

CALICO RESOURCES USA CORP.
GRASSY MOUNTAIN MINE PROJECT
MALHEUR COUNTY, OREGON

**WILDLIFE RESOURCES
BASELINE REPORT**

APRIL 2018
REVISED OCTOBER 2018
REVISED JANUARY 2019

Prepared for:

Calico Resources USA Corp.
665 Anderson Street
Winnemucca, Nevada 89445

Prepared by:



Reno:
1650 Meadow Wood Lane
Reno, Nevada 89502
Phone: (775) 826-8822 | Fax: (775) 826-8857

Elko:
835 Railroad Street
Elko, Nevada 89801
Phone: (775) 753-9496 | Fax: (775) 826-8857

**CALICO RESOURCES USA CORP.
GRASSY MOUNTAIN MINE PROJECT
WILDLIFE RESOURCES BASELINE REPORT**

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APPENDICES

- Appendix A Geographic Information System Data for all Wildlife and Habitat Surveys (Submitted Digitally; Confidential Information submitted separately)**
- Appendix B United States Fish and Wildlife Service IPac Consultation**
- Appendix C ORBIC Report (Confidential - submitted under separate cover)**
- Appendix D Field Survey Data Sheets (Confidential – submitted separately as digital scans)**
- Appendix E Comprehensive List of Wildlife Species Observed**

ATTACHMENTS

- Attachment A: Wildlife Resources Baseline Study for the Grassy Mountain Gold Project, September 2014**

LIST OF ABBREVIATIONS AND ACRONYMS

BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
Calico	Calico Resources USA Corp.
CF Cards	compact flash cards
cm	centimeter
DOGAMI	Department of Geology and Mineral Industries
EMS	EM Strategies, Inc.
ESA	Endangered Species Act
FSA	Farm Service Agency
GIS	Geographic Information Systems
GPS	Global Positioning System
HDR	HDR Engineering, Inc.
IPaC	Information for Planning and Consultation
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWC	Northwest Wildlife Consultants, Inc.
NWGAP	Northwest Regional Gap Analysis Project
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
ORBIC	Oregon Biodiversity Information Center
ORS	Oregon Revised Statute
Project	Grassy Mountain Mine Project
T&E	threatened and endangered
TES	Threatened, Endangered, and Sensitive Species
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WSA	Wildlife Study Area

**CALICO RESOURCES USA CORP.
GRASSY MOUNTAIN MINE PROJECT
WILDLIFE RESOURCES BASELINE REPORT**

1 INTRODUCTION

The purpose of this baseline report is to characterize wildlife resources in the study area prior to the start of proposed mining operations at the Grassy Mountain Mine Project (Project) in Malheur County, Oregon. EM Strategies, Inc. (EMS) was contracted by Calico Resources USA Corp. (Calico) to conduct a review of existing wildlife information and a variety of field surveys. The surveys required, and the applicable survey areas, were identified in the *Wildlife Resources Environmental Baseline Work Plan* (EMS 2017). These surveys were intended to provide all the necessary baseline data to fulfill Oregon Administrative Rule (OAR) 632-037-0055 of the Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon Revised Statute (ORS) 517.956, and other relevant Oregon Administrative Rules (OARs) and ORSs.

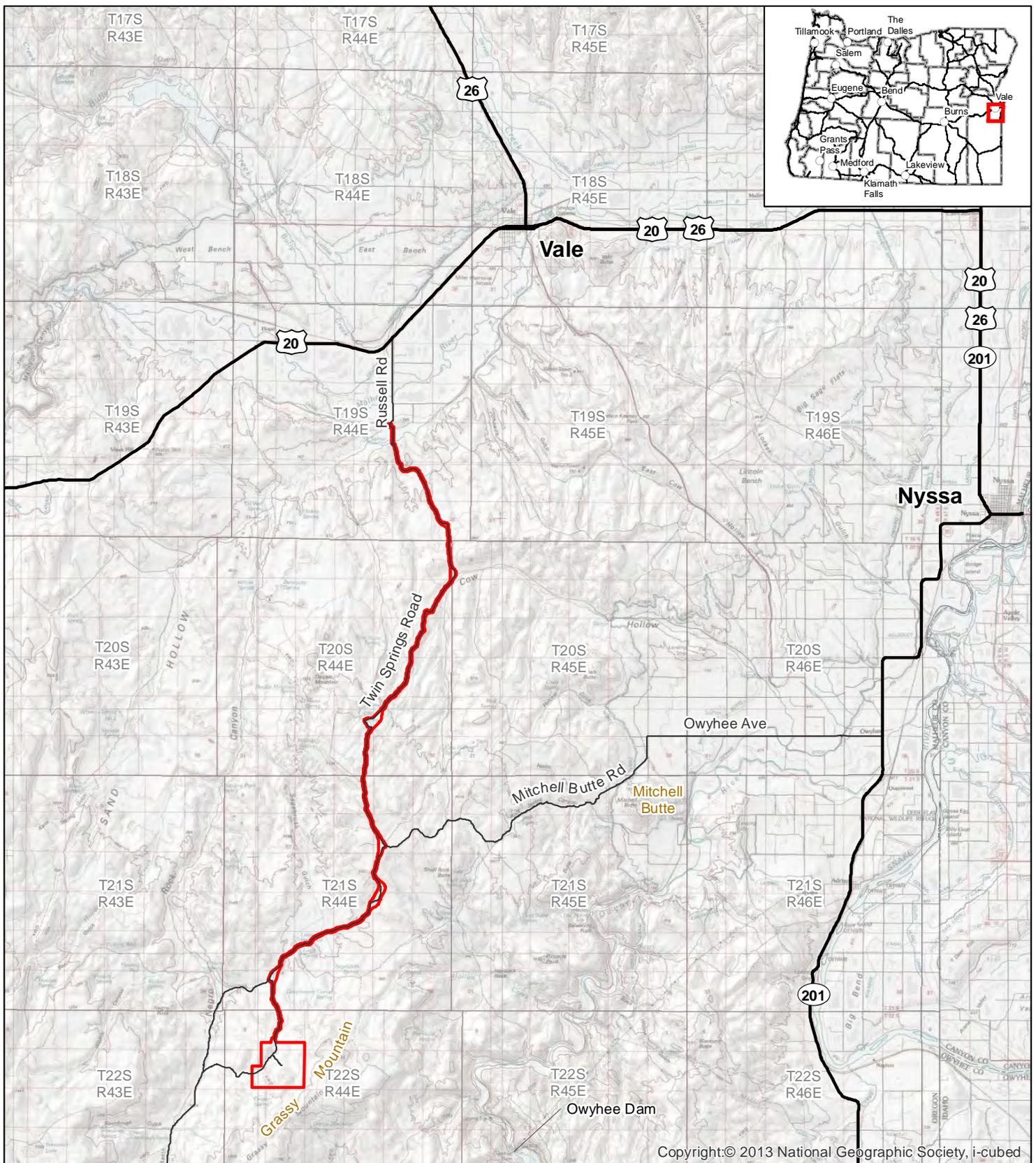
A portion of the text and data used in this report has been incorporated from the September 2014 *Wildlife Resources Baseline Study* prepared for the Project by Northwest Wildlife Consultants, Inc. (NWC), for previously surveyed areas within the current permit area. This report documents results from the 2014 NWC report, as well as new results from surveys conducted in 2017 and 2018 by EMS. The 2014 NWC report is included as Attachment A. Additional data collection may be required based on the findings of the groundwater study being prepared for the Project.

2 RESOURCE STUDY AREA

The Project is in Malheur County, Oregon, approximately 22 miles south-southwest of Vale (Figure 1) and consists of two areas: the Mine and Process Area and the Access Road Area (Permit Area) (Figure 2).

The Mine and Process Area is located on three patented lode mining claims and unpatented lode mining claims that cover an estimated 886 acres. These patented and unpatented lode mining claims are part of a larger land position that includes 419 unpatented lode mining claims and nine mill site claims on lands administered by the Bureau of Land Management (BLM). All proposed mining would occur on the patented claims, with some mine facilities on unpatented claims. The Mine and Process Area is in all or portions of Sections 5 through 8, Township 22 South, Range 44 East (T22S, R44E) (Willamette Meridian).

The Access Road Area is located on public land administered by the BLM, and private land controlled by others (Figure 2). A portion of the Access Road Area is a Malheur County Road named Twin Springs Road. The Access Road Area extends north from the Mine and Process Area to Russell Road, a paved Malheur County Road. The Access Road Area is in portions of Section 5, T22S, R44E, Sections 3, 10, 11, 14, 15, 21 through 23, 28, 29, and 32, T21S, R44E, Sections 1, 12 through 14, 23, 26, 27, and 34, T20S, R44E, Sections 6 and 7, T20S, R45E, and Sections 22, 23, 26, 35, and 36, T19S, R44E (Willamette Meridian). The width of the Access Road Area is 300 feet (150 feet on either side of the access road centerline) to accommodate possible minor widening or re-routing, and a potential powerline adjacent to the access road. There are several areas shown that are significantly wider than 300 feet on the Permit Area Map (Figure 2), which are areas where the final alignment has not yet been determined. The final engineering of the road

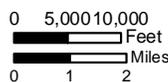


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Explanation

- █ Permit Area
- Existing Road

Projection: UTM Zone 11 North, NAD83, meters



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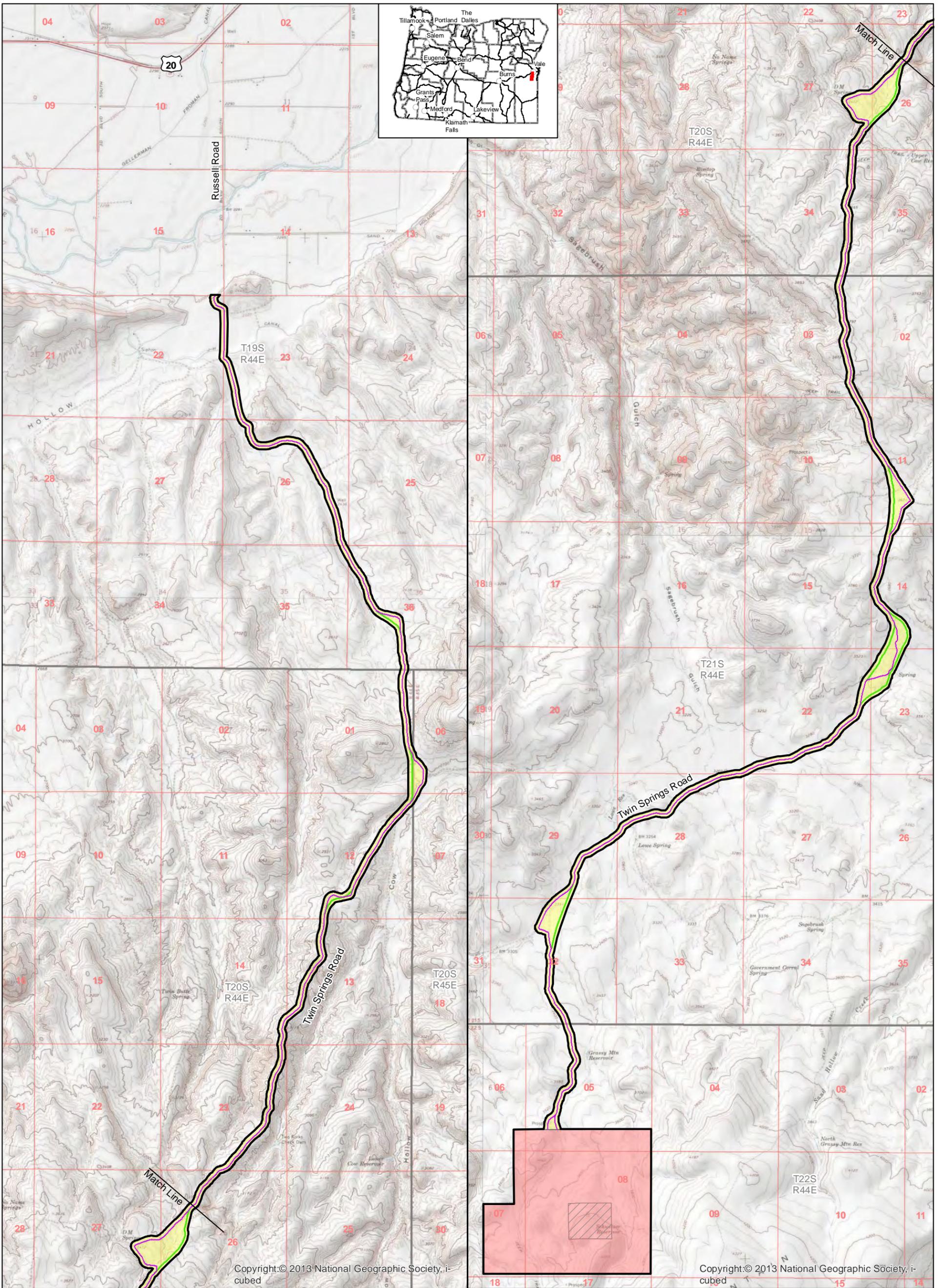
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Location Map

Figure 1

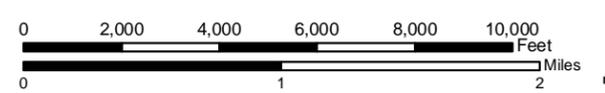
Date: 12/19/2017	Drawn By: JDB
Revised:	Project No.: 3672
Base Map: USGS 100K quads: Boise, Brogan, Vale, Weiser	
File Name: 3672G_GrassyMtn_BL_Fig01_Location.mxd	





- Explanation**
- Permit Area
 - Mine and Process Area
 - Access Road Area
 - Patented Lode Claims
 - Proposed Access Road
 - Possible Road Realignment

Projection: UTM Zone 11 North, NAD83, meters



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Permit Area Map

Figure 2

Date: 12/19/2017	Drawn By: JDB
Revised:	Project No: 3672
Base Map: USGS 7.5 Quad: 10404 West 2N, Grassy Mountain, Kalmi Spring Ranch, Sourdough Spring, Vale West	
File Name: 3672G_GrassyMtn_BL_Fig02_PermitArea.mxd	

will be consistent throughout, and within the Permit Area. The Access Road Area also includes a buffer on either side of the proposed road width for the collection of environmental baseline data. The road corridor will be 40 feet wide, which includes a 24-foot wide road travel width (12 feet on either side of the road centerline), four-foot wide shoulders on each side of the road, minimum one-foot wide ditches on each side of the road, and appropriate cut and fill. The Access Road Area totals approximately 876 acres.

A portion of the Permit Area was surveyed in 2013 and 2014 by NWC. The results of the NWC survey are presented in the September 2014 *Wildlife Resources Baseline Study for the Grassy Mountain Gold Project* (Attachment A). The Permit Area changed after the NWC survey. Portions of the new Permit Area that were not surveyed by NWC were surveyed by EMS in 2017 and 2018. The combination of the NWC and EMS survey areas comprises the Wildlife Study Area (WSA) (Figure 3). This report is documentation of the results of both surveys. Information from the 2014 NWC report is incorporated into this report.

3 REGULATORY FRAMEWORK

3.1 Federal

The Council on Environmental Quality regulations discuss “human environment” at 40 Code of Federal Regulations 1508.14. This term broadly relates to the biological, physical, social, and economic elements of the environment. It includes the wildlife resources category. Relevant data is to be used in describing the affected environment as the basis for determining the effects (direct and indirect) of a proposed action. The 2008 BLM National Environmental Policy Act (NEPA) Handbook (H-1790-1) describes potential NEPA-related federal requirements.

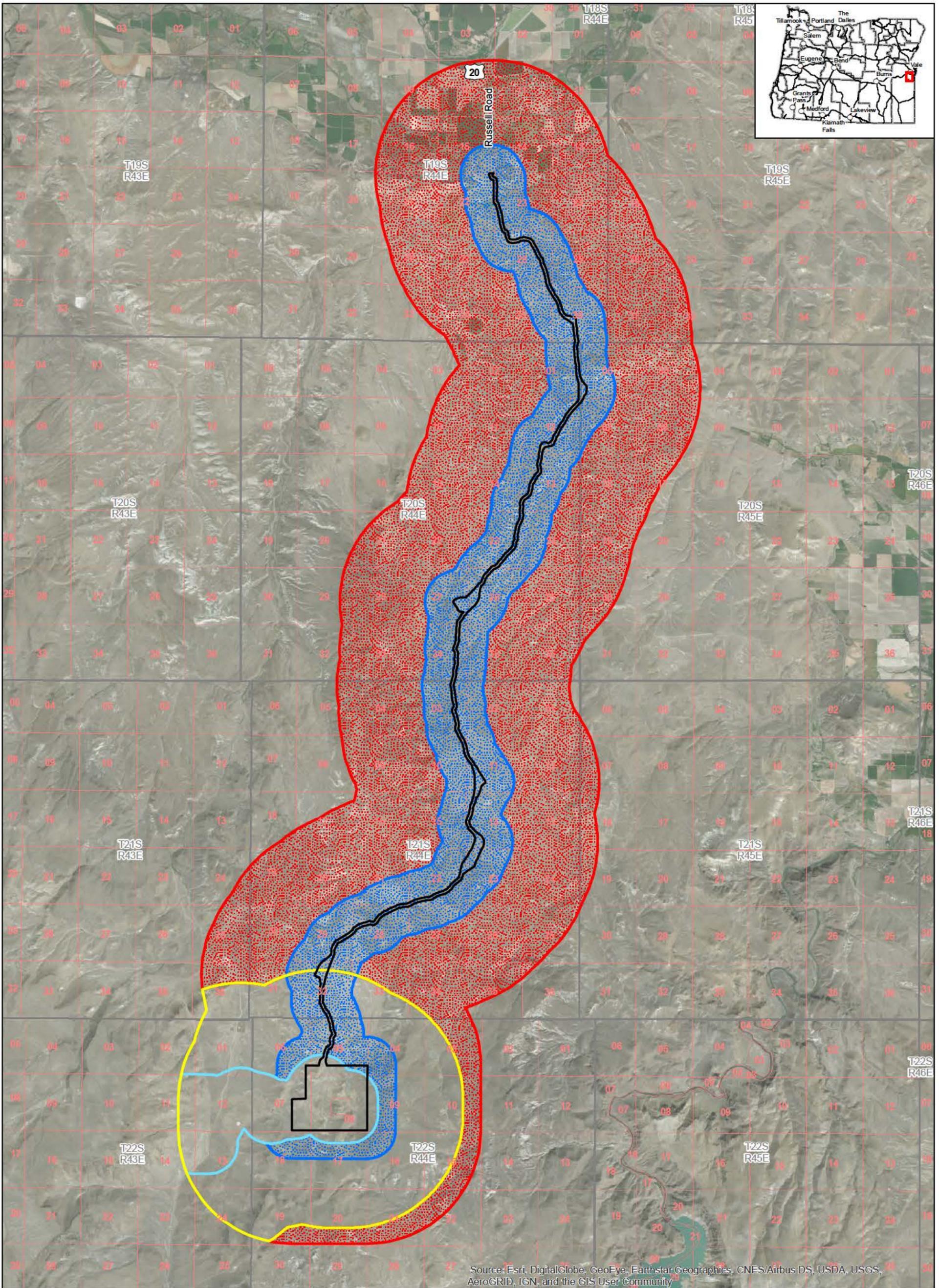
Other federal requirements, such as the Endangered Species Act (ESA) consultations, and critical habitat procedural requirements are discussed in Chapter 175, “Wildlife and Vegetation Protection; Environmental Regulation of the American Law of Mining” (Holland and Hart 2010). The following sections provide a list of relevant federal regulations.

3.1.1 Federal Endangered Species Act

Section 7 of the ESA (19 United States Code [U.S.C] § 1536(c)), as amended, states that any actions authorized, funded, or carried out by a federal agency do not jeopardize the continued existence of a federally-listed endangered or threatened species, or result in the destruction or adverse modification of federally-listed designated critical habitat. The action agencies are required to consult with the United States Fish and Wildlife Service (USFWS) and/or National Oceanic and Atmospheric Administration to determine whether federally-listed threatened and endangered (T&E) species or designated critical habitat are found within the vicinity of the proposed project, and to determine the proposed action’s potential effects on those species or critical habitats.

3.1.2 Bald and Golden Eagle Protection Act

When first enacted in 1940, the Bald and Golden Eagle Protection Act (16 U.S.C. § 668) (BGEPA) prohibited the take, transport or sale of bald eagles, their eggs, or any part of an eagle except where expressly allowed by the Secretary of the Interior. The BGEPA was amended in 1962 to extend the prohibitions to the golden eagle (*Aquila chrysaetos*).



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Explanation

- Permit Area
- 2017-2018 EMS Two-mile Buffer WSA
- 2017-2018 EMS 0.5-mile Buffer WSA
- 2013-2014 NWC Two-mile Buffer WSA
- 2013-2014 NWC 0.5-mile Buffer WSA

Projection: UTM Zone 11 North, NAD83, meters



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Wildlife Study Areas

Figure 3

Date: 03/30/2018	Drawn By: JDB/SMH
Revised:	Project No.: 3678
Base Map: USGS 100K quad: Vale	
File Name: 3678GH_GrassyMtn_Wildlife_Fig03.mxd	



3.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) implements various treaties and conventions for the protection of migratory birds. Under this Act, taking, killing, or possessing migratory birds (including any part, nest, or egg) is unlawful.

3.1.4 Bureau of Land Management (Manual 6840) – Special Status Species

The BLM's policy for management of special status species is in BLM Manual Section 6840 (BLM 2008a). Special status species include the following:

- Federally-listed Threatened or Endangered Species: Any species the USFWS has listed as an endangered or threatened species under the ESA throughout all or a significant portion of its range;
- Proposed Threatened or Endangered Species: Any species the USFWS has proposed for listing as a federally endangered or threatened species under the ESA;
- Candidate Species: Plant and animal taxa under consideration for possible listing as threatened or endangered under the ESA;
- Delisted Species: Any species in the five years following their delisting;
- BLM Sensitive Species: Species designated as Sensitive by the BLM State Director because they meet the following criteria: Native species found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either: 1) there is information that a species has undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range; or 2) the species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk (BLM 2008a); and
- State of Oregon Listed Species: State-protected animals that have been determined to meet BLM's Manual 6840 policy definition.

3.2 State

The Oregon Department of Fish and Wildlife (ODFW) manages fish and wildlife populations through objectives specified in various management plans. ODFW has direct responsibility for wildlife protection. In the Permit Area, the BLM manages habitat to support fish and wildlife.

The State of Oregon has threatened, endangered, and sensitive (TES) species provisions that protect native vertebrates and plants on state lands (ORS Sections 496.172 to 496.192; 498.026; and 564.100 to 564.135) and requires consideration of the impacts of any action on private land, in this case chemical mining, on T&E species (ORS Sections 517.956, 496.012, and 506.109).

ORS Section 517.956 establishes standards and protection measures that all chemical mining operations will follow that ensure protection measures for fish and wildlife are consistent with ODFW policies, including the following:

- a) Protective measures to maintain an objective of zero wildlife mortality;
- b) On-site and off-site mitigation ensuring there is no overall net loss of habitat value;
- c) No loss of existing critical habitat of any state or federally-listed threatened or endangered species;
- d) Fish and wildlife mortality shall be reported in accordance with a monitoring and reporting plan approved by ODFW;
- e) ODFW shall establish by rule standards for review of a proposed chemical process mining operation for the purpose of developing conditions for fish and wildlife habitat protection that satisfy the terms of this section for inclusion in a consolidated permit by DOGAMI; and
- f) Surface reclamation of a chemical process mine site shall ensure environmental protection and that a self-sustaining ecosystem, comparable to undamaged ecosystems in the area, has been established in satisfaction of the operator's habitat restoration obligations.

The purpose of OAR Chapter 635 Division 420 is to prescribe the standards for ODFW review of proposed chemical process mining operations to protect wildlife and their habitat and to further the Wildlife Policy (ORS 496.012) and the Food Fish Management Policy (ORS 506.109) of the State of Oregon. Baseline data collection will be consistent with what is required in developing a wildlife protection plan in accordance with OAR 635-420-0010, standards to protect wildlife in accordance with OAR 635-420-0015-0025, a habitat mitigation plan in accordance with OAR 635-420-0030, and wildlife mitigation plan in accordance with OAR 635420-0060.

The wildlife mitigation plan shall include the information required in OAR 635-415-0020(5). Affected wildlife habitats shall be evaluated using methodologies approved by the ODFW which are well-documented, measurable and verifiable. Examples of habitats that shall be addressed in the mitigation plan include, but are not limited to, the following:

- a) Surface waterways, streams, springs, seeps, wetlands and other wildlife habitats;
- b) Riparian areas;
- c) Big game habitat;
- d) Bird habitat;
- e) Habitat for state or federally-listed threatened or endangered species, and state sensitive species;
- f) Reproduction and nursery areas;
- g) Fish spawning areas;
- h) Geomorphic and edaphic habitats including cliffs, caves, sand dunes, playas and local distinctive soils that, along with their vegetation, contrast markedly with the surrounding area; and
- i) Wildlife migration and movement corridors.

In addition, ODFW manages wildlife species populations through management objectives specified in their respective management plans; BLM manages adequate habitat to support these numbers. BLM and ODFW work cooperatively to benefit the management of wildlife and wildlife habitat as described in the memorandum of understanding of 2001 between the two agencies.

