

**United States Department of the Interior
Bureau of Land Management**

**Environmental Assessment
Marys River 3D Seismic Project**

DOI-BLM-NV-E030-2012-0518-EA

File Number: NVN-90807

Elko District – Wells Field Office
3900 East Idaho Street
Elko, NV 89801
Phone: 775-753-0200
Fax: 775-753-0385

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List of Abbreviations and Acronyms

AO	Authorized Officer
APE	Area of Potential Effect
ATVs	all-terrain vehicles
AUMs	animal unit months
BBS	Breeding Bird Survey
BCC	Birds of Conservation Concern
BCR	Bird Conservation Regions
BLM	Bureau of Land Management
BSCs	biological soil crusts
BWQP	Bureau of Water Quality Planning
CESAs	Cumulative Effects Study Areas
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COAs	Conditions of Approval
CRA	Cultural Resource Analysts, Inc.
CWA	Clean Water Act
DPS	Distinct Population Segment
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FMU	Fire Management Unit
USFWS	U.S. Fish and Wildlife Service
GPS	Global Positioning System
HUC	Hydrologic Unit Code
IM	Instruction Memorandum
MBTA	Migratory Bird Treaty Act
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NDOA	Nevada Department of Agriculture
NDOQ	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NNHP	Nevada Natural Heritage Program
Noble	Noble Energy, Inc.
NOI	Notice of Intent
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRM	Northern Rocky Mountain
NRS	Nevada Revised Statutes
OHV	off-highway vehicle
PGH	Preliminary General Habitat
PMU	Population Management Unit

PPH	Preliminary Priority Habitat
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
RFFAs	Reasonably Foreseeable Future Actions
RMP	Resource Management Plan
ROW	right-of-way
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic Database
USDI	U.S. Department of the Interior
USGS	U.S. Geological Survey
VRM	Visual Resource Management

CHAPTER 1 - INTRODUCTION

1.1 IDENTIFYING INFORMATION

BACKGROUND:

Noble Energy, Inc. (Noble) filed a Notice of Intent (NOI) to conduct Oil and Gas Geophysical Exploration Operations with the Bureau of Land Management (BLM) Elko District, Wells Field Office on February 2, 2012. Noble proposes to conduct the Marys River 3D Seismic Project (Project) to evaluate possible hydrocarbon reserves underlying the project area in support of exploration of existing oil and gas leases.

The Marys River 3D Seismic project area encompasses approximately 39,445 acres in Elko County, Nevada (see Map 1). Within the total project area, 20,622 acres (52 percent) are administered by the BLM Elko District, Wells Field Office. In addition, there are approximately 2,603 acres (7 percent) of private surface with BLM-administered subsurface mineral rights. Private lands (and minerals) comprise the remaining 16,220 acres (41 percent). Within the project area, approximately 542 miles of source and receiver lines are proposed on public and private lands. The Project is proposed to begin in Fall 2012, once all permits and approvals are obtained.

NUMBER: DOE-BLM-NV-E030-2012-0518-EA

CASEFILE/PROJECT NUMBER: NVN-90807

PROJECT NAME: Noble Energy – Marys River 3D Seismic Project

PLANNING UNIT: Elko District, Wells Field Office

1.1.1 PROJECT LOCATION

The proposed Project would be located in Elko County Nevada approximately 4 miles northwest of Wells, Nevada and approximately 40 miles northeast of Elko, Nevada on the north side of Interstate-80. General access to the project area from Elko and Wells is via Interstate-80 to Starr Valley Road (Elko County Road 230/Exit 343) and proceeding north on local roads.

LEGAL DESCRIPTION (Surface Ownership) (see Map 2):

Mount Diablo Meridian

BLM-Administered Lands

T39N, R60E: N/2 & SW/4 Section 24

Section 25

E/2 SE/4 & W/2 W/2 Section 2

Sections 35 and 36

T39N, R61E: Section 20

N/2 N/2 Section 21

SW/4 NW/4, S/2 SW/4, SW/4 SE/4 & S/2 SE/4 Section 22

E/2, NW/4, E/2 SW/4 & NW/4 SW/4 Section 31

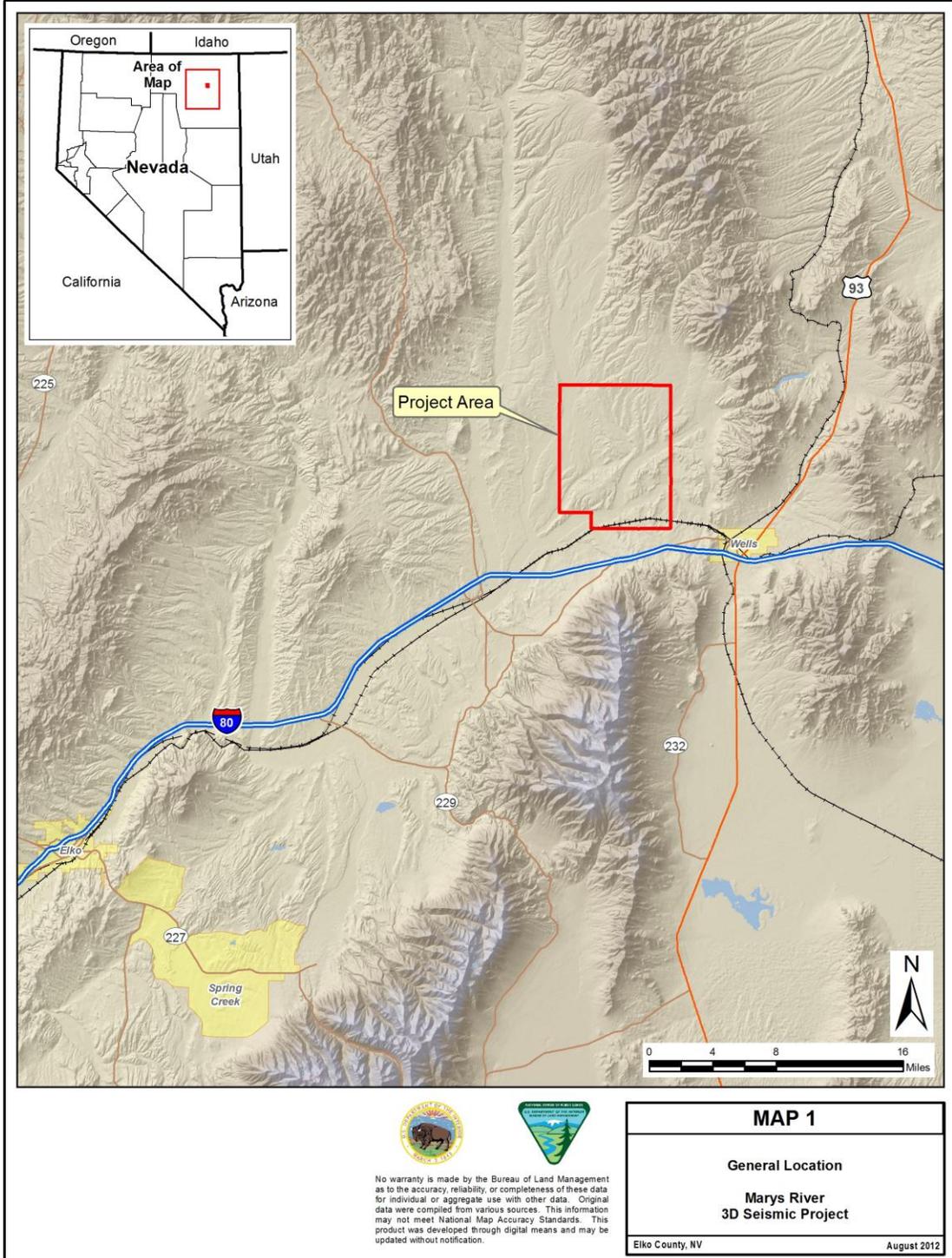
Section 32

W/2, NW/4 NE/4 & SE/4 SE/4 Section 34
T38N, R60E: Sections 1, 2, 11, 12, 13, 14, 23, 24, 25 & 26
T38N, R61E: W/2 NW/4 & NW/4 SW/4 Section 2
Sections 4, 6, 7, 8, 9
N/2 NW/4, S/2 SE/4 & NE/4 SE/4 Section 10
S/2 Section 14
Section 15
S/2 SE/4, NE/4 SE/4 Section 16
Section 18
W/2 Section 20
N/2, SE/4, N/2 SW/4 & SW/4 SW/4 Section 22
N/2 Section 23
Sections 26, 28 & 30
E/2 NE/4 and a portion of the S/2 north of RR Section 32
Section 34 and a portion of the N/2 north of RR Section 35

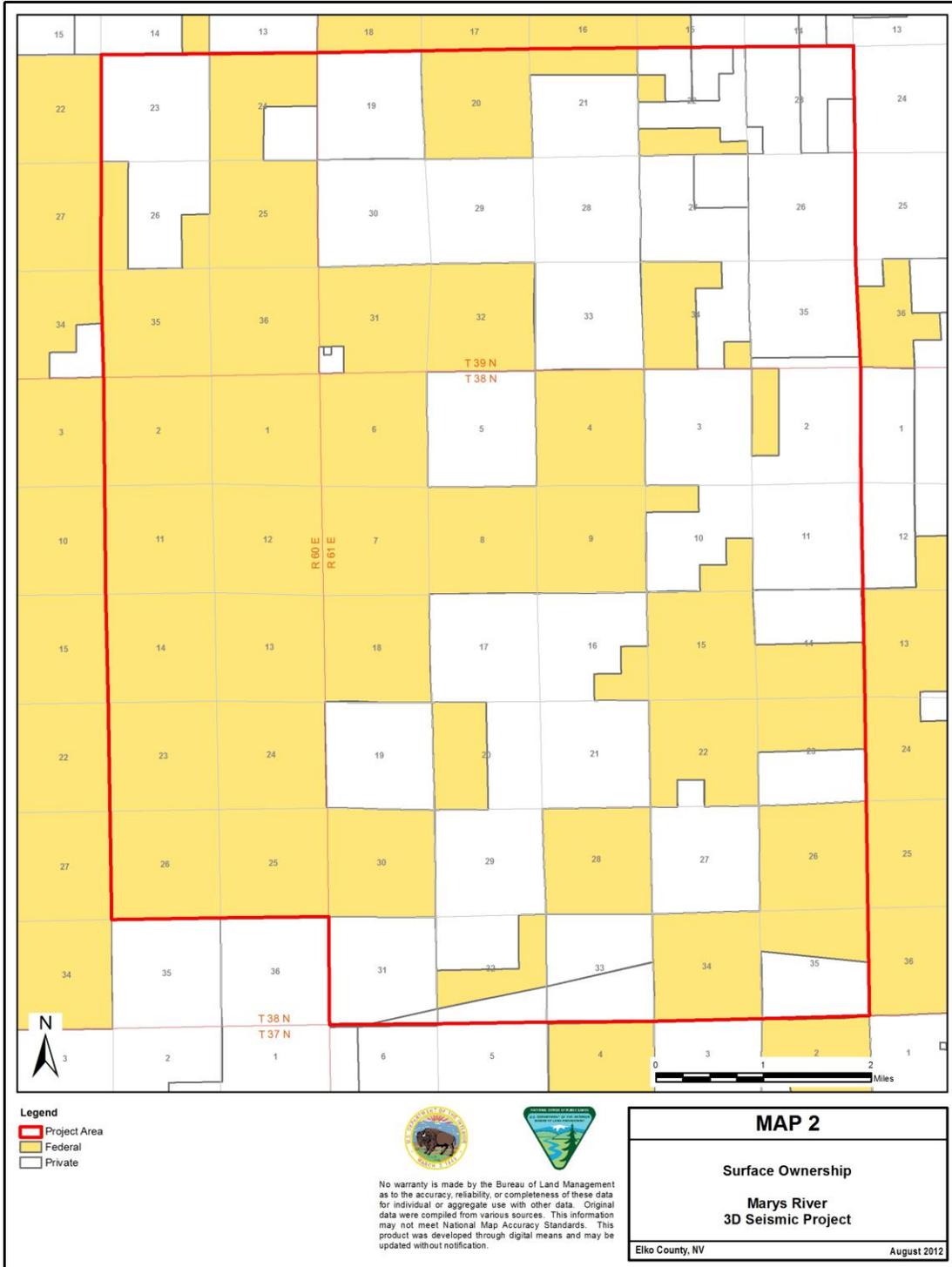
Private Lands

T39N, R60E: Section 23, SE/4
Section 24
NE/4, W/2 SE/4 & E/2 W/2 Section 26
T39N, R61E: Section 19
S/2 N/2 & S/2 Section 21
N/2 NW/4, SE/4 NW/4, NE/4, N/2 S/2 & N/2 SE/4 SE/4 Section 22
Sections 23, 26, 27, 28, 29, & 30
SW/4 SW/4 Section 31
Section 33
NW/4 NE/4, S/2 NE/4, N/2 SE/4, SW/4 SE/4 Section 34
Section 35
T38N, R61E: E/2, E/2 W/2 & SW/4 SW/4 Section 2
Sections 3 & 5
NE/4, S/2 NW/4, NW/4 SE/4 & SW/4 Section 10
Sections 11
N/2 Section 14
N/2, SW/4, NW/4 SE/4 Section 16
Sections 17 & 9
E/2 Section 20
Section 21
SE/4 SW/4 Section 22
S/2 Section 23
Sections 27, 29 & 31
NW/4, W/2 NE/4 and a portion of S/2 S/2 of RR Section 32
Section 33
S/2 and a portion of the S/2 N/2 RR Section 35

Map 1 General Location



Map 2 Surface Ownership



1.1.2 NAME AND LOCATION OF PREPARING OFFICE:

BLM Wells Field Office, Elko District, Nevada

1.2 PURPOSE AND NEED

The need for the Proposed Action stems from the BLM's legal responsibility to respond to the Notice of Intent to conduct Oil and Gas Geophysical Exploration Operation under its mandate to manage the public lands according to the Federal Land Policy and Management Act and the Mineral Leasing Act, as amended.

The purpose of the Project is to conduct seismic exploration to acquire data for exploration of existing oil and gas leases within the project area.

1.3 PLAN CONFORMANCE REVIEW

The Project is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

The Project is in conformance with the Wells Resource Management Plan (RMP), as approved June 23, 1985. The Record of Decision for the Wells RMP, page 25, provides that, "The public lands will be managed in a manner which recognizes the Nation's needs for domestic sources of minerals." As a standard operating procedure, the RMP prescribes that, "Time-of-day and/or time-of-year restrictions will be placed on construction activities associated with leasable and saleable mineral explorations and/or development that are in the immediate vicinity or would cross crucial sage-grouse, crucial deer and pronghorn antelope winter habitats, antelope kidding areas, or raptor nesting areas." The Project is also consistent with other applicable federal, state and local land use policies and plans.

1.4 PUBLIC PARTICIPATION

As part of the National Environmental Policy Act (NEPA) process, a press release outlining the Project as well as BLM's intent to prepare an Environmental Assessment (EA) analyzing the proposal was published. The proposal, the press release, and a map were posted to the BLM Elko District website at www.blm.gov/rv5c. Letters were sent to interested parties soliciting input on potential issues, impacts, and alternatives. Tribal consultation letters were sent to 14 tribes notifying them of the Project and requesting input. The BLM invited the public to provide comments on the proposal for 30 days beginning April 27, 2012. The public comment period ended on May 31, 2012.

During the comment period, two comment letters were received. The comments are summarized by resource below.

Cultural. One comment expressed concern that the Project would disturb cultural sites.

Fire Management. One comment addressed the occurrence of previous fires in the area and recommended that the BLM elevate the importance of any remaining native vegetation communities and exclude those areas from seismic activity.

Fish and Wildlife. The comments expressed concern about sage-grouse and migratory bird habitat and recommended that the BLM examine all the adverse impacts, threats, and stresses to wildlife.

General. One general comment cited support for the Project based on the energy needs of the nation.

Grazing. One comment addressed BLM's grazing management in the area and expressed concern about uplands being converted to cheatgrass due to intensive grazing and overstocking.

Geology and Soils. A comment suggested that the Project would promote soil erosion and destroy microbiotic crusts.

Noxious and Invasive Species. Comments expressed concern that the Project would promote the spread of cheatgrass and other weeds.

Policy/Process. A comment recommended preparing an EIS to analyze all direct, indirect, and cumulative adverse impacts.

Recreation. One comment stated generally that the Project would disturb recreational use in the area.

Special Status Species. A comment expressed concern that the seismic activity would crush and disturb sage-grouse habitat and collapse pygmy rabbit burrows.

Transportation and Access. One comment expressed concern that the Project would create new off-road access routes and uncontrolled motorized use in the area.

Vegetation. One comment suggested the Project would kill or harm mature and old growth sagebrush and other vegetation.

Wetland and Water Resources. A comment recommended that the BLM examine all the adverse impacts, threats, and stresses to watersheds and ecological processes in this area.

1.5 DECISIONS TO BE MADE

BLM's authority for approving oil and gas geophysical exploration operations is listed in 43 CFR 3151. BLM's approval of oil and gas activities is subject to conditions to prevent undue or unnecessary degradation of public lands and is consistent with the 1985 Wells RMP and the District-wide EA for oil and gas leasing completed in September 2005 (BLM, 2005).

This EA was prepared in conformance with the policy guidance provided in BLM's NEPA Handbook H-1790-1 (BLM, 2008a). The BLM Handbook provides instructions for compliance with the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR §1500-1508) and U.S. Department of the Interior (USDI) Manual 516 DM 1-7 on NEPA compliance (USDI, 2005).

BLM decision-makers will decide, based on the analysis contained in this EA, whether or not to authorize the Project by issuing an approved NOI with Conditions of Approval (COAs). The Decision Record associated with this EA may not constitute the final approval for all actions

associated with the Project. It does, however, provide the BLM's Authorized Officer (AO) with an analysis from which to base the final approval for individual project components.

1.6 FEDERAL, STATE AND LOCAL PERMITS OR REQUIRED CONSULTATION

BLM will consult with the Nevada State Historic Preservation Office (SHPO) concerning the possible impacts to cultural resources found in the project area. No other state or local permits/approvals are required for the Project.

CHAPTER 2 - PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The purpose of this chapter is to describe alternatives, both those analyzed in detail and those considered but not analyzed in detail. Alternatives analyzed in detail include the Proposed Action Alternative and the No Action Alternative.

2.2 ALTERNATIVE – PROPOSED ACTION

2.2.1 LOCATION AND DESCRIPTION OF PROPOSED FACILITIES

Noble proposes to conduct the 3D seismic study in the Tabor Flats area of Elko County, approximately 4 miles northwest of the City of Wells, Nevada and approximately 40 miles northeast of Elko, Nevada on the north side of Interstate-80. General access to the project area from Elko and Wells is via Interstate-80 to Starr Valley Road (Elko County Road 230/Exit 343) and proceeding north on local roads to the project area (see Map 1).

Noble owns oil and gas leases in the area on both federal and private lands. The surface ownership in this area consists of both lands administered by the BLM and private lands (see Map 2). The Project is proposed to begin in Fall 2012, once all permits and approvals are obtained.

The purpose of the seismic exploration is to gain a better understanding of the subsurface geology to determine if there is oil and gas potential and to also determine the best locations for exploratory drilling. The seismic exploration program would also provide information allowing identification of subsurface features that could impede drilling. Without the seismic program, the exploratory program would require substantially more exploratory wells to provide similar information.

The 3D seismic program includes the generation of acoustic energy transmitted into the ground by the use of vibroseis units (see Photo 1). The recording equipment includes a series of geophones, which are magnets with a copper coil surrounding the magnet (see Photos 2 and 3). Each set of geophones is connected to a recording box and battery at locations throughout the project area. When the coil is moved through the magnetic field by the acoustic energy, an electrical current is produced and recorded providing geophysical data. Shot-holes would not be required for the Project.



Photo 1 - Vibroseis Truck



Photo 2 - Receiver Line Layout

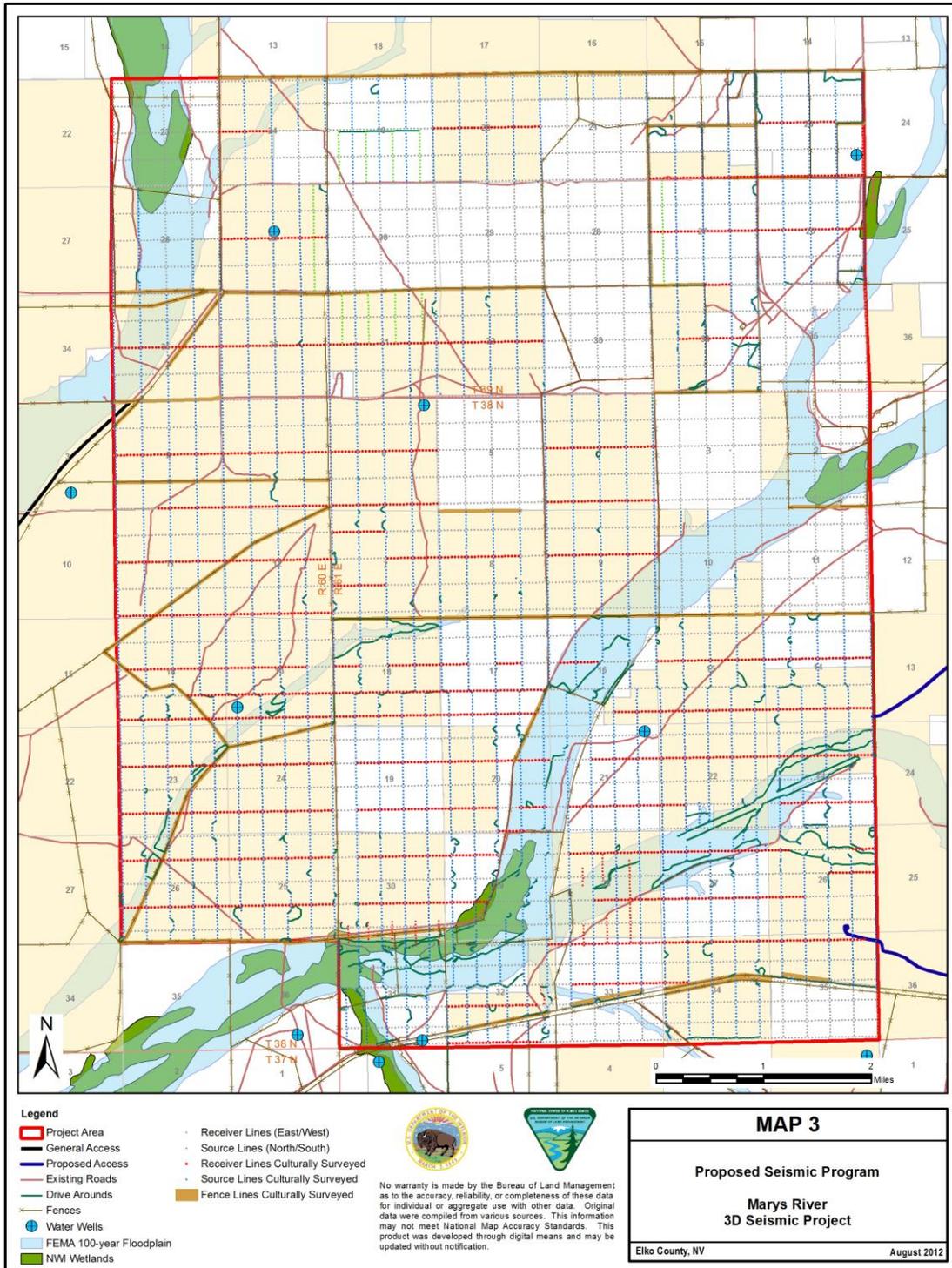


Photo 3 – Geophone along Receiver Line

Seismic data acquisition would begin with a land survey crew locating and placing temporary pin flags for receiver and source points using a global positioning system (GPS) based surveying system. Several one- or two-person crews would establish and flag the receiver and source point locations as well as access routes. The survey crew(s) would be responsible for positioning receiver and source point stations such that they avoid all known and apparent cultural, natural, and existing land use features of importance. Vehicles bringing surveyors to and from the project area would remain on existing roads and trails. Crews would travel cross-country on all-terrain vehicles (ATVs) and on foot. Cutting of vegetation is not expected to be required.

The source and receiver lines would use a 165-foot station interval and variable line intervals (see Map 3). Helicopters and line trucks (pickup trucks) would be used to lay out the receiver lines in some areas while receivers in other areas may be deployed on foot or by ATV. The use of helicopters would allow for reduced disturbance and access. The deployment method for any individual area would be determined by access while considering how to minimize effects to resources in the area. Once the equipment is dropped off, crew members would walk to the first receiver on the receiver line and manually connect the recording box, battery and geophones. The geophones would be laid out by hand around each station in a pre-determined pattern. They would be placed into the soil using foot pressure. Approximately 16 to 20 lines of receivers would be deployed at any one time beginning in the south of the project area and moving north.

Map 3 Proposed Seismic Program



The Project would involve a series of 33 source lines oriented in a north/south pattern and 40 receiver lines oriented in an east/west pattern. Source and receiver lines total approximately 542 line miles (see Map 3). Vibroseis buggies would be used to produce seismic waves at the source points along the source lines. The Project design would include approximately 8,530 source points spaced 165 feet apart, and the receiver operations would employ an array of approximately 8,600 receivers, with an inline spacing of 165 feet. The north/south source lines and the east/west receiver lines would be spaced approximately 1,320, 1,155, and 990 feet apart depending on location within the survey. A set of geophones would be at each receiver station and each station would be connected to the next by lightweight cable.

The locations of the source lines and their associated access routes were modified during initial project design to account for limited accessibility, such as around topographic hazards (e.g., drainage crossings, steep slopes); infrastructure (e.g., wells, pipelines, highways); habitat (e.g., pygmy rabbit burrows); and cultural resource sites (e.g., historic properties). Receiver lines can be deployed in most areas and would be installed and maintained by individuals on foot and on lightweight ATVs where vehicle traffic has been permitted by the BLM. Individual troubleshooters (four to six personnel) would repair any line issues that may arise during the seismic data acquisition process. Troubleshooting and line maintenance operations would use ATVs to travel on roads (established two-track roads) and source and receiver lines that have been cleared for cultural resource purposes.

Three vibroseis trucks would make a single pass along each source line. The vibroseis trucks would be staggered slightly to reduce impact to the ground surface if requested by the landowner. Ground compaction below the vibrator pad is minimal on hard, dry ground normally resulting in little or no visible indentation of the ground other than crushed vegetation. When enough sources have been recorded such that a receiver line is no longer active, the receiver line would be picked up and moved from the trailing end of the active recording patch to the front edge of the patch in an assembly line fashion to allow recording to move smoothly across the project area. Each receiver line is expected to be on the ground for 1 to 2 weeks.

2.2.1.1 Schedule, Workforce, Traffic

Data acquisition is scheduled to begin in Fall 2012 and expected to last approximately 2 months or 60 operational days. The Project is anticipated to require 50 workers (depending on the contractor crew size). Seismic operations would be conducted 7 days per week. Workers would stay in Wells or Elko and travel to and from the site each day in carpool vans. Existing roads and trails would be used for access to the project area. Vehicles anticipated during seismic operations include 8 to 12 pickup trucks (e.g., line trucks, flatbed trucks, etc.), 1 fuel truck, 2 vans, 10 to 15 ATV/kubotas, and up to 9 vibroseis trucks (3 teams of 3 trucks). All vibroseis trucks are expected to be equipped with sand/flotation tires to minimize the surface impact along source lines (see Photo 1).

2.2.1.2 Seismic Land Survey

To design the seismic program, Noble conducted a land survey to identify areas, which would need to be avoided (i.e., topographic hazards, structures, wells, etc.). The seismic design was then adjusted where necessary.

2.2.1.3 Cultural Survey

A cultural resource inventory was conducted in accordance with applicable state and federal requirements on both lands administered by the BLM and on private lands where permission could be obtained. BLM-approved archaeological contractors walked each source line and a portion of the receiver lines, where required for access. In consultation with the BLM,

adjustments to the proposed source and receiver lines and access routes were made to avoid sensitive cultural sites.

2.2.1.4 Biological Survey

Sage-grouse lek surveys were conducted for the project area plus a 3-mile buffer around the project area. Two surveys for new or undocumented leks (aerial fixed-wing flights) were conducted as well as three ground surveys of each lek to confirm activity status and record lek attendance numbers. Lek attendance numbers were used for monitoring trends and impacts, in accordance with standard BLM and Nevada Department of Wildlife (NDOW) survey protocols.

Pygmy rabbit surveys were conducted on BLM-administered lands. Vegetation types, wetlands, large game species, raptors, and general wildlife observations were also recorded. The results of the biological survey were utilized, in consultation with the BLM, to adjust the seismic source and receiver locations to minimize potential impacts. Source and receiver lines were designed to accommodate 100-foot buffers around active pygmy rabbit burrows.

2.2.1.5 Project Design Features (Applicant-Committed Measures to Protect Resources)

The following design features are included in the Marys River 3D Seismic Project. They are specifically intended to reduce any potential damage to existing infrastructure, the natural environment, and historical sites.

Cultural

If unknown cultural resources are found during operations, Noble would implement an Unanticipated Discovery Plan for Cultural Resources, which includes immediate stoppage of all work within thirty (30) meters of the discovery as directed by the BLM and immediate notification of the BLM AO.

Prior to commencement of operations, Noble will inform all employees and contractors about compliance requirements associated with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, the Paleontological Resources Preservation Act, and the National Historic Preservation Act.

Noble has developed the following protocol to minimize impacts to historic properties:

- The Project will avoid all structures, water wells, windmills and other infrastructure by 300 feet or more.
- The seismic recording team will be provided surface ownership maps indicating when they are entering private land without archaeological survey access and where no data was collected for avoidance. Where possible, the seismic recording team will implement as little traffic on private land with no archaeological access and data as possible while still keeping the integrity of the seismic data.
- The vibroseis buggies will use low impact sand tires, sometimes called balloon tires, which reduce the force on the ground to less than that of a standard pickup truck. These tires have little tread which also limits the potential surface disturbance. Ground force from sand tires is estimated at about 12 pounds per square inch (psi).
- Operations will not be conducted when the ground is wet, reducing the potential for surface disturbance. This includes shutting down operations in the event a rainstorm occurs during data acquisition.
- Operations are scheduled for between early fall and mid-winter to minimize the chance of substantial rain fall, allowing operations to be conducted on dry ground, minimizing the chances of rutting and ground damage.

- The largest potential for direct damage to surface objects within the project area is from setting the vibrator pad directly on top of an object that may be damaged. A vibrator pad is roughly 4 feet x 5 feet; using a 3 vibrator fleet and a design with 150 source locations per square mile, results in 0.03 percent of the land surface being in contact with the vibrator pads.
- Source lines will avoid all wet areas.
- Layout of source and receiver lines will follow existing disturbance (roads/two tracks) whenever possible. Receiver line equipment will be deployed mostly with helicopters and line trucks (pickups), where necessary, and quads. Actual deployment must be done by hand - connecting cables and stomping phones.
- Noble will discuss the location of any sensitive areas on private property with the landowner so that damage to these sites can be avoided. This includes the location of existing buildings, water wells, springs, canals, historic irrigation, historic sites, prehistoric sites, grave yards, or known burials. If the seismic crews discover these features, the features would be avoided by 300-foot buffers.

Wildlife Resources

Noble will inform employees and contractors that harassing or shooting of wildlife will not be permitted; dogs may not be brought to the project area; no firearms will be allowed on-site; and there will be no littering.

Soils

No truck traffic will be operated during periods or in areas of saturated ground when surface rutting could occur.

Low impact sand tires will be used to reduce ground surface disturbance. These tires, sometimes called balloon tires, reduce the force on the ground to less than that of a standard pickup truck. Additionally these tires have little tread which also limits the potential surface disturbance. Ground force from sand tires is estimated at about 12 psi.

Layout of source and receiver lines will follow existing disturbance (roads / two-tracks) whenever possible. Receiver line equipment will be deployed mostly with helicopters and line trucks (pickups), where necessary, and quads. Actual deployment must be done on foot - connecting cables and using feet to insert the geophones.

Vegetation

If operations cause unplanned surface rutting or have otherwise removed all surface vegetation, the areas will be reclaimed and reseeded as directed by the landowner. A reclamation plan will be created in consultation with the BLM.

Noxious and Invasive Species

Noble will clean all equipment and vehicles prior to going from private land to public lands in the project area to prevent the spread of noxious weeds. This process will be presented to the BLM for approval prior to commencement of operations.

Public Health and Safety

Vehicle traffic will be limited to existing roads.

Vehicles will travel at speeds within set speed limits for main roads.

Noble will have third-party oversight for permit compliance as well as internal oversight from Noble Operations personnel.

Noble will conduct a Job Site Assessment meeting prior to kick off with the entire Project team and have daily safety tailgates each morning.

All contractors will be required to have a Health and Safety Plan written and implemented specific to this Project's requirements, which will include emergency response protocol.

Water Resources, Wetland and Riparian Areas

Seismic activities will avoid streams, creeks, and wetland areas.

Source lines will avoid all wet areas whenever possible.

Fueling of vibroseis trucks will not occur within 300 feet of any riparian areas or standing or flowing surface water including streams, ponds, springs, seeps and stock reservoirs.

Fuel trucks will not travel down the source or receiver lines; fueling of the vibroseis trucks will occur at established roads and two tracks.

Noble will prepare, implement, and follow a Spill Prevention Plan in accordance with state regulations.

Noble will clean up diesel, hydraulic fuel, or other spills, including contaminated soils. All spill-related material will be hauled to an approved disposal site.

Existing Facilities

A 300-foot buffer will be maintained from hazards (infrastructure, houses, barns, concrete pads, radio antennae). Vibroseis trucks will not conduct operations within the buffer.

Any facilities damaged in connection with this Project will be immediately restored to original condition or replaced with a similar facility.

Fences will be avoided and gates will be used whenever possible. Gates will remain in the position found after going through them. If a fence must be crossed, it will be laid down or cut (as determined by the owner), crossed, and immediately put back up.

Fire Protection

Due to the sensitive nature of the sagebrush habitat in the project area and the past history of fire impacts to grazing and sage-grouse, Noble will prepare and implement a Fire Prevention Plan.

