direct Effects

Visual concerns relate mainly to the Green River Horse Camp, and associated USFS system trails and camp sites that skirt the Project Area. Project Areas that are subject to surface disturbance are generally screened by topography and forest cover. The Project would result in short-term visual impacts caused by initial surface disturbance from the drill sites located in the immediate foreground along FS Road 2612, and campsites located in the vicinity of the Horse Camp near Drill Pads 6 and 7. These impacts would principally affect the visual elements of line and color. Horizontal and *shallow diagonal* lines from reactivated roads, and from drill pads would cause moderate and temporary line contrasts with the natural landscape. Disturbance of vegetation may also cause moderate, temporary color contrasts.

For all other drill sites and reactivated roads there would be no effects to visual resources because they cannot be seen by the casual observer using either FS Road 2612 or Route 26. These sites meet or exceed the visual quality objective of Retention.

3.7.2.2.2 Indirect Effects

The proposed drilling would occur 24-hours a day. Lighting would be required during night time operations and could be a distraction or attractant to wildlife and insects. It is unlikely that lighting would be seen by people hiking or camping due to screening by topography and forest cover, with the exception of drill pads located in close proximity to existing camping/recreation areas. Capped lighting would be directed towards the drill pads, and behind baffles. Also, lighting is a transient visual effect which stops when the lights are turned off.

3.7.2.2.3 Cumulative Effects

With successful reclamation of Project reactivated roads and drill pads, together with revegetation, long-term visual impacts would be minimized. Environmental protection measures and standard operating procedures for mineral exploration would aid in protecting the visual quality of the area. The effects of the Proposed Action Alternative on visual resources would be consistent with GPNF Forest Plan Visual Quality Objectives, which is Foreground Retention. The effects to visual impacts are limited since the work is temporary, and being conducted on and along existing roadways.

3.7.2.3 Alternative Based on Scoping Comments

Alternative 3 includes the same visual elements as Alternative 2 except drilling near the Horse Camp is controlled to reduce recreational and wildlife conflicts.

3.7.2.3.1 Direct Effects

By avoiding operations at Pads 6 and 7 during peak use recreational periods, direct visual effects would be reduced, since the potential for the public viewing drilling activity at Pads 6 and 7 is reduced. Also, drilling during daylight hours, and reducing light impacts at night with baffles and directing capped lighting towards the drill pads, would further reduce visual effects from Alternative 2.

3.7.2.3.2 Indirect Effects

The indirect effects to Visual/Scenic Resources would be similar to those stated in the Proposed Action Alternative.

3.7.2.4 Cumulative Effects

The cumulative effects to Visual/Scenic Resources would be similar to those stated in the Proposed Action Alternative.

3.7.3 Visual Effect Avoidance and Minimization Measures

Surface disturbances to the roads and drill pad locations would be reclaimed to minimize visual impacts. Downcast lighting during night operations would reduce indirect effects. Drilling operations would be mobile and visual impacts from the presence of the drill would be temporary at each pad location. As needed, baffles can be placed around the

mobile drill rig to further attenuate light intrusion to surrounding environs during night time operations.

3.8 Air Quality

This section evaluates how air resources would be affected by the Proposed Action.

3.8.1 Affected Environment

The Project is located within the southern portion of the Washington Cascade Mountain range in Skamania County. Elevations around the Project Area range from approximately 2,300 to 5,000 feet above sea level.

Air quality within Washington State is regulated by local clean air agencies. The Project Area falls within the Southwest Clean Air Agency (SCAA) jurisdiction. The area is in a rural setting and considered "unclassifiable/attainment" as established in 40 CFR 81.348. This designation is for areas where there is a lack of ambient air quality data; are generally unclassifiable; and are managed as attainment areas. Air quality in the Project Area is generally good due to the limited population and lack of industrial activity. The Project Area is treated as an attainment area and is categorized as a Class II area under the Clean Air Act regulations. According to the SCAA, an SCAA permit is required only for machinery that has an aggregate horsepower (hp) greater than 500 hp.

According to the SCAA, the closest permitted emission sources are approximately 9.5 miles to the north near the town of Randle, Washington. Additional sources are located 25 miles to the west and south. The closest Class I federally protected area is the Mount Adams Wilderness Area, 25 miles to the east.

Current emission sources within the Project Area include vehicle combustion emissions, fugitive dust from travel on unimproved roads, and camp site and wild fires. Emissions for all pollutants are generally expected to be low due to the limited number of sources in the Project Area and normal precipitation events. An additional natural source affecting air quality around the Project Area is continued volcanic degassing by Mount St. Helens.

Ongoing natural gaseous emissions from Mount St. Helens includes carbon monoxide (CO), carbon dioxide (CO2), sulfur dioxide (SO2), hydrogen sulfide (H2S) and other gases. Sulfur dioxide emissions from the volcano were regularly documented following the 1980 eruption through 1988 (USGS, 2012). In addition, a series of much smaller eruptions and off-gassing events were documented from 2004-2005 (USGS, 2008). In a December 2004 report, Mount St. Helens was listed as the State's No. 1 air polluter (Doughton, 2004). This report states that although the volcano was contributing significant amounts of emissions into the air as of December 01, 2004, there were no complaints about respiratory problems linked to the emissions "because the area around Mount St. Helens is so sparsely populated" (Doughton, 2004). At the time, SO2 emissions from the volcano were reaching approximately 50 to 250 tons per day and estimates of normal CO2 production from the volcano were between 500 to 1,000 tons per day, according to a USGS scientist (Doughton, 2004).

3.8.1.1 Climate and Meteorology

Orographic lifting of moisture laden air from the Pacific Ocean on a southwesterly to westerly track results in heavy precipitation around the Project Area (WRCC, 2012). Snowfall generally occurs from September through late spring, although maximum snow depths are typically reached during the first half of March (WRCC, 2012).

The closest and most recent official meteorological records are from the Spirit Lake Ranger Station, and indicate average annual snow fall depths of 311 inches and average annual total precipitation in excess of 93 inches. The station, now closed, was located at a similar elevation approximately 13 miles to the south of the Project Area. Similar precipitation and temperatures are expected, although the 1980 eruption of Mount St. Helens and the subsequent lowering of the summit may have had some effect on regional precipitation.

3.8.1.2 Greenhouse Gas Emissions and Climate Change

The global climate is becoming warmer, and there is strong evidence that this warming is resulting, at least in part, from human-caused production of greenhouse gases. The science of predicting future climate conditions is continuously and rapidly evolving. Addressing effects on Greenhouse Gas (GHG) Emission levels within the scope of NEPA is difficult due to the lack of explicit regulatory guidance on how to meaningfully apply existing NEPA regulations to this evolving issue.

Greenhouse Gas Emissions would require analysis when emissions would constitute a significant impact, or when analysis is necessary to determine whether the impact would be significant, such as prescribed burning or timber harvest. GHG Emissions from the proposed Action are considered to be non-significant when considered in the context of the cumulative emissions at broader spatial scales per *BLM's Instruction Memorandum No. OR-2010-012.*

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be completed. Timber management, equestrian activities, and other recreational activities would still occur within the Proposed Project boundary. Fugitive dust and combustion emissions would continue to occur from recreational users and volcanic activity.

3.8.2.2 Proposed Action Alternative

The Proposed Action Alternative generally involves the use of relatively small displacement diesel powered equipment as outlined in the Proposed Exploration Plan and noted below. Small off-road equipment would be used to clear existing decommissioned roads and prepare pad locations. Diesel powered water pumps and water trucks may also be used. After road reactivation is completed, and the majority of pad installation is complete; the track mounted drills, an ATV, two four-wheel drive pickup trucks, and additional equipment would remain in use to support the exploration program.

3.8.2.2.1 Direct Effects

Direct effects from the proposed exploration program would include combustion emissions from the following equipment:

- Two track mounted diamond drills (diesel powered)
- Two six wheel ATVs (gasoline and/or diesel powered)
- Small track excavator (diesel and/or gasoline powered)
- Four 4x4 pickup trucks (gasoline and/or diesel powered)
- Water truck (diesel powered)
- Two water pumps (diesel powered)

To reduce vehicle dust emissions, a local on-site water source would be used primarily from gravity fed water sources. The water would serve to reduce dust emissions caused by Project activities. The use of an on-site water source as the primary water supply would also significantly reduce the road traffic caused by water trucks, otherwise traveling from Randle, and thus generating additional fugitive dust emissions. Assuming that the local water supply would be used at an average rate of 5 gpm as stated in the Operation Plan, and drilling occurs for 8 hours over each 24 hour work period, a water truck would not be required except in limited situations. If the quantity of local water source exceeds 5,000 gallons/day, supplemental water delivered by water truck may be needed. Based on scoping comments, obtaining most of the water for drilling from a temporary, on-site water tank filled by water trucks, using an off-site source is considered under Alternative 3.

After road reactivation has occurred, and during normal Project operations, the only daily emission sources would be from the two single-track mounted drills, an ATV, and the two four-wheel drive pickup trucks. At times, diesel water pumps may be required, which would also create emissions. Stationary equipment at the site is exempt from air source permitting requirements found in SWCAA (SWCAA 400-045).

Daily emission estimates of NO_x, CO, SO_x, PM-10 and CO_2 for the equipment mentioned above are provided in Table 3.10-1. Emissions were estimated using emission factors from AP 42, an Environmental Protection Agency (EPA) compilation of air pollutant emission factors (USEPA 1995). Horsepower estimates were estimated using similar equipment. The estimates are conservative in not providing credit for emission reduction efficiency (pollution control devices), and equipment is used at the rated horsepower for the duration shown in the tables. In general, equipment is only operated at the rated horsepower for very short periods of time. Equipment durations were roughly estimated and it should be noted that not all equipment would be used on each day. Actual emissions from the Proposed Action are anticipated to be lower.

Table 3.10-1 Daily Emission Estimates

Equipment Type	Hp Rating	Hours per day	NO_x (lbs)	CO (lbs)	SO_x (lbs)	PM-10 (lbs)	CO_2 (lbs)
Two track mounted diamond drills (diesel powered)	354[1]	24	264.0	56	18	19	9,770
Two six wheel ATVs (gasoline)	48[2]	2	1.0	0.6	0.06	0.06	102
Small track excavator JD690 (diesel powered)	140[4]	10	43.4	9	3	3	1,610
Four four-wheel drive pickup trucks (diesel powered)	1,600[5]	6	297.6	64	20	22	11,040
1500 gallon Water truck (diesel powered)	200[6]	8	49.6	11	3	4	1,840
Two water pumps (diesel powered)	2[7]	24	1.4	0	0	0	56
TOTAL (lbs)			**657**	**140.6**	**44.1**	**48.1**	**24,418**
TOTAL (tons)			**0.33**	**0.07**	**0.02**	**0.02**	**12.21**

1. Prospector II, Multi Power Products LTD (177 hp each)
2. Phone conversation on March 23, 2012 with Max All Terrain. Available gasoline engines range from 18-29 horsepower. Value used is average (24 hp each).
3. Caterpillar Performance Handbook, Edition 34
4. Ritchie Specs.com, John Deere 690B Hydraulic Excavator
5. Estimated from 2012 F350 6.7L Power Stroke Turbo Diesel (400 hp each)
6. Estimated from 2012 Ford F650 minimum power rating
7. Godwin GWP-25HX, rated at 30 gpm (1 hp each)

For comparison, during the recent eruption of Mount St. Helens in 2004 and 2005 it is estimated that the following median emission rates were produced (Gerlach, 2008):

- CO_2- 655 tons/day (t/d)
- SO_2 – 72 t/d

Volcanic pumice and ash is present at the site. These light weight and often fine grained materials are easily transported by erosive forces such as wind and runoff. Soil exposed from the Proposed Action operations would be limited to sump installation and ground disturbances from vehicle traffic.

The Proposed Action would result in direct greenhouse gas emissions as a result of energy use (e.g., fuel consumption in vehicles or equipment). However, the quantity that would result from this small scale short-term project would be too small to merit quantification in this analysis.

3.8.2.2.2 Indirect Effects

Indirect effects to air quality that may occur later in time include effects from the emissions of greenhouse gasses from combustion engines, and the possibility of fugitive dust. The combustion emissions from the Project equipment would be incrementally small and expected to be easily dispersed. Traffic levels and associated fugitive dust

emissions related with the Project are expected to be minor relative to recreational use and meteorological levels.

The Proposed Action would result in the removal of 68 trees of less than 12 inches dbh. This change in vegetation may result in net emissions or net storage of greenhouse gases. However, all woody debris would be used during reclamation as ground cover resulting in essentially a zero net effect on greenhouse gas levels as a result of natural decay and regrowth sequestration.

3.8.2.2.3 Cumulative Effects

Past actions within the Project Area that have impacted air quality include camp and wildfires, volcanic activity, timber harvesting, dispersed recreation, minerals exploration, and road reactivation and maintenance. These activities generally contribute engine exhaust and particulate matter (including fugitive dust emissions), into the air. Timber harvest practices also contribute to a loss of carbon dioxide removal capacity from the air.

Recent volcanic emissions include periods from 1980-1988 and 2004-2005. Carbon dioxide emissions are continually being generated by Mount St. Helens. Following the major 1980 eruption, the area was extensively salvage logged and many trees were removed from the area. This is especially true within portions of the Project Area as it appears to have been historically clear-cut and logged as indicated from aerial imagery.

The incremental emissions from the Proposed Action Alternative are relatively minor, with the primary emission sources being from two drill rigs and worker vehicles following completion of road reactivation. Emissions that result from Project activity are primarily from operation of diesel engines and fugitive dust. These types of emissions are easily dispersed, and no cumulative effects to air or atmospheric conditions are expected from the Proposed Action.

The incremental effect of the Proposed Action on greenhouse gas levels (either net emissions or net storage) would either be too small to merit quantification, or negligible as a result of use of all the woody debris during reclamation and subsequent sequestration during regrowth.

3.8.2.3 Alternative Based on Scoping Comments

Under Alternative 3, exploratory drilling would be performed by balancing the use of on-site water sources, off-site sources and the re-use of drilling fluids; additional requirements related to drill hole abandonment; phasing of drilling at specific locations; and modifications related to light and noise. Restrictions to on-site water use would require up to five water truck round trips per day from the Randle area under this Alternative.

3.8.2.3.1 Direct Effects

Direct effects to Air Quality would be similar to those stated in the Proposed Action Alternative with the exception that additional water truck use would be necessary to meet the average daily water needs, during administrative on-site water use restrictions related

to higher recreational water use demand. In addition, additional vehicle trips would be required to haul additional drill hole abandonment materials, such as bags of grout and/or cement. Balancing the use of on-site water sources with the use of an off-site water source and the re-use of drilling fluids may require a water truck to travel the roads between the Project site and the Randle water source, up to four times per day. Hauling water to the site on a regular basis would increase the amount of exhaust from the water truck fuel emissions; create additional fugitive dust from vehicle use; and increased road use/wear. The additional road use would most likely require road maintenance using heavy equipment, further increasing the carbon footprint of the Project.

3.8.2.3.2 Indirect Effects

The indirect effects to air quality would be similar to those stated for the Proposed Action Alternative.

3.8.2.3.3 Cumulative Effects

The cumulative effects to air quality would be similar to those stated for the Proposed Action Alternative. No effect is anticipated.

3.8.3 Air Quality Impact Avoidance and Minimization Measures

To reduce impacts, excavated materials from sump installation would be visually monitored for wind and water erosion. If needed, the piles would be covered to prevent material loss. The proposed work area generally receives enough rainfall to keep dust levels low along the unimproved roads. If visual dust is observed during road travel, a water truck would be used to reduce dust emissions. Prompt site reclamation following drilling activities would also result in a reduction of windblown material.

3.9 Transportation and Access

3.9.1 Affected Environment

3.9.1.1 Existing Road Network

The Proposed Action would involve a work crew likely commuting from the towns of Randle and/or Morton, Washington to the Project Area. When traveling from Morton, workers would access the area from US 12 near Riffe Lake; travel would proceed east along Highway 12 until it intersects with FS Road 26 (7 miles); travel would then proceed southwest along FS Road 25 until it intersects FS Road 26 (7 miles); then proceed on FS Road 26 until it intersects with FS Road 2612 (Development Road) (8 miles), where you would turn west. The Project Area is located approximately 10 miles west along FS Road 2612. The travel route is asphalt-paved until approximately the final 1.5 miles to the Project Area.

Paved sections along US 12 and CR 39 are maintained by the Washington State Department of Transportation (WSDOT) and Lewis County; FS Road 2612, 25 and 26 are maintained by the USFS.

Within the Project Area, an existing road network accessed from FS Road 2612 was decommissioned in the 1980's. These roads were created during salvage logging activities following the May 1980 eruption of Mount St. Helens and/or during historic mineral prospecting activities. The decommissioned roads have a gate restricting access from FS Road 2612, along with Kelly humps installed farther down the road beyond the gate. Decommissioning of these roads included removal of culverts located in existing drainages; and falling multiple trees across the road system to discourage motor vehicle use.

3.9.1.2 Road Users

Road use along FS Road 2612 is generally for recreational purposes. Frequent users include hiking, fishing, hunting, equestrian travel and access, camping, wildlife viewing and other typical recreational activities experienced within the national forest. Travel along FS Road 2612 is infrequent. Near the Project Area, the road is generally used to access the headwaters of the Green River, and the Green River Horse Camp near the southern boundary of the Project.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the no action alternative, no exploratory drilling would occur. Timber management, equestrian activities, and other recreational activities would still occur within the Project boundary. The previously decommissioned roads would remain in their current status. Increased travel to access the Project Area would not occur. The roads used to access the site, including FS Road 2612, would continue being used primarily for recreational activities.

3.9.2.2 Proposed Action Alternative

The Proposed Action Alternative generally involves 1.69 miles (about 3.3 acres) of decommissioned roads that would be used for access. This includes 1.35 miles (2.45 acres) of reactivated decommissioned roads from the 2010 drilling program; and 0.34 miles (0.62 acres) of newly reactivated decommissioned roads. Equipment for road reactivation and drilling would be mobilized to the site, and subsequently used to restore the former decommissioned roads, including the installation of temporary and permanent culverts and other water divergent structures. Drilling and exploration personnel would travel daily to the site during the proposed Project activities. Upon completion of the Proposed Action Alternative, the reactivated roads would again be decommissioned, and restoration would be completed. Access to active work areas and to the equipment staging area would be limited and temporary. Public access would be discouraged to the Project work areas by a gate at the access road off of FS Road 2612. Some drilling would occur on the sides of FS Road 2612, and the road used to access the Green River Horse Camp, although drilling would be phased to not conflict with recreational activities at the campsite. Drilling would occur at the side of FS Road 2612 and would not restrict public use of the road.

3.9.2.2.1 Direct Effects

Direct effects from the Proposed Action Alternative would include temporary use of former logging and decommissioned USFS roads. There would be a minor increase to traffic along the roads to the site with work crews traveling daily to the Project Area. Work vehicles traveling on USFS roads may encounter recreational users. Access around the drilling rig and equipment laydown area would be restricted for purposes of public safety. Access to the USFS decommissioned road system from FS Road 2612 would remain restricted to the public with the use of a locked gate.

Approximately 15-20 Project employees would be commuting primarily between Randle and Morton, which would not add significantly to the existing Average Daily Traffic (ADT). Water trucks, if used, would make between two and five round-trips per day. The following vehicles would be used for the Project and remain on-site:

- Two six wheel ATVs (gasoline)
- Small track excavator (diesel powered)
- Four four-wheel drive pickup trucks (gasoline and/or diesel powered)

3.9.2.2.2 Indirect Effects

Reactivation of the previously decommissioned roads would provide improved access to areas within the Proposed Action area; and improve access to the area by firefighting crews if needed.

3.9.2.2.3 Cumulative Effects

The Proposed Action involves the use of existing active and decommissioned roads. No new roads would be constructed. Increased travel on the USFS road system may lead to accelerated wear and rutting. As part of the Project, road maintenance would be made by Ascot as needed. Overall cumulative effects may lead to improved reclamation of decommissioned roads within the proposed work area at the end of the Project.

3.9.2.3 Alternative Based on Scoping Comments

Under Alternative 3, exploratory drilling would be performed with an emphasis on minimizing water use through further actions to limit loss to the formation, additional requirements related to drill hole abandonment, phasing of drilling at specific locations; and modifications to operations related to light and noise. Drilling in the vicinity of the Horse Camp would be restricted to periods that do not conflict with recreation activities.

3.9.2.3.1 Direct Effects

The direct effects to Transportation and Access would be similar to those stated in Alternative 2. No effect is anticipated with the exception that an additional vehicle (water truck) would be utilized during operations, and additional pickup truck vehicle trips would be required to haul grouting materials related to drill hole abandonment. The water truck would make approximately one or two round-trips per day between the

Project Area and an off-site water source, likely in Morton or Randle. The pickup truck would drive between off-site stockpiles of grouting material, material staging areas, and drill sites. This would increase traffic approximately one additional vehicle per four hour period.

3.9.2.3.2 Indirect Effects

Under Alternative 3, the indirect effects to Transportation and Access would be similar to those stated in Alternative 2, the Proposed Action. No effect is anticipated.

3.9.2.3.3 Cumulative Effects

Under Alternative 3, the cumulative effects to Transportation and Access would be similar to those stated in Alternative 2. No effect is anticipated.

3.9.3 Road Impact Avoidance and Minimization Measures

The Proposed Project drilling activities would not occur in a way that restricts vehicle travel along FS Road 2612 or to the Green River Horse Camp. As required by MSHA, drilling personnel would be required to drive defensively, maintain posted speed limits, and give the right-of-way to the travelling public by using turnouts whenever possible. Practice of defensive driving and obeying speed limits is expected to reduce the chance of collisions with both the public and wildlife. These safe driving techniques would extend to water truck operators.

Drilling would not occur directly within the road, except along those segments currently closed, but temporarily reactivated for this project. A gate would be temporarily installed and maintained to control public access from FS Road 2612 to these areas for safety purpose. Proposed pad locations should offer areas large enough to accommodate the equipment without restricting access. Where the Proposed Action occurs near FS Road 2612 or the access road to the Green River Horse Camp (Pads 01-07, 14 and 15), access would be limited and controlled by the contractor. Public access to areas of active operations would be discouraged.

Applicable BMPs would be used along the drainages during culvert removal and installation. Rutting and road damage caused as a result of the activities would be repaired by Ascot in a timely manner, (Figure 10, *Roads and Rehabilitation*.)

3.10 Recreation

The USFS National Forest System provides opportunities for the public to participate and enjoy a wide-range of outdoor recreational experiences in a variety of settings and performance levels, and has included use of the *Recreation Opportunity Spectrum* in the Forestwide Management Plan.

3.10.1 Affected Environment

Located in southwest Washington State, the Gifford Pinchot National Forest encompasses 1,312,000 acres. The Project Area is located on the south facing slope of

the east-west trending Goat Mountain in the Gifford Pinchot National Forest, and situated north of the Green River between 2,800 and 4,000 feet on the fringe of the area deforested by the 1980 eruptive blast of Mount St. Helens. A northern portion of the project area is covered by mature forest that escaped the effects of the 1980 eruption. Areas devastated by the eruption were salvage logged around 1982 and replanted by 1986.

Lands within the Project Area have one designation under the Northwest Forest Plan, known as the "matrix" designation, which are forest lands outside reserves and withdrawn areas, and available for regularly scheduled timber harvests. Roadless areas and "late-successional reserves" (LSRs) are present north of the project area, but no Project activity is proposed in these areas, and USFS trails that access these areas would still be open to the public during the Proposed Action.

Human activity in the Goat Mountain vicinity has been dominated by logging and silvicultural activity, recreation use, and mineral prospecting. Current uses of Goat Mountain and headwaters of the Green River are primarily for recreation and timber management. The Project Area (Figure 3) includes active and decommissioned USFS roads. The Goat Mountain vicinity provides a wide variety of recreational activities for visitors including, hiking, horseback riding, bicycling, kayaking, camping, picnicking, fishing, hunting, wildlife and bird watching opportunities, sightseeing and pleasure driving. There are also opportunities for gathering of special forest products including berries, mushrooms, boughs, beargrass, and floral greens.

The Green River, which is located at the southern end of the Project Area, has been determined to be eligible for designation under the National Wild and Scenic Rivers Act. Additional studies are required to determine suitability for Wild and Scenic River designation. Any designation would be made by Congressional Act. Until a suitability analysis is completed, the values contributing to Wild and Scenic River eligibility are protected on National Forest lands.

Primary use of the area is the Green River Horse Camp, Green River Trail #213, and Goat Mountain Trail #217. The Green River Horse Camp, managed by the Back Country Horsemen of Washington (Yakima Chapter), is located on FS Road 2612-027 at the base of Goat Mountain and adjacent to the Green River, and is the only designated USFS camp site in the vicinity of the Proposed Action. Each of the eight campsites located there is limited in space to two trailer rigs or three vehicles.

The use season is July through late October, primarily based on practical accessibility of local trails. This equates to approximately 35 weekend days and 90 weekdays. The Green River Horse Camp has six double camp sites and two single sites, equaling 70 PAOT's (People at One Time). Total seasonal PAOT capacity would be approx. 8,750, although having 70 PAOT would be extremely crowded and rarely if ever happens. A more reasonable estimate of maximum PAOT would be 30-35. Despite the fact that each site can handle five to ten people, horse party size usually averages two to three people. The Horse Camp is where the majority of visitors to the Goat Mountain area park,

because most of the area trails noted above can be accessed from there. The number of visitors to this area according to the GPNF forester, who oversees FS Road 2612 and associated trail heads, are included in Table 3.12-1.

Table 3.12-1. Visitors to the Green River Horse Camp and Associated Trails

Season	Approximate Number of Visitors per Day	Approximate Number of Visitors per Week
Summer - July through Labor Day	< 2	< 20
Summer Weekends	< 10	N/A
Fall Hunting Season (usually full week stays)	20 to 40	50

GPNF Forester 2012

The general area is managed by the Mount St. Helens Ranger District. Recreation activities associated with this camp include day hiking, backpacking, horse riding, and bicycles, (the loop system of trails provides many mountain biking experiences). USFS trails accessible from the Horse Camp are Trails #213, #213A, #213B, #217, #217A, #217B, #217C, #217D, #217E, #218, #218A, #220, and #220A; all of which would remain open to the public during the proposed drilling activities, (Figure 11, *Green River Trail Map*.) Other recreational activities include backcountry camping at several small lakes, picnicking, bird watching, and wildlife viewing.

The GPNF Land and Resource Management Plan indicates that the Project vicinity includes areas considered "Administratively Withdrawn as Unroaded Recreation without Timber Harvest UD".[19] The purpose of an Unroaded Recreation area is to "provide a variety of dispersed recreation opportunities in a semi-primitive or undeveloped setting." The Proposed Action has met the Unroaded Recreation without Timber Harvest Standards and Guidelines for "Minerals and Geology Development Proposals", (Forest Plan IV-93) by limiting the area of impact to a single and minimal 400-square foot area (per drill pad) site; timing the drilling to avoid conflict with recreational activities as much as possible; and designing the Action with plans to remove all equipment at the end of the Action, and reclaiming all disturbed areas.