4 STUDY METHODOLOGY

4.1 Literature Review

A portion of the baseline characterization outlined in this report has been incorporated from the September 2014 NWC report (Attachment A). Prior to initiating the 2017 field surveys, the results of the literature review in the NWC report were reviewed, and updated information on special status species was requested from the USFWS, the Oregon Biodiversity Information Center (ORBIC), and ODFW. ORBIC maintains a computerized inventory of the wildlife, plant, and ecological community resources of Oregon.

4.2 Field Studies

The protocols for the field studies were established in the *Environmental Baseline Work Plans* (EMS 2017). The areas surveyed by NWC in 2014 and EMS in 2017 and 2018 are illustrated in Figure 3. Surveys were conducted within the Permit Area and a 0.5-mile buffer, or the Permit Area and a two-mile buffer, dependent on the species. Throughout this report, the areas will be referred to as 0.5-Mile Buffer WSA, and Two-Mile Buffer WSA. The following studies were performed within each study area:

Two-Mile Buffer WSA

- Greater sage-grouse habitat assessment and lek survey
- Golden eagle nest survey
- Nesting raptor survey
- General observations of special status species and non-listed species

0.5-Mile Buffer WSA

- Pygmy rabbits and white-tailed jackrabbit (leoprids)
- Bats
- Burrowing owl
- Landbirds
- General wildlife encounter surveys

4.2.1 Wildlife Habitat Mapping and Categorization

The habitat categories in the Permit Area will be qualitatively categorized based on their importance to fish and wildlife, in accordance with the ODFW Fish and Wildlife Habitat Mitigation Policy. Habitat categorization will be developed using a combination of the results of the terrestrial vegetation surveys of the Permit Area (EMS 2018; HDR Engineering, Inc. [HDR] 2014; HDR 2015) and the United States Geological Survey (USGS) Northwest Regional Gap Analysis Project (NWGAP) land cover classifications (USGS 2011).

Mapping was conducted using a combination of aerial photograph interpretation and on-the-ground verification. Initial habitat boundaries were delineated at a scale of 1:5,000 in a digital geographic information system (GIS) using National Agriculture Imagery Program (NAIP) one-meter resolution orthophoto quadrangle county mosaics (United States Department of Agriculture [USDA] Farm Service Agency [FSA] 2009; USDA FSA 2011; USDA FSA 2012), digital raster graphics of standard series USGS topographic maps, and the Natural Resources Conservation Service (NRCS) soil survey geographic database (NRCS 2017).

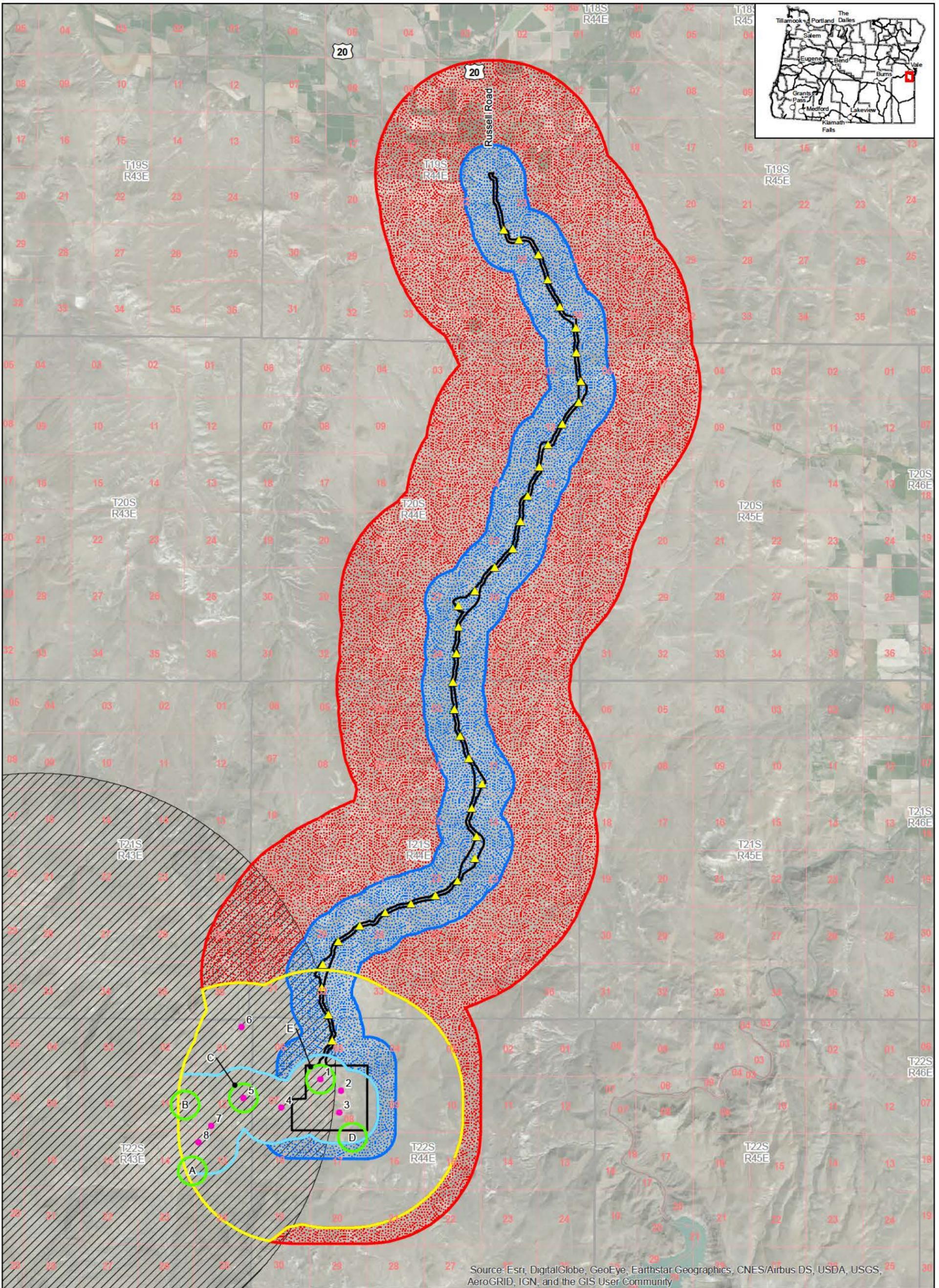
Biologists ground-verified and adjusted boundaries, further delineated habitat types, and developed detailed descriptions of each habitat type. These data were used to develop initial habitat categories based on vegetation type and wildlife species use. Initial habitat types were mapped according to current vegetation rather than according to the potential ecological climax for any given location.

Habitat types will be rated for habitat quality in the Permit Area based on definitions found in OAR 635-415-0025. This rule defines six habitat categories and establishes mitigation goals and implementation standards for each (Table 1).

Table 1: ODFW Mitigation Goals and Implementation Standards by Habitat Category

Habitat Category	Habitat Characteristics	Mitigation Goal	Achieved by
1	Irreplaceable, essential and limited	No loss of habitat quantity or quality	Avoidance
2	Essential and limited	No net loss of habitat quantity or quality and to provide a net benefit of habitat quantity or quality	In-kind, in-proximity mitigation
3	Essential, important and limited	No net loss of habitat quantity or quality	In-kind, in-proximity mitigation
4	Important	No net loss of habitat quantity or quality	In-kind or out-of-kind, in-proximity or off-proximity mitigation
5	Having high potential to become either essential or important	Net benefit in habitat quantity and quality	Actions that improve habitat conditions
6	Low potential to become essential or important	Minimize impacts	Conscientious Project design

Additional GIS layers, including ODFW Core and Low Density Areas for greater sage-grouse (*Centrocercus urophasianus*), lek locations, and known raptor nest shape files, will be used to further refine the habitat category of a habitat type and area. ODFW has identified throughout the range of the greater sage-grouse Core Areas and Low Density Areas based on the locations of known leks (ODFW 2013a). A portion of the Permit Area is designated Low Density Area (ODFW 2013a) (Figure 4). This designation is a coarse filter based on lek locations.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Explanation

- Permit Area
- 2017-2018 EMS Two-mile Buffer WSA
- 2017-2018 EMS 0.5-mile Buffer WSA
- 2013-2014 NWC Two-mile Buffer WSA
- 2013-2014 NWC 0.5-mile Buffer WSA
- Large Avian Plot Locations (2013-2014)
- Small Avian Plot Locations (2013-2014)
- ▲ Burrowing Owl Call Stations (2017)
- Low Density Area

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ODFW Greater Sage-Grouse Low Density Area, Avian Survey Plots, and Burrowing Owl Call Stations

Figure 4

Projection: UTM Zone 11 North, NAD83, meters



Date: 03/30/2018	Drawn By: SMH
Revised:	Project No.: 3678
Base Map: USGS 100K quad: Vale	
File Name: 3678H_GrassyMtn_Wildlife_Fig04_AvianSurvey.mxd	



4.2.2 Large-Plot Avian Surveys

Large-plot avian surveys were conducted by NWC in 2013 and 2014. A variable circular-plot method (Reynolds et al. 1980) was used to obtain information on species composition and relative abundance of birds on and near the Project during diurnal hours. This survey protocol was primarily designed for studying use by large birds (i.e., waterbirds and raptors), but information for all species observed was recorded during each survey. Five 800-meter radius study plots were established (Figure 4). Plots were non-overlapping and were located to provide optimal viewing conditions and thorough coverage. The avian ecologist positioned at the center of the plot recorded all vertebrate wildlife seen or heard during 20-minute point counts. Species, number, flight height, weather, etc., were collected. Survey starting point locations and times of the day were alternated among surveys to reduce spatial and temporal bias. All survey plots were surveyed four times within each of the four survey seasons. Survey dates for each season were:

- Summer: June 24 – August 14, 2013; four visits to five plots, 20 surveys
- Fall: September 4 – October 24, 2013; four visits to five plots, 20 surveys
- Winter: November 25, 2013 – February 26, 2014; four visits to five plots, 20 surveys
- Spring: March 19 – May 29, 2014; four visits to five plots, 20 surveys

In four seasons between June 2013 to May 2014, 80 20-minute avian use surveys were conducted for the Project. Flight paths of special status species or raptors were hand-plotted on topographic maps in the field. All detected vertebrate wildlife were recorded, whether inside or outside the fixed-point plot. The avian use surveys conducted in 2013 and 2014 were adequate to characterize avian use in the Permit Area vicinity during all seasons of the year since the composition of the avian population would most likely not have changed substantially between surveys; therefore, large-plot avian surveys were not conducted during the 2017 or 2018 field surveys.

4.2.3 Small-Plot Avian Surveys

Small-plot avian surveys were also conducted by NWC in 2013 and 2014 to complement the large-plot avian surveys. Small-plot avian surveys focused on smaller birds (especially passerines) and utilized the range of habitats in the general vicinity of the Project. These surveys involved the establishment of eight fixed-radius points or plots (Ralph et al. 1993) in summer 2013 (Figure 4). The small-plot avian surveys were conducted 16 times throughout the year, with four complete surveys during each season: summer (June through August), fall (September through October), winter (November through February), and spring (March through May). A total of 128 surveys were conducted.

Plots covered each habitat type within the Two-Mile Buffer WSA (Table 2). Each study plot had a radius of 100 meters. Plots were surveyed by an experienced avian ecologist using a ten-minute observation period, and all surveys were completed between sunrise and five hours after sunrise, consistent with standard protocols. Surveys were not conducted when wind and weather conditions were likely to hamper the researcher's ability to detect whatever birds were present. General data recorded included date, time, and weather variables. Data associated with bird detections included species and number, age and sex, behavior and habitat. The avian use surveys conducted in 2013 and 2014 were adequate to characterize avian use in the Permit Area vicinity during all seasons of the year since the composition of the avian population would most likely not have changed

substantially between surveys; therefore, small-plot avian surveys were not conducted during the 2017 or 2018 field surveys.

Table 2: Small-Plot Descriptions

Plot	Description
1	Exposed rock surrounded by sagebrush shrub-steppe habitat.
2	Exposed rock surrounded by sagebrush shrub-steppe habitat.
3	A small amount of exposed rock but was primarily sagebrush shrub-steppe habitat.
4	A mix of big sagebrush shrub-steppe, exotic annual grassland, and exposed rock habitats.
5	Within native perennial grassland.
6	Included a pond with riparian vegetation and a small sagebrush shrub-steppe component.
7	Sagebrush shrub-steppe with some exotic annual grassland.
8	A small patch of sagebrush shrub-steppe surrounded by exotic annual grassland.

4.2.4 Raptor, Golden Eagle, and Burrowing Owl Nest Surveys

4.2.4.1 Raptors and Golden Eagles

The objective of the raptor and golden eagle nest survey was to provide information about breeding activities in the Two-Mile Buffer WSA. The nest searches were performed in accordance with the protocols in *Inventory Methods for Raptors: Standards for Components of British Columbia Biodiversity* (Ministry of Sustainable Resource Management 2001). An aerial survey of the 2014 Permit Area and a two-mile buffer was conducted on April 27, 2014, by NWC. An aerial survey of the Two-Mile Buffer WSA was conducted by EMS April 21 and 22 and April 28 and 29, 2017, and February 6, 2018, in conjunction with the greater sage-grouse lek surveys. Flight lines were recorded for the 2017 and 2018 surveys (Appendix A).

All potential nesting areas (e.g., trees, rock formations, and transmission line towers), were examined during the 2014, 2017, and 2018 aerial surveys. All potential and confirmed raptor nests were recorded using a hand-held Global Positioning System (GPS) unit, regardless of activity status. Determination of nest status (active, inactive, unknown) was made using a combination of visual clues such as adult behavior, presence of eggs or young, presence or absence of whitewash (excrement), or observational data from the ground-based surveys. Inactive nests (no sign of present usage) were assessed for the type of bird that may have built the nest.

Subsequent to the aerial surveys, ground-monitoring surveys were conducted June 21 through 23, 2017, to determine the status of golden eagle territorial pairs and the outcome of any breeding attempts within the Two-Mile Buffer WSA. Adults and potential nest sites were observed from an appropriate distance during ground surveys. Methods followed standard protocols used throughout the range of this species (Pagel et al. 2010).

4.2.4.2 Burrowing Owls

Broadcast call surveys were performed to locate burrowing owls and their burrows (Conway and Simon 2003; Conway et al. 2007) on the following dates: May 17 and 18, June 21 and 22, and July 3 and 4, 2017. A total of 39 survey stations were called along the access road in the Permit Area (Figure 4). The survey stations were located approximately 800 meters apart. Upon arriving

at a station, the biologist spent a three-minute waiting period scanning the horizon with and without binoculars. Then the primary song call was played over a three-minute period with a 360-degree rotation. The total time at each survey station was a minimum of six minutes.

Any responding owls were watched to determine possible nest burrow locations. If no burrows were found, or it was too dark to search, the biologist returned the next day to look for burrows near the detection. A comprehensive search for potential nest burrows within 600 meters of the observation point of the owl was conducted. All burrows with an entrance diameter of greater than ten centimeters (cm) were closely examined for signs of use by burrowing owls, including feathers, pellets, whitewash, nest material such as dung, prey and their parts, or loose soil across the breadth of the burrow floor. While conducting other wildlife surveys, all potential burrows that could be used by burrowing owls were examined for signs of burrowing owl activity including molted feathers, prey remains, pellets, scat, and tracks.

4.2.5 Greater Sage-Grouse Surveys

4.2.5.1 Brood-Rearing Surveys

Brood-rearing surveys were conducted twice between June 15 and July 31, 2014, by NWC; and June 22 through 24 and July 2 through 4, 2017, in the Two-Mile Buffer WSA by EMS. The surveys focused on meadow and/or riparian habitat associated with the springs that were identified from USGS maps and the National Hydrography Dataset (NHD) (USGS 2017). The habitat around the springs was searched for sage-grouse and their sign (e.g., scat, tracks, feathers, carcasses). Areas intensively searched for sign included the interface between sagebrush and mesic meadows, in particular the area beneath sagebrush shrubs where hens and broods might shelter.

The surveys were conducted by walking meandering transects following the standard protocols in Hagen (2011). Survey tracks were recorded (Appendix A). All sage-grouse scats were recorded. Scats were also designated as winter scat (i.e., composed of sagebrush) or spring/summer scat (i.e., fibrous plant matter, invertebrates present). Small, slender scats, narrow in circumference, containing fibrous plants and abundant invertebrate remains were classified as juvenile scat. Any clocker scats were also recorded. Clocker scats are relatively large scat that are composed of smaller scats compacted together typical of nesting hens.

4.2.5.2 Winter Use Surveys

Winter use surveys were conducted by NWC on December 20, 2013, and January 14 and 15, 2014. The surveys were conducted on the ground, on foot and snowmobile, and followed standard protocols (Hagen 2011). Survey tracks were recorded (Appendix A).

The 2018 winter use surveys were conducted by EMS from the air with a bell 206 L4 helicopter. Two biologists conducted the survey. The first flight was conducted January 25 and consisted of 0.25-mile parallel transects throughout the Two-Mile Buffer WSA. Transects were flown approximately 50 to 150 feet above the ground at speeds of approximately 40 miles per hour. Flight tracks were recorded (Appendix A).

The second survey was conducted 12 days later, on February 6, 2018, which further refined the survey area flown on January 25. Areas consisting of shrubs were delineated via desktop analysis and provided as polygon shapes. These areas were flown with 0.25-mile transects or with a

centrally located transect across patches of sagebrush within the polygon. Areas that consisted of agricultural lands, grass, or shrub patches without sagebrush were not surveyed as they do not provide winter habitat for sage-grouse. Flight tracks were recorded (Appendix A).

4.2.5.3 Lek Surveys

Lek surveys were conducted in potentially suitable habitat throughout the Two-Mile Buffer WSA. Existing information on known leks was obtained from ODFW GIS layers and from conversations with the ODFW district biologist (Milburn 2014). No leks are known to occur within the Two-Mile Buffer WSA; therefore, the survey was a search for previously unknown leks.

Surveys were conducted by NWC on April 10 and 28, 2014. In 2014, the surveys were performed on the ground. The 2017 surveys were conducted on April 21 and 22 and 28 and 29 by EMS and performed from the air. Within the Low Density Area, transects were flown at 0.25-mile density. Outside of the Low Density Area, transects were flown at 0.25- to 0.5-mile density (Appendix A).

4.2.6 **Leporid Survey**

Surveys for two leporid species of concern - pygmy rabbit (*Brachylagus idahoensis*) and white-tailed jackrabbit (*Lepus townsendii*) - were conducted within the 0.5-Mile Buffer WSA. Meandering transects were walked through potentially suitable habitat. In 2014, leporid surveys were conducted in early winter and again in late spring, times when use of burrows by pygmy rabbits is expected to be highest. The 2017 surveys were performed in May and early July.

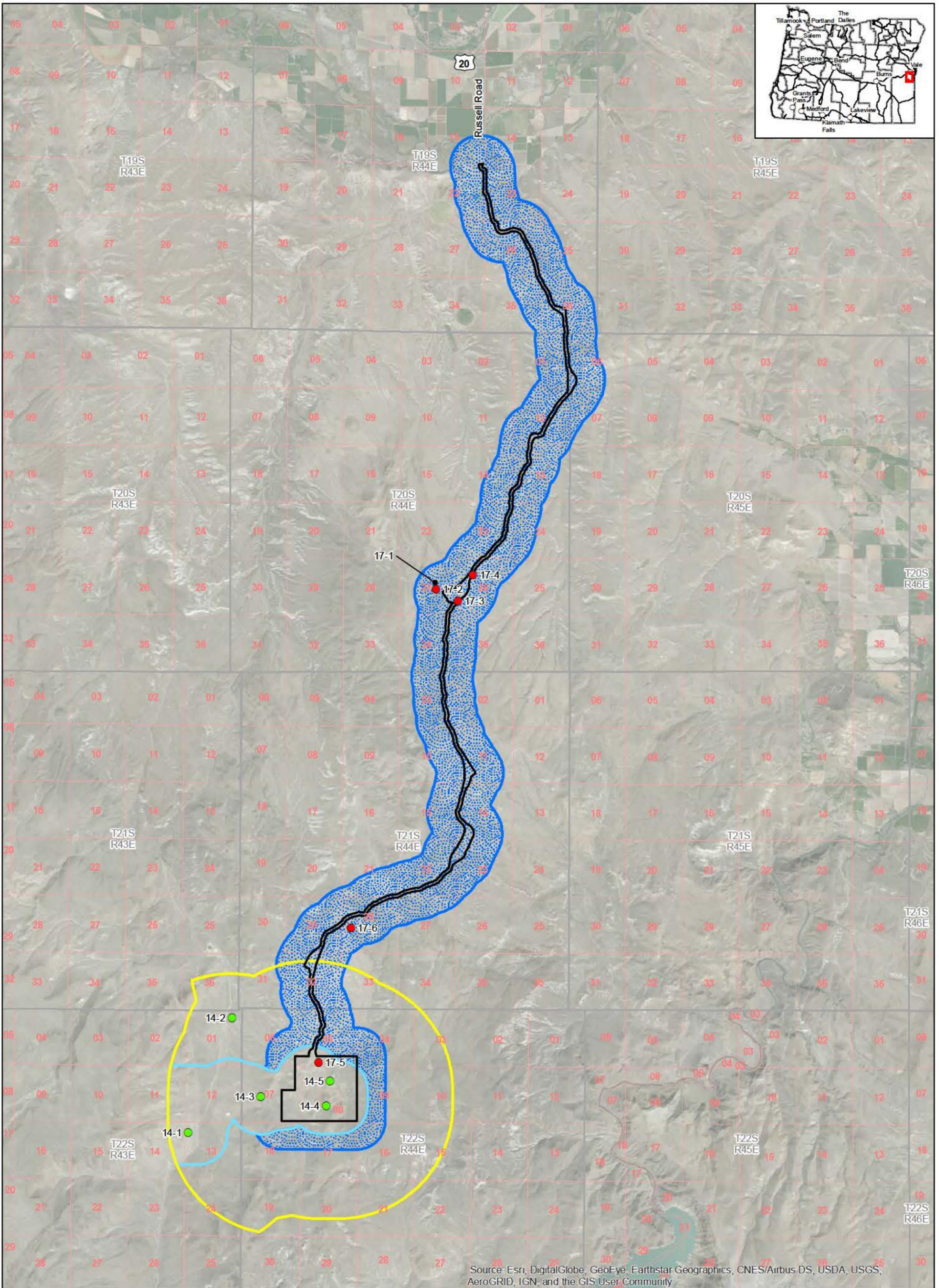
The 2017 survey protocol for pygmy rabbit surveys was based on guidelines developed by the multi-state interagency working group titled: Surveying for Pygmy Rabbits (*Brachylagus idahoensis*), Interagency Pygmy Rabbit Working Group, June 2004 version, Boise District, Idaho BLM (Ulmschneider et. al 2004). Potentially suitable habitat that was intensively surveyed included locations with mature big sagebrush, sagebrush draws, patches of sagebrush that were uneven in height and density, and drainages. Spiral and parallel transects were used to survey the potential habitat.

Any observed pygmy rabbits and/or their sign (e.g., burrows, scat, runways) were recorded with a GPS waypoint and photographed. Any burrows were classified as active (clean entrances with signs of use such as the presence of pellets and/or tracks) or inactive (cobwebs, plant debris in entrance, or collapsed). Pellets were classified as pygmy rabbit scat if they were from four to six millimeters (longest axis was measured) and were in piles under sagebrush and/or deposited as carpets of scats. The scats were classified as fresh (dark, glossy, moist), recent (brown or dark gray in color), and old (bleached gray, crumbled easily).

All detections of leporids and their sign (pellets and burrows), as well as survey routes, were recorded using a hand-held GPS unit (Appendix A).

4.2.7 **Bat Species Investigation**

Acoustic bat surveys were conducted in 2013 and 2014 by NWC and in 2017 by EMS to collect baseline information on bat species use of the 0.5-Mile Buffer WSA. In 2014, five bat detector locations were established in or near the Permit Area at landscape features (rock outcrops, water) most likely to attract bats (Table 3 and Figure 5). Data were collected for a total of 21 nights



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Explanation

- Permit Area
- 2017-2018 EMS 0.5-mile Buffer WSA
- 2013-2014 NWC Two-mile Buffer WSA
- 2013-2014 NWC 0.5-mile Buffer WSA

- Bat Detector Locations (2017)
- Bat Detector Locations (2013-2014)

CALICO RESOURCES USA CORP.
 GRASSY MOUNTAIN MINE PROJECT
 Bat Detector Locations

Projection: UTM Zone 11 North, NAD83, meters



Date: 03/30/2018 Drawn By: JDB/SMH
 Revised: Project No.: 3678
 Base Map: USGS 100K quad: Vale
 File Name: 3678H_GrassyMtn_Wildlife_Fig05_BatDetectors.mxd



Figure 5

between June 24 and October 25, 2013; and between April 8 and May 30, 2014. Pettersson D500x ultrasound detectors were used to record the echolocation calls of bats onto compact flash cards (CF cards); each was set to begin recording before dusk and to stop after dawn. Downloaded calls were analyzed using SonoBat® 3.05 acoustic identification software to identify bat species where possible.

