Draft

Supplemental Environmental Impact Statement

DOI-BLM-NV-0000-2013-0001-EIS

# Ruby Pipeline Project

June 2013

U.S. Department of the Interior
Bureau of Land Management
Nevada State Office
Reno, Nevada

BLM

Nevada State Office

# DRAFT
# SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
# RUBY PIPELINE PROJECT

## DOI-BLM-NV-0000-2013-0001-EIS

| | |
|---|---|
| **Lead Agency:** | U.S. Department of the Interior, Bureau of Land Management<br>Nevada State Office, Reno, Nevada |
| **Cooperating Agencies:** | U.S. Forest Service, Fremont-Winema Nat'l For.<br>Nevada Department of Wildlife<br>Utah Division of Wildlife Resources<br>Wyoming Game and Fish Department |
| **Project Location:** | Lincoln & Uinta Counties, WY<br>Box Elder, Cache & Rich Counties, UT<br>Elko, Humboldt & Washoe Counties, NV<br>Lake & Klamath Counties, OR |
| **Written Comments may be Submitted in the Following Methods:** | mail: Ruby SEIS<br>c/o BLM Price Field Office<br>125 South 600 West<br>Price, Utah 84501<br>email: blmruby@blm.gov<br>web: http://on.doi.gov/10QtaTb |
| **Date by Which Comments Must Be Received/Postmarked:** | August 19, 2013 |


**Abstract:**

This Draft Supplemental Environmental Impact Statement (SEIS) for the Ruby Pipeline Project was prepared by the Bureau of Land Management (BLM) in response to a ruling from the Ninth Circuit Court of Appeals (case nos. 10-72356, 10-72552, 10-72762, 10-72768, and 10-72775). The ruling directed the BLM to undertake a revised cumulative effects analysis of the Ruby Pipeline Project Final Environmental Impact Statement (EIS) as it related to the cumulative loss of sagebrush steppe vegetation and habitat. This Draft SEIS contains supplemental information about the original and present condition of the sagebrush steppe vegetation and habitat, and analyzes the cumulative impacts of the Ruby Pipeline Project based on the supplemental information. This Draft SEIS tiers to and incorporates by reference the information and analyses contained in the Ruby Pipeline Project Final EIS.



| | |
|---|---|
| **For Further Information Contact:** | Mark Mackiewicz, PMP, National Project Manager<br>mail: BLM Price Field Office<br>125 South 600 West<br>Price, Utah 84501<br>email: mmackiew@blm.gov<br>phone: (435) 636-3616 |

# DRAFT
# SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

## RUBY PIPELINE PROJECT

**Lincoln & Uinta Counties, WY**
**Box Elder, Cache & Rich Counties, UT**
**Elko, Humboldt & Washoe Counties, NV**
**Lake & Klamath Counties, OR**

**U.S. Department of the Interior**
**Bureau of Land Management**
**Nevada State Office**
**Reno, Nevada**

**DOI-BLM-NV-0000-2013-0001-EIS**

**June 2013**

# CONTENTS



# LIST OF TABLES



# LIST OF FIGURES



# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BLM | Bureau of Land Management |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| EIS | Environmental Impact Statement |
| FERC | Federal Energy Regulatory Commission |
| FWS | U.S. Fish and Wildlife Service |
| kV | kilovolt |
| NEPA | National Environmental Policy Act |
| PGH | preliminary general habitat |
| POD | Plan of Development |
| PPH | preliminary priority habitat |
| ROD | Record of Decision |
| Ruby | Ruby Pipeline, L.L.C. |
| SEIS | Supplemental Environmental Impact Statement |
| WWEC | West-wide Energy Corridor |

# INTRODUCTION

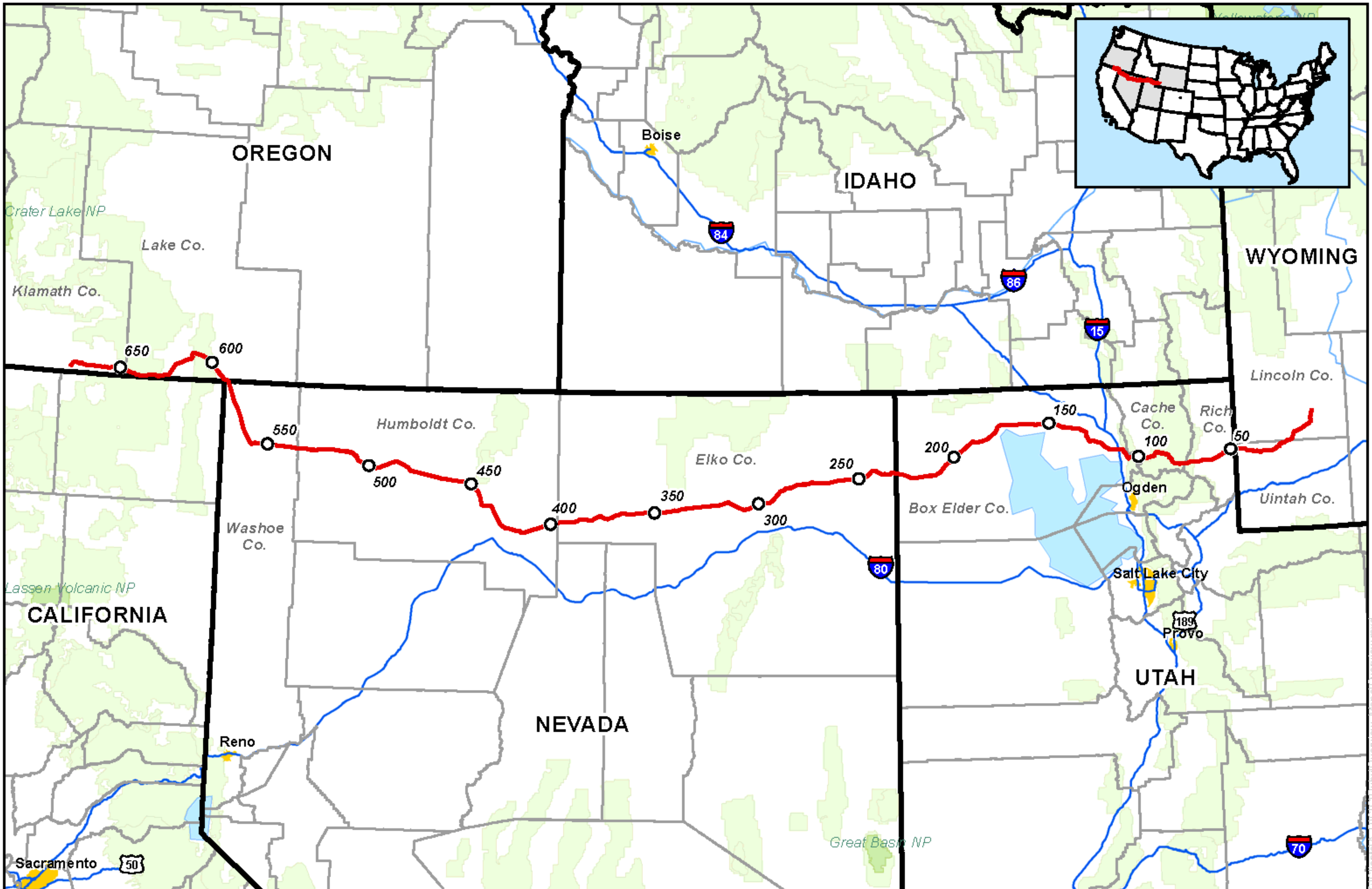
This Draft Supplemental Environmental Impact Statement (SEIS) for the Ruby Pipeline Project was prepared by the Bureau of Land Management (BLM) in response to a ruling from the Ninth Circuit Court of Appeals (case nos. 10-72356, 10-72552, 10-72762, 10-72768, and 10-72775). The ruling directed the BLM to undertake a revised cumulative effects analysis of the Ruby Pipeline Project Environmental Impact Statement (EIS) as it related to the cumulative loss of sagebrush steppe vegetation and habitat. Because this cumulative effects analysis is intended to supplement only a specific part of the cumulative effects analysis in the Final EIS, it has been prepared in a manner consistent with that goal. This analysis tiers to and incorporates by reference the information and analyses contained in the Ruby Pipeline Project Final EIS.

The Ruby Pipeline Project is a 678-mile-long, 42-inch-diameter interstate natural gas pipeline beginning near Opal, Wyoming, running through northern Utah and northern Nevada, and terminating near Malin, Oregon (see Figure 1). The project crosses about 368 miles of federal land.

The Federal Energy Regulatory Commission (FERC) is the federal agency responsible for evaluating applications to construct and operate interstate natural gas pipeline facilities. Certificates are issued under Section 7(c) of the Natural Gas Act if the FERC determines that the project is required for the public convenience and necessity. On January 27, 2009, Ruby Pipeline, L.L.C. (Ruby) filed an application with the FERC for a Certificate of Public Convenience and Necessity for its Ruby Pipeline Project. The FERC prepared an EIS to assess the environmental impact associated with the proposed project. The BLM, Bureau of Reclamation, U.S. Fish and Wildlife Service (FWS), U.S. Forest Service, Natural Resource Conservation Service, Army Corps of Engineers, Utah Public Lands Policy Coordination Office, and Lincoln County (Wyoming) Board of County Commissioners participated as cooperating agencies in the preparation of the EIS because of jurisdiction over part of the project area or because of special expertise with respect to environmental resources in the project area.

The BLM adopted the EIS in accordance with Title 40, Code of Federal Regulations (CFR), Section 1506.3 to meet its responsibilities under the National Environmental Policy Act (NEPA).

The Ruby Pipeline Project was approved by the FERC on April 5, 2010 and the Right-of-Way Grant and Plan of Development (POD) were approved by a BLM Record of Decision (ROD) on July 12, 2010. The BLM Nevada State Director, as the designated federal official, signed the ROD and authorized the right-of-way for the construction, operation, maintenance, and termination of the pipeline and associated facilities across lands under jurisdiction of the BLM, the U.S. Forest Service, the Bureau of Reclamation, and the FWS in the Wyoming, Utah, Nevada, and Oregon. Construction started in the summer of 2010 and was completed in the summer of 2011. The pipeline went into service on July 28, 2011.




Milepost

Ruby Pipeline

0 30 60 Miles

1 inch = 60 miles

N W E S

**Figure 1**
**Ruby Pipeline Project**
**Project Location Map**

The Center for Biological Diversity, Defenders of Wildlife et al., and Summit Lake Paiute Tribe, among other groups, filed petitions for review of the FWS's Biological Opinion and the BLM's ROD in the United States Court of Appeals for the Ninth Circuit. In October 2012, the Ninth Circuit denied most of the petitioners' challenges except for two challenges to the Biological Opinion and one challenge to the BLM's ROD.

In a published opinion, the court remanded and vacated the Biological Opinion to the FWS, and remanded and vacated the BLM's ROD because it relied on the Biological Opinion. In an unpublished opinion, the court remanded the ROD to the BLM to undertake a revised cumulative effects analysis as it relates to the cumulative loss of sagebrush steppe vegetation and habitat. In the unpublished opinion, the court found that the Final EIS did not provide sufficient quantified or detailed data about the cumulative loss of sagebrush steppe vegetation and habitat and did not provide information on how much acreage sagebrush steppe used to occupy, or what percentage has been destroyed.

The court subsequently stayed vacature of the FWS's Biological Opinion until the FWS issues a revised Biological Opinion and the BLM's ROD until the BLM issues a revised ROD, each on a schedule approved by the court. The BLM is providing a 45-day comment period on the Draft SEIS. At the close of that comment period, the BLM will review and respond to comments, and prepare the Final SEIS for publication, before issuing a new ROD in November of 2013.

## PURPOSE AND NEED

The purpose and need for the Ruby Pipeline Project remains unchanged from that stated in the Final EIS. As directed by the United States Court of Appeals for the Ninth Circuit, in Center for Biological Diversity et al. v. BLM, Case Number 10-72356 (2012) (consolidated), the BLM has prepared this Draft SEIS for the Ruby Pipeline Project to respond to the court's direction and provide a cumulative effects discussion of sagebrush steppe vegetation and habitat that more thoroughly meets the requirements of the NEPA. This Draft SEIS specifically includes quantified and detailed data about the cumulative loss of sagebrush steppe vegetation and habitat, and information on how much acreage sagebrush steppe used to occupy and what percentage has been destroyed.

## DECISION TO BE MADE

The Final EIS, in conjunction with this Draft SEIS and subsequent Final SEIS, will serve as the foundation for the BLM's decision on whether to reissue the BLM right-of-way granted to Ruby for the project and, if so, to determine under what terms and conditions, specifically whether additional post-construction mitigation is warranted.

## CUMULATIVE EFFECTS

The NEPA requires that federal agencies consider the cumulative impacts of proposals under their review. According to Council on Environmental Quality (CEQ) regulations implementing NEPA, the scope of the environmental analysis must consider cumulative actions, even if they are seemingly insignificant, if they may have cumulatively significant impacts when viewed with the proposed action (Title 40, CFR, Section 1508.25). Cumulative impacts are defined by the

CEQ 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 (Title 40, CFR, Section 1508.7). If significant adverse cumulative impacts are identified, cumulative impact analyses are used to determine if the project can be modified such that the impacts can be avoided or if additional or more appropriate project mitigation is necessary.

### Cumulative Actions

This Draft SEIS evaluates the impact of the Ruby Pipeline Project when added to other past, present, and reasonably foreseeable actions. Past actions have been aggregated in order to describe the impact of historic activities on the existing environment. The CEQ explicitly does not require that all actions be individually described since the impacts of previous and ongoing actions are represented in the existing environment, which is already described in the environmental analysis [1]. Consistent with the CEQ's guidance, the Ninth Circuit Court of Appeals in 2008 held that an agency may aggregate its cumulative effects analysis of past projects pursuant to CEQ regulations, and that in doing so, the analysis of cumulative impacts of historical events satisfies the "hard look" standard [2]. This Draft SEIS uses that approach. For the purpose of this Draft SEIS, past actions that have been attributed to sagebrush steppe disturbance generally are: conversion to cropland and other development (including mining and energy projects); livestock grazing (cattle and sheep); the introduction of non-native plants (mainly cheatgrass (*Bromus tectorum*)); changes in wildfire cycles; and juniper-pinyon encroachment.