3.10.2 Environmental Consequences

This section identifies the potential impacts to recreation as the result of the Proposed Project.

3.10.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would be done. Equestrian, hunting, hiking, camping and other recreational activities would continue as currently allowed by the USFS within the Proposed Project boundary.

[19] USFS LRMP: "Administratively Withdrawn as an Unroaded Recreation without Timber Harvest UD"; The "U" represents the Management Area Category (Retention); D represents the Visual Quality Objectives and Recreation Opportunity Spectrum classes (Semi-primitive/Non-Motorized).

3.10.2.2 **Proposed Action**

Under this alternative all recreational activities would continue, except within the immediate vicinity of the proposed drill sites. Temporarily reactivated USFS decommissioned roads will not be available for use by the general public and will be gated throughout the project. The values contributing to Wild and Scenic River eligibility on National Forest lands would not be impacted by the Proposed Action.

3.10.2.2.1 **Direct Effects**

Opportunities for primitive and unconfined recreation would not be available beyond the security gate that leads off of FS Road 2612 to the majority of the proposed drill sites. However, this area has been unavailable for more than 10 years because the road has been decommissioned and closed to all vehicle use. It was only reactivated in 2010 during exploratory drilling, then was re-closed at the end of the 2010 season and has remained closed since. FS Road 2612 would remain open to the public, along with access to the USFS Green River and Goat Mountain Trails, and primitive and unconfined recreation in the surrounding area. Drill pads located along FS Road 2612 would be located within a portable drill shack to protect passersby from operating equipment during drilling activities, but the road would remain open to the public. As noted above, the naturalness of areas in the immediate vicinity of the surface disturbance would be temporarily affected during operations; however, these impacts would be spatially and temporally limited, and reclamation of the drill roads and sites would avoid increased motorized use of the area. Consequently, outstanding opportunities for primitive and unconfined recreation would continue to exist throughout the vicinity of the Gifford Pinchot National Forest, including:

- Recreational Access: Late June through November.
- Green River Horse Camp: Access would be available throughout the summer and fall.
- Deer and elk season occurs from September 1 to November 31.
- Occupancy and use of the Green River Horse Camp. Several drill sites are located in and adjacent to the camp. Noise disturbance from the drilling may be an issue, especially on weekends.

Noise from exploration activities could reduce the opportunity for solitude in the immediate vicinity of each individual drill pad during periods of active operations. For example, the noise level at 100 feet away from a drill pad during drilling would be similar to the noise level of a vacuum at 10 feet away, (approximately 70 dB). (See Table 2.1-5, *Project Equipment Noise*). Noise effects would occur at one drill pad at a time (less than a week for each pad); would be temporary in that the noise effects would last only as long as the exploration was scheduled, (3-4 months); and would cease immediately upon completion of the Proposed Action.

The operating noise level would be similar to a small bulldozer or skidder with a distinctive higher pitch when the drill is turning. This can be heard on a calm day for several hundred feet, but the intensity varies with forest cover and terrain conditions. The

portable drill shack would muffle noise to the outside, as well as reduce light impacts from drilling at night. Each drill would generally be operational 24-hours a day, seven days a week, including holidays, subject to Agency directed schedule changes. Noise generated during drilling would diminish with distance as shown in Section 2.1, Table 2.1-5. These decibel levels are based on measurements obtained with the equipment placed between two buildings, which results in more reflected noise energy than would occur in the Project Area. The tarpaulin cover over the drill shack and surrounding vegetation would likely result in rapid noise attenuation and/or provide barriers for absorption of sound.

Traffic from approximately 15-20 workers commuting from Randle and Morton would add some additional vehicle traffic to the Goat Mountain site; however, employee vehicles would be parked behind the security gate leading north off of FS Road 2612, so would not interfere with visitors to the Green River Horse Camp and associated parking and trail heads. Trail #219 (Quartz Creek Big Trees) is south of the Green River and would not be impacted by this Action. There would also be a temporary noise increase from mobilization of heavy equipment at the beginning and end of the Proposed Action.

It is anticipated that hunting opportunities would not be adversely impacted by the Proposed Action. Direct effects to wildlife such as migratory and resident mammals resulting from Project Actions may include tree removal, noise, and presence of workers, equipment, and lighting. These impacts are considered minor. Some individuals may be temporarily affected; however, the population as a whole would not. Mobile wildlife would be expected to temporarily vacate habitat adjacent to operating equipment because of noise and activity, dispersing to other areas around the Project Area where hunting activities could continue.

Animal response to sound levels depends on a number of complicated factors, and has not been well studied in many species of wildlife (WSDOT 2010). It may be reasonably assumed that most wildlife would at least detect noise from heavy equipment associated with the Project when within an estimated 400 feet. Disturbance of mobile wildlife is most likely to occur within 100 feet of road reactivation/pad installation activities at specific drill pad sites. The severity of disturbance to wildlife would further vary by the duration and timing of the noise. During the non-breeding season wildlife are less likely to be tied to a certain location. Therefore, effects from noise may be reduced during the hunting (non-breeding) season when individuals can relocate to a less noisy area.

The presence of workers and equipment could also affect wildlife in the Project Area. Employees could cause additional disturbance to wildlife if they travel by foot in and around the Project Area during work activities or while on breaks. This could increase the area of habitat that may be subject to temporary disturbance by the Project Action.

The spring that flows from a hose in the ground approximately mid-way between Pads 10 and 11 along the access road, is sometimes used as a drinking water source. This water source has not been sanctioned by the USFS as potable water, (Figure 11, *Area Trails*). It is not intended to be used for anything other than non-potable uses such as washing car

windows, fighting fires, perhaps stock use. Water quality or quantity impacts to this spring resulting from the Proposed Project would be negligible.

In summary, impacts to recreation uses would be limited to the immediate vicinity of the Project Area, and more specifically, to individual drill pad sites at the time of drilling activity. Any proposed disruption would be temporary, and of a nature that would not permanently impair recreation in the Project Area.

3.10.2.2.2 Indirect Effects

No indirect effects to recreation activities are anticipated from the Proposed Action.

3.10.2.2.3 Cumulative Effects

The Proposed Action would not limit access to this area for recreation use; therefore, the only potential impacts would be from temporary noise and slightly increased traffic and work activity in the area. The primary recreation use in the immediate area is hiking, fishing, backpacking, trail and pack horse activities, wildlife and bird watching, hunting, and mineral collection. These activities may be impacted by noise and human presence in the immediate area, but effects would be temporary and they would diminish as recreation activity moves away from the south face of Goat Mountain. Noise could affect hunting; however, the Proposed Action would result in only localized temporary disturbance from noise and would, therefore, have negligible impacts on hunting. Based on the above analysis and findings, temporary effects to recreation as a result of the Proposed Action would be negligible.

3.10.2.3 Alternative Based on Scoping Comments

Under Alternative 3, the drilling on pads in close proximity to the horse camp would be controlled to reduce seasonal use conflicts with recreation. Drilling at Pads 6 and 7 are located near the Horse Camp, and would be restricted to daytime hours only during the week prior to Labor Day. Drilling at Pads 6 and 7 may not occur after Labor Day. To reduce impacts to surrounding areas due to noise a drill shack with baffles and/or insulation will be used. To reduce the impacts due to operating lights, lighting is to be directed toward the drill. Hiking, equestrian activities, recreational vehicle traffic, and other recreational uses could still occur within the Proposed Project boundary.

Under Alternative 3, which emphasizes minimizing water use through further actions to limit loss to the formation, there may still be a need to bring water in from off-site portable sources to supplement drilling needs that cannot be met locally due to permit restrictions; or for dust control and emergency use including fire suppression. This would require use of a water truck operating over paved and improved forest roads making up to five round-trips per day during drilling. All drill holes would be sealed with cement or grout.

The values contributing to Wild and Scenic River eligibility on National Forest lands would not be impacted by the Alternative 3.

3.10.2.3.1 Direct Effects

The direct effects to Recreation would be similar to those stated for the Proposed Action, with possible adjustments in timing in the vicinity of the Horse Camp and at the higher elevation of the Project Area near the IRA boundary. Effects from drilling are anticipated to be reduced relative to the Proposed Action, as drilling near the Horse Camp would be scheduled to minimize conflicts with visitors. However, use of more off-site water would increase the potential for recreational users encountering water trucks along roadways. Also, the negligible impacts to water quality or quantity of the (Pads 10 and 11) spring would be further reduced because all drill holes would be sealed with grout under this Alternative.

3.10.2.3.2 Indirect Effects

Under this alternative based on scoping comments, the indirect effects to Recreation would be similar to those stated for the Proposed Action. No effect is anticipated.

3.10.2.3.3 Cumulative Effects

The cumulative effects of this alternative would be similar to the Proposed Action and negligible.

3.10.3 Recreation Mitigation Measures

Recreation mitigation measures would include:

- Maintaining recreational access to the Green River Horse Camp and Trails 213 and 217.
- Sequencing of drilling operations to reduce impacts to high recreational use periods, particularly operations associated with Pads 6 and 7 near the Horse Camp.
- Signage and notices to alert users of the project area to facilitate public safety.
- Use of baffles and other noise reduction techniques to minimize noise impacts.
- Use of directional and capped lighting at night.
- Controlling public access to areas that are hazardous to public safety and health concerns, especially immediately around drilling, drill pads, sumps, and access roads.

Upon completion of the Proposed Project, roads and drill pads would be re-contoured and reclaimed. Additional environmental protection measures as outlined in Appendix F, *Mitigation*, would prevent impairment of recreation and undue or unnecessary degradation of the land and associated resources.

3.11 Socioeconomics

The United States Department of Housing and Urban Development (HUD), Executive Order 12898, Environmental Justice, directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations resulting from Federal programs, policies, and activities. Also, socioeconomic and demographic data for residents in the Project vicinity

were studied to determine if the Proposed Action would have disproportionate impacts on minority or low-income persons.

3.11.1 Affected Environment

The Project Area is located in Skamania County, Washington, but the communities of Randle and Morton in adjacent Lewis County would be more greatly impacted by activities in the proposed Project Area. Detailed data for minority population is available from the 2010 Census, and data regarding poverty status is available from the 2006-2010 American Community Survey. This data was used to identify the minority and low-income compositions of the Project Area including the City of Morton, Skamania County, Lewis County, and Cowlitz County, relative to State of Washington compositions. Randle is unincorporated but general population data appears similar to Morton. Table 3.13-1 indicates minority and low-income populations within these populations:

Table 3.13-1. Project Vicinity Population Data

Geographic Area	Total Population	Minority Population		Low-Income Population	
Washington State	6,724,540	1,526,471	22.7%	813,669	12.1%
Cowlitz County	102,410	11,368	11.1%	17,307	16.9%
Lewis County	75,455	7,772	10.3%	10,036	13.3%
Skamania County	11,066	797	7.2%	1,040	9.4%
City of Morton	1,126	65	5.8%	69	6.1%
Randle*	2,184	106	4.3%	(Not available)	

Notes: Percentages from US Census Bureau; population number was calculated from that percentage.
*Randle is unincorporated and limited census data and statistics are available.

The minority population was lower within the Project Area (Randle and the City of Morton) than the three counties and State as a whole.

The number of individuals over the age of 16 and percentage of these individuals that are employed and unemployed within the City of Morton, Skamania County, Lewis County, and Cowlitz County as presented in the 1990, 2000, and 2010 Censuses, relative to Washington State, are shown in Table 3.13-2.

Table 3.13-2. Project Area Employment

Subject	City of Morton			Skamania County			Lewis County		
	1990	2000	2010	1990	2000	2010	1990	2000	2010
Population 16 and Over	874	824	981	6,070	7,602	8,747	44,393	52,750	60,047
Labor Force	507	415	436	3,725	4,888	5,345	25,477	29,552	32,936
% Employed	92%	94%	86%	89%	89%	91%	92%	91%	86%
% Unemployed	8%	6%	14%	11%	11%	9%	8%	9%	14%

Subject	Cowlitz County			State of Washington		
	1990	2000	2010	1990	2000	2010
Population 16 and Over	62,042	70,982	79094	3,730,985	4,553,591	5,342,873
Labor Force	36,987	43,212	46,704	2,433,177	2,979,824	3,440,495
% Employed	93%	92%	89%	95%	94%	89%
% Unemployed	7%	8%	11%	6%	6%	11%

The Unemployment rate in the City of Morton, Lewis County, and Cowlitz County in 1990, 2000, and 2010 is generally higher than the State of Washington. Although the unemployment rate in Skamania County was lower than the State in 2010, historically it has been higher. A portion of increasing unemployment can be attributed to declining employment in natural resource industries. As shown in Table 3.13-3, data obtained from the 1990, 2000, and 2010 Censuses of the City of Morton, Skamania County, and Lewis County shows a general decrease in employment in agricultural, forestry, fisheries, hunting, and mining industries relative to Cowlitz County and Washington State. The combined agricultural, forestry, fisheries, hunting, and mining category is presented for comparison as project related employment would likely occur in this category.

Table 3.13-3. Employment by Sector

Geographic Area	Agriculture, Forestry, Fisheries, Hunting, and Mining Workers			
	1990	2000	2010	% Change 1990-2010
City of Morton	17	17	8	-53%
Skamania County	312	218	237	-24%
Lewis County	2,252	2,151	1,808	-20%
Cowlitz County	935	1,405	1,592	+70%
State of Washington	89,186	68,976	81,390	-9%

3.11.2 Environmental Consequences

This section identifies the potential impacts to socio-economics as the result of the Proposed Action.

3.11.2.1 No Action Alternative

Under the No Action Alternative, no exploratory drilling would occur. Timber management, equestrian activities, and other recreational activities would likely continue within the proposed Project Area.

3.11.2.2 Proposed Action

3.11.2.2.1 Direct Effects

The effects from exploratory drilling on low-income persons residing in the area and in greater Lewis, Cowlitz, and Skamania Counties are not expected to be disproportionately high or adverse. The effects of this Action on minority communities would be minimal. Some work is specialized, but Ascot typically attempts to hire local residents for staffing crew if possible, which may provide jobs during drilling activities for local residents. Operations associated with a similar project would require one drill foreman, two to four drillers, two to four drill helpers, two to three geologists, and two to three core technicians. Support workers might include two local trail and pad contractors, and one security employee. Out-of-area workers could stay in Randal or Morton motels or in private residences as a "room rental". It is unlikely that workers would choose to stay at the nearby Green River Horse Camp as there are limited amenities and no potable water. In addition to lodging, local purchases of fuel, food, and other supplies would likely occur as a result of the Action, creating a positive economic benefit to the local community. Also, Ascot may choose to rent an office space and/or building to process the drill cores in the greater Lewis, Cowlitz, and Skamania County areas. This would benefit the community by providing rental revenues for the duration of the exploration activities.

The noise and disturbance from Project activities may temporarily displace recreation activity, but would equally affect all people who recreate in the area, not just minorities or low-income populations. About 0.23 acres of ground disturbance is expected from the Proposed Project. Most drill sites would be accessed via USFS decommissioned roads currently closed to public vehicular use; and sites along active roads would not require road closure. Drilling activities would not affect public access to the Green River Horse Camp as USFS road closures are not proposed, and the level of project-related traffic would not compromise other road users to access the area. As noted in Section 2.2.1, existing decommissioned roads (USFS Nonsystem Roads), would be reactivated north of FS Road 2612. No public motorized vehicles would be allowed beyond the gate leading to this area. The decommissioned roads are narrow with restricted vision and may be considered a safety hazard for the general public. With irregular traffic and equipment activity on these roads during Project operations, Ascot is proposing that the general

public be kept from accessing these roads for safety reasons. Signage would be posted and gates maintained or installed where appropriate to restrict public access.

All residents of the area would be equally affected for the same length of time. Given the low percentage of reported minorities in the Project Area, minorities would not be disproportionately affected.

The Proposed Action would not have disparate effects on any consumers, minority groups, women, civil rights, or social/ethnic groups.

Future timber harvest in the area would not be precluded or impacted by the Proposed Action.

3.11.2.2.2 Indirect Effects

No indirect effects are expected to minority and low-income populations from the Project. Data collected during implementation of the Action might indicate sufficient resources such that a company might pursue a mineral lease application in the future. If this occurs, the BLM/USFS would conduct separate socioeconomic/environmental analysis of that action requested through the mineral lease application.

3.11.2.2.3 Cumulative Effects

The increment of changes in employment, access, income, or other social or economic factors resulting from the Project would be minor and not significant. Cumulative effects on socioeconomic resources are therefore not significant.

3.11.2.3 Alternative Based on Scoping Comments

Under Alternative 3, exploratory drilling would be performed with balancing the water use, additional drill hole abandonment requirements, phasing of drilling at specific locations and modifications to operations related to light and noise. One to two water truck operators may be hired for the duration of operations under this alternative.

3.11.2.3.1 Direct Effects

The direct effects to Socioeconomics would be similar to those stated in Alternative 2. No effect is anticipated with the exception that additional local personnel may be required to operate the water truck during operations or truck in supplies needed for hole abandonment. The temporary noise and disturbance from Project activities in the area of the Green River Horse Camp would be mitigated and would not displace recreation activity. The Proposed Action would equally affect all people who recreate in the area, not just minorities or low-income populations.

3.11.2.3.2 Indirect Effects

Under Alternative 3, the indirect effects to Socioeconomics would be similar to those stated in Alternative 2, the Proposed Action. No effect is anticipated.

3.11.2.3.3 Cumulative Effects

Under Alternative 3, the cumulative effects to Socioeconomics would be similar to those stated in Alternative 2. No cumulative effect is anticipated.

3.11.3 Mitigation

No mitigation opportunities have been identified or proposed.

3.12 Noise

3.12.1 Affected Environment

This section describes existing noise levels at the proposed Project site, including normal forest noise along with minor human activity from low-level recreation use. The ambient noise level in the forest is generally considered to be 40 dB (WSDOT 2011).

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

Under the No Action Alternative, no Project exploratory drilling would occur. The ambient noise level in the forest, along with noise from minor recreational activity would remain similar to current levels.

3.12.2.2 Proposed Action

3.12.2.2.1 Direct Effects

The use of trucks, excavator, ATV, and drill rig, as well as chainsaws and diesel powered water pumps, would introduce a temporary increased level of sound into the proposed Project Area. However, the noise generated during drilling and other motorized activities would diminish with distance from the source. As described under drilling operations in Section 2.1.2, the drill rig is estimated to have a maximum of 76 dB measured at 50 feet while actively drilling. In comparison, chainsaws are considered to have an average maximum noise level of 84 dB, and an excavator has 81 dB measured at 50 feet. It is anticipated that the Project drill rig and other motorized equipment would generate noise levels shown in Table 3.14-1.

Table 3.14-1. Drill Rig Equipment Noise

Distance from Drill Rig or Other Associated Activity	Maximum Decibel (dB) Level (approximate) of Drill Rig		*Decibel Levels Equivalent to:
	During Idle (2,500 RPM)	During Drilling	
10 feet	76 dB	93 dB	90 dB = jackhammer at 50 feet
50 feet	60 dB	76 dB	80 dB = heavy-duty truck at 50 feet
100 feet	55 dB	68 dB	70 dB = vacuum cleaner at 10 feet

* http://www.osha.gov/SLTC/noisehearingconservation/

Using the noise attenuation table for soft-site conditions (vegetated area), drilling would attenuate (diminish) to ambient (normal forest noise) levels at 1,377 feet from the source.

3.12.2.2.2 Indirect Effects

Using the noise attenuation table for soft-site conditions (vegetated area), sound levels from drilling would attenuate (diminish) to ambient (normal forest noise) levels at 1,377 feet from the source. All motorized equipment would be equipped with state-of-the-art mufflers. Sound levels would be further abated by use of baffles wherever possible.

3.12.2.2.3 Cumulative Effects

No cumulative noise effects are anticipated from the temporary use of drilling, vehicles or other equipment.

3.12.2.3 Alternative – Based on Scoping Comments

Under this alternative, exploratory drilling would be performed with balancing the use of on-site water with off-site water and the re-use of drilling fluids; additional requirements related to drill hole abandonment; phasing of drilling at specific locations; and operational changes related to light and noise. Noise related operational changes would include installation of additional baffling of the drill shack to lessen noise output. Drilling at Pads 6 and 7 in the vicinity of the Horse Camp would be restricted to daytime hours during the week prior to Labor Day and would not occur after Labor Day.

3.12.2.3.1 Direct Effects

The direct effects to Noise would be similar to those stated in Alternative 2, except that instantaneous noise output related to drilling would be reduced slightly by additional baffling of the drill shack; although length of time of noise generation would increase due to sealing every drill hole with grout which requires mechanized mixing and pumping. In addition, noise related to additional water truck traffic would increase along vehicle

routes and near the temporary on-site water tank. The effects related to water truck operations would likely be of short duration, (the time it takes a water truck to pass a particular location or to unload water), every two to four hours depending on water use needs. Furthermore, noise and disturbance from Project activities in the area of the Green River Horse Camp would be mitigated.

3.12.2.3.2 Indirect Effects

Under Alternative 3, the indirect effects to Noise would be similar to those stated in Alternative 2, the Proposed Action. No effect is anticipated.

3.12.2.3.3 Cumulative Effects

Under Alternative 3, the cumulative effects to Noise would be similar to those stated in Alternative 2. No cumulative effect is anticipated.

3.12.3 Mitigation

Surrounding vegetation would likely provide some barrier or absorption of sound. The natural vegetation noise barrier would be enhanced by installation of baffles or other noise reduction techniques around the drill rigs that would be used for intrusive noise reduction as well as protection for the operators from inclement weather.

Limit public access to areas that are hazardous to public safety and health concerns, especially immediately around drill pads. Construction-type fencing or other temporary barriers would be placed around drill pads in public areas including pads near the Horse Camp and along FS Road 2612.

4 CONSULTATION AND COORDINATION

4.1 List of Preparers

Name	Title/Discipline	Agency or Firm	Years of Experience
Eric Hoffman	Contract Geologist	BLM	42
Leslie Frewing	Planning Coordinator	BLM	23
Bob Harrison	Geologist, Solid Minerals Lead	BLM	37
Michael Campbell	Public Affairs Specialist	BLM	25
Chris DeWitt	Geologist – Minerals Section Chief - Division of Lands Minerals and Energy Resources	BLM	31
Cheryl Seath	Forest Geologist, CME,OSC, EP	USFS	22
Ruth Seeger	Area Mining Geologist	USFS	25
Kristie Miller	Cowlitz Valley District Ranger	USFS	31
Carol Chandler	Wildlife Biologist	USFS	34
Rick McClure	Archaeologist	USFS	30
Kim Vieira-Rainville	GIS Analyst	USFS	25
Mike McConnell	Hydrologist	USFS	15
David Hu	Fisheries Biologist	USFS	11
Mark Gingrich	Washington Zone Mineral Administrator	USFS	25
David Enos LG, LHG	Vice President/ Geologist/ Hydrogeologist	URS	24
Keith O'Connell, P.E.	Vice President/Civil and Geotechnical Engineer	URS	28

David Every, PhD.	Principle Ecologist	URS	35
Jacqui Halvorson	Planner/NEPA Specialist	URS	11
Bill Mavros	Senior Fisheries Biologist	URS	22
Jeff Walker, PWS	Botanist	URS	17
Jennifer Pretare, PhD	Senior Biologist	URS	16
Cary Kindberg	Senior GIS Analyst	URS	14
Sarah McDaniel, MA, RPA	Archaeologist	URS	13
Bill Kidder	Ecologist	URS	12
Michelle Stegner	Archaeologist	URS	12
Noah Herlocker, PWS	Senior Ecologist/Wetlands	URS	11
Gary Panther, LG	Geologist	URS	11
JR Sugalski, EIT	Environmental Engineer/Geologist	URS	5

5 AGENCIES, TRIBES AND ORGANIZATIONS CONSULTED

Authorities that contain procedural requirements that pertain to treatment of elements of the environment when the BLM is considering a Federal action and where consultation compliance has been required are listed in Table 1.3-1.