Table 3: Bat Detector Location Descriptions

Bat Detector Location	Feature Description
2014	
14-1	In a small patch of sagebrush shrub-steppe surrounded by exotic annual grassland (and coincided with the center of small-avian plot 8).
14-2	By a pond with riparian vegetation and a small sagebrush shrub-steppe component. This plot was within the 2-mile Buffer but more than a mile from the Permit Area (and coincided with the center of small-avian plot 6).
14-3	In annual exotic grassland near the base of a small cliff containing numerous pockets and cracks.
14-4	On the hill where mining is proposed overlooking a slope of scree and jumbled rock. (This location was within small-avian plot 3.)
14-5	At the base of a rock outcrop surrounded by sagebrush shrub-steppe. (This location was within small-avian plot 3.)
2017	
17-1	DM Spring, oriented across water below cottonwood trees, dense mesic vegetation, primarily surrounded by exotic annual grassland upslope
17-2	DM Spring oriented upstream near rock outcrops, some willows, intact sagebrush upslope
17-3	Trough – water in trough, overflows onto ground present as sheet with very shallow pools (<1 cm depth), surrounded by exotic annual grassland, farther away, some sagebrush in narrow ephemeral drainage to north
17-4	Rock outcrop in downcut ephemeral drainage, complex outcrop on both sides of draw, > 20 feet high from bottom of draw, numerous cracks, fissures, etc. sparse sagebrush upslope
17-5	Ephemeral drainage – oriented north in shallow drainage surrounded by sagebrush and some grasses
17-6	In sagebrush, oriented downslope toward Lowe Spring, abundant bare ground due to livestock

In 2017, acoustic surveys were conducted for bat species at six sites within the 0.5-Mile Buffer WSA associated with the access road (Table 3 and Figure 5). Pettersson ultrasonic detectors (Model D240X) connected to digital recorders were used to record bat calls on May 27 and 28 and June 21, 22, and 23. The detectors were turned on between approximately 6:30 p.m. to 7:45 p.m. and operated throughout the night to sample the temporal activity of bats. Equipment was taken down between 6:00 a.m. and 8:30 a.m. The detectors were placed in locations most likely to have bat activity such as rock outcrops, water, and an ephemeral drainage that might be used as a travel corridor.

Echolocation calls were downloaded and analyzed using SonoBat software (DNDesign, Arcata, California). Recorded calls were compared to reference calls available within the SonoBat software. Characteristics of echolocation calls can be used to distinguish even between closely related species. While intraspecific variation in call characteristics is largely relative to interspecific variation, separation of some species can be problematic, especially when only a few call samples are available.

Good call sequences contained greater than one and usually many (greater than ten) calls in which the signal was clearly distinguishable from noise, appeared fully formed (i.e., no missing call components), and might have displayed harmonics that indicated that calls were well recorded. Poor quality recordings had poor signal-to-noise ratios and were of short duration (less than 2.5 milliseconds), reduced bandwidth, or oversimplified shapes. Poor quality recordings are reported in the results as possible identifications and/or are provided as a percent confidence on identification.

4.2.8 General Wildlife Encounters

All terrestrial wildlife species observed during all surveys were recorded. Data recorded for some of these incidental observations included date, time, location, and number of individuals.

5 RESULTS AND DISCUSSION

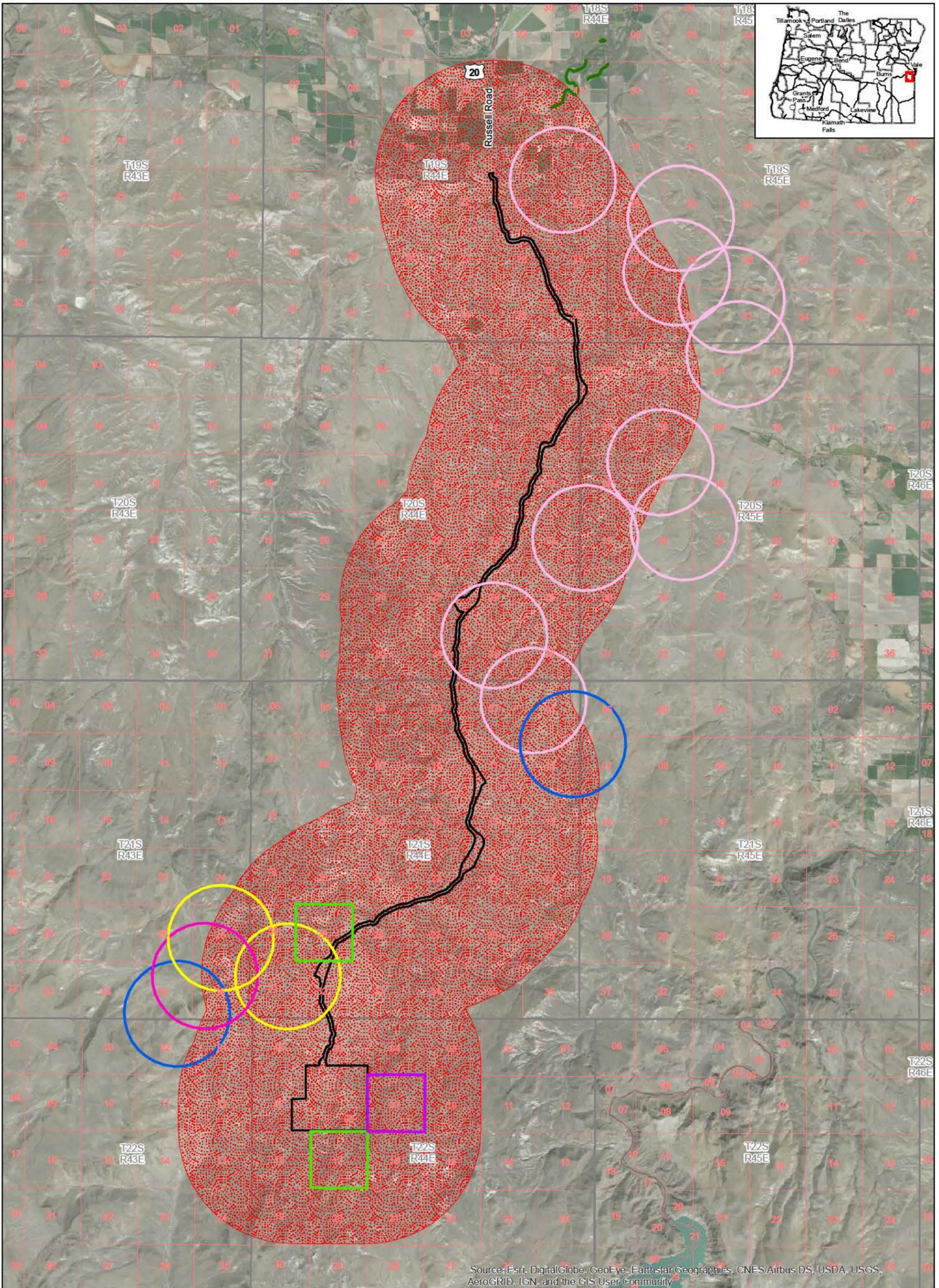
NWC conducted field surveys between June 24, 2013, and May 30, 2014. EMS conducted field surveys between April 18, 2017, and February 6, 2018. GIS information for all surveys is included in Appendix A and field survey data sheets for all surveys are included in Appendix D.

5.1 Review of Existing Information

The online Information for Planning and Consultation (IPaC) response from the USFWS (Consultation Code: 01EOFW00-2018-SLI-0114) stated that no federally listed or proposed species, or proposed and final designated critical habitat, occur within the Permit Area and/or may be affected by the Project (Appendix B). A list of rare, threatened, and endangered animal records within the Two-Mile Buffer WSA was obtained from ORBIC in April 2017 (Appendix C). The occurrences reported are shown in Figure 6. The species reported are listed in Table 4.

Table 4: ORBIC Occurrences of Wildlife Species within the Two-Mile Buffer WSA

Species	Federal Status	State Status
Desert horned lizard (<i>Phrynosoma platyrhinos</i>)	None	None
Golden eagle (<i>Aquila chrysaetos</i>)	Regulated under BGEPA	N/A
Great Basin black-collared lizard (<i>Crotophytus bicinctores</i>)	None	None
Ferruginous hawk (<i>Buteo regalis</i>)	BLM Sensitive	Sensitive
Northern leopard frog (<i>Lithobates pipiens</i>)	BLM Sensitive	None
Western burrowing owl (<i>Athene cunicularia hypugaea</i>)	BLM Sensitive	Sensitive



Explanation Permit Area 2017-2018 EMS Two-mile Buffer WSA		ORBITC Wildlife Data Desert Horned Lizard Ferruginous Hawk Golden Eagle Great Basin Black-Collared Lizard Northern Leopard Frog Western Burrowing Owl		USFWS Reported Golden Eagle Nests 2017	CALICO RESOURCES USA CORP. GRASSY MOUNTAIN MINE PROJECT ORBITC & USFWS Occurrences of Wildlife Species within the Two-mile Buffer WSA Figure 6							
Projection: UTM Zone 11 North, NAD83, meters				<table border="1"> <tr> <td>Date: 03/30/2018</td> <td>Drawn By: JDB/SMH</td> </tr> <tr> <td>Revised:</td> <td>Project No.: 3678</td> </tr> <tr> <td colspan="2">Base Map: USGS 100K quad: Vale</td> </tr> <tr> <td colspan="2">File Name: 3678G_GrassyMtn_ORBITC.mxd</td> </tr> </table>		Date: 03/30/2018	Drawn By: JDB/SMH	Revised:	Project No.: 3678	Base Map: USGS 100K quad: Vale		File Name: 3678G_GrassyMtn_ORBITC.mxd
Date: 03/30/2018	Drawn By: JDB/SMH											
Revised:	Project No.: 3678											
Base Map: USGS 100K quad: Vale												
File Name: 3678G_GrassyMtn_ORBITC.mxd												

ORBIC and the USFWS provided information on the location of known golden eagle nests within the Two-Mile Buffer WSA. ORBIC reported two occupied nests were observed in 2012. USFWS reported one additional golden eagle nest (Figure 6). In addition, special status vertebrate wildlife species that might be expected to occur (based on their distribution and habitat requirements) within the Two-Mile Buffer WSA are listed in Table 5 (NWC 2014). Special status species identified during the information review included those that are BLM Sensitive and Strategic species within the Vale District (BLM 2008b), those that are ODFW Sensitive Species within the Northern Basin and Range Ecoregion (ODFW 2016), or both.

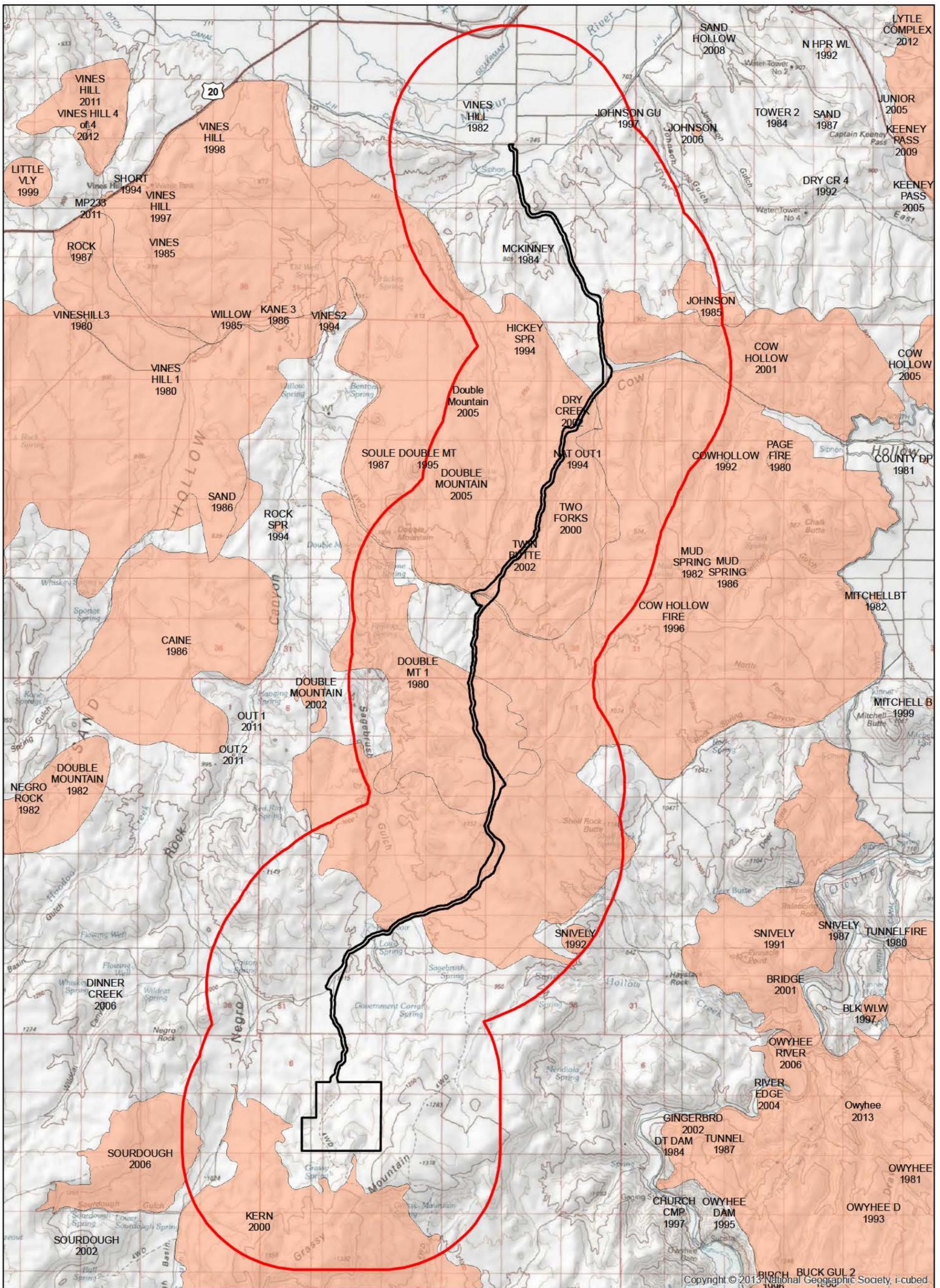
Table 5: Federal and State Listed, Proposed, and Sensitive Species Potentially Occurring in Vicinity of the Wildlife Study Area

Species	Federal Status	State Status
Greater sage-grouse (<i>Centrocercus urophasianus</i>)	BLM Sensitive	Sensitive
Swainson’s hawk (<i>Buteo swainsoni</i>)	BLM Sensitive	Sensitive
White-tailed jack rabbit (<i>Lepus townsendii</i>)	BLM Sensitive	Sensitive
Pygmy Rabbit (<i>Brachylagus idahoensis</i>)	BLM Sensitive	Sensitive
Townsend’s big-eared bat (<i>Corynorhinus townsendii</i>)	BLM Sensitive	Sensitive
Spotted bat (<i>Euderma maculatum</i>)	BLM Sensitive	Sensitive
Fringed myotis (<i>Myotis thysanodes</i>)	BLM Sensitive	Sensitive

5.2 Wildlife Habitat Mapping

Three-tenths of a mile of the northernmost portion of the Permit Area, approximately ten acres, is irrigated agricultural row crops. The area has been extensively grazed for several years. Conditions on the ground are largely a result of seeding with crested wheatgrass (*Agropyron cristatum*) in rangeland improvement projects and in response to wildfire. Approximately 52 percent of the Two-Mile Buffer WSA has been impacted by wildfire during the period of 1980 to 2018 (BLM 2018) (Figure 7).

Five vegetation community types were identified within the Permit Area during the 2014, 2015, and 2017 field surveys (EMS 2018): Wyoming Big Sagebrush/Crested Wheatgrass; Crested Wheatgrass Seeding; Bluebunch Wheatgrass/Cheatgrass/Annual; Wyoming Big Sagebrush/Bluebunch Wheatgrass; and Burned Yellow Rabbitbrush/Bluebunch Wheatgrass. Cheatgrass (*Bromus tectorum*) was a dominant species in every plant community, likely due to disturbance from grazing and wildfire.



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- Explanation**
- Permit Area
 - 2017-2018 EMS Two-mile Buffer WSA
 - Fire History (1980-2013)

CALICO RESOURCES USA CORP.
GRASSY MOUNTAIN MINE PROJECT
 Wildfire History

Projection: UTM Zone 11 North, NAD83



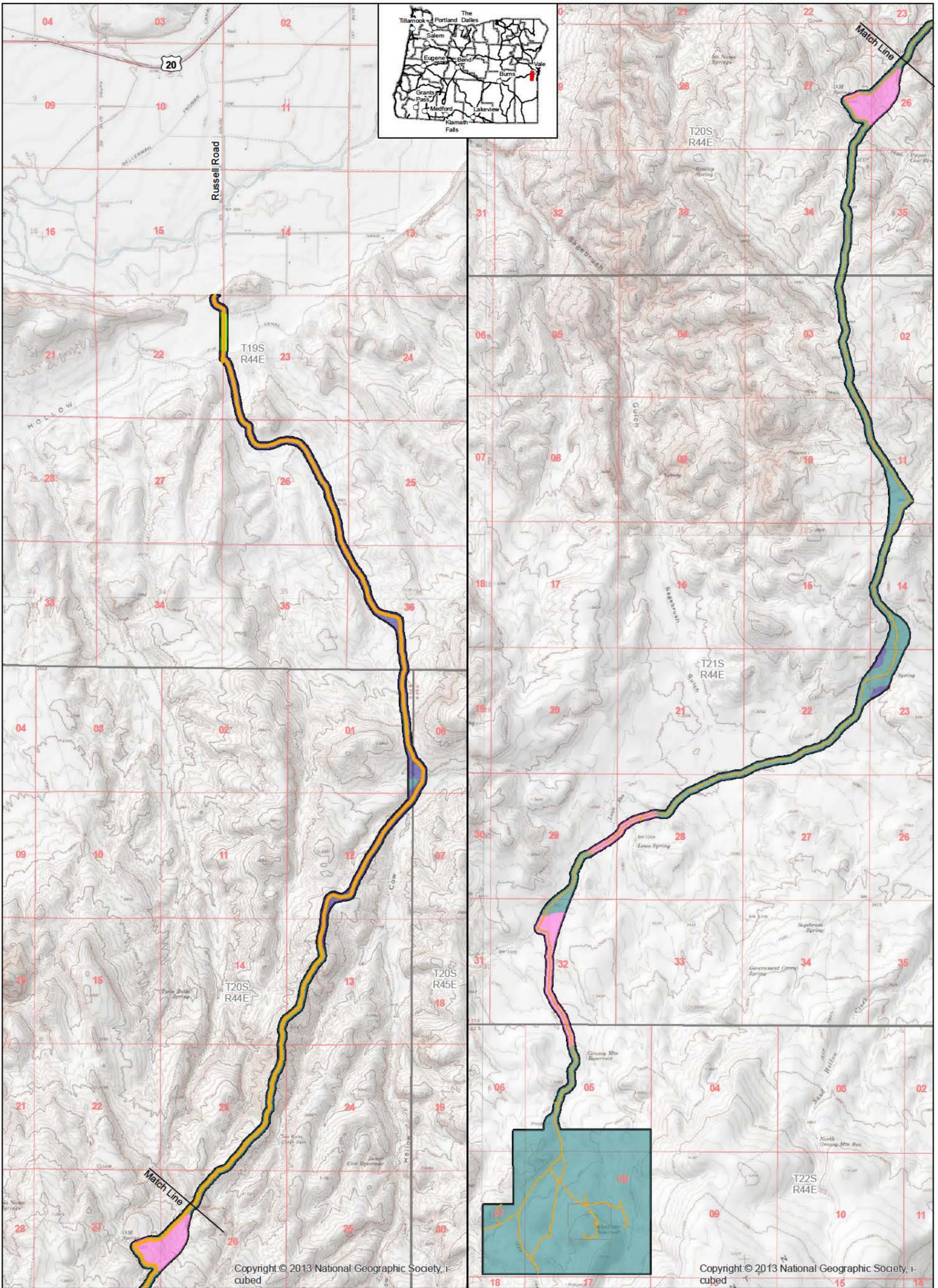
Figure 7

Date: 03/30/2018	Drawn By: GSL/SMH
Revised:	Project No.: 3878
Base Map: USGS 100K quad: Vale	
File Name: 3878H_GrassyMtn_Wildfire_Fig07_Fire.mxd	

Three general land cover types and five specific habitat types were found within the Permit Area; these are described below, summarized in Table 6, and mapped in Figure 8.

Table 6: Land Cover and Habitat Types within the Permit Area

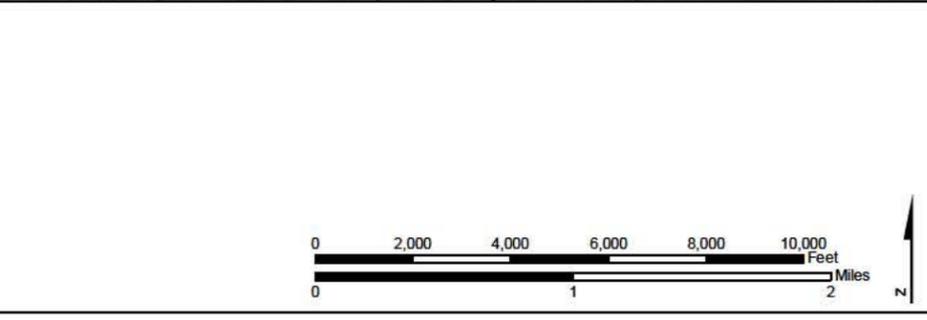
General Land Cover Type	Habitat Type	Habitat Type Description	Acres in Permit Area (Direct Impact)
Developed	Road	Compacted gravel or dirt roads devoid of vegetation and offering no value to wildlife.	56
	Agricultural	Cultivated fields	11
Grassland	Exotic Annual Grassland	Dominated by exotic annuals, particularly cheatgrass, and medusahead. Wildlife use predicated more on soil type and open landscape than on vegetation. Common breeder is horned lark. Also used by pronghorn antelope, American badger, coyote, Merriam's and Belding's ground squirrels, and burrowing owl.	228
	Perennial Grassland	Dominated by perennial bunchgrass. Shrubs, if present, are an inconspicuous component. Provides forage for Merriam's and Belding's ground squirrels, which in turn provide prey for ferruginous hawk, golden eagle, and other raptors, as well as American badger and coyote. Common breeding species include horned lark and western meadowlark. May support burrowing owl where soils are deep and sandy. Exotic annuals – especially cheatgrass – found between bunchgrasses. Due to low precipitation and cattle grazing, wildlife use limited primarily to spring.	135
Shrub-steppe	Sagebrush Shrub-steppe	Dominated by >20% cover of Wyoming big sagebrush and/or yellow rabbitbrush. Offers breeding habitat for shrub obligate species including loggerhead shrike, sage thrasher, Brewer's sparrow, sagebrush sparrow, and black-throated sparrow. Also supports western meadowlark, lark sparrow, and mourning dove. In sandy or rocky soils, sagebrush lizard, desert horned lizard, Great Basin collared lizard, long-nosed leopard lizard, striped whipsnake, western rattlesnake, and other reptiles likely to be found. Exotic grasses, especially cheatgrass, found beneath and between shrub layer throughout Permit Area.	1,332
Total Acres			1,762



Explanation

- Permit Area
- Developed Road
- Agricultural
- Exotic Annual Grassland
- Perennial Grassland
- Sagebrush Shrub-Steppe

Projection: UTM Zone 11 North, NAD83, meters



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GRASSY MOUNTAIN MINE PROJECT
Wildlife Habitat Types within the Permit Area

Figure 8

Date: 03/30/2018	Drawn By: JDB/SMH
Revised: 03/30/2018	Project No.: 3678
Base Map: USGS 7.5 Minute Topographic Series	Source: USGS, National Geographic Society, i-cubed
File Name: 3678H_GrassyMtn_Wildlife_Fig08_WildlifeHabitat.mxd	

5.2.1 Developed-Road and Agricultural

Approximately 57 acres of the Permit Area are developed in the form of compacted gravel or dirt roads relatively devoid of vegetation and offering little value to most wildlife. Roads are a potential source of the spread of noxious and invasive exotic grasses and weeds. They also constitute a potential source of fatality for birds, snakes, lizards, and mammals, though there is currently very little traffic on the roads within the Permit Area. Also within this habitat type are cultivated agricultural fields at the north end of the Permit Area (approximately ten acres).

5.2.2 Grassland-Exotic Annual Grassland

Approximately 228 acres of the Permit Area are considered exotic annual grassland. This habitat type occurs in areas that are heavily grazed and is dominated by exotic annuals - particularly cheatgrass and medusahead (*Taeniatherum caput-medusae*). Native bunchgrasses are absent or a minor component. Heavy livestock grazing, and low and very seasonal precipitation result in low value to wildlife, as exotic annual grasslands provide little nutrition or cover. Wildlife use of this habitat is predicated more on soil type and open landscape than on vegetation. The most common breeding bird is horned lark (*Eremophila alpestris*). This habitat is also used by pronghorn antelope (*Antilocapra americana*), American badger (*Taxidea taxus*), coyote (*Canis latrans*), Merriam's ground squirrel (*Urocitellus canus*) and Belding's ground squirrel (*Urocitellus beldingi*), and burrowing owl (*Athene cunicularia*). During late winter and spring, an abundance of Merriam's ground squirrels (which is expected to vary among years, but which was quite high in spring 2014) likely provides good hunting for mammalian predators and raptors, including ferruginous hawk (*Buteo regalis*), golden eagle, northern harrier (*Circus cyaneus*), and prairie falcon (*Falco mexicanus*).