The starting point for identifying present and reasonably foreseeable future actions in this Draft SEIS was the list of actions in the cumulative impact analysis in the Final EIS (see page 4-295). This includes projects with potential to disturb sagebrush steppe vegetation within the same counties crossed by the Ruby Pipeline Project. The counties crossed by the Ruby Pipeline Project represent a reasonable area of impact where the projects could interact with each other in the sagebrush steppe ecosystem. This is also referred to as the "cumulative impact area" in this Draft SEIS. The Final EIS also used county boundaries to define the geographic extent of the analysis in the Final EIS because "effects of more distant projects… would not contribute significantly to impacts associated with the proposed project." The list from the Final EIS was updated based on new information available to the BLM. Updates included removing future actions that had been cancelled, as well as adding new actions that were not previously known or planned. To be considered "reasonably foreseeable," a proposed project must have applied for a permit from local, state, or federal authorities or must be publicly known. The temporal extent of the analysis covers the expected duration of impacts from the projects. Table 1 lists present and reasonably foreseeable future actions that may cumulatively impact sagebrush steppe vegetation and habitat in the cumulative impact area.

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| **ENERGY PROJECTS** | | | | |
| Bryant Mountain Pumped Storage Hydroelectric | Klamath, OR | Enlargement of an existing upper reservoir; construction of a new lower reservoir; and installation of a subterranean powerhouse, power tunnels, and electric transmission lines | 2,030 | Unknown |
| Canada – Pacific Northwest – Northern California Transmission Project | Klamath, OR | Installation of an approximately 1,000-mile-long electric power line from British Columbia to California | 4,400 | 2009 – 2015 |
| China Mountain Wind Project | Elko, NV | Eight existing and construction of three proposed meteorological towers to support development of a 185-turbine wind farm | 50 | Unknown |
| Energy Gateway Project | Lincoln, WY<br>Uinta, WY<br>Box Elder, UT | Installation of an approximately 1,900 miles of new electric power lines across the western United States | 6,900 | 2007 – 2014 |
| Eureka Pipeline Project | Elko, NV | Installation of an approximately 17-mile-long pipeline from the terminal of NEPP at Barrick to Gold Quarry | 120 | 2014 |
| Lorella Pumped Storage Hydroelectric | Klamath, OR | Construction of an upper reservoir, lower reservoir, spillways, powerhouse, power tunnels, and a 4-mile-long electric transmission line | 600 | Unknown |
| Mary's River Oil and Gas Development | Elko, NV | Drilling up to 20 oil and gas wells and construction or upgrade of new access roads to the wells | 200 | 2014 – 2034 |
| Midnight Point and Mahogany Geothermal Exploration Project | Lake, OR | Drilling, testing, and monitoring of up to 16 geothermal wells, including improvement to existing access roads and the installation of new access roads | 60 | 2013 – 2016 |
| Moxa Arch Area Infill Gas Development Project | Lincoln, WY<br>Uinta, WY | Installation of up to1,861 new natural gas wells and the installation and operation of additional ancillary facilities in southwestern WY | 12,123 | 2010 – 2020 |
| North Elko Pipeline | Elko, NV | Installation of an approximately 24-mile-long, 12-inch-diameter natural gas pipeline from the Ruby Pipeline at a main line valve near Willow Creek Reservoir to the Barrick Goldstrike mill | 250 | 2013 |
| Oregon Community Wind Energy Project | Lake, OR | Construction of 6 or 7 wind turbines near Big Valley and associated power line right-of-way paralleling Deep Creek to Adel Substation | <10 | 2014 – 2015 |
| Pacific Connector Pipeline Project | Klamath, OR | Installation of an approximately 230-mile-long natural gas pipeline from near Malin, OR to an liquefied natural gas export terminal on the coast | 8,100 | 2015 – 2017 |
| Pacific Direct Current Intertie Upgrade | Lake, OR | Maintain and upgrade the existing Bonneville Power Administration power line from Columbia River south to the northern NV border | 4,800 | 2013 – 2015 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Ruby Interconnect Pipeline | Uinta, WY | Installation of an approximately 5.3-mile-long, 16-inch diameter natural gas pipeline extending from the Canyon Creek Compressor Station to a interconnect meter with the existing Ruby Pipeline | 100 | 2012 – 2013 |
| Ryckman Creek Storage Field Project | Uinta, WY | Construction of a new natural gas storage facility involving up to 10 new wells and 9 miles of piping that would have an initial working gas capacity of 19 billion cubic feet | 155 | 2011 – 2013 |
| Sheep Mountain Powerline | Uinta, WY | Installation of an approximately 2.5-mile-long, 13.8 kilovolt (kV) overhead electric distribution line from the Chevron Distribution Interconnect to the Ruby Interconnect Metering Station | 12 | 2012 – 2013 |
| Southwest Intertie Project | Elko, NV | Installation of an approximately 515-mile-long electric power line from southern ID to southern NV | 2,500 | 2009 – 2013 |
| Swan Lake Pumped Storage Hydroelectric | Klamath, OR | Construction of an upper reservoir and two dams; a lower reservoir and two dams; large diameter hydraulic conveyance; a powerhouse; a transformer gallery; a switchyard; 33 miles of electric transmission line; and access roads | 2,060 | Unknown |
| Zephyr Transmission Line Project | Lincoln, WY<br>Elko, NV | Installation of an approximately 950-mile-long electric power line from WY to southern NV | 6,600 | 2017 – 2020 |
| | | **ENERGY PROJECT TOTAL** | **51,069** | |
| **MINING, MINERAL EXPLORATION & RELATED ACTIVITIES** | | | | |
| Adelaide Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, and drill pads | 200 | 2013 – 2017 |
| Angel Wing Mineral Exploration | Elko, NV | Hardrock mineral exploration activities including cross country travel, roads, and drill pads | 818 | 2014 – 2019 |
| Arturo Mine | Elko, NV | Expansion of existing gold mine, including expansion of the existing open-pit; construction of two new waste rock disposal facilities; construction of a new heap leach pad and gold processing facilities; upgrading and re-aligning haul road; construction and/or relocation of support facilities; construction and installation of new power transmission lines; and continued surface exploration within the project area | 2,775 | 2013 – 2021 |
| Buffalo Mountain Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 25 | 1992 – 2015 |
| Chimney Creek North Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 250 | 1994 – 2024 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Converse Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 50 | 1998 – 2018 |
| Haystack Coal Mine | Uinta, WY | Open pit coal mine, including access road and power lines | 600 | 2012 – 2013 |
| Hollister Underground Mine | Elko, NV | Transitioning of existing underground exploration project into an underground gold and silver mining operation; existing facilities, such as the portal, water treatment facilities, rapid infiltration basins, waste-rock storage facility, and shop would be utilized; proposed facilities include a production shaft, road improvements, the construction of 11.6 miles of electric power transmission lines, continued surface and underground exploration, water removal of up to 1,100 gallons per minute, the discharge of water into Little Antelope Creek, and construction of ancillary facilities | 222 | 2013 – 2033 |
| Huntington Valley Seismic Survey | Elko, NV | The 3-D seismic program would gain a better understanding of the subsurface geology to determine if there is oil and gas potential and to determine the best locations for exploratory drilling | 650 | 2013 |
| King's Valley Uranium Exploration | Humboldt, NV | Mineral exploration activities, including cross-country travel, roads, drill pads, and trenches | 250 | 2013 – 2023 |
| Kinsley Mineral Exploration | Elko, NV | Hardrock mineral exploration activities, including cross country travel, roads, and drill pads | 2,830 | 2013 – 2018 |
| Long Canyon Mine | Elko, NV | Gold mining operations, including open-pit mine, would include one open pit, a heap leach pad, one waste rock dump, a tailings storage facility, a approximately 43-mile-long, 12-inch-diameter, natural gas pipeline, and other ancillary facilities | 1,600 | 2013 – 2027 |
| Marigold Mine | Humboldt, NV | Hardrock mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities | 2,100 | 1988 – 2020 |
| Midas Mine | Elko, NV | Expand underground capabilities in the vicinity of the Midas mine, including constructing and operating up to seven ventilation raises, one portal, access roads, a haul road from the portal, power lines to the ventilation raises, and surface exploration activities | 80 | 2013 – 2018 |
| Pinson Mine | Humboldt, NV | Hardrock mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities; underground operations are continuing on private land; those operations include administrative sites and other ancillary facilities | 1,050 | 1983 – 2020 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Pinson Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 60 | 1997 – 2018 |
| Preble Mine | Humboldt, NV | Open-pit mining operation, waste-rock disposal areas, heap-leach pads, other areas for processing, and other ancillary facilities | 220 | 1984 – 2015 |
| Rabbit Basin Sunstone Mineral Exploration | Lake, OR | Feldspar mineral exploration activities including cross-country travel, access roads, and excavation | 80 | 2013 – Foreseeable Future |
| Rossi Mine Expansion | Elko, NV | Barite mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities | 1,900 | 2015 |
| Sleeper Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities including cross-country travel, roads, drill pads, and trenching | 150 | 2003 – 2023 |
| Snowstorm Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, and drill pads | 200 | 2014 – 2024 |
| Trenton Canyon Mine | Humboldt, NV | Hardrock mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities | 2,700 | 1993 – 2015 |
| Trenton Canyon Mineral Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 950 | 1995 – 2023 |
| Tucker Hill Perlite Mine | Lake, OR | Expansion of an existing 23-acre perlite mine to 70 acres with activities consisting of quarry expansion; drilling and bulk sampling (including drill roads and pad); and removal and stockpiling of growth media | 70 | 2013 – 2028 |
| Turquoise Ridge JV Mine | Humboldt, NV | Hardrock mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities | 2,000 | 1987 – 2035 |
| Twin Creek Mine | Humboldt, NV | Hardrock mineral mining operations, including open-pit mines, waste-rock disposal areas, heap-leach pads, other areas for processing, administrative sites and other ancillary facilities | 13,300 | 1986 – 2018 |
| Washoe County Gravel Pits | Washoe, NV | Renewal of up to 17 existing gravel pit licenses, including expansion of up to 13 existing gravel pits | 130 | 2012 – 2022 |
| Western Lithium Clay Mine | Humboldt, NV | Hardrock mineral mining operations, including an open-pit mine, waste-rock disposal area, and an area for processing, sorting, storage, and shipping of product | 110 | 2014 – 2034 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Western Lithium Exploration | Humboldt, NV | Hardrock mineral exploration activities, including cross-country travel, roads, drill pads, and trenching | 75 | 2010 – 2015 |
| | | **MINING, MINERAL EXPLORATION & RELATED ACTIVITIES TOTAL** | **35,445** | |
| **LIVESTOCK GRAZING & WILD HORSE ECO-SANCTUARY** | | | | |
| Livestock Grazing | All Counties | Permit issuance and renewal for public land open to grazing | 22,158,000 | 2013 – Foreseeable Future |
| Northeast Nevada Wild Horse Eco-Sanctuary | Elko, NV | Establish a privately operated eco-sanctuary to accommodate up to 900 non-reproducing wild horses (all one sex or sterilized) | 525,000 | 2014 – Foreseeable Future |
| | | **LIVESTOCK GRAZING & WILD HORSE ECO-SANCTUARY** | **22,683,000** | |
| **RESTORATION & HABITAT IMPROVEMENT PROJECTS** | | | | |
| Aspen Enhancement<br>Warner* | Lake, OR | Management activities to enhance aspen stands | 500 | 2011 – Present |
| Cheatgrass and Other Weed Species Treatment<br>Elko Noxious Weeds*<br>Lake Co. Medusahead*<br>Paradise Medusahead | All Counties | Cheatgrass and other weed species treatment to reduce the risk of wildfires by reducing undesirable dense grassy cover and promoting perennial herbaceous species; may be accomplished by mowing or hand thinning, herbicide spraying, high intensity short duration grazing, and seeding with native grasses | >100,000 | 2013 – Foreseeable Future |
| Creek and Riparian Enhancement<br>Deming Ranch*<br>Fourth of July*<br>Holiday Ranch*<br>Honey Creek Fish Psg.*<br>Houret Ranch*<br>Mary's River Div.*<br>N. Fork Willow Rd.*<br>Pitch Log Creek*<br>Taylor Div.*<br>Thomas Creek*<br>Trib. N. Fork Willow*<br>Upper Lost River*<br>Upper Willow<br>Utley Weir*<br>Willow Creek Fish Psg.* | Elko, NV<br>Washoe, NV<br>Lake, OR<br>Klamath, OR | Habitat restoration project, including adding passage and screening to creek diversions, stream bank stabilization, and riparian area restoration | >12,300 | 2005 – 2013 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Fire Emergency Stabilization and Rehabilitation Projects<br>Box Elder*<br>Buckskin Fire<br>Buffalo Fire<br>China Garden<br>Coyote Point<br>Dixie<br>Eden Valley<br>Elko Wildfire*<br>Hanson Fire<br>Holloway Fire*<br>Horse Creek<br>Hot Springs<br>Izzenhood<br>Long Canyon Fire<br>Lost Fire*<br>Martin Creek<br>Rock Creek<br>Santa Rosa<br>Spring Creek<br>Thomas Canyon<br>Tom's Basin Wildfire*<br>Tuscarora*<br>Virgin Creek | All Counties | Sagebrush and bitterbrush planting, seeding, exclosure rebuilding, etc. | >150,000 | 2013 – Foreseeable Future |
| Fuelbreak Mowing<br>Able Creek<br>Brown's Valley<br>China Garden<br>Highway 95<br>Highway 140<br>Highway 290<br>Highway 447<br>Paisley Desert<br>Paradise Valley<br>Provo<br>Stonehouse | All Counties | Fuelbreak mowing at various locations immediately adjacent to existing roads to prevent large-scale wildfires in sagebrush habitat | Unknown | 2013 – Foreseeable Future |
| Grazing Exclosure<br>Antelope Creek*<br>Bar 2 Ranch*<br>Bull Spring*<br>Nut Mtn. & Calcutta*<br>Pinto Springs<br>River Springs Ranch* | Washoe, NV<br>Lake, OR<br>Klamath, OR | Exclusion area from livestock grazing to allow sagebrush and/or riparian habitat recovery | 425 | 2013 |

**TABLE 1 – PRESENT AND REASONABLY FORESEEABLE ACTIONS WITHIN THE CUMULATIVE IMPACT AREA**

| Project / Activity | County & State Where Project Coincides with Ruby Pipeline Project | Description | Approx. Size (acres) | Date of Project |
|---|---|---|---|---|
| Juniper Reduction<br>Big Bally*<br>Box Elder Sage-Grouse*<br>Bridge Creek<br>Bull Creek<br>Corral Allotment<br>Corral & Home Camp*<br>Crawford Mountain*<br>Express Canyon*<br>Green Mountain<br>Grouse Creek*<br>Hayes Butte<br>Highway 31<br>Hopeless*<br>Horse Camp Rim*<br>Lost River Basin *<br>North Grouse Creek*<br>North Warner*<br>Sage-Grouse Riparian*<br>Silver Creek<br>South Warner Rim*<br>Southwest Gerber<br>Vya<br>Willow Valley East* | Box Elder, UT<br>Rich, UT<br>Washoe, NV<br>Lake, OR<br>Klamath, OR | Juniper reduction at various locations using hand, mechanical, and fire in primarily sagebrush steppe to improve habitat | >158,000 | 2013 – Foreseeable Future |
| Sage-grouse Diversion<br>Elko*<br>Humboldt* | Elko, NV<br>Humboldt, NV | Install diverters on up to 428 miles of fence to deter sage-grouse collisions | N/A | 2013 – 2015 |
| | | **RESTORATION & HABITAT IMPROVEMENT PROJECTS TOTAL** | **>420,725** | |

* Identifies conservation projects funded partly or entirely by Ruby.