Portable generators used in the project area will have spark arresters.

In the event of a wildland fire, Noble will coordinate with appropriate fire-fighting personnel in the BLM Wells Field Office and local authorities.

Noble would discuss fire prevention during crew orientation and provide protocol on how to report a fire.

Daily crew meetings would be conducted to facilitate communication and to keep the crew informed of any special areas of concern in the vicinity of that day's operation, including days with high fire danger (i.e., red-flag days).

All vehicles (other than ATVs) would be equipped with fire extinguishers and a shovel to assist with first fire response in case of a fire, as well as a radio to facilitate communication on the Project site. Crews would only act on fires if they are small and manageable with the equipment available on their vehicles.

Smoking would not be allowed in the project area.

Fueling of vibroseis trucks and helicopters would only occur on roads or within areas with no or minimal vegetation; fueling trucks would be equipped with fire extinguishers.

No vehicles would be parked in direct contact with vegetation; all vehicles would be parked where there is no or minimal vegetation.

All vehicles, with the exception of vibroseis trucks, would be parked within the staging units overnight. Vehicles would be parked in areas with no or minimal vegetation.

Equipment and vehicles would be cleaned prior to entering BLM-administered lands to remove mud, dirt, and plant parts.

2.2.2 NO ACTION ALTERNATIVE

In accordance with the NEPA and CEQ regulations, which require that a No Action Alternative be presented in all environmental analyses in order to serve as a "base line" or "benchmark" from which to compare all proposed "action" alternatives, a No Action Alternative is analyzed in this EA.

Under the No Action Alternative, the Wells Field Manager would not approve the NOI to conduct Oil and Gas Geophysical Exploration Operations, and the proposed seismic program would not be conducted.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

If an alternative is considered during the environmental analysis process but the agency decides not to analyze the alternative in detail, the agency must identify those alternatives and briefly explain why they were eliminated from detailed analysis (40 CFR 1502.14).

Concerns raised during scoping have been addressed through the environmental protection measures for each resource or were included in the Project design process; therefore, no alternatives were considered other than the Proposed Action and the No Action Alternative.

CHAPTER 3 - AFFECTED ENVIRONMENT

Elements specified by statute, regulation, or Executive Order (EO) are described and analyzed in this section. Any element not present within the proposed project area or any element that would not be affected by the Proposed Action or No Action Alternative will not be analyzed in this document. Therefore, this section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and the No Action Alternative.

BLM Resource Specialists, experts in their respective fields, determined which resources would be brought forward for analysis by evaluating whether the resources were present within the project area and whether the proposed Project would impact those resources. Resources that could potentially be impacted are analyzed in this EA. Table 1 presents that resource evaluation.

**Table 1
Potentially Impacted Resources**

Resources*	Not Present	No Impact	Potentially Impacted	Mitigation necessary
Air Quality and Climate	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cultural Resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Environmental Justice	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire Management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Forestry and Forest Products	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hydrology, Floodplains, and Riparian/Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Invasive, Non-native Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Lands Containing Wilderness Characteristics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Tenure, ROW, Other Uses	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Livestock Grazing/Rangeland Health	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Migratory Birds	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mineral Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Native American Religious Concerns	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Paleontological Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Health and Safety	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Socioeconomic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Special Status Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Special Designations, ACECs	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation and Access	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Visual Resources Management	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Wastes (Hazardous or Solid)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wilderness, Including Wilderness Study Areas (WSAs)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild Horses	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife and Fisheries	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

*See Statute: NV-2009-030, BLM Manual, regulation or order that may require an element be addressed in a NV BLM EA.

Past and ongoing activities (natural and man-made) that have affected and are affecting the project area include wildland fire, drought, wildlife utilization, climate change, livestock grazing, dispersed recreation (i.e., hunting, camping, etc.), oil and gas exploration, and OHV use. These

activities have contributed to the current state of the project area and are taken into account in the resource-specific sections in Chapters 3 and 4.

3.1 AIR QUALITY AND CLIMATE

Air quality in the project area is classified by the Environmental Protection Agency as being “in attainment.” This means that National Ambient Air Quality Standards for criteria pollutants are currently being met. High winds and vehicular traffic create exhaust and localized occurrences of dust but these activities have not resulted in violations of air quality standards for any criteria pollutants. The nearest PSD (Prevention of Significant Deterioration) classified area is the Jarbidge Wilderness Area located approximately 43.1 kilometers (26.8 miles) north of the project area (see Map 4). The nearest air quality monitoring location is in Elko.

Climate is typical of the northern Great Basin with hot, dry summers and cold winters with some snow. Precipitation is fairly evenly distributed throughout the year, with a total average annual precipitation of 10.2 inches. The driest months are July and August.

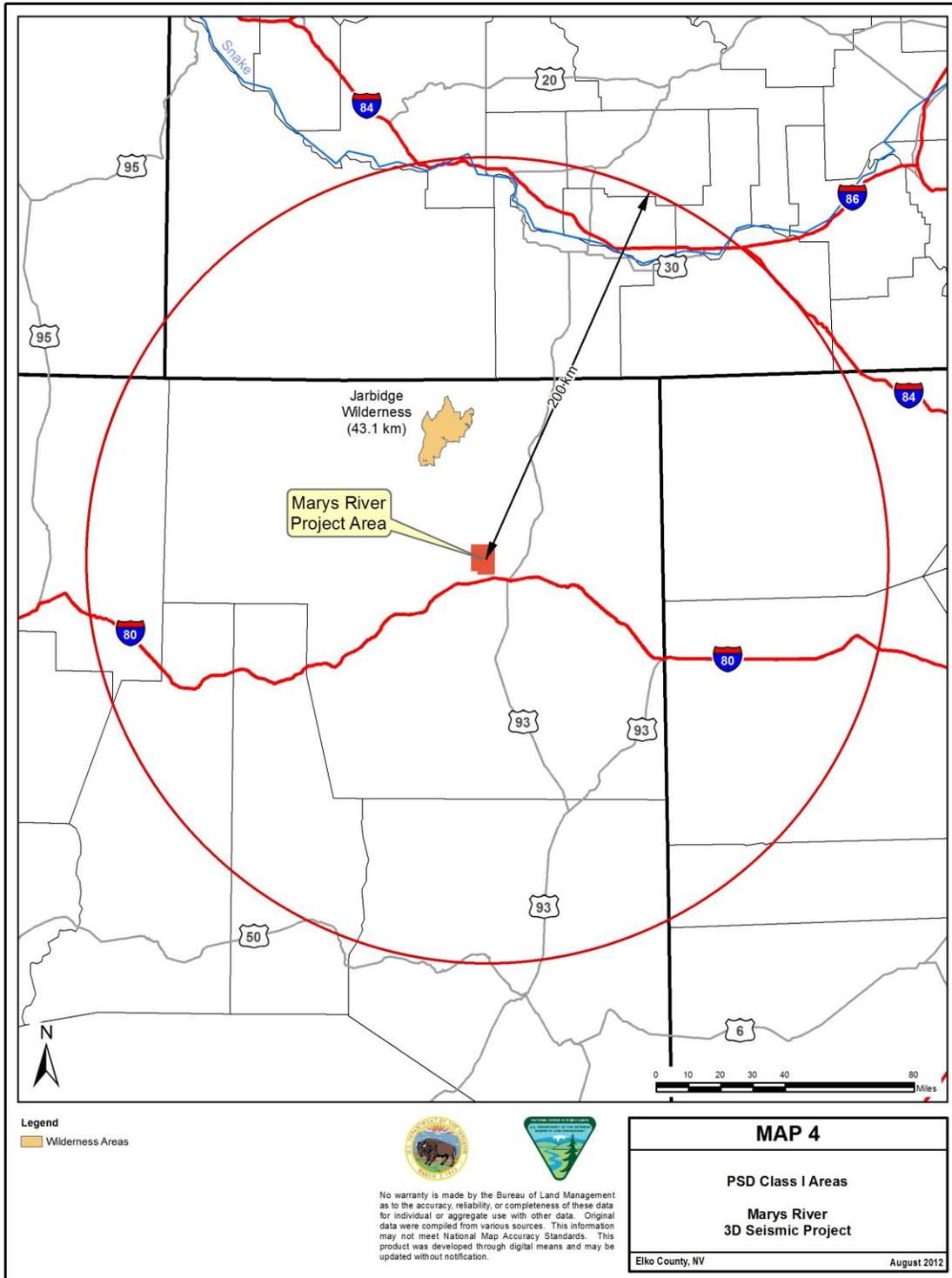
Recent changes in global climate and atmospheric conditions have been well documented by the Intergovernmental Panel on Climate Change (IPCC) and BLM has acknowledged the need to incorporate the appropriate level of climate change analysis in NEPA documents (BLM IM 2008–171). The IPCC concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.” Several activities contribute to the phenomena of climate change, including emissions of Green House Gases (GHGs) (especially carbon dioxide and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (IPCC, 2007).

3.2 CULTURAL RESOURCES

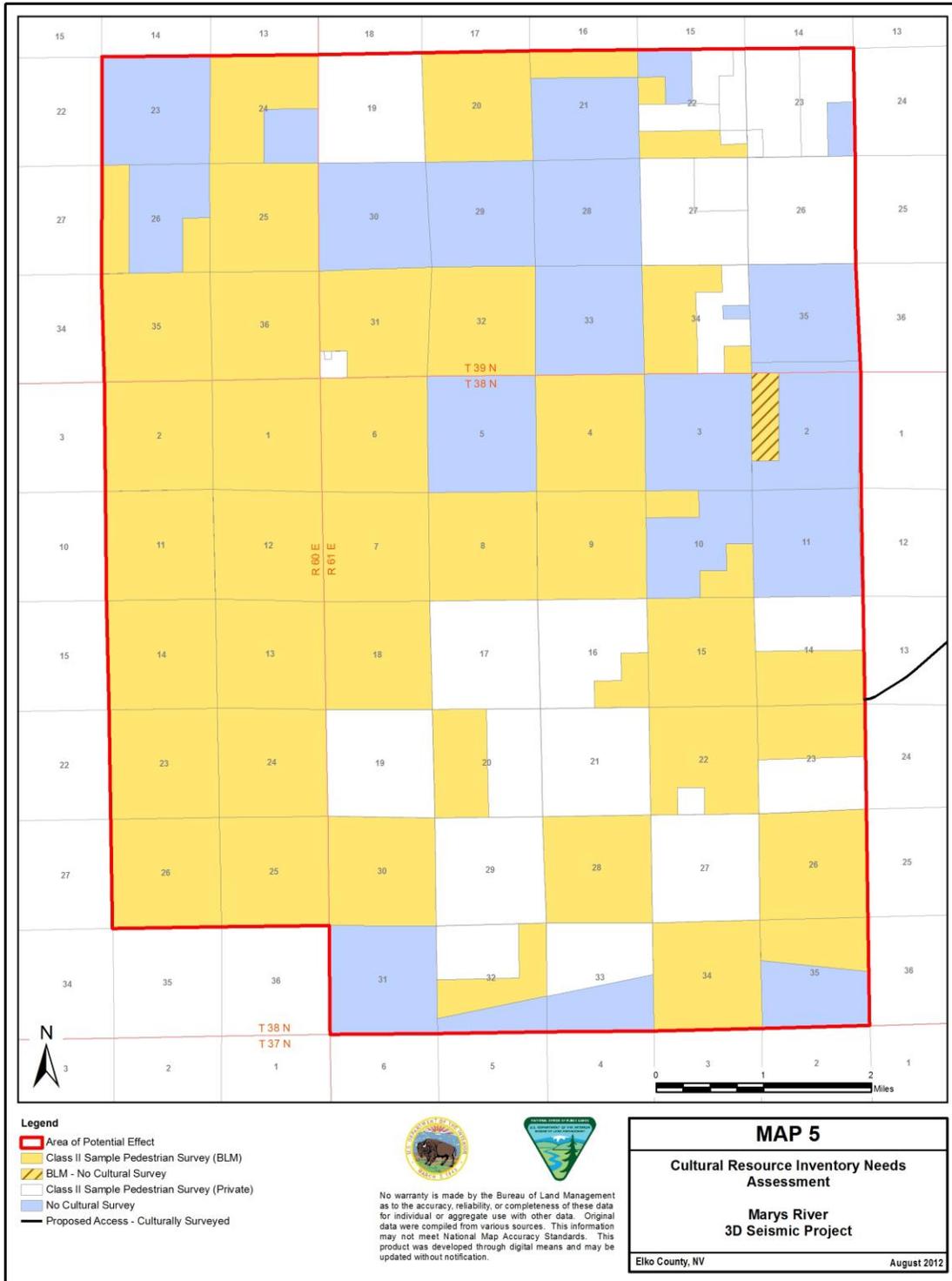
Cultural Resource Analysts, Inc. (CRA) conducted an inventory of the cultural resources within the project area, also known as the area of potential effect (APE) for purposes of the cultural resources survey. The APE is the geographical area or areas within which an undertaking may directly or indirectly cause changes in the character or use of cultural resources. The APE includes the project area as well as access routes to the project area.

A Class I existing information inventory and a Class II sample field survey were completed for the APE and access routes (see Map 5). The Class I literature review and oral histories were performed to outline the prehistoric, historic, and ethnographic nature of archaeological resources in the area. The Class II sample field survey was conducted for limited and discontinuous portions of the APE based on required seismic acquisition corridors adjusted due to landowner consent and for avoidance of historic properties. The inventory was carried out under Cultural Resource Use Permit No. N-90625 and Nevada State Antiquities Permit No. 615. Section 4.2 provides the results of the survey.

Map 4 PSD Class I Areas



Map 5 Cultural Resource Inventory Needs Assessment



The purpose of the inventory was to identify cultural resources, evaluate the eligibility of the sites for inclusion in the National Register of Historic Places (NRHP) and to recommend specific avoidance strategies for NRHP eligible cultural resources. Areas of avoidance included eligible historic properties that were outlined during the Class I literature review and in the course of the pedestrian survey.

CRA inventoried proposed source lines on BLM-administered (162 miles) and private (71 miles) lands, where survey permission was granted, and receiver lines on BLM-administered (61 miles) and private (26 miles) lands, where survey permission was granted. CRA also inventoried all of the access roads (72 miles), 86 miles of access along fence lines, and drive-arounds (areas needed for access which deviate from the source lines). The 478 miles inventoried, using a 100-foot wide corridor, totaled approximately 5,348 acres. Existing linear sites within the APE, such as the California National Historic Trail (12 miles), the Central Pacific Railroad (5.5 miles), the Southern Pacific Railroad (3.5 miles) and roads depicted on the 1880 Government Land Office plats (4.3 miles) were also surveyed.

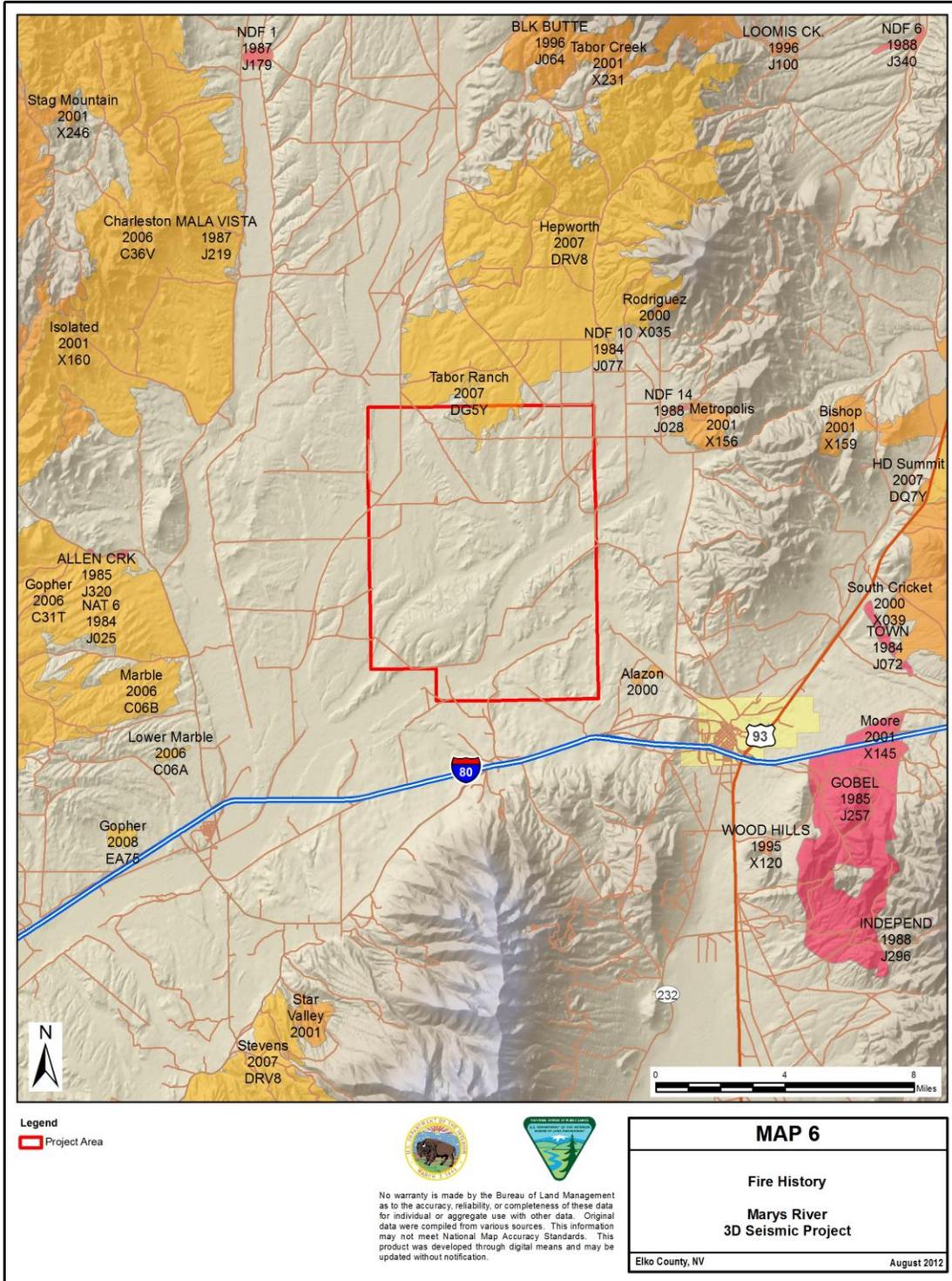
3.3 FIRE MANAGEMENT

Fire is an issue in the Elko BLM District as it is throughout this portion of Nevada. Fires in the sagebrush ecosystem have created opportunities for invasive species to dominate the systems and change the vegetation type to cheatgrass or other invasive species which can burn rapidly and spread at a high rate of speed. This creates landscapes with monotonous of invasive species, in which native species have difficulty reestablishing.

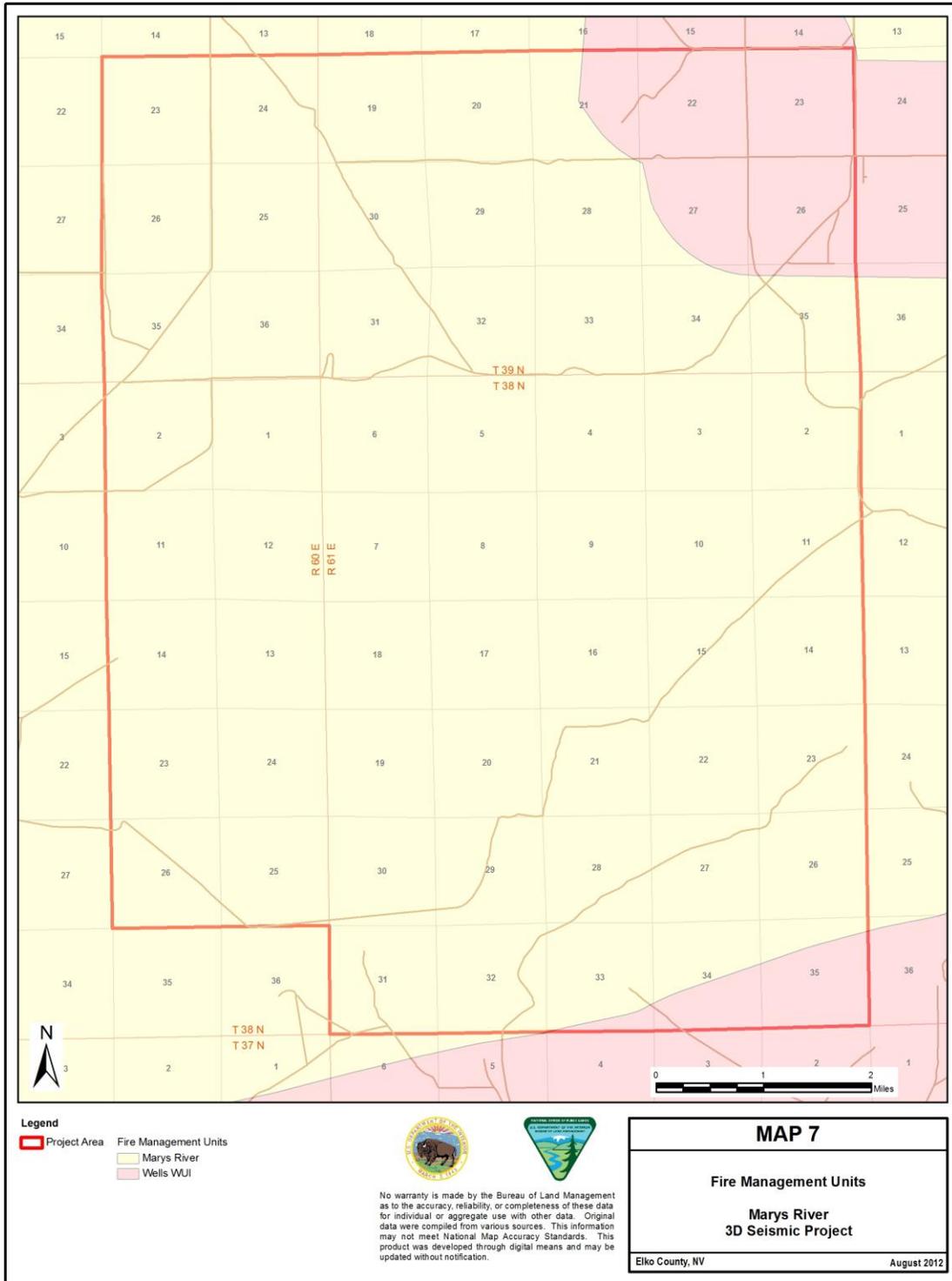
Approximately 75 percent of Elko County is considered to be at high threat levels for the occurrence of large wildland fires (Wildland Fire Associates, 2008). This assessment is based on the vegetation types present, climate, and topography, as well as proximity to agricultural communities, wildlife habitat present, and the number of large-scale historic fires within Elko County. From 1980 through 2010, approximately 304 fires have occurred within 50 miles of the project area, ranging in size from less than one acre to more than 578,000 acres (BLM, 2008b). In 2007, the Hepworth Fire burned approximately 38,038 acres, of which approximately 760 acres of habitat burned within the northern portion of the project area (see Map 6). Although wildland fires may occur year-round in the BLM Elko Field Office Area, the fire season is generally considered from May to September, with the height of the fire season in July and August (BLM, 2003).

The Elko District Office manages 7.5 million acres, and is considered to be one of the highest fire load District offices within the BLM nationwide. In 2003, BLM Elko District Office prepared an amendment to the 1987 Elko RMP and 1985 Wells Resource RMP for fire management, providing an integrated approach for response to wildfires, rehabilitating burned areas, and reducing hazardous fuel loads. The desired result of fire management activities is the establishment or maintenance of healthy ecosystems characterized by good distribution and successional stages of vegetation communities, such as would occur over time under a natural fire regime (BLM, 2003). Two BLM Fire Management Units (FMUs) occur within the project area including 35,821 acres of Marys River FMU and 3,623 acres of Wells Wildland Urban Interface FMU (BLM, 2009; see Map 7). The current fire management strategy in the BLM Elko District is full suppression of almost all fires (BLM, 2003). BLM fire management has been aggressively attacking and suppressing fires to prevent the establishment of invasive species.

Map 6 Fire History



Map 7 Fire Management Units



3.4 HYDROLOGY, FLOODPLAINS, AND RIPARIAN/WETLANDS

The project area is located within the Upper Humboldt River Basin (HUC 16040101) in the Great Basin Region. Drainage primarily flows into two perennial streams: 1) the Humboldt River which flows southwest across the southern portion of the project area; and 2) Bishop Creek which flows south and drains into the Humboldt River in the southwestern corner of the project area. Tabor Creek, a perennial drainage, bisects the northwestern corner of the project area, then parallels the western boundary of the project area near Tabor Flats. It drains into the Humboldt River about seven miles downstream of the project area. Burnt Creek is a tributary to Bishop Creek on the eastern boundary of the Project.

Hydrology within the project area is altered by agricultural diversions in the headwaters of Bishop Creek. The Bishop Creek Dam, located about 15 miles upstream of the project area, stores and diverts spring runoff for agricultural use in the Metropolis area. This diversion alters hydrologic processes associated with flooding which likely affects riparian vegetation and water quality within the project area.

A 100-year floodplain is defined by the Federal Emergency Management Agency (FEMA) as the area adjacent to a watercourse that has a one percent chance of becoming wet in any single year (FEMA, 1992). A 100-year floodplain occurs along the bank of the Humboldt River and Bishop Creek within the project area (see Map 3).

Approximately 11% of the project area is mapped as riparian area. Most of this area is located on private land adjacent to Bishop Creek and a small portion of riparian area within the project area is located on public land adjacent to the Humboldt River or on spring sources on public land. BLM data along with U.S. Geological Survey (USGS) topography maps indicate that there are four springs on public land and three springs on private land within the project area. Riparian area associated with spring sources represents a very small portion of total riparian area within the project boundary. The locations of riparian areas according to the National Wetland Inventory are shown on Map 3. More information regarding riparian vegetation within the project area is presented in Section 3.13/Vegetation.

There is little information available regarding the condition of riparian areas within the project area. BLM conducted lentic riparian assessments at two of the springs on public land and found that there were some issues at one of the springs as a result of grazing related impacts. The assessment at these two springs is not a large enough sample to represent riparian areas across the project area. The State of Nevada has completed some analysis of water quality which applies to the project area. The Clean Water Act (CWA) of 1972 requires that all states conduct a comprehensive analysis of water quality data associated with surface waters every two years to determine whether state surface water quality standards are being met and designated uses are being supported. The Nevada Division of Environmental Protection, Bureau of Water Quality Planning (NDEP-BWQP), with oversight from the U.S. Environmental Protection Agency (EPA), implements the CWA in Nevada. According to the current EPA-approved water quality assessment for Nevada, the beneficial uses for the Humboldt River are aquatic life, industrial supply, irrigation, municipal and domestic supply, propagation of wildlife, contact and non-contact recreation, and watering of livestock (NDEP 2009a). As a tributary to the Humboldt River, the beneficial uses are the same for Bishop Creek.

The CWA requires states to compile a list of waterbodies, known as the 303(d) list, that do not fully support their designated uses. According to the current 303(d) list, the Humboldt River is listed as a Category 5 - non-attaining for aquatic life for the parameters iron and total phosphorus (NDEP, 2009b).

There are several groundwater wells within the project area. A review of the Nevada Division of Water Resources (NDWR) well log GIS data (NDWR, 2012) indicates there are 11 wells, most

of which are used for stockwatering purposes (see Table 2). Map 3 shows the groundwater wells in the project area. Some of the wells shown may not be currently functioning.

Table 2
Wells within ½ Mile of the Project Area

Well Log Number	Location	Owner	Use	Approximate Distance to Project Area
105118	N39N, R61E SESE Section 23,	Gary Botts	Domestic	within Project Area
10329	N39N, R60E Section 25	Bureau of Land Management	Stock	within Project Area
24737	N38N, R61E Section 6, NENE	Bureau of Land Management	Stock	within Project Area
18578	N38N, R60E Section 13, SWSW	Sins Livestock	Stock	within Project Area
2412	N38N, R61E Section 21, NENE	Gulf Refining Co.	Unknown	within Project Area
112206	N38N, R61E Section 31, SWSE	Union Pacific Railroad Co.	Unused	within Project Area
3621	N38N, R60E Section 3, SWSE	Bureau of Land Management	Stock	2,150 feet
105590	N38N, R60E Section 36, SWSE	Fred Howell	Stock	2,030 feet
2395	N37N, R61E Section 6, NENW	Western Pacific Railroad	Unused	700 feet
96232	37N, R61E Section 6, NENW	Western Pacific Railroad	Unused	700 feet
4266	37N, R61E Section 2, NENE	Bureau of Land Management	Stock	825 feet

3.5 INVASIVE, NON-NATIVE SPECIES

The Nevada Department of Agriculture (NDOA, 2012) has responsibility for jurisdiction, management, and enforcement of the state's noxious weed law; species on Nevada's noxious weed list should be controlled on private and public lands. The 47 noxious weed species included on Nevada's list are designated as Category A (30 species), B (9 species), or C (8 species) as defined under the Nevada Revised Statutes (NRS Chapter 555 – Control of Insects, Pests and Noxious Weeds). Appendix A provides a list of these noxious weeds. The Category A list includes species that are not found or are limited in distribution within Nevada that must be eradicated. Successful treatment options generally exist for these species. Category B listed species are those weeds that may be abundant in localized areas but generally are not well established in Nevada. Reasonable treatment options for these species exist and are generally required to be treated where possible, especially in areas where populations are not well established or previously unknown to occur. Category C listed species are generally widespread and established in many counties of the state, and treatment is done at the discretion of the state quarantine officer. Under EO 13112, it is the policy of the land management agencies to prevent introduction of noxious weeds, invasive and non-native species, and to control their impact. The BLM Elko District is actively engaged with the Elko Cooperative Weed Management Area (CWMA) group to help control and minimize weed infestations within Elko County. The BLM Elko District is also responsible for implementing the Integrated Weed Management Plan (see BLM, 1998).

The NDOA (2001) mapped noxious weeds documented in Nevada during 1989 and 2001; Elko County had the highest density of weeds mapped. The BLM Elko District documented a rapid expansion of noxious weeds in Elko County in their Weed Inventory Report from 1998 to 2001;

13 species expanded by an average of 24 percent (BLM, 2001 as cited in Kadrmas, et al., 2002). Elko County (2008) indicated that acreage of infestations was increasing at an alarming rate. As of 2008, at least 28 noxious and invasive weed species have been documented in Elko County, of which 24 occur on the Nevada Noxious Weed List, including 14 that are on the Category A list (Elko County, 2008).

Biological surveys were conducted from March 1 through April 5, 2012 within the project area; one species on Nevada's noxious weed list was observed – Canada thistle, a Category C noxious weed, within riparian and playa vegetation types (Hayden-Wing Associates - HWA, 2012). Infestations of two Category B species (Russian knapweed and Scotch thistle) and two Category C species (whiteweed and perennial pepperweed) are known to occur within the project area (Mulligan, 2012). Crested wheatgrass and cheatgrass, two non-native grasses were also observed in several vegetation types throughout the project area (HWA, 2012). Table 3 identifies the weed species listed by Nevada and those species that are known to occur in Elko County.

**Table 3
Noxious Weeds and Non-Native Plant Species Observed within Elko County/Project Area**

Common Name Scientific Name	Weed Characteristics ¹	Potential in Project Area ²
Nevada Category A Weeds		
Spotted knapweed <i>Centaurea masculosa</i>	Dry, well-drained soils; infests rangelands, waste areas, and roadsides.	Elko County
Yellow starthistle <i>Centaurea solstitialis</i>	Arid and semi-arid rangeland, pastures, cultivated fields, waste areas, and roadsides; prefers shallow, gravelly soils.	Elko County
Squarrose knapweed <i>Centaurea virgata</i>	Infests rangelands, waste areas, and roadsides.	Elko County
Rush skeletonweed <i>Chondrilla juncea</i>	Rangeland, cropland, rights-of-way, and waste areas; prefers thin rocky soils or gravelly to sandy soils.	Elko County
Houndstongue <i>Cynoglossum officinale</i>	Moist areas; often found in pastures, roadsides, fence lines, waste areas, and along waterways.	Elko County
Black henbane <i>Hyoscyamus niger</i>	Open sites with well-drained soils; infests roadsides, waste areas, field borders, pastures, and rights-of-way.	Elko County
Common St. Johnswort/Klamath weed <i>Hypericum perforatum</i>	Coarse-textured, gravelly, well-drained soils in old meadow, pastures, right -of-ways, and waste areas.	Elko County
Dyer's woad <i>Isatis tinctoria</i>	Broad range of sites; often infests waste areas, roadsides, rangeland, pastures, and crop fields.	Elko County
Dalmation toadflax <i>Linaria dalmatica</i>	Dry, well-drained, gravelly soils; often infests rangelands, waste areas, roadsides, right-of-ways, and other disturbed sites.	Elko County
Yellow toadflax <i>Linaria vulgaris</i>	Coarse soils; often infests rangelands, waste areas, and roadsides.	Elko County
Purple loosestrife <i>Lythrum salicaria, L. virgatum and their cultivars</i>	Wet areas; often in marshes, and along edges of pond and waterway, and in riparian areas and floodplains.	Elko County
Sulfur cinquefoil <i>Potentilla recta</i>	Mesic and xeric disturbed sites, including rangelands, waste areas, right-of-way, and roadsides.	Elko County
Mediterranean sage <i>Salvia aethiopsis</i>	Pastures, meadows, rangeland, and other open disturbed areas.	Elko County
Sow thistle <i>Sonchus arvensis</i>	Moist (poorly drained), fine-textured and fertile soils; often infests crop fields, gardens, waste areas, and ditch banks.	Elko County
Nevada Category B Weeds		
Russian knapweed <i>Acroptilon repens</i>	Cropland, rangeland, riparian and waste areas.	Elko County; On-Site

Common Name Scientific Name	Weed Characteristics ¹	Potential in Project Area ²
Musk Thistle <i>Carduus nutans</i>	Cropland and rangeland, rights-of-way, riparian areas, and meadows.	Elko County
Diffuse knapweed <i>Centaurea diffusa</i>	Dry, well-drained soils; often infests rangelands, waste areas, and roadsides.	Elko County
Leafy spurge <i>Euphorbia esula</i>	Wide range of sites; often found in pastures, waste areas, rangelands, field borders and long waterways.	Elko County
Scotch thistle <i>Onopordum acanthium</i>	Waste areas, right-of-ways, pastureland, rangeland, and riparian areas.	Elko County, On-Site
Carolina Horsenettle <i>Solanum carolinense</i>	Sandy, well-drained soils; often infests crop fields and pastures.	Elko County (only)
White horse-nettle <i>Solanum elaeagnifolium</i>	Rangeland, roadsides, waste areas, crop fields, and meadows.	Elko County
Medusahead <i>Taeniatherum caput-medusae</i>	Sparsely vegetated rangeland degraded to low seral stage; clay soils.	Elko County
Nevada Category C Weeds		
Hoary cress (whiteweed) <i>Cardaria draba</i>	Disturbed areas and in croplands, rangelands, and riparian areas. Prefers alkaline soils.	Elko County, On-Site
Water hemlock <i>Cicuta maculata</i>	Moist soils; often in crop fields, roadsides, waste areas, and along waterways.	Elko County
Canada thistle <i>Cirsium arvense</i>	Disturbed sites; deep, loose, cool soils.	Elko County, On-Site
Poison hemlock <i>Conium maculatum</i>	Borders of pastures and cropland; tolerates poorly drained soils and occurs in riparian areas.	Elko County
Perennial pepperweed <i>Lepidium latifolium</i>	Waste areas, riparian areas, roadsides, rangeland, and cropland.	Elko County, On-Site
Salt cedar (tamarisk) <i>Tamarix spp</i>	Along streams, canals, reservoirs, floodplains, and riparian areas.	Elko County
Puncturevine <i>Tribulus terrestris</i>	Disturbed areas, right-of-ways, and disturbed dry rangelands.	Elko County
Other Non-Native, Invasive Plant Species ³		
Jointed goatgrass <i>Aegilops cylindrica</i>	Wheat fields, roadsides, waste areas, alfalfa fields, and pastures.	Elko County
Crested wheatgrass <i>Agropyron cristatum</i>	Shallow to deep, moderately coarse to fine-textured soil; moderately well to well drained soils.	On-Site
Cheatgrass (downy brome) <i>Bromus tectorum</i>	Wide range of habitats and environmental conditions.	On-Site
Spring thistle <i>Cirsium vernale</i>	Found on barren, dry hillsides, often with pinyon-juniper or sagebrush.	Elko County
Bull thistle <i>Cirsium vulgare</i>	Sunny, open areas that tolerate a wide range of conditions; typically found in disturbed areas.	Elko County, near Wells
Curly Dock <i>Rumex crispus</i>	Pastures, hay fields, and crop fields; ideal conditions are wet areas with standing water.	Elko County

¹ Creech et al., 2010; BLM, 1998.