5.2.3 Grassland-Native Perennial Grassland

Approximately 135 acres of the Permit Area are considered perennial grassland. This habitat type is dominated by crested wheatgrass, an introduced species that was seeded in the area. Bluebunch wheatgrass and Sandberg bluegrass are the dominant native perennial grasses, which together comprise an average of 22 percent of the ground cover (EMS 2017; HDR 2015). Shrubs (big sagebrush and yellow rabbitbrush), if present, are an inconspicuous component. This habitat provides forage and some cover for Merriam's and Belding's ground squirrels, which in turn provide prey for ferruginous hawk, golden eagle, and other raptors, as well as American badger and coyote. Common breeding species include horned lark and western meadowlark (*Sturnella neglecta*). This habitat likely provides potentially suitable forage for pronghorn and may support burrowing owl denning and breeding where soils are deep and sandy. Exotic annuals—especially cheatgrass—are found between the bunchgrasses, where they tend to outcompete more nutritional forbs and limit this habitat's value to wildlife.

5.2.4 Shrub-steppe-Sagebrush Shrub-steppe

Approximately 1,332 acres of the Permit Area are considered sagebrush shrub-steppe. This habitat is dominated by greater than 15 percent cover of Wyoming big sagebrush and yellow rabbitbrush (EMS 2017; HDR 2015). This habitat type offers potential breeding habitat for shrub obligate species including loggerhead shrike (*Lanius ludovicianus*), sage thrasher (*Oreoscoptes montanus*), Brewer's sparrow (*Spizella breweri*), sagebrush sparrow (*Artemisiospiza nevadensis*), and

black-throated sparrow (*Amphispiza bilineata*). Also breeding in this habitat are western meadowlark, lark sparrow (*Chondestes grammacus*), common nighthawk (*Chordeiles minor*), and mourning dove (*Zenaida macroura*). In sandy or rocky soils, sagebrush lizard (*Sceloporus graciosus*), desert horned lizard (*Phrynosoma platyrhinos*), pygmy short-horned lizard (*Phrynosoma douglasii*), Great Basin collared lizard (*Crotaphytus bicinctores*), long-nosed leopard lizard (*Gambelia wislizenii*), western whiptail (*Cnemidophorus tigris*), striped whipsnake (*Masticophis taeniatus*), western rattlesnake (*Crotalus atrox*), and other reptiles are found.

5.3 Large-Plot Avian Surveys

Seventeen species were detected during large-plot avian surveys conducted by NWC between June 2013 and May 2014 (Table 7). Three of these species, horned lark, western meadowlark, and common raven (*Corvus corax*), were found during all seasons and accounted for 137 of the 171 individuals detected. Observations of large birds outside of the plots are listed in Table 8.

Golden eagles were detected during all seasons. Ferruginous hawks, a BLM Sensitive species, were detected during summer and spring (and found nesting during the 2014 raptor nest survey [Section 5.5]). The burrowing owl, also a BLM Sensitive species, was detected in the summer and fall of 2013, but was not found during any subsequent surveys. Other raptors detected outside of the large-plot surveys were northern harrier, red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*Buteo lagopus*), short-eared owl (*Asio flammeus*), long-eared owl (*Asio otus*), and prairie falcon. The prairie falcon was confirmed nesting within the Two-Mile Buffer WSA; northern harrier was believed to be nesting within the Two-Mile Buffer WSA in 2014, and long-eared owl was estimated to have bred successfully in 2013.

Table 7: Avian Species Observed in Large-Plot Avian Surveys

Species	Summer ¹		Fall ²		Winter ³		Spring ⁴	
	# GRP	# IND	# GRP	# IND	# GRP	# IND	# GRP	# IND
Waterfowl		0		0		0		13
Green-winged teal	0	0	0	0	0	0	1	13
Raptors		0		0		0		2
Buteos		0		0		0		1
Red-tailed hawk	0	0	0	0	0	0	1	1
Eagles		0		0		0		1
Golden eagle	0	0	0	0	0	0	1	1
Gamebirds		1		0		0		0
Chukar	1	1	0	0	0	0	0	0
Shorebirds		0		0		0		1
Long-billed curlew	0	0	0	0	0	0	1	1
Passerines		26		116		27		155
Songbirds		25		115		21		150
Western king-bird	0	0	0	0	0	0	1	1
Loggerhead shrike	3	3	0	0	0	0	2	2
Horned lark	8	16	14	110	6	19	13	95
Barn swallow	0	0	1	3	0	0	0	0
Rock wren	0	0	1	1	0	0	2	2
Sage thrasher	1	1	0	0	0	0	2	2
Brewer's sparrow	0	0	0	0	0	0	4	6
Vesper sparrow	1	1	0	0	0	0	0	0
Sagebrush sparrow	0	0	0	0	0	0	1	2

Species	Summer ¹		Fall ²		Winter ³		Spring ⁴	
	# GRP	# IND	# GRP	# IND	# GRP	# IND	# GRP	# IND
White-crowned sparrow	0	0	0	0	0	0	1	3
Western meadowlark	4	4	1	1	2	2	13	37
Corvids	0	1		1		6		5
Common raven	1	1	1	1	4	6	5	5
Totals	19	27	18	116	12	27	48	171

Survey dates:

¹ Summer: June 24 through August 14, 2013; four visits to five plots = 20 surveys

² Fall: September 4 through October 24, 2013; four visits to five plots = 20 surveys

³ Winter: November 25, 2013 through February 26, 2014; four visits to five plots = 20 surveys

⁴ Spring: March 19 through May 29, 2014; four visits to five plots = 20 surveys

Table 8: Avian Species Observed Outside of Large-Plot Avian Surveys

Species	Summer 2013	Fall 2013	Winter 2013-14	Spring 2014	Total
Canada goose	0	0	10	0	10
American wigeon	0	0	0	4	4
Mallard	2	0	0	0	2
Northern shoveler	1	0	0	0	1
Northern harrier	1	0	0	1	2
Red-tailed hawk	1	1	0	1	3
Ferruginous hawk	2	0	0	2	4
Rough-legged hawk	0	1	0	0	1
Golden eagle	2	3	9	3	17
Long-billed curlew	0	0	0	2	2
Long-eared owl	3	0	0	0	3
Short-eared owl	0	1	0	0	1
Burrowing owl	1	2	0	0	3
Prairie falcon	2	0	0	0	2
Totals	15	8	19	13	55

5.4 Small-Plot Avian Surveys

Forty-seven species were detected during small-plot avian surveys conducted between June 2013 and May 2014 (Table 9). Of these, 25 were found only at plot 6, which was more than a mile from the Permit Area and contained habitats not found in the Permit Area. Together, the pond, marsh, and riparian trees at plot 6 constituted an oasis that attracted not only waterfowl, marsh birds, and riparian obligates (some of which nested there) but also migrants (including passerines) that used this taller, denser vegetation for cover and foraging during stopovers. Twenty-two species were detected at the other seven plots in habitat that is found within the Permit Area (Figure 4).

Horned lark and western meadowlark were each found at six of the seven small plots, the only species found during all four survey seasons, and the most commonly detected species. Rock wren (*Salpinctes obsoletus*) was detected during spring, summer, and fall seasons (at the three plots containing a small amount of exposed rock). Six species were detected multiple times during spring and summer seasons; these were Brewer's sparrow, lark sparrow, loggerhead shrike, Say's phoebe (*Sayornis saya*), sagebrush sparrow, and sage thrasher (Table 9). All these birds are presumed to breed in or near the Permit Area, and active nests of horned lark, lark sparrow, and common nighthawk were found incidentally during other surveys.

Table 9: Avian Species Observed in Small-Plot Avian Surveys

Species	Study Plots								
	1	2	3	4	5	6	7	8	
Gadwall	0	0	0	0	0	4	0	0	4
American wigeon	0	0	0	0	0	2	0	0	2
Mallard	0	0	0	0	0	28	0	0	28
Northern pintail	0	0	0	0	0	4	0	0	4
Blue-winged teal	0	0	0	0	0	3	0	0	3
Green-winged teal	0	0	0	0	0	14	0	0	14
California quail	0	1	0	0	0	0	0	0	1
Northern harrier	0	0	0	0	0	4	0	0	4
Ferruginous hawk	0	0	0	0	0	0	1	0	1
American coot	0	0	0	0	0	3	0	0	3
Killdeer	0	0	0	0	1	6	0	0	7
Greater yellowlegs	0	0	0	0	0	1	0	0	1
Mourning dove	0	0	0	0	0	10	1	0	11
Long-eared owl	0	0	0	0	0	3	0	0	3
Common nighthawk	0	0	0	0	0	13	0	0	13
Northern flicker	0	0	0	0	0	1	0	0	1
Say's phoebe	0	1	0	3	0	1	0	0	5
Loggerhead shrike	0	1	0	1	0	0	2	0	4
Cassin's vireo	0	0	0	0	0	2	0	0	2
Common raven	0	5	0	0	0	0	0	0	5
Horned lark	29	11	17	0	79	2	82	100	320
Cliff swallow	0	0	0	0	0	20	0	0	20
Barn swallow	25	0	0	0	0	41	0	0	66
Mountain chickadee	0	0	0	0	0	4	0	0	4
Rock Wren	0	5	7	4	0	0	0	0	16
Canyon wren	0	0	1	0	0	0	0	0	1
Ruby-crowned kinglet	0	0	0	0	0	2	0	0	2
Mountain bluebird	12	6	0	0	0	0	0	0	18
American robin	0	0	0	0	0	1	0	0	1
Sage thrasher	2	5	0	0	0	0	0	0	7
European starling	0	0	0	0	0	17	0	0	17
Brewer's sparrow	4	3	0	2	0	0	3	1	13
Lark sparrow	2	6	3	1	0	1	0	0	13
Black-throated sparrow	0	0	1	0	0	0	0	0	1
Sagebrush sparrow	3	0	3	0	0	0	0	0	6
Song sparrow	0	0	0	0	0	9	0	0	9
Swamp sparrow	0	0	0	0	0	2	0	0	2
White-crowned sparrow	0	0	0	5	0	0	0	0	5
Dark-eyed junco	0	0	0	1	0	0	0	0	1
Lazuli bunting	0	0	0	0	0	1	0	0	1
Red-winged blackbird	0	0	0	0	0	96	0	0	96
Tricolored blackbird	0	0	0	0	0	9	0	0	9
Western meadowlark	11	19	15	14	7	2	5	0	73
Brewer's blackbird	1	0	0	0	0	2	0	0	3
Brown-headed cowbird	0	0	0	0	0	3	0	0	3

Species	Study Plots								
	1	2	3	4	5	6	7	8	9
House finch	0	0	0	0	0	0	6	0	6
Lesser goldfinch	0	0	0	0	0	4	0	0	4
Total	89	63	47	31	87	315	100	101	833

Mountain bluebirds (*Sialia currucoides*) were detected at two plots, but these detections occurred on a single fall survey day. Twelve other species were detected on a single occasion and at a single plot: ferruginous hawk, California quail (*Callipepla californica*), mourning dove, common raven, barn swallow (*Hirundo rustica*), canyon wren (*Catherpes mexicanus*), black-throated sparrow, white-crowned sparrow (*Zonotrichia leucophrys*), dark-eyed junco (*Junco hyemalis*), Brewer’s blackbird (*Euphagus cyanocephalus*), and house finch (*Haemorhous mexicanus*) (Table 9).

5.5 Raptor Nest Surveys

5.5.1 NWC 2013, 2014 Surveys

5.5.1.1 Ground Survey 2013

Three raptor nests were active in 2013 (Figure 9). One of these, a common raven nest, was active again in 2014. A burrowing owl nest was identified by the presence of an adult owl and an abundance at the burrow entrance of pellets and excrement of this species. Only a single individual was ever seen at any one time, however, so whether a breeding attempt occurred remains uncertain. (Surveys did not begin in 2013 until after breeding would be expected to be complete.) The burrowing owl is a BLM Sensitive species. A successful breeding attempt by long-eared owls was documented by the presence at the pond of three young of this species and a stick nest in a tree with pellets and excrement in and beneath it. This nest was likely originally built by black-billed magpies (*Pica hudsonia*).

5.5.1.2 Aerial Survey 2014

One active ferruginous hawk nest was observed within the Two-Mile Buffer WSA during the April 27, 2014, aerial raptor nesting survey performed by NWC (NWC 2014) (Figure 9).

Within ten meters of the active ferruginous hawk nest, there was an inactive alternate nest. There were also two older inactive nests built by ferruginous hawks approximately two and three kilometers to the northeast and east-northeast of the active nest. These nests likely represented a separate ferruginous hawk breeding territory from the past. The ferruginous hawk is a BLM Sensitive species.

Three active common raven nests were also located during the aerial survey (Figure 9). These nests could be used in future years by raptors, especially by great horned owl (*Bubo virginianus*) or prairie falcon, both of which will use stick nests constructed by other species. There were two other inactive stick nests (besides those of ferruginous hawk) identified during the aerial survey.

Figure 9: Raptor Nest Survey Results (Confidential – submitted separately)

Active raptor nest density in 2014 was extremely low in the Two-Mile Buffer WSA, despite the great abundance of ground squirrels (Merriam's and Belding's). It is likely that nesting substrate is a more important factor in limiting use of this area by breeding raptors than is prey abundance or availability. The only trees in the survey area were the few small deciduous ones associated with the lone pond, and only the few rock outcrops and rimrock provided substrate for placement of the stick nests used by most raptors.

5.5.2 EMS 2017 Survey

5.5.2.1 Aerial Survey

Raptor nest surveys were flown within the Two-Mile Buffer WSA on April 21 and 28, 2017, in conjunction with the greater sage-grouse lek surveys. Potential nesting sites for raptors were surveyed from 100 feet to 350 feet from the aircraft. Nest sites transect routes were flown along likely habitat on rock outcropping, cliff faces, trees, and power line structures. The flight tracks are included in Appendix A.

No occupied raptor nests were recorded during the aerial survey. A single red-tailed hawk was observed on two occasions during the surveys south of Grassy Mountain along the rimrock. Although there were many perch sites, no nests were found in the area. It is suspected the hawk may be resident of the Owyhee Canyon cliff faces immediately south of Grassy Mountain, as both times the hawk departed the area in the direction of the canyon to the south. A red-tailed hawk was also observed perched on a power transmission pole southeast of the Permit Area.

5.5.2.2 Ground Survey

Raptors

Seven raptor nests were recorded during the June 21 through 23, 2017, ground surveys (Figure 9). Two stick raptor nests were recorded on a southeast oriented rock outcrop in Sagebrush Gulch: a large raptor nest was approximately 25 feet from the ground on an approximately 35-foot high outcrop; and a small raptor nest is situated east of the larger nest at approximately the same height. No raptors were observed at or near the nests during visits on June 21 and 22. No evidence of occupancy such as recent white wash and/or feathers was observed at the larger nest. However, one old pellet, possibly from a red-tailed hawk, as well as a few old bleached rabbit bones were found below the nest. The small raptor nest had abundant white wash on the rock face below the nest and a few dark downy feathers were visible in sticks above the nest bowl. It is possible a common raven used the nest at one time, however no raven pellets or feathers were found below the nest.

A pair of red-tailed hawks was observed perched and flying near the golden eagle nest OR GE 1327. The birds were observed in courtship behavior during the May 27 survey. Numerous perch sites were found on several rocks and sagebrush on the ridge line approximately 750 feet southeast of the nest location with abundant white wash, molted feathers, and prey remains of rabbits. No further breeding activity at this nest was observed during the June and July surveys.

A female Cooper's hawk (*Accipiter cooperii*) was recorded June 23 in the cottonwood trees that surround the pond below Sagebrush Spring. At least three small stick nests were observed in the trees. The hawk gave an alarm call but remained in the cover of the trees while the biologist

surveyed the site for sage-grouse broods from approximately 100 meters away. No Cooper's hawks were observed during site visits on July 4 and 5 and it is unlikely any of the nests were used by Cooper's hawks.

On June 22, an inactive large raptor nest was recorded in a cottonwood tree at No Name Springs. Two adult red-tailed hawks were observed soaring approximately 0.25 mile south of the nest tree. No raptors were observed perched in or near the tree during a one-hour observation period. No sign (e.g., whitewash, scat, feathers, prey remains, pellets) was found below or near the nest. On June 23, an inactive prairie falcon nest was recorded on a rock outcrop at the south end of Double Mountain. No falcons were observed during a 1.5-hour monitoring session. Molted feathers, old egg shells, and pellets were present beneath the nest ledge. No downy feathers, recent prey remains, or scat, which could suggest use in 2017, were found. Two pairs of rock doves (*Columbia livia*) were nesting in a horizontal ledge in the outcrop. A hive of bees occupied a pothole in the outcrop. Two closed-leghold trap sets were also located along the base of the outcrop.

Burrowing Owls

No burrowing owls or burrowing owl nests were found during the three broadcast surveys conducted in 2017. No evidence of burrowing owl presence within the 0.5-Mile Buffer WSA, such as pellets, feathers, tracks, and scat, were found during surveys conducted for other wildlife species. Potentially suitable breeding habitat is present along the access road in locations dominated by grass and low shrubs. Numerous burrows dug by ground squirrels, badgers, and coyotes, which could provide potential nest sites, are found throughout the 0.5-Mile Buffer WSA.

5.5.3 EMS 2018 Survey

Observations of raptors and raptor nests were recorded January 25 and February 6, 2018, while flying aerial winter sage-grouse surveys in the Two-Mile Buffer WSA. A red-tailed hawk was observed perched at a large raptor nest in a cottonwood tree along the Malheur River. A second red-tailed hawk was observed perched at a large raptor nest in a cottonwood tree next to a farm house.

A pair of ferruginous hawks was recorded at a platform nest in the foothills south of the J H Canal. One bird was perched on the platform and the other bird flushed from the ground near the platform. A ferruginous hawk nest was recorded upslope of Cow Hollow on a low relief rock outcrop approximately ten feet above the ground. A pair of prairie falcons was recorded at the nest identified in 2017 on a rock outcrop at the south end of Double Mountain.

5.6 Golden Eagle Nest Monitoring

5.6.1 NWC 2013, 2014 Survey

The golden eagle nests located and monitored by NWC in the 2014 aerial survey are outside of the Two-Mile Buffer WSA, and therefore, are not discussed in this report.

5.6.2 EMS 2017 Survey

5.6.2.1 Aerial Survey

An aerial survey was conducted of the Two-Mile Buffer WSA on April 21 and 28, 2017, in conjunction with the greater sage-grouse lek survey. No occupied golden eagle nests were observed.

5.6.2.2 Ground Survey

Golden eagle nest OR GE 1327, which is within the Two-Mile Buffer WSA, was observed for a four-hour period on May 27. A pair of red-tailed hawks was engaged in courtship behavior near the nest, however no golden eagles were observed.

5.6.3 EMS 2018 Survey

Observations of golden eagles were recorded during the aerial survey for winter use by greater sage-grouse in the Two-Mile Buffer WSA. Golden eagle nest OR GE 1327 was observed from the air on both January 24 and February 6; no golden eagles were observed near the nest nor were recent greens present in the nest. Two golden eagle nests were recorded on a pinnacle rock outcrop approximately 0.75-mile upslope of Sagebrush Gulch (Figure 9). An adult golden eagle flushed from the rock outcrop. One nest is approximately 30 feet above the ground while the other nest is approximately 40 feet above the ground on a 60-foot rock outcrop. Both nests are located on ledges. One eagle was observed perched on the outcrop on January 24 while a pair of eagles was observed at the outcrop during the February 6 survey. The eagles were variously seen flying together or perched on the outcrop with nests. In addition, observations of four adults and one immature golden eagle were recorded during both the January 24 and February 6 flights at locations that were not associated with nest sites.

5.7 Greater Sage-Grouse Surveys

Portions of the Permit Area and the Two-Mile Buffer WSA are designated by ODFW as Low Density Area (Figure 4). Greater sage-grouse surveys were conducted in shrub-dominated portions of the Two-Mile Buffer WSA.

5.7.1 NWC 2013-2014 Surveys

5.7.1.1 Brood Rearing Surveys

Greater sage-grouse brood-rearing surveys were conducted on June 25, 2013, and July 25, 2013. No sign of use of the Two-Mile Buffer WSA by greater sage-grouse was detected. No birds were encountered, nor were any feathers, tracks, or scat found. No greater sage-grouse or their sign were encountered during any other field surveys. Scat of this species can persist for many months and even years; therefore, the lack of such sign is indicative of little or no use of the Two-Mile Buffer WSA by this species in recent years.

5.7.1.2 Winter Use Surveys

Winter use surveys were conducted on December 20, 2013, and January 14 and 15, 2014; the latter were done under ideal conditions, clear days with a covering of snow on the ground. No sign of use of the survey area by greater sage-grouse was detected. No birds were encountered, nor were any feathers, tracks, or scat found.

5.7.1.3 Lek Surveys

No known greater sage-grouse leks are known to exist within the Two-Mile Buffer WSA (Milburn 2014). No sign of this species was found during any surveys prior to the April lekking season; therefore, there were no areas of potential concentration to be checked for leks. Listening for drumming males during the hour before and after sunset (on April 10 and April 28, 2014) yielded no detections of greater sage-grouse or their leks.

5.7.2 **EMS 2017-2018 Surveys**

5.7.2.1 Brood Rearing Surveys

No sage-grouse hens and chicks or evidence of sage-grouse presence (e.g., scat, tracks, feathers) were found in any of the surveyed spring locations during the June and July 2017 surveys.

5.7.2.2 Winter Use Surveys

No greater sage-grouse were detected during the two aerial winter-use surveys in January and February 2018.

5.7.2.3 Lek Surveys

No leks were found during ten hours of aerial transect surveys in April 2017.

5.8 **Leporid Surveys**

5.8.1 **NWC 2013-2014 Surveys**

No potentially suitable pygmy rabbit habitat was identified within the 0.5-Mile Buffer WSA. The most nearly suitable areas were surveyed on November 26, 2013, and May 30, 2014. No pygmy rabbits or their sign (scat or burrows) were detected. No pygmy rabbits or their sign were detected during any of the other surveys conducted within the Two-Mile Buffer WSA.

No potentially suitable white-tailed jackrabbit habitat was identified within the 0.5-Mile Buffer WSA. The most nearly suitable areas were surveyed on November 26, 2013, and May 30, 2014. No white-tailed jackrabbits were encountered, and all jackrabbit pellets found were in habitat more characteristic of the widespread congeneric black-tailed jackrabbit. No white-tailed jackrabbits were detected during any of the surveys conducted within Two-Mile Buffer WSA.

5.8.2 EMS 2017 Survey

No pygmy rabbits or their sign (e.g., burrows, scat, tracks) were found in the 0.5-Mile Buffer WSA along the access road during the May and July 2017 surveys. Potentially suitable habitat is present in the extensive patch of sagebrush that extends from DM Spring south approximately 2.5 miles. Within this area, surveys focused on patches of sagebrush that were uneven in height and density and in drainages. The sagebrush habitat in the other mapped patches lacks the shrub density and canopy cover characteristic of occupied pygmy rabbit habitat as described by Ulmschneider et al. (2004).

Small scats produced by juvenile cottontail rabbits in summer can be similar in size to those of pygmy rabbits. To confirm species attribution of these scats, three samples were collected and submitted for species identification via DNA analysis to the University of Idaho Laboratory for Ecological, Evolutionary and Conservation Genetics. The scats were from mountain cottontails (*Sylvilagus nuttallii*), not pygmy rabbits.

During the 2017 surveys, no white-tailed jackrabbits were observed in any of the survey areas. The large lagomorph scats found were typical of black-tailed jackrabbit not the larger scats produced by white-tailed jackrabbits. This species can also be readily observed during aerial surveys, but none were detected during the low-elevation 2018 winter aerial surveys conducted for sage-grouse. Potential habitat is present in the sagebrush steppe habitat in the southern portion of the 0.5-Mile Buffer WSA along the access road.

5.9 Acoustic Bat Surveys

5.9.1 NWC 2013-2014 Surveys

No caves or mine adits were found during the field surveys, and no areas with potential to concentrate roosting or maternal colonies were identified within the Permit Area. Bat detectors were operational from before sunset to after sunrise at each of the five locations (Figure 6) during a total of 21 nights between June 24 and October 25, 2013, and between April 8 and May 30, 2014. Ten species of bats were detected over the course of the study (Table 10). The number and locations of detections are listed in Table 11.

Table 10: Bat Species Detected by Survey Station June 2013 through May 2014

Common Name	Scientific Name	Protection Status	Detector Location				
			1	2	3	4	5
California myotis	<i>Myotis californicus</i>	ODFW Sensitive		X	X		
Small-footed myotis	<i>Myotis ciliolabrum</i>	None	X	X	X	X	X
Long-eared myotis	<i>Myotis evotis</i>	None					X
Yuma myotis	<i>Myotis yumanensis</i>	None	X			X	
Hoary bat	<i>Lasiurus cinereus</i>	ODFW Sensitive			X		
Silver-haired bat	<i>Lasiomycteris noctivagans</i>	ODFW Sensitive	X	X	X		X
Canyon bat	<i>Parastrellus hesperus</i>	None	X	X	X	X	X
Big brown bat	<i>Eptesicus fuscus</i>	None					X
Spotted bat	<i>Euderma maculatum</i>	BLM Sensitive ODFW Sensitive		X			

Common Name	Scientific Name	Protection Status	Detector Location				
			1	2	3	4	5
Pallid bat	<i>Antrozous pallidus</i>	BLM Sensitive ODFW Sensitive		X		X	X

Table 11: Bat Species Detected by Month: June 2013 through May 2014

Common Name	Month						
	Apr	May	Jun	Jul	Aug	Sep	Oct
California myotis		X	X	X	X		
Small-footed myotis	X	X	X	X	X	X	
Long-eared myotis				X			
Yuma myotis			X	X		X	X
Hoary bat						X	
Silber-haired bat	X	X		X		X	X
Canyon bat	X	X		X	X	X	
Big brown bat					X		
Spotted bat							X
Pallid bat				X	X		

Small-footed myotis appears to be present near the Permit Area from at least April through September. Canyon bat and California myotis are also likely present in the Permit Area through a majority of the survey season, with the latter having a slightly more protracted period of presence. Silver-haired bat appears to move through the area during spring and late summer migration with some regularity. The other species detected are uncommon or rare, with the possible exception of pallid bat, for which there were detections at three locations (Table 10) and on several nights in July and August (Table 11).