## *ENERGY PROJECTS*

Energy projects identified in Table 1 can be categorized into: high-voltage electric transmission lines, oil and gas transmission pipelines, energy exploration and development, natural gas storage, pumped storage hydroelectric, and wind energy facilities.

High-voltage electric transmission lines carry electricity long distances and begin and end in substations that serve either electric generation or load centers. These transmission lines vary from 115 kV to 500 kV. Transmission lines can carry electricity from coal-fired power plants, hydroelectric power plants, solar power plants, and wind farms. Transmission line poles (or structures) usually are between 60 and 140 feet tall. Structures can be metal or wood, single-poled or multi-poled, and single-circuited (carrying one set of transmission lines) or double-circuited (with two sets of lines). Construction and operation of transmission lines requires a linear right-of-way free of trees and other obstructions so that the poles and lines can be installed, accessed, and maintained. New access roads or improvements to existing access roads are frequently required for construction and operation activities. The right-of-way varies in width depending on the easement, the size of the poles, the presence of other nearby utilities, and the land use.

Oil and gas transmission pipelines are used to transport liquid petroleum products and natural gas long distances. These networks typically start at an initial injection station where product is injected into the line and end at a final delivery station where the product is distributed. Other major pipeline components include pump stations for liquids and compressor stations for natural gas that are used to help move the product through the pipe, block valves capable of isolating portions of the pipeline should a leak occur, and other valves and stations used for regulating pressure within the pipeline or allowing the product being transported to be delivered or inspected. Pipelines are typically buried within a designated right-of-way. The right-of-way varies in width depending on the easement, the size of pipe, the presence of other nearby utilities, and the land use. The area directly over the pipeline is kept clear of deep-rooted vegetation to allow the pipeline to be safely operated, aerially surveyed, and properly maintained.

Energy exploration and development projects often involve drilling of wells from well pads on which drilling rigs, trucks, and production equipment is situated. A well pad generally consists of a few acres of land that is cleared, leveled, and surfaced for the equipment. Oil and gas development projects often require access roads, surface impoundments, waste gas flares, storage tanks, small-diameter gathering pipelines, and pump or compressor stations. Energy exploration and development also can include geophysical investigations, which may involve laying out 3-D seismic cable and driving vibration trucks off road.

Natural gas is usually stored underground, in large storage reservoirs. There are three main types of underground storage: depleted oil and/or gas reservoirs, aquifers, and salt caverns. Depleted oil and gas reservoirs account for a majority of storage facilities. These facilities usually consist of injection and recovery wells, access roads, pipelines, metering facilities, and compressor stations. A large facility may consist of numerous wells, roads, pipelines and compressors within fenced sites dispersed over the reservoir field.

Pumped storage hydroelectric is a type of power generation that stores excess electrical energy in the form of water potential energy. At times of low electrical demand, excess electricity is used to pump water into the higher reservoir. At times of high electrical demand, water is released back into the lower reservoir through a turbine to generate electricity. Pumped storage hydroelectric facilities typically consist of an upper reservoir, an intake tunnel leading from the upper reservoir to the powerhouse, a powerhouse with one or more turbines for generating electricity, a discharge tunnel leading from the powerhouse to a lower reservoir, and a control room. Although pumped storage hydroelectric is a net consumer of energy, the system increases revenue by using electricity when prices are lowest, storing it in the form of water potential energy, and then regenerating and selling electricity when prices are highest.

Wind energy facilities consist of a collection of turbines that are used for production of electric power. Turbines have power ratings ranging from 250 watts to 5 megawatts. On large-scale facilities, the turbines are interconnected by a communications network and a medium voltage (34.5-kV) collection system, typically buried underground, which carry power generated by the turbines to a substation. At the substation, this medium-voltage electrical current is increased in voltage with a transformer for connection to the high voltage transmission system which feeds into the existing grid. A large wind farm may consist of a few dozen to several hundred individual wind turbines, and cover an extended area of hundreds of square miles. Turbines can be added to an existing facility as electricity demand grows. Other components of wind energy facilities include a permanent system of access roads used for routine maintenance; operations and maintenance facilities; and a transmission line connecting the facility to the grid. Usually the existing land uses around the facility pads can be maintained during facility operation. The typical lifespan of a utility-scale wind energy facility is 20 to 30 years.

In total, the energy projects identified in Table 1 would disturb approximately 51,069 acres. In addition to known energy projects, there are many thousands of acres of oil and gas leases that have not yet been developed but may be developed at some time in the future. Although the leases are in place and development could technically take place at any time, the market drivers to exploit them are presently unknown. Therefore, it is not possible to quantify the additional amount of environmental impact due to other oil and gas development beyond those projects identified in Table 1.

*MINING, MINERAL EXPLORATION, AND RELATED ACTIVITIES*

The Mining Law of 1872 makes public lands that are open to mineral-entry available for development and extraction of metallic and nonmetallic locatable minerals. The law also encourages mining companies to initiate exploration and development of such minerals. Mining and mineral exploration activities often involve cross-country travel; road construction and improvement; drill pad construction and drilling; trenching; open-pit excavation; underground excavation; ventilation construction; leach pad development; milling facilities; waste rock dumps; tailing storage facilities; and administrative sites. Sites can range in size from just a few acres to several thousand acres.

There is no requirement for notifying the BLM of casual use exploration and development activities that cause only negligible disturbance of public lands and resources. For activities other than casual use, either a notice (for activities 5 acres or less) or plan of operations (for activities greater than 5 acres) is required. Activities requiring notice are small and usually transitory by nature, and execution of the projects identified in the notices is unreliable. Therefore, they are not included in Table 1. Activities requiring a plan of operations, however, are larger, better known, and more reliable, and are included in Table 1. In total, the mining and mineral exploration projects identified in Table 1 would disturb approximately 35,445 acres.

*LIVESTOCK GRAZING AND WILD HORSE ECO-SANCTUARY*

Within the counties crossed by the Ruby Pipeline Project, the BLM currently administers 1,101 allotments totaling 22.2 million acres of land. Permits and leases generally cover a 10-year period and are renewable if the BLM determines that the terms and conditions of the expiring permit or lease are being met and land health standards are being maintained. The BLM's overall objective in managing grazing is to ensure the long-term health and productivity of the land and to create multiple environmental benefits that result from healthy watersheds. The terms and conditions for grazing on BLM lands (such as stipulations on forage use and season of use) are identified in the permits and leases issued by the BLM. The location and amount of grazing that takes place each year on BLM-managed lands can be affected by such factors as drought, wildfire, and market conditions.

In addition to commercial livestock, numerous wild horses and burros roam BLM rangelands in the western United States. The BLM's goal is to ensure and maintain healthy wild horse populations on healthy public lands. The BLM uses an "adoption program" as the primary tool for placing these animals into private care or into joint public-private sponsored eco-sanctuaries.

In total, livestock grazing and the wild horse eco-sanctuary identified in Table 1 would affect approximately 22,683,000 acres of land.

*RESTORATION AND HABITAT IMPROVEMENT PROJECTS*

A number of restoration and habitat improvement projects have been identified in the counties crossed by the Ruby Pipeline Project. These restoration and habitat improvement projects include activities such as cheatgrass treatment, post-fire stabilization and rehabilitation, fuelbreak mowing, juniper removal, meadow restoration, and grazing exclosures. Some of the projects are being undertaken using funds provided by Ruby as part of cooperative conservation agreements between Ruby, the BLM, and state agencies (see Appendix M of the Final EIS). In total, the restoration and habitat improvement projects identified in Table 1 could benefit more than 420,725 acres.

### Existing Environment (and the Influence of Past Actions on the Existing Environment)

Sagebrush steppe is named after the most dominant plant found in its ecosystem, sagebrush, and the ecological region it represents, steppe – a dry, mostly treeless grassland. Sagebrush steppe is characterized by sagebrush shrubs interspersed among widely spaced bunchgrasses. It is host to a remarkable variety of plant and animal species [3]; over 400 species of plants and 250 species of animals reside in the ecosystem. Plants common to sagebrush steppe include: Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), basin big sagebrush (*A. tridentata* ssp. *tridentata*), Lahontan sagebrush (*A. arbuscula* ssp. *longicaulis*), low sagebrush (*A. arbuscula*), mountain big sagebrush (*A. tridentata* ssp. *vaseyana*), bitterbrush (*Purshia tridentata*), and rabbitbrush (*Chrysothamnus nauseosus*). Animals common to sagebrush steppe include: greater sage-grouse (*Centrocercus urophasianus*), pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), burrowing owl (*Athene cunicularia*), and pygmy rabbit (*Brachylagus idahoensis*). Some animals of the sagebrush steppe require sagebrush to survive. Examples of sagebrush obligate species are sage-grouse, pygmy rabbits, sage thrashers (*Oreoscoptes montanus*), sage sparrows (*Artemisiospiza belli*), sagebrush voles (*Lemmiscus curtatus*), and sagebrush lizards (*Sceloporus graciosus*) [4].

Two environmental factors required for sagebrush steppe are: (1) a highly variable semi-arid climate and (2) long fire-free intervals [5]. The highly variable semi-arid climate is characterized by inconsistency in annual precipitation, with rapid fluctuation between wet years that favor shallow, fibrous-rooted, herbaceous plants, and dry years that favor the more deeply rooted shrubs [5]. Long fire-free intervals range from 25 years [6] to 100 years [7].

Most sagebrush steppe soils are Xerolls [5]. Xerolls are a suborder of Mollisols (grassland soils with a thick, dark surface horizon), formed in a xeric (dry) moisture regime [8]. Soil characteristics of sagebrush steppe are important because, where vegetation has been highly disturbed, the soil profile can be used to identify the potential for recovery [5].

The amount of sagebrush steppe in North America is thought to vary between about 99 million acres [9] and 165 million acres [10]. Pre-settlement sagebrush steppe communities generally had a vigorous herbaceous layer of perennial grasses and forbs intermixed with a moderate sagebrush cover [5] [11] [12]. The patchwork of quality sagebrush areas remaining today is a landscape of habitat islands for sagebrush obligate species [13].

In 1999, Neil West [5] estimated the changes that have occurred to sagebrush steppe in the western United States since the time of European settlement. West divided the sagebrush steppe ecosystem into nine categories based on an estimated 111 million acres of pre-settlement sagebrush steppe vegetation and habitat [5] [14]. Of the nine categories, four represent intact to slightly depleted states of sagebrush steppe that could be restored via management approaches that require a lesser investment of energy [5]. These categories accounted for just over 30 percent of the total area (33.3 million acres) [5]. The remaining five categories represent substantial degradation that would require expensive and/or risky resource investments, and accounted for about 70 percent of the total area (77.7 million acres) [5]. West observed that pristine sagebrush steppe ecosystems may no longer exist [5].

This Draft SEIS evaluates the historic and current extent of sage-grouse distribution and habitat in order to estimate the historic and current extent of sagebrush steppe within the cumulative impact area. Sage-grouse distribution can be used as a proxy for sagebrush steppe in the cumulative impact area because the greater sage-grouse is strongly correlated with sagebrush steppe in the counties crossed by the Ruby Pipeline Project. The maps of *historic* sage-grouse distribution evaluated in this Draft SEIS were compiled by Dr. Michael A. Schroeder, research biologist for the Washington State Department of Fish and Wildlife [15]. Schroeder's maps represent the sage-grouse's maximum distribution from the early 1800s to the late 1990s based on a variety of other sources and publications [15]. The maps of *current* sage-grouse habitat used in this Draft SEIS were developed by the BLM and state agencies. These maps depict preliminary priority habitat (PPH) and preliminary general habitat (PGH) for the greater sage-grouse. PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable greater sage-grouse populations as identified by the BLM and state wildlife agencies [16]. These areas include breeding, late brood-rearing and winter concentration areas. PGH comprises areas of occupied seasonal or year-round habitat outside of priority habitat [16]. The maps of current sage-grouse habitat may include areas where the sagebrush component has been compromised by exotic grasses, conifer encroachment, and/or wildfire; however, the PPH and PGH designations provide a consistent metric across the cumulative impact area for areas that retain their importance to sagebrush obligate species within the sagebrush steppe ecosystem, particularly sage-grouse.

Based on sage-grouse maps, sagebrush steppe is estimated to have historically occupied about 30.8 million acres, or 76 percent, of the total land area within the cumulative impact area (see Figure 2). Today, it occupies about 19.3 million acres or 48 percent (see Figure 3). The loss of sagebrush steppe can be attributed to human causes beyond the natural disturbance cycles [17]. Conversion to cropland and other development (including mining and energy projects); livestock grazing (cattle and sheep); the introduction of non-native plants (mainly cheatgrass

(*Bromus tectorum*)); changes in wildfire cycles; and juniper-pinyon encroachment are most frequently identified as main causes of loss and degradation.

