US Department of the Interior
Bureau of Land Management

Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessment

SOUTHERN GREAT BASIN

MARCH 2015

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ACRONYMS AND ABBREVIATIONS

	Full Phrase
AML	appropriate management level
BBD	breeding bird density
BIA	Bureau of Indian Affairs
BLM	United States Department of the Interior, Bureau of Land Management
EA	environmental assessment
EIS	environmental impact statement
ESR	emergency stabilization and rehabilitation
FIAT	Fire and Invasives Assessment Tool
FMP	fire management plan
Forest Service	United States Department of Agriculture, Forest ServiceForest Service-HTF
	Humboldt-Toiyabe National Forest
GIS	geographic information systems
GRSG	Greater Sage-Grouse
HMA	herd management area
LRMP	land and resource management plan
LUP	land use plan
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act of 1969
NFPORS	National Fire Plan Operations and Reporting System
NPS	National Park Service
NWR	National Wildlife Refuge
OHV	off-highway vehicle
PPA	project planning area
RMP	resource management plan
R&R	resistance and resilience
ROW	right-of-way
SEAT	single engine air tanker
SNPLMA	Southern Nevada Public Land Management Act
USFWS	United States Fish and Wildlife Service
VFD	volunteer fire department
WA	wilderness area
WSA	wilderness study area
WUI	wildland-urban interface

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SECTION 1
INTRODUCTION AND ASSESSMENT OBJECTIVES

1.1 EXECUTIVE OVERVIEW

This assessment was developed using methods described in the FIAT[1] Report (Fire and Invasive Assessment Team 2014). This process is designed to identify strategies that ameliorate threats to Greater Sage-Grouse (GRSG; *Centrocercus urophasianus*) and their habitats. It incorporates emerging science, regional findings, and local data in identifying management opportunities that counter detrimental ecological trends in wildfire, invasive annual grasses, and conifer expansion. The outcomes of the Southern Great Basin Fire and Invasives Assessment Tool (FIAT) include identifying 1,490 miles of linear fuels treatments, 2,357,606 acres of conifer treatment, 2,957,796 acres of invasive plant and/or seeding treatments, and 17,625 acres of post-fire rehabilitation in a three-year period. This is in addition to identifying site-appropriate management strategies for fire operations and post-fire decisions.

1.2 BACKGROUND

The purpose of this assessment is to identify potential project areas and management strategies in highly valued GRSG habitats which, if implemented, would reduce the threats to GRSG. The Conservation Objectives Team (COT) report (USFWS 2013) and other scientific publications identified two primary threats to the sustainability of GRSG in the western portion of its range: wildfire and conversion of sagebrush habitat to invasive annual grass-dominated vegetative communities. For the purposes of this assessment, invasive species are limited to and are hereafter referred to as invasive annual grasses. Conifer expansion (also called encroachment) is also addressed in this assessment.

To address these concerns, the Bureau of Land Management (BLM) and United States Forest Service (Forest Service) have committed to completing GRSG wildfire, invasive annual grasses, and conifer expansion assessments (see Greater

[1]FIAT is an acronym for fire and invasives assessment tool and is also used interchangeably to describe the written report, the science-based process, and the analysis tools used.

Sage-Grouse Land Use Plan Amendments, BLM Instruction Memorandum WO-2014-134).

The objective of FIAT assessments is to identify priority habitat areas and management strategies to reduce the threats to GRSG from invasive annual grasses, wildfires, and conifer expansion. In addition, these assessments are designed to provide the United States Fish and Wildlife Service (USFWS) with regulatory certainty on the extent, location, and rationale for management opportunities that address significant threats to GRSG.

In early 2013, an interagency team of wildlife, vegetation, fire, and fuels managers was assembled to develop the FIAT assessment protocols; the process involves two steps, as follows:

> Step 1: Establish the regional context for priority GRSG habitats and threat factors

> Step 2: Incorporate local data with Step 1 findings to identify potential project areas, treatment opportunities, and management strategies to ameliorate threats to GRSG

FIAT Step 1 was implemented from February 2013 to August 2014; Step 2 began in September 2014 and concludes at the end of March 2015. This assessment represents the final product and signals the completion of Step 2.

1.3 Issues, Assumptions, and Considerations Common to All Assessments

The following elements are common to all FIAT assessments.

- **Assessments must be revisited as landscape conditions change.** Because landscape conditions are highly dynamic, management needs will change over time. The management opportunities and priorities identified in this assessment are relevant for today's landscape conditions. As disturbances such as wildfire occur in the assessment area, it is imperative that the priorities and management themes be revisited and redefined. This form of adaptive management is integrated into the sage-grouse (GRSG) monitoring strategy described in Section 5.
- **Additional analysis will be required.** Most potential treatments identified in this assessment will require further National Environmental Policy Act (NEPA) analysis. During NEPA analysis, the exact location and extent of treatment may be adjusted, based on more refined local information. Summary tables presented in Section 4 denote if NEPA is completed, initiated, or needed for potential treatments. Consequently, many potential treatments detailed in Section 4 are subject to change as a result of refinement during NEPA.

- **Proper management is required.** For treatments to be effective once implemented, proper management of ongoing land uses will occur. Such land uses as grazing, wild horses and burros, and off-highway vehicles are potential impediments to successful implementation of FIAT-identified treatments. In order for these treatments to be successful, proper management of land uses must occur:
    1. at the time of treatment, which may require rest or exclusion from use
    2. following treatment, such as the proper intensity and location of uses
- **Identifying potential treatments was highly collaborative.** FIAT teams used the data and science from the FIAT Report and General Technical Report RMRS-GTR-326 (Fire and Invasive Assessment Team 2014) to identify potential treatment opportunities. In addition, guidance in the FIAT report directed teams to "use the best available local information" and engage in collaboration with agency partners. These partners included the Natural Resources Conservation Service, US Fish and Wildlife Service, and state wildlife and fish agencies. As a result, potential treatments identified in this assessment were strongly influenced by local data not present in the FIAT report, including lek locations, seasonal habitats, and projects identified in other collaborative settings.
- **Fire operations priorities.** The 1st, 2nd, and 3rd order priorities identified for fire operations integrate guidance from the FIAT report, General Technical Report RMRS-GTR-326, wildfire potential, and local data. Fire operations priorities are consistent with guidance established in the BLM's Fire Operations Action Plan Instruction Memorandum (IM No. FA IM-2015-016) and Secretarial Order No. 3336. In addition to these sources, FIAT fire operations priorities were established using local information, such as fire spread patterns/barriers, ignition frequency, and fire history. Fire operations priorities identified in this assessment are BLM-specific.

1.4 Identification of FIAT Assessment Areas

FIAT assessment areas roughly correspond to select priority areas for conservation (PACs), which were identified in the COT report (USFWS 2013). In FIAT Step 1, five assessment areas were identified, as follows:

1. Central Oregon
2. Northern Great Basin
3. Snake/Salmon/Beaverhead

4. Southern Great Basin
5. Western Great Basin—Warm Springs Valley Nevada/Western Great Basin

These were identified at a regional scale using the following criteria:

- PACs, as identified in the 2013 COT report (USFWS 2013)
- State-scale breeding bird density (Doherty 2010)
- Sagebrush landscape cover (after Knick 2011)
- Patterns of resistance to annual grass invasion and resilience following disturbance (after Chambers et al. 2014)
- Relative risk of wildfire occurrence (Forest Service 2013)
- Degree of conifer expansion (as modeled by Manier et al. 2013)

See **Figure 1-1**.

1.5 OBJECTIVES FROM LAND USE PLANS AND FIAT REPORT

The Nevada-California Subregional Environmental Impact Statement (EIS) states that "Draft Greater Sage-Grouse Environmental Impact Statements (EISs) contain a suggested framework in the appendices (Draft Greater Sage-Grouse Wildland Fire and Invasive Species Assessment) that provided a consistent approach to conduct these assessments. The current protocol was developed by the Fire and Invasive Assessment Team (FIAT), a team of wildland fire specialists and other resource specialists and managers, to specifically incorporate resistance to invasive annual grasses and resilience after disturbance principles into the assessment protocol. In October 2013, the BLM, Forest Service, and USFWS agreed to incorporate this approach into the final EIS."