² Creech et al., 2010; Elko County, 2008; HWA, 2012; Mulligan, 2012.

³ Species were either documented during 2012 surveys (HWA, 2012), or have been identified within Elko County (Elko County, 2008).

3.6 LAND TENURE, RIGHTS OF WAY AND OTHER USES

There are several rights-of-way for roads, utilities, communication sites, and the railroad within the project area. These include an irrigation and water treatment plant, the historic railroad grade, the Metropolis Road, several two track and lightly improved secondary roads, the Southern Pacific Railroad, utility lines to the north and south, several buildings along the Metropolis road, and communication sites.

Specific rights-of-way within the project area include:

- NVN52546 Elko County - road
- NVN007217 Wells Rural Electric – ROW power transmission line

NVN89748 Tetuan Resources Corporation – road
 NVN042787 Sprint Communications CO LP – buried fiber optic cable
 NVN55614 BLM – road
 CC 06309 Southern Pacific Railroad
 CC04693 Southern Pacific Railroad
 Irrigation canal rights-of-way

Table 4 lists the oil and gas leases within the project area.

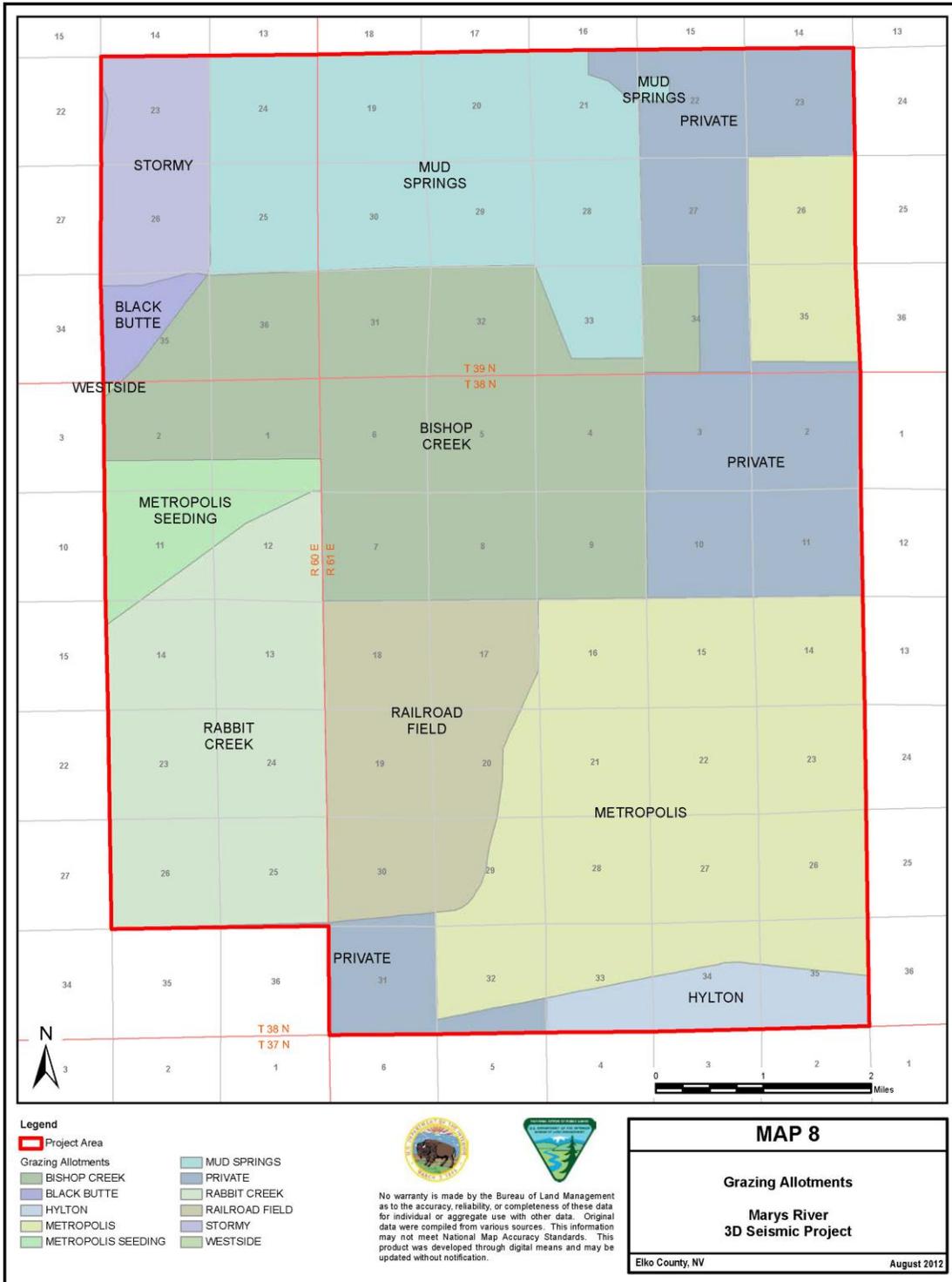
Table 4
Oil and Gas Leases within the Project Area

Lease Number	Location	Name
NVN88622	T39N R60E, Sec. 24, 26	Lonewolf Exploration & Production Co
NVN89839 (pending)	T39N R61E, Sec. 28, 30	Lonewolf Exploration & Production Co
NVN89918 (pending)	T39N R61E, Sec. 28, 30	Kirkwood Oil and Gas LLC
NVN88625	T39N R61E, Sec. 32, 34	Lonewolf Exploration & Production Co
NVN86838	T39N R61E, Sec. 20, 34, 35	Lonewolf Exploration & Production Co
NVN88619	T38N R60E, Sec. 2	Lonewolf Exploration & Production Co
NVN88620	T38N R60E, Sec 12	Lonewolf Exploration & Production Co
NVN86575	T38N R61E, Sec. 14	Lonewolf Exploration & Production Co
NVN86991	T38N R60E, Sec. 24	Liberty Petroleum Corp.
NVN89914 (pending)	T38N R60E, Sec. 26	Kirkwood Oil and Gas LLC
NVN81212	T38N R61E, Sec. 4	Lonewolf Exploration & Production Co
NVN89913 (pending)	T38N R61E, Sec. 2	Kirkwood Oil and Gas LLC
NVN86576	T38N R61E, Sec. 6, 7, 8	Lonewolf Exploration & Production Co
NVN88623	T38N R61E, Sec. 16, 18	Lonewolf Exploration & Production Co
NVN81213	T38N R61E, Sec. 16, 20	Lonewolf Exploration & Production Co
NVN74543	T38N R61E, Sec. 14, 26, 34	Tetuan Resources Corp.
NVN79487	T38N R61E, Sec. 22, 28, 32	Tetuan Resources Corp.

3.7 LIVESTOCK GRAZING/RANGELAND HEALTH

There are 10 BLM grazing allotments coinciding with the project area (see Map 8). These include the Stormy, Mud Springs, Metropolis, Hylton, Railroad Field, Rabbit Creek, Metropolis Seeding, Bishop Creek, Westside, and Black Butte allotments, totaling 130,594 acres on BLM-administered lands. A total of 24,042 active animal unit months (AUMs) are currently permitted for the allotments. Some of these AUMs include private lands. Table 5 summarizes the period of use, AUMs, and size of each of the allotments. Currently, the allotments are permitted to graze and/or trail cattle. The Stormy allotment is permitted for both cattle and horses. Only a 7.7-acre patch of the Westside allotment is within the project area.

Map 8 Grazing Allotments



**Table 5
Grazing Allotments Coinciding with the Project Area**

Allotment	Total Allotment Public Acreage	Active AUMs	Period of Use ¹	Allotment Public Acreage in Project Area
Bishop Creek (3206)	6,840	1,136	4/1-4/30	6,697.6
Black Butte (3208)	28,172	6,489	4/1 – 11/30	345.0
Hylton (4319)	2,411	839	4/10 - 7/21	371.1
Metropolis (3228)	23,947	2,510	11/15 - 3/15	4,133.9
Metropolis Seeding (2459)	2,455	1,126	4/16 - 8/1	1,074.1
Mud Springs (3242)	1,852	196	4/1 - 6/15	1,852
Rabbit Creek (3233)	5,464	1,072	12/7 - 5/12	4,471.5
Railroad Field (3243)	1,550	113	5/1 – 9/2	1,550
Stormy (3237)	50,671	8,836	2/28 - 11/30	295.4
Westside (3241)	7,232	1,725	3/15 – 7/15	7.7
Totals	130,594	24,042	--	20,854.4

¹ Several of these allotments contain pastures through which livestock are rotated within this season of use.

3.8 MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties for the protection of migratory birds. EO 13186, issued in 2001, directed actions that would further implement the MBTA. As required by MBTA and EO 13186, BLM signed a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS) in April 2010, which is intended to strengthen migratory bird conservation efforts by identifying and implementing strategies to promote conservation and reduce or eliminate adverse impacts on migratory birds. The focus of BLM's conservation efforts is on migratory species and some non-migratory game bird species that are listed as Birds of Conservation Concern (BCC). BCC have been identified by the USFWS (2008) for different Bird Conservation Regions (BCR) in the United States. The entire project area is in BCR 9, the Great Basin region. Species' common and scientific names used in the text and tables are provided in Appendix B.

Thirty-one bird species were observed during on-site surveys in 2012 (HWA, 2012), of which five were BCC (see Table 6 and Appendix C). Two other BCC, the loggerhead shrike and ferruginous hawk, are likely to occur in the project area based on species' known distributions and habitat associations in the Great Basin (Ryser, 1985) and western Colorado (Righter et al., 2004). Long-term data (1966 to 2010) indicate populations are neither increasing nor decreasing within BCR 9 for the seven BCC species (Sauer et al., 2011) included in Table 6. Data compiled for 12 National Biological Survey Breeding Bird Survey (BBS) routes (Sauer et al., 2011) within a 100-mile area surrounding the project area reveal that local populations of sage thrashers, Brewer's sparrows, and sage sparrows have been decreasing during the past 20 years, 1992 to 2011 (see Table 6 and Appendix C). Those three BCC species have been observed within the project area (HWA, 2012).

Table 6
Birds of Conservation Concern within Bird Conservation Region 9 (Great Basin)
that Occur or are Likely to Occur in the Project Area

Common Name Scientific Name	Habitat ¹	Observed On-site ²	BCR Trend ³ 1966 to 2010	Local Trend ⁴ 1992 to 2011
Ferruginous hawk <i>Buteo regalis</i>	Nests in isolated trees, rock outcrops, artificial structures, and ground near prey base.	No	No Trend	Insufficient Data
Golden eagle <i>Aquila chrysaetos</i>	Nest on open cliffs and in canyons or in tall trees (cottonwoods) in open country and riparian zones.	Yes	No Trend	Insufficient Data
Long-billed curlew <i>Numenius americanus</i>	Nests in grassy areas close to marshes but also dry upland areas, alkali flats.	Yes	No Trend	No Trend
Loggerhead shrike <i>Lanius ludovicianus</i>	Present in desert shrublands, juniper woodlands; hunts over bare ground or short vegetation.	No	No Trend	Insufficient Data
Sage thrasher <i>Oreoscoptes montanus</i>	Valleys, foothills, mesas in big sagebrush shrublands; nests in shrub or ground beneath shrub.	Yes	No Trend	Declining
Brewer's sparrow <i>Spizella breweri</i>	Closely associated with big sagebrush shrublands; nests in sagebrush, forages on ground.	Yes	No Trend	Declining
Sage sparrow <i>Amphispiza belli</i>	Close associate of big sagebrush shrublands; nests in shrub close to ground, forages on ground.	Yes	No Trend	Declining

¹ Based on Righter et al., 2004; Ryser, 1985.

² HWA, 2012.

³ Sauer et al., 2011.

⁴ Linear trends of birds counted per route, averaged for data available on 12 BBS routes within 100 miles surrounding the project area in Nevada, Idaho, and Utah between 1992 and 2011.

A total of 177 bird species, listed as Nearctic and Neotropical migratory birds by the USFWS, Division of Bird Habitat Conservation, and protected under the MBTA (USFWS, 2010a), have been observed on 12 BBS routes within 100 miles from the project area in Nevada, Idaho, and Utah (see Appendix C). Some species have been observed on a few occasions and other species are common. Trends for eight species during the past 20 years indicate their populations are decreasing, while populations for 15 species appear to be increasing. Western meadowlark, sage sparrow, Brewer's sparrow, and sage thrasher are species that were observed on-site and have declining populations in the project area and vicinity. Alternatively, Canada goose, turkey vulture, red-tail hawk, black billed magpie, American robin, and red-winged blackbird are species with increasing populations in the surrounding area that were observed on-site (HWA, 2012).

Nesting chronologies for the migratory bird species observed on-site, including the BCC, were compiled from data available for Colorado (Kingery, 1998) and Oregon (Adamus et al., 2001). The nesting cycle, through fledging young, is expected to be completed for all species of migratory birds by September 21. In Utah, USFWS (Romin and Muck, 2002) defined seasonal buffers for raptors that may nest in the project area and which are also BCC, including ferruginous hawks (March 1 to August 1) and golden eagles (January 1 to August 31) with nest site spatial buffers of 0.5 mile for golden eagles and 1.0 mile for ferruginous hawks (Whittington and Allen, 2008). Temporal and spatial buffers apply to these and other raptors nesting in Nevada. Red-tailed hawks (March 15 to August 15; 0.33 mile) and burrowing owls (March 1 to August 31; 0.25 mile) have been documented nesting in the project area (HWA, 2012) while Swainson's hawk (March 1 to August 31; 0.25 mile), prairie falcon (April 1 to August 31; 0.5 mile), and short-eared owl (March 1 to August 1; 0.25 mile) potentially occur (see Table 7 in Section 3.12, Special Status Species).

3.9 NATIVE AMERICAN RELIGIOUS CONCERNS

Various tribes and bands of the Western Shoshone have stated that federal projects and land actions can have widespread effects to their culture and religion as they consider the landscape as sacred and as a provider. The Project is located within the traditional territory of the Western Shoshone.

Tribal participants of the Wells Band of Western Shoshone are aware of the Project through BLM's notification process and have been provided the opportunity for additional Government to Government consultation. Letters, dated March 16, 2012, requesting comment on the Project were sent to the following tribes or tribally affiliated organizations (listed alphabetically below). Letters were also sent September 12, 2012, requesting review of the EA.

Battle Mountain Band Council	South Fork Band Council
Bureau of Indian Affairs	Te-Moak Tribe of Western Shoshone
Confederate Tribes of the	Wells Band Council
Goshute Indian Reservation	
Duckwater Shoshone Tribe	Western Shoshone Committee
Elko Band Council	Western Shoshone Defense Project
Ely Shoshone Tribe	Western Shoshone Descendants of Big Smoky
Shoshone Paiute Tribes of the	Yomba Shoshone Tribe
Duck Valley Indian Reservation	

3.10 RECREATION

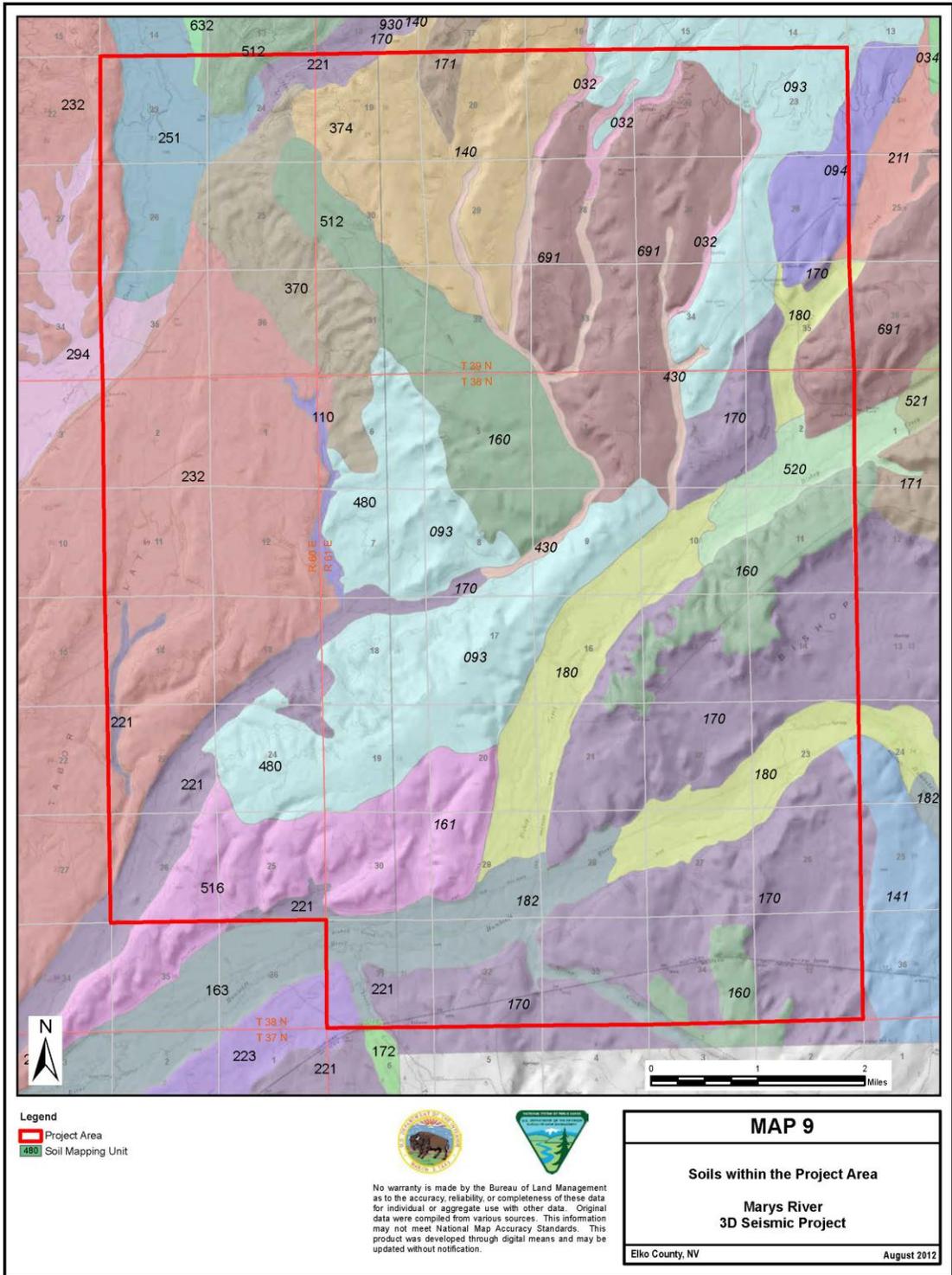
Recreation in the project area is relatively rare and is likely limited to big game hunting and associated off-highway vehicle (OHV) use. NDOW Wildlife Management Unit 075 encompasses the project area. Antelope and mule deer are commonly hunted in the management unit in the vicinity of the project area. It is uncertain how much hunting is done on BLM-administered and private lands within the project area. Approximately 220 mule deer were harvested in Unit 075 in 2011, along with 27 antelope. Hunting seasons in 2012 for antelope run from August 1 through September 5. Mule deer season in Unit 075 is from August 10 to November 5, with a break from September 30 to October 4. These date ranges for the two species include different allotted days for bow and rifle hunting. Late season bow hunting for mule deer is November 10 to 30.

The BLM Tabor Creek Recreation Area and campground is approximately 15 miles north of the project area on the west side of the Snake Mountain Range. Tabor Creek offers trout fishing, and the Snake Range is popular for mountain biking, hiking, hunting, and wildlife viewing. The area can be accessed using Upper Metropolis Road, which passes through the project area, as well as Oneil-Deeth County Road.

3.11 SOILS

Soils in the project area vary in depth, texture, erosion potential, and other characteristics based upon several soil forming factors. To identify and describe the soil types and characteristics within the project area, the Soil Surveys of Elko County, Nevada, Central Part and Northeast Part (Natural Resources Conservation Service - NRCS, 1997 and NRCS 1998) as well as the NRCS (2012) Soil Survey Geographic Database (SSURGO - Tabular and Spatial Data) were used. To provide the greatest detail in quantifying the soil properties and potential impacts, the soil analysis was based on the characteristics of the individual soil mapping units potentially affected by the Project.

Map 9 Soils within the Project Area



There are 29 soil mapping units in the 39,444.5-acre project area (see Map 9). Each of these mapping units is generally comprised of two or more soil series which are the major soils that make up the mapping unit. The majority of the soil mapping units in the project area are mapped as soil "associations." An "association" is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. During mapping it was not considered practical or necessary to map the soils separately and the pattern and relative proportion of the soils are somewhat similar. The dominant soil series that make up the mapping unit, generally have similar characteristics and properties. Other minor soil components or inclusions that may have similar or contrasting characteristics also typically occur within the mapping units. Because of the map scale used during the soil surveys, these minor soil components are not mapped out separately. The objective of soil mapping is to separate the landscape into landforms or landform segments that have similar use and management requirements.

In the project area the various soil mapping units can generally be grouped into two soil groups based on their landscape position. These two soil groups formed from alluvium (from mixed rocks) and developed on either floodplains, or alluvial fan remnants, skirts, insets or fan pediments.

Soils on Fan Remnants, Skirts, Insets and Fan Pediments

The alluvial soils that developed on fan remnants, skirts, insets and fan pediments make up approximately 83.3 percent of the project area (32,852.63 acres). These soils typically have slopes of 2 to 15 percent, are well-drained, deep (> 60 inches) to moderately deep (10 to 40 inches) over a restrictive layer (duripan). The available water capacity is high to low depending on the depth to duripan. These soils generally do not have a seasonal water table or are flooded. Two mapping units in this group are considered prime farmland soils, if irrigated and reclaimed of excess sodium; however, none of the areas of these soils within the project area is irrigated or farmed, and all areas of these soil mapping units are under rangeland production. Generally, the water erosion hazard of these soils is slight to moderate and the wind erosion hazard is slight. The water erosion hazard of the soils in this group typically increases with slope.

Soils on Floodplains

The alluvial soils on floodplains comprise approximately 6,591.9 acres, or 16.7 percent, of the project area. These soils typically have slopes between 0 and 2 percent, are deep (greater than 60 inches), poorly drained and have a high available water content. A majority of these soils have a seasonal high water table and may be flooded in the early to late spring. Several of these soils are designated as hydric or have hydric soil inclusions within the mapping unit and some are saline and or sodic at the surface. The wind and water erosion hazard of the soils in this group is slight. The Ecological Site of these soils includes: Saline Bottom, Saline Meadow, Wet Meadow, Moist Floodplain, Sodic Flat, Dry Floodplain, Loamy Bottom.

The characteristic vegetation of the soil mapping units that formed on the floodplains is more varied than the soils on fans and fan pediments and differs by the Ecological Site. The typical vegetation on Saline and Sodic Ecological Sites is generally characterized by Basin wildrye, Black greasewood, and other saline tolerant species, such as Alkali sacaton, Alkali muhly, Alkali bluegrass Bottlebrush squirreltail and inland saltgrass. On other floodplain Ecological Sites, Basin wildrye is a dominant species, along with Breadless wildrye, Basin big sagebrush, Nevada bluegrasses, western wheatgrass and Thickspike wheatgrass.

BLM has observed that overall soil quality within the project area is typical of soil quality that exists in this setting under current uses. BLM observers state that soil quality is good and there are no major issues (Dean, 2012). There are some areas of localized elevated impacts to soil quality from livestock or vehicle use, but these impacts are not widespread and do not affect soil productivity at a large scale.

Biological soil crusts are likely to be present within the project area however their extent and level of influence is likely small due to historic disturbance from vegetative seedings in much of

the project area. In addition, vegetative cover is high in most of the project area which precludes establishment of a biological soil crust. Where crusts are present they increase soil cohesiveness and reduce the hazard of erosion by wind and water (Belnap, J, 2001).

3.12 SPECIAL STATUS SPECIES

Special Status Animal Species

ESA-Listed Species. USFWS (2012) identified five species listed as threatened or endangered under the Endangered Species Act (ESA) as occurring within Elko County. They include the endangered gray wolf in the Northern Rocky Mountain (NRM) Distinct Population Segment (DPS), endangered Clover Valley speckled dace, endangered Independence Valley speckled dace, threatened bull trout in the Jarbidge River DPS, and threatened Lahontan cutthroat trout. In addition, there are three candidate species for listing as threatened or endangered: the yellow-billed cuckoo in the western United States DPS, the Columbia spotted frog, and the greater sage-grouse. Species' common and scientific names used in the text and tables are provided in Appendix B. Table 7 lists BLM sensitive species, which may occur within the project area.

According to USFWS (2011a), the gray wolf NRM DPS does not include Nevada, although the state is included in the species' historic range. Wolves may occur, but there are no known populations or packs in the state. The gray wolf is not included in Table 7.

Speckled dace subspecies inhabiting the Clover Valley and Independence Valley were simultaneously listed as endangered in 1989 (USFWS, 1989). Currently, the Independence Valley speckled dace is limited to two reservoirs that impound flows from Independence Valley Warm Springs (USFWS, 1998). The sites are within Elko County but are approximately 20 miles south of the project area with no surface hydrologic connection to the Humboldt River. The Clover Valley speckled dace is limited to three springs and outflows in the Clover Valley, also in Elko County (USFWS, 1998). The closest inhabited impoundment (Wright Ranch Spring) to the project area is 9.5 miles south, but there is no hydrologic surface connection to the Humboldt River. Neither species is expected in the project area (see Table 7).

Bull trout occur within Elko County within the Jarbidge River, a tributary to the Snake River in Idaho. There is no hydrologic surface connection to the Humboldt River and the species is not expected in the project area (see Table 7).

The Lahontan cutthroat trout was first listed as endangered in 1970 but reclassified as threatened in 1975 (USFWS, 1975). The species inhabits the Marys River Subbasin, which is included in the species' recovery plan (Elliot and Layton, 2004). In 2004, there were 14 streams in which Lahontan cutthroat trout had been established for 5 years or more (see Appendix D, Elliot and Layton, 2004). As of 1997, Hanks Creek was inhabited and is the farthest downstream tributary in the Marys River Subbasin Priority Metapopulation Recovery Area, primarily on BLM-administered land (see Map 2, Elliot and Layton, 2004). The confluence of Hanks Creek and Marys River is approximately 30 straight-line miles to the confluence of Marys River and the Humboldt River near Deeth. Optimal habitat includes clear, cold water with an average summer temperature of 72°F and a relatively stable summer temperature regime averaging 55°F (Elliot and Layton, 2004). Although data are limited, water temperatures measured in the Marys River (Station HS1, 14 straight-line miles upstream from the confluence with the Humboldt River) since 1999 (NDEP, 2011) indicates average temperatures in July were 71°F (68°F in 2008; 74.5°F in 2003), while average temperatures exceeded 55°F from May through September. It seems likely that Lahontan cutthroat trout would not move downstream during the period of warmer water temperatures and they are not expected to occur in Tabor Creek, Bishop Creek, or the Humboldt River within the project area. For these reasons, the Potential Occurrence of Lahontan cutthroat trout within the project area was judged as "unlikely" (see Table 7).