Table 5.1-1 Tribes and Federal and State Agencies Consulted

Consulting Agency/Tribe	Compliance Required	Date of Consultation	Approved/Signed Y/N
Tribal Government-to-Government Consultation			
Cowlitz Tribe	Government to Government Consultation	March 16, 2012 May 30, 2012 August 28, 2012 November 16, 2012 - On-going	
Federal Agencies			
US Department of the Interior – Bureau of Land Management	Lead Agent Decision Record and FONSI	On-going	
US Forest Service – Region 6	Surface Managing Agency –Decision Notice and FONSI	On-going	
US Department of Fish and Wildlife	Complying with the ESA. Submitting the BA initiates informal consultation with USFWS.	USFS	August 21, 2012
Washington State Agencies			
Washington State Department of Archaeological and Historic Preservation	A cultural resource professional completes a survey to determine if any historic buildings or archaeological sites are located in the APE	USFS Archaeologist	July 30, 2012
Washington State Department of Fish and Wildlife	Comply with the ESA. Submitting the BA initiates informal consultation with WDFW.	USFS	July 25, 2012
State of Washington Department of Ecology	Comply with Southwest Clean Air Agency; chapter 90.48 RCW, Water Pollution Control and WAC 173-201, Water Quality Standards for Surface Waters of the State of Washington	BLM	August 14, 2012

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7 APPENDICES

APPENDIX A

Environmental Assessment Figures 1-11

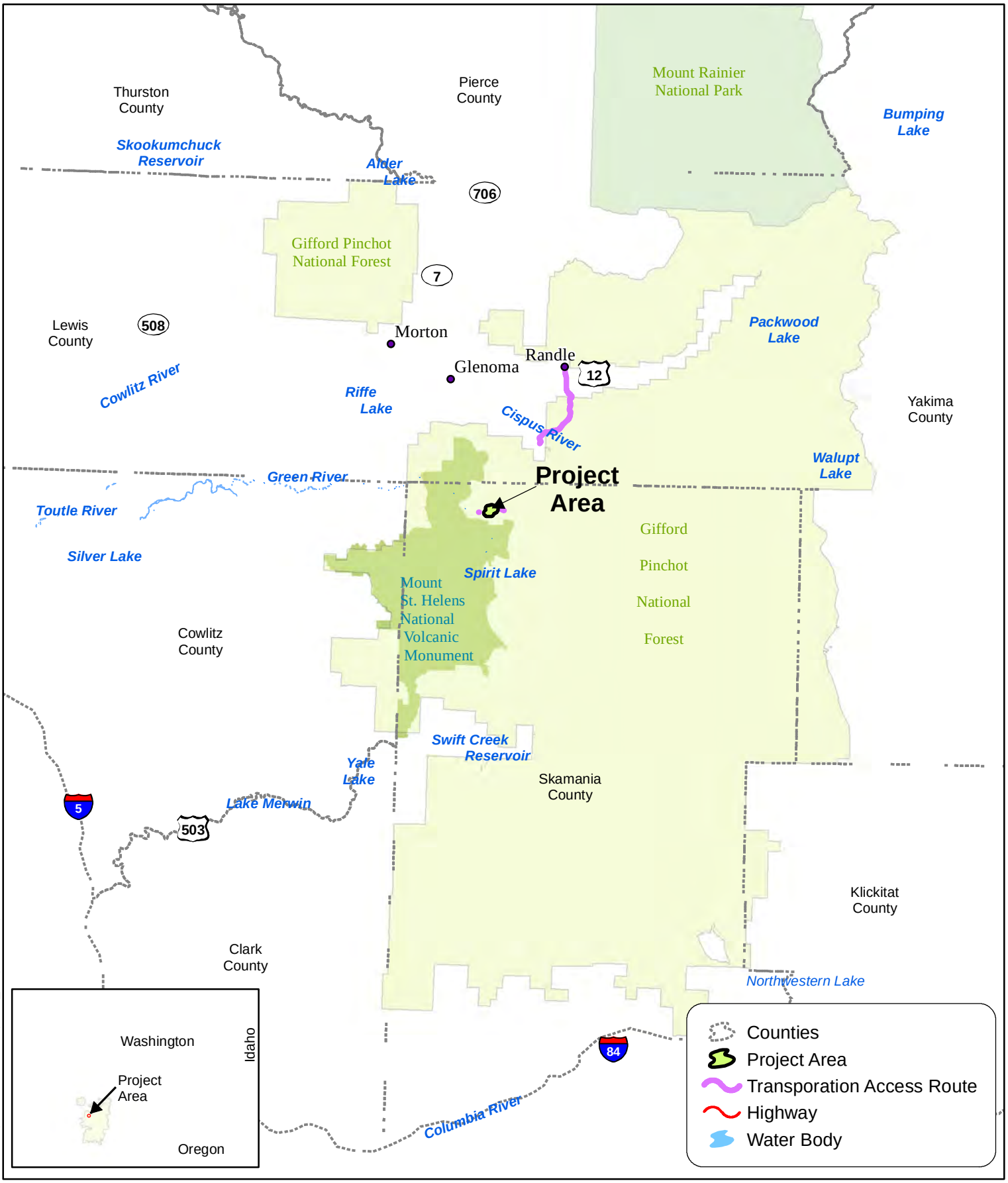


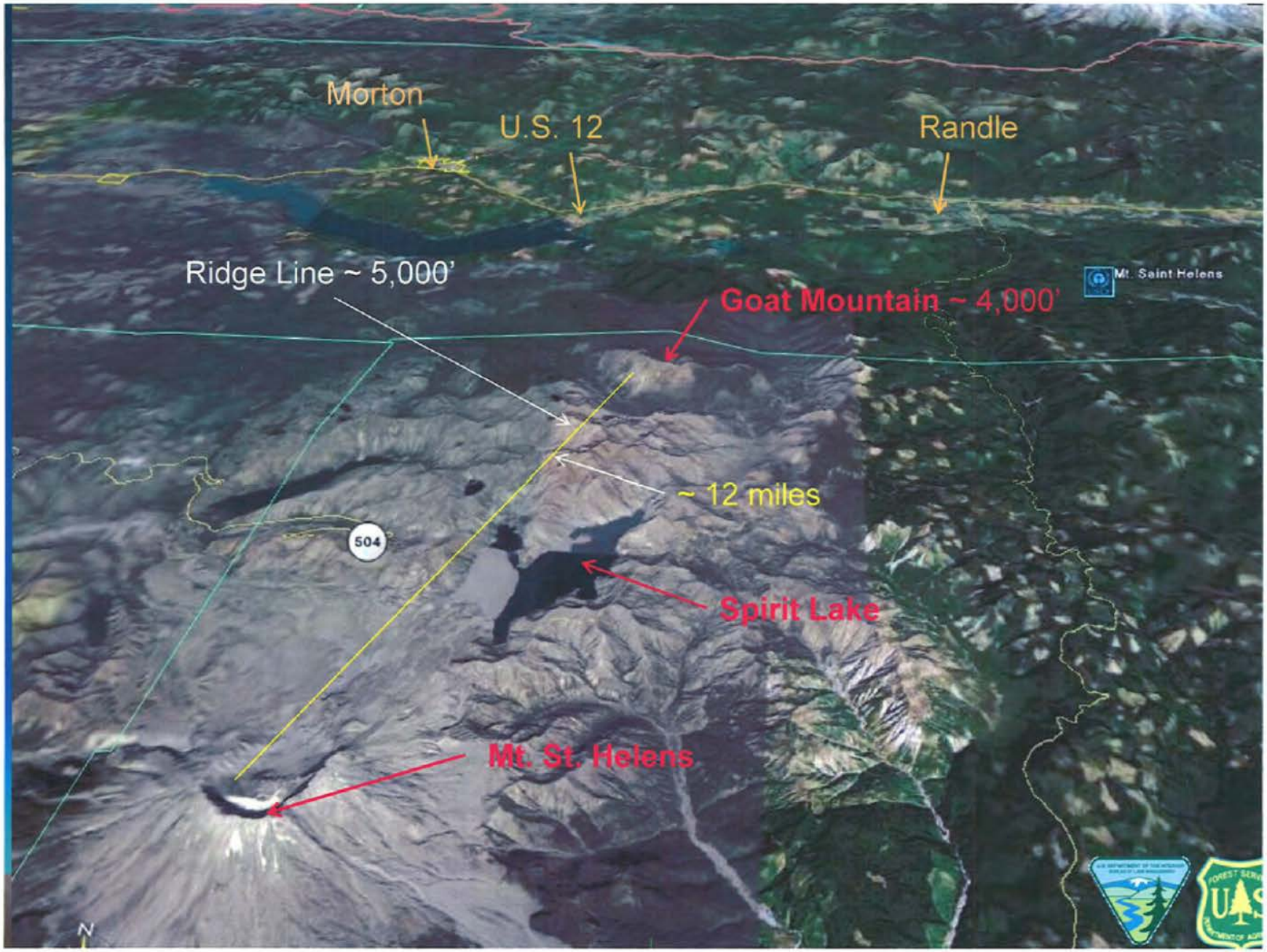
Figure 1
Project Vicinity

URS

0 5 10
Scale In Miles

SOURCE: USDA Forest Service

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington



Path: Q:\geo\Ascot\MXD\Figure2_MtStHelensBlastZone.mxd

Figure 2

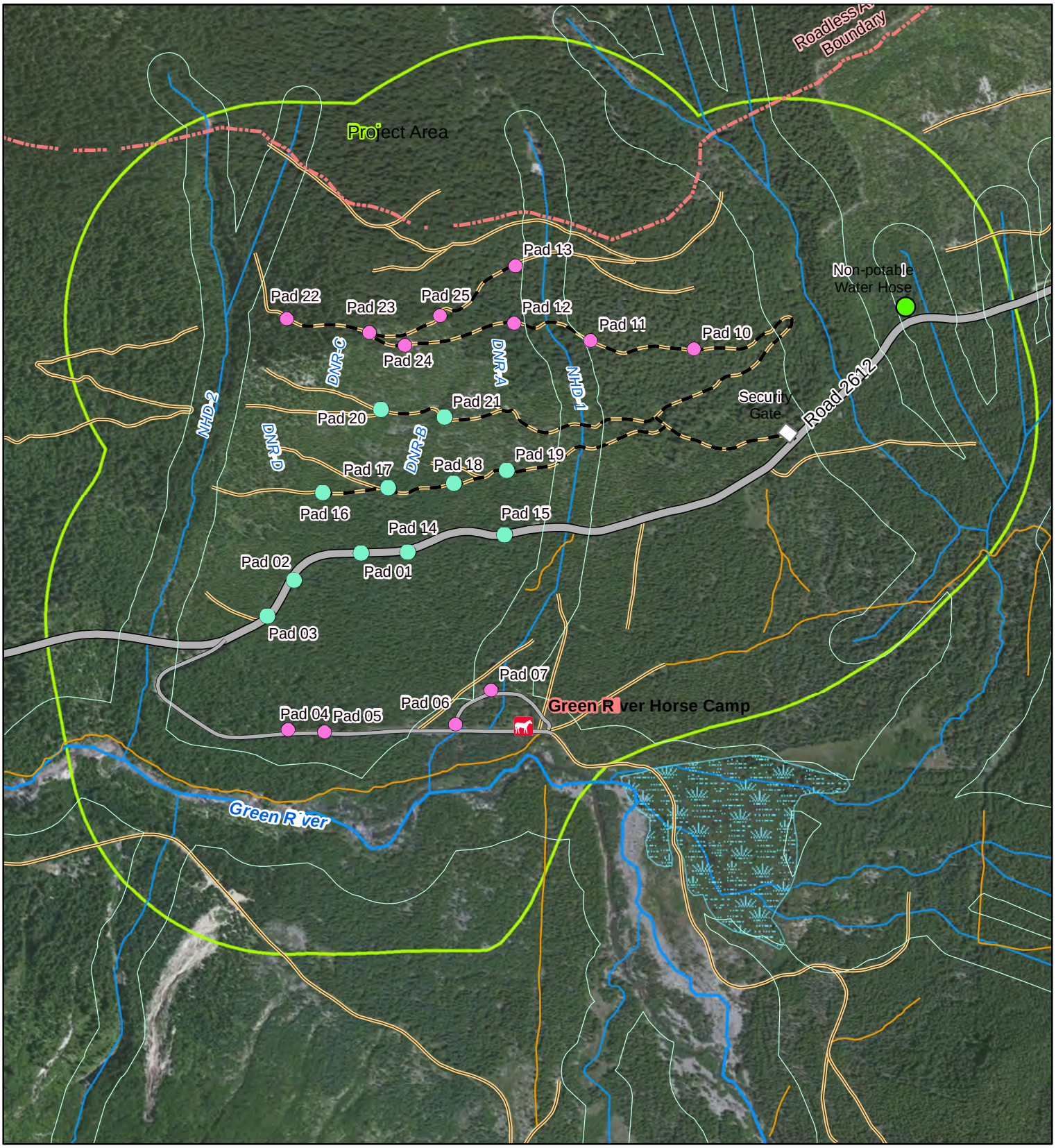
Mount St. Helens Blast Zone

URS

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

The Mount St. Helens Blast Zone is represented by the gray area on this map.

SOURCE: USDA Forest Service



Pad Locations Subject to Scheduling Restrictions (APE)*
Proposed Pad Locations (APE)
Roadless Area
Riparian Reserves
Roads Proposed for Reactivation
Active Road
Inactive (LI) Road
Primary Road
Trail
Lake/Pond
Swamp/Marsh
Stream/River
Project Area

Path: Q:\geo\AscotMXD\Figure3_ProjectArea_.mxd

Figure 3
Project Area

URS

* Note: Cultural Resource Area of Potential Effect (APE) approximate size is represented by location symbol.

0 400 800
Scale In Feet

SOURCE: USDA Forest Service

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

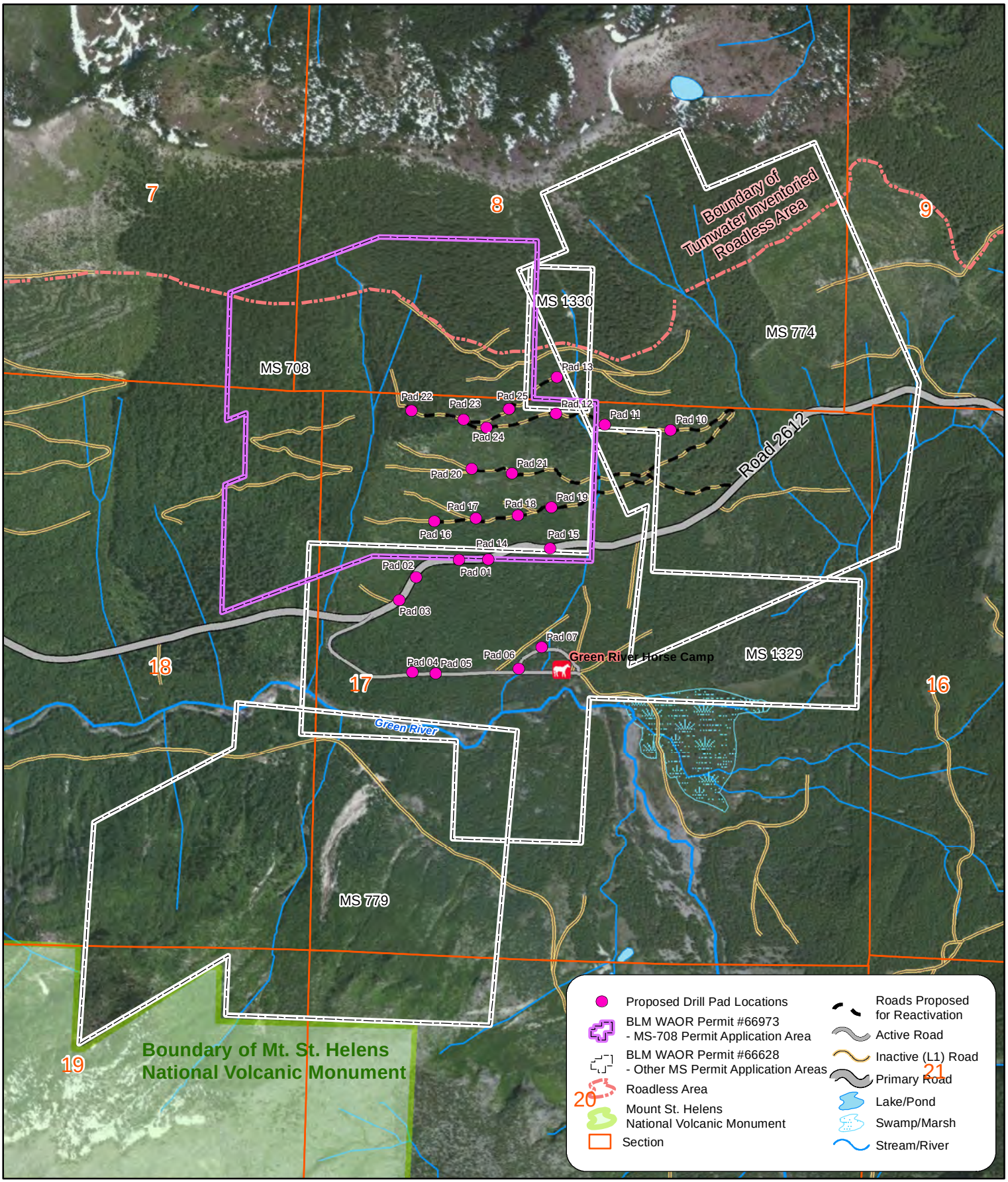


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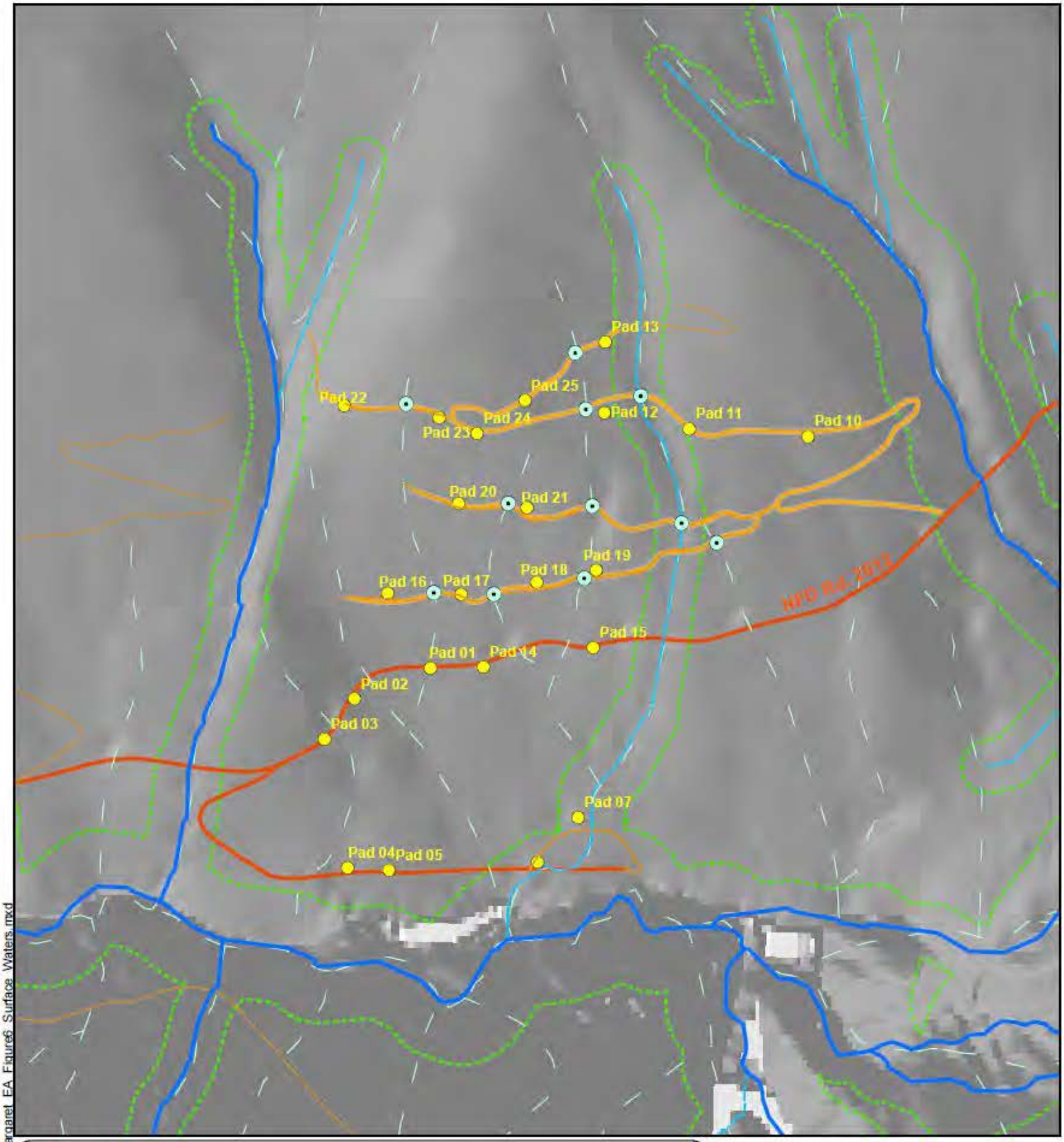
Figure 4
Mineral Survey Limits

0 600 1,200
Scale In Feet

SOURCE: USDA Forest Service

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington



Path: K:\Mt_Margaret_EA_Figure6_Surface_Waters.mxd

Legend

- Proposed Pad Locations
- Open high Clearance Veh. Road
- Closed, Unimproved Road
- Roads Proposed for Reactivation
- Riparian Reserves (NWFP)

Nat. Hydrography Dataset Flowlines:

- Perennial
- Intermittent
- WDNR Seasonal/Ephemeral Streams
- Possible Culvert Location

N

0 400 800

Scale in Feet

Figure 6
Surface Water Analysis

URS

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

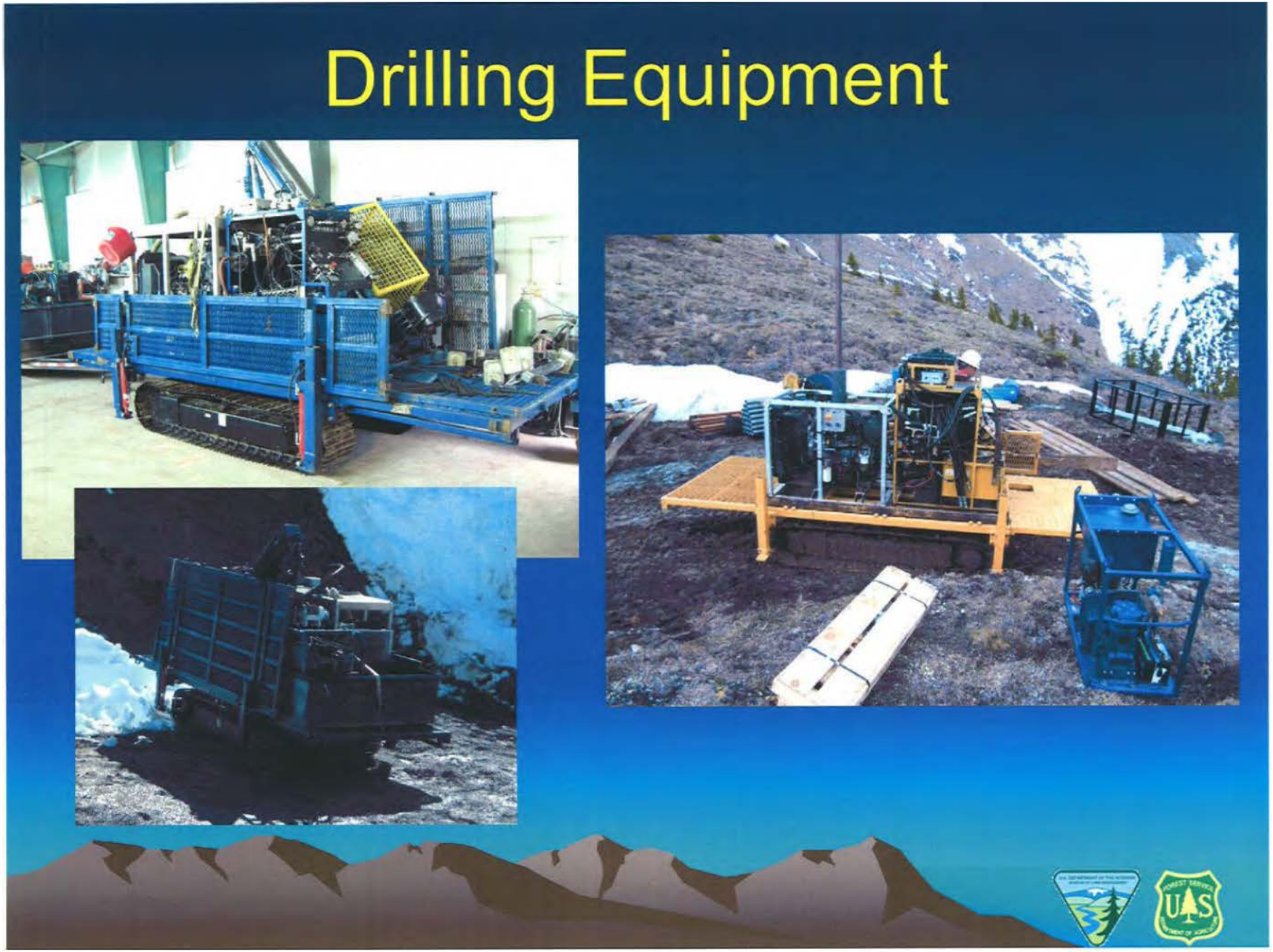


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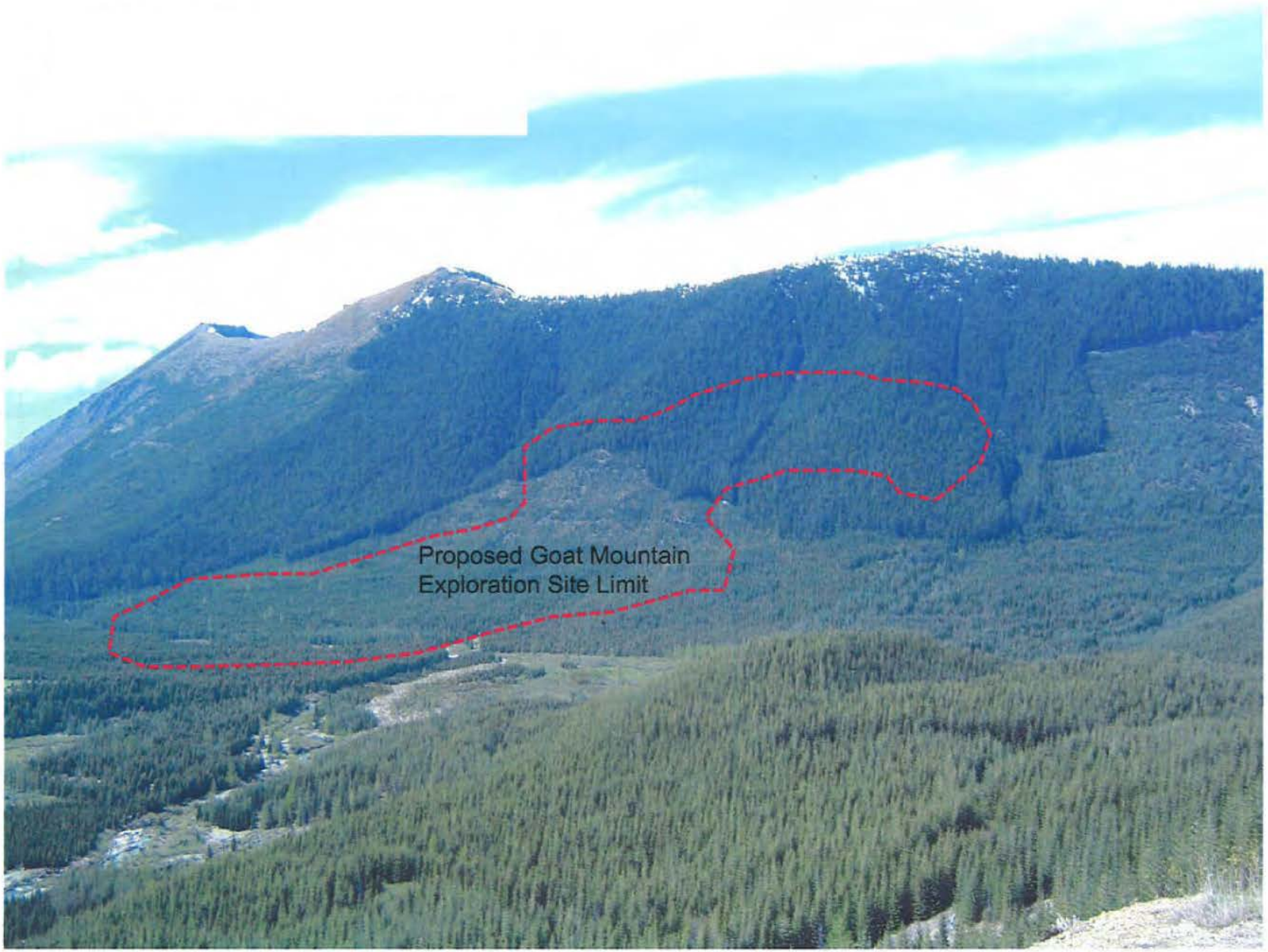
Figure 7