Objectives originally stated in the FIAT report are as follows:

- Identify important GRSG occupied habitats and baseline data layers important in defining and prioritizing GRSG habitats
- Assess the resistance to invasive annual grasses and resilience after disturbance and prioritize GRSG habitats for conservation and restoration
- Identify geospatially explicit management strategies to conserve GRSG habitats

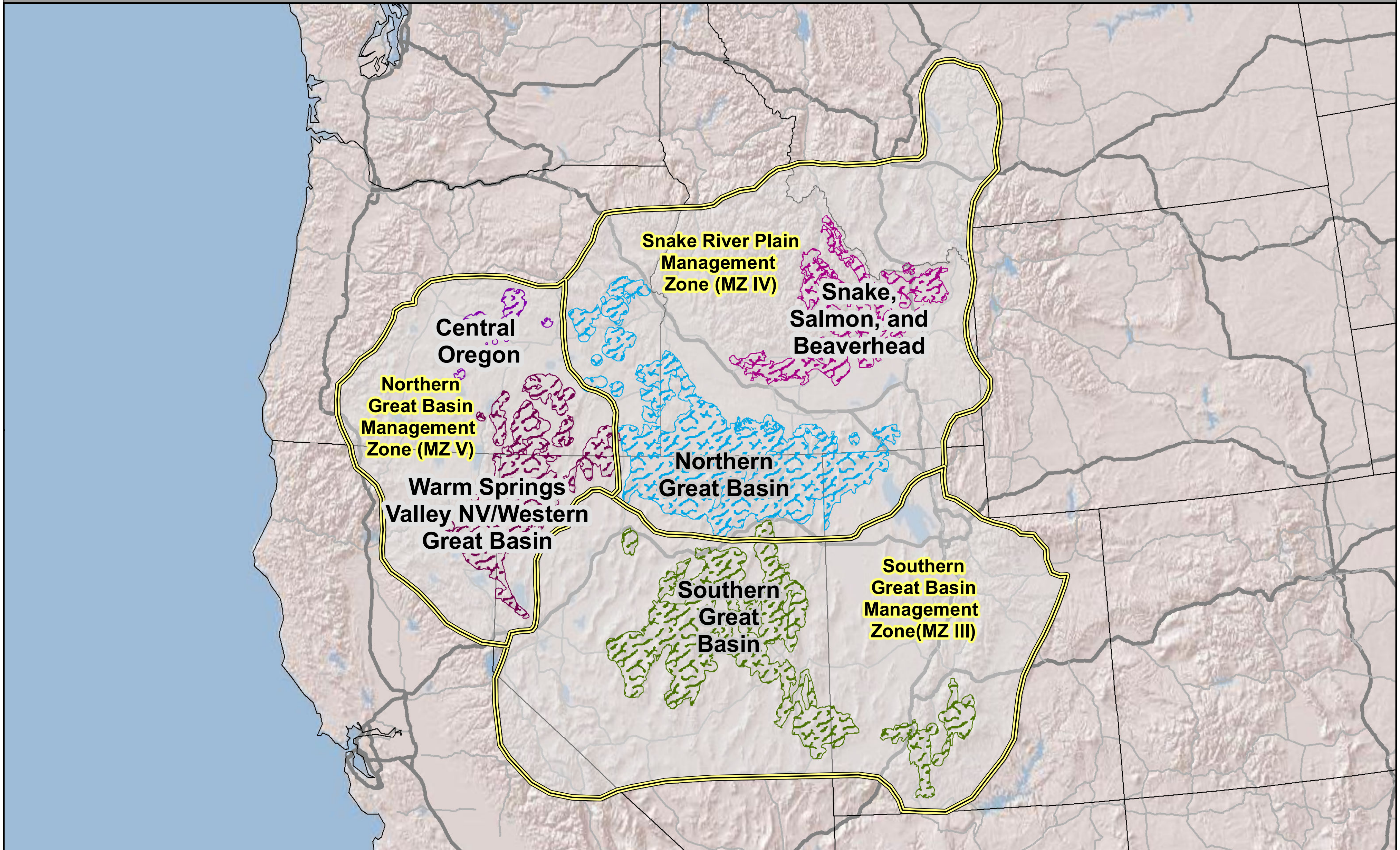
1.6 DESCRIPTION OF MEETINGS, PROCESS FOR COLLABORATION, AND PARTNERSHIPS

The FIAT process requires partnership with cooperators, agencies, and others involved in land or wildlife management in the FIAT assessment areas. The Southern Great Basin FIAT Team collaborated with Forest Service, USFWS,

Assesment Areas in Relation to Management Zones

Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

All Assessment Areas
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

WAFWA SG Management Zones
Central Oregon
Northern Great Basin
Snake, Salmon, and Beaverhead
Southern Great Basin
Warm Springs Valley NV/Western Great Basin

1:8,000,000
March 2015
Date Saved: 3/24/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Nevada Department of Wildlife (NDOW), Utah Division of Wildlife Resources (UDWR), Natural Resources Conservation Service (NRCS), Forest Service Intermountain Research Station, Nevada Department of Forestry (NDF), and Utah Forestry Fire and State Lands. Eleven workshops were held and included meetings in Reno and Battle Mountain, Nevada, and Cedar City and Richfield, Utah. Attendees participated in the following:

- Reviewed FIAT Step 1 data for accuracy
- Incorporated refined local information, such as lek location, breeding bird density (BBD), telemetry, vegetation, fire occurrence, and other data to augment Step 1 findings
- Identified project planning areas (PPA), potential treatments, and appropriate management strategies in the four program areas
- Documented the rationale and local factors influencing the identification of management strategies
- Incorporated local knowledge to justify proposed management actions outside of focal habitats.

Team Leader Sandy Gregory (Nevada BLM Fuels Management Lead) conducted outreach for participation via phone calls, e-mails, and direct conversations. From this outreach, approximately 16 interagency participants contributed to the Southern Great Basin FIAT. BLM, Forest Service, USFWS, NDF, NDOW, and UDWR were asked to attend all of the workshops for consistency across the assessment area.

Workshop participants shared local data, such as lek information, seasonal habitat maps, and potential treatments already planned through partnerships outside of FIAT. Multiple sources of data were combined to provide the basis for an integrated program of work in the Southern Great Basin FIAT assessment area. A complete list of names and affiliations of meeting participants and contributors is in Appendix D.

1.7 Meetings

Table 1-1
List of Meetings

Date	Location
October 8, 2014	Reno, NV
October 15, 2014	Reno
October 16. 2014	Reno
October 17, 2014	Reno
October 28, 2014	Battle Mountain, NV
October 29, 2014	Battle Mountain
October 30, 2014	Battle Mountain
November 18, 2014	Cedar City, UT

Table 1-1
List of Meetings

Date	Location
November 19, 2014	Cedar City
November 20, 2014	Cedar City
December 3, 2014	Richfield, UT
December 4, 2014	Richfield
December 5, 2014	Richfield
December 10, 2014	Battle Mountain
December 16, 2014	Reno
December 17, 2014	Reno
December 18, 2014	Reno
January 13, 2015	Reno
January 14, 2015	Reno
January 15, 2015	Reno
February 17, 2015	Battle Mountain
February 18, 2015	Battle Mountain
February 25, 2015	Battle Mountain
February 26, 2015	Battle Mountain
February 27. 2015	Battle Mountain
March 3, 2015	Reno
March 4, 2015	Reno
March 5, 2015	Reno
March 11, 2015	Reno

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SECTION 2
DATA MANAGEMENT AND STEP-DOWN PROCESS

2.1 EXAMINATION OF FIAT STEP 1 FINDINGS

After establishing the SGB FIAT Team, members of the Management Zone III (MZ III)/SGB FIAT Team reviewed the Step 1 data layers. On October 8, 2014, the first team meeting was held, and attendees determined the need to request data from local, state, and federal partners. This request went out to the NDF, NDOW, Humboldt-Toiyabe National Forest (Forest Service-HTF), Dixie and Fishlake National Forests, NRCS, Utah Partnership for Conservation and Development (UPCD), US Geological Survey (USGS), Utah State University, and the Nevada and Utah BLM.

Members of the SGB FIAT Team reviewed the Step 1 data layers at each meeting to assess their accuracy or applicability for inclusion in the analysis. The team members identified primary threats, three major and two minor (USFWS 2013) to GRSG habitats and populations across MZ III. These threats to habitat loss and fragmentation are as follows:

- Wildfire (major)
- Invasives (major)
- Conifer expansion (major)
- Mining (minor)
- Energy (minor)

The three primary major threats were assessed in all PPAs; mining and energy were discussed as needed throughout the assessments.