Table 7
BLM Sensitive Animal Species in the BLM Elko District and Elko County, with Potential for Occurrence within the Project Area

Species Common Name Scientific Name	Habitat ¹	Location ¹	Federal Status ²	State Status ²	Potential ³ Project Area Occurrence
Mammals					
Preble's shrew <i>Sorex preblei</i>	In semiarid shrub-grass associations, marshy areas, creeks and bogs bordered by willows and other shrubs; also montane-sagebrush and wet areas in open conifer stands.	Present in Elko County; present in Marys River Watershed	BLM-S		Possible
Pallid bat <i>Antrozous pallidus</i>	In low desert with blackbrush/creosote, shrub-brush sagebrush and salt desert shrub, coniferous forest (pinyon-juniper), and non-coniferous woodlands	Present in Elko County; no records in project area vicinity	BLM-S	Protected	Unlikely
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Roosts in caves, mines, trees, buildings, from deserts to high-elevation mixed coniferous forest. Mostly in sagebrush, salt desert shrub, pinyon-juniper, agriculture in Nevada.	Present in Elko County; no records in project area vicinity	BLM-S	Protected	Possible
Big brown bat <i>Eptesicus fuscus</i>	In pinyon-juniper, blackbrush, creosote, sagebrush agriculture and urban habitats. Adapted to human habitation	Present in Elko County, no records in project area vicinity	BLM-S		Possible
Spotted bat <i>Euderma maculatum</i>	From desert scrub to high elevation conifer forests found in pinyon-juniper, sagebrush, riparian; mostly associated with rocky cliffs. Roosts in crevices in cliff faces.	No records in Elko County	BLM-S	Protected	Unlikely
California myotis <i>Myotis californicus</i>	From Lower Sonoran desert scrub to forests. Roosts in crevices, under bark, hollow trees, mines and caves.	No records in Elko County	BLM-S		Possible
Small-footed myotis <i>Myotis ciliolabrum</i>	From desert scrub, grasslands, sagebrush steppe, to pinyon-juniper woodlands, agriculture, pine-fir forests. Roosts in caves, mines, trees.	Present in Elko County; no records in project area vicinity	BLM-S		Possible
Long-eared myotis <i>Myotis evotis</i>	Mostly in forested areas with ponderosa pine, in pinyon-juniper in northern Nevada, also in sagebrush and desert scrub. Roosts in hollow trees, under tree bark, some in rock crevices.	Present in Elko County; no records in project area vicinity	BLM-S		Unlikely
Fringed myotis <i>Myotis thysanodes</i>	Roosts in mines, caves, trees, buildings from low desert scrub to high elevation conifer forests.	No records in Elko County	BLM-S	Protected	Possible
Long-legged myotis <i>Myotis volans</i>	In pinyon-juniper woodland, montane coniferous forest; roosts in hollow trees.	Present in Elko County; no records in project area vicinity	BLM-S		Unlikely
Yuma myotis <i>Myotis yumanensis</i>	Various habitats for low to mid-elevations, sagebrush, salt desert, agriculture, riparian vegetation. Roosts in buildings, trees, mines, caves, bridges, rock crevices.	One record in Elko County, none in project area vicinity.	BLM-S		Possible
Western pipistrelle <i>Pipistrellus hesperus</i>	Lower and Upper Sonoran desert habitats with blackbrush, creosote, salt desert shrub, and sagebrush; occasionally in ponderosa pine and pinyon-juniper	Two records in Elko County, none in project area vicinity.	BLM-S		Unlikely
Brazilian free-tailed bat <i>Tadarida brasiliensis</i>	Mostly in lower elevation habitats in Sierra Nevada. Roosts on cliff faces, mines, caves, buildings, bridges, and hollow trees	No records in Elko County	BLM-S	Protected	Possible

Species Common Name Scientific Name	Habitat ¹	Location ¹	Federal Status ²	State Status ²	Potential ³ Project Area Occurrence
Pygmy rabbit <i>Brachylagus idahoensis</i>	Associated with dense stands of old-growth sagebrush, on plains and alluvial soils at elevations from 4,500 to 7,000 feet. Use sagebrush for food and shelter.	Present in project area	BLM-S	Protected	Present
Fletcher dark kangaroo mouse <i>Microdipodops megacephalus nasutus</i>	Upper Sonoran sagebrush desert associated with sagebrush, shadscale, and rabbitbrush in fine gravelly soils from 3,900 to 8,000 feet	Potentially in Marys River Watershed; documented on-site *	BLM-S	Protected	Possible *
Sierra Nevada red fox <i>Vulpes vulpes necator</i>	Habitats typical of high Sierra (California) whitebark pine and mountain hemlock descending to lower mixed conifers in winter.	Uncertain distribution in Nevada	BLM-S	Protected	None
North American wolverine <i>Gulo gulo luscus</i>	Coniferous forest habitats during winter and high elevation talus slopes during summer, feeding on winter carrion and locally abundant rodents.	Limited to Sierra Nevada and Rocky Mountains	ESA-C		None
Birds					
Columbia sharp-tailed grouse <i>Tympanuchus phasianellus columbianus</i>	Shrub and bunchgrass rangelands with at least 20 percent of the vegetation with tall deciduous shrubs (serviceberry, chokecherry, hawthorn, aspen).	Occurs in Northeast Nevada; not in Marys River Watershed	BLM-S	Protected	Unlikely
Greater sage-grouse <i>Centrocercus urophasianus</i>	Large contiguous area of sagebrush with tall grass understory for nesting cover. Avoids steep slopes and sagebrush invaded by pinyon-juniper.	Present in project area	ESA-C BLM-S	Protected	Present
Least bittern <i>Ixobrychus exilis heperis</i>	Nests and forages in tall emergent vegetation, usually cattail or bulrush.	Not in Northeast Nevada; not in Marys River Watershed	BLM-S	Protected	None
White-faced ibis <i>Plegadis chihi</i>	Reservoir shorelines, wet meadows, irrigated fields. Nests in bulrushes in relatively deep water, away from predators.	Occurs in Northeast Nevada; in Marys River Watershed		Protected	Unlikely
Bald eagle <i>Haliaeetus leucocephalus</i>	Nests and roosts in large cottonwood trees and ponderosa pine along rivers, reservoirs, lakes. Often near prey sources (prairie dog colonies).	Occurs in Northeast Nevada; in Marys River Watershed		Protected	Unlikely
Northern goshawk <i>Accipiter gentilis</i>	Nests in forest stands with large mature trees and open canopy, open areas for foraging, usually spruce/fir stands.	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	None
Swainson's hawk <i>Buteo swainsoni</i>	Summer resident in northern and central Nevada. Nests in shrubs, cottonwoods within arid grasslands, deserts, and agricultural area with scattered trees and shrubs.	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	Possible *
Ferruginous hawk <i>Buteo regalis</i>	Nest in tops of isolated trees, tops of rock pillars, rock outcrops, hilltops, on man-made structures (utility poles, windmills) in open desert and sagebrush steppe.	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	Unlikely
Prairie falcon <i>Falco mexicanus</i>	Nests in cliffs or bluffs in open habitats such as cheatgrass and mixed shrubs with a prey base including horned larks.	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	Possible *

Species Common Name Scientific Name	Habitat ¹	Location ¹	Federal Status ²	State Status ²	Potential ³ Project Area Occurrence
Mountain plover <i>Charadrius montanus</i>	Flat areas of desert grasslands where vegetation is very short, usually in association with prairie dogs.	Not in Northeast Nevada; not in Marys River Watershed	BLM-S		None
Black tern <i>Chlidonias niger</i>	Nests near and forages for insects over open water of ponds, lakes, sewage lagoons.	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	Possible
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	Nests in old growth cottonwoods in riparian woodlands with dense understories. May require extensive stands of riparian forest.	Not in Northeast Nevada; not in Marys River Watershed	ESA-C BLM-P	Protected	None
Burrowing owl <i>Athene cunicularia hypugea</i>	Nests in burrows, primarily associated with prairie dog towns, in open desert grasslands, heavily grazed pastures. May use burrows of other mammals (ground squirrels, badgers).	Present in project area	BLM-S	Protected	Present
Short-eared owl <i>Asio flammeus</i>	Widely distributed breeder and year-round resident in northern Nevada; forages and nests in open areas, usually with a grass component including grasslands, shrub-steppe, wet meadows	Occurs in Northeast Nevada; in Marys River Watershed	BLM-S	Protected	Possible *
Amphibians					
Columbia spotted frog <i>Rana luteiventris</i>	Slow moving or ponded clear surface water with little or no canopy cover. Deep silt or muck substrate may be needed for hibernation and torpor.	Occurs in Northeast Nevada; in Marys River Watershed	ESA-C BLM-S	Protected	Possible
Fish					
Lahontan cutthroat trout <i>Oncorhynchus clarki henshawi</i>	Variety of cold waters ranging from large alkaline lakes to small mountain lakes and from major rivers to small tributaries. In streams they inhabit riffles, deep pools, under shelter objects.	Occurs in Northeast Nevada; in Marys River Watershed	ESA-LT BLM-S	Protected	Unlikely
Interior Columbia Basin redband trout <i>Oncorhynchus mykiss gairdneri</i>	In Owyhee and Malheur river drainages.	In Snake River Drainage	BLM-S	Protected	None
Bull trout <i>Salvelinus confluentus</i>	In streams with cold water temperatures (<59°F) with complex cover including large woody debris, undercut banks, boulders, pools, side channels, stream margins and pools with cover.	In Jarbidge River, tributary to Sake River, in Elko County	ESA-LT BLM-S	Protected	None
Independence Valley speckled dace <i>Rhinichthys osculus lethoporus</i>	In cold streams and rivers with rocky substrates, small thermal springs with silt substrates. Now confined to a series of springs and associated deep pools and shallow marshlands.	Restricted to the Independence Valley Elko County	ESA-LE BLM-S	Protected	None
Clover Valley speckled dace <i>Rhinichthys osculus oligoporus</i>	In cold streams and rivers with rocky substrates, small thermal springs with silt substrates. Now confined to three springs and outflows in the Clover Valley.	Restricted to the Clover Valley Elko County	ESA-LE BLM-S	Protected	None
Relict dace <i>Relictus solitarius</i>	In a few small thermal springs, creeks, and marsh areas with heavy growths of filamentous algae, rushes, mosses. Dense aquatic vegetation an important component.	Steptoe, Goshute, and Ruby valleys of Elko County	BLM-S	Protected	None
Independence Valley tui chub <i>Siphaeles (Gila) bicolor isolata</i>	Warm Springs of Independence Valley in Elko County.	Restricted to the Independence Valley of Elko County	BLM-S	Protected	None
Insects					

Species Common Name Scientific Name	Habitat ¹	Location ¹	Federal Status ²	State Status ²	Potential ³ Project Area Occurrence
Mattoni's blue <i>Euphilotes pallescens mattonii</i>	Unknown.	Present in Elko County	BLM-S		Unknown
Greys silverspot <i>Speyeria hesperis greyi</i>	Unknown.	Present in Nevada	BLM-S		Unknown
Nevada viceroy <i>Limenitus archippus lahontani</i>	Known from along the Humboldt River and lower tributaries with additional colonies near Fallon and Fernely. Local colonies in riparian areas where the host plant (willows) grow.	Apparently restricted to Nevada	BLM-S		Unknown
Mollusks					
California floater <i>Anodonta californiensis</i>	Freshwater mussel. In Utah, found in bottoms of small ponds and in a small creek with mud pools and abundant aquatic vegetation multicellular and single cell algae.	Present in Humboldt River Drainage, Elko County	BLM-S		Unlikely
Schell Creek mountainsnail <i>Oreohelix nevadensis</i>	Terrestrial snail found in Spring-Steptoe Valleys.	Limited to White Pine County	BLM-S		None
Transverse gland pyrg <i>Pyrgulopsis cruciglans</i>	Freshwater snail; found in Steptoe Basin and Bonneville Basin.	Present in Elko County	BLM-S		Unlikely
Humboldt pyrg <i>Pyrgulopsis humboldtensis</i>	Freshwater snail, restricted to the Lahontan Basin.	Present in Elko County	BLM-S		Unlikely
Vinyards pyrg <i>Pyrgulopsis vinyardi</i>	Freshwater snail, restricted to the Lahontan Basin.	Present in Elko County	BLM-S		Unlikely

¹ Habitat and Location sources for taxonomic groups:

Mammals: Zeveloff, 1988; NatureServe, 2012; Bradley, et al., 2006; Aubry, 1997; Copeland and Kucera, 1997; Ports and George, 1990.

Birds: Ryser, 1985; Righter et al., 2004; USGS, 2012.

Amphibians: Columbia Spotted Frog Technical Team, 2003.

Fish: Sigler and Sigler, 1987; Behnke, 1992; USFWS, 2004; USFWS, 1998; NatureServe, 2012

Insects: NatureServe, 2012

Mollusks: NatureServe, 2012; Hershler and Sada, 2002.

² ESA-C = Candidate species; ESA-LT = Threatened species; ESA-LE = Endangered species; BLM-S = BLM sensitive species; BLM-P = BLM proposed species; Protected = species listed in N.R.S. 501.

³ Potential project area Occurrence: Present = species observed on-site; Possible = species' habitat associations present on-site, distribution in project area vicinity; Unlikely = 1) potential habitat present but unlikely due to distribution; None = habitat not present in the project area; no distribution in vicinity, * = Burton, 2012.

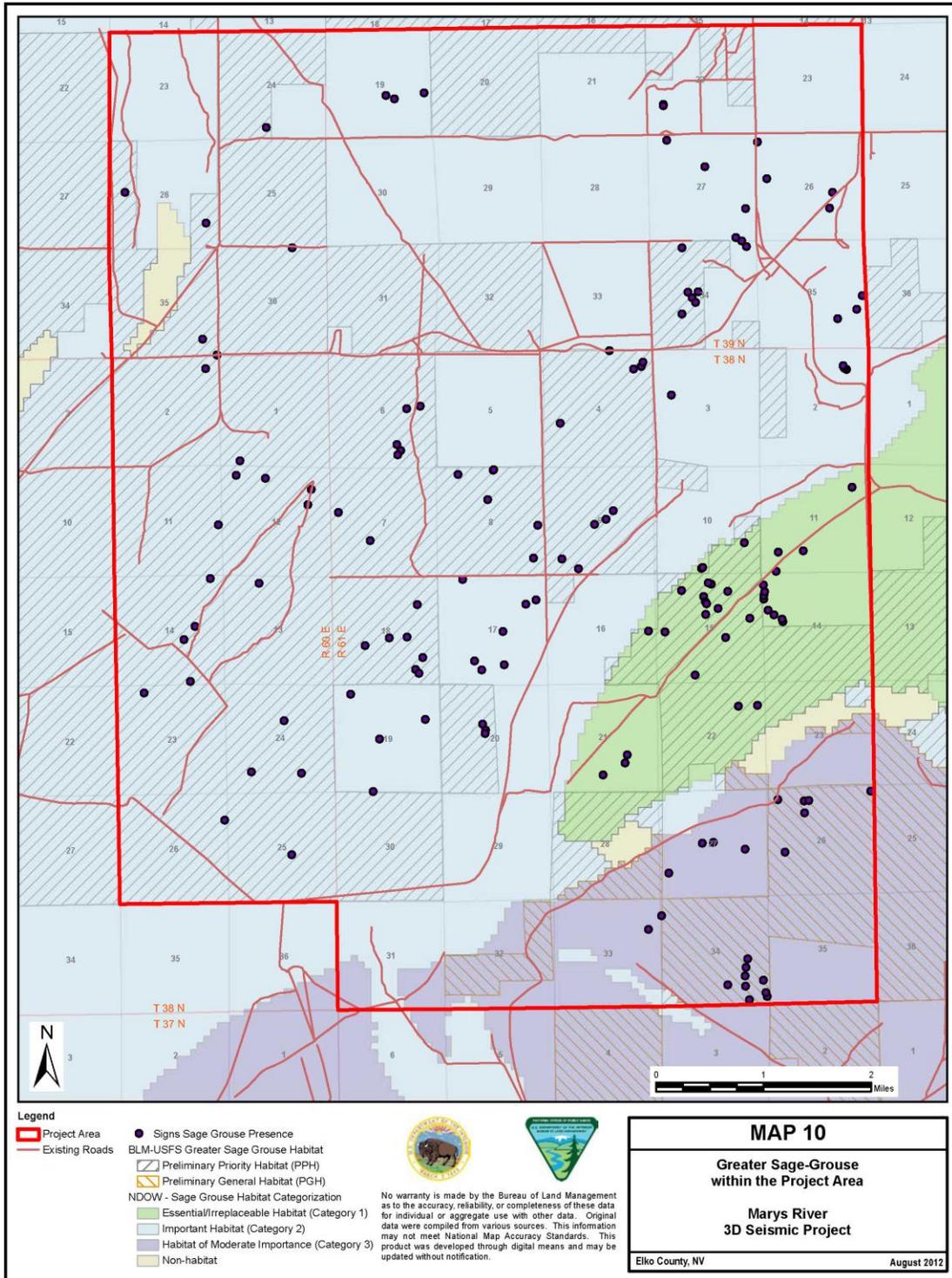
ESA Candidate Species. There is no suitable habitat present for yellow-billed cuckoos; they require large blocks of riparian woodland with cottonwoods and willows, with dense foliage in the understory (USFWS, 2011b). However, the other two candidate species could occur with in the project area and are discussed below.

Columbia Spotted Frog. Columbia spotted frogs were petitioned for listing under the ESA in 1989 and populations, including those in Nevada, were found to be declining due the extensive loss and alteration of wetland habitat. USFWS (1993) found that listing the Great Basin population (and others) under the ESA was warranted but precluded by other priorities and designated the species as a candidate. The Jarbidge–Independence subpopulation of Columbia spotted frog is north of the project area, including watersheds in the Humboldt River Basin and extending into Idaho and the Snake River Basin (Columbia Spotted Frog Technical Team, 2003.). The Marys River Conservation Unit is one of several in the Jarbidge–Independence subpopulation area. Though much of the Marys River System remains unsurveyed for Columbia spotted frogs, large numbers of frogs were found in 1998 with potential for downstream dispersal into suitable habitats. Given the proximity of populations in Currant Creek to the Tabor Creek headwaters, presence of spotted frogs in Tabor Creek and the project area may be possible (see Table 7).

Greater Sage-Grouse. After a 12-month review, USFWS (2010b) found that listing the greater sage-grouse as threatened or endangered under ESA throughout its range was warranted but precluded by higher priority listing actions. USFWS indicated that listing the greater sage-grouse under the ESA will be proposed in the future but for the present the species is a candidate for listing. Greater sage-grouse are considered a sagebrush-obligate species (Connelly et al., 2004). Based on sightings of birds, feces, and nests with egg shells, greater sage-grouse are known to occur within the project area (HWA, 2012). Although no active leks have been reported within the project area (one active lek is 1.75 miles away), NDOW (2012a) has classified portions of the project area (see Map 10) as Category 1 - Essential and Irreplaceable Habitat (8 percent), Category 2 - Important Habitat (80 percent), Category 3 - Habitat of Moderate Importance (11 percent), and Non-habitat (1 percent). Category 1 and 2 habitats are the areas of highest conservation value to maintaining sustainable sage-grouse populations. Category 1 and Category 2 habitats include breeding habitat (lek sites and nesting habitat), brood rearing habitat, and winter range generally consisting of sagebrush, but also riparian communities, perennial grasslands, agriculturally developed land, and restored habitat, including recovering burned areas NDOW (2012a).

The project area coincides with sage-grouse nesting and early brood-rearing habitat, late-brood rearing habitat, and winter habitat. In Nevada, breeding and nesting habitats are occupied from March through May (BLM, 2000). Early brood-rearing habitat is used by female grouse with chicks for up to 3 weeks following hatching whereas definition and use of late brood-rearing habitat is dependent on many factors including precipitation during spring and early summer and availability of forbs throughout the summer (Nevada Governor’s Sage-grouse Conservation Team, 2010). In Nevada, brood-rearing habitats are used from April through August (BLM, 2000). Use of winter habitats depends on winter severity but generally winter habitats are occupied from October through March (BLM, 2000).

Map 10 Greater Sage-Grouse Habitat within the Project Area



Habitats in Category 1 and 2 have the highest conservation value to maintaining sustainable sage-grouse populations (NDOW, 2012b). NDOW has not established management directives based on their habitat categorization; they promote the habitat categories as the best available information for use in planning and decision-making by land management agencies (NDOW, 2012b).

BLM has similarly classified sage-grouse habitats within the project area, though limited to federal lands. As required under Instruction Memorandum (IM) No. 2012-044, BLM (2012a) has classified Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) in the project area on public lands. PPH has the highest conservation values to sage-grouse, similar to NDOW’s Category 1 and Category 2 habitat that includes breeding, late brood-rearing, and winter concentration areas. Approximately 89 percent of the BLM-administered land within the project area is classified as PPH. PGH includes seasonally or year-round occupied habitat outside of priority habitats and is similar to NDOW’s Category 3 habitat. Approximately 10 percent of the BLM-administered land within project area is classified as PGH.

BLM Instruction Memorandum (IM) No. 2012-043 (BLM, 2012b) sets conservation policies to minimize habitat loss in PPH and PGH. In PPH, BLM’s policy is to maintain, enhance, or restore conditions for greater sage-grouse and its habitat. Because leases in the project area were issued prior to publication of IM No. 2012-043, the BLM policy for issuing a proposed authorization for geophysical exploration activities in PPH includes “seasonal timing limitations and BMPs as permit conditions of approval to eliminate or minimize surface-disturbing and disruptive activities within nesting and brood-rearing habitat and winter concentration areas.” In PGH, BLM’s policy is “to reduce and mitigate adverse effects on greater sage-grouse and its habitat to the extent practical” (BLM, 2012b). The project area is within the Elko County Planning Area and Oneil Basin Population Management Unit (PMU). There are nine other PMUs in Elko County, which supports the highest density of leks in Nevada and supports some of the largest sage-grouse populations in the state. Recently (between 1999 and 2007), wildfires have reduced sage-grouse habitat in Elko County (NDOW, 2011a). After wildfires in 2007, male lek attendance in 2008 within the Oneil Basin PMU decreased 10.5 percent from attendance in 2007. Since 2007, male attendance within the PMU and within all of Elko County has been increasing (see Figure 1), although average attendance in the Oneil Basin PMU has been lagging the average lek attendance within all PMUs in Elko County since 2009.

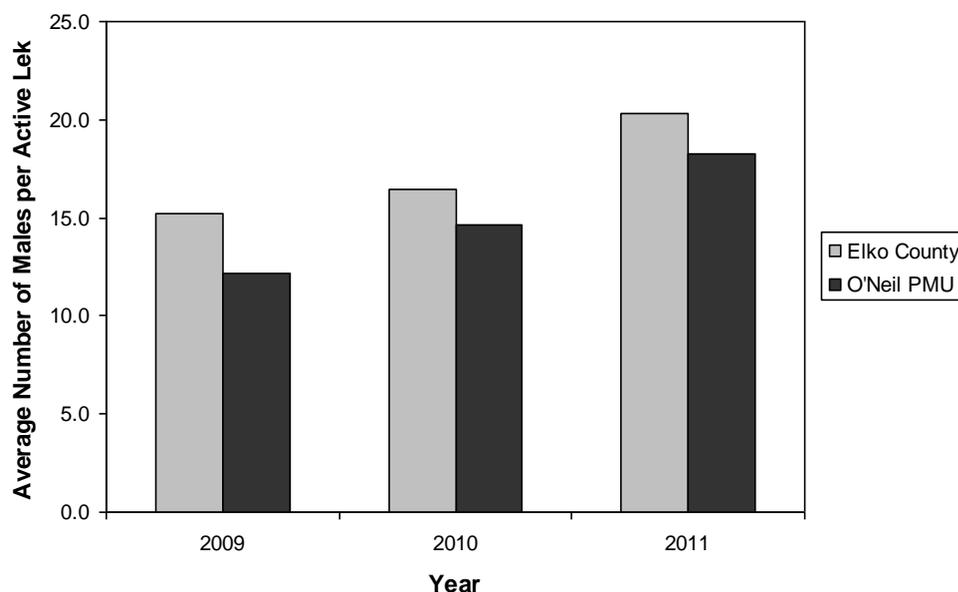


Figure 1
Male Sage-Grouse Lek Attendance within the Oneil Basin PMU Compared to Lek Attendance in all PMUs within Elko County, 2009 to 2011

Greater sage-grouse demographic trends within the Oneil Basin PMU have been estimated from wings collected from hunters to estimate the annual production as chicks per hen. Data compiled since 2002 indicate that productivity had been significantly decreasing between 2003 and 2008 (see Figure 2) with values decreasing below 2.25 chicks per hen, the minimum productivity level required to maintain a stable or increasing population (Connelly et al., 2000). Production of juveniles in the Oneil Basin PMU increased in 2009 but not to a level sufficient to produce population growth.

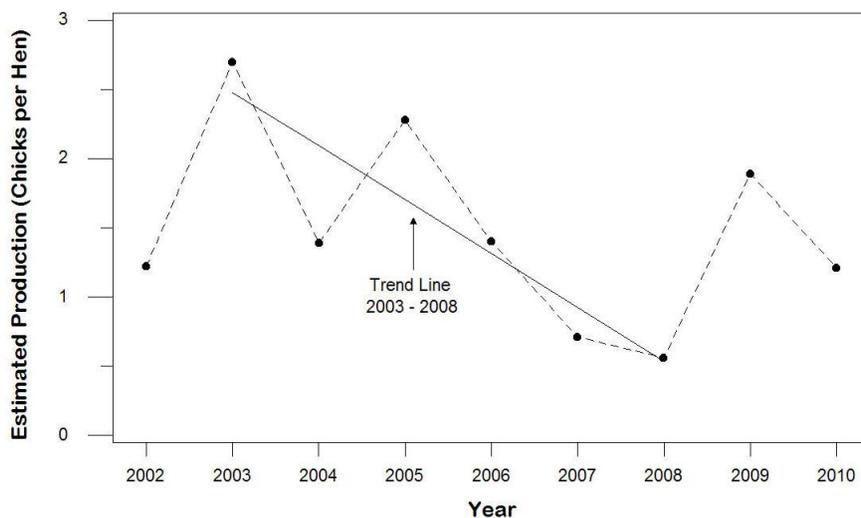


Figure 2
Estimated Annual Production of Sage-Grouse Juveniles within the Oneil Basin PMU from 2002 to 2010. The Production Trend was Decreasing between 2003 and 2008 ($r^2 = 0.741$, $P < 0.05$)

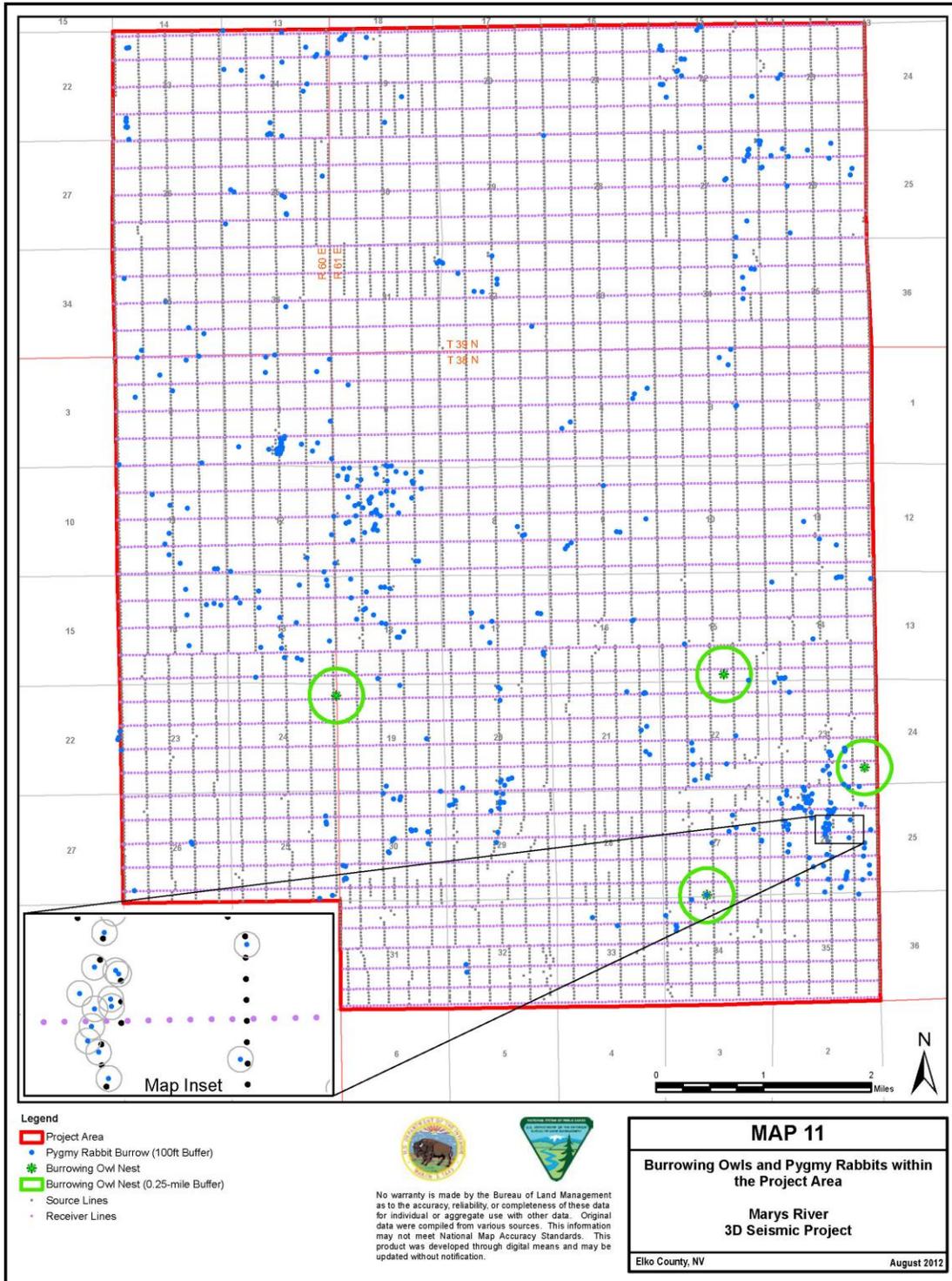
The BLM Nevada State Office was consulted regarding the project in accordance with IM NV-2012-056.

BLM-Sensitive Species. BLM (2003) identified 38 animal Species of Special Concern that may occur in the Elko BLM District (BLM, 2003). Other BLM designated Sensitive Species were added based on lists of rare animals compiled by Nevada Natural Heritage Program (NNHP, 2004). BLM species protected by Nevada State Law (NRS 501) are included in Table 7. Some of the tabulated species were discussed above because they are listed or candidates for listing under the ESA.

In addition to greater sage-grouse, western burrowing owls are present in the project area (see Map 11). Four possible nests were found during 2012 (HWA, 2012). Pygmy rabbits are also present as year-round residents in the project area (see Map 11). USFWS (2010c) reviewed a petition for listing pygmy rabbits under the ESA but determined that listing the species (outside of the Columbia Basin) was not warranted, including pygmy rabbits in Nevada. USFWS concluded that populations within the state appear to have expanded the known range of the species (USFWS, 2010c). A search for pygmy rabbit burrows and other sign (tracks, feces) was conducted in the project area during 2012 (HWA, 2012). The survey revealed 1,488 pygmy rabbit burrows or burrow openings at 529 locations within the project area, mostly in Sagebrush Grassland (44 percent of locations) and Sagebrush Community (35 percent) vegetation types, commensurate with the relative extent of those types in the project area. Fifteen percent of all burrow locations were observed in Drainage vegetation, nearly twice as many as would be expected by the relative abundance of that type in the project area (see Table 9/Section 3.13).

Map 11

Burrowing Owls and Pygmy Rabbits within the Project Area



Shrub cover within Drainage vegetation is assumed to range between 10 and 30 percent and includes sagebrush where past control measures have not been conducted (see Section 3.13/Vegetation). Pygmy rabbits are highly dependent on big sagebrush for food and shelter year-round, particularly sagebrush that is tall and dense where soils are deep and loose to allow burrowing (USFWS, 2010c). Such conditions occur in the Drainage vegetation type.

In addition to the sensitive species known to occur (HWA, 2012), several species included in Table 7 could possibly occur, particularly mobile species such as Townsend's big-eared bat, fringed myotis, and Yuma myotis and other sensitive bat species. Based on habitats present, species' habitat associations, and distributions (see Table 7), Preble's shrew, Fletcher dark kangaroo mouse, Swainson's hawk, prairie falcon, black tern, and short-eared owl could also be present in sagebrush-dominated vegetation, drainages and riparian areas within the project area.

Special Status Plant Species

USFWS (2012) identified the Goose Creek milkvetch as occurring within Elko County. The plant was petitioned for listing as threatened in 2004; however, in 2009 USFWS found that listing the species was warranted but precluded by higher priority actions and was assigned candidate status under the ESA (USFWS, 2009). It typically grows on dry volcanic ash soils from the Salt Lake Formation in sparsely vegetated sagebrush and juniper communities (USFWS, 2011c). The species is restricted to the Goose Creek drainage in Cassia County, Idaho, Box Elder County, Utah, and extreme northeastern Elko County, Nevada (USFWS, 2011c). The headwaters of Goose Creek are in the Sawtooth National Forest in Idaho. The creek flows south through Elko County before turning east and north into Utah and then to the Snake River at Burley, Idaho. At its closest point, Goose Creek is 60 miles northeast of the project area and Goose Creek milkvetch is not expected to occur within the project area.

BLM designated sensitive plant species for Nevada are included on lists of rare plants compiled by the Nevada Natural Heritage Program (NNHP, 2004). BLM policy is to provide sensitive species with the same level of protection as provided for candidate species (BLM Manual 6840.06 C) to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed." BLM (2003) identified 18 plant Species of Special Concern that may occur in the BLM Elko District area (BLM, 2003). These species and species protected by Nevada State Law [listed in Nevada Administrative Code (NAC) 537.010 and protected under Nevada Revised Statutes (NRS) 527.260-.300] are included in Table 8.

Sensitive plant species' associated habitats, elevational ranges, and distributions were evaluated from information in the Nevada Rare Plant Atlas (NNHP, 2001). One species, Elko rockcress, might occur in the project area. Its main distribution is in northeastern Elko County in the vicinity of Highway 93, north and east of the project area at elevations ranging from 5,300 to 6,100 feet. It is associated with Wyoming big sagebrush and green rabbitbrush, both of which occur in the project area; however, its presence is dependent on moss cover found on volcanic ash and tuff (Morefield, 1997) that may or may not be present in the project area. Occurrences of three other sensitive plant species in the project area were judged to be unlikely due to known distributions (distance from the project area) and/or documented elevational ranges, even though potential habitats could be present. All other species in Table 8 were judged to have no potential for occurrence in the project area because of their distributions, specific habitat associations, and expected elevation ranges did not coincide with the project area.

Elko whitlowcress is not included in Table 8. It is endemic to Nevada and on the NNHP's Watch List (species that could be declining in Nevada and could become at-risk in the future (NNHP, 2010), but is not protected under NRS 527.260-.300 nor is it a BLM sensitive species. After examining a location where the species was known to occur in 1985, provided by BLM Elko District, the species was not found in the project area and no suitable habitat was present (HWA, 2012).

Table 8
BLM Sensitive Plant Species within the Elko District and Elko County with Potential for Occurrence within the Project Area

Species Common Name Scientific Name	Habitat¹	Location¹	Federal Status²	State Status²	Potential³ Project Area Occurrence
Meadow pusseytoes <i>Antennaria arcuata</i>	Bare, periodically disturbed soil in marginal, seasonally dry parts of moist, alkaline meadows, seeps, and springs, surrounded by sagebrush and grasslands; from 6,200 to 6,500 feet.	4 records in Elko County; none in Marys River Watershed	BLM-S		Unlikely
Grouse Creek rockcress <i>Arabis falcatoria</i>	On site regularly blown clear of snow, often in the shelter of low shrubs, in the mountain mahogany zone. Absent from adjacent snow drift areas; at 8,600 feet.	1 record in Elko County; none in Marys River Watershed	BLM-S		None
Elko rockcress <i>Arabis falcifruca</i>	On moderate to steep north-facing slopes in the sagebrush zone, dominated by moss, Wyoming big sagebrush, green rabbitbrush, Sandberg bluegrass; from 5,300 to 6,100 feet.	6 records in Elko County; none in Marys River Watershed	BLM-S		Possible
Goose Creek milkvetch <i>Astragalus anserinus</i>	See account, above.	4 records in Elko County; none in Marys River Watershed	ESA-C BLM-S		None
Lamoille Canyon (Robbins) milkvetch <i>Astragalus robbinsii</i> var. <i>occidentalis</i>	Aquatic or wetland-dependent; in seeps, riparian strips or edges, near stream banks, or higher elevation meadow margins, in willow, cottonwood communities with sedges, rushes; from 6,500 to 10,000 feet.	>20 records in Elko County; 3 records in Marys River Watershed	BLM-S		Unlikely
Osgood Mountains milkvetch <i>Astragalus yoder-williamsii</i>	Dry soils among boulders on flat, gentle slopes in sagebrush steppe with low sagebrush, mountain big sagebrush, rabbitbrush fescue, bluegrass, needle-and-thread; from 5,660 to 7,300 feet.	1 record in Elko County; none in Marys River Watershed	BLM-P	Critically Endangered	Unlikely
Barren Valley collomia <i>Collomia renacta</i>	Lightly disturbed north-sloping rocky soil near drainage bottom, ecotone between big sagebrush and low sagebrush associations; from 6,800 to 7,200 feet.	2 records in Elko County; none in Marys River Watershed	BLM-S		None
Broad fleabane <i>Erigeron latus</i>	Shallow, relatively barren soils or bedrock on flats and slopes of volcanic scablands or benches in the sagebrush steppe and juniper zones; from 6,200 to 6,450 feet.	5 records in Elko County; none in Marys River Watershed	BLM-S		None
Sulphur Springs buckwheat <i>Eriogonum argophyllum</i>	Evaporite-cruste sandy soils along runoff channels on a hot spring mound, with a sparse associated vegetative cover surrounded by big sagebrush vegetation; 6,030 to 6,050 feet.	1 record in Elko County; none in Marys River Watershed	BLM-P	Critically Endangered	None
Lewis buckwheat <i>Eriogonum lewisii</i>	Dry, relatively barren, rocky residual soils on convex ridge-line knolls and crests with the densest stands on southerly aspects, with low sagebrush, bottlebrush squirreltail; 6,470 to 9,720 feet.	>15 records in Elko County; none in Marys River Watershed	BLM-S		None
Grimes vetchling <i>Lathyrus grimesii</i>	Dry, shallow, silty clay soils; relatively barren patches on mostly steep slopes of all aspects, sparse to moderately dense cover with bitterbrush, rabbitbrush, cheatgrass; from 6,080 to 8,260 feet.	>15 records in Elko County; none in Marys River Watershed	BLM-S		Unlikely
Davis peppergrass <i>Lepidium davisii</i>	Cay playas on volcanic plains in the sagebrush zone with sparse associated silver sage and shadscale, surrounded by big sagebrush; from 5,125 to 5,200 feet.	2 records in Elko County; none in Marys River Watershed	BLM-S		None

Species Common Name Scientific Name	Habitat ¹	Location ¹	Federal Status ²	State Status ²	Potential ³ Project Area Occurrence
Owyhee prickly phlox <i>Leptodactylon glabrum</i>	Crevices in steep to vertical, coarse-crumbling volcanic canyon walls. Intolerant of water paths or seeps that may form in the rock crevices; from 4,300 to 5,300 feet.	1 record in Elko County; none in Marys River Watershed	BLM-S		None
Least phacelia <i>Phacelia minutissima</i>	Aquatic or wetland-dependent. Bare soil and mud banks in meadows, at perimeters of corn lily, aspen stands, in sagebrush swales, along creek beds and springs; from 6,240 to 8,900 feet.	>20 records in Elko County; none in Marys River Watershed	BLM-S		None
Cottam cinquefoil <i>Potentilla cottamii</i>	Crevices or narrow ledges on outcrops of quartzite, other rocks, prefers northern, shaded exposures, upper subalpine conifer zone with limber pine, subalpine fir; 9,400 to 10,600 feet.	1 record in Elko County; none in Marys River Watershed	BLM-S		None
Ruby Mountains primrose <i>Primula capillaris</i>	Moist soils derived from glacial till, just below bedrock in subalpine meadows in subalpine conifer zones with whitebark pine, dependent on wetland margins; from 8,900 to 10,360 feet.	>5 records in Elko County; none in Marys River Watershed	BLM-P		None
Nachlinger catchfly <i>Silene nachlingerae</i>	Ridgeline outcrops, talus, rocky soils at base of steep slopes or cliffs in subalpine conifer zone with limber pine; from 7,160 to 11,250 feet.	2 records in Elko County; none in Marys River Watershed	BLM-S		None
Leiberg clover <i>Trifolium leibergii</i>	On dry, relatively barren gravel soils of crumbling volcanic outcrops, mostly with northeast to southeast to southwest aspects, with sparse vegetation; from 6,560 to 7,800 feet.	10 records in Elko County; none in Marys River Watershed	BLM-S		None
Rock violet <i>Viola lithion</i>	Seasonally wet crevices in steep, shaded avalanche chutes and cirque headwalls in the subalpine conifer zone limber pine, aspen, snowberry; from 7,840 to 10,480 feet.	1 record in Elko County; none in Marys River Watershed	BLM-S		None

¹ Habitats and locations based on descriptions from the Nevada Rare Plant Atlas (NNHP, 2001).