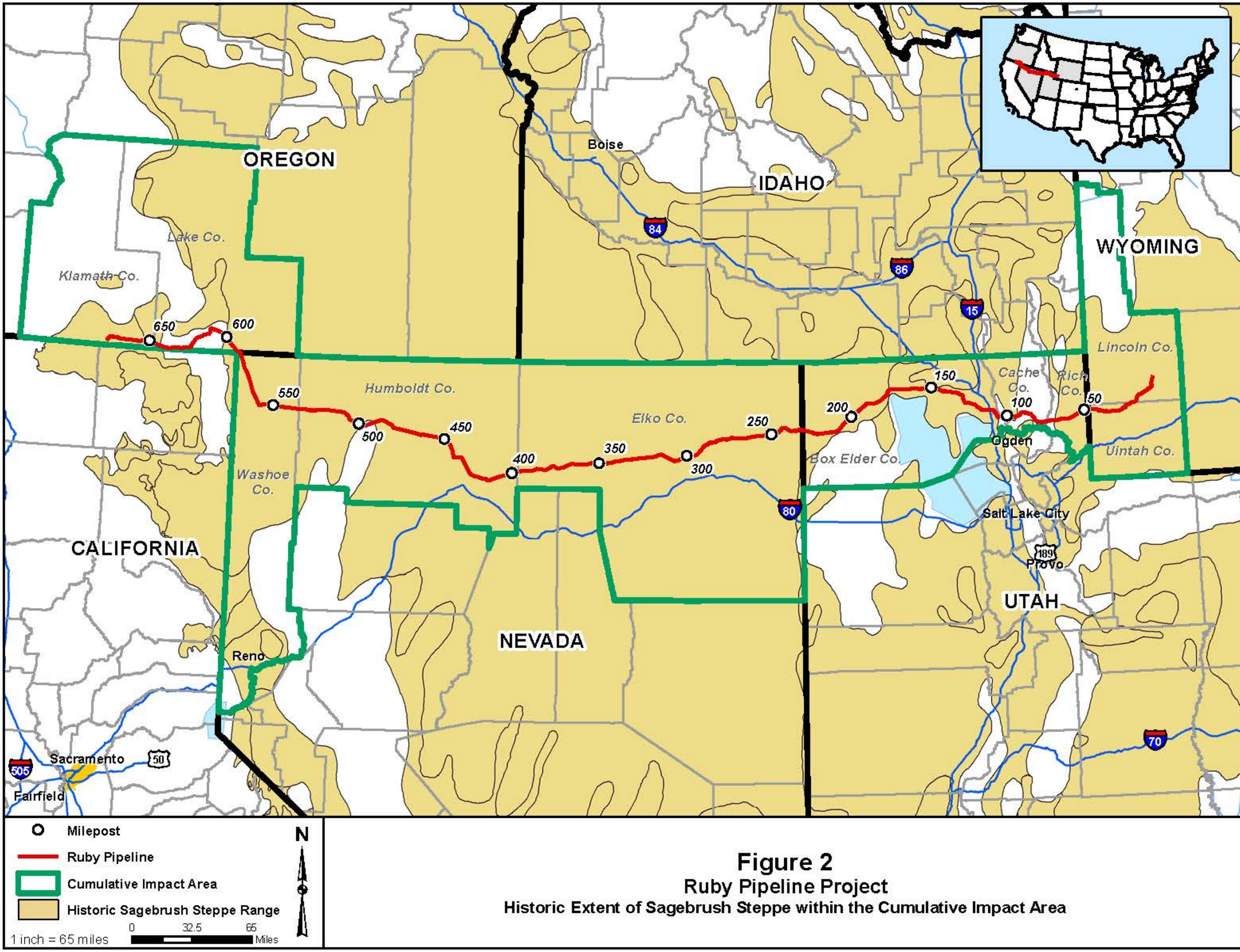
*CONVERSION TO CROPLAND AND OTHER DEVELOPMENT*

Agricultural and other development resulted in historic losses of sagebrush steppe ecosystems in the western United States [18]. Biologists estimate that up to 17 percent of the original sagebrush steppe vegetation and habitat in the western United States has been lost to agriculture, urbanization, and other industrial development [19]. Sagebrush steppe is generally not considered suitable for farming without irrigation, and most farming in the cumulative impact area is by irrigated agriculture [20] [21]. Based on the latest agricultural census, there are about 1.4 million acres of cropland in the cumulative impact area, representing about 4 percent of the total land area [20]. This is a reduction from about 1.7 million acres reported in the 2002 census [20]. In addition to cropland, sagebrush steppe has experienced conversion for other purposes, including mining, energy extraction, road development, and urbanization [22] [23] [24].

*LIVESTOCK GRAZING*

Livestock grazing has resulted in direct and indirect impacts on sagebrush steppe. Prior to European settlement, grazing of sagebrush steppe was primarily by wildlife browse. European settlement, however, brought with it livestock grazing, mainly cattle and sheep. Livestock were introduced into the West in the 1500s when the Spanish established missions [25]. The livestock industry in the western United States grew substantially in the years after the Civil War [26] and into the first part of the 1900s. In the early days, the animals roamed freely and were only rounded up for branding and marketing [26]. The livestock industry grew rapidly due to the large profits created by a seemingly unlimited supply of free forage on federal lands [26]. By the late 1800s, rangeland in the western United States was severely overcrowded [26].

The unregulated grazing that took place before enactment of the Taylor Grazing Act of 1934 caused unintended damage to the sagebrush steppe. In more recent years, grazing practices have been revised to allow sagebrush steppe to be grazed and prosper. Today, laws that apply to the BLM's management of grazing on public lands include the Taylor Grazing Act of 1934, the NEPA of 1969, the Endangered Species Act of 1973, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. On public lands, the BLM's overall objective is to ensure long-term health and productivity, using rangeland health standards and guidelines developed with input from citizen-based Resource Advisory Councils across the western United States [27]. These standards and guidelines address maintaining and promoting adequate amounts of vegetative ground cover; subsurface soil conditions; riparian wetland function; stream channel morphology; hydraulic and nutrient cycling; seedling establishment; water quality; habitat for threatened, endangered, candidate, and other special status species; and native plant and animal communities [28]. Current healthy management techniques include methods such as seed dissemination, rest rotation, early season grazing, fencing to control livestock movement, and water development to improve livestock distribution across the landscape [27]. Livestock grazing can result in environmental benefits. For example, intensively managed "targeted" grazing can be used to control some invasive plant species or reduce the fuels that contribute to severe wildfires [27].




# Figure 2
## Ruby Pipeline Project
### Historic Extent of Sagebrush Steppe within the Cumulative Impact Area

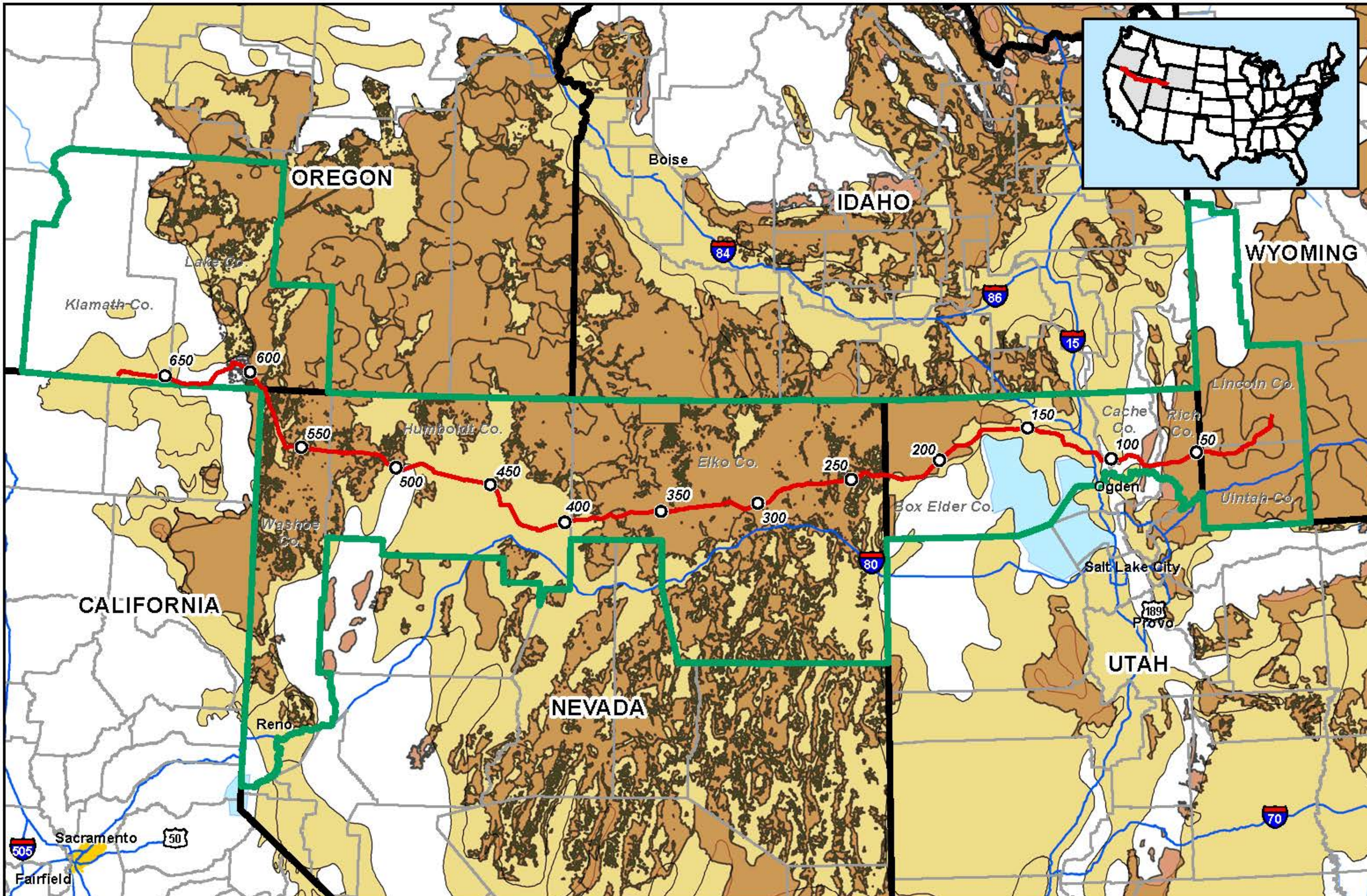



**Figure 3**
**Ruby Pipeline Project**
**Current Extent of Sagebrush Steppe within the Cumulative Impact Area**

Livestock that graze native sagebrush steppe tend to focus on the more palatable herbaceous grasses and avoid the less palatable woody species, thus the sagebrush shrubs are freed from competition and achieve dominance relatively quickly (10 to 15 years) if left unchecked [5]. Historically, overgrazing by livestock resulted in a reduced herbaceous understory and a commensurate increase in sagebrush cover [13] [29] [30]. In some cases, excessive overgrazing led to the disappearance of perennial grasses and a dramatic, self-perpetuating increase in sagebrush [31] and encroachment of adjacent juniper and pinyon forest [32]. With virtually no herbaceous understory to help carry natural wildfires, the overly dense sagebrush propagated while limiting the establishment of native herbaceous perennials [31]. Biologists estimate that approximately 70 percent of the area covered by sagebrush in the western United States has been altered by livestock grazing [19]. This equates to about 21.6 million acres of historic sagebrush steppe within the cumulative impact area.

*INVASIVE SPECIES*

The reduction in native ground cover from livestock overgrazing in the early days also created conditions suitable for the invasion of nonnative annual grasses [13] [29] [30]. Grazing and livestock trampling also resulted in the destruction of biological surface crusts, which created conditions more suitable for introduction and spread of non-native plants [33]. Cheatgrass in particular gained a strong foothold in the sagebrush steppe ecosystem and is widely considered one of the most problematic nonnative species in the western United States. Cheatgrass was accidentally introduced to North America through ship ballasts from Asia, and the first introduction is thought to have come from ballast dumps near St. Louis [34]. Infestations in the early days were often found in wheat fields and near railroads [34]. Wheat seed was often contaminated with cheatgrass seed [34]. Straw infested with cheatgrass was used as packing material for goods transported via railroad [34]. Today, biologists have established clear connections between the distribution of invasive plants and land use features such as roads, well pads, pipelines, and electric transmission lines [35]. The greatest richness of invasive plants is associated with two-track roads [35].

Cheatgrass spread rapidly through sagebrush steppe because it was pre-adapted to the environmental conditions of the ecosystem [34]. Cheatgrass out-competes most native grasses for available nutrients and goes to seed earlier than native grasses [36]. Cheatgrass produces a lot of seed that germinates in the fall, puts up some leaves, and grows to maturity in early spring at cool soil temperatures (except in areas where the winters are extremely cold and the plants die, such as northern Nevada) [37]. During droughts, cheatgrass can use up all the available soil moisture before native species begin growing, and cheatgrass is more responsive to fire than most native species [37]. In short, cheatgrass is exceptionally adept at out-competing most native species for soil moisture, and once established, it will inhibit the survival of seedlings of perennial herbaceous species [38]. Native plants and populations differ in their ability to tolerate cheatgrass. For example, Sandberg bluegrass (*Poa secunda*) has been known to suppress cheatgrass, and big squirreltail (*Elymus multisetus*) is known to be good at both tolerating and competing with cheatgrass [39]. Remnant native populations growing in invaded areas may be an important source of genotypes for restoration of invaded communities, but not all remnant populations will provide competitive specimens [39]. In addition to cheatgrass, other invasive species that have disrupted the sagebrush steppe ecosystem include Russian thistle (*Salsola* spp.), tumble mustard (*Sisymbrium altissimum*), knapweed (*Centaurea* spp.), and medusahead (*Taeniatherum caput-medusae*) as well as others.

Many areas invaded by cheatgrass and other invasive species have been seriously altered and no longer support the vegetation of the natural community [40]. At high densities, cheatgrass dominance can lead to complete community type conversions from perennial bunchgrass to cheatgrass monocultures [40]. Cheatgrass can maintain dominance for many years on sites where native vegetation has been eliminated or reduced by livestock grazing or fire [40]. The presence and dominance of cheatgrass affects many aspects of community structure, process, and function including diversity of plant and animal species and disturbance to natural fire regimes [40]. Cheatgrass is a dominant factor in the ecosystem and has resulted in an estimated 18 percent loss of sagebrush steppe since European settlement [19]. This equates to to about 5.6 million acres of historic sagebrush steppe within the cumulative impact area.

Restoring the health of areas affected by cheatgrass is one of the BLM's highest priorities. The two most common forms of noxious and invasive weed treatments on BLM lands are reseeding as part of post-fire stabilization/rehabilitation and application of herbicides on infested areas [41]. The goal of post-fire stabilization/rehabilitation is the reestablishment of perennial vegetation, which, in turn, prevents cheatgrass establishment and competes with the cheatgrass [41].

*WILDFIRES*

Cheatgrass also has increased the frequency and intensity of wildfires [38]. After decades of uncontrolled livestock grazing into the mid-1900s, cheatgrass often dominated the understory and provided the fuel to allow larger, more frequent fires to occur earlier in the year [5]. Because big sagebrush species do not re-sprout following a wildfire event, these species rely on recruitment and reestablishment solely from nearby seed sources or active restoration efforts. The recovery of these sagebrush-steppe communities is often pre-empted by the shortened fire return interval, ultimately depleting the seed source and converting burned areas to annual grass. Cheatgrass is estimated to have influenced fire dynamics across almost 50 percent of the entire sagebrush biome [19].