When more refined data was available it was included in Step 2. Step 2a of the assessment process addressed wildfire, invasive annual grasses, and conifer expansion in or near the sage-grouse focal habitat areas using 75 percent BBD information. NDOW originally provided this information in 2009; it was updated in 2013 and 2014, which expanded the original BBD areas by four percent. This new information was included in this assessment after discussions with the Technical Team that conducted the Step 1 analysis. This process enhanced the most representative data, allowing the SGB FIAT Team to best depict current conditions and trends in the assessment areas.

Step 2b allowed for the development of the purpose and need of sage-grouse focal habitat activity/PPAs. This includes prioritized management tactics and treatments to implement effective fuels management, habitat recovery and restoration, fire operations, and post-fire rehabilitation projects. This habitat activity/PPA will serve as the basis for future National Environmental Policy Act of 1969 (NEPA) analysis of site-specific projects (see Section 4).

2.2 Incorporation of Local Data

PPAs were based on Step 1of the FIAT analysis. BBD, conifer expansion, wildfire threat, sagebrush landscape cover, conifer expansion, and additional local data were used to inform the assessment.

The local layers included GIS (geographic information systems) data from Forest Service, NDOW, UPCD, and University of Utah. As an example, three different breeding bird density layers were used. Section 2.3 identifies national and regional the data layers used to develop the SGB team map coverage used in the assessment.

2.2.1 Data Description

Appendix B identifies the data layers used in the Step1, Step 2 and Step 2b framework for incorporating management strategies to initiate implementation and activity plans. Section 2.3 discusses the data layers used to inform the assessment.

2.2.2 Rationale for Selection

The rationale for using the data layers below was based on a collective concurrence of the Nevada Sagebrush Ecosystem Council Technical Team (SETT), NDOW, UDWR, California Department of Fish and Wildlife (CDFW), USGS, BLM, and other local data layers that best met objectives set in the FIAT protocol.

2.3 National Data Layers

Step 1 FIAT Team members were from federal agencies that administer the four federal program areas that are the focus of the assessment. They used this approach to identify priority habitat areas, further referred to as “focal habitats.” These are the portions of a PAC with important habitat characteristics; they contain the bird populations that are most impacted by the previously identified threats (See Chambers et al. 2014 for further Step 1 details). The results of Step 1 of the FIAT process, including geospatial data, were made available as the starting point for the Step 2 assessment teams.

2.3.1 Breeding Bird Density

BBD included three different layers; NDOW updated the 2009 data set to the 2014 data set and included Utah's BBD also. See **Figure 2-1**.

2.3.2 Conifer Expansion Vegetation

At the time of this assessment, the conifer expansion model developed by Coates *et al.* was not available. Due to this, the conifer expansion maps used were a combination of SynthMap (which enhanced LANDFIRE and SWReGAP data), the annual grass indexes from Nevada Natural Heritage Program, and the pinyon-juniper land cover from USGS developed during Step 1. See **Figure 2-2** and **Figure 2-3**.

2.3.3 Wildfire Threats

Fire occurrence data were obtained from spatial wildfire occurrence data for the United States, from 1992 to 2012 (Fire Program Analysis Fire Occurrence database, 2014) and BLM Wildland Fire Management Information fire records for 2013 and 2014. These records use the point of origin latitude and longitude and capture acres burned and year of fire.

Burn probability was designed to identify the relative likelihood of large fires occurring across the landscape at a regional scale. This metric was used in Step 1 to assess wildfire risk in PACs and in focal habitat. Burn probability raster data were generated by the Missoula (Montana) Fire Lab in 2013 using the large fire simulator, FSim. This was developed for use in the National Interagency Fire Program Analysis project and uses historical weather data and LANDFIRE fuel model data to simulate fires burning. The version used in Step 2 is the most current burn probability data layer, created by the Missoula Fire Lab. Burn Probability was classified into the categories of no burn, low, moderate, high, very high.

Wildland fire perimeters from GEOMAC, Nevada BLM Corporate GIS, and Wildland Fire Decision Support System were used in this analysis. Fire perimeters were clipped to PPA boundary in GIS. Duplicate fires were removed using Microsoft Excel.

A Fire Response Time data layer map was developed to aide in cooperative fire response activities. The information is to be loaded into the Computer Aided Dispatch system (CAD) to facilitate an appropriate multiagency response to wildfires. The suppression sage-grouse priority data layer map was developed locally to prioritize areas of high value and low R&R for suppression response. The 30 mile response time layer was developed to depict initial attack response times for aircraft and 60 minutes for ground resources. See **Figure 2-4**.

2.3.4 Soil Moisture/Temperature Regime

Soil Survey and ecological site descriptions from NRCS from Step 1 were used; at the time of this assessment no other soil surveys or ecological site descriptions were available. See **Figure 2-5**.

2.3.5 Sagebrush Landscape Cover

In Nevada, the SGB team used SynthMap, (which enhanced LANDFIRE and SWReGAP data), the annual grass indexes from Nevada Natural Heritage Program, and the sagebrush layer developed during Step 1. In Utah, the SGB used SWReGAP data because SynthMap was not available for their state. See **Figure 2-6**.

2.3.6 Other Data Layers

- NDOW, UDWR, and Utah State University provided updated telemetry data for SGB FIAT areas.
- Weather station data, including Remote Automatic Weather Station (RAWS) data, were used in the burn probability layers.
- PACS, focal habitats, winter habitats, and GRSG population distribution updates were included in this assessment.
- Map of cheatgrass and other invasive annual grasses that degrade GRSG habitat (Rapid Ecoregional Assessment (REA), Nevada Heritage, UDWR, and Utah State University (USU) data) were used.
- LANDFIRE data was used to inform the fire regime condition class, biophysical settings and Vegetation Dynamics Development Tool (VDDT) models.
- Land use plans were used.
- Local monitoring or inventory information was included.
- ESRI world imagery for conifer expansion and fuelbreak data gaps were used.

See **Figure 2-7** for a summary of land ownership in the Southern Great Basin assessment area.

The lack of an accurate invasive annual grasses map made it difficult to determine the expanse of cheatgrass, medusahead, and other invasive species in the MZ III, SGB FIAT area. A broad brush determination was made based on the USFWS's suggestion that greater than 20 percent cheatgrass understory would need to be identified in the PPAs. Passive treatments inside and outside of the focal habitats would be incorporated, while the greater than 20 percent cheatgrass understory would be monitored. The invasive annual grasses in the SGB FIAT area are ephemeral. Because of this, future research should be supported to determine when active cheatgrass chemical treatments are needed to treat cheatgrass understory.