² ESA-C = Candidate species; BLM-S = BLM sensitive species; BLM-P = BLM proposed species; Critically Endangered = species listed in NRS 527.060-.120.

³ Potential project area Occurrence: Possible = within elevational range and species' habitat associations; Unlikely = 1) not expected from elevation/habitat, but in the watershed or 2) habitat and elevation appropriate but unlikely due to distribution; None = habitat and elevation not present in the project area.

3.13 VEGETATION

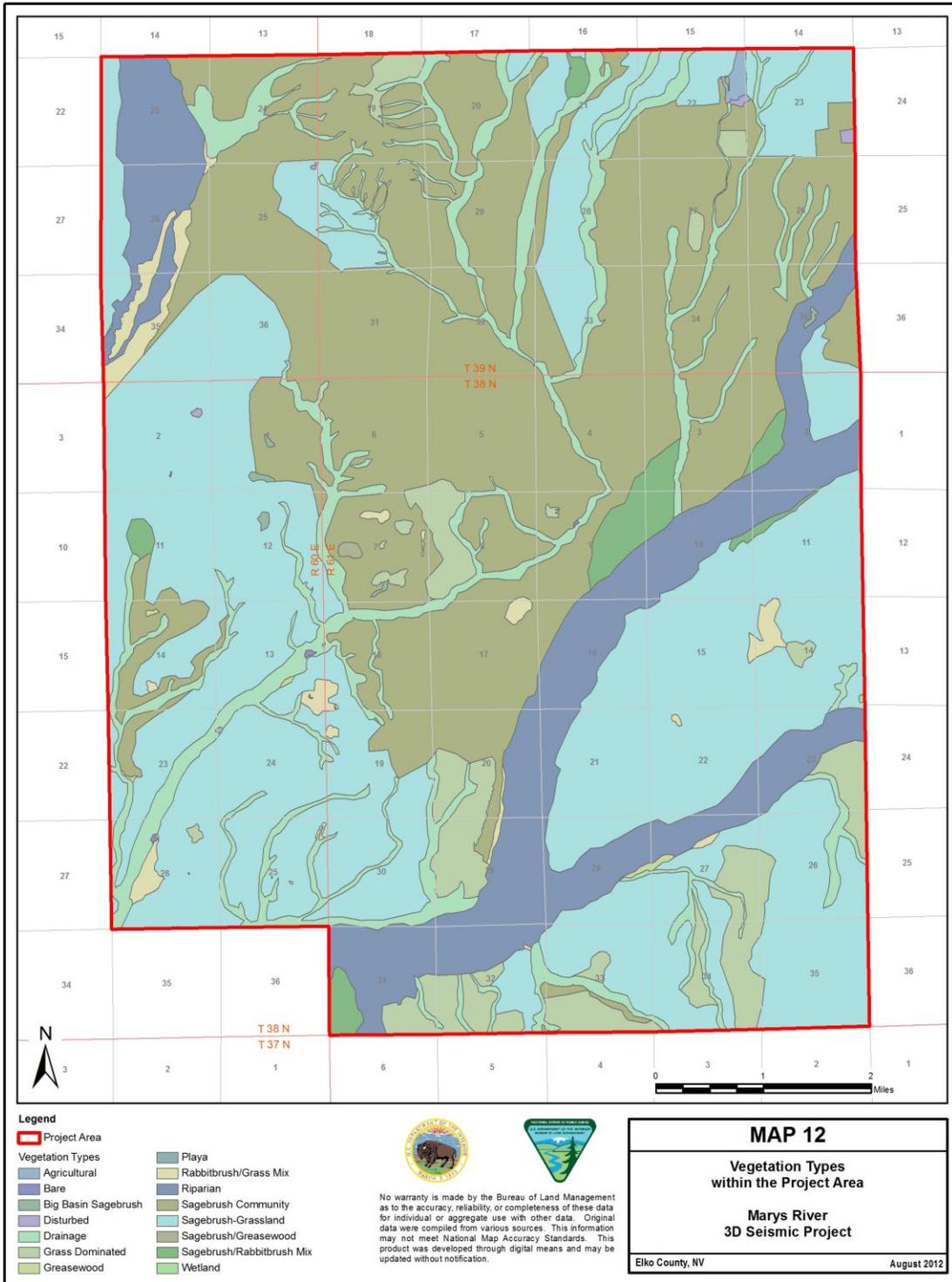
Elevations within the project area range from 5,300 to 5,700 feet; topography is relatively flat with rolling hills, many drainages, hilltops, draws, and eroded hillsides. Vegetation community classifications in the project area follow standards developed by the Southwest Regional Gap Analysis Project (Lowry et al., 2005). Vegetation was mapped on-site with component descriptions provided by HWA (2012). Species' common and scientific names used in the text and tables are provided in Appendix B.

Vegetation is dominated by big sagebrush communities that vary by associated shrub species components and amounts of vegetative cover provided by shrubs (see Map 12 and Table 9). The Inter-Mountain Basins Big Sagebrush Shrubland predominates the project area, with Wyoming big sagebrush as the dominant species, usually in association with rubber rabbitbrush, and Douglas or green rabbitbrush. Big sagebrush shrubland covers approximately 74 percent of the project area (HWA, 2012). However, areas of sagebrush have been treated in the past as parts of programs described in the Rangeland Program Summary (BLM, 1986) to burn (without seeding) 27,000 acres, spray (without seeding) 1,500 acres, and chain, burn, and seed 5,500 acres within the Wells Resource Area for livestock grazing. In addition, 37,500 acres without treatments were proposed for seeding to provide for spring forage for livestock.

Antelope bitterbrush and threetip sagebrush are often shrub associates with big sagebrush in the Great Basin, but were not reported in the project area. Hood's phlox was found in the understory of sagebrush-dominated vegetation along with native grasses including bluebunch wheatgrass and western wheatgrass (HWA, 2012). Other native grasses that are generally associated with sagebrush-dominated vegetation include Indian ricegrass, blue grama, thickspike wheatgrass, needle-and-thread, James' galleta, and Sandberg bluegrass (NatureServe, 2004). Two non-native grasses, crested wheatgrass and cheatgrass or downy brome are extensive within various shrub and non-shrub vegetation types across the project area (HWA, 2012); the former was probably introduced for livestock forage concomitant with sagebrush treatments (BLM, 1986), the latter is an invasive, noxious weed.

Approximately 11 percent of the project area was mapped as riparian vegetation, including areas along the Humboldt River and Bishop Creek in the southern portion, along Burnt Creek in the east and along Tabor Creek in the northwest corner. Typical riparian vegetation, such as willows and sedges were reported, as well as non-native crested wheatgrass and invasive Canada thistle (HWA, 2012). Black greasewood is a shrub type generally associated with various drainages and riparian vegetation. It often forms a monotypic cover type on alluvial flats, terraces, and along drainages, although greasewood may also be a shrub component within the big sagebrush shrubland. Other native species such as silver sage, narrowleaf willow, arroyo willow, rushes, tufted hairgrass, slender wheatgrass, and Rocky Mountain iris are likely to occur in Great Basin riparian shrubland (NatureServe, 2004). Numerous ephemeral drainages occur in the project area (9 percent of the total area), although vegetation in the drainages is generally dominated by the same species that are found on adjacent upland sites: Wyoming big sagebrush, crested wheatgrass, and cheatgrass. The amount of shrub cover in Drainage vegetation appears to be similar to shrub cover in Sagebrush Community and Rabbitbrush-Grassland vegetation types and was estimated to range between 10 and 30 percent (Table 9) during on-site reconnaissance (Edge Environmental, 2012). Other sites that have been disturbed by oil and gas development such as well pads, pipelines, and ranching/livestock operations would be classified as invasive annual grasslands (Lowry et al., 2005) and, if vegetated, are dominated by cheatgrass and crested wheatgrass.

Map 12 Vegetation Types within the Project Area



**Table 9
Vegetation Types, General Characteristics, and Locations within the Project Area**

General Vegetation Type	Gap Cover Type ¹	Mapped Sub-Types ²	Characteristics ^{2,3}	General Location	Area (acres)
Shrubland	Inter-Mountain Basins Big Sagebrush Shrubland	Sagebrush Community	Shrub cover 10-30%	Large areas covered, mostly central and northern project area.	13,647.6
		Sagebrush-Rabbitbrush	Shrub cover 10-20%	Mostly adjacent to riparian areas along Bishop Creek, Humboldt River.	591.5
		Sagebrush-Grassland	Shrub cover 5%	Large areas covered, mostly in western and southern project area.	14,820.4
		Rabbitbrush-Grassland	Shrub cover 10-20%	Scattered patches, mostly associated with riparian-drainages.	498.7
	Inter-Mountain Basins Greasewood Flat	Greasewood	Shrub cover 5-15%	Several small patches adjacent to riparian-drainages.	25.7
Grassland	Invasive Annual Grassland	Grassland	Shrub cover <5%	Mostly in southern half; upland sites, on low hillsides, hilltops.	1944.4
		Disturbed	Surface disturbance	Small sites, mostly north half.	23.7
		Bare ground	Heavily grazed	Three sites along tributary to Tabor Creek.	6.1
	Inter-Mountain Basins Playa	Playa	Depression, dry or wet	Three playas in project area.	0.4
Riparian-Drainage	Great Basin Foothill Riparian Woodland and Shrubland	Riparian	Bordering perennial streams	Bordering Humboldt River, Bishop Creek, Tabor Creek.	4392.0
		Drainage	Bottom land with shrub cover 10-30%	Bordering multiple intermittent tributaries to perennial streams.	3450.7
Agriculture	Agriculture	Agriculture	Irrigated/fallow	One location, northeast project area.	43.3
TOTAL					39,444.5

¹ Lowry et al., 2005; NatureServe, 2004.

² HWA, 2012.

³ Edge Environmental, 2012.

3.14 VISUAL RESOURCES MANAGEMENT

Visual resources are the visible physical features of a landscape that convey scenic value. Scenic values in the BLM field offices have been classified according to the Visual Resource Management (VRM) system, and the objectives are to minimize the visual impacts of surface disturbing activities and to maintain scenic values on public lands.

The BLM-administered lands within the project area are designated as VRM Class IV. In Class IV areas, the level of change to the characteristic landscape can be high. Management activities can consist of major modifications and may dominate the view of the casual observer.

3.15 WILDLIFE AND FISHERIES

Big Game. The entire project area is pronghorn summer range. The project area overlaps mule deer and elk limited use habitats. The project area is within Management Unit 075, managed by NDOW for big game harvest. Species' common and scientific names used in the text and tables are provided in Appendix B.

Pronghorn within Management Unit 075 and adjacent Management Units (072 and 074) in northeastern Elko County have had low fawn recruitment, averaging 37 fawns per 100 does during the period 2000 to 2009. However, the rate of 40 fawns per 100 does was reported in 2010 (NDOW, 2011b). Related to increased recruitment, the 2011 population estimate was 1,000 pronghorns in the northeastern Elko County Unit Group (including Units 075, 072 and

074), an increase from 950 animals in 2010 (Appendix Table 24 in NDOW, 2011b). Seventeen adult male pronghorn were harvested in Unit 075 in 2010, whereas 27 adult males were harvested in 2011 (NDOW, 2011c). Habitats within northeastern Elko County have been affected by wildfires during the past 10 years; growth of perennial grasses and forbs have responded positively on summer ranges after the fires but shrubs, such as big sagebrush and bitterbrush, have not recovered to the detriment of pronghorn, which depend on shrub browse for winter survival (NDOW, 2011b).

The 2011 mule deer population in northeastern Elko County was estimated at 12,700 deer, an increase from 11,500 mule deer in 2010 (Appendix Table 22 in NDOW, 2011b). Spring composition surveys indicate 42 fawns per 100 adults, an increase in fawn recruitment from 36 fawns per 100 adults in 2010 (Appendix Table 15 in NDOW, 2011b). Six does and 214 adult males were harvested during 2011 in Unit 075 (Appendix Table 1 in NDOW, 2011b). Similar to pronghorns, mule deer habitats in northeastern Elko County have been reduced by wildfires that have limited shrub availability. Further, weeds such as cheatgrass have invaded burned areas and replaced native vegetation. In addition to habitat loss, mule deer are struck by vehicles as they migrate to seasonal ranges across Interstate-80 and Highway 93 (NDOW, 2011b). Several deer-crossing structures (overpasses, underpasses), recently constructed on Highway 93, have reduced mule deer-vehicle mortality.

A small population of elk inhabits Unit 075 in the Snake Mountains, east and north of the project area. The 2011 population estimate was 120 elk, a decrease from 160 animals in 2010 (Appendix Table 23 in NDOW, 2011b). Harvest of antlerless elk increased in 2011 to achieve the population objective of 100 animals. There are no habitats within the project area that are occupied by elk.

Upland Game and Small Game. Upland game and small game animals are managed within counties (NDOW, 2009). During the 2008 to 2009 season, 14 species of furbearing mammals were harvested in Elko County – the most numerous were coyotes (406), followed by bobcat (310) and beaver (249). Beavers and coyotes were observed within the project area in 2012 (HWA, 2012). Small game mammals including mountain cottontail rabbit, pygmy rabbit, and white-tailed jackrabbit have been harvested in Elko County (NDOW, 2009) and occur in the project area. Upland game birds are harvested in Elko County. Four of the species most harvested in 2009 that are known or likely to occur in the project area include chukar (5,551 harvested), mourning doves (2,212 harvested), greater sage-grouse (1,861 harvested), and Hungarian partridge (588 harvested). Ruffed grouse (268 harvested) may also occur in the project area (Burton, 2012), but there is no population associated with the project area. Harvested migratory waterfowl also occur in the project area (HWA, 2012), including Canada goose, mallard, and northern pintail.

Non-Game Species. Non-game bird species were discussed under migratory birds, above. Only one reptile, the desert horned lizard, was seen during 2012 surveys (HWA, 2012). However, there are other non-game reptiles that occur including the common sagebrush lizard (Edge Environmental, 2012), Great Basin collared lizard, Great Basin whiptail, western fence lizard, western skink, and western rattlesnake (Burton, 2012). Four species of non-game mammals observed in the project area include Uinta chipmunk, Townsend's ground squirrel, Ord's kangaroo rat, and porcupine. Pocket gopher mounds were also observed (HWA, 2012). Ord's kangaroo rats and Townsend's ground squirrels are common to arid sagebrush and saltbush-greasewood communities, and porcupines inhabit shrubby stream bottomlands (Zaveloff, 1988). Uinta chipmunks are most closely associated with trees such as pines, juniper, and scrub oak (Zaveloff, 1988). In addition, seven species of bats, Preble's shrew, and Fletcher dark kangaroo mouse possibly occur in the project area in association with sagebrush shrub-grassland habitats (see Table 7, above) and are non-game wildlife species.

Fish. No information has been found regarding fish occurrence within the project area. Native non-game fish that inhabit the upper Marys River drainage were reported by Elliot and Layton (2004, see Appendix A). Non-native game fish species that occur within the Humboldt River in Elko County have been reported by NDOW (2010). Based on fish species' habitat associations and tolerance to water temperatures (Sigler and Sigler, 1987), summarized in Table 10, there are three non-game species (reidside shiner, Tui chub, and Tahoe sucker) and two game species (common carp and black bullhead) that may occur in Tabor Creek, Bishop Creek, and/or the Humboldt River that flow as perennial waterbodies through the project area.

**Table 10
Fish Species, Habitats, and Potential Occurrence within the Project Area**

Common Name Scientific Name	Habitat¹	Spawning¹	Project Area Occurrence
Native Non-Game Fish²			
Tui chub <i>Gila bicolor</i>	In small streams, large lakes/reservoirs with temperatures 70°F.	Late April to early August with temperatures 62°F to 72°F.	Possible
Speckled dace <i>Rhinichthys osculus</i>	Swift, cold riffles in mountain streams; quiet, cool water in springs.	June and July with temperatures ≈65°F.	Unlikely
Redside shiner <i>Richardsonius balteatus</i>	Ponds, lakes, streams, and irrigation ditches.	April to June with temperatures >50°F.	Possible
Tahoe sucker <i>Catostomus tahoensis</i>	Large and small lakes and streams with warmer inshore, shallow habitats.	Lakes, streams in spring with temperatures ≈53°F.	Possible
Mountain sucker <i>Catostomus platyrhynchus</i>	In riffles with gravel, rubble, boulders; clear cold streams (55°F to 70°F).	June and July with temperatures >50°F.	Unlikely
Paiute sculpin <i>Cottus beldingi</i>	Rocky riffles in cold clear water, rubble or gravel substrates.	May or June in shallow water, riffles.	Unlikely
Non-Native Game Fish³			
Common carp <i>Cyprinus carpio</i>	Large deep lakes/reservoirs to small warm ponds/streams.	Spring with temperatures from 58°F to 67°F.	Possible
White catfish <i>Ictalurus catus</i>	Adapted to large rivers, reservoirs with slightly brackish water, slow currents.	Water temperatures >70°F.	Unlikely
Black bullhead <i>Ictalurus melas</i>	In turbid water, silt bottom, no strong current, streams, and ponds.	May to July with temperatures 65°F to 70°F.	Possible
Channel catfish <i>Ictalurus punctatus</i>	Adapted to large, moderately swift streams with pools, undercut banks.	Spring to early summer with temperatures 72°F to 75°F.	Unlikely
Bluegill <i>Lepomis macrochirus</i>	Clean waters of creeks, ponds, reservoirs; temperatures 70°F to 80°F.	Spring with temperatures from 64°F to 80°F.	Unlikely
Smallmouth bass <i>Micropterus dolomieu</i>	Rocky and sandy areas, large lakes, streams, rivers, shallow water.	Late spring to early summer with temperatures 61°F to 65°F.	Unlikely
Largemouth bass <i>Micropterus salmoides</i>	Upper levels of warm ponds, lakes, and large slow rivers.	Late spring to midsummer with temperatures 62°F.	Unlikely

¹ Sigler and Sigler, 1987.

² Elliot and Layton, 2004.

³ NDOW, 2010.

CHAPTER 4 – ENVIRONMENTAL EFFECTS

Environmental impact analysis was based upon available data and literature from state and federal agencies, peer-review scientific literature, and resource studies conducted in the project area.

This chapter presents comparative analyses of the environmental consequences (i.e., direct and indirect effects) on the affected environment stemming from implementation of the Proposed Action or the No Action Alternative. Comparison of impacts is intended to provide an impartial assessment to help inform the decision-maker and the public. Actions resulting in adverse impacts to one resource may impart a beneficial impact to other resources. For each resource analyzed, environmental consequences include:

- **direct impacts** – impacts that are caused by the action, and that occur at the same time and in the same general location as the action.
- **indirect impacts** – impacts that occur at a different time or in a different location than the action to which the impacts are related.
- **short or long-term impacts** – when applicable, the short-term or long-term aspects of impacts are described. For the purposes of this EA, short-term impacts occur during or after the activity or action and may continue for up to 2 years. Long-term impacts occur beyond the first 2 years.

The predicted intensity and duration of effects from implementation of the Proposed Action for each resource were evaluated to determine how these effects could be avoided or reduced through the application of environmental protection measures. The design features included in Noble's Plan of Operations were evaluated for their ability to reduce expected effects. The need for additional mitigation measures was then determined for each resource, based on the expectation that potential effects could be further reduced or avoided. Additional environmental protection measures are included for each resource, if appropriate.

Cumulative Effects

NEPA requires federal agencies to consider the cumulative effects of proposals under their review. Cumulative effects are defined in the CEQ regulations 40 CFR §1508.7 as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency...or person undertakes such other actions." Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time. The CEQ states that the "cumulative effects analyses should be conducted on the scale of human communities, landscapes, watersheds, or "airsheds" using the concept of "project impact zone" or more simply put, the area that might be affected by the Project.

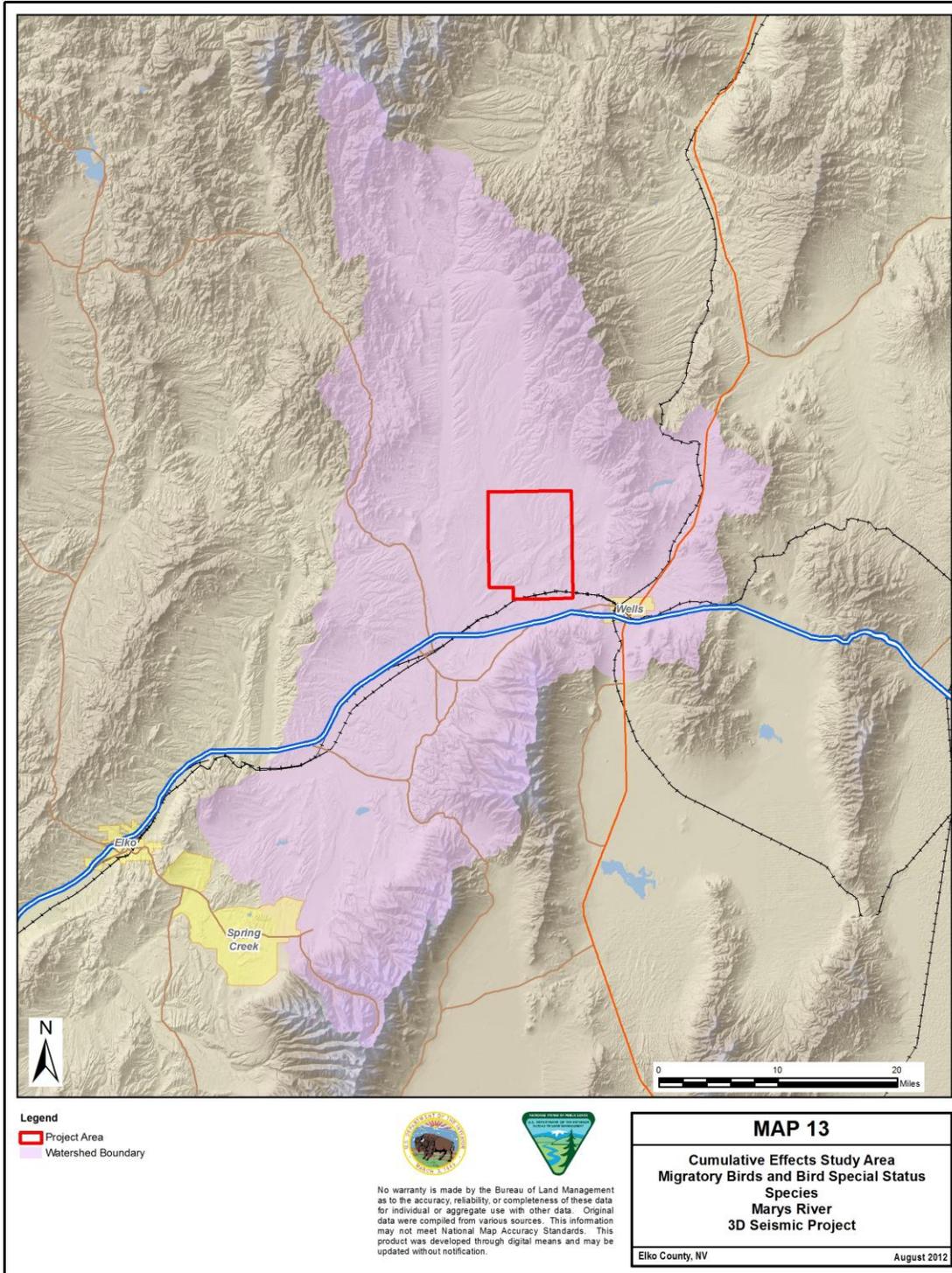
Table 11 provides the rationale for the cumulative effects analysis by resource and identifies the Cumulative Effects Study Areas (CESAs) and associated acreages for each resource, where a CESA is appropriate. Cumulative effects are analyzed within the specific resource sections below. Maps 13 through 16 depict the four CESA boundaries described in Table 11.

**Table 11
Cumulative Effects Rationale**

Resource	Cumulative Effects Study Areas (CESAs)		
	CESA Boundary	Acres	CESA Rationale
Air Quality and Climate	Not applicable		Because the Project's effects would be minimal in both duration (60 operational days) and intensity (short-term, vehicular disturbance), a CESA is not warranted for air impacts.
Hydrology and Riparian/Wetlands	Watershed	1,078,218	The boundary of seven subwatersheds within the Upper Humboldt watershed – Tabor Creek (HUC 1604010103), Bishop Creek (HUC 1604010102), Town Creek-Humboldt River (HUC 1604010101), Reed Creek-Humboldt River (HUC 1604010107), Lower Marys River (HUC 1604010105), Upper Marys River (HUC 1604010104), and Lamoille Creek (HUC 1604010106) – has been used as the geographic scope for the cumulative effects analysis for these resources. The combination of these seven subwatersheds comprises an area which encompasses the project area and includes most of the activities which could impact resources in the project area. Potential impacts of the Project would not be likely to result in any issues outside of this area.
Invasive, Non-Native Species			
Livestock Grazing			
Migratory Birds and Bird Special Status Species			
Recreation			
Soils			
Vegetation			
Greater Sage-grouse ¹	Oneil PMU	1,014,670	The project area is located in the southern part of the Oneil Population Management Unit for sage-grouse.
General Wildlife & Special Status Species (excluding bird species) ¹	Watershed north of I-80	689,177	Crossing I-80 would present a barrier to most of these species; therefore, the portion of the watershed north of I-80 was used for analysis.
Pronghorn ¹	Herd Units 072, 074, 075	1,177,094	The project area is located in the southern portion of Unit 075, and using the boundary of the three units provides perspective of the seasonal range use in relation to the Project.

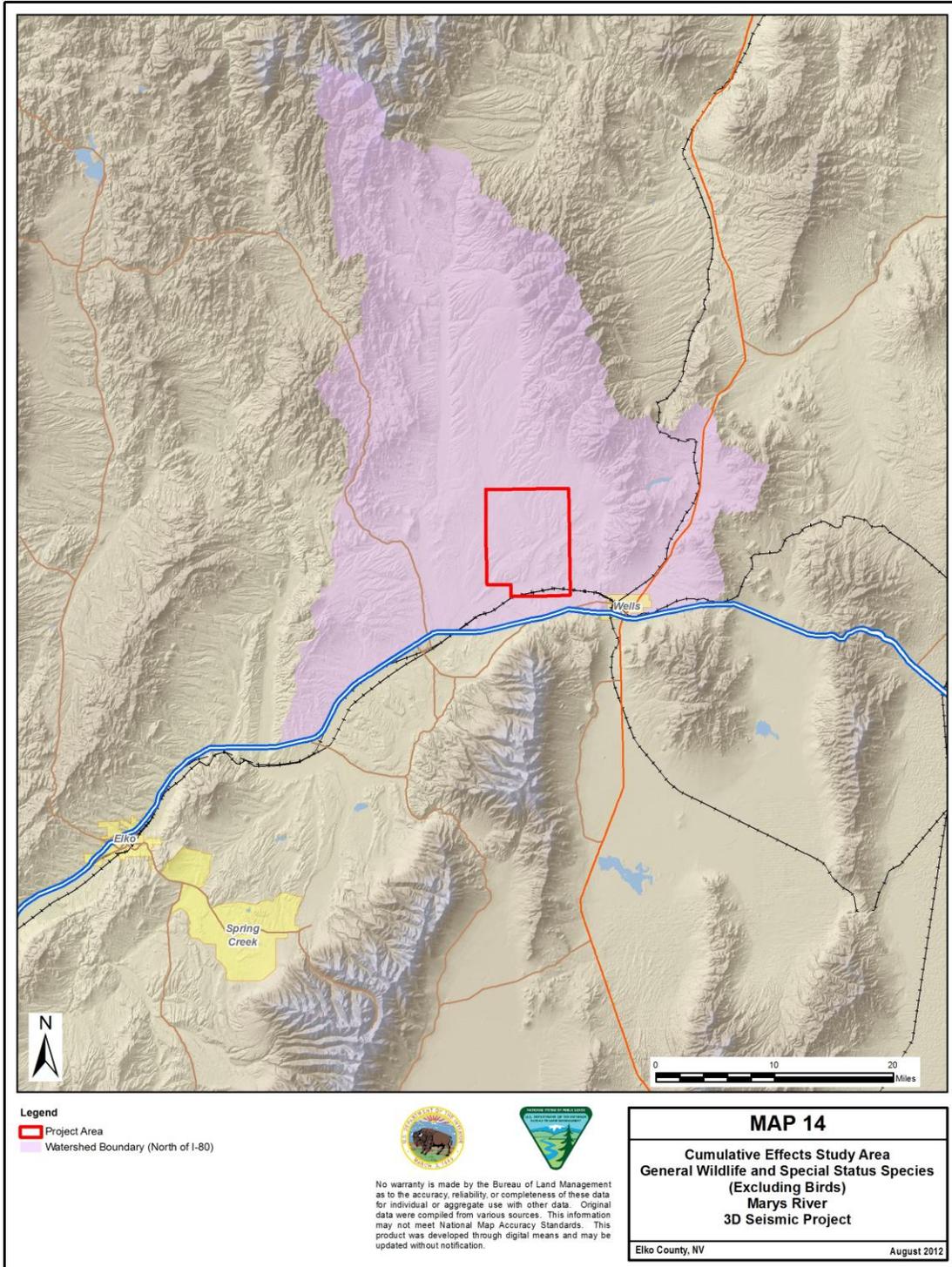
¹ NDOW was consulted in the development of these CESAs.