Historically, sagebrush steppe vegetation in the Great Basin was impacted by wildfires at return intervals of 25 years [6] to 100 years [5] [7]. These historic fire regimes maintained a patchy distribution of shrubs and predominance of grasses [21]. Recent studies suggest that the historic fire return intervals may have been even longer – 171 to 342 years for areas dominated by Wyoming big sagebrush and 137 to 217 years for areas dominated by mountain big sagebrush [42].

Today, areas infested by cheatgrass tend to burn at more frequent intervals [7]. Most locations within the cumulative impact area have a fire return interval that has been reduced to well below100 years [43]. Studies within the cumulative impact area in Nevada reflect a relatively lower frequency and fire size in the decade of the 1980s with a dramatic increase (more than tripling) in 1990s that remains high to the present day (nearly quadruple the 1980s rate) [44]. The general area of fire activity is within an apparent storm track, which bisects the state from west to east [44]. While certain spikes of fire activity are obvious, of note are the general increases in recent fire activity in populations that were last burned long ago [44].

Some studies have concluded that the fire return interval is now so short in some sagebrush steppe locations that reestablishment of native vegetation after a burn has become unlikely unless the area is actively managed [7] [45]. Within the past 10 years, fires have been so prolific within the cumulative impact area, particularly western Utah and eastern and central Nevada, that they burned approximately 3.7 million acres of sagebrush steppe, some areas more than once. The acreages of sagebrush steppe affected by invasive grasses and consequent wildfires eclipse all other natural and anthropogenic effects [44]. To actively manage these effects, the BLM undertakes a broad range of activities. Fuels management through cheatgrass control is one major activity; however, the program also includes fire suppression preparedness, prevention, and education; community assistance and protection; and safety [46].

*JUNIPER-PINYON ENCROACHMENT*

Several studies have reported a decline in fires in areas heavily grazed by livestock and not overrun by cheatgrass [47] [48]. The introduction of livestock in the late 1800s greatly reduced fine fuels in many areas [19]. With virtually no herbaceous understory to help carry natural wildfires, the overly dense sagebrush propagated while limiting the establishment of native herbaceous perennials [31]. The longer fire return intervals allowed juniper-pinyon woodlands to encroach into sagebrush steppe and increase in dominance [19]. Juniper and pinyon eventually displace sagebrush, grasses, and forbs needed by greater sage-grouse and other sagebrush wildlife [49]. Utah juniper (*Juniperus osteosperma*), western juniper (*J. occidentalis*), single-leaf pinyon (*Pinus monophylla*) and two needle pinyon (*P. edulis*) are the primary conifer species invading the sagebrush biome [19]. Estimates of woodland expansion vary regionally throughout the western United States, ranging 60 to 90 percent beyond their original footprint [19]. Specific information about woodland expansion within the cumulative impact area was not available for this SEIS.

### Environmental Effects (of Present and Reasonably Foreseeable Future Actions)

Past actions that shaped the sagebrush steppe ecosystem into what it is today are discussed in the Existing Environment section above. Present and reasonably foreseeable future actions that continue to shape the sagebrush steppe ecosystem are discussed here. For the purpose of this Draft SEIS, these actions can be grouped into four main categories: energy projects; mining, mineral exploration, and related activities; livestock grazing and wild horse eco-sanctuary; and restoration and habitat improvement projects. Table 2 identifies the aggregate acreage of sagebrush steppe directly affected by each category.

**TABLE 2 – CUMULATIVE IMPACT ACREAGES**

| Category of Action | Estimated Acres of Sagebrush Steppe that Would Be Directly Affected by Present and Reasonably Foreseeable Actions within the Cumulative Impact Area | Expressed as a Percentage of the Total Amount of Sagebrush Steppe in the Cumulative Impact Area |
|---|---|---|
| Energy Projects (including the Ruby Pipeline Project*) | 33,603 | 0.17% |
| Mining, Mineral Exploration & Related Activities | 16,920 | 0.09% |
| Livestock Grazing & Wild Horse Eco-Sanctuary | 13,553,711 | 70.20% |
| Restoration & Habitat Improvement Projects | >420,725 | 2.18% |

* The Ruby Pipeline Project accounts for about 9,225 acres of direct impact on sagebrush steppe within the cumulative impact area. This equates to about 0.05 percent of the total amount sagebrush steppe within the cumulative impact area.

## *ENERGY PROJECTS*

The primary direct impact from construction of the Ruby Pipeline Project on sagebrush steppe is from the cutting, clearing, and removal of existing vegetation within the construction right-of-way and workspaces. An estimated 9,225 acres of sagebrush steppe was affected by construction of the Ruby Pipeline Project (see Table 2). This represents 0.05 percent of the total 19.3 million acres of sagebrush steppe within the cumulative impact area. The Final EIS prepared for the Ruby Pipeline Project considered design features to minimize impact on the environment. For example, to minimize impacts on the environment, including sagebrush steppe, the Ruby Pipeline Project was co-located with other existing roads and utilities. Co-location of facilities is a generally accepted means to control the location of development and limit impacts on sensitive resources by keeping disturbance within established corridors. Installation of new pipeline along an existing, cleared right-of-way (such as other pipeline, electric transmission line, road, or railroad) may be environmentally preferable to construction of a new right-of-way, and construction effects and cumulative impacts can normally be reduced by use of a previously cleared right-of-way. Likewise, long-term or permanent environmental impacts can normally be reduced by avoiding the creation of new right-of-way through previously undisturbed areas. The Ruby Pipeline Project was co-located along about 44 percent of its route. About 58 percent of the route in sagebrush steppe habitat was co-located with other rights-of-way.

The Final EIS prepared for the Ruby Pipeline Project evaluated the possibility of routing the pipeline within West-wide Energy Corridor (WWEC). The WWEC is a collection of non-contiguous energy corridors identified by the U.S. Department of Energy, U.S. Department of Defense, BLM, and U.S. Forest Service in 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming). The WWEC includes more than 6,000 miles of 3,500-foot-wide corridor on federal land; however, the corridor is not contiguous and does not extend onto interposing private or non-federal parcels. Despite the potential benefits of co-location within the WWEC, the non-contiguous nature of the WWEC can make utilizing the corridor for long projects across multiple federal parcels impractical. Project proponents must still obtain rights-of-way on interposing private lands that do not have a corridor designation. The Final EIS found that following the WWEC would have resulted in a pipeline about 151 miles longer than the proposed route, which would include an additional 73 miles of non-federal land. This additional pipeline length also would necessitate more compression (e.g., installation of aboveground compressor stations), which would, in turn, increase long-term air emissions. The Final EIS concluded that routing along the WWEC would not confer an environmental advantage over the proposed route.

In addition to co-locating with existing rights-of-way where practical, the Final EIS considered reducing impacts of the Ruby Pipeline Project through certain management practices focused on active restoration and revegetation of the right-of-way. However, even with most of the land affected by the Ruby Pipeline Project being reclaimed and allowed to return to its original state, the effects of construction are expected to be long-term due to the time required to reestablish the vegetation characteristics of the native community types. The arid environment in the project vicinity is not conducive to plant growth, and regeneration of vegetation and transition back to a sagebrush steppe state following construction is expected to be slow. Moreover, the regeneration expectation of seeded or planted natural vegetation in the project area varies greatly and can be ineffective. Natural regeneration of these areas may take 50 years or longer. Site-specific conditions such as grazing, rainfall amounts, elevation, weeds, and soil type could extend impacts beyond 50 years, or, if ideal, could aid reclamation success and shorten restoration timeframes. Several Indian tribes noted this concern during consultation for this SEIS, and raised related concerns such as the spread of non-native species. More information on these concerns is provided in the Native American Consultation section of this SEIS.

Direct impacts from energy projects other than the Ruby Pipeline Project identified in Table 1 would be similar to those of Ruby, except that clearing for non-pipeline projects would be limited to aboveground structure sites and access roads because the entire width of the right-of-way or project site does not typically require clearing and the infrastructure is spanned above and across the landscape. Co-location and other mitigation measures would be implemented to the extent practical on these other projects through various federal, state, and/or local permitting processes, thereby reducing the degree and duration of impacts. In total, the Ruby Pipeline Project plus other energy projects identified in Table 1 would disturb a combined 66,808 acres of land. For the purpose of this Draft SEIS, we have assumed that sagebrush steppe affected by the energy projects listed in Table 1 would be affected proportionally to its occurrence in the study area in order to gain a perspective of how much sagebrush steppe would be affected. Using this method, about 33,603 acres of sagebrush steppe would be affected by the Ruby Pipeline Project and other energy projects combined (see Table 2). This equates to about 0.17 percent of the total amount of sagebrush steppe in the cumulative impact area. These projects would be required to reclaim most disturbed areas following construction and represent a relatively minor impact compared to the historic invasion of cheatgrass across more than 50 percent of the landscape, recent wildfires that have affected vast amounts of sagebrush steppe, and the historic expansion of juniper and pinyon into sagebrush steppe by 60 to 90 percent [19].

Indirect impacts from energy projects on wildlife would occur as a result of the removal and fragmentation of sagebrush habitat. Relatively intact sagebrush steppe habitats are essential for survival of sage-grouse and other species uniquely adapted to the environment, and are important for mule deer, elk, and other species [10]. As the sagebrush steppe becomes scarce and fragmented, species that rely on the habitat for their food and shelter also become scarce, and predators are able to more easily prey on species that remain, further stressing the balance [50]. Impacts on riparian areas within the sagebrush steppe may be more consequential than other areas. Riparian areas are important because of the habitat (food, cover, and migratory corridor) they provide to many plant and animal species. Riparian habitat tends to support greater biodiversity (a wider range of species) than the surrounding areas because of the abundance of water. Although the extent of riparian areas in sagebrush steppe is less than many other ecosystems, the riparian areas have a greater significance for some functional values [25]. They are especially important for neotropical migratory birds because the riparian areas are scattered amidst great expanses of arid land [25]. They also provide crucial habitat for 50 to 75 percent of vertebrate species found in the western intermontane region, including many species designated as endangered, threatened, or sensitive [25]. Livestock often favor riparian areas because of the availability and abundance of shade, lush vegetation, and water [25]. Areas where riparian vegetation is removed by energy projects likely would experience a localized reduction of biodiversity. Depending on vegetation cover, the duration of impact could range from short-term to permanent. Impacts would be short-term in areas comprised of quick-growing herbaceous (grassy) vegetation, but would be long-term or permanent where slow-growing (such as sagebrush) vegetation is cleared. The Final EIS for the Ruby Pipeline Project indicated that about 206 acres of woody riparian land would be affected by Ruby. A number of mitigation measures were stipulated in the Final EIS to minimize impacts on these areas, including placing restrictions the construction right-of-way width in certain woody riparian areas; requiring the replanting of woody vegetation after construction; protecting replanted areas from grazing and browsing during restoration; and monitoring the success of restoration for 5 years after construction.

Studies have shown that fragmentation of the landscape, which can result from the development of large-scale energy projects, particularly influences predation and nest success by providing predators with beneficial features, such as better visibility [51] [52] [53]. Further, artificial structures (e.g., infrastructure, transmission lines, disturbed ground) can increase the abundance, diversity, or hunting efficiency of predators [54] [55]. Human-altered landscapes have a greater abundance of predators and risk of predation may be greater in these areas [53]. Ground-nesting species such as greater sage-grouse may be exceptionally vulnerable to predation in landscapes that have been altered by human development [53].

Wildlife most affected by the removal and fragmentation of habitat would be sagebrush-obligate species that also are listed as sensitive by the BLM within the study area. BLM-sensitive species generally depend on specialized or unique habitats that are considered to be at risk by the BLM [56]. Within the cumulative impact area, sagebrush-obligate species that also are BLM-sensitive species include greater sage-grouse, Brewer's sparrow (*Spizella breweri*), sage sparrow, sage thrasher, pygmy rabbit, and northern sagebrush lizard (*Sceloporus graciosus graciousus*). Detailed information about habitat requirements and threats to each of these species can be found at various sources and are incorporated here by reference [24] [57] [58] [59] [60] [61].

Each of the sensitive sagebrush-obligate bird species listed above varies somewhat in its habitat preference. For example, sage thrashers use sagebrush habitats, but they also may utilize pinyon-juniper woodlands and arid to semi-arid shrubs and grasslands [59]. Sage sparrows on the other hand prefer contiguous areas of tall, dense sagebrush [58]. Direct and indirect impacts on these species, including recent declines in sage-grouse populations and other sagebrush-obligate species, have been linked to energy development [53]. Removal of sagebrush associated with these projects would reduce available breeding, nesting, and/or forage habitat for these species in and around energy development projects, and would increase predation. Research suggests that habitat alteration that removes live sagebrush and reduces patch size is negative for all sagebrush obligates, specifically greater sage-grouse, Brewer's sparrow, sage sparrow, and sage thrasher [62]. Reproductive success of these sagebrush-obligate birds is lower in fragmented landscapes than in contiguous landscapes [63]. Operational activity associated with energy infrastructure (e.g., traffic and noise) is known to displace wildlife and alter habitat use patterns [64]. Such effects generally cover areas substantially larger than the area directly impacted [64]. Studies on greater sage-grouse showed marked drops in male lek attendance within 2 and 3 miles of energy development projects [65] [66] (a lek is a traditional place where male sage-grouse assemble during the mating season to engage in competitive displays to attract females). Studies also showed that there is a delay of 2 to 10 years between energy development and its measurable effects on lek attendance [66]. On the other hand, instances also have been documented where rights-of-way have provided suitable sage-grouse lek habitat; leks have been documented on rights-of-way where there were no previous records of leks [67].

Pygmy rabbits and northern sagebrush lizards are somewhat less mobile than birds, and also could be impacted by removal of sagebrush habitat. Pygmy rabbits are especially susceptible to predation in areas with little shrub cover [68]. Shrub cover would not be present in disturbed areas for several years or decades following construction; consequently, the disturbed areas, especially on long, linear electric transmission lines and oil and gas transmission pipelines, could create barriers to rabbit and lizard movement until revegetation is similar to adjacent conditions. Recently, however, telemetry studies by the Nevada Department of Wildlife have documented pygmy rabbits travelling freely across rights-of-way [67]. Further, fresh pygmy rabbit signs (droppings) were observed in Spring 2013 on parts of the Ruby pipeline right-of-way that were planted with sagebrush seedlings (including big sagebrush) and perennial grasses and forbs, suggesting that reclamation efforts can enhance forage diversity for pygmy rabbits where the surrounding habitat is less than ideal [67].