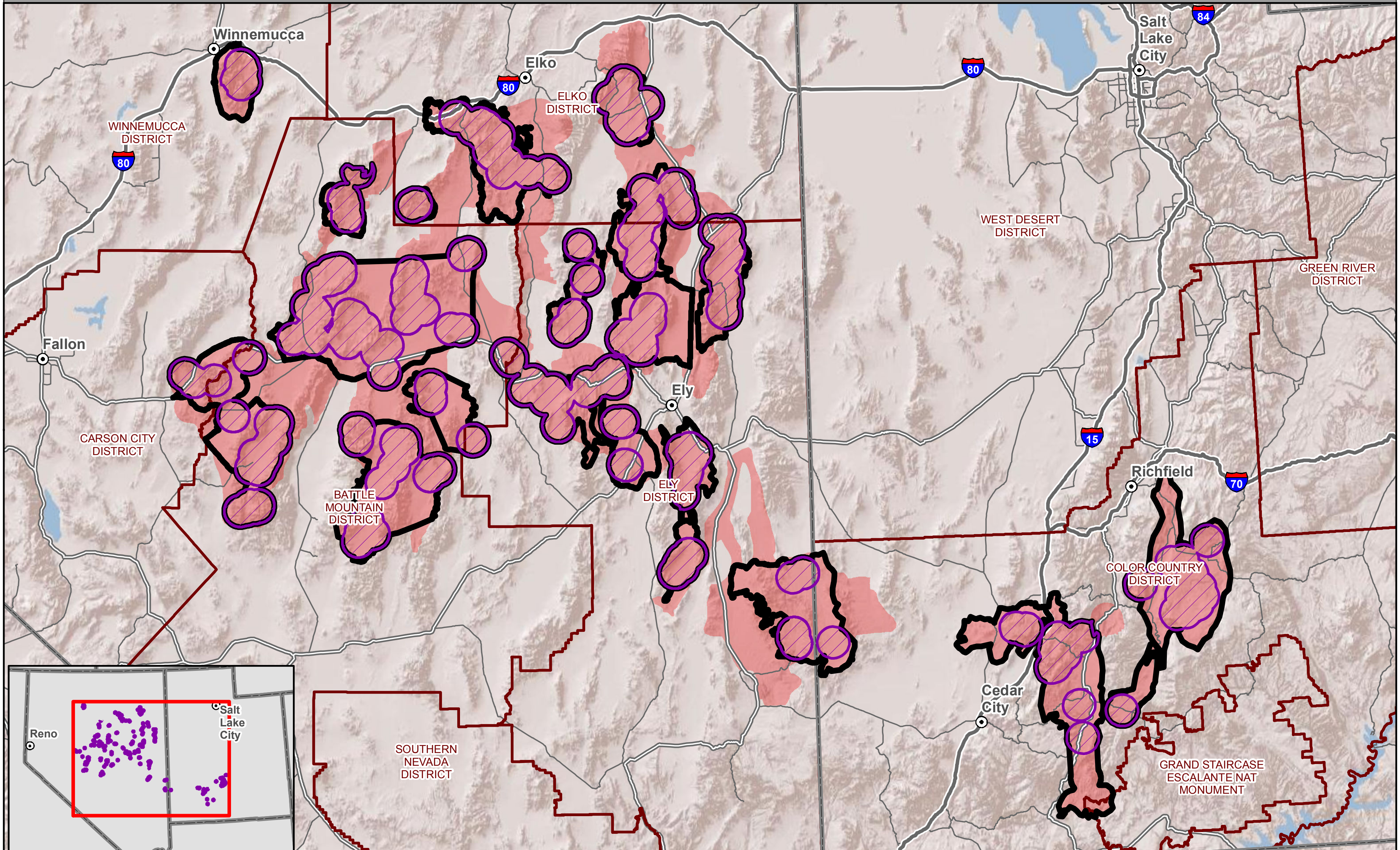
At the time of this assessment, the conifer expansion model was not available from Coates *et al*., therefore, SynthMap and the conifer expansion layer were used to determine where pinyon-juniper (pinyon-juniper) would need to be removed. The SGB team also used ERSI imagery, elevation, and aspect information to help determine Phase 1 and 2 pinyon-juniper sites.

The layers identified above were used to answer the Step 2b management questions and to determine the associated management strategies in or near focal habitats.

Breeding Bird Density (Focal Habitat Areas)

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

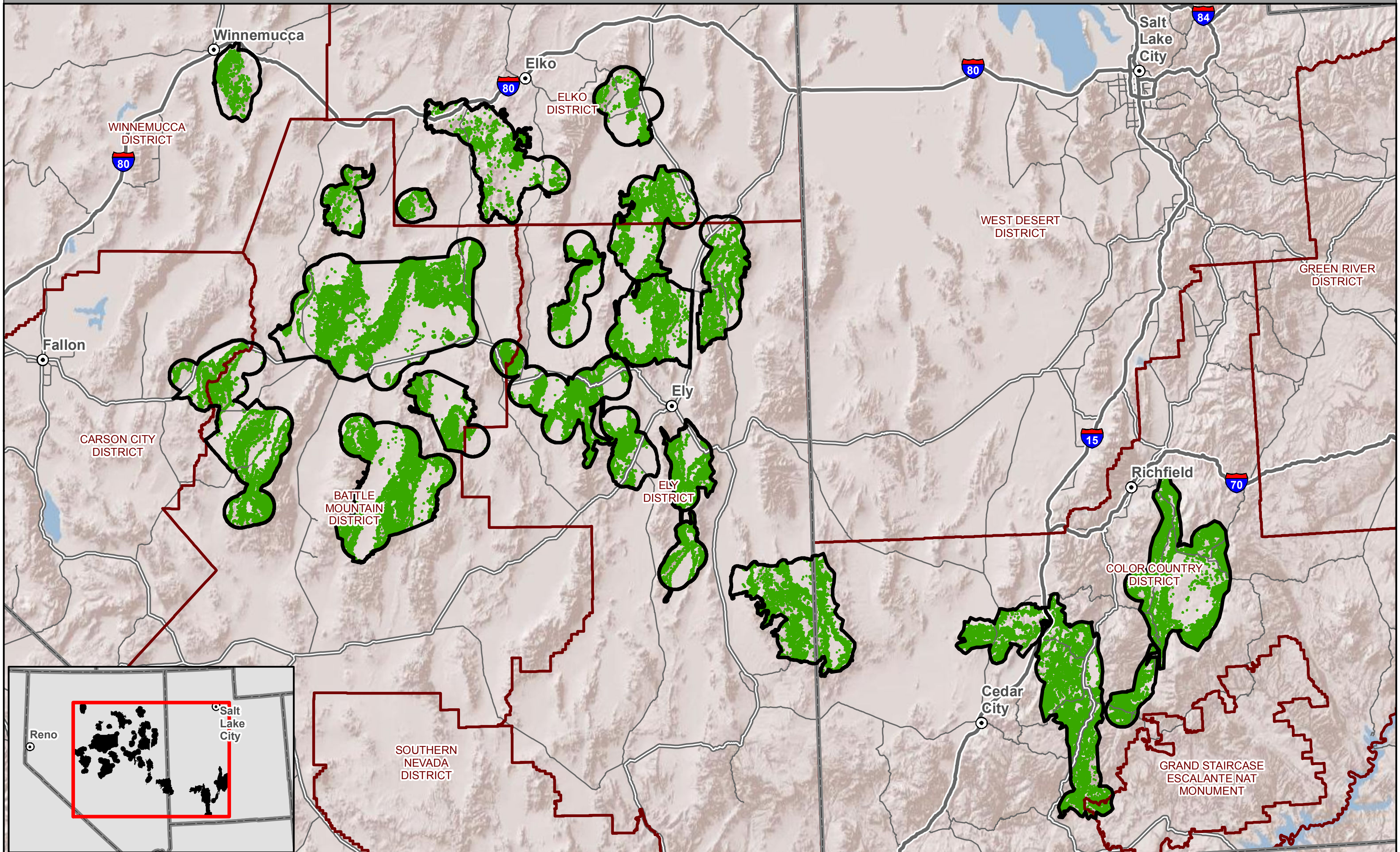
Breeding Bird Density 75%
Project Planning Area
Assessment Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Conifer Expansion