Map 13 CESA for Migratory Birds and Bird Special Status Species (and other resources)

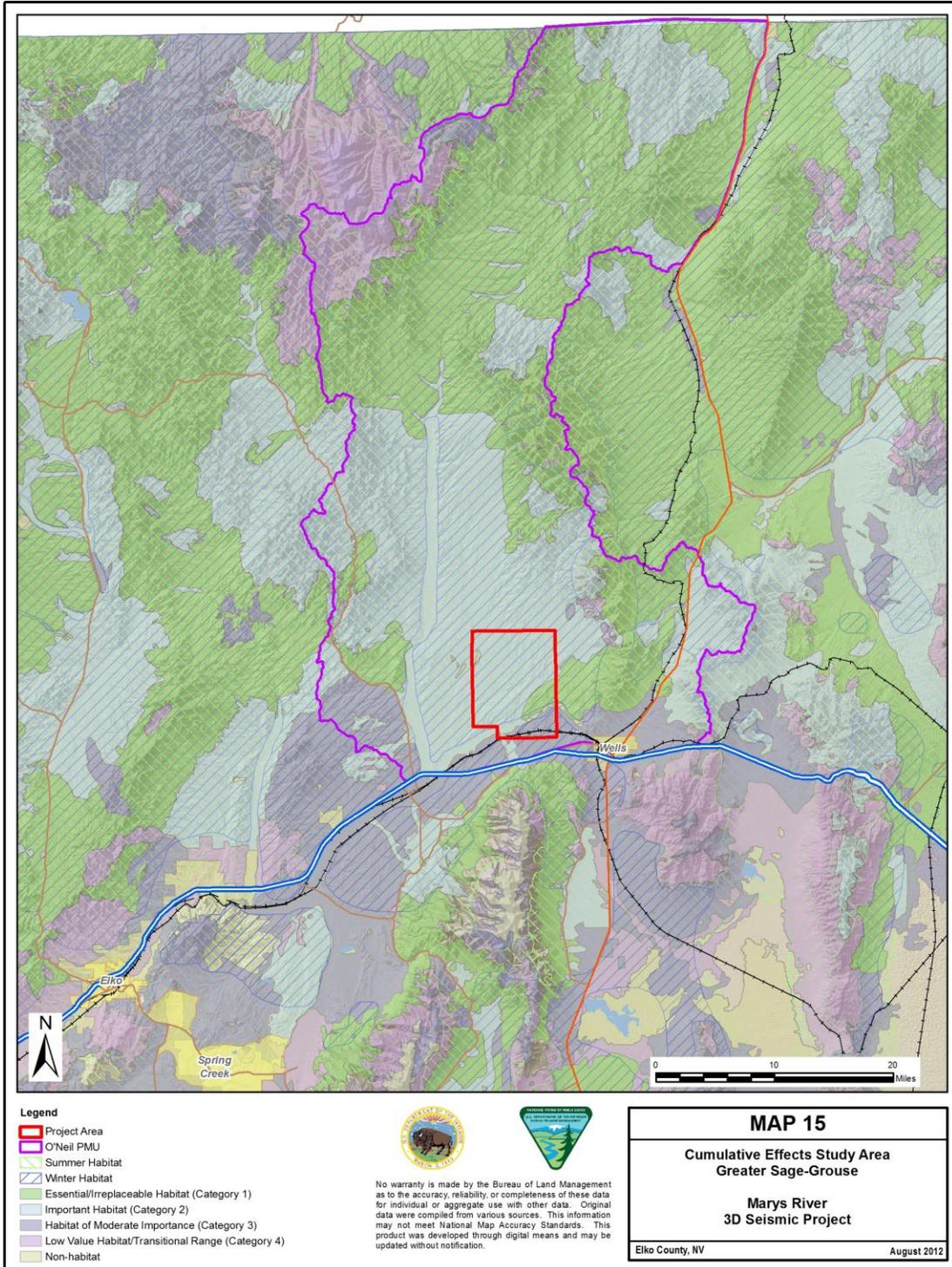


Map 14

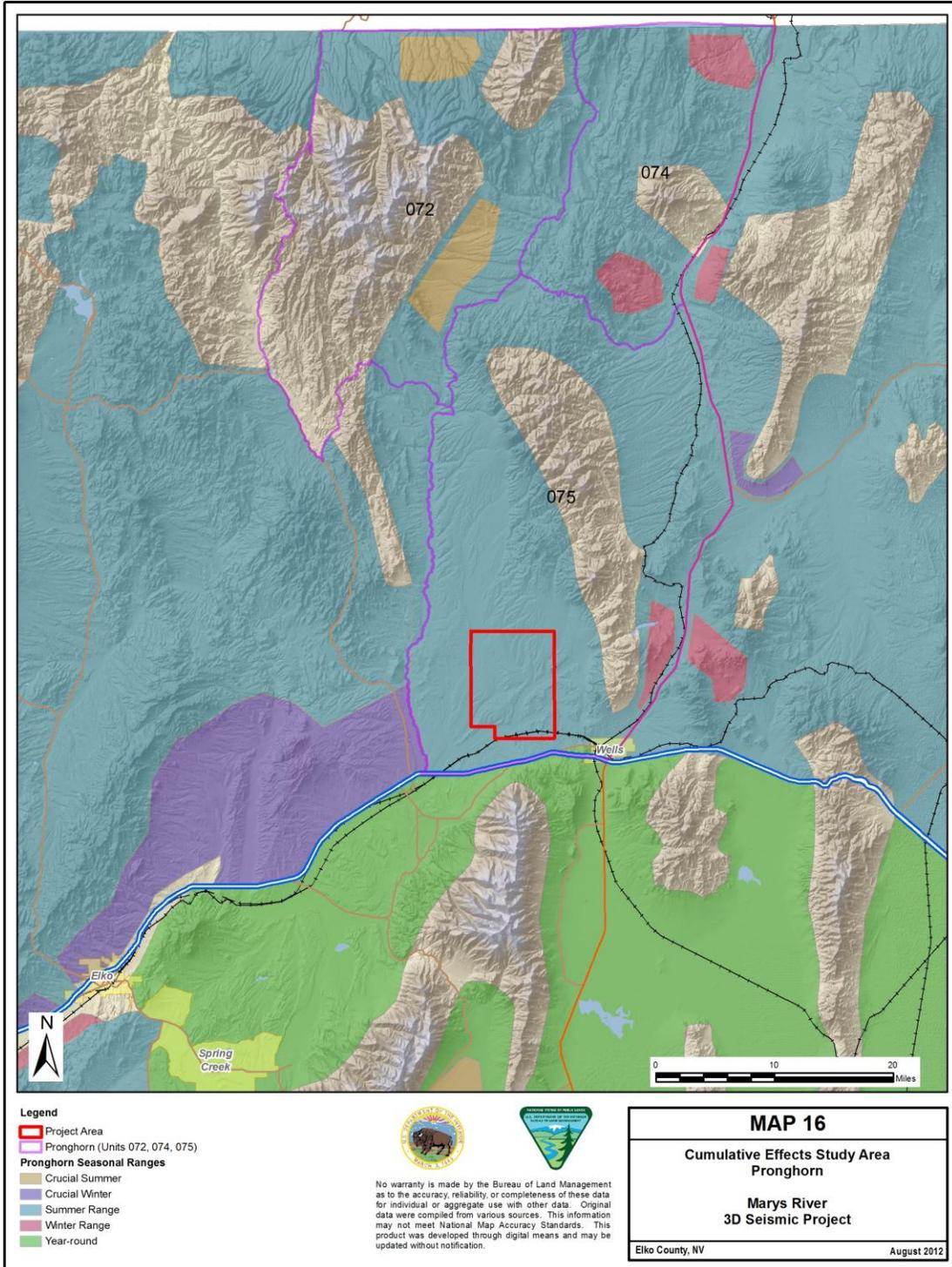
CESA for General Wildlife and Special Status Species



Map 15 CESA for Greater Sage-Grouse



Map 16 CESA for Pronghorn



The Reasonably Foreseeable Future Actions (RFFAs) describes existing facilities identified within and adjacent to the project area, as well as proposed projects which may be constructed in the area in the reasonably foreseeable future. To be included in the RFFAs, a proposed future action must have a high probability of occurrence and be defined well enough to consider in any cumulative impact analysis. On BLM-administered lands, foreseeable projects are those for which the BLM has received applications. The BLM LR2000 database was queried for closed, authorized, and pending rights-of-way and surface management features (see itemized list below). The acreages of those features are included in the specific resource sections.

NVN84650	Ruby Pipeline – natural gas pipeline
N7639	Sierra Pacific – power transmission line
N1027	Wells Rural Electric power transmission line
N89911	Wells Rural Electric power transmission line
N17084	Wells Rural Electric power transmission line (within multiple use right-of-way corridor)
CC021089	telephone line
N65550	fiber optic cable (within multiple use right-of-way corridor)
N60910	Citizens Communications – buried telephone line
CC018412	Overhead power line
N39938	Walker Wincup Gamble – overhead telephone line
CC04693	Railroad
Elko 04086	Railroad
Elko04897	Railroad
CC05150	Railroad
N46208	Elko County Road
N60305	BLM road
N54651	BLM road
N55607	BLM road
N5686	Forest Service – road
N46756	Elko County Road
N52546	Elko County Road
N7470	Forest Service – road
N89748	Road
NEV065706	Road
N47000	Elko County Road
N53406	Forest Service – wilderness designation area
N55624	BLM water pipelines
NVN83165	Bishop Creek Dam

Also identified, but not individually listed, were stock ponds, reservoirs, springs, canals, and numerous water pipelines/conduits.

4.1 AIR QUALITY AND CLIMATE

4.1.1 PROPOSED ACTION ALTERNATIVE

Vehicular travel used during the seismic program could increase fugitive dust and vehicle emissions which would continue until the seismic program is complete. All emissions would be short-term and temporary in nature and would not result in exceeding the NAAQS. Greenhouse gas emissions from project vehicles would represent a very small portion of the global budget of constituents which affect global climate change.

Environmental Protection Measures

BLM would require the following to reduce impacts to air quality:

- Posted speed limits shall be obeyed and Noble shall instruct personnel not to exceed 30 miles per hour on all dirt roads with no posted speed limits.

- Noble shall use water trucks, where necessary, to control fugitive dust.

4.1.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to air quality or climate in the project area.

4.1.3 CUMULATIVE EFFECTS

Air quality and climate are influenced by a variety of natural and man-made factors such as weather, climate change, smoke from wildfires, exhaust from vehicles, agriculture, travel on native surfaces and blowing dust from disturbed and native surfaces. Even when under these influences air quality is generally good and considered to be in attainment of National Ambient Air Quality Standards. These described cumulative effects would continue under the No Action Alternative. As described above, the Project would not likely result in additional impacts to air quality; therefore, there would be no incremental increase in cumulative effects. There are no cumulative effects of concern for air quality under the Proposed Action and No Action Alternative.

4.2 CULTURAL RESOURCES

4.2.1 PROPOSED ACTION ALTERNATIVE

Eighteen sites and eight isolated resources were newly recorded in the course of cultural resource surveys. Fifteen of the sites are historic and three are prehistoric. Five of the isolates are prehistoric and three are historic. Five sites are recommended as eligible for inclusion in the NRHP. The remainder of the sites and the eight isolated resources are recommended as not eligible for inclusion in the NRHP.

Two previously recorded linear sites that cross through the project area (26EK5150 and 26EK9820) were also revisited. One missing portion of segment 36 of the California National Historic Trail (26EK5150) was newly recorded and two previously recorded segments (segments 35 and 36) were reassessed. Six newly identified segments of the Central Pacific Railroad (26EK9820) were recorded. The historic town site of Metropolis and the Metropolis Cemetery were excluded from the project area due to the fragile and sensitive nature of these locations.

The Project would avoid sensitive cultural resources. Seismic vibrators produce a small amplitude ground motion that may cause damage to nearby freestanding structures and infrastructure laying on the surface of the ground where there is an unconstrained free surface allowing variable displacement with surface wave motion. However, the low amplitude ground motion does not lead to substantial subsurface displacement of material. Because the subsurface does not have a free boundary, little displacement of material is possible, and almost no differential displacement is possible that would lead to disturbance or damage to buried historical materials.

To protect cultural resources, the following measure would be employed by Noble and its contractors:

- Noble would discuss the location of any sensitive areas on private property with the landowner so that damage to these sites can be avoided. This includes the location of existing buildings, water wells, springs, canals, historic irrigation, historic sites, prehistoric sites, grave yards, or known burials. If the seismic crews discover these features, the features would be avoided by 300-foot buffers.

Environmental Protection Measures

In addition to the project's design features, BLM would require the following:

- All eligible sites and contributing components of eligible sites shall be avoided by a distance of 50 meters (164 feet) by all activities associated with the Project.
- Project personnel may drive on the noncontributing segments of the eligible linear sites ONLY if no improvements (i.e., road building or construction) are made within the 50-meter buffer of the historic property, and there is no deviation from the road within 50 meters of the historic property.
- Noble shall not knowingly disturb, alter, injure, or destroy any historical or archaeological site, structure, building or object on public lands. If Noble discovers any previously unidentified cultural resource that might be altered or destroyed by the Project, Noble shall immediately stop all activities in the vicinity of the discovery and the discovery shall be left intact and reported (775-753-0200) to the BLM Wells Field Office (BLM Authorized Officer), which shall evaluate the discoveries, take action to protect, remove or preserve the resource within 30 working days (43 CFR 3809.420).
- Pursuant to 43 CFR 10.4(g), Noble shall notify the BLM Authorized Officer, by telephone (775-753-0200), with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony (as defined in 43 CFR 10.2). Further pursuant to 43 CFR 10.4(c) and (d), Noble shall immediately stop all activities in the vicinity of the discovery and protect it for 30 days or until notified to proceed by the BLM Authorized Officer.

4.2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts to cultural resources from the Proposed Action.

4.2.3 CUMULATIVE EFFECTS

Cultural resources may be affected by continued or increased human presence (i.e., illegal collection and vandalism). These effects would continue under the No Action Alternative. As described above, the Project would avoid cultural resources; therefore, there would be no incremental increase in cumulative effects. There are no cumulative effects of concern for cultural resources under the Proposed Action and No Action Alternative.

4.3 FIRE MANAGEMENT

4.3.1 PROPOSED ACTION ALTERNATIVE

Cheatgrass is prevalent within many areas of the project area (HWA, 2012) and provides a large fuel load that can contribute to wildland fires. Once started, the fires tend to burn fast, cover large areas, and increase the frequency of fires in an area (Wildland Fire Associates, 2008). Based on the volume of cheatgrass present, recent large fires within the Project vicinity, and the high risk of fire potential in the project area (see Appendix B to Wildland Fire Associates, 2008), the Project could either ignite a fire or be susceptible to potential wildland fires, especially in dry conditions during the fall. To decrease the potential for fire ignition and in preparation for a wildland fire, the following measures would be employed by Noble and its contractors:

- Noble would discuss fire prevention during crew orientation and provide protocol on how to report a fire.
- Daily crew meetings would be conducted to facilitate communication and to keep the crew informed of any special areas of concern in the vicinity of that day's operation, including days with high fire danger (i.e., red-flag days).
- All vehicles (other than ATVs) would be equipped with fire extinguishers and a shovel to assist with first fire response in case of a fire, as well as a radio to facilitate

communication. Crews would only act on fires if they were small and manageable with the equipment available on their vehicles.

- Smoking would not be allowed in the project area.
- Fueling of vibroseis trucks and helicopters would only occur on roads or within areas with no vegetation; fueling trucks would be equipped with fire extinguishers.
- No vehicles would be parked in direct contact with vegetation; all vehicles would be parked where there is minimal vegetation.
- All vehicles, with the exception of vibroseis trucks, would be parked within the staging units overnight. Vehicles would be parked in areas without vegetation.
- Equipment and vehicles would be cleaned prior to entering BLM-administered lands to remove mud, dirt, and plant parts, as described within Section 4.5/Invasive, Non-Native Species. This process would minimize distribution of cheatgrass within the project area.

Vibroseis trucks would stay in the field; however, potential for fire ignition from the trucks is very minimal because engines are mounted on the top of the trucks and no other hot parts are near the ground. Also, most trucks used for the Project would be diesel, which have a cooler exhaust system and would minimize fire potential in the project area. The Project is not expected to be a fire risk.

Environmental Protection Measures

BLM would require the following environmental protection measures to further reduce effects to fire management:

- All vehicles, including ATVs, shall carry fire extinguishers.
- Adequate fire fighting equipment shall be kept at the staging areas, including shovels, extinguishers, and an ample water supply.
- Vehicle catalytic converters shall be inspected often and cleaned of all brush and grass debris.
- Wildland fires shall be reported immediately to the Elko Interagency Dispatch Center (775)748-4000.
- If a fire is caused by the Project, Noble shall be responsible for fire suppression costs.

4.3.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts to fire management from the Proposed Action.

4.3.3 CUMULATIVE EFFECTS

Cumulative effects that could impact fire management include: wildland fire, oil and gas exploration, dispersed recreation (i.e. hunting, camping, etc.), grazing, and OHV use. These described cumulative effects would continue under the No Action Alternative. As described above, with implementation of the protective measures, the fire risk associated with the Project is small. There would be no incremental increase in cumulative effects.

4.4 HYDROLOGY, FLOODPLAINS, AND RIPARIAN/WETLANDS

4.4.1 PROPOSED ACTION ALTERNATIVE

The types of activities described for the Project, without the protective measures included in the Project design, could affect water resources by creating disturbance and increasing the likelihood of erosion and deposition. Seismic activity may also alter lithology which could affect productivity of springs and wells. The proponent is proposing to use methods which would minimize the potential for these impacts to occur. Vehicular traffic near water resources would

be avoided. The potential for surface runoff and erosion would be limited due to low slope and the light level of proposed disturbance. The intensity of seismic activity proposed would not be expected to be sufficient to cause any impacts to lithology; however, the proponent is planning to avoid impacts to springs and wells by not performing any seismic activity nearby. Few, if any, effects to hydrology, floodplains, and riparian/wetlands are anticipated from the Project.

Environmental Protection Measures

None in addition to applicant project design features (i.e., avoidance of wet areas, 300-foot fueling buffer) and BLM standard stipulations.

4.4.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to the hydrology and riparian/wetland resources in the project area.

4.4.3 CUMULATIVE EFFECTS

Cumulative effects to water resources within the CESA occur as a result of a variety of natural and man-made factors including climate change, flooding, drought, wildlife utilization, livestock grazing, and upstream water diversions. Water quality and riparian areas are negatively affected by these impacts and it is apparent that these resources have already sustained substantive cumulative effects as described above for the affected environment. Proposed expansion of the Bishop Creek Dam would likely increase the intensity of these negative impacts. The described cumulative effects would continue under the No Action Alternative. As described above, the Project would not likely result in additional impacts to water quality and riparian areas; therefore, it would not result in additional cumulative impacts of concern.

4.5 INVASIVE, NON-NATIVE SPECIES

4.5.1 PROPOSED ACTION ALTERNATIVE

Surface disturbance, increased vehicle traffic to and from the project area, equipment placement and operation of vibroseis trucks, foot traffic, and ATV use in undeveloped areas could increase the disturbance within the project area, thereby creating habitat for expansion of noxious weeds within the project area and could introduce new invasive species. Noxious and invasive non-native weed species are common along major roadways and in disturbed areas. Use of existing roads and fencelines to move equipment and vehicles within the project area could result in the introduction of noxious weeds into uninfested areas. Minimizing soil disturbance and maintaining vegetation canopy to the extent practical would suppress weeds and prevent their establishment and growth. To minimize the spread or introduction of noxious weeds during seismic activities, Noble would:

- clean all equipment and vehicles with compressed air or water to remove mud, dirt, and plant parts prior to entering BLM-administered lands;
- utilize smooth, low-impact sand/floatation tires to reduce the force on the ground and minimize surface disturbance along the source lines;
- not allow equipment (i.e., seismic trucks, ATVs, pick-up trucks) to operate in areas of saturated ground when surface rutting could occur;
- require cross-country travel by small pick-up truck, ATV, or foot that would minimize ground disturbance and allow for greater mobilization around potential weed infestations;
- avoid streams, creeks, and wetland areas, which would avoid introducing noxious weeds into these sensitive areas; and
- revegetate areas as soon as practical where surface rutting or vegetation removal would occur.

Environmental Protection Measures

BLM would require the following environmental protection measures to further reduce effects from invasive, non-native species:

- Noble shall avoid all noxious weed infestations within the project area to the greatest extent possible.
- Weed identification materials shall be provided to workers in order to document weeds in the project area to avoid weed infestations; weeds observed should be reported to the BLM.
- Noble shall clean all equipment and vehicles at an off-site facility prior to arrival on-site and when going from private land to public lands. Equipment shall be cleaned before leaving the project area. Exceptions to this would be vehicles traveling daily to/from the project area and the City of Wells. Cleaning will remove all dirt, debris, and plant materials from vehicles.
- In consultation with the BLM, Noble shall identify sites where equipment can be cleaned; seeds and plant parts from project equipment need to be collected (on a plastic pad) and disposed of in a sanitary landfill. All equipment and vehicles will undergo an initial wash before their arrival on-site.
- Workers shall inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment prior to leaving the project area.
- Where the Project creates bare ground, vegetation shall be reestablished to prevent conditions to establish weeds; certified weed-free seed shall be used.
- If gravel is necessary for the Project, weed-free gravel shall be used.

4.5.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from invasive species associated with the Proposed Action in the project area.

4.5.3 CUMULATIVE EFFECTS

Cumulative effects within the CESA that could increase invasive, non-native plants and noxious weeds include: wildland fire, mineral exploration, oil and gas exploration, dispersed recreation (i.e., hunting, camping, etc.), grazing, and OHV use. These effects would continue under the No Action Alternative. Implementation of the design features and environmental protection measures would minimize the likelihood of the Project spreading or introducing invasive species/noxious weeds within the project area and watershed; therefore there would be no incremental increase in cumulative effects.

4.6 LAND TENURE, RIGHTS OF WAY AND OTHER USES

4.6.1 PROPOSED ACTION ALTERNATIVE

The Project would be completed within 60 operational days; effects would be temporary to other land uses, rights-of-way, or other uses. The Project would not result in additional rights-of-way or land uses.

Environmental Protection Measures

None in addition to applicant project design features and BLM standard stipulations.

4.6.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to land uses, rights of way or other facilities in the project area.

4.6.3 CUMULATIVE EFFECTS

Cumulative effects would occur as continued development in the area for rights-of-way and other uses is expected in the future. These effects would continue under the No Action Alternative. The Project would not affect land tenure (through implementation of the design features), nor would it increase land tenure; therefore, there would be no incremental increase in cumulative effects.

4.7 LIVESTOCK GRAZING/RANGELAND HEALTH

4.7.1 PROPOSED ACTION ALTERNATIVE

The Project would take place during a period when cattle are expected to be present on the coinciding grazing allotments. Vibroseis trucks, helicopters, and ATV use associated with the Project could potentially startle and scatter livestock. Increased vehicle traffic could raise the risk of injury or death to grazing cattle in the area. An increase in other human activity related to receiver line placement could cause cattle to avoid areas of activity during this phase of the project.

An estimated 396.4 acres of surface land (see Table 9) would be impacted by the vibroseis truck tires and seismic plates throughout the project area. This includes the crushing of livestock forage and other vegetation throughout the grazing allotments. The effects on forage grasses and other herbaceous vegetation are expected to last until the next growing season. Allotment AUMs are expected to be marginally and temporarily impacted.

Previous similar seismic projects have been conducted on active grazing allotments with minimal impacts to cattle in the area, and the Project will not prevent allotment permittees from grazing and related activities. Cattle would be free to graze in areas where receiver lines are on the ground.

To minimize effects, Noble has committed to the following:

- Fencing would not be cut or temporarily moved without the landowner's permission and/or presence.
- Fences would be closed or mended immediately after truck crossings.

Environmental Protection Measures

BLM would require the following environmental protection measures to further reduce effects to grazing:

- Noble shall consult with the BLM Rangeland Specialist and allotment permittees to communicate Project timing and locations of activities.
- Noble shall close gates used for access immediately after passing through them.
- Fences and/or gates that are replaced shall meet BLM stipulations.

4.7.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts to grazing and rangeland resources from the Proposed Action within the project area.

4.7.3 CUMULATIVE EFFECTS

Cumulative effects to livestock grazing and rangeland health within the CESA include: wildland fire, oil and gas exploration, Bishop Creek Dam, dispersed recreation (i.e., hunting, camping, etc.), and OHV use. These effects would continue under the No Action Alternative. As described above, the Project may have a small effect on grazing. There are no cumulative effects of concern for grazing and rangeland health under the Proposed Action and No Action Alternative.

4.8 MIGRATORY BIRDS

4.8.1 PROPOSED ACTION ALTERNATIVE

The average date for fledging young by migratory bird species observed on-site is August 15. For sagebrush-obligate species seen on-site, including BCC, the latest date for fledging young is August 6 for sage thrashers and Brewer's sparrow (Kingery, 1998), and early August for sage sparrows (Holmes and Johnson, 2005). Loggerhead shrikes are expected to fledge young by June 30. Even though young of these BCC species will remain in their nest vicinities for a period of time after they fledge, implementation of the Project in October would avoid take, as defined under MBTA, of these and other migratory birds nesting on-site.

Loss of shrub cover for some time after implementing the Project could reduce nesting cover and substrate for birds, especially for sagebrush and shrub-nesting obligates such as the BCC and other passerine species noted above. As described in Section 4.13.1 (Vegetation), 59.9 acres of shrub vegetation (including big sagebrush) are expected to be crushed by vibroseis truck tires and seismic plates. Reduction of vegetation structure in shrub stands would cause habitat fragmentation on a limited scale by altering habitat suitability. As described in Section 4.15.1 (Wildlife and Fisheries), noise from vibroseis trucks may attenuate to background levels 8,063 feet away and noise from pickup trucks would attenuate to background 283 feet away. Noise, vehicles/machinery, and human presence may displace birds away from home ranges although displacement would be near or at the end of the nesting cycle, having less consequence to breeding success than if effects occurred earlier in the cycle.

Habitat fragmentation has changed the landscape by removing habitat and leaving remnant areas of native habitat less functional, physically and biologically (Saunders, et al., 1991). Habitat fragmentation caused by overland travel of vibroseis trucks, pickup trucks, and ATVs is not expected to be as severe as fragmentation caused by surface clearing actions, such as roads and utility line corridors. Fragmentation of sagebrush shrub-steppe habitats affects breeding densities, nesting success, and nest predation of nesting species (Knick and Rotenberry, 2002). Such effects are typical of large-scale conversion of shrubland to grasslands. Fragmentation of nesting habitat allows predator access to breeding sites used by birds along newly created corridors and through edges of habitats that were previously continuous. Habitat fragmentation contributes to higher rates of nest predation in grasslands (Burger et al., 1994) and at habitat edges (Gates and Gysel, 1978; Marini et al., 1995). Corvids, including common ravens and American crows, are opportunistic predators and will prey on other species' nests. Prohibiting on-site trash within the project area could reduce attractions for corvids and other potential predators of migratory birds.

No unintentional take of migratory birds (defined in EO 13186) would occur because the Project would begin in October, after the nesting periods for all species. Nesting habitats in sagebrush-shrub vegetation used by three BCC in BCR 9 (sage thrasher, Brewer's sparrow, and sage sparrow) may be affected by the Project. During the past 20 years, the three BCC that are sagebrush-obligate species appear to be declining within the region although not within BCC 9. The Project may have an effect on declining populations of those three BCC species, though probably not a measureable effect as noted in the BLM-USFWS MOU (pursuant to EO 13186).

Environmental Protection Measures

The following environmental protection measures have been identified to reduce potential impact to migratory birds:

- Noble shall begin no earlier than September 1 in order to avoid disturbance to nests and any remaining juveniles.
- Noble shall prohibit trash storage in the project area.

4.8.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no change from the Proposed Action to habitats used for nesting and shelter by BCC and other migratory birds within the project area.

4.8.3 CUMULATIVE EFFECTS

Migratory birds (primarily passerine species plus waterfowl and shorebirds) are generally protected and/or avoided for any activities on public land but may not be protected for actions on private land. Past, present, and reasonably foreseeable activities that could impact nesting habitats for migratory birds include: wildland fire, livestock grazing, noxious weed proliferation, oil and gas exploration, dispersed recreation (i.e., hunting, camping, etc.), and OHV use. Changes in vegetative structure can extend over the long-term. Regional data for three BCC that are sagebrush obligate species indicate their populations are declining. Cumulative effects, including the Project and reasonably foreseeable actions, will contribute to habitat loss and/or alteration and may further affect populations of sagebrush obligate species. Cumulative effects would be limited to vegetation/habitat (<400 acres) and would be small (approximately 0.04 percent) within the CESA (see Map 13) as provided in Table 12.

Table 12
Acres Affected within the Watershed CESA

Resource	Total Acres within CESA	Acres Disturbed by Fire ¹	Acres Disturbed by Past, Present, and RFFA's ²	Total Acres Disturbance (%) ³	Acres of Habitat Disturbed by Project
Migratory Birds and Bird Special Status Species	1,078,218	253,756 (23.5%)	Mineral 408 Wind Energy ⁴ 14,779 ROWs 16,220 Total (2.9%) 31,407	285,559 (26.5%)	396 (0.04%)

¹ Source: BLM GIS data. Historic Fires (1981-2008).

² Acres are approximate – based on BLM LR2000 GeoReport database. Includes closed, authorized, and pending rights-of-way and surface management features.

³ Because disturbance acres may overlap (i.e., fire with past/present/RFFAs), the total is a conservative estimate.

⁴ Acres are associated with wind energy test sites.

4.9 NATIVE AMERICAN RELIGIOUS CONCERNS

4.9.1 PROPOSED ACTION ALTERNATIVE

Of the tribes and tribal affiliations that were notified of the Project (see Section 3.9), BLM received a letter on September 24th from the Confederate Tribes of the Goshute Indian Reservation requesting consultation. BLM met with the tribe on October 5th to discuss the Project and will continue consultation, as requested, for the Project. Based on the description and location of the Project, BLM has determined that this activity would not adversely affect any Native American religious site or religious practice or ceremony. The Project is not within a known Traditional Cultural Property. Existing ethnographic information does not suggest that Native American traditional, spiritual and/or cultural sites would be affected. Should issues arise, consultation will be on-going during the life of the Project.

Environmental Protection Measures

The following environmental protection measures have been identified to reduce potential impact to Native American Religious Concerns:

- If any cultural properties, items, or artifacts (stone tools, projectile points, etc.) not previously recorded by the BLM are encountered, the items shall NOT be collected and

the BLM Wells Field Office must be notified immediately of the discovery (775-753-0200).

- Though the possibility of disturbing Native American gravesites within the project area is extremely low, inadvertent discovery procedures must be noted. Under the Native American Graves Protection and Repatriation Act, section (3)(d)(1), it states that the discovering individual must notify the land manager in writing of such a discovery. If the discovery occurs in connection with an authorized use, the activity, which caused the discovery, is to cease and the materials are to be protected until the land manager can respond to the situation.

4.9.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to Native American Religious Concerns in the project area.

4.9.3 CUMULATIVE EFFECTS

It is likely that Native American concerns would be affected by most of the anticipated present and future actions in that continued or increased human presence almost always results in increased illegal collection and vandalism as well as conflicts with traditional uses and values. These effects would continue under the No Action Alternative. The Project should not affect Native American concerns, and, therefore, would not result in cumulative effects.

4.10 RECREATION

4.10.1 PROPOSED ACTION ALTERNATIVE

The Project may coincide with hunting seasons scheduled for Management Unit 075. Hunter access to the area would not be restricted. It is likely that hunters would choose to temporarily avoid the area where seismic activities would be occurring because these activities could startle and displace big game and generally impede the sport of hunting. Project personnel/crews would wear blaze orange vests in the field during hunting seasons.

Area roads and access to the Tabor Creek Recreation Area would remain open during seismic operations.

Environmental Protection Measures

None in addition to applicant project design features and BLM standard stipulations.

4.10.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to recreation resources in the project area.

4.10.3 CUMULATIVE EFFECTS

Cumulative effects to recreation resources (i.e., hunting, camping, OHV use) within the CESA include: wildland fire, oil and gas exploration, and grazing. These effects would continue under the No Action Alternative. As described above, the Project may have a small effect on recreation. There are no cumulative effects of concern for recreation resources under the Proposed Action and No Action Alternative.

4.11 SOILS

4.11.1 PROPOSED ACTION ALTERNATIVE

Under the Project, impacts to soils would occur from vehicles, which could potentially cause soil compaction and may alter soil structure. Although some vegetation may be crushed, the affected/crushed vegetation would continue to provide soil cover that should effectively prevent any increase in wind and water erosion. Effects to soils by contamination would be minimized by implementation of Noble's Spill Plan, which would require that any spills be cleaned up immediately. Overall effects to soils would be minimized by the use of helicopters (displacing the vehicles) and accessing areas from existing roads and trails.

The potential for soil compaction associated with placing and retrieving receiver lines, through the use of ATVs and foot traffic, is expected to be minor, short-term and incidental throughout the project area. All of the soils in the project area (39,444.5 acres) are susceptible to potential compaction and rutting. There are 6,167.20 acres, or 15.6 percent of the project area, that are associated with nine soil mapping units designated as hydric soils or have hydric soil inclusions within them. All nine of these mapping units are located on floodplains within the project area. Similarly, these same nine soil mapping units typically have a seasonal high water table within 5 feet of the surface which generally occurs between about February and July. These nine mapping units have a hazard of potential flooding during various times of the year; typically flooding may occur between March and June although several of the mapping units have a flooding hazard all year. The flooding hazard duration (i.e., very brief to long) and frequency (rare to frequent) also varies by soil mapping unit. Noble proposes to conduct seismic operations in the fall (dry season) and avoid all streams, creeks, wetlands, and saturated ground, thereby minimizing the potential impacts.

Noble proposes to drive the vibroseis trucks in a single file. Agricultural and forestry soil compaction research indicates that approximately 75 percent of total compaction on a soil occurs with the first pass; an additional 10 percent occurs with the second pass; and only 5 percent more with the third pass. Therefore, reducing the width of the source lines by confining traffic to the same area (single file) would minimize the total area affected.¹ Although this would intensify the potential for compaction in a limited area, the effect would be localized.

Cross-country traffic and subsequent compaction/rutting could affect Biological Soil Crusts (BSCs). This effect would decrease organism diversity in these areas, which could decrease soil nutrients, soil stability, and organic matter in the soil horizon. Crusts are well adapted to severe growing conditions but poorly adapted to compressional disturbances and/or removal. Once the Project is completed, it is expected that BSCs would eventually recolonize affected areas along traveled routes. Full recovery of BSCs from extensive disturbance is a slow process, particularly for mosses and lichens. Recovery of pre-disturbance crust thickness can take up to 50 years, and mosses and lichens can take up to 250 years to recover. No grading or other surface disturbing activities would occur, and, therefore, it is expected that potential impacts to BSCs would take considerably less time to recover.

None of the soils is irrigated or farmed in the project area, and all soils are under rangeland production. Therefore, no impact to prime farmland soils would occur.

Implementation of the Project would begin in Fall 2012 and is expected to last approximately 2 months. During this period of the year, soils are dry, soil strengths are the highest, and soils are the least susceptible to compaction or rutting effects.

¹ <http://www.soilsurvey.org/tutorial/page10.asp>

To minimize impacts to soils, Noble would:

- utilize existing roads, two-tracks, and trails to access the project area and conduct the Project.
- use low impact sand/balloon tires on heavy vibroseis trucks.
- conduct operations when the ground is dry and shut down operations in the event of a rainstorm.
- use helicopters to deploy receiver lines to minimize vehicular traffic.
- avoid areas of streams, creeks, wetland and saturated ground.
- develop and implement a Spill Prevention Plan in accordance with state regulations.

These design features would prevent or minimize impacts to soil resources within the project area, and, therefore, effects from the Project are expected to be short-term and minor.

Environmental Protection Measures

None in addition to applicant project design features and BLM standard stipulations.