5.9.2 EMS 2017 Survey

Three bat species were detected during the acoustic surveys (Table 12). Three of the six survey locations did not have any recordings. All equipment was working.

Table 12: Bat Species Detected on May 27 and 28 and June 21 to 23, 2017

Common Name	Scientific Name	Protection Status	Detector Location					
			17-1	17-2	17-3	17-4	17-5	17-6
California myotis	<i>Myotis californicus</i>	ODFW Sensitive	X	X	X			
Small-footed myotis	<i>Myotis ciliolabrum</i>	None	X	X	X			
Silver-haired bat	<i>Lasiomycteris noctivagans</i>	ODFW Sensitive		X	X			

Fewer species were detected in 2017 as compared to 2014 likely due to only five survey nights. In addition, the 0.5-Mile Buffer WSA of the Permit Area along the access road provides little structural diversity that can provide day-roosting habitat for bats. No adits, shafts, or caves were found. Potential day-roosting habitat consists of a few rock outcrops and the deciduous trees at DM Spring. The three sites with recordings had water that probably attracted bats for foraging and drinking.

5.10 General Wildlife Observations

Wildlife species and habitats occurring within and adjacent to the 0.5-Mile Buffer WSA are consistent with desert areas of the Great Basin and consist of desert-rangeland type habitat where sagebrush and grasses are the dominant species. A comprehensive list of all vertebrate wildlife species observed during the NWC and EMS surveys is in Appendix E.

Mule deer (*Odocoileus hemionus*) and pronghorn antelope are present in the 0.5-Mile Buffer WSA year-round, but in low densities. ODFW-designated mule deer winter range is bisected by approximately five miles of the north end of the Permit Area. There is no other big game winter range that intersects the Permit Area (ODFW 2015). During the NWC surveys in 2014, the largest herds of mule deer and pronghorn antelope were observed at the northern end of the Permit Area along the access road where they presumably feed in the alfalfa fields. During the 2017 EMS surveys, mule deer and pronghorn antelope were observed primarily in the vicinity of springs. Elk (*Cervus canadensis*) scat was noted in a few locations near springs and one bull elk was observed near an unnamed spring east of Sagebrush Gulch. During the 2018 aerial winter sage-grouse surveys, groups of mule deer were recorded throughout the Two-Mile Buffer WSA while a herd of 30 pronghorn antelope was observed in Cow Hollow. No elk were observed.

Use of the 0.5-Mile Buffer WSA is low by water-dependent species, such as the migratory waterfowl and shorebirds that travel within the Pacific Flyway. Lake Owyhee, located six miles to the southeast of the site, attracts several species of migrating waterfowl, shorebirds, and passerines. Many of these birds cross the 0.5-Mile Buffer WSA in transit. Sagebrush-dependent species, like sage sparrow, occur in the 0.5-Mile Buffer WSA, but in low numbers due to the high degree of disturbance to the existing habitat and the dominance of cheatgrass. Raptor use is common.

During the NWC surveys, the Pacific chorus frog (*Pseudacris regilla*) was detected numerous times at the single pond within the Permit Area and at DM Spring. The sagebrush lizard and western fence lizard were generally associated with small rock outcrops, like those at Small Avian Plots 1-3. The long-nosed leopard lizard, Great Basin collared lizard, western whiptail, desert horned lizard, and pygmy short-horned lizard were encountered primarily in sagebrush shrub-steppe and in sandy soil types.

Ground squirrels, especially Merriam's, were extremely abundant in the 0.5-Mile Buffer WSA. They provide an important source of prey for the raptor species that breed in the area. Both badger and coyote were present; these species prey on the abundant ground squirrels, create their own burrows and expand those of their prey, and provide potential burrows for burrowing owls and other wildlife. A bobcat (*Lynx rufus*) was encountered on one occasion during the NWC survey, and tracks were found during winter surveys. Porcupines (*Erethizon dorsatum*) were observed in several locations within the 0.5-Mile Buffer WSA.

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7 CONTACTS

Richard DeLong
EM Strategies, Inc.
1650 Meadow Wood Lane
Reno, Nevada 89502
(775) 826-8822
rich@emstrats.com

Kris Kuyper
EM Strategies, Inc.
1650 Meadow Wood Lane
Reno, Nevada 89502
(775) 826-8822
kris@emstrats.com

8 LIST OF PREPARERS

EM Strategies, Inc.

Sarah Harrelson – Report Preparation
Kris Kuyper – Report Preparation
Jim Branch – GIS Figure Creation
Catherine Lee – Technical Review
Rich DeLong – Technical Review
Ellen Farley – Editorial Review

APPENDIX A

**GEOGRAPHIC INFORMATION SYSTEM DATA FOR ALL WILDLIFE AND HABITAT SURVEYS
(SUBMITTED DIGITALLY)**

APPENDIX B

U.S. FISH & WILDLIFE SERVICE IPAC CONSULTATION



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398

Phone: (503) 231-6179 Fax: (503) 231-6195

<https://www.fws.gov/oregonfwo/articles.cfm?id=149489416>

In Reply Refer To:

December 01, 2017

Consultation Code: 01EOFW00-2018-SLI-0114

Event Code: 01EOFW00-2018-E-00212

Project Name: Grassy Mountain

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the

human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact the Endangered Species Division at the Service's Oregon Fish and Wildlife Office at (503) 231-6179. For information regarding listed marine and anadromous species under the jurisdiction of NOAA Fisheries Service, please see their website (http://www.nwr.noaa.gov/habitat/habitat_conservation_in_the_nw/habitat_conservation_in_the_nw).

Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
-

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Oregon Fish And Wildlife Office
2600 Southeast 98th Avenue, Suite 100
Portland, OR 97266-1398
(503) 231-6179

Project Summary

Consultation Code: 01EOFW00-2018-SLI-0114

Event Code: 01EOFW00-2018-E-00212

Project Name: Grassy Mountain

Project Type: MINING

Project Description: Exploration project permit area and access road

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/43.78722054961776N117.31858383599294W>



Counties: Malheur, OR

Endangered Species Act Species

There is a total of 0 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

APPENDIX C

ORBIC REPORT

(CONFIDENTIAL AND SUBMITTED UNDER SEPARATE COVER)

APPENDIX D

FIELD SURVEY DATA SHEETS

(CONFIDENTIAL - SUBMITTED SEPARATELY AS DIGITAL SCANS)

APPENDIX E

COMPREHENSIVE LIST OF WILDLIFE SPECIES OBSERVED

**Appendix E. Comprehensive list of all vertebrate wildlife observed during field surveys
2013-2014 and 2017-2018**

Common Name	Scientific Name
	Birds
Canada goose	<i>Branta canadensis</i>
Turkey vulture	<i>Cathartes aura</i>
Gadwall	<i>Anas strepera</i>
American wigeon	<i>Anas americana</i>
Mallard	<i>Anas platyrhynchos</i>
Northern pintail	<i>Anas acuta</i>
Blue-winged teal	<i>Anas discors</i>
Green-winged teal	<i>Anas crecca</i>
Northern shoveler	<i>Anas clypeata</i>
California quail	<i>Callipepla californica</i>
Chukar	<i>Alectoris chukar</i>
Northern harrier	<i>Circus cyaneus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Ferruginous hawk*	<i>Buteo regalis</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Golden Eagle*	<i>Aquila chrysaetos</i>
American coot	<i>Fulica americana</i>
Killdeer	<i>Charadrius vociferous</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Long-billed curlew	<i>Numenius americanus</i>
Mourning dove	<i>Zenaida macroura</i>
Long-eared owl	<i>Asio otus</i>
Short-eared owl	<i>Asio flammeus</i>
Burrowing owl*	<i>Athene cunicularia hypugaea</i>
Common nighthawk	<i>Chordeiles minor</i>
Northern flicker	<i>Colaptes auratus</i>
American kestrel	<i>Falco sparverius</i>
Prairie falcon	<i>Falco mexicanus</i>
Say's phoebe	<i>Sayornis saya</i>
Western kingbird	<i>Tyrannus verticalis</i>
Loggerhead shrike*	<i>Lanius ludivicianus</i>
Cassin's vireo	<i>Vireo cassinii</i>
Common raven	<i>Corvus corax</i>
Horned lark	<i>Eremophila alpestris</i>
Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Barn swallow	<i>Hirundo rustica</i>
Mountain chickadee	<i>Poecile gambeli</i>
Rock wren	<i>Salpinctes obsoletus</i>
Canyon wren	<i>Catherpes mexicanus</i>

Ruby-crowned kinglet	<i>Regulus calendula</i>
Mountain bluebird	<i>Sialia currucoides</i>
American robin	<i>Turdus migratorius</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
European starling	<i>Sturnus vulgaris</i>
Brewer's sparrow	<i>Spizella breweri</i>
Vesper sparrow	<i>Pooecetes gramineus</i>
Lark sparrow	<i>Chondestes grammacus</i>
Black-throated sparrow	<i>Amphispiza billneata</i>
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>
Song sparrow	<i>Melospiza melodia</i>
Swamp sparrow	<i>Melospiza georgiana</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Lazuli bunting	<i>Passerina cyanea</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Tricolored blackbird	<i>Agelaius tricolor</i>
Western meadowlark	<i>Sturnella neglecta</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Brown-headed cowbird	<i>Molothrus ater</i>
House finch	<i>Carpodacus mexicanus</i>
Lesser goldfinch	<i>Carduelis psaltria</i>
American goldfinch	<i>Carduelis tristis</i>
Mammals	
California myotis	<i>Myotis californicus</i>
Small-footed myotis	<i>Myotis ciliolabrum</i>
Long-eared myotis	<i>Myotis evotis</i>
Yuma myotis	<i>Myotis yumanensis</i>
Hoary bat*	<i>Lasiurus cinereus</i>
Silver-haired bat*	<i>Lasionycteris noctivagans</i>
Canyon bat	<i>Parastrellus Hesperus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Spotted bat*	<i>Euderma maculatum</i>
Pallid bat*	<i>Antrozous pallidus</i>
Black-tailed jackrabbit	<i>Lepus americanus</i>
Mountain cottontail	<i>Sylvilagus nuttallii</i>
Belding's ground squirrel	<i>Uroditellus beldingi</i>
Merriam's ground squirrel	<i>Uroditellus canus</i>
Northern pocket gopher	<i>Thomomys talpoides</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Bushy-tailed woodrat	<i>Neotoma cinerea</i>
Montane vole	<i>Microtus montanus</i>
Common porcupine	<i>Erethizon dorsatum</i>
Coyote	<i>Canis latrans</i>

American badger	<i>Taxidea taxus</i>
Bobcat	<i>Lynx rufus</i>
Elk	<i>Cervus canadensis</i>
Mule deer	<i>Odocoileus hemionus</i>
Pronghorn	<i>Antilocarpa Americana</i>
Amphibians and Reptiles	
Pacific chorus frog	<i>Pseudacris regilla</i>
Great basin collared lizard	<i>Crotaphytus bicinctores</i>
Long- nosed leopard lizard	<i>Gambelia wislizenii</i>
Western fence lizard	<i>Sceloporus occidentals</i>
Sagebrush lizard	<i>Sceloporus graciosus</i>
Desert horned lizard	<i>Phrynosoma platyrhinos</i>
Pygmy short- horned lizard	<i>Phrynosoma douglasi</i>
Western whiptail	<i>Cnemidophorus tigris</i>
Racer	<i>Coluber constrictor</i>
Striped whipsnake	<i>Masticophis taeniatus</i>
Gopher snake	<i>Pituophis catenifer</i>
Western rattlesnake	<i>Crotalus viridis</i>

*denotes species is of state or federal status

ATTACHMENT A

**WILDLIFE BASELINE STUDY FOR THE GRASSY MOUNTAIN GOLD PROJECT, SEPTEMBER 2014
BY NORTHWEST WILDLIFE CONSULTANTS, INC.**

**Wildlife Resources Baseline Study
for the
Grassy Mountain Gold Project
Malheur County, Oregon**

Prepared for:

Calico Resources USA Corporation

and

HDR Engineering, Inc.

412 E. Parkcenter Blvd., Suite 100
Boise, Idaho 83706-6659

Prepared by:

Rick Gerhardt and Brett Anderson

Northwest Wildlife Consultants, Inc.

815 NW 4th Street
Pendleton, Oregon 97801



September 30, 2014

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ACRONYMS

BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
Calico	Calico Resources USA Corporation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DOGAMI	Oregon Department of Geology and Mineral Industries
ESA	Endangered Species Act
FSA	Farm Service Agency
GIS	Geographic Information System
GPS	Global Positioning System
HDR	HDR Engineering, Inc.
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWC	Northwest Wildlife Consultants, Inc.
OAR	Oregon Administrative Rule
ODFW	Oregon Department of Fish and Wildlife
OEF	Oregon Eagle Foundation
ORS	Oregon Revised Statute
TES	Threatened, Endangered, and Sensitive Species
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1 INTRODUCTION

Calico Resources USA Corporation (Calico) is proposing a gold mining exploration project (Project) near Grassy Mountain, Malheur County, Oregon. The project site is located south of the town of Vale and is within the Northern Basin and Range Ecoregion (ODFW 2008). The Project consists of a mining site of approximately 62 acres, a processing area of approximately 281 acres, and an access road between the two that covers approximately 45 acres (Figure 1).

Northwest Wildlife Consultants, Inc. (NWC) was subcontracted by HDR to conduct a review of existing wildlife information and a variety of field surveys to characterize the use of the Project and surrounding area by terrestrial wildlife in general and by wildlife species of concern in particular. The surveys required and the applicable survey areas were identified through discussions by HDR with representatives of the United States Fish and Wildlife Service (USFWS) and the Oregon Department of Fish and Wildlife (ODFW). These surveys were intended to provide all of the necessary baseline data to fulfill Oregon Administrative Rule (OAR) 632-037-0055 of the Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon Revised Statute (ORS) 517.956, and other relevant OARs and ORSs.

The studies described in this report are:

- Habitat typing and categorization
- Large-plot avian use surveys
- Small-plot avian use surveys
- Raptor nest survey
- Golden eagle nest monitoring
- Greater sage-grouse surveys (brood-rearing surveys, winter use surveys, and lek surveys)
- Leporidae (pygmy rabbit and white-tailed jackrabbit) surveys
- Bat species investigation
- General wildlife encounters

2 REGULATORY ENVIRONMENT

The State of Oregon has threatened, endangered, and sensitive (TES) species provisions that protect native vertebrates and plants on state lands ORS sections 496.172 to 496.192; 498.026; 564.100 to 564.135), and requires consideration of the impacts of any action on private land, in this case chemical mining, on TES species (ORS sections 517.956. 496.012, and 506.109).

ORS section 517.956 establishes standards and protection measures that all chemical mining operations will follow that ensure protection measures for fish and wildlife are consistent with ODFW policies, including the following:

- (a) Protective measures to maintain an objective of zero wildlife mortality;
- (b) On-site and off-site mitigation ensuring that there is no overall net loss of habitat value;
- (c) No loss of existing critical habitat of any state or federally-listed threatened or endangered species;
- (d) Fish and wildlife mortality shall be reported in accordance with a monitoring and reporting plan approved by ODFW;

- (e) ODFW shall establish by rule standards for review of a proposed chemical process mining operation for the purpose of developing conditions for fish and wildlife habitat protection that satisfy the terms of this section for inclusion in a consolidated permit by DOGAMI; and
- (f) Surface reclamation of a chemical process mine site shall ensure environmental protection and that a self-sustaining ecosystem, comparable to undamaged ecosystems in the area, has been established in satisfaction of the operator's habitat restoration obligations.

The purpose of OAR Chapter 635 Division 420 is to prescribe the standards for ODFW review of proposed chemical process mining operations for the purpose of developing conditions for protection of wildlife and their habitat, to further the Wildlife Policy (ORS 496.012) and Food Fish Management Policy (ORS 506.109) of the State of Oregon. Baseline data collection should be consistent with what is required in developing a wildlife protection plan in accordance with OAR 635-420-0010, standards to protect wildlife in accordance with OAR 635-420-0015-0025, a habitat mitigation plan in accordance with OAR 635-420-0030, and wildlife mitigation plan in accordance with 635-420-0060. Species to be addressed include all species listed under the Oregon Endangered Species Act (OAR 635-100-0100 to 0130) and Oregon Sensitive Species Rule (OAR 635-100-040).

The wildlife mitigation plan shall include the information required in OAR 635-415-0020(5). Affected wildlife habitats shall be evaluated using methodologies approved by ODFW, which are well-documented, measurable and verifiable. Examples of habitats that shall be addressed in the mitigation plan include, but are not limited to the following:

- (a) Surface waterways, streams, springs, seeps, wetlands and other aquatic habitats;
- (b) Riparian areas;
- (c) Big game habitat;
- (d) Bird habitat;
- (e) Habitat for state or federally-listed T&E species, and state sensitive species;
- (f) Reproduction and nursery areas;
- (g) Fish spawning areas;
- (h) Geomorphic and edaphic habitats including cliffs, caves, sand dunes, play as and local distinctive soils that, along with their vegetation, contrast markedly with the surrounding area; and
- (i) Wildlife migration and movement corridors.

In addition, ODFW manages wildlife species populations through management objectives specified in their respective management plans; BLM manages adequate habitat to support these numbers. BLM and ODFW work cooperatively to benefit the management of wildlife and wildlife habitat as described in the 2001 memorandum of understanding (MOU) between the two agencies. BLM species are discussed further in the federal law section of this work plan.

2.1 Federal Laws

The Council on Environmental Quality (CEQ) regulations discuss "human environment" at 40 Code of Federal Regulations (CFR) 1508.14. This term broadly relates to the biological, physical, social and economic elements of the environment. It includes the wildlife resources category. Relevant data is to be used in describing the affected environment as the basis for determining the effects (direct and indirect) of a proposed action. The 2008 BLM *NEPA*

Handbook (H-1790-1) describes potential National Environmental Policy Act (NEPA)-related federal requirements.

Other federal requirements, such as the Endangered Species Act (ESA) consultations, and critical habitat procedural requirements are discussed in Chapter 175, "Wildlife and Vegetation Protection; Environmental Regulation of the American Law of Mining" (2010 Holland and Hart). These primarily involve USFWS. The following sections provide a list of relevant federal regulations.

2.1.1 Federal Endangered Species Act

Section 7 of the ESA (19 United States Code [USC] § 1536(c)), as amended, states that any action authorized, funded, or carried out by a federal agency does not jeopardize the continued existence of a federally-listed T&E species, or result in the destruction or adverse modification of federally-listed designated critical habitat. The action agencies are required to consult with USFWS and/or the National Oceanic and Atmospheric Administration (NOAA) to determine whether federally-listed T&E species or designated critical habitat are found within the vicinity of the proposed project, and to determine the proposed action's potential effects on those species or critical habitats.

2.1.2 Bald and Golden Eagle Protection Act

When first enacted in 1940, the Bald and Golden Eagle Protection Act (16 U.S.C. § 668) (BGEPA) prohibited the take, transport or sale of bald eagles, their eggs, or any part of an eagle except where expressly allowed by the secretary of interior. The Act was amended in 1962 to extend the prohibitions to the golden eagle.

2.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) (MBTA) implements various treaties and conventions for the protection of migratory birds. Under this act, taking, killing, or possessing migratory birds (including any part, nest, or egg) is unlawful.

2.1.4 Bureau of Land Management (Manual 6840) – Special Status Species

BLM Manual 6840 defines sensitive species as "... those species not already included as BLM special status species under (1) federal listed, proposed, or candidate species, or (2) State of Oregon listed species. Native species may be listed as 'sensitive' if one of the following applies: (1) could become endangered or extirpated from a state or significant portion of its range; (2) is under review by the USFWS; (3) numbers or habitat capability are declining so rapidly that federal listing may become necessary; (4) has typically small and widely dispersed populations; (5) inhabits ecological refugia, specialized, or unique habitats; or (6) is state-listed; although, is better conserved through application of the BLM sensitive species status."

3 STUDY AREA

The Grassy Mountain Project area is located in Malheur County, Oregon, about 25 miles south-southwest of Vale. The mine is located on three patented lode mining claims that cover an estimated 62 acres. The three patented lode claims are part of a larger land position defined as three patented lode claims, 419 un-patented lode claims managed by the Bureau of Land Management (BLM), and 1,300 acres of the land, including six associated placer claims all controlled by Calico Resources USA Corp. (Calico).

The project area encompasses portions of Section 32, Township 21 South, Range 44 East; Sections 1 and 12, Township 22 South, Range 43 East; Sections 5, 6, 7, and 8, Township 22 South, Range 43 East.

Three different areas are mentioned in this report. The Permit Area consists of the proposed mining site, processing area, and access road (which together comprise approximately 388 acres) and a larger area around them (a total area of approximately 1,552 acres; Figure 1). Some of the surveys were conducted primarily on the Permit Area and within a 0.5-mile buffer of the Permit Area (Figure 1). Other surveys were conducted throughout an area that extended 2 miles beyond the Permit Area; these included surveys designed to detect nesting raptors and species of concern, including BLM sensitive species (Figure 1).

4 METHODOLOGY

4.1 Literature Review

Prior to initiating field surveys, NWC conducted a review of available existing information. Resources examined included reports of previous studies specific to the Project area (Western Technologies 1988; IMS 1989; Cedar Creek Associates 1991; Newmont 1993) and the Wildlife Resources Baseline Study Work Plan (Wallace and Whittaker 2013). Also consulted were the BLM Southeastern Oregon Resource Management Plan (BLM 2001), which includes a list of BLM special status species, the ODFW list of special status species (ODFW 2008), the ODFW big game winter range delineation (ODFW 2013a), the ODFW core and low density greater sage-grouse layer (ODFW 2013b), ODFW's sage-grouse conservation assessment and strategy (Hagen 2011), and the Oregon Eagle Foundation (OEF) state-wide golden eagle nest database (Isaacs 2012).

NWC also interviewed the ODFW district biologist (Milburn 2014) and the lead researcher for OEF (Isaacs 2013).

4.2 Field Surveys

Field studies were designed with the input of ODFW and USFWS biologists and followed protocols developed and used by NWC (e.g., NWC 2010; Gerhardt and Gritski 2011) and others in studying proposed developments (especially wind energy facilities) in Oregon and elsewhere.

4.2.1 Wildlife Habitat Mapping and Categorization

Biologists used a combination of historical land cover data, color aerial image interpretation, topographic information, soil data, and on-site verification to characterize the range of habitat types present within the wildlife analysis area (Figure 1) from the perspective of wildlife use, both general (for species assemblages, e.g. shrub-steppe obligates) and specific (for individual taxa, i.e., special status species).

Habitat types within the smaller Permit Area were mapped (Figure 2) according to current vegetation rather than according to the potential ecological climax for any given location. Habitat was mapped at the major plant community level utilizing a combination of in-office and on-site delineations. All habitats represented in the Permit Area were field-assessed at some point during the habitat mapping/wildlife survey periods.

Initial habitat boundaries were delineated at a scale of 1:5,000 in a digital geographic information system (GIS) using NAIP 1-meter (m) resolution orthophoto quadrangle county mosaics (USDA-FSA 2009; USDA-FSA 2011; USDA-FSA 2012), digital raster graphics of standard series U.S. Geological Survey (USGS) topographic maps, and the Natural Resources Conservation Service (NRCS) soil survey geographic database (USDA NRCS, 2013). Initial boundaries were delineated based on obvious differences in vegetation, land form, and land use. An NWC biologist then ground-verified and adjusted boundaries, further delineated habitat types, and developed detailed descriptions of each habitat type.

Habitat types were rated for habitat quality (Categories 1–6) based on definitions found in Oregon Administrative Rule (OAR) 635-415-0025. This rule defines six habitat categories and establishes mitigation goals and implementation standards for each.

Category	Habitat Characteristics
1	Irreplaceable, essential and limited
2	Essential and limited
3	Essential, or important and limited
4	Important
5	Having high potential to become either essential or important
6	Low potential to become essential or important

ODFW has identified throughout the range of the greater sage-grouse core areas and low density use areas based on the locations of known leks (ODFW 2013b). Core area is considered by ODFW to be Category 1 habitat, irreplaceable, essential, and limited; none of this habitat exists within the Grassy Mountain wildlife survey area. Low density use areas are considered by ODFW to be Category 2, essential and limited; a large proportion of the Permit Area and of the larger wildlife survey area is so designated (ODFW 2013b; Figure 1). This designation is a coarse filter based on lek locations; final habitat assessment depends on a site specific determination of whether these areas either contain habitat upon which sage-grouse depend or contain signs of use by this species. Where neither applied, habitat categorization was based on vegetation characteristics or the presence of other sensitive species.

Both biologists performing this habitat mapping and characterization (BA and RG) have assessed habitat values and categorized wildlife habitat on more than a dozen projects in grassland and shrub-steppe habitats in eastern Oregon, each of them involving thousands of acres and with the resulting assessments approved by ODFW.