Drilling Equipment

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

SOURCE: USDA Forest Service



Path: Q:\geo\AscotMXD\Figure8_Project Area Outline on Goat Mountain Photo.mxd

Figure 8

Project Area Outline on Goat Mountain Photo

URS

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

VIEW TO NORTHWEST
SOURCE: USDA Forest Service

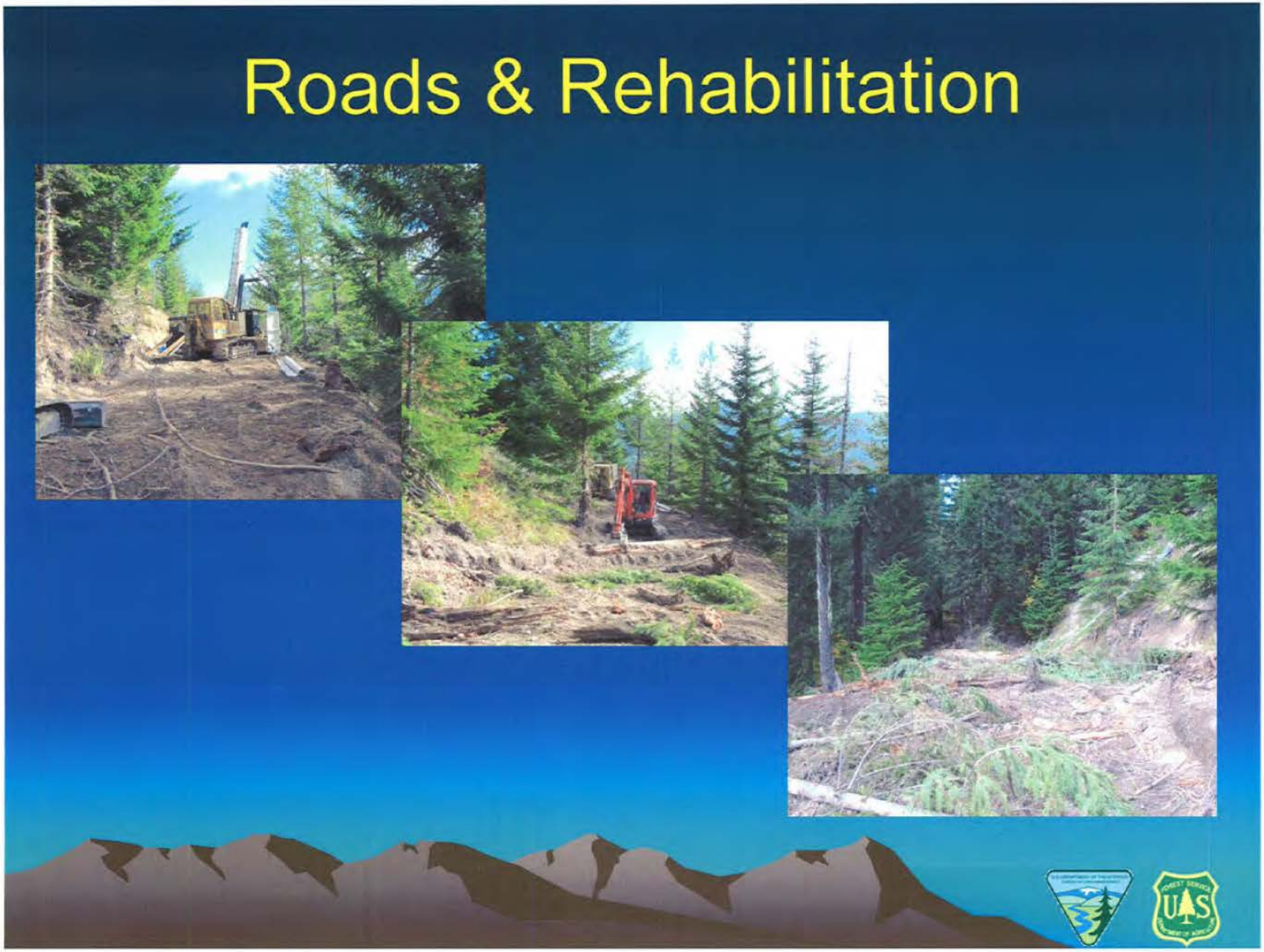


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Figure 10

Roads and Rehabilitation

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

URS

SOURCE: USDA Forest Service

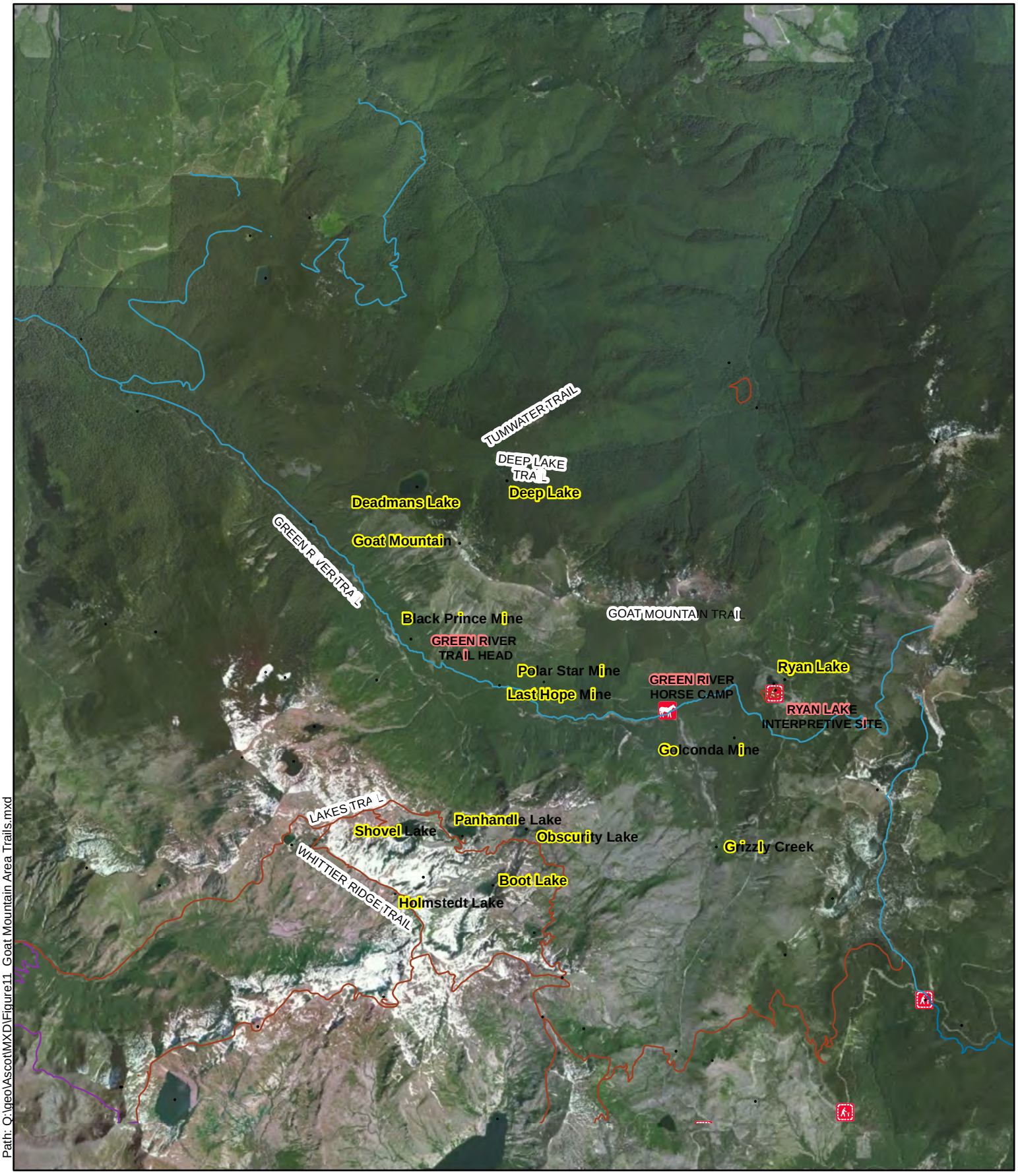

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Figure 11

Goat Mountain Area Trails

URS

Goat Mountain Prospecting Permit Application
Environmental Assessment
Gifford Pinchot National Forest, Washington

SOURCE: USDA Forest Service

APPENDIX B

Associated Regulations, Plans, Policies and Sample Prospecting Permit Application

[In addition to the stipulations included in this Permit Application Form, the agencies may add additional stipulations appropriate to the Proposed Action.]

Relationship to Federal, State and Local Regulations, Plans and Policies

- American Indian Religious Freedom Act: (42 USC 1996a) A federal law and a joint resolution of Congress passed in 1978. It was enacted to protect and preserve the traditional religious rights and cultural practices of Native Americans. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use and possession of objects considered sacred. The Act required policies of all governmental agencies to eliminate interference with the free exercise of Native religion, based on the First Amendment, and to accommodate access to and use of religious sites to the extent that the use is practicable and is not inconsistent with an agency's essential functions. This may also include government to government consultation with area Tribes. See Section 5.2, Tribal Consultation and Section 3.6.1.4, Plants of Cultural Importance.
- Aquatic and Riparian Conservation Strategy (ACS) guidelines: The Aquatic and Riparian Conservation Strategy (ACS) is a Regional strategy designed to maintain and restore the ecological health of watersheds and aquatic and riparian ecosystems on National Forest System (NFS) lands in the Pacific Northwest Region (Region). Its goal is to develop networks of properly functioning watersheds that support populations of fish and other aquatic and riparian-dependent organisms across the Region. The Strategy focuses on maintenance and restoration of the dynamic ecological processes responsible for creating and sustaining habitats over broad landscapes, as opposed to individual project or small watershed scales (USDA and USDI 1994a and 1994b).

- Aquatic Conservation Strategy (ACS) Objectives: The ACS was developed to improve and maintain the ecological health of watersheds and aquatic ecosystems contained within them on federal public lands. The four primary components of the ACS are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration.

- Clean Air Act: (42 USC Chapter 85) A 1963 United States federal law designed to control air pollution on a national level. It requires the Environmental Protection Agency (EPA) to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. See Section 3.89, Air Quality.
- Clean Water Act: (33 USC Chapter 26). The primary federal law in the United States governing water pollution. Commonly abbreviated as the CWA, the act established the goals of eliminating releases of high amounts of toxic substances into water, eliminating additional water pollution by 1985, and ensuring that surface waters would meet standards necessary for human sports and recreation by 1983. The Clean Water Act does not directly address groundwater contamination. Groundwater protection provisions are included in the Safe Drinking Water Act, Resource Conservation and Recovery Act, and the Superfund Act. See Section 3.2.4, Surface Water Impact Avoidance and Minimization Measures; and Section XX, Proposed Hardrock Mineral Prospecting Plan and Mitigation.

- Endangered Species Act Of 1973: (16 USC Chapter 35) The Act was designed to protect critically imperiled species from extinction as a "consequence of economic growth and development untempered by adequate concern and conservation." The Act is administered by two federal agencies, the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration (NOAA). See Section 3.4.4, Wildlife Mitigation Measures; and Section 3.5.4, Aquatic Design Criteria/BMPs and Fisheries Design Criteria/BMPs.
- Executive Orders 11988 (Floodplains, 42 FR 26951) and 11990 (Wetlands, 42 FR 26961): Floodplains: Executive Order 11988 is to avoid adverse impacts associated with the occupancy and modification of floodplains. Floodplains are defined by this order as, ". . . the lowland and relatively flat areas adjoining inland and coastal waters are including flood prone areas of offshore islands, including at a minimum, that area subject to a one percent [100-year recurrence] or greater chance of flooding in any one year." Wetlands: Executive Order 11990 is to avoid adverse impacts associated with destruction or modification of wetlands.
- Federal Land Policy and Management Act of 1976 (FLPMA), (43 USC Chapter 35BLM 43 CFR) surface management regulations: A United States federal law that governs the way in which the public lands administered by the Bureau of Land Management (BLM) are managed. The law was enacted in 1976 by the 94th Congress and is found in the United States Code under Title 43.

- Forest Service National Core Best Management Practices (BMPs) for Water Quality Management in Minerals Management Activities (USFS 2010): The National Core BMPs encompass the wide range of activities on NFS lands across the nation.

- Inventoried Roadless Areas: An inventory of United States Forest Service (USFS) lands that have been identified by government reviews as lands without existing roads that could be suitable for roadless area conservation as wilderness or other non-standard protections. The first review of USFS roadless lands was started in 1967 after the creation of the Wilderness Act by Congress in 1964. The rationale for limiting road-building in the inventoried roadless areas was to minimize the negative associated environmental impacts of roads construction, maintenance, and automobile traffic. The second impetus for the creation of the Roadless Rule was an effort to expand the system of protected federal lands to include ecosystems that were not very well represented in the current system of National Parks, wilderness areas, and preserves.
- National Environmental Policy Act: (42 USC 4321 and 4331-4335) A United States environmental law that established a United States national policy promoting the enhancement of the environment and also established the President's Council on Environmental Quality (CEQ). NEPA outlines procedural requirements for all federal government agencies to prepare Environmental Assessments (EAs) or Environmental Impact Statements (EISs). EAs and EISs contain statements of the environmental effects of proposed federal agency actions.
- National Forest Management Act: (16 USC 1604) A United States federal law that is the primary statute governing the administration of national forests and was an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for

the management of renewable resources on national forest lands. The National Forest Management Act (NFMA) obliged the USFS to use a systematic and interdisciplinary approach to resource management. It also provided for public involvement in preparing and revising forest plans. It expanded upon the land and resource management plans (LRMP) outlined in the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), and started by requiring the USFS to compile an inventory of all its lands, followed by a zoning process to see what uses land was best suited for - dubbed the "suitability determination." These plans required alternative land management options to be presented, each of which have potential resource outputs (timber, range, mining, recreation) as well as socio-economic effects on local communities.

- National Historic Preservation Act: (16 USC 470) Legislation intended to preserve historical and archaeological sites in the United States. Among other things, the act requires federal agencies to evaluate the impact of all federally funded or permitted projects on historic properties (buildings, historic or archaeological sites, etc.) through a process known as Section 106 Review.
- National Pollutant Discharge Elimination System: (40 CFR 122) NPDES is a permit program that helps control water pollution by regulating point sources that discharge pollutants into waters of the United States
- Northwest Forest Plan (NWFP): The policy and direction of the NFP is derived from two key documents and the decisions and recommendations made by Regional Interagency Executive Committee (RIEC). Two key documents are:
    - Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl.
    - Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.
- The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan (FRP) rule.

Form 3510-1
(March 2010)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0121
Expires: February 28, 2013

PROSPECTING APPLICATION AND PERMIT

1. Serial Number *(See Specific Instructions - Item 1)*

2. What mineral(s) are you applying for?

3a. Applicant's name

3b. Applicant's address

4. Give legal description of land requested *(See General Instructions, Item 4)*

5. Legal description of land included in permit

APPLICANT DOES NOT FILL IN THIS SPACE

Total acres	Rental submitted $	Total acres	Rental retained $

6. Are the lands administered by a government agency? ☐ Yes ☐ No *(If "Yes," give name of agency)*

7. Are you the sole party in interest? ☐ Yes ☐ No *(See Specific Instructions - Item 7)*

8a. Are you a citizen of the United States? ☐ Yes ☐ No

8b. Are you over the age of majority? ☐ Yes ☐ No

9a. Is application made for a corporation or other legal entity? ☐ Yes ☐ No *(If "Yes," see Specific Instructions - Item 9a)*

9b. Has a statement of qualification been filed? ☐ Yes ☐ No *(If "Yes," give file number, if "No," see regulation 43 CFR 3502)*

10. **A processing fee will be determined on a case-by-case basis.** *(See Specific Instructions - Item 10)*

11. **Be sure to enclose the first year's advance rental computed at the rate of 50¢ per acre or fraction thereof** *(See Specific Instructions - Item 11)*

I CERTIFY That my interests, direct or indirect, in leases, permits, and applications therefor, do not exceed the maximum permitted by law or regulation, and that the statements made herein are true, complete, and correct to the best of my knowledge and belief and are made in good faith.

(Signature of Applicant)

(Signature of Applicant)

(Date)

(Attorney-in-fact)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

DO NOT WRITE BELOW THIS LINE

_____ PROSPECTING PERMIT
(Name of Mineral(s))

A permit for the lands in Item 5, above, is hereby issued under the ☐ Mineral Leasing Act, 30 U.S.C. 181 et seq., ☐ Acquired Lands Leasing Act, 30 U.S.C. 351 et seq., ☐ Section 402 of Reorganization Plan No. 3 of 1946, 5 U.S.C. Appendix 1031, ☐ Other Special Act(s) *(as indicated below)* and is subject to all regulations found in 43 CFR 3500 and to the terms and conditions set forth on the reverse hereof.

This permit, to the extent applicable, is subject to standard and/or special stipulations. ☐ Stipulations if any are attached.

THE UNITED STATES OF AMERICA

Effective date of permit _____ By _____

This permit is issued for a period of _____ years

(Title) (Date)

(Continued on page 2)

PERMIT TERMS AND CONDITIONS

Sec. 1. *Rights conferred by issuance of prospecting permit.* Permittee is granted the exclusive right to prospect on and explore the lands to determine the existence of a valuable deposit of the mineral applied for or any compound of that mineral in accordance with the terms and conditions of the permit. Permittee must diligently prospect the lands by core drilling or other acceptable methods. The permittee may remove only such material as is necessary to demonstrate the existence of a valuable mineral deposit.

Sec. 2. *Operating regulations.* (a) Permittee must comply with all regulations of the Secretary of the Interior; and, as to the lands described herein under his jurisdiction, to the regulations and orders of the Secretary of Agriculture.

(b) Permittee must comply with the provisions of the operating regulations of the Bureau of Land Management (BLM) (43 CFR 3590) and all orders issued pursuant thereto. Copies of the operating regulations may be obtained from the BLM.

(c) Permittee must maintain a permit bond in the amount determined by the BLM.

(d) Permittee must allow inspection of the premises and operations by representatives of the Departments of the Interior, Agriculture, or other agency administering the lands and provide for the free ingress and egress of Government officers and users of the lands under authority of the United States.

Sec. 3. *Multiple use.* (a) Valid existing rights acquired prior hereto on the lands described herein will not be adversely affected hereby.

(b) The granting of this permit will not preclude the issuance of other permits, leases, or other development of the same lands.

(c) The permitted lands will be subject, at all times, to any other lawful uses by the United States, its lessees, permittees, licensees, and assigns, but such use should not materially interfere with the permittee's operations hereunder.

(d) The Government reserves the right to sell or otherwise dispose of the surface of the permitted lands under existing law or laws hereafter enacted, insofar as such disposal will not materially interfere with the rights of the permittee.

(e) The permittee must afford all facilities for inspection of the prospecting work on behalf of the Secretary of the Interior or head of agency administering the lands and to make a report, on demand, of all matters pertaining to the character, progress, and results of such work.

(f) The permittee must observe such conditions as to the use and occupancy of the surface of the lands as provided by law, in case any of said lands will have or may be entered or patented with a reservation of mineral deposits to the United States.

Sec. 4. *Removal of deposits.* Permittee must remove from the lands only such deposits as may be necessary to experimental work or to establish the existence of valuable deposits within the permit area and must keep a record of all minerals mined.

Sec. 5. *Rental.* Permittee must pay an annual rental of 50 cents per acre, or fraction thereof, but not less than $20 per year. The annual rental payment must be made on or before the anniversary date of the permit, payable to Minerals Management Service.

Sec. 6. *Extension of permit.* (a) This permit may be subject to extension under applicable regulation upon approval by the Bureau of Land Management (BLM) and upon the showing of entitlement hereto. *(No extension may be granted for sodium* or sulphur prospecting permits.)

(b) Application for extension of this permit, where authorized by law or regulation, must be filed in the proper BLM office at least 90 days prior to the date of expiration of this permit. Unless such an application is filed within the time specified, this permit will expire without notice to the permittee.

Sec. 7. *Assignments.* All assignments or transfers of this permit or of any interest therein must be filed with the BLM for approval in accordance with the provisions of the appropriate regulation and will take effect as of the first day of the month following approval thereof, or, if transferee so requests, as of the first day of the month during which such approval is given.

Sec. 8. *Relinquishment of permit.* Permittee may relinquish this permit, in whole or part, by filing in the proper BLM office a written relinquishment which, upon acceptance by the BLM, will be effective as of the date of filing.

Sec. 9 *Termination or cancellation.* (a) This permit will terminate automatically upon failure of the permittee to pay the rental on or before the anniversary date thereof.

(b) This permit may be cancelled in accordance with the regulations upon failure by permittee to comply with the regulations or the provisions of the law, or for violation of any of the terms or stipulations of the permit and exploration plan. Such cancellation may occur if such failure or default continues for 30 days after service of written notice thereof by the BLM.

Sec. 10. Protection of surface, natural resources, and improvements. The permittee agrees to take such reasonable steps as may be needed to prevent operations on the permitted lands from unnecessarily: (1) causing or contributing to soil erosion or damaging crops, including forage, and timber growth thereon or on Federal or non-Federal lands in the vicinity; (2) polluting air and water; (3) damaging improvements owned by the United States or other parties; or (4) destroying, damaging or removing fossils, historic or prehistoric ruins, or artifacts; and upon any partial or total relinquishment or the cancellation or expiration of this permit, or at any other time prior thereto when required and to the extent deemed necessary by the lessor to fill any pits, ditches and other excavations, remove or cover all debris, and so far as reasonably possible, restore the surface of the permitted land and access roads to their former condition, including the removal of structures as and if required. The BLM will prescribe the steps to be taken and restoration to be made with respect to the permitted lands and improvements thereon whether or not owned by the United States.

Sec. 11. *Antiquities and objects of historic value.* When American antiquities or other objects of historic or scientific interest including but not limited to historic or prehistoric ruins, fossils or artifacts are discovered on lands covered by this permit, or discovered during performance of this permit, the item(s) or condition(s) will be left intact and immediately brought to the attention of the contracting officer or his representative.

Sec. 12. *Discovery of Valuable Deposit:* A permittee may file an application for a noncompetitive lease not later than 60 days after expiration of the prospecting permit. An applicant for a noncompetitive lease must show that a valuable deposit of the mineral specified in the prospecting permit was discovered within the permit area and during the life of the permit. For noncompetitive lease applications for sodium, potassium and sulphur, it additionally must be shown that the lands are chiefly valuable for that mineral *(as opposed to nonmineral disposition of the lands).* See regulations in 43 CFR, Part 3500 for filing requirements for specific minerals.

Sec. 13. *Equal opportunity clause.* This permit is subject to the provisions of Executive Order No. 11246 of Sept. 24, 1965, as amended, which sets forth the nondiscrimination clauses. A copy of this order may be obtained from the BLM.

Sec. 14. *Special Stipulations.*

(Section 14 continued on page 3)

GENERAL INSTRUCTIONS

Number of copies. Three copies of the application, typewritten or printed plainly and signed in ink, must be filed in the BLM office having jurisdiction for the State in which the lands are located.

If additional space is needed to furnish any of the required information, the information should be prepared on additional sheets (8 1/2 x 11"), initialed, and attached to this application.

SPECIFIC INSTRUCTIONS

NOTE: After an initial review and clearance of the application, but prior to the BLM's issuance of the prospecting permit, the applicant will be required to file in triplicate an exploration plan reasonably designed to determine the existence or workability of the deposit. *See regulations in 43 CFR Part 3500, for specific requirements regarding information to be included in exploration plan.*

Item 1 - Serial Number will be issued by the BLM at the time the application is filed. Any future correspondence concerning this application/permit should reference the serial number.

Item 2 - Specify mineral(s) applied for.

Item 4 - Land description: A complete and accurate description of the lands for which the permit is desired must be given in accordance with the regulations at 43 CFR 3503. The acreage must not exceed the maximum permitted by laws or regulations. In instances where the United States does not own a 100-percent interest in the mineral deposits in any particular tract, the applicant should indicate the percentage of Government ownership.

Item 7 - Party in interest: Applicant must indicate whether or not he is the sole party in interest. If not, the applicant must submit, at the time the offer is filed, a signed statement setting forth the names of the other interested parties. All interested parties must furnish evidence of their qualifications to hold an interest in this permit, if issued.

Item 9a - Application by a Corporation. If the applicant is a corporation, an officer or authorized attorney-in-fact of the corporation must submit the information specified in regulation 43 CFR 3502.30.

Application by an Association including a partnership. If the applicant is an unincorporated association, the application must be accompanied by a copy of the articles of association together with a showing as to citizenship and holdings of its members, as are required of an individual.

Application by a trust: See regulation 43 CFR 3502.29 for specific requirements.

Item 9b - Statement of Qualifications: If information as to qualifications has been filed previously with BLM, reference to that serial number may be made.

Item 10 - A processing fee will be charged which will be determined on a case-by-case basis under 43 CFR 3000.11.

Item 11 - Advance rental: An advance rental at the rate of 50 cents per acre, or fraction thereof, but not less than $20 made payable to the Department of the Interior - Bureau of Land Management must be submitted with this application. *(For example, the advance rental payment for an application covering 40.1 acres would be $20.50).*

(Continued on page 4)

NOTICES

The Privacy Act of 1974 and the regulations, in 43 CFR 2.48(d) provide that you be furnished with the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq.; 5 U.S.C. Appendix 1031; 43 CFR 3500
PRINCIPAL PURPOSE: BLM will use the information you provide to process your application for a permit to prospect.
ROUTINE USES: BLM will disclose information to: (1) Appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions; (2) appropriate Federal agencies when their concurrence is required before BLM grants a right in public lands or resources: (3) a member of the public in response to a specific request for pertinent information; (4) a congressional office in response to an inquiry made at the request of an individual; and (5) to a consumer reporting agency to expedite collecting debts owed the government.
EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosing this information is required to obtain and a benefit. If you do not provide the information, BLM may reject your application.

The Paperwork Reduction Act of 1995 requires us to inform you that:
BLM collects this information to comply with the regulations at 43 CFR 3500, which implement the provisions of the Mineral Leasing Act of 1920, as amended; the Mineral Leasing Act for Acquired Land of 1947; and Section 402 of Reorganization Plan No. 3 of 1946 or other special leasing act.
BLM uses the information to identify the applicant and the Federal lands for which the applicant seeks permission to prospect for minerals.
Response to this request is required to obtain and keep a benefit.
BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless its displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 5 hours per response, including the time for reviewing instructions, gathering, and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0121), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C., 20240.