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

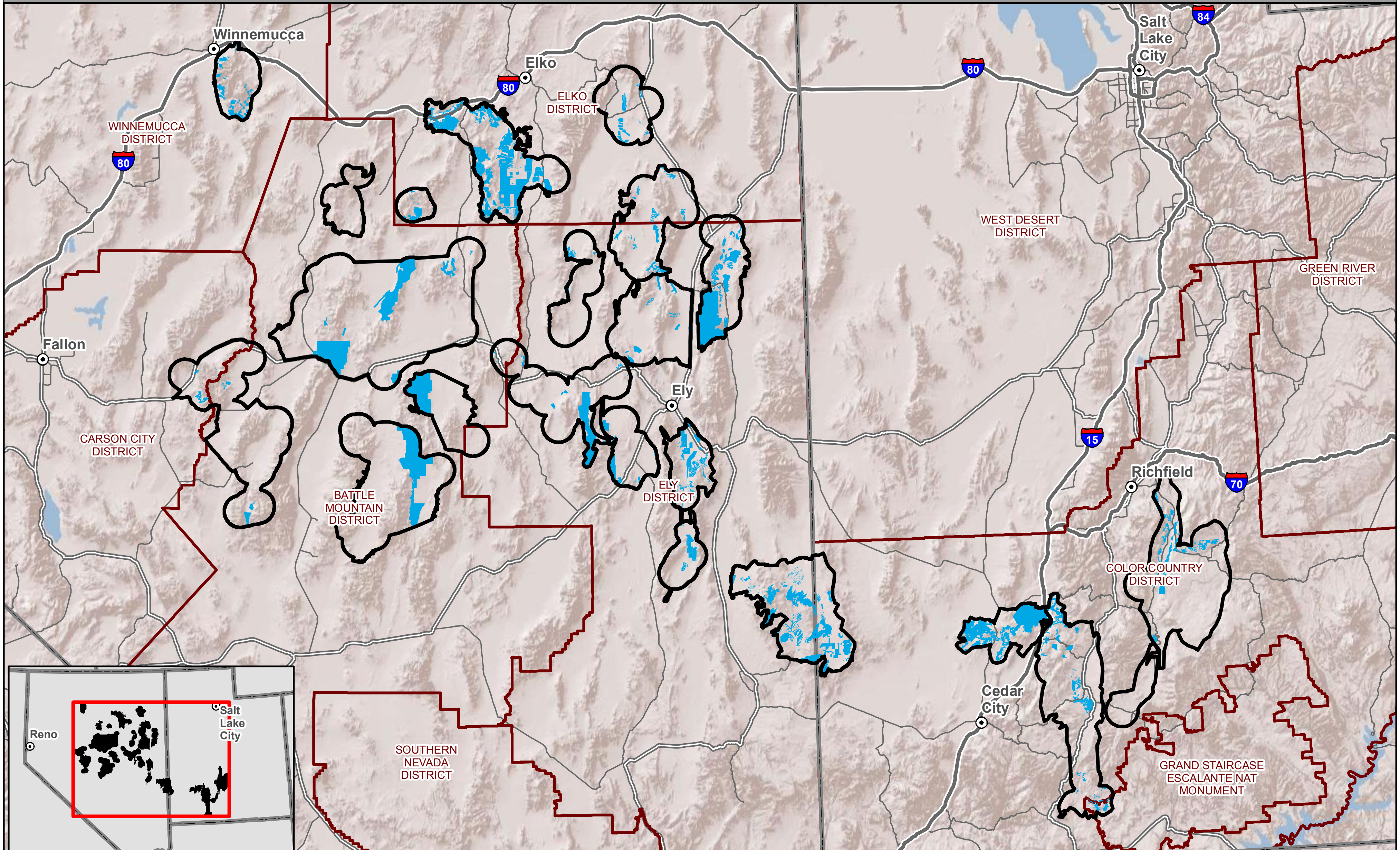
Conifer Expansion
Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Vegetation Treatments (Completed & Ongoing) 1,216,614 acres

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

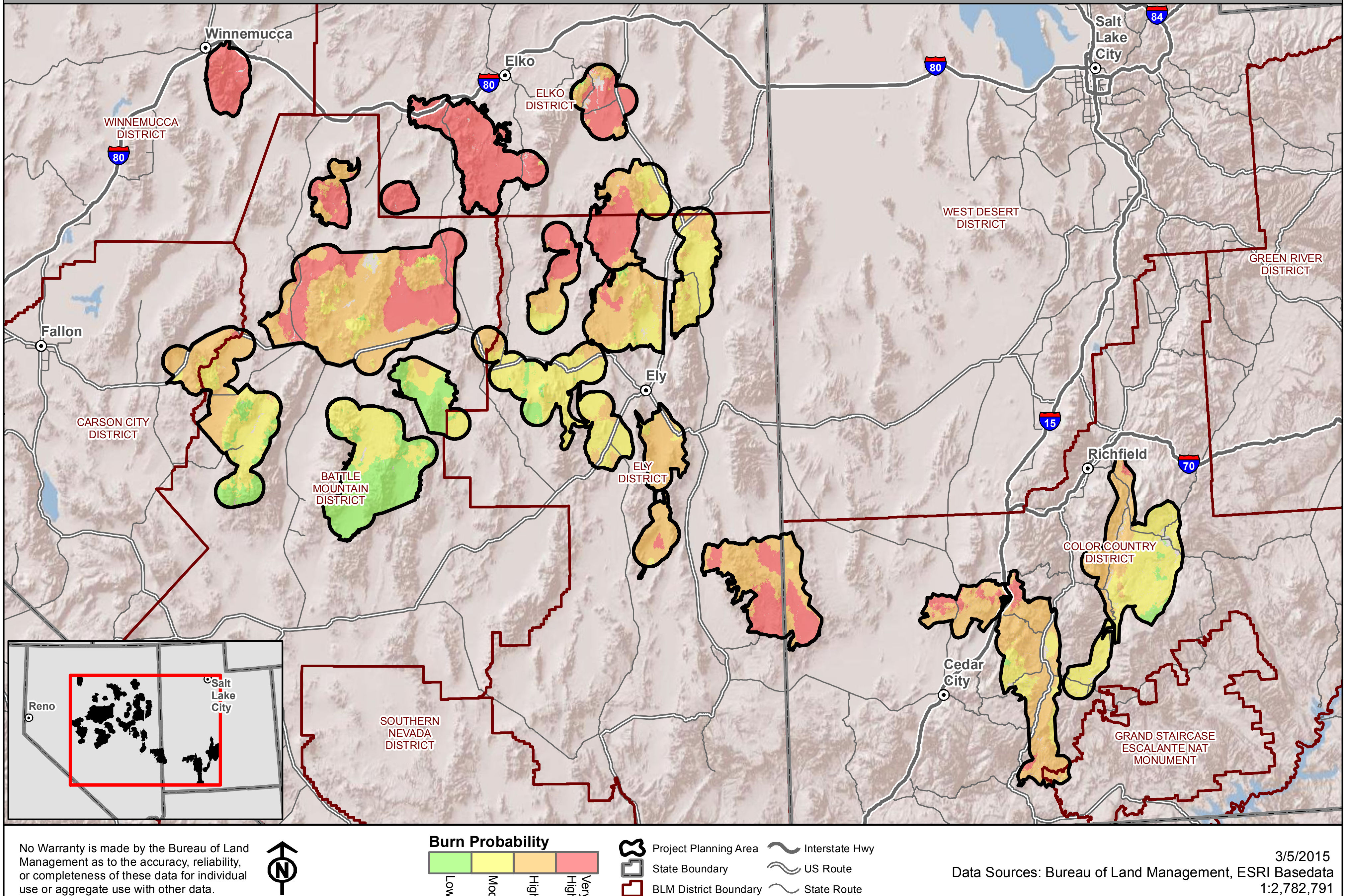
Project Planning Area
Vegetation Treatment
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Wildfire Threat (Burn Probability)