4.11.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to soils in the project area.

4.11.3 CUMULATIVE EFFECTS

Cumulative effects to soils within the CESA occur as a result of a variety of natural and man-made factors including livestock grazing, drought, climate change, and physical disturbance. Soils are generally negatively affected by these impacts but they have not resulted in any major or high intensity impacts to soil quality on a large spatial or temporal scale within the CESA. The cumulative effects would continue under the No Action Alternative. As described above, the Project would result in few additional impacts to soil resources; therefore, there would be little or no incremental increase in cumulative effects under the Project. There are no cumulative effects of concern for soil quality under the Proposed Action and No Action Alternative.

4.12 SPECIAL STATUS SPECIES

4.12.1 PROPOSED ACTION ALTERNATIVE

ESA-Listed Species. The Project would not affect ESA-listed species. There is surface hydrologic connectivity between waterbodies within the project area (Tabor Creek, Burnt Creek, Bishop Creek, Humboldt River) and the Lahontan cutthroat trout Marys River Subbasin Priority Metapopulation Recovery Area. However, there is no evidence that Lahontan cutthroat trout migrate downstream in the Marys River mainstem to the Humboldt River near Deeth, which would be the only route for the species to occur within the project area. Average water temperatures in the Marys River likely to exceed 55°F between May through September and would likely be a thermal barrier to the species' movement downstream. Lahontan cutthroat trout that might occur in Tabor Creek, Burnt Creek, Bishop Creek, and the Humboldt River would not be affected because the Project would avoid all streams, creeks, and wetland areas and fueling of vibroseis trucks would not occur within 300 feet of any riparian areas or standing or flowing surface water.

ESA Candidate Species. Yellow-billed cuckoos would not be affected by the Project.

Columbia Spotted Frog. Columbia spotted frogs that might occur in Tabor Creek, Burnt Creek, Bishop Creek, and the Humboldt River would not be affected because the Project would avoid

all streams, creeks, and wetland areas and fueling of vibroseis trucks would not occur within 300 feet of any riparian areas or standing or flowing surface water.

Greater Sage-grouse. Implementation of the Project would coincide with sage-grouse use of brood-rearing and wintering habitats. These seasonally used habitats are within NDOW's Category 1 and Category 2 Habitats (public and private lands) and BLM's PPH category (public lands only).

Many of the effects to greater sage-grouse by seismic operations have been addressed in other wildlife sections and include 1) displacement from occupied habitats whether due to human presence, terrestrial and aerial machinery, or noise; 2) alteration of vegetation within tracks of vibroseis trucks and impact from seismic plates, which includes short-term effects (until next growing season) to herbaceous vegetation and longer-term effects (two years or more) to sagebrush and other shrubs (longer than 2 years); 3) short-term effects to vegetation due to fugitive dust; 4) long-term effects to soils and vegetation due to soil compaction and destruction of biologic soil crusts; 5) degradation of affected vegetation by invasive noxious weeds; 6) fragmentation of nesting and hiding cover; and 7) attracting predators of sage-grouse and nests to the project area. Corvids are effective nest predators of greater sage-grouse, taking eggs and possibly recently hatched chicks, and their abundance has been related to higher nest predation rates of sage-grouse (Hagen, 2009).

Effects of energy development on sage-grouse, including crushing vegetation during seismic operations, have been reviewed and summarized by USFWS (2010). The amount of vegetation affected by vibroseis trucks and seismic impact has been estimated in Section 4.13/Vegetation. The same approach was used to estimate effects to vegetation within each of the NDOW habitat categories that coincide with the project area. Vibroseis trucks traveling the estimated 542 miles of source lines and receiver lines, combined (worst case scenario), are expected to affect a total of 396.4 acres of ground surface. Based on estimates of shrub cover within different mapped vegetation within the project area, the Project would affect (assumed worst case) 59.9 acres of shrub cover and 336.4 acres of non-shrub cover (see Section 4.13/Vegetation).

Within NDOW Category 1 habitats, the estimated total affected ground surface would be 33.8 acres and 308.4 acres in Category 2 habitats (see Table 13). The total area in both habitat categories would be 342.2 acres within the various mapped vegetation types. Shrub cover that would be affected by truck tires and seismic plates in those vegetation types and that coincide with Category 1 and 2 habitats would total 56.3 acres while 285.9 acres of non-shrub cover (herbaceous vegetation, litter, bare ground) would be affected (see Table 13). By these estimates, there would be a net loss of effective habitat over some period of time, especially of shrub and sagebrush cover (see discussion in Section 4.13/Vegetation and Table 17).

**Table 13
Vegetation Types Affected and Estimates of Maximum Effects
within NDOW Sage-Grouse Habitat Categories**

Mapped Vegetation	Shrub Cover Characteristics	Estimated Area Affected by Vehicle Tracks and Seismic Impact				Total Affected In Categories 1 and 2	
		Category 1: Essential Irreplaceable Habitat (acres)	Category 2: Important Habitat (acres)	Category 3: Habitat of Moderate Importance (acres)	Non-Habitat (acres)	Maximum Shrub Area (acres)	Non-Shrub Area (acres)
Sagebrush Community	Shrub cover 10-30%	0	130.4	0.4	0.2	39.1	91.3
Sagebrush-Rabbitbrush	Shrub cover 10-20%	0	5.0	1.1	0	1.0	4.0
Sagebrush-Grassland	Shrub cover 5%	31.8	93.7	29.1	0.3	6.3	119.1

Mapped Vegetation	Shrub Cover Characteristics	Estimated Area Affected by Vehicle Tracks and Seismic Impact				Total Affected In Categories 1 and 2	
		Category 1: Essential Irreplaceable Habitat (acres)	Category 2: Important Habitat (acres)	Category 3: Habitat of Moderate Importance (acres)	Non-Habitat (acres)	Maximum Shrub Area (acres)	Non-Shrub Area (acres)
Rabbitbrush-Grassland	Shrub cover 10-20%	0.7	3.1	0.1	0.9	0.8	3.0
Greasewood	Shrub cover 5-15%	0	0.1	0.1	0	0	0.1
Grassland	Shrub cover <5%	0.2	9.0	12.1	0	0.4	8.9
Disturbed	None	0	0.3	0	0	0	0.3
Bare ground	None	0	0	0	0	0	0
Playa	None	0	0	0	0	0	0
Riparian	Not Defined	0.9	37.4	2.8	3.7	0	38.3
Drainage	Assumed shrub cover 10-30%	0.3	28.9	3.5	0	8.8	20.4
Agriculture	None	0	0.4	0	0	0	0.4
TOTAL		33.8	308.4	49.2	5.0	56.3	285.9

Within BLM's PPH, the estimated total affected ground surface would be 191.5 acres within the various mapped vegetation types and 24.4 acres within PGH (see Table 14). Shrub cover that would be affected within PPH would total 32.3 acres while 159.3 acres of non-shrub cover (herbaceous vegetation, litter, bare ground) would be affected (see Table 14).

Sage-grouse demographic data indicate that juvenile recruitment (production) within the Oneil Basin PMU has been below levels that are necessary for positive population growth, at least since 2005 (see Figure 2). Recent trends in male lek attendance rates in the PMU have been slightly increasing, but have been below average lek attendance within all PMUs in Elko County (see Figure 1). Given these demographic indicators, the Project would have a negative effect on sage-grouse habitats with the highest conservation values within the project area and may have a negative effect on the sage-grouse population in the Oneil Basin PMU.

There is a very limited number of hunting tags issued by NDOW annually for sage-grouse, resulting in minimal impact to adult birds. NDOW follows guidelines by the Western Association of Fish and Wildlife Agencies (Connelly, et al., 2004) which provide that hunting take below 10 percent of a PMU population is not an impact to the population as a whole. Elko County has closed PMUs to hunting where hunting resulted in take above 10 percent. The Oneil PMU is open to hunting because it has not exceeded the 10 percent take threshold.

BLM-Sensitive Species. Effects to BLM-sensitive animal species would generally be similar to effects addressed in Section 4.8/Migratory Birds, in Section 4.15/Wildlife and Fisheries, and to other sensitive species discussed in this section. The project is not expected to affect any of the seven bat species listed in Table 7 that could possibly occur. Vibroseis truck tires and seismic plates could crush Preble's shrews and Fletcher dark kangaroo mice. As discussed in Section 4.8/Migratory Birds, the BLM-sensitive birds that possibly nest in the project area (Swainson's hawk, prairie falcon, black tern, and short-eared owl) would have completed nesting and young would have fledged by the time of Project initiation. Take of adults, young, and/or an occupied nest by vibroseis trucks, pickup trucks, ATVs, and/or helicopter rotor wash could occur if the Project begins before the end of species' nesting cycles.

**Table 14
Vegetation Types Affected and Estimates of Maximum Effects
within BLM Sage-Grouse Habitat Categories**

Mapped Vegetation	Shrub Cover Characteristics	Estimated Area Affected by Vehicle Tracks and Seismic Impact			Total Affected In PPH	
		Preliminary Priority Habitat (acres)	Preliminary General Habitat (acres)	Not Displayed (acres)	Maximum Shrub Area (acres)	Non-Shrub Area (acres)
Sagebrush Community	Shrub cover 10-30%	68.8	0.1	0.2	20.6	48.2
Sagebrush-Rabbitbrush	Shrub cover 10-20%	3.4	0	0	0.7	2.7
Sagebrush-Grassland	Shrub cover 5%	86.5	16.0	0.3	4.3	82.2
Rabbitbrush-Grassland	Shrub cover 10-20%	2.8	0	0.7	0.6	2.2
Greasewood	Shrub cover 5-15%	0.1	0	0	0.0	0.1
Grassland	Shrub cover <5%	4.4	5.2	0	0.2	4.3
Disturbed	None	0.1	0	0	0	0.1
Bare ground	None	0	0	0	0	0.0
Playa	None	0	0	0	0	0.0
Riparian	Not Defined	5.6	1.0	2.9	0	5.6
Drainage	Assumed shrub cover 10-30%	19.5	2.2	0	5.9	13.7
Agriculture	None	0.2	0	0	0	0.2
TOTAL		191.5	24.4	4.1	32.3	159.3

One sensitive plant species, Elko rockcress, might occur in the project area. It is associated with Wyoming big sagebrush and green rabbitbrush, both of which are extensive in the project area. As with other vegetation, Elko rockcress occurring beneath vibroseis truck tires and/or seismic plates would be crushed. The plant is a perennial herb with a branched root crown (Morefield, 1997) and would probably grow from the root if aboveground structures were damaged. However, the species is incapable of colonizing moderately disturbed ground (for example, trampling by livestock) within appropriate habitat (Morefield, 1997).

Effects to other BLM-sensitive species that are known to occur within the project area are discussed below.

Western Burrowing Owls. Burrowing owls are protected by Nevada State Law and the MBTA. In Utah, USFWS (Romin and Muck, 2002) defined seasonal buffers for burrowing owls from March 1 to August 31, extending 0.25 mile from the nest burrow (Whittington and Allen, 2008). The temporal and spatial buffers apply to Nevada. The four burrowing owl nest sites and buffers within the project area are shown on Map 11. The Project would occur outside the seasonal buffer and would not affect owls.

Pygmy Rabbits. Seismic operations with vibroseis trucks can affect pygmy rabbit burrows. According to one study, heights of burrows within 82 feet (25 meters) of seismic operations were significantly lower after seismic activities than before; burrows collapsed if rolled over by vibroseis truck tires or impacted directly by seismic plates (Wilson, 2011). In these situations, damage to the burrow included infill of soil and splintered sagebrush blocking the entrance. Pygmy rabbits did not appear to be displaced from home ranges by seismic operations (Wilson, 2011). Available evidence does not indicate that driving vibroseis trucks within 10 feet or less of

pygmy rabbit burrows, without rolling directly over the burrow and with no seismic impact, causes changes in burrow characteristics. Based on available information, the BLM Elko District would require vibroseis trucks travelling along source lines to be at least 100 feet from active pygmy rabbit burrows found during surveys in 2012 (HWA, 2012) (see Map 11). In more densely populated pygmy rabbit areas (e.g., Sections 7 and 26, T38N, R61E), BLM may also require a biological monitor to precede the vibroseis trucks to ensure that an adequate buffer is maintained.

Other effects to pygmy rabbits are expected to be similar to effects to greater sage-grouse and other wildlife. Pygmy rabbits are a sagebrush-obligate species and may be sensitive to direct loss or modification of sagebrush habitat by any number of causes, including energy exploration and development (USFWS, 2010c). As noted, source lines have been routed to avoid pygmy rabbit burrows by 100 feet or more. Vibroseis truck tires and impact from seismic plates may affect an estimated 200.8 acres of ground surface including 30.6 acres of shrub and 170.3 acres of non-shrub vegetation. Similarly, trucks traveling along receiver lines (worst case scenario – not expected) may affect an estimated 195.5 acres of ground surface with estimates of 29.3 acres of shrub and 166.2 acres of non-shrub vegetation. The total estimated area of shrub vegetation affected is 59.9 acres (see Table 17). Based on other energy projects, seismic exploration represents a low level impact endeavor, especially when environmental protection measures have been implemented to specifically address pygmy rabbit protection.

Environmental Protection Measures

The following environmental protection measures have been identified to further reduce potential impacts to Special Status Animal Species:

- Receiver lines shall not be laid out using pickup trucks in the vicinity of active burrows.
- Vibroseis trucks shall maintain a buffer of 100 feet from active pygmy rabbit burrows.
- In more densely populated pygmy rabbit areas, BLM may require a biological monitor to precede the vibroseis trucks to ensure that an adequate buffer is maintained.

4.12.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no change from the Proposed Action to current conditions for Special Status Animal Species within the project area.

4.12.3 CUMULATIVE EFFECTS

Special Status Species are generally protected and/or avoided for any activities on public lands but may not be protected for actions on private lands unless they are actually federally-listed or state-protected. There is special concern for some species (such as Greater sage-grouse, pygmy rabbits) although they are still hunted. These species and several others (such as sagebrush-obligates) have been subjected to a long period of incremental habitat loss and conversion of native vegetation to vegetation dominated by invasive species has occurred throughout the CESA and has reduced the value of habitats to sagebrush associated wildlife species. Nearly all sensitive species would be affected by the past, present, and reasonably foreseeable future actions (i.e., wildland fire, livestock grazing, noxious weed proliferation, oil and gas exploration, dispersed recreation, OHV use, etc.) unless impacts are avoided or mitigated. Given the Project schedule, 60 operational days, and spatial buffers around pygmy rabbit burrows, cumulative effects to Special Status Species would be limited to vegetation/habitat (<400 acres) and would be small within the CESAs (see Map 14 and Map 15) as shown in Table 15 and Table 16.

Table 15
Acres Affected within Watershed CESA North of I-80

Resource	Total Acres within CESA	Acres Disturbed by Fire ¹	Acres Disturbed by Past, Present, and RFFA's ²	Total Acres Disturbance (%) ³	Acres of Habitat Disturbed by Project
Special Status Species and General Wildlife (excluding birds)	689,177	221,950 (32.2%)	Mineral 349	250,039 (36.3%)	396 (0.06%)
			Wind Energy ⁴ 13,100		
			ROWs 14,244		
			Total (4%) 27,693		

¹ Source: BLM GIS data. Historic Fires (1981-2008).

² Acres are approximate – based on BLM LR2000 GeoReport database. Includes closed, authorized, and pending rights-of-way and surface management features.

³ Because disturbance acres may overlap (i.e., fire with past/present/RFFAs), the total is a conservative estimate.

⁴ Acres are associated with wind energy test sites.

Table 16
Acres Affected within Oneil PMU CESA

Total Acres within CESA	Total Acres of Habitat within CESA	Acres Disturbed by Fire ¹	Acres of Habitat Disturbed by Project	Acres Disturbed by Past, Present, and RFFA's ²
1,014,670	BLM Habitat	BLM Habitat	BLM Habitat	Mineral 352 Wind Energy ³ 69,140 ROWs 20,886 Total 90,378
	PPH 665,794	PPH 213,368 (32%)	PPH 191.5 (0.03%)	
	PGH 41,092	PGH 22,767 (55%)	PGH 24.4 (0.06%)	
	NDOW Habitat	NDOW Habitat	NDOW Habitat	
	Essential 464,455	E 41,674 (9%)	E 33.8 (0.01%)	
	Important 429,394	I 239,594 (56%)	I 308.4 (0.07%)	
	Moderate 68,713	M 28,838 (42%)	M 49.2 (0.07%)	
Low 48,277	Low 8,796 (18%)	Low 0		

¹ Source: BLM GIS data. Historic Fires (1981-2008).

² Acres are approximate – based on BLM LR2000 GeoReport database. Includes closed, authorized, and pending rights-of-way and surface management features.

³ Acres are associated with wind energy test sites.

4.13 VEGETATION

4.13.1 PROPOSED ACTION ALTERNATIVE

The Project 1) would affect plants and plant structure if they are crushed, injured or killed; 2) may generate dust that could affect plants in the vicinity; 3) may affect biological soil crusts (see Section 4.11/Soils); and 4) may lead to increased infestations of noxious weeds (see Section 4.5/Invasive, Non-Native Species). Vibroseis trucks are equipped with low-tread, large tires (estimated 5 feet tall, 3 feet wide) to distribute the load on the ground to about 12 psi. Passage of three trucks single file would intensify but confine vegetation effects to single locations compared to effects by three trucks traveling on different paths.

Vibroseis truck tires have been reported to damage or kill shrubs by crushing them (BLM, 2002). Menkens and Anderson (1985) found that vegetation structure was affected by vibroseis truck tires and impact of the seismic plate; vegetation was flattened by both and remained flattened for a year following the impact. Vegetation impacted by the seismic plate recovered in the following year but vegetation crushed by tires showed effects of the impact for at least two years afterwards (Menkens and Anderson, 1985).

Greasewood, bitterbrush, and rabbitbrush re-sprout following fire or mechanical treatments (Church, 2009; Bunting, et al., 1987). Big sagebrush does not sprout back from similar effects but regenerates from seed (West, 1988). Cover is reduced considerably by mechanical treatment of sagebrush (e.g., crushed using a Lawson aerator), lasting for a 2- to 5-year period; big sagebrush may eventually re-grow from seed and/or survival of damaged plants, depending on precipitation (Yeo, 2009; Summers, 2005).

The Project would affect vegetation types along the source lines in almost the same proportions that they occur within the project area; for example: 1) slightly less Sagebrush Community (33.0 percent) would be affected relative to the amount present (34.6 percent); and 2) slightly more Sagebrush-Grassland (39.0 percent) would be affected relative to the amount present (37.6 percent). The total estimated surface effects due to truck tires and seismic plate impact is 396.4 acres (see Table 17).

Most effects to big sagebrush would be in habitats with the most sagebrush shrub cover which would be in sagebrush community (with a range of 10 to 30 percent shrub cover) and sagebrush-rabbitbrush vegetation (range of 10 to 20 percent shrub cover). Effects to sagebrush would be less in sagebrush-grassland vegetation (5 percent shrub cover). No shrub cover was estimated for the Riparian and Drainage types so shrubs are assumed to be absent. Shrubs occur in Drainage vegetation, with shrub cover estimated between 10 and 30 percent. Applying the maximum shrub cover in the estimated range noted in Table 17, a total of 59.9 acres of shrubs (of various species) would be impacted by truck tires and seismic plates within the project area. Crushing effects to shrubs in that area would be expected to persist for two years or more. Effects to non-shrub vegetation (grasses, forbs) within 336.4 acres would be expected to last through the next growing season.

**Table 17
Vegetation Types Affected and Estimates of Maximum Effects to
Shrub Components and Non-Shrub Vegetation**

Mapped Vegetation	Shrub Cover Characteristics	Vegetation in Project Area		Estimated Area Affected by Vehicle Tracks and Seismic Impact			
		Total Area (acres)	Percent	Total Track Area (acres)	Percent of Track Area	Maximum Shrub Area (acres)	Non-Shrub Area (acres)
Sagebrush Community	Shrub cover 10-30%	13,647.6	34.6	131.0	33.0	39.3	91.7
Sagebrush-Rabbitbrush	Shrub cover 10-20%	591.5	1.5	6.1	1.5	1.2	4.9
Sagebrush-Grassland	Shrub cover 5%	14,820.4	37.6	154.8	39.0	7.7	147.0
Rabbitbrush-Grassland	Shrub cover 10-20%	498.7	1.3	4.8	1.2	1.0	3.8
Greasewood	Shrub cover 5-15%	25.7	0.1	0.3	0.1	0	0.3
Grassland	Shrub cover <5%	1,944.4	4.9	21.3	5.4	0.9	20.5
Disturbed	None	23.7	0.1	0.3	0.1	0	0.3
Bare ground	None	6.1	0.0	0	0	0	0
Playa	None	0.4	0.0	0	0	0	0
Riparian	Not Defined	4392.0	11.1	44.8	11.3	0	44.8
Drainage	Assumed shrub cover 10-30%	3450.7	8.7	32.7	8.3	9.8	22.9
Agriculture	None	43.3	0.1	0.4	0.1	0	0.4
TOTAL		39,444.5	100	396.4	100	59.9	336.4

Fugitive dust could be generated by vibroseis trucks, pickup trucks, ATVs, and helicopter operations. Damage or mortality to individual plants as a result of decreased light transmission due to dust deposited directly on leaves or other photosynthetic surfaces could occur during seismic operations. Dust from various sources could impair photosynthesis, gas exchange, transpiration, leaf morphology, and stomata function (Farmer, 1993; Sharifi et al., 1997; Rai et al., 2009). Dust from the Project could also interfere with plant reproduction by affecting pollinators during the late summer and autumn flowering season, such as rubber rabbitbrush, gray horsebrush, broom snakeweed, common yarrow, and various other members of the aster family (Asteraceae), if present.

Environmental Protection Measures

- None in addition to applicant project design features and BLM standard stipulations.

4.13.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to vegetation within the project area.

4.13.3 CUMULATIVE EFFECTS

Cumulative effects that could impact vegetation within the CESA include: wildland fire, oil and gas exploration, dispersed recreation (i.e., hunting, camping, etc.), grazing, increased noxious weed presence, and OHV use. These effects would continue under the No Action Alternative. As described above, the Project’s impacts would be small. Within the CESA (see Map 13), the

Project is not expected to add to or prolong any of the cumulative effects already occurring due to other forms of multiple use; therefore, there would be little or no incremental increase in cumulative effects under the Proposed Action. There are no cumulative effects of concern for vegetation under the Proposed Action and No Action Alternative.

4.14 VISUAL RESOURCES MANAGEMENT

4.14.1 PROPOSED ACTION ALTERNATIVE

Vehicular travel, fugitive dust from vehicular travel, and helicopter use in the project area would be temporary impacts to visual resources. These activities do not conflict with the management objectives of the VRM Class IV area in which the project area is located.

Environmental Protection Measures

None in addition to applicant project design features and BLM standard stipulations.

4.14.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no impacts from the Proposed Action to visual resources in the project area.

4.14.3 CUMULATIVE EFFECTS

There would be no cumulative effects of concern to visual resources from the Proposed Action or No Action Alternative.

4.15 WILDLIFE AND FISHERIES

4.15.1 PROPOSED ACTION ALTERNATIVE

Game and Non-game Species. The Project may coincide with the 2012 harvest seasons within Management Unit 075 for pronghorn, mule deer, chukar, Hungarian partridge, quail, cottontail and pygmy rabbits, jackrabbits, and sage-grouse. The Project may also coincide with the pronghorn rut, which extends through early October, although males would establish and defend territories beginning in March or April (Kitchen, 1974). The presence of vibroseis trucks, pickup trucks, ATVs, helicopters, and people on foot during seismic exploration is likely to similarly displace pronghorns from home ranges and breeding territories in the vicinity of the activities (Reeve, 1984), but the effects are expected to be localized and temporary, perhaps lasting as long as the Project duration. The mule deer rut is during November (Mackie et al., 1998), so disruption of breeding should not occur, although deer in the vicinity could be displaced by seismic operations (Horejsi, 1976; Ihsle, 1982). Other game and non-game wildlife would be expected to be displaced from home ranges by seismic activities. Displaced individuals are often susceptible to increased predation, especially if they escape to habitats without suitable hiding cover.

Wildlife displacement can be a response to noise, although noise and human presence coincide so the effects of either may not be discernable. Most studies of noise effects on wildlife have been related to roads and traffic (reviewed in Federal Highway Administration, 2004). There is no single noise threshold that would apply to all wildlife, and species are affected and respond differently throughout the year during different stages in life cycles. Noise from vibroseis and pickup trucks would be detected by wildlife if above ambient background levels, assumed to be 40 dB in a rural setting (non-wilderness- see EPA, 1974). A diesel-powered vibroseis truck is assumed to produce noise similar to other construction trucks, 84 dBA at 50 feet, while pickup trucks produce noise 55 dBA at 50 feet (Federal Highway Administration, 2006). Vibroseis truck

noise would attenuate to background levels 8,063 feet away; noise from the pickup trucks would attenuate to background 283 feet away.

All small game mammals, furbearers, nongame mammals, reptiles, and amphibians are susceptible to mortality by vehicles on or off roads. Species most susceptible to vehicle-related mortality include those that are inconspicuous (lizards, snakes, and small mammals), those with limited mobility, burrowing species (pocket gophers, ground squirrels, pygmy rabbits), wildlife with behavioral activity patterns (i.e., nocturnal/crepuscular activity) making them vulnerable, and wildlife that may scavenge carrion (Leedy, 1975; Bennett, 1991; Forman and Alexander, 1998; Trombulak and Frissel, 2000). Those species could be crushed by vibroseis tires and/or operation of seismic plates.

Overland travel of vibroseis trucks and other vehicles would affect vegetation, primarily by crushing plants, which affects plant abundance and vegetation structure within areas of tire tracks and impact by seismic plates. Effects to herbaceous vegetation is expected to last until the next growing season, but effects to shrubs could last for two years or longer, especially crushed sagebrush. Loss of shrub cover for some time would reduce forage for some herbivores (pronghorn, mule deer, pygmy rabbits, sage-grouse), reduce hiding cover and thermal shelter (cottontails, jackrabbits, sage-grouse, horned lizards, and other reptiles, other game and non-game species), and reduce nesting cover and substrate for birds. Effects to sagebrush obligate species could extend over a period of several years since sagebrush killed by crushing would not regenerate from roots (see Section 4.13.1/Vegetation). Reduction of vegetation structure in shrub stands would cause habitat fragmentation on a limited scale but would not be as severe as fragmentation caused by surface clearing actions, such as roads and utility line corridors.

Fish. The Project is scheduled after native fish species spawn. Because all streams, creeks, and wetland areas would be avoided and fueling of vibroseis trucks would not occur within 300 feet of any riparian areas or standing or flowing surface water (including streams, ponds, springs, seeps and stock reservoirs), native and non-native fish that might occur in Tabor Creek, Burnt Creek, Bishop Creek, and the Humboldt River would not be affected by the Project.

Environmental Protection Measures

None in addition to applicant project design features and BLM standard stipulations.

4.15.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, there would be no change from the Proposed Action to current conditions for game and non-game wildlife species or habitats within the project area.

4.15.3 CUMULATIVE EFFECTS

Wildlife (game and non-game) would be affected by the past, present, and reasonably foreseeable future activities within the CESA (see Map 14 and Map 16) because these species are found almost everywhere and are highly mobile. The primary effects to these species are direct habitat loss or conversion, habitat fragmentation, or disturbance during critical seasons (breeding, nesting, rearing of young, and critical wintering) of their lifecycles. Pronghorn fawn recruitment within the CESA has been low and has likely contributed to limited population growth. Cumulative effects, including the Project and reasonably foreseeable actions, will affect pronghorn population growth. The Project would be temporary and completed in 60 operational days; therefore, cumulative effects to wildlife would be minor within the scope of the CESAs (see Map 14 and Map 16) as shown in Table 15 and Table 18.

Table 18
Acres Affected within Pronghorn CESA - Units 072, 074, 075

Total Acres within CESA	Total Acres of Seasonal Ranges within CESA		Acres of Habitat Disturbed by Fire ¹		Acres of Habitat Disturbed by Project		Acres Disturbed by Past, Present, and RFFA's ²	
1,177,094	Crucial Summer	37,974	Crucial Summer	15,219 (54%)	Crucial Summer	0	Mineral	529
	Crucial Winter	694	Crucial Winter	0	Crucial Winter	0	Wind Energy ³	2,246
	Summer	822,789	Summer	163,393 (20%)	Summer	396	ROWs	21,989
	Winter	35,578	Winter	8,092 (23%)	Winter	0		
	Yearlong	2,033	Yearlong	0	Yearlong	0	Total	94,764

¹ Source: BLM GIS data. Historic Fires (1981-2008).

² Acres are approximate – based on BLM LR2000 GeoReport database. Includes closed, authorized, and pending rights-of-way and surface management features.

³ Acres are associated with wind energy test sites.

CHAPTER 5 – TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

The BLM sent letters (dated March 16, 2012) to or consulted with the following:

Tribes

Battle Mountain Band Council
Confederate Tribes of the Goshute Indian Reservation
Duckwater Shoshone Tribe
Elko Band Council
Ely Shoshone Tribe
Shoshone Paiute Tribes of the Duck Valley Indian Reservation
South Fork Bank Council
Te-Moak Tribe of Western Shoshone
Wells Band Council
Yomba Shoshone Tribe

Agencies

Bureau of Indian Affairs
Nevada Department of Wildlife (Allen Jenne)
Western Shoshone Committee
Western Shoshone Defense Project
Western Shoshone Descendants of Big Smoky

CHAPTER 6 – LIST OF PREPARERS

6.1 LIST OF PREPARERS AND PARTICIPANTS

BLM INTERDISCIPLINARY REVIEW

NAME	TITLE	AREA OF RESPONSIBILITY
Bryan Fuell	Wells Field Manager	Field Manager
Bryan Mulligan	Natural Resource Specialist	Weeds
Nycole Burton	Natural Resource Specialist	Wildlife
Allen Mariluch	Environmental Protection Specialist	Native American, Recreation, Visual
Donna Jewell	Assistant Field Manager, Renewable	Renewable Resources
Sara Ferreira	Realty Specialist	Land use, right of way
Whitney Wirthlin	Geologist – Project Lead	Hazardous Wastes/Solid Wastes
Jeff Moore	Rangeland Management Specialist	Grazing/Rangeland Health
Mark Dean	Hydrologist	Water/Air/Soil
Matthew Werle	Archaeologist	Archaeology
Victoria Anne	Planning and Environmental Coordinator	NEPA

Edge Environmental, Inc.