4.2.2 Large-Plot Avian Surveys

An avian ecologist (RG)—with more than ten years of experience at conducting avian surveys in grassland, shrub-steppe, and riparian habitats in eastern Oregon—conducted avian point counts with a variable circular-plot method (Reynolds et al. 1980) to obtain information on species composition and relative abundance of birds on and near the Project during diurnal hours. This survey protocol was primarily designed for studying use by large birds (i.e., waterbirds and raptors), but information for all species observed was recorded during each survey.

Five 800m-radius study plots were established to provide excellent coverage of the Permit Area and the area within 0.5 miles of the Permit Area (Figure 1). Plots were non-overlapping and were located to provide optimal viewing conditions and thorough coverage. The avian ecologist positioned at the center of the plot recorded all vertebrate wildlife seen or heard during 20-minute point counts. Species, number, flight height, weather, etc., were collected. Survey starting point locations and times of the day were alternated among surveys to reduce spatial and temporal bias. All survey plots were surveyed four times within each of the four survey seasons.

Survey dates for each season were:

- Summer: June 24–August 14, 2013; 4 visits to 5 plots, 20 surveys
- Fall: September 4–October 24, 2013; 4 visits to 5 plots, 20 surveys
- Winter: November 25, 2013–February 26, 2014; 4 visits to 5 plots, 20 surveys
- Spring: March 19–May 29, 2014; 4 visits to 5 plots, 20 surveys

In all, 80 20-minute avian use surveys were conducted during the period June 2013–May 2014 for the Grassy Mountain Gold Project in four seasons.

Flight paths of special status species or raptors were hand-plotted on topographic maps in the field. All detected vertebrate wildlife were recorded, whether inside or outside the fixed-point plot.

4.2.3 Small-Plot Avian Surveys

Small-plot avian surveys complement the large-plot avian surveys, in particular by focusing on smaller birds (especially passerines) utilizing the range of habitats in the general vicinity of the Project. These surveys involved the establishment of eight fixed-radius points or plots (Ralph et al. 1993) in summer 2013. The small-plot avian surveys were conducted 16 times throughout the year, with four complete surveys during each season: summer (June–August), fall (September–October), winter (November–February), and spring (March–May). In all, 128 surveys were conducted. The resulting data can aid in describing overall habitat quality and value for native wildlife of the Permit Area and vicinity.

Plots covered each habitat type within the Permit Area, and one plot (Plot 6) was established at the single pond outside the Permit Area but within the wildlife analysis area (Figure 1). Each study plot had a radius of 100 meters. Plots were surveyed by an experienced avian ecologist using a ten-minute observation period, and all surveys were completed between sunrise and five hours after sunrise, consistent with standard protocols used nationwide. Surveys were not conducted when wind and weather conditions were likely to hamper the researcher's ability to detect whatever birds were present.

General data recorded included date, time, and weather variables. Data associated with bird detections included species and number, age and sex, behavior and habitat.

4.2.3.1 Plot Descriptions

Plot 1 consisted of exposed rock surrounded by sagebrush shrub-steppe habitat.

Plot 2 consisted of exposed rock surrounded by sagebrush shrub-steppe habitat. This plot was entirely outside of, but quite near, the Permit Area.

Plot 3 contained a small amount of exposed rock, but was primarily sagebrush shrub-steppe habitat.

Plot 4 was a mix of big sagebrush shrub-steppe, exotic annual grassland, and exposed rock habitats.

Plot 5 was entirely within native perennial grassland.

Plot 6 included a pond with riparian vegetation and a small sagebrush shrub-steppe component. This plot was within the 2-mile buffer but more than a mile from the Permit Area.

Plot 7 was primarily in sagebrush shrub-steppe but with some exotic annual grassland.

Plot 8 was in a small patch of sagebrush shrub-steppe surrounded by exotic annual grassland.

4.2.4 Raptor Nest Survey

The objective of the raptor nest survey was to provide information about raptor breeding in the vicinity of the proposed Project. The primary potential impact to nesting raptors is expected to be disturbance during the breeding season.

An aerial survey of the Permit Area and a 2-mile buffer of the Permit Area was conducted on April 27, 2014; the total survey area was 14,979 acres (6,061 ha; Figure 3). The helicopter pilot had more than ten years' experience at this type of survey, and the raptor biologist (RG) conducting these surveys has been searching for and monitoring raptor nests since 1988.

All potential nesting areas—including trees, rock formations, and transmission line towers—were examined during the aerial survey. (Many were identified and examined prior to the aerial survey as the biologist conducted other surveys throughout the study area.) All potential and confirmed raptor nests were recorded, regardless of activity status. Determination of nest status (active, inactive, unknown) was made using a combination of visual clues such as adult behavior, presence of eggs or young, presence or absence of whitewash (excrement), or observational data from the ground-based surveys. Inactive nests (no sign of present usage) were assessed for the type of bird that may have built the nest.

Species for which this survey is not effective include cavity-nesting raptors (small owl species and American kestrel) and ground-nesting raptors (northern harrier and burrowing and short-eared owls). During the course of conducting the other studies and travelling between surveys during the raptor breeding season, the surveyor had ample opportunity to search for nests of these species within the 0.5-mile buffer of the Permit Area and through much of the 2-mile buffer, and every tree within the 2-mile buffer was checked from the ground for cavity nests.

All nest locations were recorded using a hand-held Global Positioning System (GPS) unit. All data were inspected and then entered into a GIS database.

4.2.5 Golden Eagle Nest Monitoring

For areas within the larger survey area where golden eagles were identified, monitoring was conducted during the 2014 breeding season to determine the status of territorial pairs and the outcome of any breeding attempts. Adults and potential nest sites were observed from an appropriate distance—close enough to view eagles and nests with the aid of binoculars and spotting scope, but far enough so as not to disturb the eagles. Observations were also made during the aerial nest survey (Section 2.4). Methods followed standard protocols used throughout the range of this species (Pagel et al. 2010). This monitoring was done by an eagle specialist (RG) with more than 20 years' experience studying this species, including banding, telemetry, and prey studies in addition to nest surveys and monitoring.

4.2.6 Greater Sage-Grouse Surveys

Greater sage-grouse use surveys were conducted in suitable habitat within the 2-mile buffer area. Brood-rearing surveys were conducted during summer, and winter use surveys were conducted during a period when snow covered the ground. Both types of survey involved walking meandering transects through the highest quality habitat looking for sage-grouse and their sign (pellets and tracks), following standard protocols (Hagen 2011).

ODFW GIS data layers for core and low density sage-grouse areas (ODFW 2013b; shown on Figure 1) served as the foundation for characterizing habitat for this species. Within these areas—and, if appropriate, outside these areas—suitable habitat was defined by the character and quality of sagebrush shrub-steppe and its proximity to meadows, springs, or riparian areas.

Brood-rearing surveys were conducted twice between June 15 and July 31 (and separated by 10 days). Winter use surveys occurred twice between December 1 and January 21 (and separated by 10 days), with the ideal conditions being a clear day with snow on the ground. During all surveys, locations of all detections—of sage-grouse, their tracks, or their droppings—were recorded with a hand-held GPS unit and stored in a GIS environment. Survey routes were also recorded in GPS and stored in GIS. All sage-grouse were counted and classified by age and sex.

Lek surveys involved the counting of displaying male and attending female sage-grouse on previously identified or newly found leks in suitable habitat throughout the 2-mile buffer area. The surveyor also stopped at different points throughout the survey area to listen for the drumming of male sage-grouse. Surveys occurred in April, at the height of the lekking season, and from one hour before to one hour after sunrise. Existing information on known leks was obtained from ODFW GIS layers and from conversation with the ODFW district biologist (Milburn 2014). Evidence of previously unknown leks—concentrations of tracks, droppings, and feathers—was noted during all other ground surveys.

All greater sage-grouse surveys were conducted by a biologist (RG) with more than six years' experience conducting lek monitoring and surveying for this species in central and eastern Oregon.

4.2.7 Leporid Surveys

Surveys for two leporid species of concern, pygmy rabbit and white-tailed jackrabbit, were conducted within the 0.5-mile buffer of the Permit Area. A wildlife biologist (RG) with more than six years' experience surveying for both species in central and eastern Oregon first identified the most suitable habitat for each species, and then walked meandering transects through that habitat searching for individuals or their sign. Sign included pellets and—for pygmy rabbits—burrows. (Individuals and sign of these two species were recorded whenever encountered during any of the other surveys as well.) All detections of leporids and their sign were recorded using a hand-held GPS unit and the resulting data were stored in a GIS environment. Survey routes were also recorded in GPS and stored in GIS.

Classic habitat for pygmy rabbit—dense and tall big sagebrush in deep soils (Ulmschneider 2004)—was not found within the survey area. Likewise, there was a dearth of suitable habitat for white-tailed jackrabbit—high-quality native perennial grassland—while habitat more suitable to the congeneric black-tailed jackrabbit was relatively abundant. The wildlife biologist surveyed the areas within the 0.5-mile buffer that most nearly approximated suitable pygmy rabbit and white-tailed jackrabbit habitat; in addition, one survey was conducted outside the 0.5-mile buffer—but within the 2-mile buffer—in the likeliest pygmy rabbit habitat. Leporid surveys were conducted in early winter and again in late spring, times when use of burrows by pygmy rabbits is expected to be highest.

4.2.8 Bat Species Investigation

NWC conducted a ground level, habitat-based bat species inventory. The primary goal of the study was to investigate bat species diversity within the Project boundary using acoustic

monitoring equipment. The objective was to field-collect baseline information on bat species presence during specific periods in specific areas. Specifically, this inventory was designed to verify the presence on the Project of species of concern, especially Townsend's big-eared bat.

The Permit Area and the area within 0.5 miles of the Permit Area were examined closely for caves or mine adits that might harbor roosting bats. This area contained a very limited amount of cliffs and rock outcrops where caves or adits could exist, and during the full year of surveys, these were searched by the surveyor numerous times. Since none were found, five bat detector locations were established on or near the Permit Area at landscape features (rock outcrops, water) most likely to attract bats (Figure 1).

4.2.8.1 Bat Detector Location Descriptions

Location 1 was in a small patch of sagebrush shrub-steppe surrounded by exotic annual grassland (and coincided with the center of small-avian plot 8).

Location 2 was by a pond with riparian vegetation and a small sagebrush shrub-steppe component. This plot was within the 2-mile buffer but more than a mile from the Permit Area (and coincided with the center of small-avian plot 6).

Location 3 was in annual exotic grassland near the base of a small cliff containing numerous pockets and cracks.

Location 4 was on the hill where mining is proposed overlooking a slope of scree and jumbled rock. (This location was within small-avian plot 3.)

Location 5 was at the base of a rock outcrop surrounded by sagebrush shrub-steppe. (This location was within small-avian plot 3.)

Field investigations were conducted periodically between June and October 2013 and during April and May 2014. Five Pettersson D500x ultrasound detectors were used to record the echolocation calls of bats onto compact flash cards (CF cards); each was set to begin recording before dusk and to stop after dawn. Downloaded calls were analyzed using SonoBat[®] 3.05 acoustic identification software to identify and delete unusable files (those containing only background/ambient/insect noise) and then identify bat species where possible. Recordings for which species identification was unclear were not used. The biologist (BA) who conducted these analyses had more than five years' experience at designing, implementing, and analyzing the results of such bat inventories.

4.2.9 General Wildlife Encounters

All terrestrial vertebrate species of concern, uncommon species, all big game, and all reptiles encountered during all surveys and whenever the researcher was within the larger survey area, were recorded. Data recorded with these incidental observations included date, time, location, number of individuals, and age and sex (where appropriate and discernible).

5 RESULTS AND DISCUSSION

Wildlife field studies began on June 24, 2013 and concluded on May 30, 2014. Results are presented here and in Tables 1-7 and Figures 1-6. Appendix A summarizes the results with regard to special status wildlife species with the potential to occur on the Permit area and

within 2 miles of the Permit Area, and Appendix B is a comprehensive list of all terrestrial vertebrate wildlife species encountered during the course of these field studies.

5.1 Review of Existing Information

The review of existing information yielded a list of terrestrial vertebrate wildlife species of special status that might be expected to occur (based on their distribution and habitat requirements) within the wildlife analysis area. These species—five mammalian species and six avian species—are included in Appendix A along with notes describing whether or not they were subsequently found during surveys. (A sixth mammalian species—spotted bat—was not expected based on the habitat within the wildlife analysis area, but is included in Appendix A because it was subsequently detected during field studies.) Special status species identified during the information review included those that are BLM special status species within the Vale District (BLM 2001), those that are ODFW special status species within the Northern Basin and Range Ecoregion (ODFW 2008), or both. Also included is golden eagle, which is protected under the Bald and Golden Eagle Protection Act (BGEPA). Greater sage-grouse—a BLM sensitive species and an ODFW sensitive-vulnerable species—is also a candidate for listing under the Endangered Species Act.

No ODFW-designated big game winter range overlaps the wildlife analysis area (ODFW 2013a), though deer winter range lies to the southeast (Figure 1). A large proportion of the Permit Area and of the larger wildlife analysis area is designated greater sage-grouse low density use area (ODFW 2013b; also see Sections 2.1 and 3.2 and Figure 1)

5.2 Wildlife Habitat Mapping and Categorization

Three general land cover types and four specific habitat types were found within the Permit Area (Figure 2); these are described below and summarized in Table 1.

5.2.1 Developed–Road

Approximately 6.5 acres of the Permit Area are developed in the form of roads. These are compacted gravel or dirt roads relatively devoid of vegetation and offering little value to most wildlife. Roads are a potential source of the spread of noxious and invasive exotic grasses and weeds. They also constitute a potential source of fatality for birds, snakes, lizards, and mammals, though there is currently very little traffic on the roads within the Permit Area. This habitat type is all characterized as Category 6 habitat, with low potential to become important or essential (Table 2).

5.2.2 Grassland–Exotic Annual Grassland

The largest habitat type within the Permit Area is exotic annual grassland, which constitutes approximately 1,128.5 acres of this area (Figure 2). This habitat type is dominated by exotic annuals, particularly cheatgrass and medusahead, with native bunchgrasses being absent or a minor component. Heavy livestock grazing and low and very seasonal precipitation result in low value to wildlife, as exotic annual grasslands provide little nutrition or cover. Wildlife use of this habitat is predicated more on soil type and open landscape than on vegetation. The most common breeding bird is horned lark. This habitat is also used by pronghorn, American badger, coyote, Merriam's and Belding's ground squirrels, and burrowing owl. During late winter and spring, an abundance of Merriam's ground squirrels (which is expected to vary among years but which was quite high in spring 2014) likely provides good hunting for mammalian predators and raptors, including ferruginous hawk, golden eagle, northern harrier, and prairie falcon.

Based on the presence of a known greater-sage grouse lek to the west of the area, ODFW has mapped all of this habitat type as Category 2 (ODFW 2013b). Ground verification

yielded the conclusion, however, that this area contains neither habitat upon which sage-grouse depend nor evidence of sage-grouse use. Therefore, based on habitat type, condition, and use by wildlife, all of the exotic annual grassland within the Project area is characterized as Category 4—important—habitat (Table 2).

5.2.3 Grassland–Native Perennial Grassland

Approximately 72.5 acres of the Permit Area are native perennial grassland (Figure 2). This habitat type is dominated by native perennial grasses, including Idaho fescue and Sandberg’s bluegrass, which together comprise at least 20% of the ground cover. Shrubs (big sagebrush and green rabbitbrush), if present, are an inconspicuous component. This habitat provides forage and some cover for Merriam’s and Belding’s ground squirrels, which in turn provide prey for ferruginous hawk, golden eagle, and other raptors, as well as American badger and coyote. Common breeding species include horned lark and western meadowlark. This habitat likely provides important forage for pronghorn, and may support burrowing owl denning and breeding where soils are deep and sandy. Exotic annuals—especially cheatgrass—are found between the bunchgrasses, where they tend to outcompete more nutritional forbs and limit this habitat’s value to wildlife. Due to livestock grazing and the low and seasonal nature of the precipitation, wildlife use of this habitat is largely limited to spring season.

Based on the presence of a known greater-sage grouse lek to the west of the area, ODFW has mapped all of this habitat type as Category 2 (ODFW 2013b). Ground verification yielded the conclusion, however, that this area contains neither habitat upon which sage-grouse depend nor evidence of sage-grouse use. Therefore, based on habitat type, condition, and use by wildlife, all of the native perennial grassland within the Project area is characterized as Category 3—essential, or important and limited—habitat (Table 2).

5.2.4 Shrub-steppe–Sagebrush Shrub-steppe

Approximately 345 acres of the Permit Area are sagebrush shrub-steppe (Figure 2). This habitat is dominated by >20% cover of basin big sagebrush and green rabbitbrush. This type offers high-quality breeding habitat for shrub obligate species including loggerhead shrike, sage thrasher, Brewer’s sparrow, sagebrush sparrow, and black-throated sparrow. Also breeding in this habitat are western meadowlark, lark sparrow, common nighthawk, and mourning dove. In sandy or rocky soils, sagebrush lizard, desert horned lizard, pygmy short-horned lizard, Great Basin collared lizard, long-nosed leopard lizard, western whiptail, striped whipsnake, western rattlesnake, and other reptiles are found. Exotic grasses—especially cheatgrass—are found beneath and between the shrub layer of this habitat type throughout the Permit Area; these exotics tend to outcompete native grasses and forbs, and limit the value of this habitat to wildlife.

Based on the presence of a known greater-sage grouse lek to the west of the area, ODFW has mapped a portion (248 of the 345 acres) of this habitat type as Category 2 (ODFW 2013b). Ground verification yielded the conclusion, however, that this area contains neither habitat upon which sage-grouse depend nor evidence of sage-grouse use. Therefore, based on habitat type, condition, and use by wildlife, all of the sagebrush shrub-steppe within the Project area is characterized as Category 3—essential, or important and limited—habitat (Table 2).

5.3 Large-Plot Avian Surveys

Seventeen species were detected during large-plot avian surveys conducted between June 2013 and May 2014 (Table 3). Three of these species, horned lark, western meadowlark,

and common raven, were found during all seasons and accounted for 137 of the 171 individuals detected. Golden eagle was detected on one occasion during spring.

Although the large-plot avian surveys were designed to detect large birds—raptors and waterbirds—using the 0.5-mi buffer area, very few detections resulted. Many more detections of such species occurred within the larger (2-mile buffer) survey area while the surveyor was travelling between surveys of all types (Table 4). Golden eagles were detected during all seasons, indicating two golden eagle territories that were occupied year round. Ferruginous hawk—a BLM special status species—was detected during summer and spring (and found nesting during the raptor nest survey, as described below). Burrowing owl—another BLM special status species—was detected in summer and fall of 2013 (but was not found during any surveys during 2014).

Other raptors detected outside of surveys were northern harrier, red-tailed hawk, rough-legged hawk, short-eared owl, long-eared owl, and prairie falcon. Prairie falcon was confirmed nesting within the 2-mile survey area; northern harrier was believed to be nesting within the 2-mile survey area in 2014, and long-eared owl was deemed to have bred successfully in 2013 (Section 3.4; Figure 3).

5.4 Small-Plot Avian Surveys

Forty-seven species were detected during small-plot avian surveys conducted between June 2013 and May 2014 (Table 3). Of these, 25 were found only at plot 6, which was more than a mile from the Permit Area and which contained habitats not found on the Permit Area. Together, the pond, marsh, and riparian trees at plot 6 constituted an oasis that attracted not only waterfowl, marsh birds, and riparian obligates (some of which nested there) but also migrants (including passerines) that used this taller, denser vegetation for cover and foraging during stopovers. Whereas some of these species may fly over or through the Permit Area, of more relevance are those 22 species detected at the seven plots on or adjacent to the Project area.

Horned lark and western meadowlark were each found at six of the seven Permit Area small plots, were the only species found during all four survey seasons, and were by far the most commonly detected species. Rock wren was detected during spring, summer, and fall seasons (at the three plots containing a small amount of exposed rock). Six species were detected multiple times during spring and summer seasons; these were Brewer's sparrow (at five Permit Area small plots), lark sparrow (four plots), loggerhead shrike (three plots), and Say's phoebe, sagebrush sparrow, and sage thrasher (two plots each; Table 4). All of these are presumed to breed on or near the Permit area, and active nests of horned lark, lark sparrow, and common nighthawk were found incidentally during other surveys.

Mountain bluebird was detected at two plots, but these detections occurred on a single fall survey day. Twelve other species were detected on a single occasion and at a single plot: ferruginous hawk, California quail, mourning dove, common raven, barn swallow, canyon wren, black-throated sparrow, white-crowned sparrow, dark-eyed junco, Brewer's blackbird, and house finch (Table 4).

5.5 Raptor Nest Survey

The aerial raptor nest survey covered an area of approximately 14,979 acres (6,061 ha; Figure 3). Raptor survey results displayed on Figure 3 (confidential, submitted under separate cover) include results of searches for suitable raptor nests sites in conjunction with

other surveys (during both 2013 and 2014) in addition to the aerial survey of April 27, 2014.

During the complete aerial survey, three active raptor nests were found within the survey area; they were:

- 1 ferruginous hawk
- 1 golden eagle
- 1 prairie falcon

Within 10 meters of the active ferruginous hawk breeding attempt there was an alternate nest not being used. There were also two older inactive nests built by ferruginous hawks to the northeast and east-northeast of the active nest (Figure 3); at approximately 2 and 3 km from the active nest, these likely represent a separate ferruginous hawk breeding territory in the past.

Within the territory of the active golden eagle breeding attempt (the Negro Rock territory), there were two alternate nests identified, one on the same rock monolith where the breeding attempt occurred (and for which this territory is named), and one approximately 1.4 miles to the west-southwest (Figure 3). There was another inactive golden eagle nest identified just outside the survey area on a rimrock to the southwest; this was within a different territory (the Sourdough Basin territory). During 2013 surveys, a golden eagle nest was identified on a transmission tower in this territory and within the 2-mile survey area; though shown on Figure 3, this nest was no longer present at the time of the aerial survey in 2014. For further information about these golden eagle territories, see Section 3.5 below).

There were five active common raven nests found within the survey area (Figure 3). These could be used in future years by raptors, especially by great horned owl or prairie falcon, both of which will use—but do not themselves construct—stick nests. Another raven nest and an active American kestrel breeding attempt were documented just outside the survey area (on the rimrock between the survey area boundary and the inactive golden eagle nest) and are shown on Figure 3. There were four other inactive stick nests (besides those of ferruginous hawk and golden eagle) identified during the aerial survey.

Also shown on Figure 3 are three nests active in 2013. One of these—a common raven nest—was active again in 2014. A burrowing owl nest was identified by the presence of an adult owl and of an abundance at the burrow entrance of pellets and excrement of this species. Only a single individual was ever seen at any one time, however, so whether a breeding attempt actually occurred here remains uncertain. (Surveys did not begin in 2013 until after breeding would be expected to be complete.) A successful breeding attempt by long-eared owls was documented by the presence at the pond of three young of this species and a stick nest in a tree with pellets and excrement in and beneath it (Figure 3). This nest was likely originally built by black-billed magpies.

Active raptor nest density in 2014 was extremely low in the survey area. This was despite the great abundance of ground squirrels (Merriam's and Belding's; see Section 3.9). It is likely that nesting substrate is a more important factor in limiting use of this area by breeding raptors than is prey abundance or availability. The only trees in the raptor nest survey area were the few small deciduous ones associated with the lone pond, and only the few rock outcrops and rimrock provided substrate for placement of the stick nests used by most raptors.

Two of the three raptors nesting in 2014—and the burrowing owl possibly breeding in 2013—are species of concern. Ferruginous hawk and burrowing owl are BLM special status species (BLM 2001), and golden eagle is protected under the Bald and Golden Eagle Protection Act (BGEPA).

5.6 Golden Eagle Nest Monitoring

There were two golden eagle territories identified (see Section 3.4) for which nest monitoring took place. At one, a breeding attempt occurred in 2014, but it resulted in failure during the nestling stage. At the other territory, only a single adult was found during the 2014 breeding season, and no breeding attempt was documented. Included in this discussion are the territory names and numbers used by the Oregon Eagle Foundation (OEF) in its state-wide tracking database (Isaacs 2012).

A pair of adult golden eagles was discovered at the Negro Rock territory (OEF #C0418) when surveys began in late June 2013. They remained on their territory throughout the year, and were often found perching on Negro Rock or the rock outcrop across the draw from it. On April 11, a prey exchange between the adults led to the discovery of an active breeding attempt in the lower of the two nests on Negro Rock (Figure 3). During the aerial raptor nest survey of April 27, the nest contained a single young between one and two weeks old. By May 29, however, the nest was empty, there was no sign of the young on or below the nest cliff, and this breeding attempt was deemed to have failed. A third nest built by golden eagles, approximately 1.4 miles west-southwest of Negro Rock, is considered by OEF a potentially separate territory (designated #C1328). No eagles were found occupying this site, and the NWC eagle specialist believes this to be an alternate site for the Negro Rock territory and not a separate territory.

A single adult eagle was documented throughout the summer and fall of 2013 and winter 2013-2014 at a territory near the southwest boundary of the survey area (Figure 3). A golden eagle nest was identified on a transmission tower within this territory in 2013, but it was no longer present by spring of 2014. During observations of this territory during the 2014 breeding season, only the single adult (believed to be a female) was ever encountered, and no breeding attempt was documented. The aerial raptor nest survey of April 27 documented an inactive golden eagle nest on the high rimrock outside of the survey area boundary. This territory—previously unknown to OEF—has been designated the Sourdough Basin territory, #C1319.