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



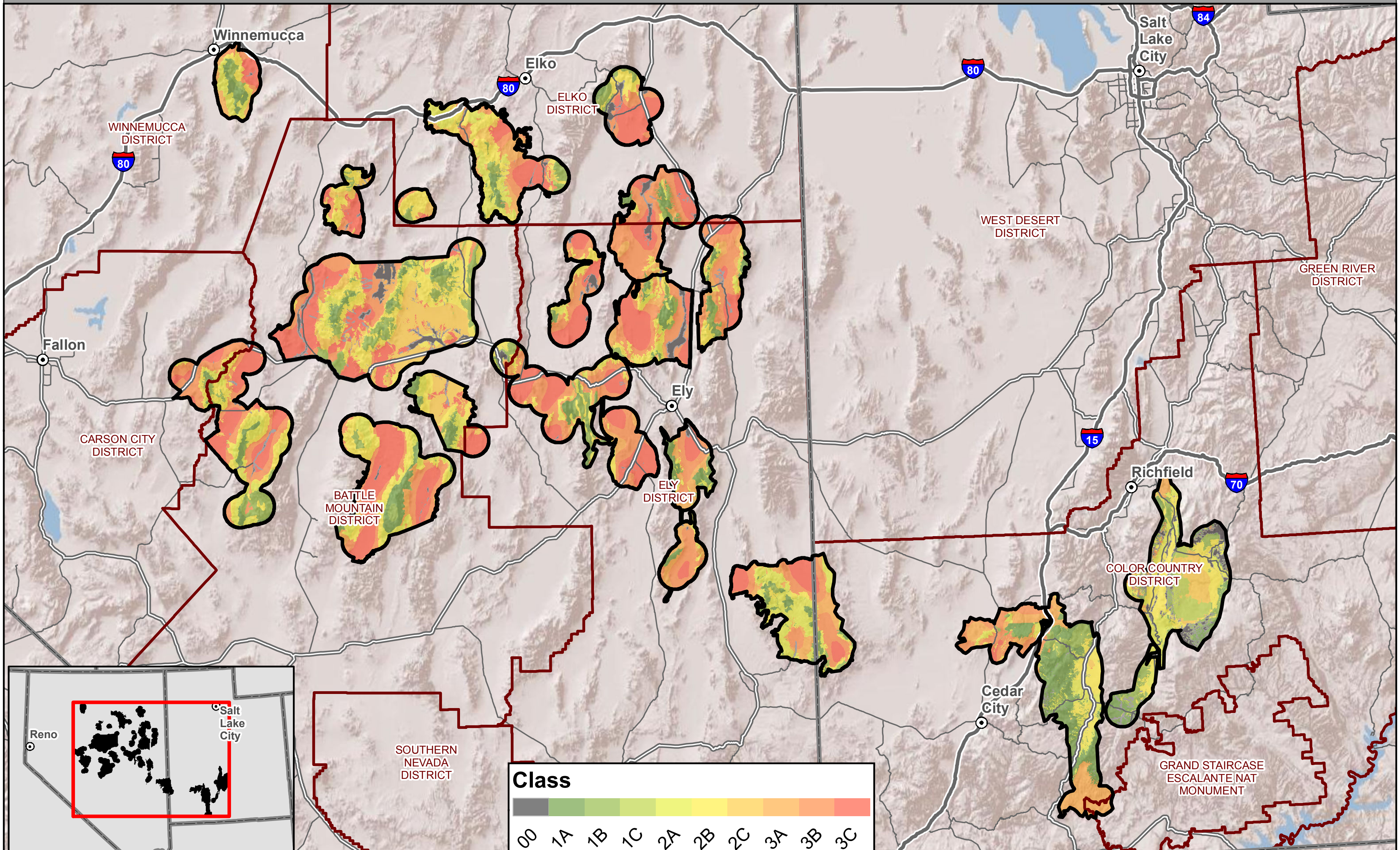
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Soil Moisture / Temperature Regimes

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

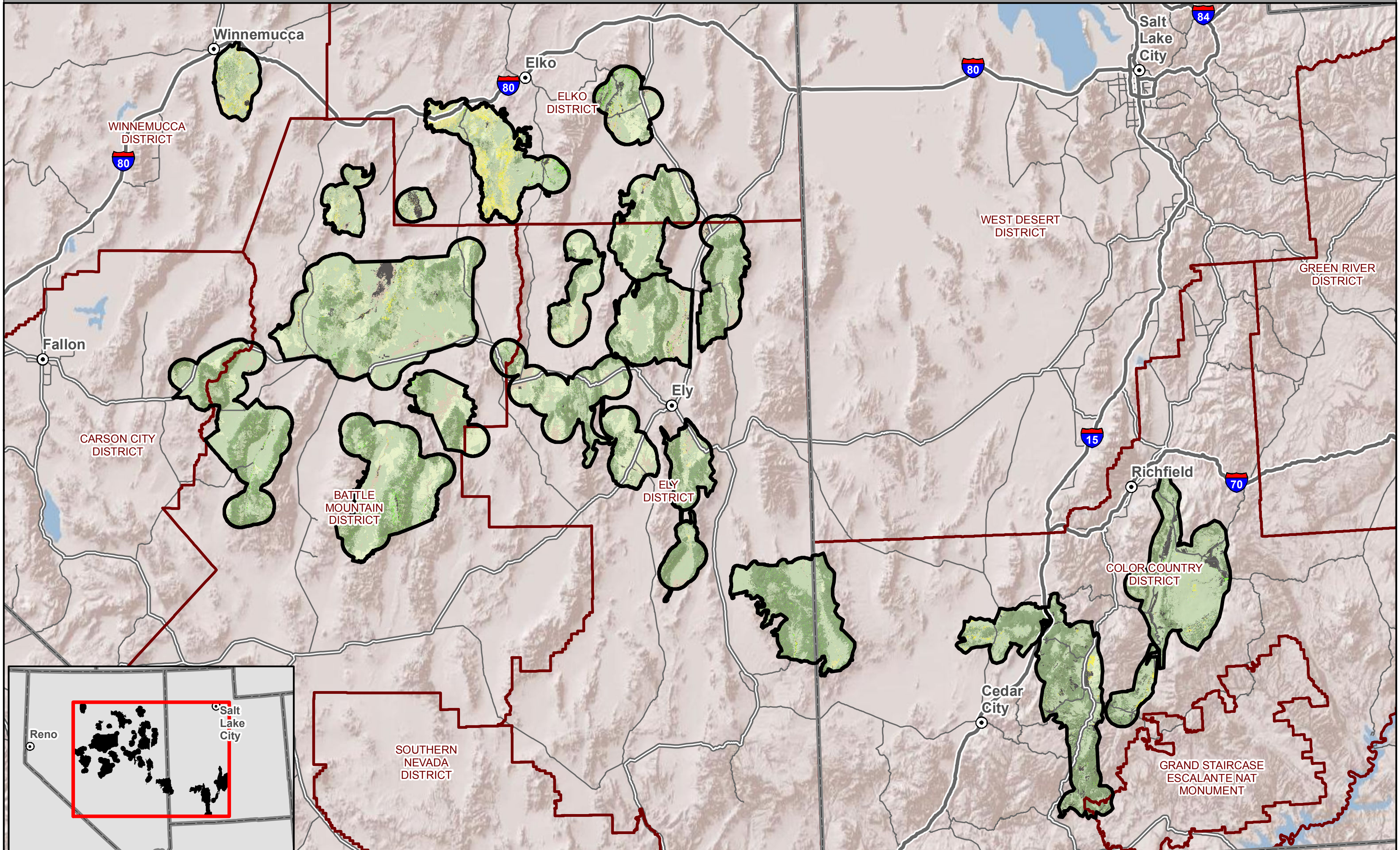
Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/13/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Sagebrush Landscape Cover

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

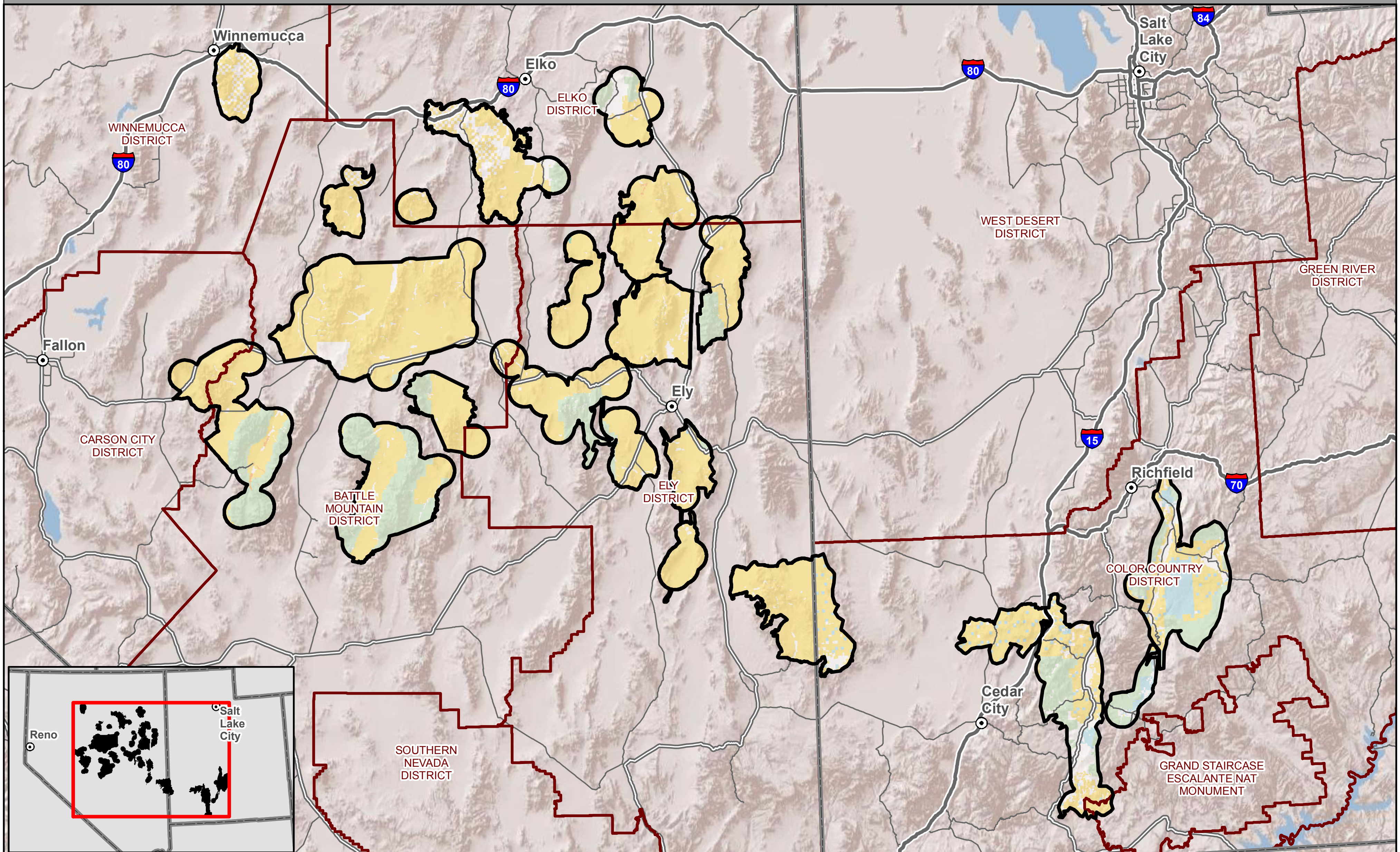
Big Sagebrush Shrubland
Black/Low Sagebrush
Grassland
Invasives
Riparian
Salt Desert Scrub
Woodland
Other
Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