Indirect impact on sagebrush steppe also may result from disturbance of soils, which provides opportunities for invasive species to become established with less competition from natives. Cheatgrass is known to be exceptionally adept at out-competing native species and disrupting biodiversity of the ecosystem.

One potential benefit of removing vegetation from transmission line rights-of-way is that the corridor can act as a fuelbreak for controlling wildfires, particularly in areas of heavy cheatgrass infestation where fire return intervals are short. In the event of a wildfire, the de facto fuelbreak provided by the cleared right-of-way corridor can help slow down or stop wildfires, and allow firefighter anchor points in areas with contiguous intact sagebrush cover. Fuelbreaks help extend the burn cycle to more natural intervals and preserve slow growing sagebrush species that are essential to the environment. Although fuelbreaks may be considered to have a direct, negative impact where vegetation is cleared from the land, the fuelbreak benefits much larger blocks of land by helping limit the size of future wildfires. Rights-of-way can even be managed (such as by patterned mowing) to allow for future fuelbreak effects to prevent large scale block burns. Most transmission line projects, however, are actively revegetated across their entire width following construction. As a result, the benefit may be short term.

*MINING, MINERAL EXPLORATION, AND RELATED ACTIVITIES*

Direct impacts on sagebrush steppe from mining and mineral exploration activities would be similar to those impacts associated with energy projects as described above, except that open pit mines are typically not backfilled or reclaimed at the end of the mine life. In total, mining and mineral exploration projects in Table 1 would disturb about 35,445 acres. Assuming that sagebrush steppe would be affected proportionally across the study area, about 16,920 acres of sagebrush steppe would be affected by mining and mineral exploration projects (see Table 2). This equates to about 0.09 percent of the total amount of sagebrush steppe in the cumulative impact area.

Indirect impacts on wildlife would be similar to the impacts from energy projects, except that mining and mineral exploration activities would not fragment the landscape in the same manner as the long, linear electric and pipeline corridors, nor would they provide the same type of fuelbreak benefits as those projects. However, mining projects often provide conveniently located and reliable sources of water for firefighting efforts, and in certain instances have heavy equipment readily available for firefighting.

*LIVESTOCK GRAZING AND WILD HORSE ECO-SANCTUARY*

Livestock and wild horses that graze in sagebrush steppe tend to consume grasses and avoid the shrubs. Historically, this resulted in a sagebrush dominated landscape in overgrazed lands. Today, however, livestock grazing is conducted a manner aimed at achieving a balance of herbaceous and shrubby species and maintaining the health of the land. Because topography, climate, soils, water availability, and other factors vary from location to location and from year to year, ranchers and land managers are required to change grazing practices to achieve the desired condition of the land. Public land is managed according to certain standards and guidelines for soils and vegetation conditions, species diversity, riparian area conditions, and water quality. Where standards are met, no changes in grazing patterns may be warranted. However, where standards are not met, changes may be needed to achieve viable, healthy, productive, and diverse populations of native and desired plant and animal species, including sagebrush-obligate sensitive species. Changes may involve altering grazing patterns as well as implementing certain improvements, such as installation or removal of fences and cattleguards; development of springs, wells, water lines, troughs, and ponds; and reestablishing vegetation by active seeding. The BLM currently has permits and leases covering about 22.2 million acres of land in the cumulative impact area, of which about 13.3 million acres is sagebrush steppe. Specifics about future grazing are not precisely known, except that grazing continues to be an important use of public land and likely would continue in the future in a manner similar to the present. Future specific decisions about grazing, however, will be determined by the condition of the land and the standards and guidelines put in place to ensure the health of the land.

In addition to commercial livestock, numerous wild horses and burros roam BLM rangelands in the western United States (about 37,300 as of the last census) [69]. Specific information about the numbers of wild horses and burros within the cumulative impact area was not available for this SEIS. Wild horses and burros have almost no natural predators, and left unchecked, their herd sizes can double almost every 4 years [69]. The BLM's goal is to ensure and maintain healthy wild horse populations on healthy public lands by managing wild horse and burro herd populations in accordance with the land's capacity to support them [70]. To help ensure that herd sizes are in balance with the land, the BLM uses an "adoption program" as the primary tool for placing these animals into private care or into joint public-private sponsored eco-sanctuaries [71]. The BLM is considering a proposal for a large 525,000-acre public-private eco-sanctuary within the cumulative impact area where wild horses and burros would be allowed to graze and roam. Of this total, at least 250,611 acres is estimated to be sagebrush steppe.

*RESTORATION AND HABITAT IMPROVEMENT PROJECTS*

Several of the projects identified in Table 1 are designed specifically to improve sagebrush steppe habitat. These projects involve activities such as cheatgrass treatment, fuelbreak mowing, juniper removal, meadow restoration, post-fire emergency stabilization and rehabilitation projects, and grazing exclosures. In total, restoration and habitat improvement projects would benefit more than 420,725 acres of sagebrush steppe. Some of the projects are being undertaken using funds provided by Ruby as part of cooperative conservation agreements between Ruby, the BLM, and state agencies (see Table 1 in this SEIS and Appendix M of the Final EIS), and are intended to mitigate the impacts associated with the loss of habitat function from the pipeline and to provide conservation benefits to greater sage-grouse, pygmy rabbit, and other species. Ruby is required to provide up to $22.9 million in funding for restoration and habitat improvement projects as well as habitat studies in the vicinity of the pipeline. This funding would provide benefit, in part, for more than 90,300 acres of sagebrush steppe, including sagebrush obligate sensitive species.

*SUMMARY OF IMPACTS*

It is clear that the cumulative impacts of past actions on sagebrush steppe vegetation and habitat have been significant – about 11.5 million acres (37 percent) of sagebrush steppe has been lost within the cumulative impact area based on sage-grouse distribution and habitat mapping (see Figures 2 and 3), and nearly all sagebrush steppe has been degraded to some extent [5]. Perhaps the most notable cause of sagebrush steppe decline can be attributed to wildfires [44]. It should be noted, however, that sagebrush steppe is a dynamic ecosystem that has a wide variety of successional stages and states. Vegetation present in any area is a function of climate, soils, available plant species, and disturbance regimes. The limitations posed by and interrelationships between these four factors dictate the plant communities present on any given site at any given time. Traditional thoughts on plant ecology held that each combination of these factors supports one "climax" plant community. However, current range science holds that a site may support multiple stable states, with disturbances and other factors controlling which state a site is in and how and when the community transitions from one state to another. Movement between these various states is not necessarily linear and may require high energy inputs, such as fire or mechanical treatments, for a site to move from one stable state to another. In other words, movement may not always be accomplished through passive changes in management [72].

With regard to present and reasonably foreseeable future actions, cumulative impacts would not be significant. Agricultural use and livestock grazing have been on the decline, and both activities are expected to continue in the future in a manner similar to the present. Livestock grazing, including grazing associated with wild horse and burro eco-sanctuary, would impact more than 13.6 million acres of sagebrush steppe (see Tables 1 and 2) and will continue to be administered by the BLM in a manner to promote the long-term health and productivity of the land. The Ruby Pipeline Project and other energy and mining actions would continue a historic trend toward a reduction of sagebrush steppe vegetation and habitat. In total, these projects would affect an estimated 50,523 acres of sagebrush steppe, of which the Ruby Pipeline Project accounts for about 18 percent (see Tables 1 and 2). In total, the Ruby Pipeline Project and other energy and mining actions would affect about 0.26 percent of the existing 19.3 million acres of sagebrush steppe vegetation and habitat in the cumulative impact area. These activities are overshadowed by losses to wildfire that occur every year. In the past 3 years alone, about 1.4 million acres of sagebrush steppe burned in the cumulative impact area. This is more than 28 times the amount that would be lost in the foreseeable future due to energy development and mining. Wildfires will occur in the future and those fires may have major effects on large areas of sagebrush steppe. Although wildfires can be caused by natural or anthropogenic events, they are not actions per se and it is not precisely clear when or where they will occur. The amount of post-fire emergency stabilization and rehabilitation that occurs each year in response to wildfires is limited and is based on funding from Congress, which varies annually. To date, Ruby has provided about $1.6 million of additional funding for post-fire emergency stabilization and rehabilitation projects. This additional funding was provided through Ruby's cooperative conservation agreements and has benefitted more than 56,600 acres of land.

A number of restoration and habitat improvement projects are expected to occur within the cumulative impact area that would benefit sagebrush steppe vegetation and habitat. In total, these projects would benefit more than 420,725 acres (see Tables 1 and 2) of sagebrush steppe by treating cheatgrass areas, removing juniper, stabilizing and rehabilitating burned areas, and providing forage and cover for sagebrush dependent species. A majority of this acreage is for juniper removal and fire stabilization/rehabilitation. Ruby is presently undertaking efforts to actively restore and revegetate most of the 9,225 acres of sagebrush steppe directly impacted by its project, except for about 61 acres that were permanently converted for aboveground facilities. Additionally, Ruby is partly or fully funding more than 42 other restoration and habitat improvement projects benefitting more than 90,300 acres of sagebrush steppe (almost 10 times the footprint of the direct impact area).

When adding past, present, and reasonably foreseeable actions together, the cumulative impacts on sagebrush steppe vegetation and habitat would be significant. This is due, in large part, to past impacts, which alone are significant and have, to some extent, left no areas of sagebrush steppe untouched. Although some of the present and reasonably foreseeable impacts would be beneficial to sagebrush steppe, the scale of beneficial impacts would be outweighed by the cumulative adverse impacts. By way of comparison, beneficial impacts would affect only about 1 percent of the land within the cumulative impact area historically occupied by sagebrush steppe. Further, beneficial impacts would result only in incremental improvements to sagebrush steppe vegetation and habitat, not restoration to its original state.

This Draft SEIS addresses the court's direction to provide quantified and detailed data about the cumulative loss of sagebrush steppe vegetation and habitat and information on how much acreage sagebrush steppe used to occupy, and what percentage has been destroyed. This Draft SEIS is consistent with the Final EIS in concluding that cumulative impacts on sagebrush steppe vegetation and habitat would be significant. This Draft SEIS also is consistent with the Final EIS in concluding that clearing of sagebrush steppe for the Ruby Pipeline Project could result in long-term impacts on the environment because this vegetation type could take as long as 50 years or more to return to preconstruction conditions. The mitigation required in the original Final EIS contemplated these significant, long-term impacts. The mitigation is described in the Final EIS, and includes, but is not limited to, activities such segregating topsoil from subsoil during construction to preserve the native seed bank in the topsoil; reseeding areas disturbed by construction with species similar to those in the surrounding natural plant communities; planting shrubs to aid in the reestablishment of sagebrush and other shrubby species; implementing measures to control the spread of invasive weeds during and after construction; and off-site mitigation, such as the restoration and habitat improvement projects identified in Table 1. Because there are no impacts in excess of those discussed in the Final EIS, no additional mitigation is described in this Draft SEIS.

# CONSULTATION AND COORDINATION

Following is a summary of consultation and coordination activities conducted with Native American tribes, agencies, and individuals during preparation of this SEIS.

## Native American Consultation

The BLM sent a certified letter, dated March 13, 2013, to notify 36 tribes of BLM'S intent to develop a SEIS for the Ruby Pipeline Project and to initiate government-to-government consultation. The BLM identified tribes to contact based on previous participation in the Ruby Final EIS as summarized in Table 4.10.3-1 of the Final EIS. Follow-up phone calls were made to the tribes and project information was also distributed and discussed as part of government-to-government consultations between the BLM and the following tribes. Consultation with tribes is ongoing.

**TABLE 3 – NATIVE AMERICAN CONSULTATIONS**

| Tribe | BLM Office | Date | Contact |
|---|---|---|---|
| Summit Lake Paiute Tribe | Black Rock Field Office | March 16, 2013 | Meeting with Tribal Council |
| Confederated Tribes of the Goshute Indian Reservation | Elko District Office | April 5, 2013 | Meeting with Tribal Council |
| Pyramid Lake Paiute Tribe | Winnemucca District Office | April 10, 2013 | Meeting with Elwood Lowrey (Chairman), Terry James (Vice Chairman), Scott Carey, and John Mosley |
| Fort McDermitt Indian Reservation | Winnemucca District Office | April 15, 2013 | Meeting with Maxine Smart (Acting Chairwoman) and Duane Masters |

**TABLE 3 – NATIVE AMERICAN CONSULTATIONS**

| Tribe | BLM Office | Date | Contact |
|---|---|---|---|
| Elko Band Council | Elko District Office | April 17, 2013 | Meeting with Davis Gonzales (Vice Chair), Alfreda Jake, Evelyn Temoke-Roche, Paula Brady, Vernon Thompson, and Nick McKnight |
| Summit Lake Paiute | Winnemucca District Office | April 20, 2013 | Tribal Council, including Randi Desoto (Chairwoman) and Will Cowan (Resource Specialist) |
| Confederated Tribes of Warm Springs | Klamath Falls Resource Area Office | April 22, 2013 | Email to Sally Bird |
| Battle Mountain Band Council | Elko District Office | April 24, 2013 | Meeting with Mike Young (Chairman), Michael Price, Lorrie Carpenter, Delbert Holley, Florine Maine, Gregory Holley, Stanford Knight, Donna Hill |
| The Klamath Tribes | Klamath Falls Resource Area Office | April 29, 2013 & May 1, 2013 | Email/phone exchange with Perry Chocktoot Jr. |
| Pit River Tribe | Surprise Field Office | May 2, 2013 | Meeting with the Tribal Council |
| Confederated Tribes of the Goshute Indian Reservation | Elko District Office | May 3, 2013 | Meeting with Ed Naranjo (Chairman), Madeline Greymountain (Vice-Chair), Amos Murphy, Richard Henriod, Lavar Tom |

As part of the consultation process, the Summit Lake Paiute Tribe indicated that the seed mixes generally used by industry and agencies for reclamation do not restore the sagebrush steppe habitat to its original state. The Tribe noted that seed mixes often contain crested wheatgrass (*Agropyron cristatum*) and forage kochia (*Bassia prostrate*), which are not native to sagebrush steppe. The Tribe also noted that seed mixes often do not contain seeds of plants used for food, medicine, or in ceremonies important to tribal lifestyle. These plants include, but are not limited to, little leaf horsebrush (*Tetradymia glabrata*), yampa root (*Perideridia gairdneri*), rabbitbrush (*Chrysothamnus* spp.), yellow cress (*Rorippa* spp.) and native sunflowers (*Helianthus* spp.). Northern Paiutes who still hold traditional beliefs also point out that the native vegetation removed in the course of development is sacred, but that vegetation from reseeding after development projects is not sacred since it was not put there by the Creator. The Ft. McDermitt Indian Reservation made general comment about the ineffectiveness of mitigation on the Ruby pipeline right-of-way. The Klamath Tribes also responded with concerns about non-native plant species, impacts on habitat for mule deer and sage grouse, and for impacts on traditional root-gathering areas in the sagebrush steppe habitat.