APPENDIX C

Public Comment Summary Matrix

	11/30/2012		
No.	**Public Comment**	**Public Comment Summary**	**Agency Comment Response**
1	We believe that the BLM should not issue a permit for exploratory drilling because of the environmental and human effects the drilling will have. However, should the BLM move forward we believe that this project warrants the development of an EIS.	This project warrants the development of an EIS.	Based on initial scoping meeting with BLM, USFS and URS technical staff January 6, 2012 it was determined that, based on the BLM NEPA Handbook, no significant impacts would result from this Action; and an EA was the appropriate level of NEPA analysis. (See Section 7, page 69) "The following actions normally require preparation of an EIS: (1) Approval of Resource Management Plans. (2) Proposals for Wild and Scenic Rivers and National Historic Scenic Trails. (3) Approval of regional coal lease sales in a coal production region. (4) Decision to issue a coal preference right lease. (5) Approval of applications to the BLM for major actions in the following categories: (a) Sites for steam-electric power plants, petroleum refineries, synfuel plants, and industrial structures (b) Rights-of-way for major reservoirs, canals, pipelines, transmission lines, highways and railroads (6) Approval of operations that would result in liberation of radioactive tracer materials or nuclear stimulation (7) Approval of any mining operation where the area to be mined, including any area of disturbance, over the life the mining plan is 640 acres or larger in size."
2	There was not adequate time for the public to respond to an EIS.	Not adequate time for the public to respond to an EIS.	This is an EA analysis, not an EIS. The EIS public process differs from the EA public process. (See BLM NEPA Handbook - Sections 7.0 and 8.0.) The BLM and USFS provided a 30-day public scoping comment period; held three public meetings that included mailings/PSA; and a 30-day EA comment period and mailings/PSA, which was extended 15 days at the request of the public. BLM has and continues to host a public web site on this Action. (BLM Handbook Section 8.2). Both the EA and the BLM draft FONSI were made available for the well-publicized public comment period, and were posted to the BLM Internet project site. Public was given 45 days to comment. Scoping comments were also accepted early on in the EA process. See EA Section 1.9 for Scoping and Public Involvement summary.
3	The public was provided with opportunities for involvement in the process that far exceeded NEPA's minimum requirements.	The Draft EA process provided sufficient opportunity for public comment and agency consideration of those comments.	The Agencies held three well publicized public scoping/ information meetings within the geographic area of the proposed prospecting, accepted public scoping comments for a 30-day period, and released the EA for public review and comment again for 30 days which was extended for an additional 15 days (45 total). The BLM also established and maintained a well documented project web site that provided reviewers with the means to submit comments on-line.
4	We are concerned that this particular EA may not be in draft form and that comments made on this EA are not going to be fully considered. We request that all public comments be fully considered and addressed.	Will the public comments be fully considered?	All substantive comments received during the extended public comment period (see previous response) were considered and the EA, as necessary, was appropriately revised. This matrix was prepared to document a summary of the public comments and the agencies responses. Substantive comments, where warranted, resulted in modifications to the EA, and the nature of the revisions is summarized in EA Section 1.9, Scoping and Public Involvement.
5	To fully participate in the NEPA process the public should be given access to documents of importance to the analysis.	Will the public have access to the public record?	All project related documents have been placed in the BLM OR/WA State Office Public Room and the most relevant were posted on the BLM Internet project site.

No.	Public Comment	Public Comment Summary	Agency Comment Response
6	To fully participate in the NEPA process the public should be given access to documents of importance to the analysis. This includes the documentation for the primary purpose for which the lands were acquired.	Will the public have access to all NEPA documents including documentation for the primary purpose lands were acquired?	All project related documents were placed in the BLM OR/WA State Office Public Room and the most relevant were posted on the BLM Internet project site. EA Section 1.5 and 1.7, includes discussion of the acquisition including the Primary Purpose and appropriate federal authorities. (See also response to comments #15 and #16.)
7	In determining the scope of the required NEPA analysis, a federal agency must consider not only the proposed action, but also other types of related actions including "cumulative actions" and "connected actions." Thus, BLM should have considered a future mine within the scope of its NEPA analysis as a cumulative action and/or connected action.	Consider "Cumulative Actions" including a future mine in the EA.	EA Section 3.1 – Introduction, notes that the scope of the Proposed Action does not encompass future mining as reasonably foreseeable. No mining is currently proposed, and any future mining proposal would require separate administrative actions by the USFS and BLM, including a NEPA analysis and review process. A reasonably foreseeable future action (RFFA) is when a "future action" becomes "reasonably foreseeable" once it is "proposed;" until then it is "speculative" and need not be accounted for in the cumulative effects analysis in an EA or EIS. (Wilderness Workshop v. U.S. Bureau of Land Management, 531 F.3d 1220, 1229 (10th Cir. 2008)). Also see O'Reilly v. U.S. Army Corps of Engineers, 477 F.3d 225, 236 (5th Cir.2007) (citing 40 C.F.R. § 1508.23). (See EA Appendix D, NAEP NEPA Review – Cumulative Impacts Legal Review.)
8	Although we understand that this project is different from General Moly, Inc.'s lease application in 2005, this application could open the door to a mining proposal that does not meet the requirements for the reason for acquisition of this area.	This proposed Action could lead to mining.	The proposed action pertains to mineral exploration/prospecting. Should prospecting indicate the presence of a valuable deposit and should a "lease application" be received, a separate administrative action and NEPA process will follow.
9	The fact that the EA or Ascot Resource Inc. has labeled future mine development "speculative" is not determinative. Under NEPA: It must be remembered that the basic thrust of an agency's responsibilities under NEPA is to predict the environmental effects of proposed action before the action is taken and those effects fully known.	That the EA or Ascot Resources, Inc., have labeled future mine development "speculative" is not determinative.	EA Section 3.1 – Introduction, notes that the scope of the Proposed Action analyzed in the EA does not encompass future mining because future mining is not reasonably foreseeable. Under 43 C.F.R. § 46.30, reasonably foreseeable future actions are those "for which there are existing decisions, funding, or proposals identified by the bureau." No mining action is currently proposed, and BLM is not aware of any plans for future mining. Moreover, any future mining proposal would require separate administrative actions by the USFS and BLM, including a NEPA analysis and review process, as well as a separate decision. Future mining in the project area is highly speculative and indefinite. BLM therefore did not include future mining activities in its NEPA analysis for the hardrock prospecting permit applications. Based on both initial scoping and the analysis presented in the EA pursuant to BLM's NEPA Handbook, BLM's FONSI finds that no significant impacts would result from the Proposed Action; and thus an EA is the appropriate level of NEPA analysis. (See BLM NEPA Handbook Section 7, page 69).

No.	Public Comment	Public Comment Summary	Agency Comment Response
10	An agency must engage in "reasonable forecasting" to determine the scope of its NEPA analysis. According to the Environmental Protection Agency (EPA), NEPA requires that agencies "develop scenarios that predict which future actions might reasonably be expected. This includes reasonably foreseeable future actions "even if they are not specific proposals" or "finalized [projects)."	The agency must engage in reasonable foreseeable forecasting even if they are not specific proposals.	BLM has existing case law which reinforces the position that mining impacts are not appropriate for analysis for prospecting permit applications as decided in the following appeals case: United States Department of the Interior Office of Hearings and Appeals Interior Board of Land Appeals, Missouri Coalition for the Environment Heartwood. When assessing reasonably foreseeable future actions, it was appropriate for BLM not to consider mine development, since development does not necessarily follow exploration, . . . nor is it reasonably foreseeable to occur. (See Appendix D for relevant court cases).
11	Both BLM and the permittee acknowledge that significant mineral deposits exist in the project area to be evaluated with the proposed project.	Both BLM and Ascot acknowledge that a significant mineral deposit exists.	There is a known mineral occurrence but insufficient information exists to determine whether a "valuable deposit" occurs. BLM has taken no speculative position regarding whether or not a valuable deposit exists within the Permit/Project Area. (See 43 CFR 3501.5). Rather the EA in Section 1.1.2 -- *History* , notes that based on available information, the Permit Applications Area that encompasses the subject Mineral Survey lands appears to include a large portion of what is often referred to as the undeveloped "Margaret Deposit." Some existing public domain reports suggest that this might be one of the largest copper-molybdenum-silver-gold calc-alkaline porphyries of Miocene age known in Washington State.
12	BLM and Ascot acknowledge that a significant mineral deposits exist in the project area and Ascot has committed financial resources to mineral exploration, therefore, a future mine is reasonably foreseeable.	Ascot has committed significant financial resources for exploration; Thus a mine is foreseeable.	As noted in EA Section 1.1.2 -- *History* , BLM only notes that available published information suggests the presence of a porphyritic Miocene age deposit. Whether that deposit is of sufficient extent and suitable mineralization to meet the criteria for a valuable deposit such that: "*a person of ordinary prudence would be justified in the further expenditure of his or her labor and means, with a reasonable prospect of success in developing a profitable mine.*" This determination will require the substantive information that would be obtained from the proposed mineral prospecting". See response to Comment #14.
13	Exploratory drilling must occur prior to mineral removal.	Exploratory drilling must occur prior to mineral removal.	Exploratory drilling does not always show the existence of a valuable deposit. According to the Rocky Mountain Mineral Law Foundation, in the 1970s of 352 likely locations, exploration indicated that only 23 were possible targets of which only 2 were developed. (An Introduction to Geology and Hard Rock Mining, Science and Technology Series, by Dr. Willard Lacy; Chapter 2, Item 9 – Risks.)
14	The Trust for Public Lands acquired these lands in 1986, via purchase and donation to protect these lands.	TPL acquired these lands via purchase and donation to protect these lands.	The comment includes mention of the intent of the 3rd Party (Trust for Public Lands) in the acquisition of some of the lands involved in the permit applications. There are no deed restrictions that were placed by TPL on the deeds and after acquisition, the lands are managed as part of the National Forest System, subject to existing statutes and Forest Plan direction.
15	Drilling is not compatible with the primary purpose for which the land was acquired.	Drilling is not compatible with the primary purpose for which the land was acquired.	USFS consent is contingent upon a determination that the activities will not interfere with the primary purposes for which the lands were acquired. Under the Weeks Act of 1911, the subject lands were acquired in order to regulate flow of navigable streams or for the production of timber. The EA clearly indicates that the proposed action will not significantly affect this purpose. (See also response to Comment #17.)

No.	Public Comment	Public Comment Summary	Agency Comment Response
16	The proposed prospecting activity will interfere with the primary purposes for which the United States acquired the public lands that are the subject of the prospecting applications.	Prospecting activity will interfere with the primary purposes for which the United States acquired the public lands that are the subject of the prospecting applications.	The Secretary of Interior is responsible for managing the Federal mineral estate and the authority to grant prospecting permits lies with the BLM. The NFS lands involved were acquired under the authority of the Weeks Act of 1911 for the purposes of regulating the flow of navigable streams or for the production of timber (P.L. 61-435, as amended). The Mineral Resources on Weeks Law Lands, 1917 established that the Secretary of Agriculture could authorize the prospecting, development, and utilization of mineral resources of the lands acquired under the Weeks Law of 1911. These functions were transferred to the Secretary of Interior in the Reorganization Plan No. 3 of 1946 (43CFR3501.1(b)). From 1917 to the present, the direction of Congress has been to consider the "prospecting, development and utilization" of minerals on lands acquired under the Weeks Act, as important and lawful uses of these public lands. Where hardrock mineral prospecting involves acquired NFS lands, the applicable regulatory framework sets out that the BLM can only issue prospecting permits with the consent of the surface managing agency. Consent is contingent upon a determination that the activities will not interfere with the primary purposes for which the lands were acquired and specifies certain required conditions for use and protection of the NFS lands involved. Under the Weeks Law of 1911, lands are acquired as may be necessary to regulate the flow of navigable streams or for the production of timber. Both agencies have worked cooperatively to evaluate the permit applications and to rely on both statutory authority and BLM regulations, as well as direction in the Forest Plan. (See EA Sections 1.5 and 1.7) The EA and project record make it clear that the lands within the prospecting permit applications are National Forest System lands that are not withdrawn from operation of the mineral leasing acts. The project record provides details about the acquisition of the lands, which were acquired because they are within the boundary of the GPNF and were considered to have important resource values especially for recreation and water quality. Upon acquisition, the lands have been and are being managed for the full range of public uses and values, consistent with existing laws, regulations, policy, and direction within the Forest Plan for the GPNF. The regulatory framework for the FS decision is described in the FS DN as well as in EA Section 1.7. The FS must make a finding that issuance of the prospecting permits will not "interfere" with the primary purposes for which the lands were acquired.
17	The Weeks Act authorized the acquisition of land for two primary purposes: to promote the production of timber and to regulate the flow of navigable streams.	The Weeks Act authorized the acquisition of land for two primary purposes: to promote the production of timber and to regulate the flow of navigable streams.	The Weeks Act authorized the acquisition of land for two purposes: (1) to regulate the flow of navigable streams; and (2) to promote the production of timber. Based on the analysis in the EA, the proposed prospecting activity will not interfere with either purpose.
18	The Proposed Project will interfere with the production of timber.	The Proposed Project will interfere with the production of timber.	Based on the EA, there is no evidence to support a determination that the proposed prospecting activity will interfere with the production of timber or the regulation of the flow of navigable streams. The proposed prospecting activities will require the removal of no more than 68 trees from mature stands. (See EA Table 3.7-2). The removal of trees from younger stands will be limited given that the total disturbed area for all of the drill pads will be approximately 0.23 acres and that the total disturbed area for road reactivation will be approximately 3.3 acres, 2.45 acres of which were reactivated in 2010. Based on these facts, the Agencies found that "[t]he Proposed Project [will] not impact future use of the area for timber production."

No.	Public Comment	Public Comment Summary	Agency Comment Response
19	The Proposed Project will interfere with the flow of navigable streams.	The Proposed Project will interfere with the flow of navigable streams.	With respect to the flow of navigable streams, the EA, EA Section 3.3.2.2.1 explains that the impact of the proposed project, if detectable, will be negligible. The EA explains: Maximum (peak) estimated water use for the Proposed Action (20 gpm) would be approximately 0.1 percent of the minimum and 0.01 percent of the average flows recorded for the [USGS] gauging station [located on the Green River downstream from the Project Area] (on a per minute basis - EA Section 3.3.2.2.1). Estimated average water use of the Proposed Action (5 gpm) is 0.03 percent, and 0.002 percent of the minimum and average recorded flows (on a per minute basis). Given that water use for the proposed project represents fractions of a percent of allocated and available water within the watershed; and since most water used during drilling would be discharged back into the watershed, the effects of water withdrawal are expected to be negligible. The impact, if detectible, will be further reduced as pumping of onsite groundwater i slimited to less than 5,000 gallons per da. As such, these findings would not support a determination that the Proposed Action will interfere with the regulation of the flow of navigable streams. Impact to flow of Green River: The amount of withdrawal is limited to 5,000 gpd and withdrawal rate is gauged using a flow rate gauge to ensure that water used from artesian sources does not exceed the state's 5,000 gpd limit for permit exemption requirement. 5,000 gpd (668 cfd) is the upper limit for the exploration water use requirement each day. In the EA it stated the rate of water use would range anywhere from 5 to 20 gpm (0.01 to 0.04 cfs). As a comparison the Green River in the vicinity of the project flows anywhere from 30 to 50 cfs for the summer low flow in July per a 1993 survey that was done in that area, possibly as low as 20 cfs for the September month. A stream gauge many miles downstream near the confluence of the North Fork Toutle River identified in the EA which reported a low flow of 80 cfs in August. The lowest flow for all streams on the forest usually occurs in September. Whether at 80 cfs or 20 cfs for summer low flow, the hydrology report completed for the EA confirmed that the withdrawal amount of 0.01 to 0.04 cfs (5 to 20 gpm) would hardly have any impact (negligible) on Green River's flow. Impacts to groundwater: Pertinent portions of the EA have been clarified to more fully describe the water used for exploration drilling, and the written analysis regarding impacts to both surface and groundwater have been expanded. The groundwater use is limited to no more than 5,000 gallons per day, which is the amount allowed under exemption in Washington. The WA Department of Ecology also provided important comments regarding water, and these, combined with various public comments were taken into consideration by the Agencies. Additional mitigation measures to protect groundwater resources have been incorporated into the final EA Mitigation Measure and Appendix F.

No.	Public Comment	Public Comment Summary	Agency Comment Response
20	The fact that some of the subject lands were acquired with funds made available under the Land and Water Conservation Fund Act precludes prospecting activity on those lands.	Lands acquired with funds made available under the Land and Water Conservation Fund Act (LWCF) precludes prospecting activity on those lands.	A) The Land and Water Conservation Fund was created by Congress in 1964 to provide money to purchase land for the benefit of all Americans. The money placed into the Fund, by Congress, is primarily derived from royalties received into the Treasury from off-shore Federal oil and gas leases. Four Agencies are eligible to obtain LWCF funding including the U.S. D.A. Forest Service and the U.S.D.I. Bureau of Land Management, U.S.D.I. National Park Service and the U.S.D.I. Fish and Wildlife Service. Lands purchased with money provided through the LWCF are used for a variety of public purposes. The Fund facilitates the purchase of public lands, but the enabling Statutes provide the foundation of the purpose for which the lands were acquired. (See EA, Sections 1.5 and 1.7). B) Some of the public comments described or interpreted their ideas on the intent of the 3rd Party who worked with the Forest Service on the acquisition of some of the lands/interests involved in the permit applications. The project record contains information on the dealings between the Forest Service and the 3rd party non-government organization (NGO), Trust for Public Lands (TPL). The project record also includes letters from the Forest Supervisor at the time, explaining to local members of the Congressional delegations and county commissioners, that the sought after lands and mineral interests were desirable as NFS lands. The TPL, along with many other NGOs have been long-standing and important partners in the acquisition of many acres of Federal lands across the Country. However, the "intent" or "purpose" of 3rd parties in aiding the acquisition of lands suitable and used for NFS lands, does not over-ride existing statutory direction or Forest Plan management prescriptions. In addition, the project record clearly reflects that there are no deed restrictions that were placed by TPL on the deeds, indicating that the United States was not willing and did not accept, any limits on the incoming Federal lands. In fact, the United States acknowledged that there remained an outstanding private mineral interest, which, in the view of the Agency officials at the time, would not prevent the acquisition of lands and interests that were available. After acquisition, the lands were to be managed as part of the National Forest System, subject to existing statutes and Forest Plan direction.
21	Information contained in the acquisition files associated with the subject lands does alter the statutory primary purposes for which the lands were acquired.	Information contained in the acquisition files associated with the subject lands does alter the statutory primary purposes for which the lands were acquired.	The statutory authority for an acquisition provides the best evidence of the purpose of the acquisition. Forest Service correspondence and analysis cannot alter the primary purposes for which Congress authorized the acquisition of land. The EA and project record make it clear that the lands within the prospecting permit applications are National Forest System lands that are not withdrawn from operation of the mineral leasing acts. The project record provides details about the acquisition of the lands, which were acquired because they are within the boundary of the Gifford Pinchot National Forest and were considered to have important resource values especially for recreation and water quality. Upon acquisition, the lands have been and are being managed for the full range of public uses and values, consistent with existing laws, regulations, policy, and direction within the Forest Plan for the Gifford Pinchot National Forest. The regulatory framework for the FS decision is described in the FS DN as well as in the EA, Section 1.7. The FS must make a finding that issuance of the prospecting permits will not "interfere" with the primary purposes for which the lands were acquired. When the United States acquired these lands, the Forest Service concluded that protecting the Green River was an important resource objective. The project record includes various records documenting this acquisition. These include: • A letter from the Trust for Public Lands ("TPL")—evidences TPL's motivation for donating certain mineral interests to the United States. • A letter from the Forest Supervisor to the Regional Forester and a purchase option and contract. The letter makes clear that the Forest Service contemplated that mining could occur on the acquired lands, (and the purchase option and contract provided that title to the acquired lands would be conveyed to the United States.) • Several letters sent by the Forest Supervisor to members of Congress and County Commissioners referred to the protection of the Green River as an important resource objective.

No.	Public Comment	Public Comment Summary	Agency Comment Response
22	Proposed prospecting will interfere with the "scenic beauty" of the area, creating visual and noise disruptions to areas used heavily for recreation.	Prospecting would interfere with scenic beauty and recreation.	EA Section 3.9 -- *Visual/Scenic Resources,* fully describes the VQO for the Permit/Project Area. Throughout Section 3.0,*Affected Environment and Environmental Consequences*, visual and noise mitigation associated with the proposed project is described at some length. The drilling on pads within close proximity of the horse camp would be controlled to reduce seasonal use conflicts with recreational users of the camp. Drilling at pads 6 and 7 would be restricted to day time hours only during the week prior to Labor Day weekend and no drilling at these sites after Labor Day weekend. There are mitigations in place also to reduce noise and lighting impacts. (See EA Section 3.12.2.3). Hiking, equestrian activities, recreational vehicle traffic, and other recreational uses can still occur within the Proposed Project boundary.
23	Would interfere with the "primary purposes for which the land was acquired." …… "the regulation of the flow of navigable streams" and to "promote or protect the navigation of streams on whose watersheds they lie."	Protect navigable streams.	See Agency response to Comment #20. Based on the EPA (2008) definition of "navigable waters", the proposed Action, as it relates to the Green River and it's tributaries, would not interfere with travelers, recreational or other purposes; or fish/shellfish interstate commerce.
24	Neglecting to include an area in a monument for political reasons and/or cost concerns regarding mineral buyout does not automatically create a preference for mining in this area.	Failure to include an area in the Mt. St. Helens NVM does not create a preference for mining.	Agree - likewise does not preclude exploration/mining. The legislation creating the National Volcanic Monument specifically sated that no "buffers" would be established around the perimeter of the Monument. That means that the lands adjacent to the Monument are to be managed according to the Forest Plan, and existing Statutes and Regulations.
25	It is the acquisition of this land, the means by which it was acquired, and the reasons for acquisition that are of primary concern. The concern is that FS already consented to the 2010 and 2011 Actions that were similar to the proposed Action. Without the FS perspective and a discussion of the potential reasons for compatibility, the EA is lacking analysis on this issue.	It is the acquisition of this land, the means by which it was acquired, and the reasons for acquisition that are of primary concern for the GPTF.	USFS consent is contingent upon a determination that the activities will not interfere with the primary purposes for which the lands were acquired. Under the Weeks Act of 1911, the subject lands were acquired in order to regulate flow of navigable streams or for the production of timber. The acquisition files are included in the Project Record, and explained in the EA in Section 1.5 and 1.7.
26	FS will need to prove that exploratory drilling on the lands does not damage the primary purpose for which the lands were acquired.	Prove that exploratory drilling will not damage the purpose for which the lands were acquired.	EA determines that exploratory drilling with terms and conditions does not interfere with primary purpose. Non-significant impacts would be mitigated with BMPs and stipulations outlined in the EA and the BLM prospecting permit, (See EA Section 1.5 and 1.7).

No.	Public Comment	Public Comment Summary	Agency Comment Response
27	EA fails to adequately consider effects of water use on aquifer levels and surface stream flows. EA fails to ensure that senior water rights downstream will not be impaired by groundwater.	EA is inadequate in addressing water issues.	Water related protection measures and drilling practices were modified in Alternative 3.0. Specific mitigation measures to protect surface and groundwater including drill hole plugging are included in Appendix F. Water use was analyzed in EA Section 3.3.1.4, *Hydrological Conditions*. Total water use from local sources would not exceed 5,000 gallons per day, and will be measured with a flow rate gauge. The Washington State Department of Ecology allows up to 5,000 gallons per day of water to be withdrawn from groundwaters of the State without a water right or use permit. Supplemental water, if needed, would be obtained off-site and delivered to the drill site by a water truck. If onsite storage of water is required, location of a water storage tank will be mutually agreed upon by the USFS, BLM, and the permittee. Under the Proposed Action, most water required for drilling would be obtained from on-site sources. See EA Section 3.3.1.4, Hydrological Conditions.
28	How can the amount of water use be measured if the well is not metered?	Metering of groundwater withdrawal.	See EA Section 2.1.3.2; water use will be gauged with a flow-rate meter.
29	The EA is lacking discussion and analysis of the impacts or effects to the stability of the water table, the surface, and underground flow regime. What is the mitigation plan for new water withdrawals? What senior water rights exist that may be impacted or impaired by new water withdrawals?	EA lacks analysis of impacts and mitigation for groundwater withdrawal.	The EA supports the conclusion that the proposed activity will not interfere with the protection of the Green River or groundwater flows. The EA found that impacts on the quantity and quality of surface and ground water would be "negligible." As discussed in EA Section 3.3.2.2.1, water use would be minimal as experienced during exploratory drilling in 2010. Drill holes would be sealed to prevent groundwater discharge from drill holes, and would prevent flow of water between zones of differing water pressures. Grout sealing, if needed, would prevent water loss and prevent potential ARD generating reactions with sulfide minerals from occurring. By limiting on-site groundwater use to 5,000 gallons per day (as required), groundwater use is limited to an amount that is negligible to watershed allocated use and water availability. Most of the water used would be infiltrated back into the substrate primarily by infiltration into drill sumps, further minimizing the loss of water from the area. Use of non-toxic drilling fluid additives would prevent impacts to groundwater and surface water. Spill containment kits would be kept at fuel storage areas and with the drill, water pump and in the service trucks. A Spill Prevention Plan submitted to the USFS would be followed, and any spills or leaks would be immediately reported and promptly cleaned up. No new water withdrawals are proposed for this Action. (See EA Section 3.3.2.2). Under EA Section 3.3.2.3, the drilling system in Alternative 3 has been revised to include a closed drilling system for maintenance of return circulation throughout drilling of each bore hole, and complete abandonment of each hole with sealing materials (bentonites) or cement if ground water or artesian flow is encountered. Drill additives used would meet NSF/ANSI approval standards for drilling water wells, which would reduce the potential for toxics compounds entering groundwater. These products and methods are used for well drilling also. Mitigation Measures are listed in EA Appendix F.
30	What is the process for notifying the public and water managers if and when the drilling project requires more water to be trucked in from other location(s)?	Notifying public and water managers when additional water is required.	EA Section 2.1.3.2 -- *Water Requirements*. If more than 5,000 gpd of groundwater is needed, an appropriate State water right permit, if applicable, will be obtained by the permittee.j A FS road use permit would be required for trucking from off-site sources.

No.	Public Comment	Public Comment Summary	Agency Comment Response
31	Contamination of the water and site can occur from improper use of casing material, improper sealing of the bore holes and sediment sloughing of the grout or cement, and reactions with drilling additives that will be added to the bore holes. The EA does not include a comprehensive list of the additives to be used. To better understand the effects of the additives on the environment, the EA should include a list of the actual additives to be used.	Contamination of sites and waters from drilling and drill additives.	Under EA Section 3.3.2.3, the drilling system in Alternative 3 has been revised to include a closed drilling system for maintenance of return circulation throughout drilling of each bore hole, and complete abandonment of each hole with sealing materials (bentonites) or cement if ground water or artesian flow is encountered. Drill additives used would meet NSF/ANSI approval standards for drilling water wells, which would reduce the potential for toxics compounds entering groundwater. These products and methods are used for well drilling also. Mitigation Measures are listed in EA Appendix F.
32	The EA does not consider where the excess water, if water is trucked in, will be discharged. Adding water to the watershed could increase instability and cause erosion. The current EA only proposes that the water used would be infiltrated back into the substrate either through down-hole loss or infiltration into drill sumps." The EA does not indicate how large these sumps will be.	How will drill water be disposed of?	EA Alternative 3 has been revised to include maintenance of recirculation throughout drilling of each borehole to minimize loss to the formation of both drilling fluids and cuttings. Excess water will be stored in lined sumps or in above ground storage tanks (see EA Section 2.1.4,) and (EA Section 3.3.2.2.1.). Sump size is described in EA Section 2.1.3. (Also see previous response.)
33	The EA fails to mention what is to be done with the cores that are brought up to the surface for analysis.	Fate of rock cores.	See EA Section 1.0, *Introduction, and* 3.13.2.2.1, which notes that rock core will be removed for off-site analysis.