Name	Resource/Responsibility
Carolyn Last	Project Manager, Document Control and Review
Mary Bloomstran	Air Quality, Noise, Document Control and Review
Dan Duce	Soils, Prime or Unique Farmlands
Nikie Gagnon	Water Resources, Land Tenure, ROW,
Rebecca Buseck	Invasive, Non-Native Species Special Status Plants Fire Management
Archie Reeve	Migratory Birds Wildlife (Fish, Aquatic, and Terrestrial) Special Status Animal Species Vegetation
Josh Moro	Visual Resources, Recreation
Cultural Resource Analysts, Inc.	Cultural

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Appendix A

Noxious Weeds Included on the Nevada Noxious Weed List

Appendix A
Noxious Weeds Included on the Nevada Noxious Weed List ¹

Common Name Scientific Name	Weed Characteristics ²	Potential in Project Area ³
Nevada Category A Weeds		
Camelthorn <i>Alhagi camelorum</i>	Areas of high water tables such as saline meadows, playas, riparian areas, and cropland.	Known in central/south Nevada
Mayweed chamomile <i>Anthemis cotula</i>	Disturbed sites; infests roadsides, waste areas, landscaped areas, and crop fields.	Known to occur in southern/central/western/northern Nevada
Giant reed <i>Arundo donax</i>	Moist soils.	Known in northern/southern Nevada
Purple starthistle <i>Centaurea calcitrapa</i>	Waste areas, right-of-ways, and pastureland.	Known to occur in northcentral Nevada
Iberian starthistle <i>Centaurea iberica</i>	Arid and semi-arid rangeland, abandoned cropland, and waste areas; not known to occur in Nevada.	Not known to occur in Nevada
Spotted knapweed <i>Centaurea masculosa</i>	Dry, well-drained soils; infests rangelands, waste areas, and roadsides.	Elko County
Malta starthistle <i>Centaurea melitensis</i>	Infests rangelands, pastures, crop fields, waste areas, and roadsides.	Known to occur in southern Nevada
Yellow starthistle <i>Centaurea solstitialis</i>	Arid and semi-arid rangeland, pastures, cultivated fields, waste areas, and roadsides; prefers shallow, gravelly soils.	Elko County
Squarrose knapweed <i>Centaurea virgata</i>	Infests rangelands, waste areas, and roadsides.	Elko County
Rush skeletonweed <i>Chondrilla juncea</i>	Rangeland, cropland, rights-of-ways, and waste areas; prefers thin rocky soils or gravelly to sandy soils.	Elko County
Common crupina <i>Crupina vulgaris</i>	Abandoned cropland, improved pasture, gravel pits, disturbed areas, and right-of-ways.	Known in western Nevada
Houndstongue <i>Cynoglossum officinale</i>	Moist areas; often found in pastures, roadsides, fence lines, waste areas, and along waterways.	Elko County
Goatsrue <i>Galega officinalis</i>	Nutrient rich loam and clay soils in moist meadows; not known to occur in Nevada.	Not known to occur in Nevada
Hydrilla <i>Hydrilla verticillata</i>	Still or slow-moving water; not known to occur in Nevada.	Not known to occur in Nevada
Black henbane <i>Hyoscyamus niger</i>	Open sites with well-drained soils; infests roadsides, waste areas, field borders, pastures, and rights-of-ways.	Elko County
Common St. Johnswort/Klamath weed <i>Hypericum perforatum</i>	Coarse-textured, gravelly, well-drained soils in old meadow, pastures, right-of-ways, and waste areas.	Elko County
Dyer's woad <i>Isatis tinctoria</i>	Broad range of sites; often infests waste areas, roadsides, rangeland, pastures, and crop fields.	Elko County
Dalmatian toadflax <i>Linaria dalmatica</i>	Dry, well-drained, gravelly soils; often infests rangelands, waste areas, roadsides, right-of-ways, and other disturbed sites.	Elko County

Common Name Scientific Name	Weed Characteristics ²	Potential in Project Area ³
Yellow toadflax <i>Linaria vulgaris</i>	Coarse soils; often infests rangelands, waste areas, and roadsides.	Elko County
Purple loosestrife <i>Lythrum salicaria, L.virgatum and their cultivars</i>	Wet areas; often in marshes, and along edges of pond and waterway, and in riparian areas and flood plains.	Elko County
Eurasian water-milfoil <i>Myriophyllum spicatum</i>	Lakes, ponds, canals.	Known in western/eastern Nevada
African rue <i>Peganum harmala</i>	Desert scrub, waste places.	Known in south/southwest Nevada
Green (crimson) fountaingrass <i>Pennisetum setaceum</i>	Climates with mild winters; infests disturbed areas such as roadsides, desert areas, washes, and waste areas.	Known in southern Nevada
Sulfur cinquefoil <i>Potentilla recta</i>	Mesic and xeric disturbed sites, including rangelands, waste areas, right-of-ways, and roadsides.	Elko County
Austrian fieldcress <i>Rorippa austriaca</i>	Cultivated fields and waste areas near cultivated fields; not known to occur in Nevada.	Not known to occur in Nevada
Mediterranean sage <i>Salvia aethiopsis</i>	Pastures, meadows, rangeland, and other open disturbed areas.	Elko County
Giant salvinia <i>Salvinia molesta</i>	Areas that do not experience extended periods of freezing temperatures; not known to occur in Nevada.	Not known to occur in Nevada
Sow thistle <i>Sonchus arvensis</i>	Moist (poorly drained), fine-textured and fertile soils; often infests crop fields, gardens, waste areas, and ditch banks.	Elko County
Austrian peaweed (Swainsonpea) <i>Sphaerophysa salsula / Swainsona salsula</i>	Cultivated fields and waste areas near cultivated fields; not known to occur in Nevada.	Not known to occur in Nevada
Syrian beancaper <i>Zygophyllum fabago</i>	Infests rangeland, roadsides, and desert areas.	Known to occur in central Nevada
Nevada Category B Weeds		
Russian Knapweed <i>Acroptilon repens</i>	Cropland, rangeland, riparian and waste areas.	Elko County, On-Site
Sahara mustard <i>Brassica tournefortii</i>	Dry, sandy soils and sparse vegetation; infests roadsides, waste areas, washes, and desert areas.	Known to occur in southern Nevada
Musk thistle <i>Carduus nutans</i>	Cropland and rangeland, rights-of-ways, riparian areas, and meadows.	Elko County
Diffuse knapweed <i>Centaurea diffusa</i>	Dry, well-drained soils; often infests rangelands, waste areas, and roadsides.	Elko County
Leafy spurge <i>Euphorbia esula</i>	Wide range of sites; often found in pastures, waste areas, rangelands, field borders and long waterways.	Elko County
Scotch thistle <i>Onopordum acanthium</i>	Waste areas, right-of-ways, pastureland, rangeland, and riparian areas.	Elko County, On-Site
Carolina horsenettle <i>Solanum carolinense</i>	Sandy, well-drained soils; often infests crop fields and pastures.	Elko County (only)

Common Name Scientific Name	Weed Characteristics ²	Potential in Project Area ³
White horse-nettle <i>Solanum elaeagnifolium</i>	Rangeland, roadsides, waste areas, crop fields, and meadows.	Elko County
Medusahead <i>Taeniatherum caput-medusae</i>	Sparsely vegetated rangeland degraded to low seral stage; clay soils.	Elko County
Nevada Category C Weeds		
Hoary cress <i>Cardaria draba</i>	Disturbed areas and in croplands, rangelands, and riparian areas. Prefers alkaline soils.	Elko County, On-Site
Water hemlock <i>Cicuta maculata</i>	Moist soils; often in crop fields, roadsides, waste areas, and along waterways.	Elko County
Canada thistle <i>Cirsium arvense</i>	Disturbed sites; deep, loose, cool soils.	Elko County, On-Site
Poison hemlock <i>Conium maculatum</i>	Borders of pastures and cropland; tolerates poorly drained soils and occurs in riparian areas.	Elko County
Perennial pepperweed <i>Lepidium latifolium</i>	Waste areas, riparian areas, roadsides, rangeland, and cropland.	Elko County, On-Site
Johnsongrass <i>Sorghum halepense</i>	Pastures, cultivated cropland, meadows, and waste areas.	Known to occur in south/southwest Nevada
Salt cedar (tamarisk) <i>Tamarix spp</i>	Along streams, canals, reservoirs, floodplains, and riparian areas.	Elko County
Puncturevine <i>Tribulus terrestris</i>	Disturbed areas, right-of-ways, and disturbed dry rangelands.	Elko County

¹ NDOA, 2012.

² Creech et al., 2010; BLM, 1998.

³ Creech et al., 2010; Elko County, 2008; HWA, 2012; Mulligan, 2012.

Appendix B

Common Names and Scientific Names for Animal and Plant Species Discussed in the Text and Included in Tables

Appendix B
Common Names and Scientific Names for Animal and Plant Species
Discussed in the Text and Included in Tables

Mammals (in taxonomic order):

Preble's shrew, *Sorex preblei*
Townsend's big-eared bat, *Corynorhinus townsendii pallescens*
Spotted bat, *Euderma maculatum*
Small-footed Myotis, *Myotis ciliolabrum*
Long-eared Myotis, *Myotis evotis*
Fringed myotis, *Myotis thysanodes*
Long-legged Myotis, *Myotis volans*
Yuma myotis, *Myotis yumanensis*
Pygmy rabbit, *Brachylagus idahoensis*
Mountain cottontail, *Sylvilagus nuttallii*
White-tailed jackrabbit, *Lepus townsendii*
Uinta chipmunk, *Tamias umbrinus*
Townsend's ground squirrel, *Urocitellus townsendii*
Pocket gopher, *Thomomys* spp.
Fletcher dark kangaroo mouse, *Microdipodops megacephalus nasutus*
Ord's kangaroo rat, *Dipodomys ordii*
Beaver, *Castor canadensis*
Porcupine, *Erethizon dorsatum*
Coyote, *Canis latrans*
Sierra Nevada red fox, *Vulpes vulpes necator*
Gray wolf, *Canis lupus*
North American wolverine, *Gulo gulo luscus*
Bobcat, *Felis rufous*
Pronghorn, *Antilocapra Americana*
Elk, *Cervus elaphus*
Mule deer, *Odocoileus hemionus*

Herpetofauna (in taxonomic order)

REPTILES

Great Basin collared lizard, *Crotaphytus bicinctores*
Desert horned lizard, *Phrynosoma platyrhinos*
Common sagebrush lizard, *Sceloporus graciosus*
Western fence lizard, *Sceloporus occidentalis*
Great Basin whiptail, *Aspidoscelis tigris tigris*
Western skink, *Plestiodon skiltonianus*
Western rattlesnake, *Crotalus viridis*

AMPHIBIANS

Columbia spotted frog, *Rana luteiventris*

Birds (in taxonomic order):

Canada goose, *Branta canadensis*
Mallard, *Anas platyrhynchos*
Northern pintail, *Anas acuta*
Chukar, *Alectoris chukar*
Hungarian partridge, *Perdix perdix*

Ruffed grouse, *Bonasa umbellus*
Greater sage-grouse, *Cetrocercus urophasianus*
Columbia sharp-tailed grouse, *Tympanuchus phasianellus columbianus*
Least bittern, *Ixobrychus exilis heperis*
White-faced Ibis, *Plegadis chihi*
Turkey vulture, *Cathartes aura*
Bald eagle, *Haliaeetus leucocephalus*
Northern goshawk, *Accipiter gentilis*
Swainson's hawk, *Buteo swainsoni*
Red-tail hawk, *Buteo jamaicensis*
Ferruginous hawk, *Buteo regalis*
Golden eagle, *Aquila chrysaetos*
American kestrel, *Falco sparverius*
Prairie falcon, *Falco mexicanus*
Mountain plover, *Charadrius montanus*
Long-billed curlew, *Numenius americanus*
Black tern, *Chlidonias niger*
Mourning dove, *Zenaida macroura*
Yellow-billed cuckoo, *Coccyzus americanus*
Western burrowing owl, *Athene cunicularia hypugea*
Short-eared owl, *Asio flammeus*
Loggerhead shrike, *Lanius ludovicianus*
Black-billed magpie, *Pica pica*
American robin, *Turdus migratorius*
Sage thrasher, *Oreoscoptes montanus*
Green-tailed towhee, *Pipilo chlorurus*
Brewer's sparrow, *Spizella breweri*
Sage sparrow, *Amphispiza belli*
Red-winged blackbird, *Agelaius phoeniceus*
Western meadowlark, *Sturnella neglecta*
Brewer's blackbird, *Euphagus cyanocephalus*

Fish (in taxonomic order):

Lahontan cutthroat trout, *Oncorhynchus clarki henshawi*
Bull trout, *Salvelinus confluentus*
Interior Columbia Basin redband trout, *Oncorhynchus mykiss gairdneri*
Common carp, *Cyprinus carpio*
Tui chub, *Gila bicolor*
Independence Valley tui chub, *Siphaeles (Gila) bicolor isolata*
Relict dace, *Relictus solitarius*
Speckled dace, *Rhinichthys osculus*
Independence Valley speckled dace, *Rhinichthys osculus lethoporus*
Clover Valley speckled dace, *Rhinichthys osculus oligoporus*
Redside shiner, *Richardsonius balteatus*
Mountain sucker, *Catostomus platyrhynchus*

Tahoe sucker, *Catostomus tahoensis*
White catfish, *Ictalurus catus*
Black bullhead, *Ictalurus melas*
Channel catfish, *Ictalurus punctatus*
Bluegill, *Lepomis macrochirus*
Smallmouth bass, *Micropterus dolomieu*
Largemouth bass, *Micropterus salmoides*
Paiute sculpin, *Cottus beldingi*

Invertebrates (in alphabetical order):

INSECTS

Mattoni's blue, *Euphilotes pallescens mattonii*
Nevada viceroy, *Limenitus archippus lahontani*
Greys silverspot, *Speyeria hesperis greyi*

MOLLUSKS

California floater, *Anodonta californiensis*
Schell Creek mountainsnail, *Oreohelix nevadensis*
Transverse gland pyrg, *Pyrgulopsis cruciglans*
Humboldt pyrg, *Pyrgulopsis humboldtensis*
Vinyards pyrg, *Pyrgulopsis vinyardi*

Plants (in alphabetical order):

Common yarrow, *Achillea millefolium*
Indian ricegrass, *Achnatherum hymenoides*
Russian knapweed, *Acroptilon repens*
Jointed goatgrass, *Aegilops cylindrica*
Crested wheatgrass, *Agropyron cristatum*
Meadow pusseytoes, *Antennaria arcuata*
Grouse Creek rockcress, *Arabis falcatoria*
Elko rockcress, *Arabis falcifruca*
Silver sage, *Artemisia cana*
Big sagebrush, *Artemisia tridentata*
Wyoming big sagebrush, *Artemisia tridentata* ssp. *wyomingensis*
Threetip sagebrush, *Artemisia tripartita* ssp. *tripartita*
Goose Creek milkvetch, *Astragalus anserinus*
Lamoille Canyon (Robbins) milkvetch, *Astragalus robbinsii* var. *occidentalis*
Osgood Mountains milkvetch, *Astragalus yoder-williamsii*
Blue grama, *Bouteloua gracilis*
Downy brome (cheatgrass), *Bromus tectorum*
Hoary cress (whitetop), *Cardaria draba*
Musk thistle, *Carduus nutans*
Sedges, *Carex* spp.
Diffuse knapweed, *Centaurea diffusa*
Spotted knapweed, *Centaurea masculosa*
Yellow starthistle, *Centaurea solstitialis*
Squarrose knapweed, *Centaurea virgata*
Rush skeletonweed, *Chondrilla juncea*
Rubber rabbitbrush *Chrysothamnus (Ericameria) nauseosus*

Douglas (green) rabbitbrush, *Chrysothamnus viscidiflorus*
Water hemlock, *Cicuta maculata*
Canada thistle, *Cirsium arvense*
Spring thistle, *Cirsium vernale*
Bull thistle, *Cirsium vulgare*
Barren Valley collomia, *Collomia renacta*
Poison hemlock, *Conium maculatum*
Houndstongue, *Cynoglossum officinale*
Tufted hairgrass, *Deschampsia cespitosa*
Elko whitlowcress, *Draba sphaeroides*
Thickspike wheatgrass, *Elymus laneolatus*
Slender wheatgrass, *Elymus trachycaulus*
Broad fleabane, *Erigeron latus*
Sulphur Springs buckwheat, *Eriogonum argophyllum*
Lewis buckwheat, *Eriogonum lewisii*
Leafy spurge, *Euphorbia esula*
Broom snakeweed, *Gutierrezia sarothrae*
Needle-and-thread, *Hesperostipa comata*
Common St. Johnswort/Klamath weed, *Hypericum perforatum*
Black henbane, *Hyoscyamus niger*
Rocky Mountain iris, *Iris missouriensis*
Dyer's woad, *Isatis tinctoria*
Rush, *Juncus* spp.
Juniper, *Juniperus* spp.
Grimes vetchling, *Lathyrus grimesii*
Davis peppergrass, *Lepidium davisii*
Perennial pepperweed, *Lepidium latifolium*
Owyhee prickly phlox, *Leptodactylon glabrum*
Dalmation toadflax, *Linaria dalmatica*
Yellow toadflax, *Linaria vulgaris*
Purple loosestrife, *Lythrum salicaria*, *L. virgatum*
Scotch thistle, *Onopordum acanthium*
Western wheatgrass, *Pascopyrum smithii*
Least phacelia, *Phacelia minutissima*
Hood's phlox, *Phlox hoodia*
Pine, *Pinus* spp.
James' galleta, *Pleuraphis jamesii*
Sandberg bluegrass, *Poa secunda*
Cottam cinquefoil, *Potentilla cottamii*
Sulfur cinquefoil, *Potentilla recta*
Ruby Mountains primrose, *Primula capillaris*
Bluebunch wheatgrass, *Pseudoroegneria spicata*
Bitterbrush, *Purshia* spp.
Antelope bitterbrush, *Purshia tridentate*
Scrub oak, *Quercus* spp.
Curly dock, *Rumex crispus*
Willows, *Salix* spp.
Narrowleaf willow, *Salix exigua*
Arroyo willow, *Salix lasiolepis*
Mediterranean sage, *Salvia aethiopsis*
Black greasewood, *Sarcobatus vermiculatus*
Nachlinger catchfly, *Silene nachlingerae*
Carolina Horsesnail, *Solanum carolinense*

White horenettle, *Solanum elaeagnifolium*
Sow thistle, *Sonchus arvensis*
Medusahead, *Taeniatherum caput-medusae*
Salt cedar (tamarisk), *Tamarix* spp.
Gray horsebrush, *Tetradymia canescens*
Puncturevine, *Tribulus terrestris*
Leiberg clover, *Trifolium leibergii*
Rock violet, *Viola lithion*

Appendix C

**Bird Species Reported on National Biological Survey Breeding Bird Survey Routes within
100 Miles of the Marys River 3D Seismic Project, 1992 to 2011**



Appendix C
Bird Species Reported on National Biological Survey Breeding Bird Survey Routes within 100 Miles of the Marys River 3D Seismic Project, 1992 to 2011.

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Canada Goose <i>Branta canadensis</i>	NTMB		Yes-HWA	Increasing***
Gadwall <i>Anas strepera</i>	NTMB			Insufficient Data
American Wigeon <i>Anas americana</i>	NTMB			Insufficient Data
Mallard <i>Anas platyrhynchos</i>	NTMB		Yes-HWA	No Trend
Blue-winged Teal <i>Anas discors</i>	NTMB			Insufficient Data
Cinnamon Teal <i>Anas cyanoptera</i>	NTMB			No Trend
Green-winged Teal <i>Anas crecca</i>	NTMB			Insufficient Data
Northern Shoveler <i>Anas clypeata</i>	NTMB			Insufficient Data
Northern Pintail <i>Anas acuta</i>	NTMB		Yes-HWA	Insufficient Data
Redhead <i>Aythya americana</i>	NTMB			Insufficient Data
Ring-necked Duck <i>Aythya collaris</i>	NTMB			Insufficient Data
Lesser Scaup <i>Aythya affinis</i>	NTMB			Insufficient Data
Common Merganser <i>Mergus merganser</i>	NTMB			Insufficient Data
Red-breasted Merganser <i>Mergus serrator</i>	NTMB			Insufficient Data
Ruddy Duck <i>Oxyura jamaicensis</i>	NTMB			Insufficient Data
California Quail <i>Callipepla californica</i>				Insufficient Data
Chukar <i>Alectoris chukar</i>			Yes-HWA	Insufficient Data
Gray Partridge <i>Perdix perdix</i>			Yes-HWA	Insufficient Data
Ruffed Grouse <i>Bonasa umbellus</i>				Insufficient Data
Ring-necked Pheasant <i>Phasianus colchicus</i>				Insufficient Data
Greater Sage-Grouse <i>Centrocercus urophasianus</i>			Yes-HWA	Insufficient Data
Wild Turkey <i>Meleagris gallopavo</i>				Insufficient Data
Common Loon <i>Gavia immer</i>	NTMB			Insufficient Data
Pied-billed Grebe <i>Podilymbus podiceps</i>	NTMB			Insufficient Data
Eared Grebe <i>Podiceps nigricollis</i>	NTMB	BCC		Insufficient Data
Western Grebe <i>Aechmophorus occidentalis</i>	NTMB			Insufficient Data
Clark's Grebe <i>Aechmophorus clarkii</i>	NTMB			Insufficient Data

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Double-crested Cormorant <i>Phalacrocorax auritus</i>	NTMB			Insufficient Data
American White Pelican <i>Pelecanus erythrorhynchos</i>	NTMB			Insufficient Data
American Bittern <i>Botaurus lentiginosus</i>	NTMB			Insufficient Data
Great Blue Heron <i>Ardea herodias</i>	NTMB			Insufficient Data
White-faced Ibis <i>Plegadis chihi</i>	NTMB			Insufficient Data
Snowy Egret <i>Egretta thula</i>	NTMB			Insufficient Data
Turkey Vulture <i>Cathartes aura</i>	NTMB		Yes-HWA	Increasing*
Northern Harrier <i>Circus cyaneus</i>	NTMB		Yes-HWA	Insufficient Data
Sharp-shinned Hawk <i>Accipiter striatus</i>	NTMB			Insufficient Data
Cooper's Hawk <i>Accipiter cooperii</i>	NTMB			Insufficient Data
Northern Goshawk <i>Accipiter gentilis</i>	NTMB			Insufficient Data
Swainson's Hawk <i>Buteo swainsoni</i>	NTMB			Insufficient Data
Red-tailed Hawk <i>Buteo jamaicensis</i>	NTMB		Yes-HWA	Increasing***
Ferruginous Hawk <i>Buteo regalis</i>	NTMB	BCC		Insufficient Data
Golden Eagle <i>Aquila chrysaetos</i>	NTMB	BCC	Yes-HWA	Insufficient Data
American Kestrel <i>Falco sparverius</i>	NTMB		Yes-HWA	Decreasing*
Prairie Falcon <i>Falco mexicanus</i>	NTMB		Yes-HWA	Insufficient Data
Virginia Rail <i>Rallus limicola</i>	NTMB			Insufficient Data
Sora <i>Porzana carolina</i>	NTMB			Insufficient Data
American Coot <i>Fulica americana</i>	NTMB			No Trend
Sandhill Crane <i>Grus canadensis</i>	NTMB		Yes-HWA	Insufficient Data
Killdeer <i>Charadrius vociferus</i>	NTMB		Yes-HWA	No Trend
Black-necked Stilt <i>Himantopus mexicanus</i>	NTMB			Insufficient Data
American Avocet <i>Recurvirostra americana</i>	NTMB			Insufficient Data
Spotted Sandpiper <i>Actitis macularia</i>	NTMB			Insufficient Data
Willet <i>Catoptrophorus semipalmatus</i>	NTMB			Insufficient Data
Long-billed Curlew <i>Numerius americanus</i>	NTMB	BCC	Yes-HWA	No Trend
Marbled Godwit <i>Limosa fedoa</i>	NTMB	BCC		Insufficient Data
Wilson's Snipe <i>Gallinago delicata</i>	NTMB		Yes-HWA	No Trend

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Wilson's Phalarope <i>Phalaropus tricolor</i>	NTMB			Insufficient Data
Red-necked Phalarope <i>Phalaropus lobatus</i>	NTMB			Insufficient Data
Ring-billed Gull <i>Larus delawarensis</i>	NTMB			Insufficient Data
California Gull <i>Larus californicus</i>	NTMB			Insufficient Data
Caspian Tern <i>Sterna caspia</i>	NTMB			Insufficient Data
Forster's Tern <i>Sterna forsteri</i>	NTMB			Insufficient Data
Rock Pigeon <i>Columba livia</i>				No Trend
Eurasian Collared-Dove <i>Streptopelia decaocto</i>				Insufficient Data
Mourning Dove <i>Zenaida macroura</i>	NTMB			No Trend
Western Screech-Owl <i>Otus kennicottii</i>	NTMB			Insufficient Data
Great Horned Owl <i>Bubo virginianus</i>	NTMB		Yes-HWA	Insufficient Data
Burrowing Owl <i>Athene cunicularia</i>	NTMB		Yes-HWA	Insufficient Data
Short-eared Owl <i>Asio flammeus</i>	NTMB		Yes-HWA	Insufficient Data
Common Nighthawk <i>Chordeiles minor</i>	NTMB			No Trend
Common Poorwill <i>Phalaenoptilus nuttallii</i>	NTMB			Insufficient Data
White-throated Swift <i>Aeronautes saxatalis</i>	NTMB			Insufficient Data
Black-chinned Hummingbird <i>Archilochus alexandri</i>	NTMB			Insufficient Data
Calliope Hummingbird <i>Stellula calliope</i>	NTMB	BCC		Insufficient Data
Broad-tailed Hummingbird <i>Selasphorus platycercus</i>	NTMB			Insufficient Data
Rufous Hummingbird <i>Selasphorus rufus</i>	NTMB			Insufficient Data
Belted Kingfisher <i>Ceryle alcyon</i>	NTMB			Insufficient Data
Lewis's Woodpecker <i>Melanerpes lewis</i>	NTMB	BCC		Insufficient Data
Red-naped Sapsucker <i>Melanerpes erythrocephalus</i>	NTMB			Insufficient Data
Downy Woodpecker <i>Picoides pubescens</i>	NTMB		Yes-BLM	Insufficient Data
Hairy Woodpecker <i>Picoides villosus</i>	NTMB			Insufficient Data
Northern Flicker <i>Colaptes auratus</i>	NTMB		Yes-HWA	No Trend
Olive-sided Flycatcher <i>Contopus cooperi</i>	NTMB			Insufficient Data
Western Wood-Pewee <i>Contopus sordidulus</i>	NTMB		Yes-BLM (nonbreeding)	Insufficient Data

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Willow Flycatcher <i>Empidonax traillii</i>	NTMB	BCC	Yes-BLM	Insufficient Data
Least Flycatcher <i>Empidonax minimus</i>	NTMB			Insufficient Data
Hammond's Flycatcher <i>Empidonax hammondi</i>	NTMB			Insufficient Data
Gray Flycatcher <i>Empidonax wrightii</i>	NTMB			Decreasing**
Dusky Flycatcher <i>Empidonax oberholseri</i>	NTMB			Insufficient Data
Cordilleran Flycatcher <i>Empidonax occidentalis</i>	NTMB			Insufficient Data
Say's Phoebe <i>Sayornis saya</i>	NTMB			Insufficient Data
Ash-throated Flycatcher <i>Myiarchus cinerascens</i>	NTMB			Increasing**
Cassin's Kingbird <i>Tyrannus vociferans</i>	NTMB			Insufficient Data
Western Kingbird <i>Tyrannus verticalis</i>	NTMB			Increasing***
Eastern Kingbird <i>Tyrannus tyrannus</i>	NTMB			Insufficient Data
Loggerhead Shrike <i>Lanius ludovicianus</i>	NTMB	BCC		Insufficient Data
Northern Shrike <i>Lanius excubitor</i> ⁵	NTNB		Yes-HWA (nonbreeding)	Not Observed
Plumbeous Vireo <i>Vireo plumbeus</i>	NTMB			Insufficient Data
Cassin's Vireo <i>Vireo cassinii</i>	NTMB			Insufficient Data
Warbling Vireo <i>Vireo gilvus</i>	NTMB		Yes-BLM	Insufficient Data
Steller's Jay <i>Cyanocitta stelleri</i>	NTMB			Insufficient Data
Pinyon Jay <i>Gymnorhinus cyanocephalus</i>	NTMB	BCC		Decreasing**
Western Scrub-Jay <i>Aphelocoma californica</i>	NTMB			Insufficient Data
Clark's Nutcracker <i>Nucifraga columbiana</i>	NTMB			Insufficient Data
Black-billed Magpie <i>Pica hudsonia</i>	NTMB		Yes-HWA	No Trend
American Crow <i>Corvus brachyrhynchos</i>	NTMB			No Trend
Common Raven <i>Corvus corax</i>	NTMB		Yes-HWA	No Trend
Horned Lark <i>Eremophila alpestris</i>	NTMB		Yes-HWA	No Trend
Tree Swallow <i>Tachycineta bicolor</i>	NTMB			Insufficient Data
Violet-green Swallow <i>Tachycineta thalassina</i>	NTMB			No Trend
Northern Rough-winged Swallow <i>Stelgidopteryx serripennis</i>	NTMB			No Trend
Bank Swallow <i>Riparia riparia</i>	NTMB			Insufficient Data

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Cliff Swallow <i>Petrochelidon pyrrhonota</i>	NTMB			No Trend
Barn Swallow <i>Hirundo rustica</i>	NTMB			No Trend
Black-capped Chickadee <i>Poecile atricapilla</i>	NTMB		Yes-BLM	Insufficient Data
Mountain Chickadee <i>Poecile gambeli</i>	NTMB			Increasing*
Juniper Titmouse <i>Baeolophus ridgwayi</i>	NTMB			Insufficient Data
Bushtit <i>Psaltriparus minimus</i>	NTMB		Yes-BLM	Insufficient Data
Red-breasted Nuthatch <i>Sitta canadensis</i>	NTMB			Insufficient Data
White-breasted Nuthatch <i>Sitta carolinensis</i>	NTMB			Insufficient Data
Brown Creeper <i>Certhia americana</i>	NTMB			Insufficient Data
Rock Wren <i>Salpinctes obsoletus</i>	NTMB			Decreasing**
Canyon Wren <i>Catherpes mexicanus</i>	NTMB			Insufficient Data
Bewick's Wren <i>Thryomanes bewickii</i>	NTMB			Insufficient Data
House Wren <i>Troglodytes aedon</i>	NTMB		Yes-BLM	Insufficient Data
Marsh Wren <i>Cistothorus palustris</i>	NTMB		Yes-BLM	Insufficient Data
American Dipper <i>Cinclus mexicanus</i>	NTMB			Insufficient Data
Blue-gray Gnatcatcher <i>Polioptila caerulea</i>	NTMB			No Trend
Golden-crowned Kinglet <i>Regulus satrapa</i>	NTMB			Insufficient Data
Ruby-crowned Kinglet <i>Regulus calendula</i>	NTMB		Yes-BLM	Insufficient Data
Western Bluebird <i>Sialia mexicana</i>	NTMB			Insufficient Data
Mountain Bluebird <i>Sialia currucoides</i>	NTMB			No Trend
Townsend's Solitaire <i>Myadestes townsendi</i>	NTMB			Insufficient Data
Veery <i>Catharus fuscescens</i>	NTMB			Insufficient Data
Swainson's Thrush <i>Catharus ustulatus</i>	NTMB			Insufficient Data
Hermit Thrush <i>Catharus guttatus</i>	NTMB			Insufficient Data
American Robin <i>Turdus migratorius</i>	NTMB		Yes-HWA	Increasing***
Gray Catbird <i>Dumetella carolinensis</i>	NTMB		Yes-BLM (nonbreeding)	Insufficient Data
Northern Mockingbird <i>Mimus polyglottos</i>	NTMB			Insufficient Data
Sage Thrasher <i>Oreoscoptes montanus</i>	NTMB	BCC	Yes-HWA	Decreasing***

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Brown Thrasher <i>Toxostoma rufum</i>	NTMB			Insufficient Data
European Starling <i>Sturnus vulgaris</i>				No Trend
Cedar Waxwing <i>Bombycilla cedrorum</i>	NTMB			Insufficient Data
Orange-crowned Warbler <i>Vermivora celata</i>	NTMB			Insufficient Data
Virginia's Warbler <i>Vermivora virginiae</i>	NTMB	BCC		Insufficient Data
MacGillivray's Warbler <i>Oporornis tolmiei</i>	NTMB		Yes-BLM	Insufficient Data
Common Yellowthroat <i>Geothlypis trichas</i>	NTMB		Yes-BLM	Insufficient Data
Yellow Warbler <i>Dendroica petechia</i>	NTMB		Yes-BLM	Increasing***
Yellow-rumped Warbler <i>Dendroica coronata</i>	NTMB			Insufficient Data
Black-throated Gray Warbler <i>Dendroica nigrescens</i>	NTMB			Insufficient Data
Wilson's Warbler <i>Wilsonia pusilla</i>	NTMB			Insufficient Data
Nashville Warbler <i>Vermivora ruficapilla</i> ⁶	NTMB		Yes-BLM (nonbreeding)	Not Observed
Yellow-breasted Chatlcteria <i>virens</i>	NTMB		Yes-BLM	No Trend
Green-tailed Towhee <i>Pipilo chlorurus</i>	NTMB	BCC		Increasing*
Spotted Towhee <i>Pipilo maculatus</i>	NTMB			Increasing**
Chipping Sparrow <i>Spizella passerina</i>	NTMB			No Trend
Brewer's Sparrow <i>Spizella breweri</i>	NTMB	BCC	Yes-HWA	Decreasing***
Vesper Sparrow <i>Poocetes gramineus</i>	NTMB		Yes-BLM	Decreasing***
Lark Sparrow <i>Chondestes grammacus</i>	NTMB			No Trend
Black-throated Sparrow <i>Amphispiza bilineata</i>	NTMB			No Trend
Sage Sparrow <i>Amphispiza belli</i>	NTMB	BCC	Yes-HWA	Decreasing**
Lark Bunting <i>Calamospiza melanocorys</i>	NTMB			Insufficient Data
Savannah Sparrow <i>Passerculus sandwichensis</i>	NTMB		Yes-BLM	No Trend
Grasshopper Sparrow <i>Ammodramus savannarum</i>	NTMB			Insufficient Data
Fox Sparrow <i>Passerella iliaca</i>	NTMB		Yes-BLM	Insufficient Data
Song Sparrow <i>Melospiza melodia</i>	NTMB		Yes-BLM	Increasing**
Lincoln's Sparrow <i>Melospiza lincolni</i>	NTMB			Insufficient Data
White-crowned Sparrow <i>Zonotrichia leucophrys</i>	NTMB			Insufficient Data

Common Name Scientific Name	Neotropical Migratory Bird Status ¹	Bird of Conservation Concern (BCR 9) ²	Reported On-Site ³	Species' 20-Year Trend (1992-2011) ⁴
Dark-eyed Junco <i>Junco hyemalis</i>	NTMB		Yes-HWA	Insufficient Data
Western Tanager <i>Piranga ludoviciana</i>	NTMB		Yes-BLM	Increasing***
Rose-breasted Grosbeak <i>Pheucticus ludovicianus</i>	NTMB			Insufficient Data
Black-headed Grosbeak <i>Pheucticus melanocephalus</i>	NTMB		Yes-BLM	Increasing**
Blue Grosbeak <i>Guiraca caerulea</i>	NTMB			Insufficient Data
Lazuli Bunting <i>Passerina amoena</i>	NTMB		Yes-BLM	No Trend
Bobolink <i>Dolichonyx oryzivorus</i>	NTMB			Insufficient Data
Red-winged Blackbird <i>Agelaius phoeniceus</i>	NTMB		Yes-HWA	Increasing**
Western Meadowlark <i>Sturnella neglecta</i>	NTMB		Yes-HWA	No Trend
Yellow-headed Blackbird <i>Xanthocephalus xanthocephalus</i>	NTMB			No Trend
Brewer's Blackbird <i>Euphagus cyanocephalus</i>	NTMB			No Trend
Brown-headed Cowbird <i>Molothrus ater</i>	NTMB		Yes-BLM	Increasing**
Scott's Oriole <i>Icterus parisorum</i>	NTMB			Insufficient Data
Bullock's Oriole <i>Icterus bullockii</i>	NTMB			Insufficient Data
Cassin's Finch <i>Carpodacus cassinii</i>	NTMB			No Trend
House Finch <i>Carpodacus mexicanus</i>	NTMB		Yes-BLM	No Trend
Red Crossbill <i>Loxia curvirostra</i>	NTMB			Insufficient Data
Pine Siskin <i>Carduelis pinus</i>	NTMB			Insufficient Data
Lesser Goldfinch <i>Carduelis psaltria</i>	NTMB			Insufficient Data
American Goldfinch <i>Carduelis tristis</i>	NTMB		Yes-BLM	Insufficient Data
Evening Grosbeak <i>Coccothraustes vespertinus</i>	NTMB			Insufficient Data
House Sparrow <i>Passer domesticus</i>				No Trend

Notes:

¹ Neotropical Migratory Bird (NTMB) species based on the Migratory Bird Revised List, USFWS, 2010a.

² Birds of Conservation Concern (BCC) within Bird Conservation Region 9, based on USFWS, 2008.

³ Sources: HWA, 2012; BLM, personal communication.

⁴ Significance of (Decreasing or Increasing) Linear Trends: * = P<0.1; ** = P<0.05; *** = P<0.001. Sufficient data criteria are annual average number counted ≥ 1 bird per route per year and annual average routes reporting species ≥ 5 routes per year

⁵ Observed on-site (HWA, 2012) but not reported on BBS routes.

⁶ Observed on-site (BLM, personal communication) but not reported on BBS routes.