The seed mixes used on the Ruby Pipeline Project near the Summit Lake Reservation do not contain crested wheatgrass or forage kochia, although these species are in seed mixes in some other locations farther away (e.g., fuelbreaks and low precipitation areas). The seed mixes near the Summit Lake Reservation also do not contain little leaf horsebrush, yampa root, rabbitbrush, yellow cress, or native sunflowers, although yampa root was specially planted by Ruby in a location farther away (e.g., the Barrel Springs area). All project seed mixes are identified in appendices D, E, Q, and W of the BLM's POD. The FERC and BLM are monitoring restoration of the right-of-way and will continue to do so as specified by the FERC's Certificate of Public Convenience and Necessity and the BLM's POD. Future decisions about restoration will be based on the results of monitoring and other relevant information, including information gained through consultation with federally recognized Native American tribal governments.

## Agency Consultation

The BLM identified cooperating agencies based on participation in the Ruby Pipeline Project EIS. On April 8, 2013 BLM mailed invitations to participate in the SEIS effort to the following agency offices:

- Bureau of Reclamation, Klamath Basin Area Office
- Nevada Department of Wildlife
- Oregon Department of Fish and Wildlife
- U.S. Department of Agriculture, Forest Service, Fremont-Winema National Forest
- U.S. Department of Agriculture, Forest Service, Uinta-Wasatch-Cache National Forest
- FWS, Mountain-Prairie Region
- Utah Division of Wildlife Resources
- Wyoming Game and Fish Department

The BLM followed up with an email to these agencies on April 9, 2013. As of the date of this Draft SEIS, the following agencies accepted BLM's invitation and are participating in the development of the Draft SEIS:

- Nevada Department of Wildlife
- U.S. Department of Agriculture, Forest Service, Fremont-Winema National Forest
- Utah Division of Wildlife Resources (via Utah Public Lands Policy Coordination Office)
- Wyoming Game and Fish Department

Agencies declining the invitation include:

- Oregon Department of Fish and Wildlife
- FWS, Mountain-Prairie Region

The following agencies did not reply to the invitation:

- Bureau of Reclamation, Klamath Basin Area Office
- U.S. Department of Agriculture, Forest Service, Uinta-Wasatch-Cache National Forest

Cooperating agencies have assigned points-of-contact to participate in ongoing interdisciplinary team calls and have been provided an opportunity to review and comment on preliminary administrative versions of the Draft SEIS. The BLM has also involved the cooperating agencies in acquiring data for the SEIS.

## Public Outreach

The public was first notified of the Draft SEIS effort on April 30, 2013 when the Environmental Protection Agency published the "*Notice of Intent to Prepare a Draft Supplemental Environmental Impact Statement for the Ruby Pipeline Project*" in the *Federal Register* (78 FR 25301). In addition, the BLM Nevada State Office issued a press release and postcards notifying the public of this effort. The BLM used an updated version of the mailing list contained in Appendix A of the Ruby Final EIS for this mailing.

On April 3, 2013, the BLM provided the Ninth Circuit Court of Appeal and the litigants an update on the status of the Ruby Pipeline SEIS Project.

### Supplemental Environmental Impact Statement

After Draft SEIS publication, tribes, agencies, and the public will be provided an opportunity to comment on this Draft SEIS. The comment period will end 45 days after publication of the Notice of Availability of the Draft SEIS in the *Federal Register*. In addition, the BLM will issue a press release and send post card notifications to the revised project mailing list. The 36 tribes will also receive a copy of the Draft SEIS and a letter extending the offer of government-to-government consultation.

The Draft SEIS will be made available to the public via the BLM Ruby Project website: http://www.blm.gov/nv/st/en/info/nepa/ruby_pipeline_project.html, and the ePlanning NEPA Register at: http://on.doi.gov/10QtaTb. Consistent with the Final EIS distribution, the Draft SEIS will be available at libraries and other locations. The list of additional locations can be found on the following pages and the project website.

## LIBRARIES AND FEDERAL OFFICES THAT WILL RECEIVE A COPY OF THE RUBY DRAFT SEIS

- Brigham City Carnegie Library, 26 E. Forest Street, Brigham City, Utah
- Cokeville Branch Library, 240 E. Main Street, Cokeville, Wyoming
- Colorado State University Library, Morgan Library, 1201 Center Avenue Mall, Ft. Collins, Colorado
- Elko County Library, 720 Court Street, Elko, Nevada
- Eureka County Library, 210 S. Monroe Street, Eureka Nevada
- Great Basin College Library, McMullen Hall, 1500 College Parkway, Elko, Nevada
- Humboldt County Library, 85 E. Fifth Street, Winnemucca, Nevada
- Klamath Community Library, Bonanza Branch, 31703 Hwy 70, Bonanza, Oregon
- Klamath County Library, 126 S. Third Street, Klamath Falls, Oregon
- Lander County Library, 625 S. Broad Street, Battle Mountain, Nevada
- Library of Congress, 101 Independence Avenue SE, Washington, DC
- Library of Congress, Madison Building, Exchange & Gift Div., Fed Doc Sec, C Street, Washington, DC
- Lincoln County Library, 519 Emerald Street, Kemmerer, Wyoming
- Logan City Library, 255 N. Main Street, Logan, Utah
- Lyon County Library, Dayton Valley Branch, 321 Old Dayton Valley Road, Dayton, Nevada
- Malin Branch Library, 2507 Front Street, Malin, Oregon
- Nevada Department of Wildlife, 1100 Valley Road, Reno, Nevada
- Nevada State Library, 100 N. Stewart Street, Carson City, Nevada
- Oregon State University, 121 The Valley Library, Corvallis, Oregon
- Pershing County Public Library, 1125 Central Avenue, Lovelock, Nevada
- Public Lands Policy Coordination Office, 5100 State Office Building, Salt Lake City, Utah
- Regional Planning Community, Library, 85 E. 5th Street, Winnemucca, Nevada
- Sacramento City College Library, 3835 Freeport Boulevard, Sacramento, California
- Salt Lake City Public Library, 210 East 400 South, Salt Lake City, Utah
- Siskiyou County Library, 719 Fourth Street, Yreka, California
- Southern Oregon University, Government Documents/ Hannon Library, 1250 Siskiyou Boulevard, Ashland, Oregon
- Sublette County Public Library, 155 S. Tyler Avenue, Pinedale, Wyoming
- Susanville Library District, 1618 Main Street, Susanville, California
- Sweetwater County Public Library, 300 N. First Street, Green River, Wyoming
- Tremonton City Library, 210 N. Tremont Street, Tremonton, Utah
- U.S. Bureau of Land Management, Black Rock Field Office, 5100 E. Winnemucca Boulevard, Winnemucca, Nevada
- U.S. Bureau of Land Management, Elko District Office, 3900 E. Idaho Street, Elko, Nevada
- U.S. Bureau of Land Management, Humboldt Field Office, 5100 E. Winnemucca Boulevard, Winnemucca, Nevada

- U.S. Bureau of Land Management, Kemmerer Field Office, 312 Highway 189 N., Kemmerer, Wyoming
- U.S. Bureau of Land Management, Klamath Falls Resource Area Office, 2795 Anderson Avenue, Ste. 25, Klamath Falls, Oregon
- U.S. Bureau of Land Management, Lakeview District Office, 1301 S. G Street, Lakeview, Oregon
- U.S. Bureau of Land Management, Nevada State Office, 1340 Financial Boulevard, Reno, Nevada
- U.S. Bureau of Land Management, Oregon State Office, 333 SW First Avenue, Portland, Oregon
- U.S. Bureau of Land Management, Salt Lake Field Office, 2370 South 2300 West, Salt Lake City, Utah
- U.S. Bureau of Land Management, Surprise Field Office, 602 Cressler Street, Cedarville, California
- U.S. Bureau of Land Management, Tuscarora Field Office, 3900 E. Idaho Street, Elko, Nevada
- U.S. Bureau of Land Management, Utah State Office, 440 West 200 South, Suite 500, Salt Lake City, Utah
- U.S. Bureau of Land Management, Wells Field Office, 3900 E. Idaho Street, Elko, Nevada
- U.S. Bureau of Land Management, Winnemucca District Office, 5100 E. Winnemucca Boulevard, Winnemucca, Nevada
- U.S. Bureau of Land Management, Wyoming State Office, 5353 Yellowstone Avenue, Cheyenne, Wyoming
- U.S. Bureau of Reclamation Library, 6th and Kipling Street, Building 67, Denver, Colorado
- U.S. Department of Interior, Natural Resource Library, Gifts and Exchange Section, 1849 C Street, NW, Washington, DC
- U.S. Department of Interior, Natural Resources Library, 1849 C Street NW, Washington, DC
- U.S. Department of Interior, U.S. Bureau of Land Management, Building 50, Denver Federal Center, Denver, Colorado
- U.S. Forest Service, Fremont-Winema National Forests, 1301 S. G Street, Lakeview, Oregon
- U.S. Geological Survey Library, 950 National Center, Room 1D 100, 12201 Sunrise Valley Drive, Reston, Virginia
- Uinta County Library, 701 Main Street, Evanston, Wyoming
- University of California, Acquisitions Bancroft Library, Berkeley, California
- University of Nevada- Las Vegas Library, 4505 S. Maryland Parkway, Las Vegas, Nevada
- University of Nevada- Las Vegas, James Dickinson Library, 4505 Maryland Parkway, Las Vegas, Nevada
- University of Nevada Libraries, Mathewson-IGT Knowledge Center/0322, Business & Government Information Center, 1664 N. Virginia Street, Reno, Nevada
- University of Nevada- Reno, DeLaMare Library/262, 1664 N. Virginia Street, Reno, Nevada

- University of Nevada- Reno, Life & Health Sciences Library Fleischmann Agriculture Bldg., Reno, Nevada
- University of Oregon Library, 1501 Kincaid Street, Eugene, Oregon
- University of Wyoming Libraries, Dept. 3334, 1000 E. University Avenue, Laramie, Wyoming
- USDA National Agricultural Library, Abraham Lincoln Building, 10301 Baltimore Avenue, Beltsville, Maryland
- Washoe County Libraries, Downtown Reno Library, 301 S. Center Street, Reno, Nevada
- Washoe County Libraries, Gerlach Community Library, 555 E. Sunset Blvd, Gerlach, Nevada
- Weber County Library, North Branch Library, 475 East 2600 North, North Ogden, Utah
- Weber County Library, Ogden Valley Branch Library, 131 South 7400 East, Huntsville, Utah
- Weber County Main Library, 2464 Jefferson Avenue, Ogden, Utah
- Wells Branch Library, 208 Baker Street, Wells, Nevada
- West Wendover Branch Library, 590 Camper Drive, West Wendover, Nevada
- Western Wyoming College Library, 2500 College Drive, Rock Springs, Wyoming
- Wyoming Game and Fish Department, 5400 Bishop Boulevard, Cheyenne, Wyoming

## REFERENCES

[1] Council on Environmental Quality, *Guidance on Consideration of Past Actions in Cumulative Impacts Analysis,* 2005.

[2] *League of Wilderness Defenders-Blue Mountains Biodiversity Project versus the United States Forest Service,* 2008.

[3] S. A. Trimble, The Sagebrush Ocean: A Natural History of the Great Basin, University of Nevada Press, 1999.

[4] M. M. Rowland, L. H. Suring, M. Leu and S. T. Knick, "Sagebrush-Associated Species of Conservation Concern," in *Sagebrush Ecosystem Conservation and Management*, Lawrence, KS, Allen Press, 2011, pp. 46-68.

[5] N. E. West, "Synecology and Disturbance Regimes of Sagebrush Steppe Ecosystems," *Proceedings: Sagebrush Steppe Ecosystem Symposium, Boise State University,* pp. 15-26, 1999.

[6] D. B. Houston, "Wildfires in Yellowstone National Park," *Ecology,* pp. 1111-1117, 1973.

[7] S. G. Whisenant, "Changing Fire Frequencies on Idaho's Snake River Plains: Ecological Management Implications," in *Proceedings: Symposium on Cheatgrass Invasion, Shrub Die-off, and Other Aspects of Shrub Biology and Management*, Ogden, 1990.

[8] M. D. Licker, McGraw-Hill Dictionary of Scientific & Technical Terms, 6th Edition, New York: The McGraw-Hill Companies, Inc., 2003.

[9] J. D. McIver, M. Brunson and S. C. Bunting, "The Sagebrush Steppe Treatment Evaluation Project (SageSTEP): A Test of State-and Transition Theory," U.S. Department of Agriculture, Forest Service, Fort Collins, 2010.

[10] National Wildlife Federation, "Global Warming and Sagebrush Steppe Habitat," 13 March 2013. [Online]. Available: http://www.nwf.org/Wildlife/Threats-to-Wildlife-and Habitat/Sabebrush-Steppe.aspx. [Accessed 13 March 2013].

[11] J. F. Franklin and C. T. Dyrness, "Natural Vegetation of Washington and Oregon," U.S. Department of Agriculture, Forest Service, Portland, 1973.

[12] R. O. Harniss and R. B. Murray, "Thirty Years of Vegetal Change Following Burning of Sagebrush-grass Range," *Journal of Range Management,* pp. 322-325, 1973.

[13] A. R. Sands, S. Sather-Blair and V. Saab, "Sagebrush Steppe Wildlife: Historical and Current Perspectives," in *Proceedings: Sagebrush Steppe Ecosystems Symposium*, Boise, 1999.

[14] N. E. West, "Western Intermountain Sagebrush Steppe," in *Ecosystems of the World: Temperate Deserts and Semi-deserts*, N. E. West, Ed., Amsterdam, Elsevier Science, 1983, pp. 351-374.

[15] M. A. Schroeder, *Current and Historic Distribution of Greater and Gunnison Sage-grouse in North America,* Olympia, WA: Washington State Department of Fish and Wildlife, 2002.

[16] Bureau of Land Management, *Greater Sage-Grouse Interim Management Policies and Procedures,* Washington, DC, 2011.

[17] E. D. McArthur, "Sagebrush Systematics and Distrubance," *Proceedings: Sagebrush Steppe Ecosystems Symposium, Boise State University,* pp. 9-14, 1999.

[18] U.S. Geological Survey, "Energy, Land Use, and Sagebrush Ecosystems: Finding the Delicate Balance," 2013. [Online]. Available: http://www.fort.usgs.gov/SageEnergy/. [Accessed 29 April 2013].