No.	Public Comment	Public Comment Summary	Agency Comment Response
34	EA fails to adequately analyze the proposed Project's effect on soils, the current road network, and soil compaction under and around the drill pads.	Project effects on soils.	See EA Section 2.1.3 - *Proposed Design Features and Environmental Protection Measures*, which describes soil management noting that it will be removed, stockpiled, returned during reclamation, and that compacted travel surfaces will be scarified, and no new roads would be constructed. Project uses existing decommissioned roads; used roads and drill pads will be scarified at the conclusion of this action. Discussed in EA Section 2.1.3.3, *Reclamation*, sites would be reclaimed as part of the permit stipulations. The physical properties of the area are largely influenced by local volcanism, most recently by the 1980 eruption of Mount St. Helens, which covered much of the Project Area in ash and pyroclastic materials associated with lateral blast deposits (USACE 2007). The Project Area includes five soil units mapped by the Skamania County Area Soil Survey (NRCS 2008) as discussed in Section 3.4*Soils*. Generally, the soil units are described by the Natural Resources Conservation Service (NRCS) as "well drained" and lacking any restrictive soil layer that would prevent deep infiltration. The soils are also listed as having relatively low soil erosion K Factor (0.15).11 A K factor of 0.15 indicates that the area's soils have a low risk of erosion from surface water flows. Additional discussion of the geology of the Project Area is presented in Section 3.2*Geologic and Mineral Resources*."
35	EA fails to adequately analyze road usage and effects from increased road usage.	Analyze effects of road usage.	Roads, effects from temporary reactivation of currently closed roads, road usage, and reclamation are described throughout the EA, and in particular in Section 3.11.3 - *Road Impact Avoidance and Minimization Measures*. A FS Road Use Permit for commercial operations would be required. See EA Section 2.1.3.4 Appendix F includes mitigation to protect public safety.
36	The EA inadequately analyzes the impacts to recreation by dismissing the use of the actual drill location without due consideration. Although the roads have been decommissioned, the area still provides opportunities to hike, hunt, and observe wildlife. Recreation on a wider scale will be severely impacted by noise, dust, lights, and the physical presence of drill equipment.	Inadequately analyzed the impacts to recreation.	Effects of the proposed project on recreation are addressed throughout the EA and in particular in Section 3.12*Recreation*. Use beyond the proposed temporary gate to the currently closed forest roads above FS Road 2612 will not preclude hiking or horseback travel into the Project Area in the long term. Only the immediate area of the active drill sites and operating equipment will be secured in the interest of public safety. The recreation impacts are considered temporary and minimal in both intensity and area. The project site impacts a total of 3/4-acre of newly disturbed ground out of the 1,368,300 acre Gifford Pinchot National Forest. No FS trails will be closed or restricted. See EA Section 3.0 and Appendix F for mitigation measures for dust, light, noise and traffic.
37	The action alternative could disrupt the Horse Camp for the entire season, including Labor Day weekend. If access to the horse camp is blocked, then there will be no established campsite in the area.	Disruption and access to the horse camp.	As noted in EA Section 2.1.3.4, *Timetable of Operations*, No drilling would take place during the peak use period of the Green River Horse Camp, including Labor Day weekend. Regardless of timing, the road to the Horse Camp would remain open during exploration activities. The Horse camp will not be blocked or restricted in any way as a result of this Action. Recreation mitigation is listed in EA Section 3.12.3 and Appendix F.
38	The EA inadequately analyzes the effects on hunting. The Margaret elk are extremely important for quality hunting.	Effects on hunting.	As noted in EA Section 3.12.2.2.1 - *Direct Effects*, hunting opportunities would not be adversely impacted by the Proposed Action. Direct effects to wildlife such as migratory and resident mammals resulting from Project Actions may include tree removal, noise, and presence of workers, equipment, and lighting. These impacts are considered minor. Some individuals may be temporarily affected; however, the population as a whole would not. Mobile wildlife would be expected to temporarily vacate habitat adjacent to operating equipment because of noise and activity, dispersing to other areas around the Project Area where hunting activities could continue. Appendix F provides further mitigation measures. Goat Mountain is not considered to be suitable winter range for elk. See EA Section 3.5.1.3. See EA Section 3.12.2.3 and Appendix F for mitigation measures.

No.	Public Comment	Public Comment Summary	Agency Comment Response
39	The EA inadequately analyzes affects to tourists using Mount St. Helens. The EA does little to address any effects to visitors' experience of Mount St. Helens and the scenic value of Goat Mountain.	Effects on tourists using Mt. St. Helens and Goat Mountain.	As noted in EA Section 3.9, *Visual/Scenic Resources* , no drill sites nor the drill rig and ancillary equipment can be seen from the visitor centers at Mount St. Helens as the view path is blocked by higher ridgelines located between Mount St. Helens and Goat Mountain, which is 12 miles away to the northeast. Nearby ridgelines, including Whittier Ridge, block the view of Goat Mountain from the Mount St. Helens Volcanic Monument, so drilling operations and equipment on Goat Mountain would not be visible from the Monument. The 14-foot tall drill mast would be further obscured by the 20+ foot tall tree canopy. The Proposed Project Area is within the Forest Plan retention and partial retention VQOs. See Forest Plan Figure iv-7, page 4-23.
40	Impacts to goshawk not addressed in EA.	Impacts to goshawk.	The GPNF biologist states: Goshawks are not found in the area. If goshawks are found near the project site, appropriate buffers and timing restrictions will be implemented. The Project Record includes the Wildlife Analysis and BA, which is summarized in the EA in Section 3.5.1.3.
41	The EA does not adequately consider effects on important wildlife species. The EA states that certain species simply do not exist in this area, or that if they exist the project will only be short term so effects from roads and noise will be temporary at best.	Effects on important wildlife species.	The EA notes in Section 3.5.1.3 - *Wildlife Species* , that only those species that were identified as having a potential to be affected by the proposed project are discussed. Those 26 species with no habitat present, and no documented presence in the Project Area are eliminated from further analysis, including: gray wolf, grizzly bear, marbled murrelet, marbled murrelet critical habitat, peregrine falcon, common loon, harlequin duck, great gray owl, sharptail snake, Cope's giant salamander, Oregon spotted frog, Barry's hairstreak, Johnson's hairstreak, golden hairstreak, mardon skipper, Great Basin fritillary, Puget Oregonian, Columbia Gorge Oregonian, Evening fieldslug, western ridged mussel, warty jumping slug, Burrington's jumping slug, Malone's jumping slug, panther jumping slug, barren juga, Oregon megomphix, crowned tightcoil, shiny tightcoil, and blue-gray taildropper. Like the gray wolf, the proposed project area does not present an attractive environment due to the high active road density (more than 1.7 miles per square mile). The Forest Plan MIS species, Forest Service Sensitive Species and threatened and endangered species were considered in analysis of this project. The species cover a wide variety of habitat needs. The EA disclosed the noise disturbance, vegetation removal and mitigations to minimize the potential noise and light disturbance in the wildlife section, EA Section 3.5. The proposed action has a short term noise disturbance and minimal ground disturbance in reopening roads and some vegetation removal for some of the drill sites. All roads will be closed after use. The area will have minimal disturbance as a result of the proposed action.
42	The BA does not adequately analyze effects to fisheries.	Effects on fisheries	EA Section 3.6, *Fisheries* , addresses effects of the proposed project at length, including those to the local fish population, noting that by implementing and maintaining impact avoidance and minimization measures consistent with the ACS guidelines and the USFS National Core BMPs for Water Quality Management in Minerals Management Activities (FS-990a), impacts to surface water should be minimized to the point of being negligible. Of the 23 drill sites, 9 (pads 1 – 7, 14, and 15) are accessed directly along existing open roads (FS Road 2612 and a campground road). The remaining sites would be accessed on currently closed roads that would be temporarily reopened. Of the 14 sites on roads to be reopened, 7 (pads 10, 11, 12, 20, 21, 23, and 24) are on roads that were reopened for drilling in 2010 and then closed again. Four sites (pads 16, 17, 18, and 19) are on a road that was reopened recently (possibly 2007 or 2008) and then closed again. The remaining 3 (pads 13, 22, and 25) are on roads that have not been open as recently and have small tree seedlings and saplings growing on them. These project features are displayed on Figure 2. The pad number sequence is not continuous because two sites (pads 8 and 9) were eliminated from this exploration.
43	The BA never mentions black bear as being present in the area. Black bear are valuable big game species and do occur in this area. Bear activity in the area will be adversely affected by exploratory drilling activities. Effects to this species should be analyzed.	No discussion of black bear.	Wildlife and proposed project related effects are discussed throughout the EA. In particular EA Section 3.5.3 - Wildlife Mitigation Measures, describes how such impacts will be minimized. If black bear are present, their response to the proposed project activities would be similar to that of other large mammals, such as elk, and would be expected to be temporarily displaced from the Project Area while the exploration is occurring with a high expectation of their return to the area after the exploration activities cease as noted in Section 3.5.2.2.1 - Direct Effects. The black bear while not discussed in the effects section would have a similar response to the human activity as the elk. Bears would avoid the area during the drilling and return once the activity is over. There would be limited disturbance of vegetation and foraging opportunities and the roads would be closed once the exploration is complete.

No.	Public Comment	Public Comment Summary	Agency Comment Response
44	A National Pollutant Discharge Elimination System permit under the Federal Clean Water Act is required.	A NPDES permit is required	NPDES permits are required In Washington State for new disturbance that is greater than one acre in size. This Action would disturb 0.85 acres including pads and roadways. Additionally, standard stipulations on the prospecting permit require holder to obtain all necessary State and Federal permits. If an NPDES or any other Clean Water Act Permit is required, the permit holder must obtain it. See Appendix F for Mitigation Measures.
45	The BA conclusively assumes that federally listed species such as grizzly bears, gray wolves, Canada lynx, and various species of fish do not exist within the Project Area largely without citation to scientific authority. The EA does not adequately consider the effects on important wildlife species. The EA draws unsupported conclusions about project impacts to listed wildlife and other species in violation of NEPA and the ESA 'Under NEPA and the Endangered Species Act (ESA), BLM is required to discuss anticipated project impacts to listed species. ESA 7(a)(2).	BA assumes certain federally listed species do not exist within the Project Area without scientific citation. EA draws unsupported conclusion about impacts on listed wildlife. Effects on important wildlife species.	*The EA considered effects on species*: EA biologists analyzed ESA, MIS, S&M species within the project area and determined there would be no loss of habitat and no significant impacts to species as a result of this Proposed Action. WDFW and USFW concurred with the EA analysis, determination and mitigation. *The project is defined as follows*: Of the 23 drill sites, 9 (pads 1 – 7, 14, and 15) are accessed directly along existing open roads (FS Road 2612 and a campground road). The remaining sites would be accessed on currently closed roads that would be temporarily reopened. Of the 14 sites on roads to be reopened, 7 (pads 10, 11, 12, 20, 21, 23, and 24) are on roads that were reopened for drilling in 2010 and then closed again. Four sites (pads 16, 17, 18, and 19) are on a road that was reopened recently (possibly 2007 or 2008) and then closed again. The remaining 3 (pads 13, 22, and 25) are on roads that have not been open as recently and have small tree seedlings and saplings growing on them. These project features are displayed on Figure 2. The pad number sequence is not continuous because two sites (pads 8 and 9) were eliminated from this exploration. The Forest Plan MIS species, Forest Service Sensitive Species and threatened and endangered species were considered in analysis of this project. The species cover a wide variety of habitat needs. The EA disclosed the noise disturbance, vegetation removal and mitigations to minimize the potential noise and light disturbance in the wildlife section. (EA Section 3.5). The proposed action has a short term noise disturbance and minimal ground disturbance in reopening roads and some vegetation removal for some of the drill sites. All roads will be closed after use. The area will have minimal disturbance as a result of the proposed action. EA Sections 3.5, *Wildlife* and 3.6, *Fisheries* , describe known wildlife and fisheries within the Permit Area, included listed endangered species that may occur within the Project Area. EA Section 3.5. Determinations were made by a qualified biologist through thorough research (see references on pages 14 and 15 in the BA.) WSFW and USFW both concurred with determinations in the BA with supplemental mitigation measures.
46	As another general matter, the EA contains cursory and largely unsupported determinations of project effects to various listed, sensitive, or otherwise pertinent species and their habitat. Where BLM lacks data, its assumptions about project effects to listed or other species are unsupported and undermine its NEPA analysis.	EA contains cursory and largely unsupported determinations of project effects to various listed, sensitive, or otherwise pertinent species and their habitat.	EA Section 3.5, *Wildlife* . Determinations were made by a qualified biologist through thorough research (see references on pages 14 and 15 in the BA.) WSFW and USFW both concurred with determinations in the BA with supplemental mitigation measures.

APPENDIX D

National Association of Environmental Professionals (NAEP)
NEPA Review – Cumulative Effects Legal Review

Appendix D

A mine is not currently being proposed at Goat Mountain, and is only speculative. A speculative mine is not required by law to be accounted for in the cumulative effects analysis.

BLM has existing case law which reinforces the position that mining impacts are not appropriate for analysis for prospecting permit applications as decided in the following appeals case: *United States Department of the Interior Office of Hearings and Appeals Interior Board of Land Appeals, Missouri Coalition for the Environment Heartwood, IBLA 2003-184. Decided 9.5.07*: "[4] Quite properly, the EA did not analyze the potential environmental effects of mining. Appellants are mistaken in their belief that the EA was required to address the potential environmental impact of mining under any future lease which might be issued to Doe Run as a result of exploration, regardless of whether appellants regard those impacts as "cumulative" or the mining itself as a "connected" or "similar" action under 40 C.F.R. § 1508.25(a). When assessing reasonably foreseeable future actions, it was appropriate for BLM not to consider mine development, since "[d]evelopment does not necessarily follow exploration, . . . nor is it reasonably foreseeable to occur," given that the results of exploration, as well as other factors, may well determine that the company will never seek to develop a mine. *Concerned Citizens For Responsible Mining (On Reconsideration)*, 131 IBLA 257, 267 (1994) (plan of operations); *see id.* at 265-66 (mine exploration and development are not connected actions, as defined in 40 C.F.R. § 1508.25(a)(1), and therefore do not require consideration in a single EA); *see also National Wildlife Federation*, 145 IBLA 348, 376 (1998) ("[m]ine development is not a reasonably foreseeable result of exploration"); *Southern Utah Wilderness Alliance*, 122 IBLA 165, 168-70 (1992) (seismic survey and drilling a well); and *Uintah Mountain Club*, 116 IBLA 269, 271-72 (1990) (prospecting permits)."

From NAEP NEPA Review:
"Two new cases reinforce the notion that a "future action" becomes "reasonably foreseeable" once it is "proposed" ..... until then it is "speculative" and need not be accounted for in the cumulative impacts analysis in an EA or EIS: *Wilderness Workshop v. U.S. Bureau of Land Management*, 531 F.3d 1220, 1229 (10th Cir. 2008) (preliminary injunction denied for decision by the Bureau of Land Management (BLM) and the Forest Service (USFS) authorizing a company to construct, operate, and maintain the Bull Mountain Pipeline through roadless National Forest land) (EIS on natural gas pipeline is adequate even though it "did not consider development of new gas wells that would be facilitated by the pipeline as connected actions," where pipeline has independent utility and additional gas wells are not imminent):

"It is important to note that 'projects', for the purposes of NEPA, are described as 'proposed actions', or proposals in which action is imminent." *O'Reilly v. U.S. Army Corps of Eng'rs*, 477 F.3d 225, 236 (5th Cir.2007) (citing 40 C.F.R. § 1508.23). "[T]he mere contemplation of certain

action is not sufficient to require an impact statement." *Id.* (internal quotation marks omitted). "While a cumulative impact analysis requires the [reviewing agency] to include 'reasonably foreseeable' future actions in its review, improper segmentation is usually concerned with projects that have reached the proposal stage."*Id.*

In this case, the defendants concluded in their FEIS, in response to public comments, that it was unnecessary to analyze potential natural gas well development as a "connected action." 531 F.3d at 1231:However, as defendants noted in the FEIS, the development of additional natural gas wells is entirely speculative at this point, and will ultimately depend on "gas price and demand, among many other variables." In other words, although SG is undoubtedly contemplating the development of additional gas wells in the area, nothing in the record on appeal suggests that such development is imminent. *See O'Reilly,* 477 F.3d at 236."

APPENDIX E

Goat Mountain Hard Rock Prospecting Permit Applications EA
Biological Assessment

BIOLOGICAL ASSESSMENT –

GOAT MOUNTAIN HARDROCK PROSPECTING PERMIT APPLICATIONS TO BLM

Prepared for:

U.S. Forest Service
Gifford Pinchot National Forest
10600 NE 51st Circle
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April 12, 2012
Revised October 23, 2012 based on modifications to the Goat Mountain Hardrock Prospecting Permit Applications Environmental Assessment Project Alternative 3 resulting from public comments.

URS

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EXECUTIVE SUMMARY

Summary of Determination: This project **may affect but is not likely to adversely affect** northern spotted owls from potential harassment caused by noise disturbance because the project activities would be restricted in suitable habitat until after the early nesting season of the northern spotted owl. The project will have **no effect** on designated critical habitat for northern spotted owls.

There would be no effect to gray wolf, grizzly bear, bull trout, Lower Columbia River Chinook salmon, Lower Columbia River coho salmon and steelhead Lower Columbia River DPS. These species are very unlikely to occur in the action area and these species are not discussed in this Biological Assessment.

1.0 INTRODUCTION

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended, requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. Section 7(c) of the ESA, as amended, requires federal agencies to prepare a Biological Assessment (BA) for the purpose of complying with Section 7(a) by identifying any threatened or endangered species which is likely to be affected by the action.

1.1 Background and Consultation History

Information for this Biological Assessment was gathered from several sources including recent literature, Washington Department of Fish and Wildlife (WDFW) priority habitat and species (PHS) data, U.S. Forest Service (USFS), NMFS, USFWS, Washington Department of Natural Resources (WDNR), local agency biologists, and agency species lists. URS biologists conducted a site visit on October 4, 2011.

1.2 Project Location

The proposed project would occur in northeastern Skamania County, Washington within the Gifford Pinchot National Forest (Figure 1). The project area would include lands

immediately adjacent to the Green River Horse Campground just outside the northeast boundary of the Mount St. Helens National Volcanic Monument (Figure 2). The proposed project would be located in portions of Township 10 North, Range 6 East, Sections 8 and 17 (Willamette Meridian). Access to the project area would occur via USFS Road 2612.

The project area occurs in both undeveloped and actively managed industrial forest lands. The project site is located in the Southern Washington Cascades Province, within the Pacific silver fir (*Abies amabilis*) vegetation zone (Franklin and Dyrness 1988). It is located north of the Green River on the south facing slopes of the east-west trending Goat Mountain. The project would occur between 2,800 and 4,000 feet on the fringe of an area deforested by the 1980 Mount St. Helens eruption. A portion of the northern part of the project area is covered by mature forest that escaped the effects of the 1980 eruption. Areas devastated by the eruption were salvaged logged in 1982 and replanted by 1986. The current habitat conditions where the proposed action would occur varies from young forest plantations about 27 years of age to forests up to about 127 years of age (Figure 2). The project area, except for a fringe at the northern edge that is in a roadless area, is designated as forest matrix land to be managed for timber harvest and other uses.

Two perennial tributaries of the Green River occur within the project area but just outside the area where roads or drill pads will be used for the project (one to the east and one to the west). They drain south directly into the Green River from the forested slopes of Goat Mountain. At least two other small tributaries go through the project area. The project area is located at approximately River Mile 32 of the Green River.

1.3 Description of Project Elements

The Goat Mountain Hardrock Prospecting Permit Applications and associated exploratory drilling (Project), would install 23 drill pads to directionally drill 63 three-inch diameter holes to collect rock core samples for analysis to obtain geological and mineralogical information. The proposed project would use an existing active road, and temporarily reactivate approximately 1.69 miles of existing USFS decommissioned roads. All drilling pads and temporarily reactivated roads would be reclaimed after prospecting is completed. Each element of the project is discussed in more detail below.

Drill Pads

Drilling pads are each a maximum of 20 x 20 feet (400 square feet). They would occupy the road prism on reactivated roads and wherever possible reuse old drill pad sites to avoid clearing or grading additional forest habitat. Each drill pad location would be

cleared of vegetation and leveled. No impervious surface would be created. Drill pads along existing open roads would include use of existing road shoulders and widening of the shoulder as needed to accommodate the drill equipment. On active, open roads, no additional road maintenance due to the exploration activities is anticipated. Reclamation of drill pads and reactivated roads will include restoring water bars, removal of temporary culverts and re-establishing the drainage contours, placement of large wood pieces that were set aside during road reactivation, and reseeding.

Road Reactivation

Approximately 1.69 miles of existing USFS decommissioned roads would be "reactivated" by a small brushing excavator and/or chain saw which would clear shrubs, remove stumps, and remove fallen trees. This would be done by a small "Kubota" sized brushing excavator. Reactivated roads would be restricted from public access by a gate and signage. Personnel would access the drilling sites via 4 WD trucks and ATVs.

Of the 23 drill sites, nine (Pads 1 – 7, 14, and 15) are accessed directly along existing open roads (FS Road 2612 and a campground road). The remaining sites would be accessed on currently decommissioned USFS roads that would be temporarily reactivated. Of the 14 sites on roads to be reactivated, seven (Pads 10, 11, 12, 20, 21, 23, and 24) are on roads that were reactivated for drilling in 2010 and then closed again. Four sites (Pads 16, 17, 18, and 19) are on a road that was reactivated recently (possibly 2007 or 2008) and then closed again. The remaining three (Pads 13, 22, and 25) are on roads that were decommissioned and reclaimed, and currently have small tree seedlings and saplings growing on them. These project features are displayed on Figure 2. The pad number sequence is not continuous because two sites (Pads 8 and 9) were eliminated from this exploration.

Tree Removal

Hazard trees have been noted in the area. If hazard trees are deemed dangerous to the safety of the project by the company and USFS, they would be removed on a selective basis. On the roads that were reopened for the 2010 exploration program, no trees would be removed (with the possible exception of new danger trees that developed because of wind or other factors since 2010), and the new project footprint would be almost identical to the 2010 footprint.

The number of trees with the potential to be removed as a result of the project was calculated for the northern portion of the project area, which is considered mature forest.

This includes roads and pad area for pads 10, 11, 12, 13, 22, 23, 24, and 25. Up to 68 trees would be removed. Their size and location is described below.

On the road segments to Pads 22, 25, and 13 in the mature timber stand, which were not reopened in 2010, a few trees would be removed. On the road between pad 23 and pad 22, one approximately 10-inch dbh tree and several up to 4-inch dbh trees would need to be removed. At pad 22, two trees of 10-12-inch dbh would probably need to be removed. On the road between pad 23 and pad 25, two approximately 10-inch dbh trees would probably need to be removed plus about 25 trees between 4 inches and 7 inches dbh. At pad 25, one approximately 12-inch dbh tree and two approximately 6-inch dbh trees would probably need to be removed. On the road between pad 25 and pad 13, two approximately 12-inch dbh trees and several trees up to 4-inch dbh would probably need to be removed. At pad 13, no trees larger than 4-inch dbh would need to be removed.

Drilling Operation

Under Alternative 3, drilling fluid additives would be required to meet NSF/ANSI 60-2003 standards, or as approved by the agencies, for use in potable water supply wells to protect human health and the environment should drill holes encounter permeable zones and groundwater systems. Source water used for drilling would emphasize the use of on-site sources, including Duval Hole 06 and/or MM-10-10, supplemented as necessary by purchase from regulated potable water source(s) that are periodically tested and documented. On-site sources would be tested prior to use for pH, temperature, salinity, and at a minimum arsenic, cadmium, copper, lead, mercury, and zinc. Salinity testing is required to assist in selection of drilling fluid additives (bentonite). A temporary water storage tank would be placed at the Project site and filled with water purchased off-site, possibly from the town of Randle or other local community. The on-site tank would provide surge storage and/or compensation storage during times when uses of at-site sources are administratively restricted, or additional water is needed for road maintenance, dust suppression, and emergency fire control. Use of a water storage tank on-site for drilling operations would increase water truck traffic on local roads. The location of a water storage tank would be agreed upon by the USFS, BLM, and Ascot's field representative.

Use of on-site water from Duval Hole 06 and/or MM-10-10 would be limited to 5,000 gallons of groundwater per day, unless an appropriate water right or use permit is obtained from the Washington State Department of Ecology (Ecology). Other unforeseen conditions may arise that could result in further use restrictions by decisions from the Agencies. No local surface water would be used for project water needs. Daily on-site

water use would be recorded using a totalizing flow meter. Duval Hole 06 and MM-10-10 would be abandoned in accordance with Washington Administrative Code (WAC) 173-160-381 following the cessation of the drilling program, unless directed otherwise by the Agencies.

Drilling operations would be optimized to promote return of drill cuttings to minimize cutting distribution into adjacent formations, and to seal water bearing and porous formations to reduce cross-aquifer flow of groundwater. If loss of circulation is encountered during drilling, steps would be taken to re-establish circulation by sealing the formation causing the loss prior to continued drilling; if circulation is not re-established the drill hole would be abandoned by sealing. Drill cuttings, drilling fluid, and other waste water from drilling will be contained at the ground surface within each drill pad. Appropriately sized sumps lined with impermeable liner and/or tanks would be used. Sumps and/or tanks would be required to be placed within currently defined drill pads, or at an alternate location approved by the agencies. Drilling fluid would be reused to the extent practicable, to minimize water use. Drilling fluid decant water would be infiltrated through an enviro-mat at the ground surface within the respective drill pad; solid materials such as cuttings would be appropriately disposed of off-site.

To verify that groundwater is not negatively being impacted by drilling activities, groundwater from Duval Hole 06 and MM-10-10 would be sampled prior to drilling activities and monthly during drilling. Samples would be analyzed for temperature, pH, salinity, and at a minimum arsenic, cadmium, copper, lead, mercury, and zinc. If significant changes in water quality are observed, drilling would be suspended until appropriate measures to protect groundwater are determined and implemented, or the cause ascribed to natural conditions.

Drill holes advanced through overburden would be over-cased with a temporary casing extending into underlying bedrock to prevent near surface groundwater from flowing into the annular space of the exploratory drill hole and to prevent fluids from discharging out of the annular space to soil.

Upon completion of drilling at each exploratory drill hole, the drill hole would be sealed generally as described in Washington State Department of Natural Resources' fact sheet "Mineral Exploration Well/ Drill Hole Plugging and Abandonment". Sealing would include a ten-foot cement surface plug placed within the top twenty feet of each drill hole to help ensure an adequate surface seal. Portland concrete cement mixed with clean water and aggregates, or bagged cement mixed with clean water, would be used for the surface plug. The top of the surface plug would be completed one to two feet lower than

the post-reclamation surface of the drill pad to prevent future trip hazards and address aesthetic concerns. Alternate drill hole abandonment/sealing methods and materials would be considered for prior approval. Alternate abandonment methods would include drill-string tremie placement of sealing materials, and use of high-solids bentonite grout and/or bentonite/cement mixtures such as described in Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160), providing the sealing methods and materials ensure a seal that would prevent water flow into, within, and around the abandoned drill hole. To verify that Ascot is prepared to address artesian flow of groundwater, an emergency sealing plan would be provided to the permitting agency in advance of drilling that would include instructions and contact information for getting equipment and supplies to the drill site in a timely manner and provide reasonable plans for controlling and stopping flow.