Surface Management Agency (SMA)

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Agency

BIA BLM DOD FS FWS NPS PVT ST WTR

Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

SECTION 3
ASSESSMENT AREA CHARACTERIZATION

3.1 SOUTHERN GREAT BASIN ASSESSMENT AREA

Most of the Southern Great Basin assessment area is in Nevada; a portion is in Utah. This ecoregion is bounded by the Sierra Nevada Range on the west along the California-Nevada border, the Wasatch Range on the east in Utah, adjoining the southern boundary of the Northern Great Basin assessment area along the Humboldt River on the north, and the Mojave Desert on the south. The assessment area covers 78,990,901 acres. In the assessment area 9,117,296 acres were broken into 20 identified PPAs for detailed assessment, which is referred to as PPAs.

See **Figure 3-1**.

Landownership in the assessment area is a combination of public (91 percent) and private (nine percent), See **Table 3-1**.

Table 3-1
Southern Great Basin Landownership Acreage

Ownership	Acres	Percentage
Private	831,338	9
BLM	6,494,970	71
Forest Service	1,517,857	17
Other federal lands	13,493	<1
State land	259,591	3

Source: Nevada BLM Corporate GIS

General topography in the assessment area is intermountain basin and range type, with north/south oriented mountain ranges with flat basins. Elevations in the PPA range from a high of 10,900 feet in the Steptoe Cave PPA to a low of 4,400 feet in the Sonoma PPA. The typical elevation difference between adjoining basins and ranges in the assessment area is between 4,500 and 5,500 feet.

3.1.1 Vegetation

Higher elevations are dominated by coniferous vegetation. Most of this is woodland vegetation, though some key connective habitats for GRSG at high elevations are composed of low sagebrush habitat. As elevation transitions downwards from mountain peaks and ridges, the woodland vegetation is replaced by various big sagebrush communities; the continued drop in elevation coincides with less abundant moisture. These big sagebrush communities typically give way to low sagebrush communities, salt desert scrub, riparian[2] habitat, and barren playas.

In both the SynthMap and GAP data, there are numerous categories of vegetation habitat types. To simplify our analysis, we grouped the vegetation data into eight categories. Big sagebrush shrubland habitats are dominated by the three subspecies of big sagebrush. Black and low sagebrush habitats are dominated by black and low sagebrush. Grassland habitats are areas where native perennial grasses >25 percent and co-occur with shrubs such as ephedra, rabbitbrush, or winterfat. Riparian habitats are all riparian areas found in woodlands, shrublands, or grasslands. Salt desert scrub habitats are characterized by greasewood, hopsage, and saltbush associations. Woodland areas are all pinyon-juniper areas as well as other forest types such as aspen, fir, mahogany, and pine. Finally, the other category is all other vegetation types that did not fit into our categories.

The following tables illustrate the major vegetation habitat types in the PPAs. The State of Nevada has chosen to use SynthMap data, which it considers to have a higher degree of accuracy than other data sources. The State of Utah does not have access to SynthMap data, and its table uses GAP data to characterize the same major vegetation types. See **Table 3-2**.

Table 3-2
Major Vegetation Types in the SGB Landscape

Vegetation	Acres	Percentage	Vegetation	Acres	Percentage
Big sagebrush shrubland	3,487,607	47	Big sagebrush shrubland	839,588	49
Black/low sagebrush	1,093,403	15	Black/low sagebrush	16,819	1
Grassland	74,653	1	Grassland	19,474	1
Riparian	119,104	2	Riparian	8,324	1
Salt desert scrub	327,938	4	Salt desert scrub	968	0
Woodland	2,006,852	27	Woodland	706,611	41
Invasives	164,612	2	Invasives	37	0
Other	121,805	2	Other	120,324	7

Sources: Nevada SynthMap, Utah GAP DATA

[2]Wetlands next to rivers or streams

3.1.2 Invasive Annual Grasses

Invasive annuals are numerous species of annual bromes, most notably cheatgrass (*Bromus tectorum*), and medusahead rye (*Taeniatherum caput-medusae*). Wyoming sagebrush plant communities are particularly susceptible to conversion to annual grasslands after fire when the understory contains higher densities of annual grass.

Once converted to exotic annual grasses, these plant communities have crossed a threshold that precludes their returning to traditional plant community composition through normal plant succession processes. These areas are essentially lost in their ability to provide GRSG habitat unless significant investment in restoration inputs are undertaken.

3.1.3 Conifer Encroachment

Pinyon-juniper woodlands can be divided into areas where they are encroaching into other vegetative types and areas that should be persistent woodlands. Areas of persistent pinyon-juniper woodlands can be found at the higher elevations. Conifers are encroaching in the shrub-dominated areas next to the persistent woodlands, as trees migrate out into these areas and infill them over time. Conifer expansion mainly occurs along valley bottoms and alluvial fans. For this FIAT assessment, the Southern Great Basin ecoregion was subdivided into 20 PPAs using the following criteria:

- For annual grasses, PPAs are a subset of the assessment area, where application of management strategies will be focused to conserve GRSG. PPAs are emphasis areas with warm-dry soil regimes and a high risk of invasive annuals and where management emphasis should be given.
- For conifer invasion, PPAs are in or near conifer expansion in landscapes with greater than 25 percent sagebrush. PPAs are emphasis areas where there is an intersection with 75 percent BBD.

3.1.4 Fire Regime and History

Pinyon-juniper expansion and invasive annual grass establishment have significantly contributed to altered fire regimes and condition classes throughout the PPAs in the SGB management area. The Interagency Fire Regimes Condition Class Handbook (FRCC; Barrett et al. 2010) establishes how FRCCs are used by fire management personnel. FRCCs characterize the relative frequency and severity in which a habitat historically burned and the extent of departure from that relative frequency. Fire regimes are grouped according to severity and frequency and are ranked from 1 to 5; condition classes represent the deviation of an area from the historical fire regime and are ranked from I to III. See **Table 3-3** and **Table 3-4**.

Table 3-3
Fire Regime

Fire Regime	Fire Return Interval	Fire Severity
1	0-35 years	Low/mixed
2	0-35 years	Stand replacing
3	35-200 years	Low/mixed
4	35-200	Stand replacing
5	200+ years	Any

Source: Barrett et al. 2010

Table 3-4
Condition Class

Condition Class	Adjective Rating	Percent Departure from Historical
I	Low departure	Less than 33
II	Moderate departure	33-66
III	High departure	More than 66

Source: Barrett et al. 2010

Eighty-five percent of the acres in the PPAs are in fire regimes 3 and 4, meaning that historically fire occurred at intervals between 35 and 200 years. Condition class II and III, at 90 percent, are overwhelmingly represented in the coarse-scale, land fire data analysis used for this assessment. See **Table 3-5** and **Table 3-6**.