[19] J. W. Connelly, S. T. Knick, M. A. Schroeder and S. J. Stiver, Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats, Cheyenne: Western Association of Fish and Wildlife Agencies. Unpublished Report., 2004.

[20] National Agricultural Statistics Service, "2007 Census of Agriculture," U.S. Department of Agriculture, Washington, DC, 2009.

[21] Oregon Department of Fish and Wildlife, "Oregon Conservation Strategy," Oregon Department of Fish and Wildlife, Salem, 2006.

[22] A. H. Winward, "Management of Sagebrush Steppe Vegetation," in *Sagebrush Steppe Ecosystems Symposium*, Boise, 1999.

[23] Washington Department of Fish and Wildlife, "Washington Department of Fish and Wildlife," 2013. [Online]. Available: http://wdfw.wa.gov/conservation/research/projects/shrubsteppe/. [Accessed 29 April 2013].

[24] U.S. Fish and Wildlife Service, "Greater Sage-grouse (Centrocercus urophasianus) Conservation Objectives: Final Report," U.S. Fish and Wildlife Service, Denver, 2013.

[25] U.S. Department of the Interior, "The Impact of Federal Programs on Wetlands: A Report to Congress by the Secretary of the Interior," U.S. Department of the Interior, Office of Environmental Policy & Compliance, Shepardstown, WV, 1994.

[26] Bureau of Land Management, "History of Public Land Livestock Grazing," 17 July 2009. [Online]. Available: http://www.blm.gov/nv/st/en/prog/grazinghistory_of_public.html. [Accessed 13 March 2013].

[27] Bureau of Land Management, "Fact Sheet on the BLM's Management of Livestock Grazing," 5 February 2013. [Online]. Available: http://www.blm.gov/wo/st/en/prog/grazing.html. [Accessed 12 April 2013].

[28] J. M. Feller, "Recent Developments in the Law Affecting Livestock Grazing on Western Riparian Areas," *Wetlands,* vol. 18, no. 4, pp. 646-657, 1998.

[29] J. P. Blaisdell, R. B. Murray and D. E. McArthur, "Managing Intermountain Rangelands - Sagebrush-grass Ranges," U.S. Department of Agriculture, Forest Service, Ogden, 1982.

[30] J. A. Young, "History and Use of Semiarid Plant Communities - Changes in Vegetation," in *Proceedings: Ecology and Management of Annual Rangeland*, Ogden, 1994.

[31] J. A. Young, "Historical Sagebrush Ecosystems: Human Influences," in *Proceedings: Sagebrush Steppe Ecosystems Symposium*, Boise, 1999.

[32] J. C. Chambers, "Sagebrush Steppe: a Story of Encroachment and Invasion," *Fire Science Brief,* pp. 1-6, December 2008.

[33] M. D. Reisner, J. B. Grace, D. A. Pyke and P. S. Doescher, "Conditions Favoring Bromus Tectorum Dominance of Endangered Sagebrush Steppe Ecosystems," *Journal of Applied Ecology,* pp. 1-11, 2013.

[34] F. Menalled, J. Mangold and E. Davis, "Cheatgrass: Identification, Biology and Integrated management," Montana State University, Extension, Bozeman, 2008.

[35] D. J. Manier, C. Aldridge, P. Anderson, G. Chong, C. Homer, M. O'donnell and S. Schell, "Land Use and Habitat Conditions Across the Southwestern Wyoming Sagebrush Steppe: Development Impacts, Management Effectiveness and the Distribution of Invasive Plants," *Natural Resources and Environmental Issues,* vol. 17, no. 1, p. Article 4, 2011.

[36] Bureau of Land Management, "Cheatgrass," 1 Octobe 2009. [Online]. Available: http://www.blm.gov/wy/st/en/programs/weeds_pests/Cheatgrass.html. [Accessed 29 April 2013].

[37] Bureau of Land Management, "BLM Nevada's War Against Weeds," 19 March 2009. [Online]. Available: http://www.blm.gov/nv/st/en/prog/more_programs/invasive_species.html. [Accessed 15 March 2013].

[38] National Park Service, "Cheatgrass," 13 March 2013. [Online]. Available: http://www.nps.gov/asko/NatRes/EPMT/Species_bios/Bromus%20tectorum.pdf. [Accessed 13 March 2013].

[39] N. Shaw and M. Pellant, "Great Basin Native Plant Selection and Increase Project: 2012 Progress Report," U.S. Department of Agriculture, Rocky Mountain Research Station and U.S. Department of the Interior, Bureau of Land Management, Boise, ID, 2013.

[40] K. Zouhar, "Bromus Tectorum," 2003. [Online]. Available: http://www.fs.fed.us/database/feis/plants/graminoid/brotec/all.html. [Accessed 15 March 2013].

[41] Bureau of Land Management, "BLM Nevada's War Against Weeds," 2013. [Online]. Available: http://www.blm.gov/nv/st/en/prog/more_programs/invasive_species.print.html. [Accessed 23 April 2013].

[42] B. E. Bukowski and W. L. Baker, "Historical Fire Regimes, Reconstructed from Land-survey Data, Led to Complexity and Fluctuation in Sagebrush Landscapes," *Ecological Applications,* pp. 546-564, 2013.

[43] Landfire, "LANDFIRE Mean Fire Return Interval (LANDFIRE.US_110MFRI)," 2008. [Online]. Available: http://landfire.cr.usgs.gov/NationalProductDescriptions13.php. [Accessed 15 May 2013].

[44] P. Rouch, Interviewee, *Personal Communication.* [Interview]. 22 May 2013.

[45] D. Quinney, "Then and Now: Changes in Vegetation and Land Use Practices in Southwestern Idaho Sagebrush Lands, with Emphasis on Sagebrush and Former Sagebrush Lands of the Snake River Birds of Prey National Conservation Area North of the Snake River," in *Proceedings: Sagebrush Steppe Ecosystem Symposium*, Boise, 1999.

[46] Bureau of Land Management, "Wildland Fire Operations," 8 July 2011. [Online]. Available: http://www.blm.gov/nifc/st/en/prog/fire/fireops.html. [Accessed 18 April 2013].

[47] R. F. Miller and J. A. Rose, "Fire History and Western Juniper Encroachment in Sagebrush Steppe," *Journal of Range Management,* vol. 52, pp. 550-559, 1999.

[48] R. F. Miller and R. J. Tausch, "The Role of Fire in Pinyon and Juniper Woodlands: A Descriptive Analysis," *Tall Timbers Research Station Miscellaneous Publication No. 11,* pp. 15-30, 2001.

[49] A. Kerr and M. Salvo, "Managing Western Juniperto Restore Sagebrush Steppe and Quaking Aspen Stands," Sagebrush Sea Campaign, 2007.

[50] J. W. Connelly, M. A. Schroeder, A. R. Sands and C. E. Braun, "Habitat and Management: Sage Grouse Management," *Wildlife Society Bulletin,* pp. 967-985, 2000.

[51] A. Chalfoun, F. R. T. III and M. J. Ratnaswamy, "Nest Predators and Fragmentation: A Review and Meta-analysis," *Conservation Biology,* vol. 16, pp. 306-318, 2002.

[52] S. E. Stephens, D. N. Koons, J. J. Rotella and D. W. Willey, "Effects of Habitat Fragmentation on Avian Nesting Success: A Review of the Evidence at Multiple Spatial Scales," *Biological Conservation,* vol. 115, pp. 101-110, 2003.

[53] S. L. Webb, C. V. Olson, M. R. Dzialak, S. M. Harju, J. B. Winstead and D. Lockman, "Landscape Features and Weather Influence Nest Survival of a Ground-nesting Bird of Conservation Concern, the Greater Sage-grouse, in Human-altered Environments," *Ecological Processes,* pp. 1-4, 2012.

[54] S. Larivière, L. R. Walton and F. Messier, "Selection by Striped Skunks (Mephitis mephitis) of Farmsteads and Buildings as Denning Sites," *The American Midland Naturalist,* vol. 142, pp. 96-101, 1999.

[55] P. Coates and D. J. Delehanty, "Nest Predation of Greater Sage-grouse in Relation to Microhabitat Factors and Predators," *Journal of Wildlife Management,* vol. 74, pp. 240-248, 2010.

[56] Bureau of Land Management, "Manual 6840: Special Status Species Management," U.S. Department of the Interior, Bureau of Land Management, Washington, DC, 2012.

[57] B. Walker, "Effects of management practices on grassland birds: Brewer's Sparrow," 12 August 2004. [Online]. Available: http://www.npwrc.usgs.gov/resource/literatr/grasbird/brsp/brsp.htm. [Accessed 22 April 2013].

[58] J. W. Martin and B. A. Carlson, "Sage Sparrow (Artemisiospiza belli), The Birds of North America Online (A. Poole, Ed.)," 1998. [Online]. Available: http://bna.birds.cornell.edu/bna/species/326. [Accessed 24 April 2013].

[59] T. D. Reynolds, T. D. Rich and D. A. Stephens, "Sage Thrasher (Oreoscoptes montanus): The Birds of North America Online (A. Poole, Ed.)," 1999. [Online]. Available: http://bna.birds.cornell.edu/bna/species/463. [Accessed 22 April 2013].

[60] U.S. Fish and Wildlife Service, "12-Month Finding on a Petition to List the Pygmy Rabbit as Endangered or Threatened," U.S. Fish and Wildlife Service, Washington, DC, 2010.

[61] U.S. Geological Survey, "North Dakota's Federally Listed Endangered, Threatened, and Candidate Species – 1995, Northern Sagebrush Lizard (Sceloporus graciosus graciosus)," 2 February 2013. [Online]. Available: http://www.npwrc.usgs.gov/resource/wildlife/nddanger/species/scelgrac.htm. [Accessed 23 April 2013].

[62] C. E. Braun, O. O. Oedekoven and C. L. Aldridge, "Oil and Gas Development in Western North America: Effects on Sagebrush Steppe Avifauna with Particular Emphasis on Sage-grouse," Colorado State University, Fort Collins, 2002.

[63] M. W. Vander Haegen, "Fragmention by Agriculture Influences Reproductive Success of Birds in a Shrubsteppe Landscape," *Ecological Applications,* pp. 934-947, 2007.

[64] H. Sawyer, R. M. Nielson, F. Lindzey and L. L. McDonald, "Winter Habitat Selection of Mule Deer before and during Development of a Natural Gas Field," *The Journal of Wildlife Management,* vol. 70, no. 2, pp. 396-403, 2006.

[65] B. L. Walker, D. E. Naugle and K. E. Doherty, "Greater Sage-Grouse Population Response to Energy Development and Habitat Loss," *The Journal of Wildlife Management,* vol. 71, no. 8, pp. 2644-2654, 2007.

[66] S. M. Harju, M. R. Dzialak, R. C. Taylor, L. D. Hayden-Wing and J. B. WInstead, "Thresholds and Time Lags in Effects of Energy Development on Greater Sage-Grouse Populations," *The Journal of Wildlife Management,* vol. 74, no. 3, pp. 437-448, 2010.

[67] K. Wilkenson, Interviewee, *Personal Communicatoin.* [Interview]. 14 May 2013.

[68] D. A. Denaith and M. McGee, "Species Assessment for Pygmy Rabbit (Brachylagus idahoensis) in Wyoming," U.S. Department of the Interior, Bureau of Land Management, Cheyenne, 2004.

[69] Bureau of Land Management, "Wild Horse and Burro Quick Facts," 2013. [Online]. Available: http://www.blm.gov/wo/st/en/prog/whbprogram/history_and_facts/quick_facts.html. [Accessed 25 May 2013].

[70] Bureau of Land Management, "Rangeland and Herd Management," 2012. [Online]. Available: http://www.blm.gov/wo/st/en/prog/whbprogram/herd_management.html. [Accessed 25 May 2013].

[71] Bureau of Land Management, "Adoptioin Program," 2012. [Online]. Available: http://www.blm.gov/wo/st/en/prog/whbprogram/adoption_program.html. [Accessed 25 May 2013].

[72] G. Miller, Interviewee, *Personal Communication.* [Interview]. 2 May 2013.

# INDEX

# LIST OF PREPARERS

BLM Staff

Barry, Wes – Range Specialist, Winnemucca District Office
Burke, Tom – Archeologist, Nevada State Office
Burton, Robert – Soils and Vegetation Specialist, Winnemucca District Office
DeForest, Amanda – Assistant Field Manager, Wildlife, Winnemucca District Office
Flores, Elias – Supervisory Natural Resources Specialist, Surprise Field Office
Hall, Mark – Project Mgr.-Planning & Environmental Coordinator, Winnemucca District Office
Haynal, Pat – Asst. Field Mgr.-Cultural, Land and Realty (Acting), Winnemucca District Office
Hoffheins, Don – Planning & Environmental Coordinator, Klamath Falls Resource Area
Lamborn, Kelly – Realty Specialist, Kemmerer Field Office
Loda, Ken – Assistant Field Manager-Minerals, Winnemucca District Office
Mackiewicz, Mark – National Project Manager, Washington DC
McFarlane, Deb – Assistant Field Manager, Elko District Office
Messmer, Derek – Fire and ES&R Supervisor, Winnemucca District Office
Miller, Gerry – Project Manager-Watershed, Elko District Office
Rodman, Julie – Archaeologist, Wells Field Office
Rovanpera, Jennifer – Archaeologist, Surprise Field Office
Watson, Dave – Realty Specialist, Salt Lake Field Office
Whitman, Paul – Planning and Environmental Coordinator, Lakeview Resource Area
Wilkinson, Kenneth – Wildlife Biologist, Elko District Office

Cooperating Agency Staff

Fry, Matt – Staff Biologist, Wyoming Game and Fish Department
James, Bill – Energy Development/NEPA Coordinator, Utah Division of Wildlife Resources
Siegel, Steven – Acting Chief of Habitat, Nevada Department of Wildlife
Yost, Bryan – Fremont-Winema National Forest

Contractor Staff

Anderson, Kent – GIS Specialist, Merjent, Inc.
Ellis, J. Grace – Project Manager, Galileo Project, LLC
Jessen, Kim – Environmental Specialist, Merjent, Inc.
Lenz, Kristin – Biologist, Merjent, Inc.
Mackenthun, Jeff – Biologist, Merjent, Inc.
Muehlhausen, John – Project Manager, Merjent, Inc.
Rocco, Peter – Deputy Project Manager, Galileo Project LLC
Roush, Paul – Biologist, Independent Contractor
Thayne, Greg – NEPA Specialist, Galileo Project, LLC