Reclamation

Pads and access roads would be reclaimed by scarring an uneven surface as close to original grade as is practical and stable. Cast piles would be pulled back from the outside on to areas with a slope and spread irregularly over the surface with natural contours.

1.4 Project Timing

For access purposes, work would be confined to the snow-free season in this area, which is from mid to late May until early November. The proposed program would take approximately five months to complete with the proposed equipment. The preferred start date would be late May 2012, with a completion date by late October 2012. If permitting for the program pushes the start date past May 2012, the project may be split it into two phases, with drilling of the southern area separated from drilling of the northern steeper areas (due to timing restrictions on various components). At the latest drilling and reclamation would be completed by October 2013.

Further timing restrictions are discussed below, in Section 1.5 Impact and Avoidance Measures and Section 4.1 Direct Effects.

1.5 Impact and Avoidance Measures

To avoid potential impacts to northern spotted owls, no road clearing, vegetation removal, or drilling actions would be conducted in or adjacent to spotted owl suitable habitat until after the early breeding season ends June 30 (February 28 – June 30).

No new roads would be created in the late successional old growth forest stands. Reactivating existing roads and establishing or reestablishing drill pads, including clearing and grading, would not increase the dimensions of the road such that forest habitat would be lost.

Up to 68 trees would be removed as part of the road reactivation, none of which are considered “mature trees”, and all would be less than 12dbh (diameter at breast height). Any additional danger trees that must be dropped would be retained at that location as downed woody debris to provide habitat for resident wildlife.

No new drilling pads and only minimal expansion, as necessary, of existing drilling pads (that requires clearing trees) would occur. No new drilling pads and no expansion of existing drilling pads would occur within undisturbed, late successional mature forest, or forest habitat suitable to northern spotted owls.

Temporarily reactivated roads would be reclaimed after drilling in that section of the project area is completed. Drilling pads and access roads would be reclaimed by scarring the road to an uneven surface as close to original grade as is practical and stable. This would minimize the amount of time that topsoil and vegetation is stockpiled and minimize potential erosion and downstream sedimentation from future precipitation events.

Spill containment and response kits would be present and immediately accessible at all drilling and equipment maintenance sites in the event of an accidental chemical spill or release. All equipment and maintenance / fueling operations would use adequate spill prevention containment devices.

2.0 ACTION AREA

The Action Area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action” (50 CFR §402-02). Specifically, the Action Area includes the geographic extent of biological, chemical, or physical effects created by the project above baseline conditions. No adverse biological or chemical effects are anticipated to occur based on the project elements described in Section 1.3 Description of Project Elements. Noise is assumed to be the most significant physical effect resulting from the proposed actions and is therefore used to calculate the Action Area. Based on noise calculations in Section 4.1 Direct Effects, the action area would be approximately 2,877 feet from the geographic extent of chainsaw or excavator

noise (the greatest noise producing activities) used for vegetation clearing (Figure 3). The Action Area, as shown on Figure 3, goes a shorter distance on the north side because the ridge top likely acts as a barrier to noise.

3.0 LISTED SPECIES AND CRITICAL HABITATS IN THE ACTION AREA

3.1 Federally Listed Species in the Action Area

Federally listed threatened and endangered species with potential to occur in Skamania County include (USFWS 2012a, NMFS 2012):

- Bull trout (*Salvelinus confluentus*) – coastal Puget Sound distinct population segment (DPS),
- Lower Columbia River Chinook salmon (*Onchorynchus tshawytscha*) evolutionarily significant unit (ESU),
- Lower Columbia River coho salmon (*O. kisutch*) ESU,
- Steelhead (*O. mykiss*) Lower Columbia River DPS,
- Canada lynx (*Lynx canadensis*),
- Gray wolf (*Canis lupus*),
- Grizzly bear (*Ursus arctos horribilis*), and
- Northern spotted owl (*Strix occidentalis caurina*).

Grizzly bears and gray wolves may have occurred historically in Skamania County, Washington. Grizzly bears and gray wolves could utilize the habitat in the vicinity of the Action Area. However, no documented presence of grizzly bears or gray wolves has been recorded in recent history, and no populations are near enough for dispersal by either species to the Action Area. The closest documented recent sighting of either species is for gray wolves north of Interstate 90 in Kittitas County, Washington (WDFW 2011). The above mentioned species are therefore not addressed in this biological assessment.

In 2004 the potential Canada lynx habitat was analyzed on the Gifford Pinchot National Forest. A small amount of habitat was identified near Mt Adams. It was determined not adequate to support a breeding unit for Canada lynx. The US Forest Service submitted the information to USFWS, Lacey office. The USFWS concurred with the determination. Therefore, Canada lynx is not considered in this BA.

Of the federally listed species with potential to occur in Skamania County, only the northern spotted owl has the potential to occur in or near the Action Area. The northern spotted owl was listed as a federally threatened species throughout its range in Washington, Oregon and northern California effective July 23, 1990 (USFWS 1990). Loss of late-successional forest habitat from timber harvest was the primary impetus for the listing. A 2004 status review for the northern spotted owl found the major threats at that time included the effects of past and current timber harvesting, loss of habitat from fire, and competition with barred owls (*Strix varia*). Of the threats identified at the time of listing, only one (predation linked to forest fragmentation) does not now appear well supported (Courtney et al. 2004).

Northern spotted owls are documented to occur in the project vicinity (USFS 2012). According to U.S. Forest Service (USFS) GIS data, the nearest northern spotted owl observation record from surveys in 2003 is located approximately 2.5 miles north of the project site (Figure 4). According to the same data, the nearest observed "activity polygon" for northern spotted owl is approximately 3.75 miles northeast of the project site (Figure 4).

Northern spotted owl suitable habitat is present within the action area for all stages of spotted owl life history (USFS 2012). Spotted owl habitat is often subdivided into distinct components (USFWS 2011, 1992).

- Nesting / Roosting Habitat – forested areas used for nesting, roosting, foraging, and dispersal by spotted owls that usually have more late-seral forest characteristics than "foraging" or "dispersal" habitats.
- Foraging Habitat – forested areas largely used for foraging, dispersal, and other nocturnal activities, but *not* nesting or roosting.
- Dispersal Habitat – forested areas predominantly used for dispersal, but *not* nesting, roosting, or foraging.

These categories are not absolutes but instead represent generalizations. Nesting-roosting habitat is generally considered to provide all or most habitat requirements, whereas foraging and dispersal habitats are considered to provide only a subset of the spotted owl's habitat requirements (USFWS 2011).

Approximately 436 acres of suitable habitat are located within the Action Area. Seven of the 23 drilling pad sites (10, 11, 12, 13, 22, 23, and 25) are located within northern spotted owl habitat considered suitable for nesting, roosting, foraging and dispersal (Figure 5). Drilling pad 24 is immediately adjacent to the suitable habitat mentioned

above (within approximately 75 feet). Access routes to drilling pads 10, 11, 12, 13, 22, 23, 24 and 25 also occur within suitable habitat. The remaining fifteen pads are located within forest stands that provide no suitable habitat of any kind for northern spotted owl. The total of each type of habitat within the action area is summarized in Table 1.

Table 1. Suitable Northern Spotted Owl Habitat Within the Action Area.

Type of Habitat	Acres within Action Area	Percent of Habitat in the Action Area
Suitable Nesting, Roosting, Foraging and Dispersal Habitat	174	13
Suitable Foraging and Dispersal Habitat	128	9
Suitable Dispersal Habitat	134	10
Unsuitable	*918*	*68*
TOTAL	**1,354 Acres**	**100%**

3.2 Federally Designated Critical Habitat in the Action Area

Critical habitat is designated for the northern spotted owl, bull trout, steelhead, and Chinook salmon in Skamania County (USFWS 2012, NMFS 2005). Bull trout designated critical habitat does not occur in the Green River drainage (USFWS 2010). Designated critical habitat for steelhead and Chinook salmon includes the Green River upstream to approximately river mile 25, the location of an impassible anadromous fish barrier (Haapala 1993, NMFS 2005, StreamNet 2012). Steelhead and Chinook salmon designated critical habitat therefore does not extend upstream into the Action Area. Northern spotted owl designated critical habitat is present to the east and south beyond the proposed Action Area (Figure 6) (USFS 2012). A new proposed rule for northern spotted owl designated critical habitat was proposed in March 2012 as part of a legal order would add, remove, or reclassify northern spotted owl critical habitat based on updated science and forest management directives (USFWS 2012b).

4.0 EFFECTS OF THE ACTION

This analysis addresses all potential actions of the project on listed species and critical habitats, including direct, indirect, interdependent and interrelated effects of the project. These effects can be defined as follows:

- Direct effects are defined as the direct or immediate effects of the project on the species or its habitat. Direct effects include those resulting from interdependent or interrelated actions.
- Indirect effects are those that are caused by or would result from the proposed action and are later in time, but still reasonably certain to occur.
- Interdependent actions are those that have no independent utility apart from the action under consideration. Interdependent actions are typically "because of" the proposed action.
- Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interrelated actions are typically "associated with" the proposed action.

4.1 Direct Effects

Northern Spotted Owls

The Ascot Plan of Operations (Ascot USA 2011) proposed that actions would occur during the nesting season, raising the potential of direct effects from harassment caused by noise disturbance near active nests. Northern spotted owls may be susceptible to noise disturbance from project actions. The proposed use of trucks, excavator, ATV, and drilling rig, as well as chainsaws and pumps, would introduce increased levels of sound into the project area.

The ambient noise level in the forest is generally considered to be 40 dB (WSDOT 2011). Chainsaws are considered to have an average maximum noise level of 84 dB and an excavator 81 dB (measured at 50 feet). Using a noise attenuation table for soft-site conditions (vegetated area), it is estimated that the maximum generating activity would potentially have a behavioral effect on northern spotted owls at 182 feet or less from the activity[1]. Using the same assumptions, this noise would attenuate to ambient levels at approximately 2,877 feet from the source.

As mentioned in Section 1.3 Description of Project Elements, the drill rig is estimated to have a maximum of 76 dB (at 50 feet) while actively drilling. Using the noise attenuation table, drilling would attenuate to ambient levels at 1,377 feet from the source, and potentially have a behavioral effect on northern spotted owls at 87 feet or less from the activity.

[1] Assuming 84 dB for chainsaws, and a behavioral effects threshold of 70 dB.

Spotted owl nesting behaviors may be disrupted by loud noise and activity that occurs in close proximity to an active nest during the early portion of the nesting season. Northern spotted owl early nesting season is defined as February 28 to June 30 in the Gifford Pinchot National Forest. Early nesting season behavior includes nest site selection, egg laying, incubation, and brooding of nestlings to the point of fledging (Forsman et al. 1984, pp. 32-38).

Because the area has not been recently surveyed for northern spotted owls, it is possible that an active northern spotted owl nest site could be located in the northern portion of the project area (in the area of suitable habitat). **To avoid potential noise-related disturbance to northern spotted owls, the project would have a limited operating period, between July 1 to February 28 within suitable northern spotted owl habitat. No road reactivation or drilling activities in or immediately adjacent to the late successional old growth forest stands would be allowed in the upper elevation section of the project area until after June 30.**

Northern Spotted Owl Habitat

Up to 68 trees would be removed within designated "suitable" habitat for northern spotted owls as part of the road reactivation. The trees to be removed would be small; none would be greater than 12 inches dbh or considered "mature trees". The relatively small number of trees to be removed, and their small size is the reason for determining that the project is "not likely to adversely affect" northern spotted owls.

A few additional danger trees may be removed, the exact number of which would be determined during road reactivation. The purpose of danger tree removal would be to assure the safety of drilling crews. Work would be primarily completed within existing road prisms or on existing drilling pads created during previous prospecting actions (Ascot USA 2011). Specific tree removal needs within the mature forest is described in Section 1.3. The potential removal of a limited number of danger trees does not change the "not likely to adversely affect" determination for northern spotted owls.

Downed woody debris and young regenerating trees and shrubs would be pushed temporarily to the edges along access roads and at drilling pads. Some trees along the access roads and at drilling pads may be partially delimbed to provide access and safety at each drilling site. At the completion of the project, the drilling pads and access road improvements would be reclaimed. Debris created during the vegetation clearing actions would be scattered back across the roads and drilling pads. Graded areas would also be reseeded according to USFS specification. The effects of vegetation removal are

considered temporary due to the reclamation activities specified by the proposed action. Reclamation and reseeding would replicate the habitat conditions existing prior to the proposed action.

4.2 Indirect Effects

Indirect effects to wildlife are defined as those which will be later in time but are reasonably certain to occur. No indirect effects are anticipated from the proposed action.

4.4 Effects Determination

Suitable nesting, roosting, foraging and dispersal habitat exists for northern spotted owls within the proposed project area. A small number of small tree (no mature trees) would be removed as part of the project. Approximately 68 trees are estimated to be removed, as visually observed during a site visit. No trees to be removed are expected to be greater than 12 inches dbh. Vegetation removal would be limited to saplings, shrubs, partial delimbing, and downed woody debris unless safety hazard "danger trees" are encountered. Avoidance and minimization measures will be implemented in order to reduce the potential effects to northern spotted owls. They include a limited operating period from July 1 to February 28 within suitable northern spotted owl habitat, including drilling pads 10, 11, 12, 13, 22, 23, 24, and 25, and the roads leading to those pads. Additional avoidance and minimization measures, discussed in Section 1.5 include the use of existing drilling pads and roads and reclamation of reactivated roads. The impacts of proposed vegetation removal would be temporary, as reclamation is proposed by the applicant. Native plant materials will be used for revegetation and rehabilitation where timely natural regeneration of the native plant community is not likely to occur. Under no circumstances will non-native invasive plant species be used for revegetation.

Direct effects to northern spotted owls during the early nesting season may occur as a result of noise above ambient conditions caused by road and pad work and drilling activities. However, a limited operation period from July 1 to February 28 will be in effect for areas within suitable spotted owl habitat. Because of this avoidance measure, potential effects to northern spotted owl, if they are present, would be limited to the late nesting season when they are less vulnerable to disturbance from noise and tree cutting. Based on these avoidance and minimization measures, the project "**may affect, but is not likely to adversely affect**" northern spotted owls.

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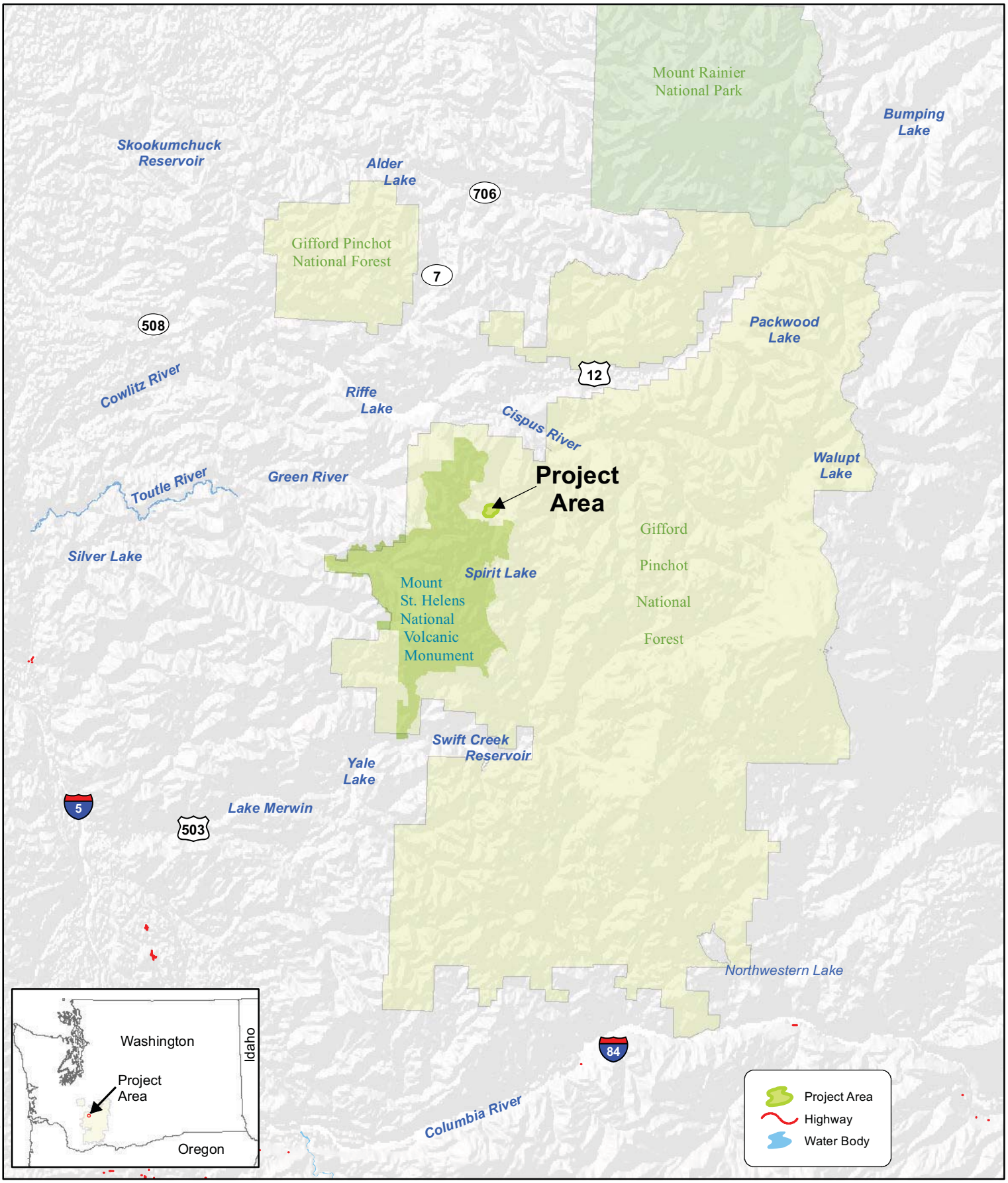

Figure 1
Project Vicinity

URS

N

0 5 10 20
Scale In Miles

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

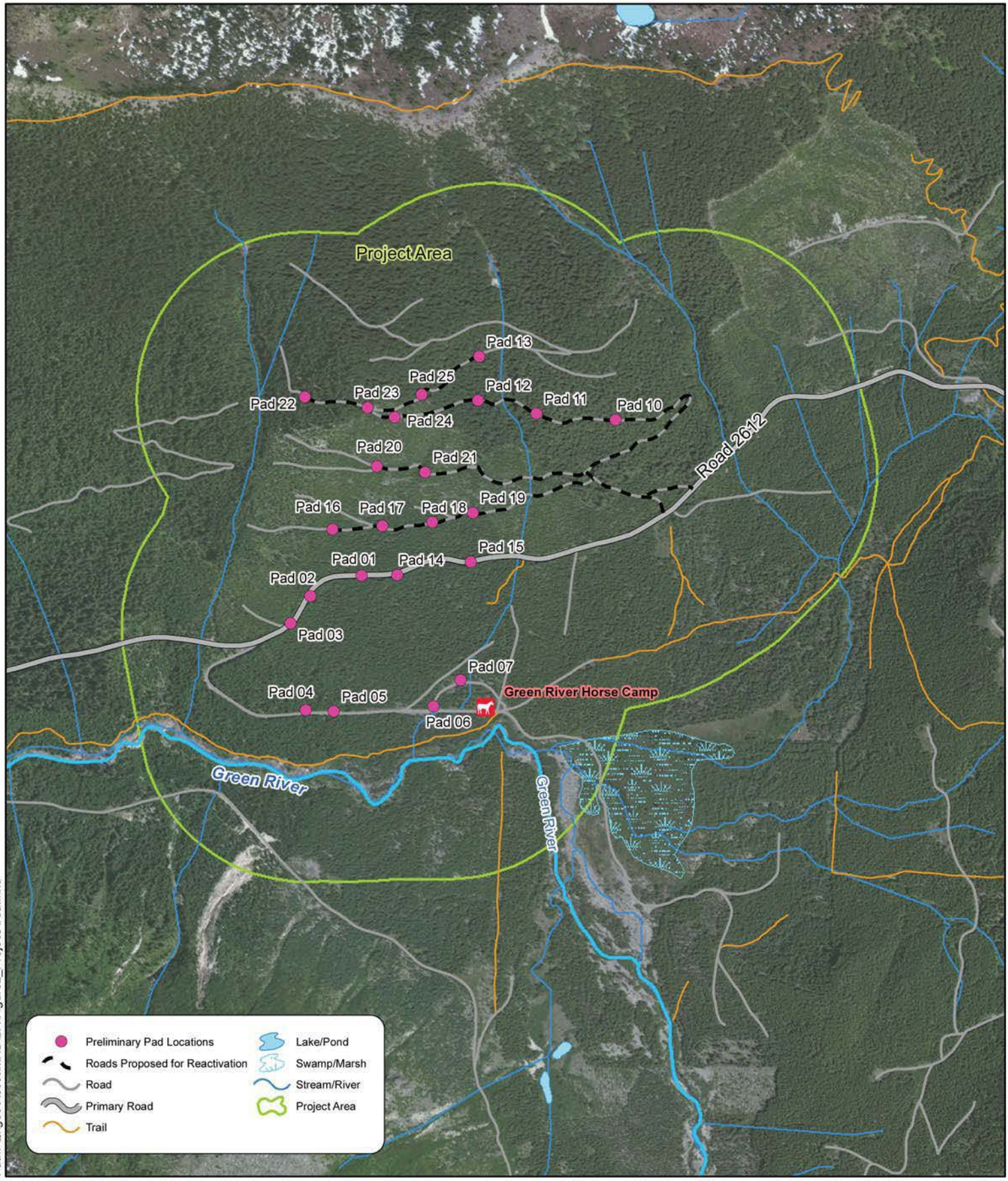

Figure 2
Project Area

URS

N

0 500 1,000
Scale In Feet

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

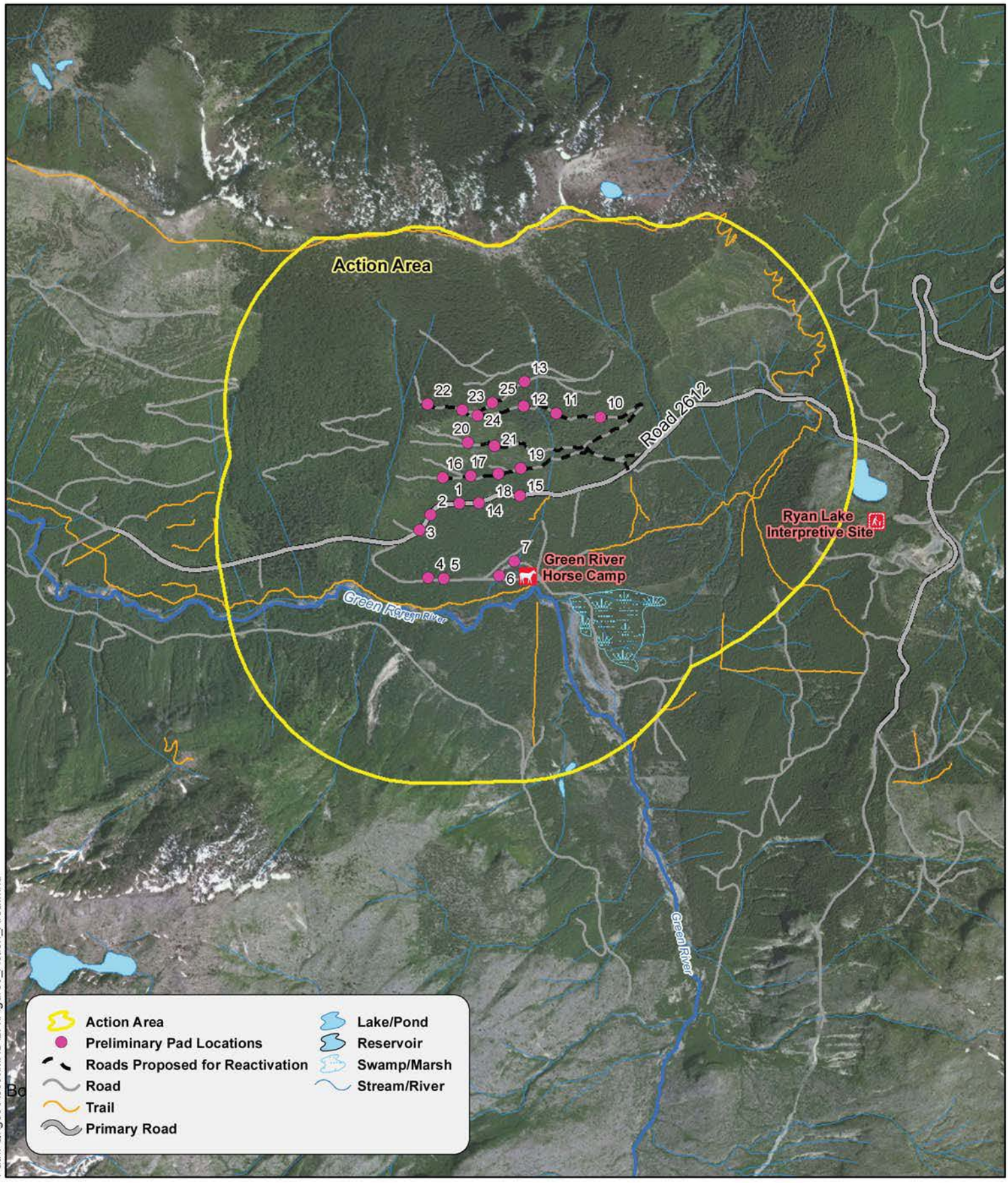

Figure 3
Action Area

URS

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

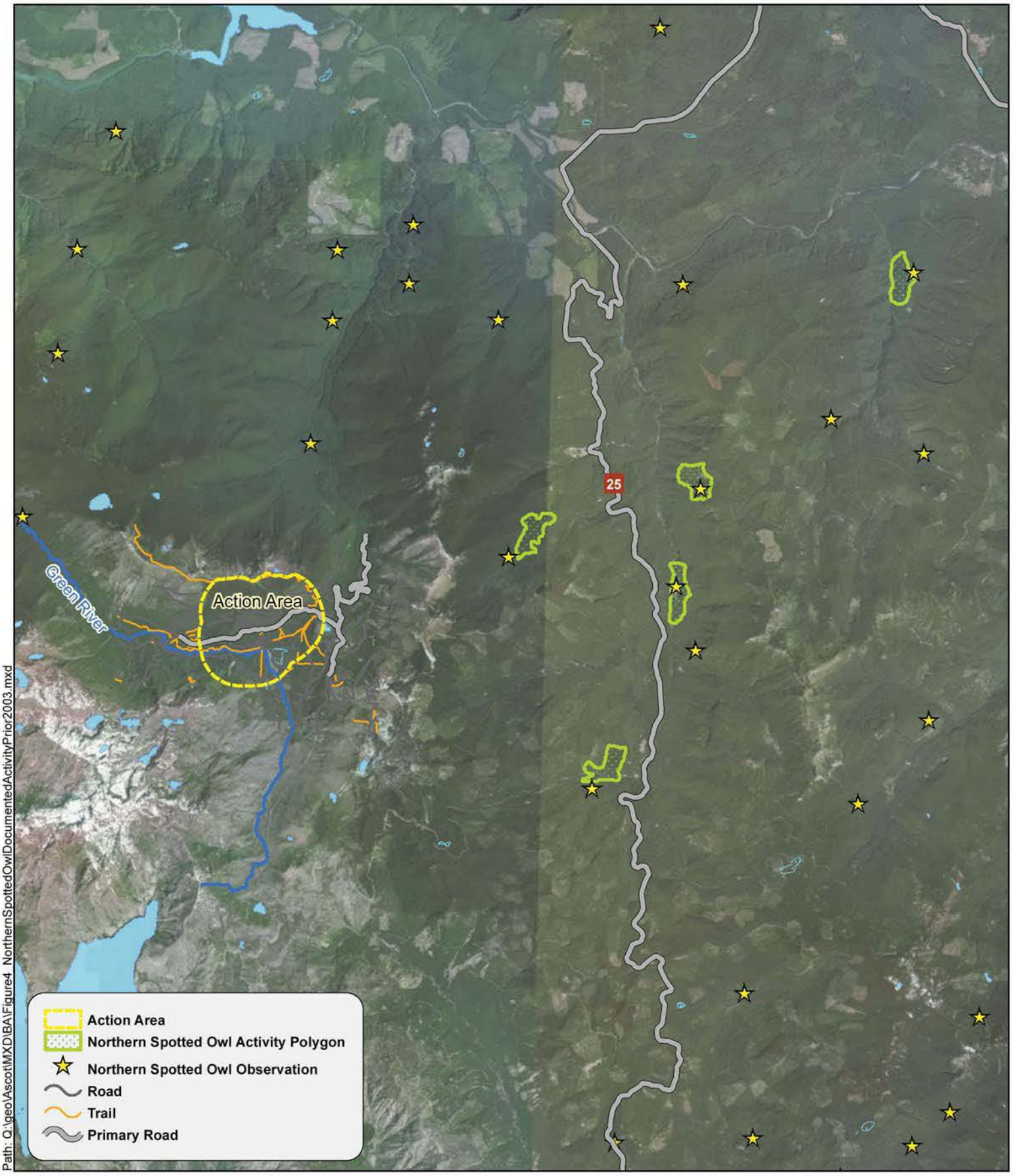

Figure 4

Northern Spotted Owl Documented Activity (Prior to 2003)