5.7 Greater Sage-Grouse Surveys

Portions of the Permit Area and a large portion of the 2-mile buffer are designated by ODFW as low density greater sage-grouse habitat; this is based on the presence of a known lek to the west of this area. Based on actual habitat type and condition, however, little or none of this area constitutes high quality sage-grouse habitat. Much of it is annual grassland characterized by exotic grasses and weeds, and the remainder is rather poor-quality big sagebrush shrub-steppe with an understory of exotic grasses (see Section 3.1). Surveys were conducted in the most nearly suitable of this poor habitat.

Greater sage-grouse brood-rearing surveys were conducted on June 25, 2013 and July 25, 2013. Winter use surveys were conducted on December 20, 2013 and January 14–15, 2014; the latter were done under ideal conditions, clear days with a covering of snow on the ground. No sign of use of the survey area by greater sage-grouse was detected. No birds were encountered, nor were any feathers, tracks, or droppings found. No greater sage-grouse or their sign were encountered during any other surveys. Because droppings of this

species can persist for many months and even years, the lack of such sign is indicative of little or no use by this species in recent years.

No known greater sage-grouse leks are known to exist within the 2-mile buffer area of the Project (Milburn 2014). Because no sign of this species was found during any surveys prior to the April lekking season, there were no areas of potential concentration to be checked for leks. Listening for drumming males during the hour before and after sunset (on April 10 and April 28, 2014) yielded no detections of greater sage-grouse or their leks. No leks of this species currently exist within the Grassy Mountain Permit Area or the area within 2 miles of the Permit Area.

5.8 Leporid Surveys

No classic pygmy rabbit habitat was identified within the Permit Area or within the area within 0.5 miles of the Permit Area. Nonetheless, the most nearly suitable areas were surveyed on November 26, 2013 and May 30, 2014. No pygmy rabbits or their sign (droppings or burrows) were detected. No pygmy rabbits or their sign were detected during any of the other surveys conducted within 2 miles of the Permit Area. There were numerous detections of mountain cottontails and their sign, however (Figure 4). This similar species is much more of a generalist in its habitat requirements, and likely to be found in many habitats not supporting pygmy rabbits.

No high-quality white-tailed jackrabbit habitat was identified within the Permit Area or within the area within 0.5 miles of the Permit Area. Nonetheless, the most likely areas were surveyed on November 26, 2013 and May 30, 2014. No white-tailed jackrabbits were encountered, and all jackrabbit pellets found were in habitat more characteristic of the widespread congeneric black-tailed jackrabbit. No white-tailed jackrabbits were detected during any of the surveys conducted within 2 miles of the Permit area. There were numerous detections of black-tailed jackrabbits and their sign, however (Figure 4).

While the habitat at the Grassy Mountain Project and vicinity support populations of the more common mountain cottontail and black-tailed jackrabbit, comprehensive wildlife surveys found no indication within 2 miles of either of the leporid species of concern, pygmy rabbit or white-tailed jackrabbit.

5.9 Bat Species Investigation

Bat detectors were operational from before sunset to after sunrise at each of the five locations (Figure 1) during a total of 21 nights between June 24 and October 25, 2013 and between April 8 and May 30, 2014.

Ten species of bat were detected over the course of the study (Tables 6 and 7). Two species—western small-footed myotis and canyon bat—were detected at all five stations (Table 6; Figure 1). There were no detections of Townsend's big-eared bat, a BLM special status species and an ODFW sensitive-critical status species. Several detected species are designated by ODFW as sensitive vulnerable; these are hoary bat, silver-haired bat, pallid bat, and spotted bat (ODFW 2008). Spotted bat is also a BLM special status species (BLM 2001).

Silver-haired bat was detected at four locations, and pallid bat was detected at three locations. Two species—California myotis and Yuma myotis—were detected at two locations, and long-eared myotis, hoary bat, big brown bat, and spotted bat were each detected at one location. Six species were detected at each of two locations, #2 and #5; locations #3

and #4 each had five species detections, and location #1 had four species detections (Table 6).

Six bat species were detected in July, and five species each were detected in August and September (Table 7). The fewest species (three) were detected in April and October. Small-footed myotis was detected in April through September, with October being the only survey month in which it was not detected (Table 7). Two species were detected in five of the seven survey months; silver-haired bat was detected in all months except June and August, and canyon bat was detected in all months except June and October. Long-legged bat, big brown bat, and spotted bat were each represented by a single detection, and hoary bat was identified from five detections on a single night.

No caves or mine adits were found during these surveys, and no areas with potential to concentrate roosting or maternal colonies were identified within the Permit Area. Although these survey methods should not be used to estimate densities or number of individuals, these results do suggest some general conclusions. Small-footed myotis appears to be present in the vicinity of the proposed Project from at least April through September. Canyon bat and California myotis are also likely present through much of the survey season, with the latter having a slightly more protracted period of presence. Silver-haired bat appears to move through the area during spring and late summer migration with some regularity. The other species detected are uncommon or rare, with the possible exception of pallid bat, for which there were detections at three locations (Table 6) and on several nights in July and August (Table 7).

5.10 General Wildlife Encounters

A comprehensive list of all vertebrate wildlife species encountered during and between surveys is found as Appendix B. Notable avian species encountered outside of surveys are addressed in Section 3.2. This section addresses the amphibian, reptile, and mammal species documented during all surveys.

There was a single amphibian species, seven lizard species, and four snake species encountered during wildlife surveys (Figure 5; Appendix B). Pacific chorus frog was detected numerous times at the single pond within the larger survey area. Sagebrush lizard and western fence lizard were generally associated with small rock outcrops, like those at small avian plots 1-3. Long-nosed leopard lizard, Great Basin collared lizard, western whiptail, desert horned lizard, and pygmy short-horned lizard were encountered primarily in sagebrush shrub-steppe and in sandy soil types (Figure 5). The recorded distribution of these species is largely an artefact of the timing of transect surveys; these lizards are undoubtedly to be found on other parts of the survey area that were not walked during conditions appropriate for lizard activity.

Similarly, the four snake species encountered—western rattlesnake, gopher snake, racer, and striped whipsnake—were fortuitously encountered, either on Project area roads or in front of the walking surveyor. The distribution of detections (Figure 5) should not be understood as an accurate delineation of the full distribution of these species within the larger survey area.

None of the amphibian or reptile species encountered are federal or state special status species in the physiographic ecoregion and BLM district in which the Project lies (BLM 2001; ODFW 2008).

In addition to the leporid species (Section 3.8) and bat species (Section 3.9) already addressed, there were 12 other mammal species encountered during all wildlife surveys (Figure 6; Appendix B). Locations of some common rodents—Merriam's and Belding's ground squirrels, northern pocket gopher, deer mouse, and montane vole—are not displayed on Figure 6, and only actual Ord's kangaroo rats (not their burrows or sign) are displayed. Ground squirrels—especially Merriam's—were extremely abundant in large portions of the Permit Area and surroundings during their spring activity periods. They undoubtedly provide an important source of prey for the raptor species that breed in the area as well as for rough-legged hawks in the late winter months.

Both badger and coyote were present (Figure 6); these species prey on the abundant ground squirrels, create their own burrows and expand those of their prey, and provide potential burrows for burrowing owls and other wildlife. Bobcat was encountered on one occasion, and tracks were found during winter surveys. Other mammals found were bushy-tailed woodrat and common porcupine (Figure 6).

Two species of big game were detected within the larger survey area. Mule deer were found in small numbers, generally at the base of rimrocks at the highest elevations; they were never detected within the Permit Area. Pronghorn were observed on most survey days, including within the western portion of the Permit Area. Although numerous locations are displayed in Figure 6, most are undoubtedly of the same group of individuals. The largest number of pronghorn observed at a single time was 19; generally, the herd encountered contained between two and 11 individuals.

Except for some of the bat species (addressed in Section 3.9), none of the mammals encountered during comprehensive wildlife surveys at Grassy Mountain are federal or state special status species in the physiographic ecoregion and BLM district in which the Project lies (BLM 2001; ODFW 2008).

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7 TABLES

Table 1. General land cover and wildlife habitat types* within Permit Area of the Grassy Mountain Gold Project, Malheur County, Oregon.

General Land Cover Type	Specific Habitat Type	Specific Habitat Type Description*	Acres in Permit Area
Developed	Road	Compacted gravel or dirt roads devoid of vegetation and offering no value to wildlife.	6.45
Grassland Steppe dominated by native and/or non-native grasses (<20% shrub cover)	Exotic Annual Grassland	Dominated by exotic annuals, particularly cheatgrass and medusahead. Wildlife use predicated more on soil type and open landscape than on vegetation. Common breeder is horned lark. Also used by pronghorn, American badger, coyote, Merriam's and Belding's ground squirrels, and burrowing owl.	1,128.71
	Native Perennial Grassland	Dominated by native perennial bunchgrass. Shrubs, if present, are an inconspicuous component. Provides forage for Merriam's and Belding's ground squirrels, which in turn provide prey for ferruginous hawk, golden eagle, and other raptors, as well as American badger and coyote. Common breeding species include horned lark and western meadowlark. May support burrowing owl where soils are deep and sandy. Exotic annuals—especially cheatgrass—found between bunchgrasses. Due to low precipitation and cattle grazing, wildlife use limited primarily to spring.	72.58
Shrub-steppe Steppe dominated by shrubs (>20% shrub cover)	Sagebrush Shrub-steppe	Dominated by >20% cover of basin big sagebrush and green rabbitbrush. Offers high quality breeding habitat for shrub obligate species including loggerhead shrike, sage thrasher, Brewer's sparrow, sagebrush sparrow, black-throated sparrow. Also supports western meadowlark, lark sparrow, and mourning dove. In sandy or rocky soils, sagebrush lizard, desert horned lizard, Great Basin collared lizard, long-nosed leopard lizard, striped whipsnake, western rattlesnake, and other reptiles likely to be found. Exotic grasses—especially cheatgrass—found beneath and between shrub layer throughout Permit Area.	344.53
Total Acres			1,552.27

* Refer to Section 3.2 of this report for more detailed descriptions of habitats and wildlife use.

Table 2. General land cover and wildlife habitat types within Permit Area of the Grassy Mountain Gold Project, Malheur County, Oregon.

Land Cover Type	Habitat Type	Category	Area–NWC
Developed	Road	6	6.5 ac
Grassland	Exotic Annual Grassland	4	1,129 ac
		2	0 ac
	Native Perennial Grassland	3	73 ac
		2	0 ac
Shrub-steppe	Sagebrush Shrub-steppe	3	345 ac
		2	0 ac

Table 3. Avian species observed within 800-meter study plots in the Grassy Mountain Wind avian use study during four seasons, 2013-2014.

Species	Summer ¹		Fall ²		Winter ³		Spring ⁴	
	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind	# Grp	# Ind
Waterfowl		0		0		0		13
Green-winged teal	0	0	0	0	0	0	1	13
Raptors		0		0		0		2
<i>Buteos</i>		<i>0</i>		<i>0</i>		<i>0</i>		<i>1</i>
Red-tailed hawk	0	0	0	0	0	0	1	1
<i>Eagles</i>		<i>0</i>		<i>0</i>		<i>0</i>		<i>1</i>
Golden eagle	0	0	0	0	0	0	1	1
Gamebirds		1		0		0		0
Chukar	1	1	0	0	0	0	0	0
Shorebirds		0		0		0		1
Long-billed curlew	0	0	0	0	0	0	1	1
Passerines		26		116		27		155
<i>Songbirds</i>		<i>25</i>		<i>115</i>		<i>21</i>		<i>150</i>
Western kingbird	0	0	0	0	0	0	1	1
Loggerhead shrike	3	3	0	0	0	0	2	2
Horned lark	8	16	14	110	6	19	13	95
Barn swallow	0	0	1	3	0	0	0	0
Rock wren	0	0	1	1	0	0	2	2
Sage thrasher	1	1	0	0	0	0	2	2
Brewer's sparrow	0	0	0	0	0	0	4	6
Vesper sparrow	1	1	0	0	0	0	0	0
Sagebrush sparrow	0	0	0	0	0	0	1	2
White-crowned sparrow	0	0	0	0	0	0	1	3
Western meadowlark	4	4	1	1	2	2	13	37
<i>Corvids</i>		<i>1</i>		<i>1</i>		<i>6</i>		<i>5</i>
Common raven	1	1	1	1	4	6	5	5
Totals	19	27	18	116	12	27	48	171

Survey dates:

¹ Summer: June 24 through August 14, 2013; 4 visits to 5 sites = 20 surveys

² Fall: September 4 through October 24, 2013; 4 visits to 5 sites = 20 surveys

³ Winter: November 25, 2013 through February 26, 2014; 4 visits to 5 sites = 20 surveys

⁴ Spring: March 19 through May 29, 2014; 4 visits to 5 sites = 20 surveys

Table 4. Avian species observed while in-transit during surveys at Grassy Mountain Wind Project, summer 2013 through spring 2014.

Species	Summer 2013	Fall 2013	Winter 2013-14	Spring 2014	Total
Canada goose	0	0	10	0	10
American wigeon	0	0	0	4	4
Mallard	2	0	0	0	2
Northern shoveler	1	0	0	0	1
Northern harrier	1	0	0	1	2
Red-tailed hawk	1	1	0	1	3
Ferruginous hawk	2	0	0	2	4
Rough-legged hawk	0	1	0	0	1
Golden eagle	2	3	9	3	17
Long-billed curlew	0	0	0	2	2
Long-eared owl	3	0	0	0	3
Short-eared owl	0	1	0	0	1
Burrowing owl	1	2	0	0	3
Prairie falcon	2	0	0	0	2
Total	15	8	19	13	55

Table 5. Avian species detected during small-plot surveys at Grassy Mountain Gold Project, June 2013 through May 2014.

species	Study Plots								
	1	2	3	4	5	6	7	8	
Gadwall	0	0	0	0	0	4	0	0	4
American wigeon	0	0	0	0	0	2	0	0	2
Mallard	0	0	0	0	0	28	0	0	28
Northern pintail	0	0	0	0	0	4	0	0	4
Blue-winged teal	0	0	0	0	0	3	0	0	3
Green-winged teal	0	0	0	0	0	14	0	0	14
California quail	0	1	0	0	0	0	0	0	1
Northern harrier	0	0	0	0	0	4	0	0	4
Ferruginous hawk	0	0	0	0	0	0	1	0	1
American coot	0	0	0	0	0	3	0	0	3
Killdeer	0	0	0	0	1	6	0	0	7
Greater yellowlegs	0	0	0	0	0	1	0	0	1
Mourning dove	0	0	0	0	0	10	1	0	11
Long-eared owl	0	0	0	0	0	3	0	0	3
Common nighthawk	0	0	0	0	0	13	0	0	13
Northern flicker	0	0	0	0	0	1	0	0	1
Say's phoebe	0	1	0	3	0	1	0	0	5
Loggerhead shrike	0	1	0	1	0	0	2	0	4
Cassin's vireo	0	0	0	0	0	2	0	0	2
Common raven	0	5	0	0	0	0	0	0	5
Horned lark	29	11	17	0	79	2	82	100	320
Cliff swallow	0	0	0	0	0	20	0	0	20
Barn swallow	25	0	0	0	0	41	0	0	66
Mountain chickadee	0	0	0	0	0	4	0	0	4
Rock wren	0	5	7	4	0	0	0	0	16
Canyon wren	0	0	1	0	0	0	0	0	1
Ruby-crowned kinglet	0	0	0	0	0	2	0	0	2
Mountain bluebird	12	6	0	0	0	0	0	0	18
American robin	0	0	0	0	0	1	0	0	1
Sage thrasher	2	5	0	0	0	0	0	0	7
European starling	0	0	0	0	0	17	0	0	17
Brewer's sparrow	4	3	0	2	0	0	3	1	13
Lark sparrow	2	6	3	1	0	1	0	0	13
Black-throated sparrow	0	0	1	0	0	0	0	0	1
Sagebrush sparrow	3	0	3	0	0	0	0	0	6
Song sparrow	0	0	0	0	0	9	0	0	9
Swamp sparrow	0	0	0	0	0	2	0	0	2
White-crowned sparrow	0	0	0	5	0	0	0	0	5
Dark-eyed junco	0	0	0	1	0	0	0	0	1
Lazuli bunting	0	0	0	0	0	1	0	0	1
Red-winged blackbird	0	0	0	0	0	96	0	0	96
Tricolored blackbird	0	0	0	0	0	9	0	0	9
Western meadowlark	11	19	15	14	7	2	5	0	73
Brewer's blackbird	1	0	0	0	0	2	0	0	3
Brown-headed cowbird	0	0	0	0	0	3	0	0	3
House finch	0	0	0	0	0	0	6	0	6
Lesser goldfinch	0	0	0	0	0	4	0	0	4
total	89	63	47	31	87	315	100	101	833

Table 6. Bat species detected by survey station at Grassy Mountain Gold Project, June 2013 through May 2014.

Common Name	Scientific Name	Detector Location				
		1	2	3	4	5
California myotis	<i>Myotis californicus</i>		X	X		
Small-footed myotis	<i>Myotis ciliolabrum</i>	X	X	X	X	X
Long-eared myotis	<i>Myotis evotis</i>					X
Yuma myotis	<i>Myotis yumanensis</i>	X			X	
Hoary bat	<i>Lasiurus cinereus</i>			X		
Silver-haired bat	<i>Lasionycteris noctivagans</i>	X	X	X		X
Canyon bat	<i>Parastrellus hesperus</i>	X	X	X	X	X
Big brown bat	<i>Eptesicus fuscus</i>					X
Spotted bat	<i>Euderma maculatum</i>		X			
Pallid bat	<i>Antrozous pallidus</i>		X		X	X

Table 7. Bat species detected by month at Grassy Mountain Gold Project, June 2013 through May 2014.

Common Name	Scientific Name	Month						
		Apr	May	Jun	Jul	Aug	Sep	Oct
California myotis	<i>Myotis californicus</i>		X	X	X	X		
Small-footed myotis	<i>Myotis ciliolabrum</i>	X	X	X	X	X	X	
Long-eared myotis	<i>Myotis evotis</i>				X			
Yuma myotis	<i>Myotis yumanensis</i>			X	X		X	X
Hoary bat	<i>Lasiurus cinereus</i>						X	
Silver-haired bat	<i>Lasionycteris noctivagans</i>	X	X		X		X	X
Canyon bat	<i>Parastrellus hesperus</i>	X	X		X	X	X	
Big brown bat	<i>Eptesicus fuscus</i>					X		
Spotted bat	<i>Euderma maculatum</i>							X
Pallid bat	<i>Antrozous pallidus</i>				X	X		

8 FIGURES

Figure 1. Wildlife Analysis Area for the Grassy Mountain Gold Project, Malheur County, Oregon.

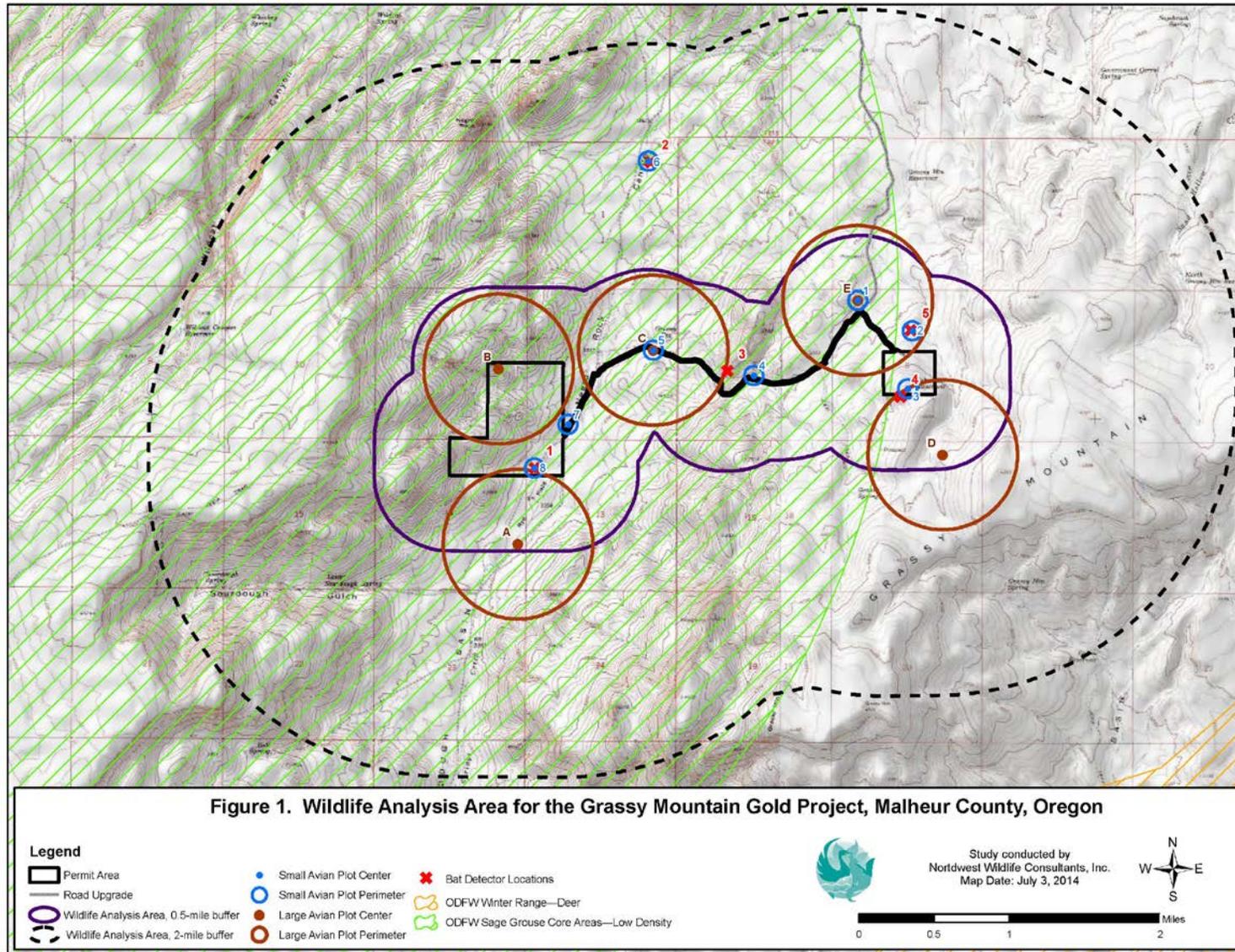


Figure 2. Wildlife Habitat Types at the Grassy Mountain Gold Project, Malheur County, Oregon.

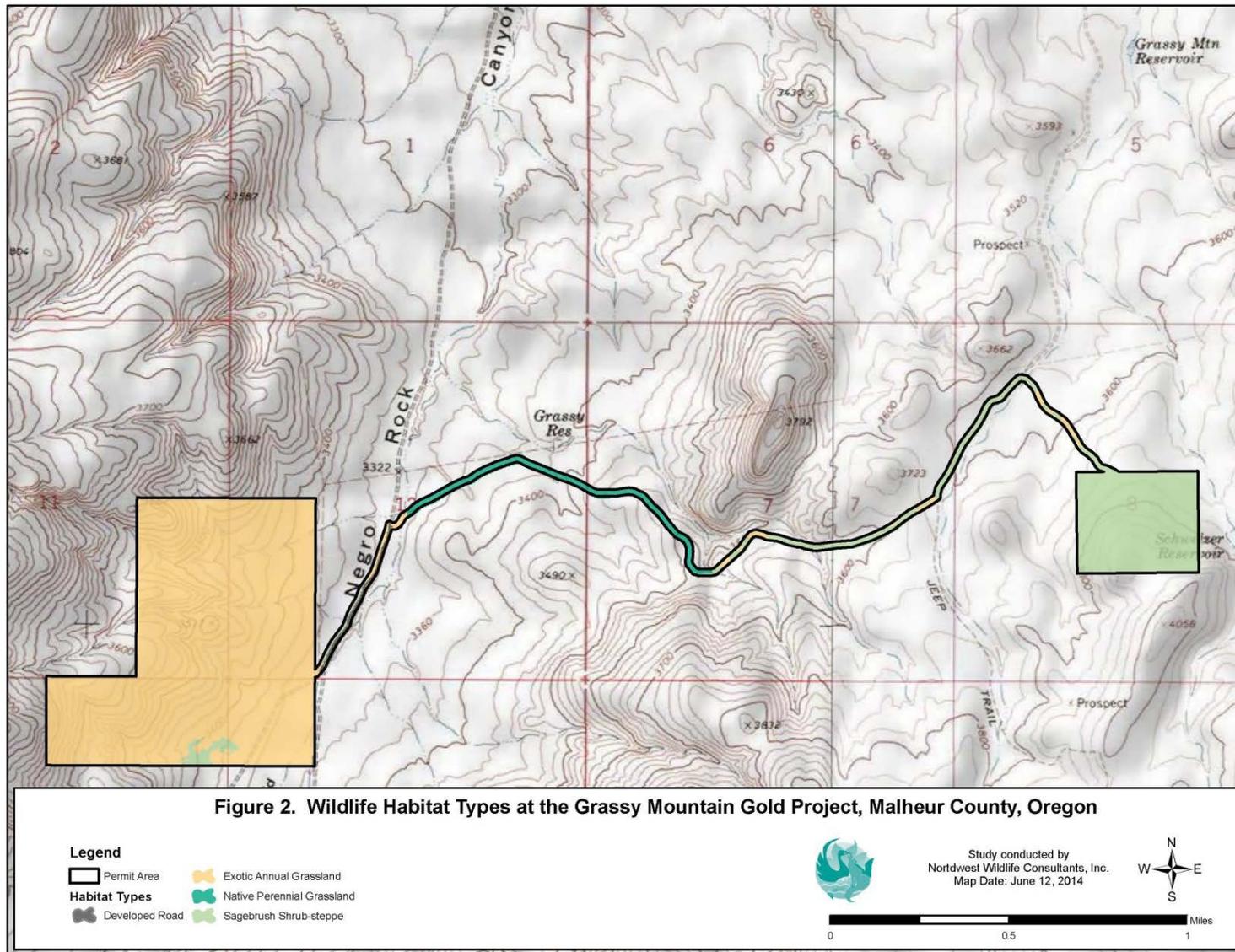


Figure 3. Nests of Raptors and Other Large Birds near the Grassy Mountain Gold Project, Malheur County, Oregon.
(Confidential—submitted separately)

Figure 4. Detections of Leporids during Wildlife Surveys at Grassy Mountain Gold Project, Malheur County, Oregon.

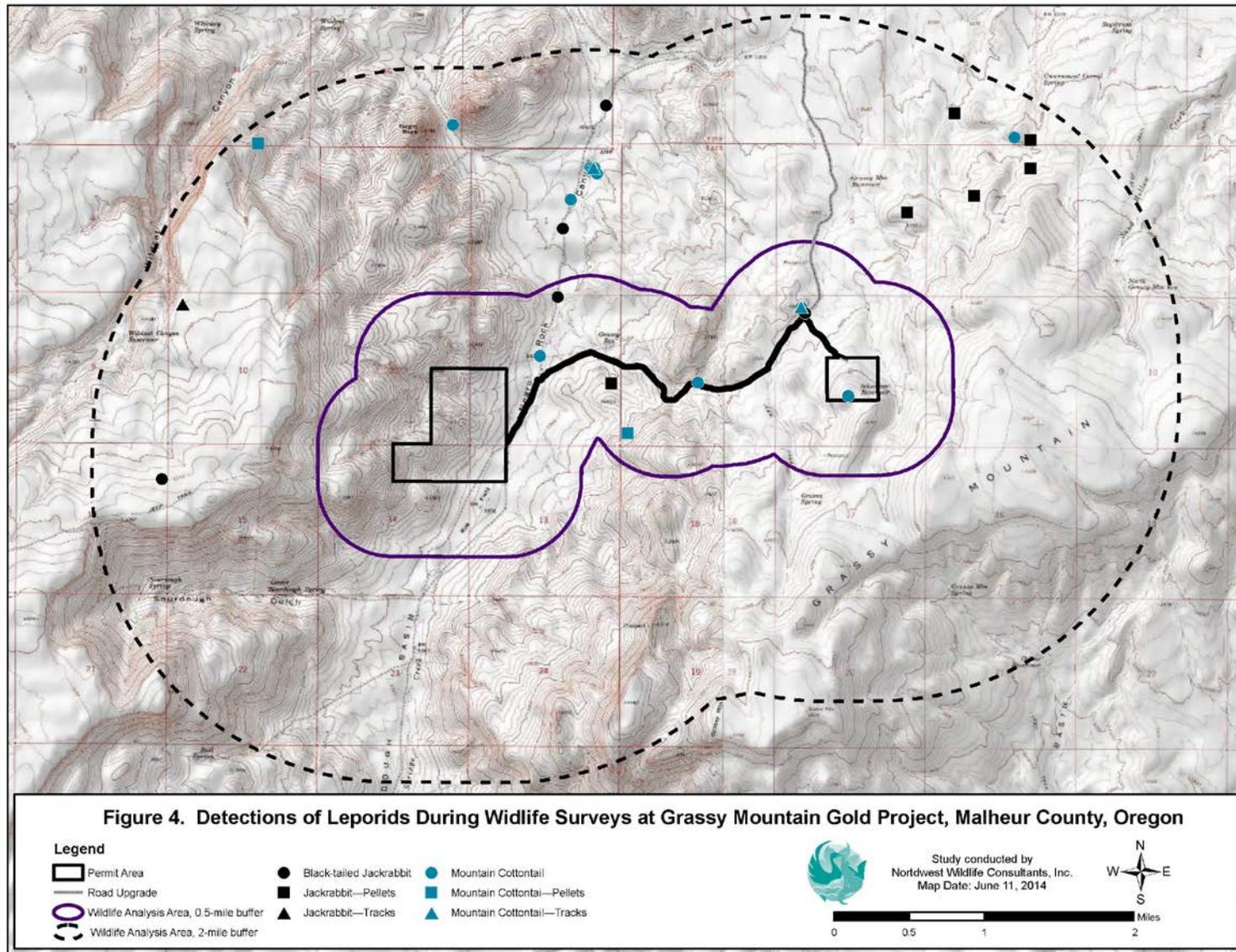


Figure 5. Detections of Reptiles and Amphibians during Wildlife Surveys at Grassy Mountain Gold Project, Malheur County, Oregon.

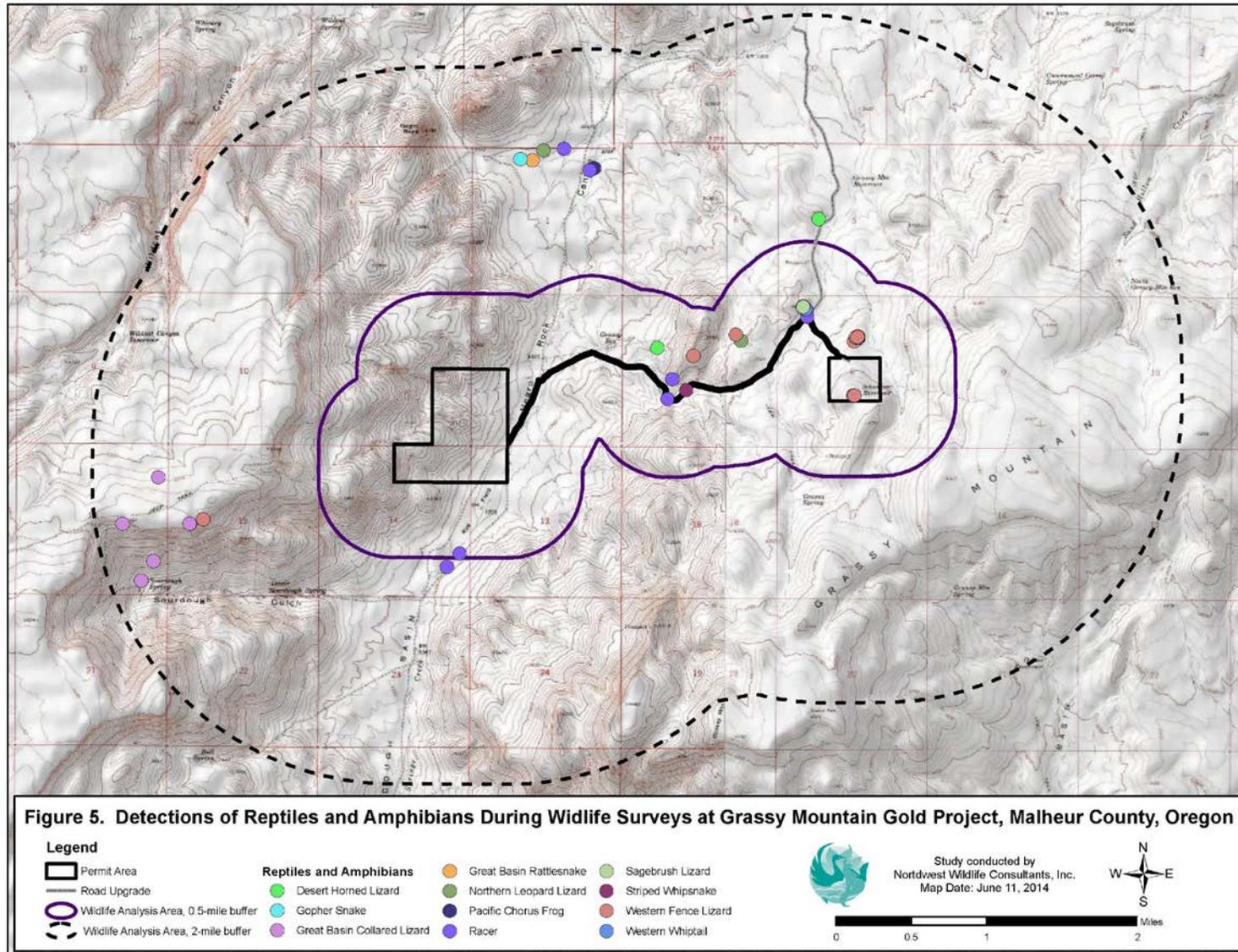
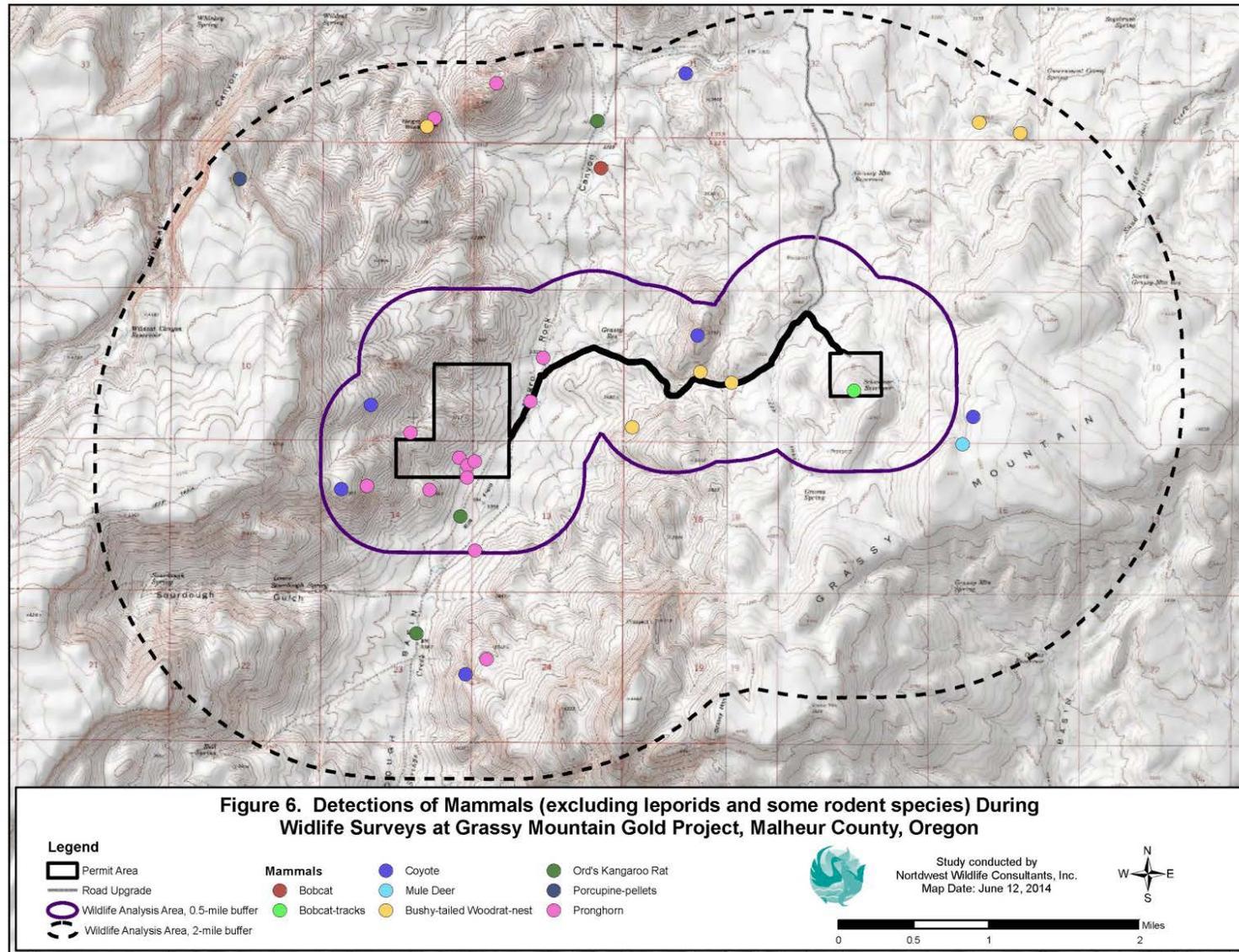


Figure 6. Detections of Mammals (excluding leporids and some rodent species) during Wildlife Surveys at Grassy Mountain Gold Project, Malheur County, Oregon.



9 APPENDICES

Appendix A. Special status vertebrate wildlife species occurrence in the Grassy Mountain area based on comprehensive wildlife surveys, June 2013–May 2014.

Common Name and Scientific Name	Federal Status	ODFW Status	Occurrence Within or Near Grassy Mountain D = Documented N = Not Documented
Mammals			
Hoary bat <i>Lasiurus cinereus</i>	–	SV	D —Detected at one bat detector location (Table 6) during one night in September (Table 7). Project area contains no suitable breeding habitat, which is forested lands, but this highly migratory species may pass through Project area during dispersal and migration.
Silver-haired bat <i>Lasionycteris noctivagans</i>	–	SV	D —Detected at four of five bat detector locations (Table 6) during April, May, July, September, and October (Table 7). Project area contains no suitable breeding habitat, which is forested lands, but this highly migratory species regularly passes through Project area during dispersal and migration.
Pallid bat <i>Antrozous pallidis</i>	SoC	SV	D —Detected at three bat detector locations (Table 6) during July and August (Table 7). Project area contains no suitable breeding habitat, which is tree cavities, mines, caves, and buildings; seasonality of detections suggests that presence on Project area is during migration.
Spotted bat <i>Euderma maculatum</i>	SEN	–	D —Detected at one bat detector location (Table 6) during one night in October (Table 7). Project area contains no suitable breeding habitat, which is rocky canyons, but this highly mobile species may occasionally pass through Project area.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	SEN	SC	N —No detections of this species during 105 station-nights of bat inventory studies at five locations between June and October 2013 and between April and May 2013. No caves or mine adits identified within 2 miles of Permit Area.
Pygmy rabbit <i>Brachylagus idahoensis</i>	SEN	SV	N —No individuals or their tracks or droppings detected during any wildlife surveys within 2 miles of Permit Area despite surveys targeted for this species. No suitable habitat identified within 2 miles of Permit Area.
White-tailed jackrabbit <i>Lepus townsendii</i>	–	SV	N —No individuals or their tracks or droppings detected during any wildlife surveys within 2 miles of Permit Area despite surveys targeted for this species. No suitable habitat identified within 2 miles of Permit Area.
Birds			
Ferruginous hawk <i>Buteo regalis</i>	SEN SoC BoCC	–	D —One active nest found within 0.5 miles of Permit Area (Figure 3). Individuals and pair detected during avian use surveys (Table 3) and while surveyor was in-transit between surveys (Table 4). Inactive nests indicate the possibility of a second breeding territory in the past..
Swainson's hawk <i>Buteo swainsoni</i>	SEN	SV	N —No suitable habitat or nest trees exist within 2 miles of Permit Area. Found associated with agriculture approximately 20 miles to north and northeast of Project, but not expected near Permit Area (except during migration).

Common Name and Scientific Name	Federal Status	ODFW Status	Occurrence Within or Near Grassy Mountain D = Documented N = Not Documented
Golden eagle <i>Aquila chrysaetos</i>	BGEPA BoCC	–	D —One active and two alternate nests (within the same breeding territory) found in northwestern portion of the 2-mile survey area (Figure 3). A second territory found at southwestern edge of 2-mile survey area; occupied by single female during 2014 breeding season, but no breeding attempt documented. Individuals and pairs observed during avian use surveys (Table 3) and while surveyor was travelling between surveys (Table 4).
Greater sage-grouse <i>Centrocercus urophasianus</i>	C	SV	N —No individuals, feathers, tracks, or droppings of this species detected despite extensive brood-rearing and winter use surveys and listening for drumming males during lekking season. Portion of Project designated as low-density habitat (ODFW, 2013b) based on known lek to west of survey area, but habitat generally not suitable within 2 miles of Permit Area.
Burrowing owl <i>Athene cunicularia</i>	SoC SEN	–	D —Active den identified during 2013 large-plot avian use surveys (Figure 3). Single bird observed on several occasions in 2013. Abundant burrows of badger, coyote, small mammals likely provide opportunities for breeding and use during other seasons.
Loggerhead shrike <i>Lanius ludovicianus</i>	SEN BoCC	–	D —Detected in sagebrush shrub-steppe habitats during avian use surveys (Tables 3 and 5). Likely breeder near Permit Area. Generally requires sizeable area of large sagebrush for breeding.

Status Key:

Federal:

T	Threatened	SoC	Species of Concern
E	Endangered	NW	Not Warranted; delisted
C	Candidate		
BGEPA	Eagle Protection Act (16 U.S.C. 668-668d, June 8, 1940, as amended 1959, 1962, 1972, 1978)		
BoCC	USFWS Birds of Conservation Concern (Table 7 BCR 9, Great Basin Region).		
SEN	BLM Special Status Species (Sensitive; BLM, 2001)		

Note: All migratory birds are protected by the Migratory Bird Treaty Act (MBTA).

Oregon:

T	Threatened	E	Endangered
SC	"Critical" sensitive species are those for which listing as Threatened or Endangered would be appropriate if immediate conservation actions were not taken. Some peripheral species which are at risk throughout their range and some disjunct populations (those that are geographically isolated from other populations) area also considered "Critical."		
SV	"Vulnerable" sensitive species are not in imminent danger of being listed as Threatened or Endangered, but could become sensitive-critical, Threatened, or Endangered with changes in populations, habitats or threats.		

Appendix B. Comprehensive list of all vertebrate wildlife observed during avian use surveys, raptor nest surveys, greater sage-grouse surveys, leporid surveys, and bat species investigation, including incidental and in-transit sightings, Grassy Mountain Gold Project (listed taxonomically within classes).

Common Name	Scientific Name	Within Permit Area	Within 2-mile Buffer
Birds			
Canada goose	<i>Branta canadensis</i>		X
Gadwall	<i>Anas strepera</i>		X
American wigeon	<i>Anas americana</i>		X
Mallard	<i>Anas platyrhynchos</i>		X
Northern pintail	<i>Anas acuta</i>		X
Blue-winged teal	<i>Anas discors</i>		X
Green-winged teal	<i>Anas crecca</i>		X
Northern shoveler	<i>Anas clypeata</i>		X
California quail	<i>Callipepla californica</i>		X
Chukar	<i>Alectoris chukar</i>		X
Northern harrier	<i>Circus cyaneus</i>	X	X
Red-tailed hawk	<i>Buteo jamaicensis</i>	X	X
Ferruginous hawk*	<i>Buteo regalis</i>	X	X
Rough-legged hawk	<i>Buteo lagopus</i>	X	X
Golden eagle*	<i>Aquila chrysaetos</i>	X	X
American coot	<i>Fulica americana</i>		X
Killdeer	<i>Charadrius vociferous</i>	X	X
Greater yellowlegs	<i>Tringa melanoleuca</i>		X
Long-billed curlew	<i>Numenius americanus</i>		X
Mourning dove	<i>Zenaida macroura</i>		X
Long-eared owl	<i>Asio otus</i>		X
Short-eared owl	<i>Asio flammeus</i>	X	X
Burrowing owl*	<i>Athene cunicularia hypugaea</i>	X	X
Common nighthawk	<i>Chordeiles minor</i>	X	X
Northern flicker	<i>Colaptes auratus</i>	X	X
American kestrel	<i>Falco sparverius</i>		X
Prairie falcon	<i>Falco mexicanus</i>	X	X
Say's phoebe	<i>Sayornis saya</i>	X	X
Western kingbird	<i>Tyrannus verticalis</i>		X
Loggerhead shrike*	<i>Lanius ludovicianus</i>	X	X
Cassin's vireo	<i>Vireo cassinii</i>		X
Common raven	<i>Corvus corax</i>	X	X
Horned lark	<i>Eremophila alpestris</i>	X	X
Cliff swallow	<i>Petrochelidon pyrrhonota</i>		X
Barn swallow	<i>Hirundo rustica</i>		X
Mountain chickadee	<i>Poecile gambeli</i>		X
Rock wren	<i>Salpinctes obsoletus</i>	X	X
Canyon wren	<i>Catherpes mexicanus</i>	X	X
Ruby-crowned kinglet	<i>Regulus calendula</i>		X
Mountain bluebird	<i>Sialia currucoides</i>	X	X

Common Name	Scientific Name	Within Permit Area	Within 2-mile Buffer
American robin	<i>Turdus migratorius</i>		X
Sage thrasher	<i>Oreoscoptes montanus</i>	X	X
European starling	<i>Sturnus vulgaris</i>		X
Brewer's sparrow	<i>Spizella breweri</i>	X	X
Vesper sparrow	<i>Pooecetes gramineus</i>	X	X
Lark sparrow	<i>Chondestes grammacus</i>	X	X
Black-throated sparrow	<i>Amphispiza bilineata</i>	X	X
Sagebrush sparrow	<i>Artemisiospiza nevadensis</i>	X	X
Song sparrow	<i>Melospiza melodia</i>		X
Swamp sparrow	<i>Melospiza georgiana</i>		X
White-crowned sparrow	<i>Zonotrichia leucophrys</i>		X
Dark-eyed junco	<i>Junco hyemalis</i>		X
Lazuli bunting	<i>Passerina cyanea</i>		X
Red-winged blackbird	<i>Agelaius phoeniceus</i>		X
Tricolored blackbird	<i>Agelaius tricolor</i>		X
Western meadowlark	<i>Sturnella neglecta</i>	X	X
Brewer's blackbird	<i>Euphagus cyanocephalus</i>		X
Brown-headed cowbird	<i>Molothrus ater</i>		X
House finch	<i>Carpodacus mexicanus</i>		X
Lesser goldfinch	<i>Carduelis psaltria</i>		X
American goldfinch	<i>Carduelis tristis</i>		X
Mammals			
California myotis	<i>Myotis californicus</i>	X	X
Small-footed myotis	<i>Myotis ciliolabrum</i>	X	X
Long-eared myotis	<i>Myotis evotis</i>	X	X
Yuma myotis	<i>Myotis yumanensis</i>		X
Hoary bat*	<i>Lasiurus cinereus</i>	X	X
Silver-haired bat*	<i>Lasionycteris noctivagans</i>	X	X
Canyon bat	<i>Parastrellus hesperus</i>	X	X
Big brown bat	<i>Eptesicus fuscus</i>	X	X
Spotted bat*	<i>Euderma maculatum</i>		X
Pallid bat*	<i>Antrozous pallidus</i>	X	X
Black-tailed jackrabbit	<i>Lepus americanus</i>	X	X
Mountain cottontail	<i>Sylvilagus nuttallii</i>	X	X
Belding's ground squirrel	<i>Uroditellus beldingi</i>	X	X
Merriam's ground squirrel	<i>Uroditellus canus</i>	X	X
Northern pocket gopher	<i>Thomomys talpoides</i>	X	X
Ord's kangaroo rat	<i>Dipodomys ordii</i>	X	X
Deer mouse	<i>Peromyscus maniculatus</i>	X	X
Bushy-tailed woodrat	<i>Neotoma cinerea</i>		X
Montane vole	<i>Microtus montanus</i>	X	X
Common porcupine	<i>Erethizon dorsatum</i>		X
Coyote	<i>Canis latrans</i>		X
American badger	<i>Taxidea taxus</i>	X	X
Bobcat	<i>Lynx rufus</i>		X

Common Name	Scientific Name	Within Permit Area	Within 2-mile Buffer
Mule deer	<i>Odocoileus hemionus</i>		X
Pronghorn	<i>Antilocarpa americana</i>	X	X
Amphibians and Reptiles			
Pacific chorus frog	<i>Pseudacris regilla</i>		X
Great Basin collared lizard	<i>Crotaphytus bicinctores</i>		X
Long-nosed leopard lizard	<i>Gambelia wislizenii</i>		X
Western fence lizard	<i>Sceloporus occidentalis</i>	X	X
Sagebrush lizard	<i>Sceloporus graciosus</i>	X	X
Desert horned lizard	<i>Phrynosoma platyrhinos</i>		X
Pygmy short-horned lizard	<i>Phrynosoma douglasi</i>	X	X
Western whiptail	<i>Cnemidophorus tigris</i>	X	X
Racer	<i>Coluber constrictor</i>	X	X
Striped whipsnake	<i>Masticophis taeniatus</i>	X	X
Gopher snake	<i>Pituophis catenifer</i>	X	X
Western rattlesnake	<i>Crotalus viridis</i>	X	X

* denotes species is of state or federal special status.

Appendix C. Global Positioning System data for all wildlife and habitat studies at Grassy Mountain Gold Project, Malheur County, Oregon, June 2013–May 2014 (provided on accompanying CD).

Appendix D. Copies of all field data forms associated with wildlife and habitat studies at Grassy Mountain Gold Project, Malheur County, Oregon, June 2013–May 2014 (provided as digital scans on accompanying CD).

Appendix E. Copies of all QA forms associated with wildlife and habitat studies at Grassy Mountain Gold Project, Malheur County, Oregon, June 2013–May 2014 (provided as digital scans on accompanying CD).