URS

N

0 1 2

Scale In Miles

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

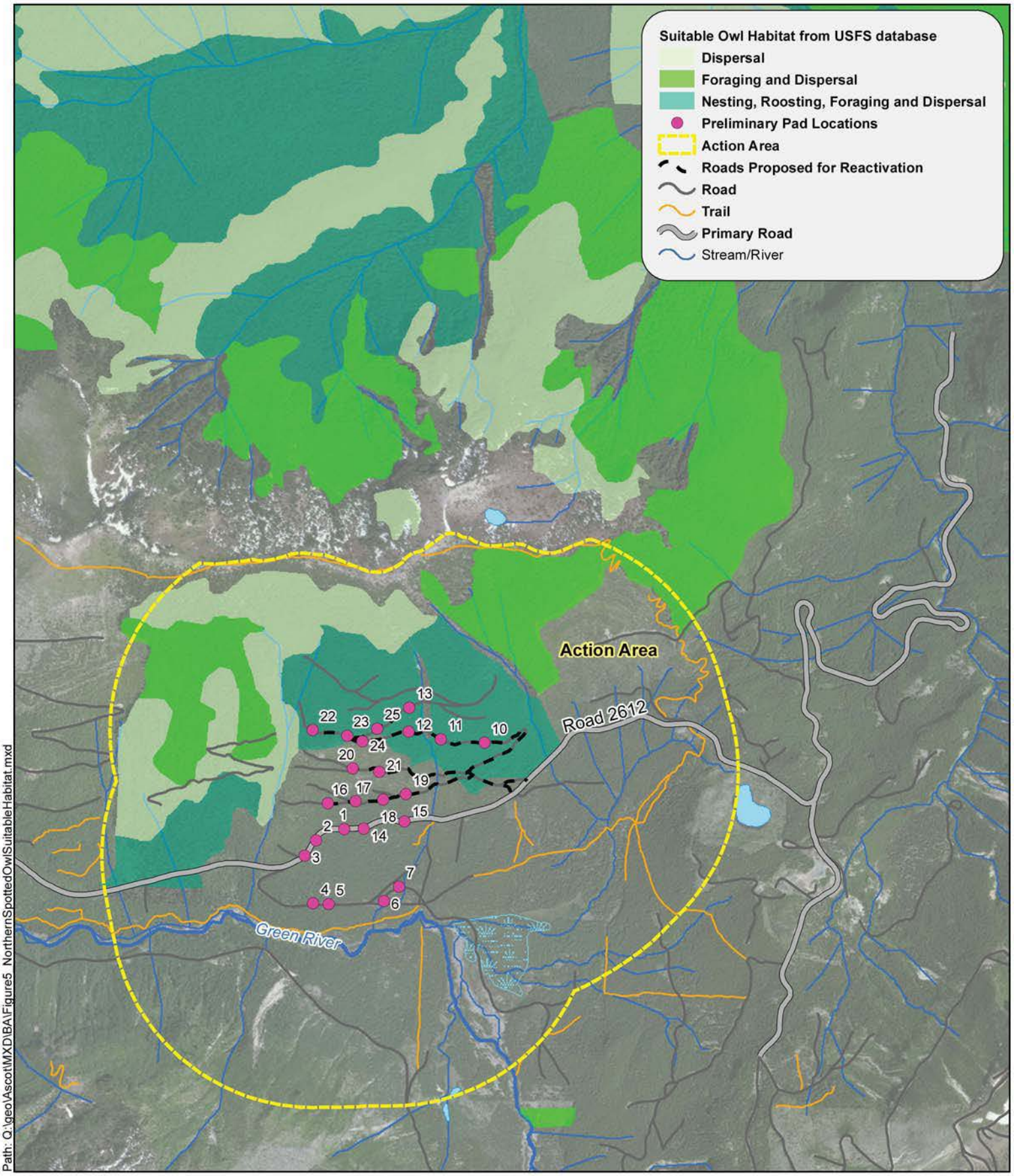

Figure 5

Northern Spotted Owl Suitable Habitat

URS

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

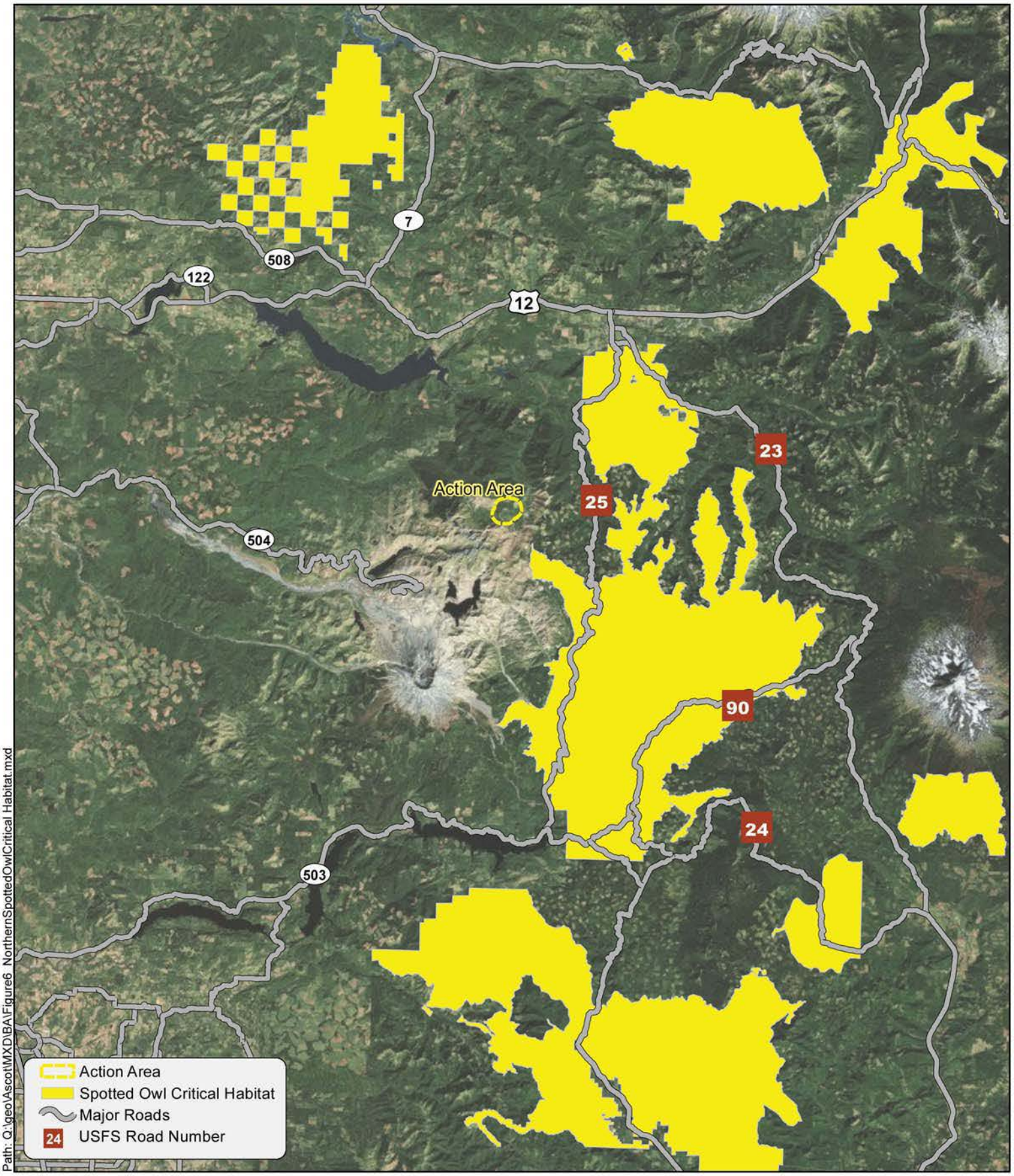

Figure 6

Northern Spotted Owl 2008 Designated Critical Habitat

URS

N

0 1 2 4 6

Scale In Miles

Goat Mountain Prospecting Permit Application
Biological Assessment
Gifford Pinchot National Forest, Washington

APPENDIX F

Mitigation Measures

Appendix F
Goat Mountain Hardrock Mineral Prospecting Permit Applications Environmental Assessment
Mitigation Measures

Mitigation Measure	Description	EA Section
Air Quality		3.10
MM-1	To reduce impacts, excavated materials from sump construction would be visually monitored for wind and water erosion. If needed, the piles would be covered to prevent material loss. The proposed work area generally receives enough rainfall to keep dust levels low along the unimproved roads. If visual dust is observed during road travel, a water truck would be used to reduce dust emissions during heavy traffic. Prompt site reclamation following drilling activities would also result in a reduction of windblown material.	3.10
Cultural Resources		3.8
MM-2	All project employees will be instructed regarding the type and nature of archaeological and cultural features that might be encountered during project construction, including the proper steps for protecting and reporting such features before further ground disturbing activities are undertaken.	3.8
MM-3	Ascot and its agents will be required to adhere to protocol outlined in an Inadvertent Discovery Plan, which details actions to be followed by Ascot and its agents in the unlikely event unanticipated cultural resources or human remains are encountered during implementation of the Project. Ascot will be advised of state and federal regulations and laws protecting cultural resources and human remains, both orally and as documented in the Inadvertent Discovery Plan, which would be developed by the USFS GPNF archaeologist, who will be responsible for ensuring that the plan is adhered to throughout the duration of the Project. Should any cultural resources or human remains be encountered, further ground disturbing activities would be curtailed until the site has been properly investigated and cleared.	3.8
MM-4	In the case that a designated member of an associated Tribe(s) request to monitor the Project Site during drilling, this activity would be included as a permit condition and coordinated through the BLM/USFS. The designated tribal member will adhere to all on-site safety measures.	3.8
Fisheries		3.6
MM-5	Applicable — General Water Quality BMPs shall be adhered to (USFS National Core BMPs 2012).	3.6
MM-6	Within seven days after Project completion, any disturbed sites adjacent to streams would be protected from erosion through approved grading, seeding (native seeds) and use of weed-free mulching and other erosion control devices necessary to mitigate movements of sediment into stream waters. If initial erosion control measures are inadequate, a new erosion control plan would be required and implemented as soon as possible. If seasonally late, then ensure that within one year of Project completion stream banks would be vegetated with native grasses or woody species that have been approved by the USFS District hydrologist and botanist.	3.6

MM-7	Develop and carry a BLM approved Spill Prevention Control and Countermeasures (SPCC) plan before operations begin. Containment plan should include but not be limited to possessing a spill containment kit on-site and having pre-identified containment locations. A spill containment kit would be located where equipment is stored or operated. Equipment would be scrubbed so it is free of external petroleum-based products and invasive plant seeds or biomass. Hydraulic/oil/fuel leaks would be repaired prior to operating on National Forest System lands. Equipment would be checked daily for leaks and any necessary repairs would be completed prior to commencing work activities along the stream. Equipment storage locations would be approved by the Project administrator. Equipment would not be stored adjacent to or in stream channels when not in use, which would avoid potential effects of vandals, accidents, or natural disasters. Any accidental spills of a hazardous material (e.g., oil, fuel, transmission fluid) from any operating equipment or in place of storage on land or in water must be reported to GPNF personnel.	3.6
MM-8	Service and refueling areas would be located at least 100 feet from stream courses or wet areas (including chainsaws and other hand powered tools).	3.6
Geology[1]		3.2
MM-9	Avoid or minimize long-term impacts to soil, water quality and riparian resources to the extent permitted by the geologic target when selecting locations for exploration activities.	3.2
MM-10	Avoid water bodies, sensitive areas, unstable slopes and highly erosive soils to the extent practicable.	3.2
MM-11	Limit clearing, excavation and other surface disturbing activities to the minimum necessary for exploration needs.	3.2
MM-12	Design and construct all new roads and drilling pads to a safe and appropriate standard, "no higher than necessary" to accommodate their intended use (see BMP Road-2 (Road Location and Design), BMP Road-3 (Road Construction and Maintenance) and BMP Road-4 (Road Operations and Maintenance)).	3.2
MM-13	Employ suitable design and construction practices to avoid, minimize, or mitigate surface disturbances as well as maintain the reclamation potential of the site.	3.2
MM-14	Use directional drilling techniques when practicable to avoid or reduce surface disturbance.	3.2
MM-15	Limit the extent of open exploratory areas at one time and restore one site before moving on to the next one, to the extent practicable.	3.2
MM-16	Use applicable practices from BMP Fac-2 (Facility Construction) to minimize erosion and stormwater discharge from ground disturbance at exploration sites.	3.2
MM-17	Use applicable practices of Chemical Use Management Activities BMPs when chemicals are used in exploration activities.	3.2
MM-18	Use applicable practices of BMP Fac-6 (Hazardous Materials) to manage petroleum products and other hazardous materials used in exploration activities.	3.2
MM-19	Use applicable practices from BMP Min-2 (Mineral Exploration) to properly manage all exploration-related wastes, including drilling fluids, produced water and potentially acid-generating rock materials, to minimize the risk of groundwater and surface water contamination and to meet state and federal requirements.	3.2
MM-20	Use applicable practices of BMP Min-7 (Ore Stockpiles, Mine Waste Storage and disposal, Reserve Pits and Settling Ponds) and BMP Min-8 (Produced Water).	3.2

[1] Forest Service Manual BMPs for Minerals Exploration (Ref. FSM 2810, 2820, and 2850).

MM-21	Use applicable practices of BMP Min-9 (Minerals Extraction Site Reclamation) to reclaim the project site once exploration activities are completed.	3.2
Hydrology/Hydrogeology[2]		3.3
MM-22	Guideline-1. Adverse effects to aquatic and other riparian dependent resources from mineral operations should be minimized or avoided. For operations in a riparian management area, ensure operators take all practicable measures to maintain, protect, and rehabilitate water quality, and habitat for fish and wildlife and other riparian dependent resources which may be affected by the operations.	3.3
MM-23	Guideline-2. Structures and support facilities should be located outside Riparian Reserves. Where no alternative to siting facilities in Riparian Reserves exists, locate them in a way to minimize adverse effects to aquatic and other riparian dependent resources. Existing roads should be maintained to minimize damage to aquatic and riparian dependent resources in the Riparian Reserves.	3.3
MM-24	Guideline-4. Where possible, adjust the operating plans for existing activities to minimize adverse effects to aquatic and riparian dependent resources in the Riparian Reserves.	3.3
MM-25	Guideline RF-1. (RF-Road Management from Standard and Guidelines in Forest Plan) Generally avoid new road construction in Riparian Reserves, except where necessary for stream crossings.	3.3
MM-26	Standard RF-2. Avoid side-casting (placement of unconsolidated earthen waste materials resulting from road and drill site construction or maintenance) in Riparian Reserves.	3.3
MM-27	Standard RF-3. Avoid placing fill material on organic debris in Riparian Reserves.	3.3
MM-28	Standard RF-4. Minimize or avoid disruption of natural hydrologic flow paths, including diversion of stream flow and interception of surface and subsurface flow when constructing or reconstructing roads or landings either inside or outside of Riparian Reserves.	3.3
MM-29	Guideline RF-5. Wetlands and unstable areas should be avoided when reconstructing existing roads or constructing new roads and landings. Minimize impacts where avoidance is not practical.	3.3
MM-30	Standard RF-6. New or replaced permanent stream crossings will accommodate at least the 100-year flood, including associated bedload and debris.	3.3
MM-31	Standard RF-7. Where physically feasible, construction or reconstruction of stream crossings will avoid diversion of stream flow out of the channel and down the road in the event of crossing failure.	3.3
MM-32	Standard RF-8. In fish bearing streams, construction or reconstruction of stream crossings will provide and maintain passage for all fish species and all life stages of fish.	3.3
MM-33	Guideline RF-9. Construction or reconstruction of stream crossings should allow passage for other riparian dependent species where connectivity has been identified as an issue.	3.3
MM-34	Guideline RF-11. Generally minimize hydrologic connectivity and delivery from roads. This includes roads inside and outside of Riparian Reserves.	3.3

[2] Aquatic and Riparian Conservation Strategy Guidelines (ACS); Aquatic Conservation Strategy (ACS) Objectives. Forest Service National Core Best Management Practices (BMPs) for Water Quality Management in Minerals Management Activities (USFS 2012); Minerals and Road Management Standards and Guidelines established for Riparian Reserves in the GPNF Forest Plan

MM-35	Guideline RF-12. Road drainage should be routed away from potentially unstable channels, fills, and hill slopes. This applies both inside and outside of Riparian Reserves.	3.3
Standards and Guidelines: Attachment A to the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl 1994		
MM-36	RF-2. For each existing or planned road, meet Aquatic Conservation Strategy objectives by: a) Minimizing road and landing locations in Riparian Reserves. b) Completing watershed analyses (including appropriate geotechnical analyses) prior to construction of new roads or landings in Riparian Reserves. c) Preparing road design criteria, elements, and standards that govern construction and reconstruction. d) Preparing operation and maintenance criteria that govern road operation, maintenance, and management. e) Minimizing disruption of natural hydrologic flow paths, including diversion of stream flow and interception of surface and subsurface flow. f) Restricting sidecasting as necessary to prevent the introduction of sediment to streams. g) Avoiding wetlands entirely when constructing new roads.	3.3
MM-37	RF-4. New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges and other stream crossings determined to pose a substantial risk to riparian conditions will be improved, to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of stream flow out of the channel and down the road in the event of crossing failure.	3.3
MM-38	RF-5. Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.	3.3
MM-39	RF-6. Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams.	3.3
MM-40	RF-7. To meet the Aquatic Conservation Objectives. The contractor shall provide: a) Inspections and maintenance during storm events. b) Inspections and maintenance after storm events. c) Road operation and maintenance, giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources. d) Traffic regulation during wet periods to prevent damage to riparian resources.	3.3

MM-41	To maintain water quality and to reduce the amount of water needed during drilling the following measures are to be followed: a) Only NSF/ANSI Standard 60-2003 Certified drilling fluid additives and bentonite grouts may be used during drilling. b) Water bearing zones and open formations encountered during drilling would be sealed, using approved drilling fluids and /or bentonite grouts, during drilling to allow for the recirculation of drilling fluids to the maximum extent possible. If loss of circulation is encountered during drilling, the portion of the formation causing the loss would be sealed prior to continued drilling, and the drill hole will be abandoned if circulation cannot be re-established. c) Drilling fluids would be reused to the extent possible. Appropriately sizes sumps lined with an impermeable liner and/or tanks would be used to contain drill fluids. Spent drilling fluids would be treated according to the Proposed Action Alternative 2. d) Daily on-site water use would be recorded using a totalizing flow meter.	3.3
MM-42	The water quality is to be monitored at two on-site water sources. The water at Duval Hole 06 and MM-10-10 are to be sampled prior to initiation of the drilling program. The water is to be tested for temperature, pH, salinity, and at minimum arsenic, cadmium, copper, lead, mercury, and zinc. The water is to be tested once per month during drilling operations. If significant changes in water quality are observed, drilling shall be suspended until appropriate measures to protect groundwater are determined and implemented, or the cause is identified to not be project related. If Duval Hole 06 and MM-10-10 are used for on-site water, the hole must be abandoned in accordance with Washington Administrative Code (WAC) 173-160-381, to the extent practicable, unless otherwise directed by the Agencies.	3.3
MM-43	Following the completion of drilling, the drill holes are to be grouted and sealed to prevent the flow of water within, into, or around the abandoned drill hole. Sealing would include a ten-foot cement surface plug placed within the top twenty feet of each drill hole to help ensure an adequate surface seal. Portland concrete cement mixed with clean water and aggregates, or bagged cement mixed with clean water, would be used for the surface plug. The top of the surface plug would be completed one to two feet lower than the post-reclamation surface of the drill pad to prevent future trip hazards and address aesthetic concerns. Alternate drill hole abandonment/sealing methods and materials would be considered for prior approval. Alternate abandonment methods would include drill-string tremie placement of sealing materials and use of high-solids bentonite grout and/or bentonite/cement mixtures such as described in Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160). Drilling fluid additives would be required to meet NSF/ANSI 60-2003 standards, or as approved by the agencies. These products protect the environment should drill holes encounter permeable zones and groundwater systems.	3.3
Noise		3.14
MM-44	Surrounding vegetation would likely provide some barrier or absorption of sound. The natural vegetation noise barrier would be enhanced by installation of baffles or other noise reduction techniques around the drill rigs that would be used for intrusive noise reduction as well as protection for the operators from inclement weather.	3.14
Recreation		3.12
MM-45	Maintaining recreational access to GRHC (Green River Horse Camp) and Trails 213 and 217.	3.12

MM-46	Sequencing of drilling operations to reduce impacts during high recreational use periods, particularly operations associated with Pads 6 and 7 near the GRHC.	3.12
MM-47	Signage and notices to alert users of the project area to facilitate public safety.	3.12
MM-48	Use of baffles and other noise reduction techniques to minimize noise impacts.	3.12
MM-49	Upon completion of the Proposed Project, roads and drill pads would be reclaimed.	3.12
MM-50	Controlling public access to areas that are hazardous to public safety and health concerns, especially immediately around drilling, drill pads, sumps, and access roads.	3.12
Soils		3.4
MM-51	Erosion of soils would be mitigated by BMPs such as silt fences, mulch on roads, culverts and water bars, and adherence to all practicable sedimentation controls consistent with applicable erosion control measures and BMPs, including such additional mitigation measures subject to the authorizing Agencies' discretion.	3.4
Transportation		3.11
MM-52	As required by MSHA, drilling personnel would be required to drive defensively, maintain posted speed limits, and give the right-of-way to the travelling public by using turnouts whenever possible. Practice of defensive driving and obeying speed limits is expected to reduce the chance of collisions with both the public and wildlife. These safe driving techniques would extend to water truck operators.	3.11
MM-53	Drilling would not occur directly within the road, except along those segments currently closed, but temporarily reactivated for this project. A gate would be temporarily installed and maintained to control public access from FS Road 2612 to these areas for safety purpose. Proposed pad locations should offer areas large enough to accommodate the equipment without restricting access. Where the Proposed Action occurs near FS Road 2612 or the access road to the Green River Horse Camp (Pads 01-07, 14 and 15), access would be limited and controlled by the contractor. Public access to areas of active operations would be discouraged.	3.11
MM-54	Applicable BMPs would be used along the drainages during culvert removal and installation. Rutting and road damage caused as a result of the activities would be repaired by Ascot in a timely manner.	3.11
Vegetation		3.7
MM-55	To prevent the introduction of noxious weeds into the project area all heavy equipment will be cleaned prior to entering National Forest System lands. An inspection by the USFS will be required to ensure that equipment is clean before work can begin.	3.7
MM-56	Use weed-free straw and/or mulch for all projects conducted on National Forest System Lands.	3.7
MM-57	Upon completion of the project, the drilling pads and access road improvements would be reclaimed. All roads will be water barred and closed after use. Native plant materials are the first choice in revegetation where timely natural regeneration of the native plant community is not likely to occur. Under no circumstances will non-native invasive plant species be used for revegetation. Woody vegetative debris would also be installed in disturbed areas. USFS will specify the seed mixture.	3.7
MM-58	Guide to Noxious Weed Prevention Practices (USDA 2001).	3.7
MM-59	The Pacific Northwest Region Invasive Plant Program Record of Decision for Preventing and Managing Invasive Plants (USDA 2005).	3.7
Visual/Scenic Resources		3.9

MM-60	Surface disturbances to the roads and drill pad locations would be reclaimed to minimize visual impacts. Downcast lighting during night operations would reduce indirect effects. Drilling operations would be mobile and visual impacts from the presence of the drill would be temporary at each pad location. As needed, baffles can be placed around the mobile drill rig to further attenuate light intrusion to surrounding environs during night time operations.	3.9
Wildlife Resources		3.5
MM-61	The project would have a limited operating period from March 1 to June 30 in the northern portion of the project area where mature forest is located to protect suitable owl habitat. No surface disturbing activities will occur from March 1 to June 30. No road reactivation or drilling activities in or immediately adjacent to the late successional older forest stands in the upper elevation section of the Project Area until after July. Road reactivation or drilling would occur only between July 1 and February 28 for the northern portion of the Project Area where suitable Northern Spotted Owl habitat is present.	3.5
MM-62	A qualified employee would clear each drill pad site of wildlife prior to setting up the drill rig and beginning operations. Low mobility wildlife, such as salamanders or frogs would be carefully removed from the Project site. All appropriate permits for collection and relocation of wildlife and amphibians will be obtained by the contractor.	3.5
MM-63	Lighting used for construction and operation of the project would be limited to the minimum needed for safety and reasonable functionality; in certain instances, lighting would be further managed by directing operational lighting inward; sound baffles would also limit noise intrusion into the area surrounding an active work site.	3.5
MM-64	Drilling equipment and generators will be outfitted with noise muffling devices when feasible to reduce the level of disturbance to wildlife from noise.	3.5
MM-65	If listed species or critical habitats not identified in the EA are encountered, they will be appropriately identified and project activities appropriately adjusted to avoid or minimize impacts.	3.5