Table 3-5
Fire Regime Acres

Regime	Acres	Percent
1	198,505	2
2	0	0
3	4,012,159	44
4	3,739,151	41
5	1,067,175	12
Unclassified	83,592	1

Source: LANDFIRE refresh 2011

Table 3-6
Condition Class Acres

Class	Acres	Percent
I	749,470	8
II	1,902,918	21
III	6,259,368	69
Unclassified	188,434	2

Source: LANDFIRE refresh 2011

The condition class data indicate that most of acres in the PPAs are moderately or highly departed from historic fire regimes. This is due to missed fire return intervals, expansion of pinyon-juniper woodlands, or establishment of invasive annual grasses. Though not a direct correlation, areas in condition class II and III typically represent areas in which some form of treatment is necessary to reestablish natural processes and areas that are at risk of state conversion.

3.1.5 Fire History

Several large fires have occurred in the intermountain basins in the big sagebrush communities. Fire has played a greater role in impacting transition areas in the ecoregion encompassed by the assessment area. Large fires that happened before this assessment (in 1999, 2005, 2006, and 2007), significantly degraded GRSG habitat. The PPAs reflect these losses and degraded habitats because they are primarily in the less fire-prone, more expanded, and infilled habitats in the SGB assessment area. See **Table 3-7**.

Table 3-7
Fire Activity in Southern Great Basin PPAs

Year	Acres	Number of Fires
1999	398,507	143
2000	65,515	182
2001	68,480	237
2002	26,835	110
2003	249	144
2004	6,606	166
2005	17,302	109
2006	48,717	146
2007	130,549	136
2008	1,827	100
2009	637	68
2010	3,415	50
2011	60,369	102
2012	55,030	139
2013	9,676	76
2014	321	42
Total	**895,216**	**1,950**

Source:

3.1.6 Fire Risk

As a consequence of the identification process used to delineate the PPAs, the most fire-prone, highest risk GRSG habitats in the assessment area have already been excluded from more intensive analysis. They also have already exhibited shortened fire return intervals, state conversions, and habitat value degradation to the point that they do not qualify as PPAs.

Primary risks to identified focal habitats are pinyon-juniper expansion, annual grassland expansion associated with degraded understories, overgrazing, and fire-prone area expansion.

3.1.7 Past Treatments

Past treatments have had varying degrees of success, which can be demonstrated in the resistance and resilience (R&R) model. In general, monitoring data has indicated that proactive management strategies have proved beneficial to protecting and enhancing existing GRSG habitat. Examples are conifer removal, planned habitat enhancement seeding, and fuels treatments.

Reactive post-fire rehabilitation treatments have exhibited mixed degrees of success following wildfires in limiting the spread of invasive annuals throughout the assessment area. Note that several past large-scale post-fire rehabilitation treatments have occurred outside the PPAs; however, they did not result in the maintenance of habitat values sufficient to allow for them to be included in a PPA.

Historically, proactive management throughout the assessment area has largely taken place in the PPAs. These areas had been identified as needing habitat treatment long before the FIAT process, generally targeted at mitigating conifer expansion using various techniques. Monitoring data indicates that these treatments have been largely successful.

3.1.8 Soil/Moisture Regime (R&R)

Throughout the SGB assessment area, pinyon-juniper has significantly infilled and expanded into the big sagebrush communities. This represents a significant loss of GRSG habitat, particularly in the less fire-prone areas.

Analysis conducted by Chambers et al. (2014) using R&R modeling techniques illustrates the challenges in preserving the best GRSG habitat in the SGB assessment area. Here 48 percent of the area is categorized as warm-dry soils with low R&R to invasive annual grasses post fire.

See **Table 3-8**.

This prevalence of low R&R lands in the assessment area has played a significant role in the expansion of monotypic[3] stands of invasive annual grasses. The shortened fire return intervals and the susceptibility of the landscape to further conversion of these stands has contributed to GRSG habitat losses in the fire-prone areas in the SGB assessment area. Most of these areas are so badly degraded that they no longer meet the criteria for inclusion in the PPA.

See **Figure 3-2** and **Figure 3-3**.

[3]Single species

Table 3-8
Soil/Moisture Regime (R&R)

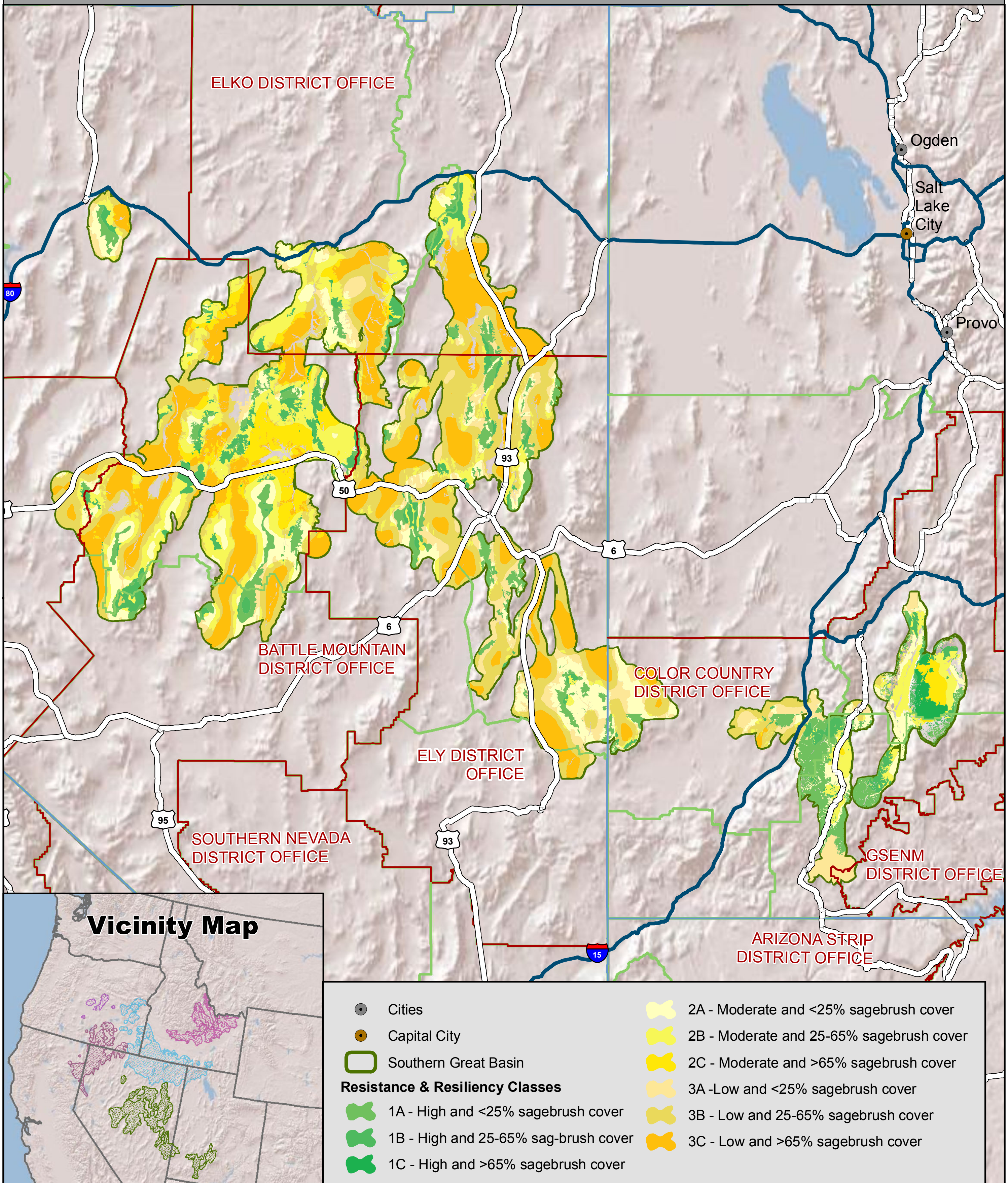
Class	Acres	Percent
1A	897,261	10
1B	603,527	7
1C	94,543	1
2A	963,480	11
2B	1,337,074	15
2C	511,615	6
3A	716,701	8
3B	1,862,706	20
3C	1,822,621	20

Source: NRCS 2015

Sage-Grouse Habitat Matrix

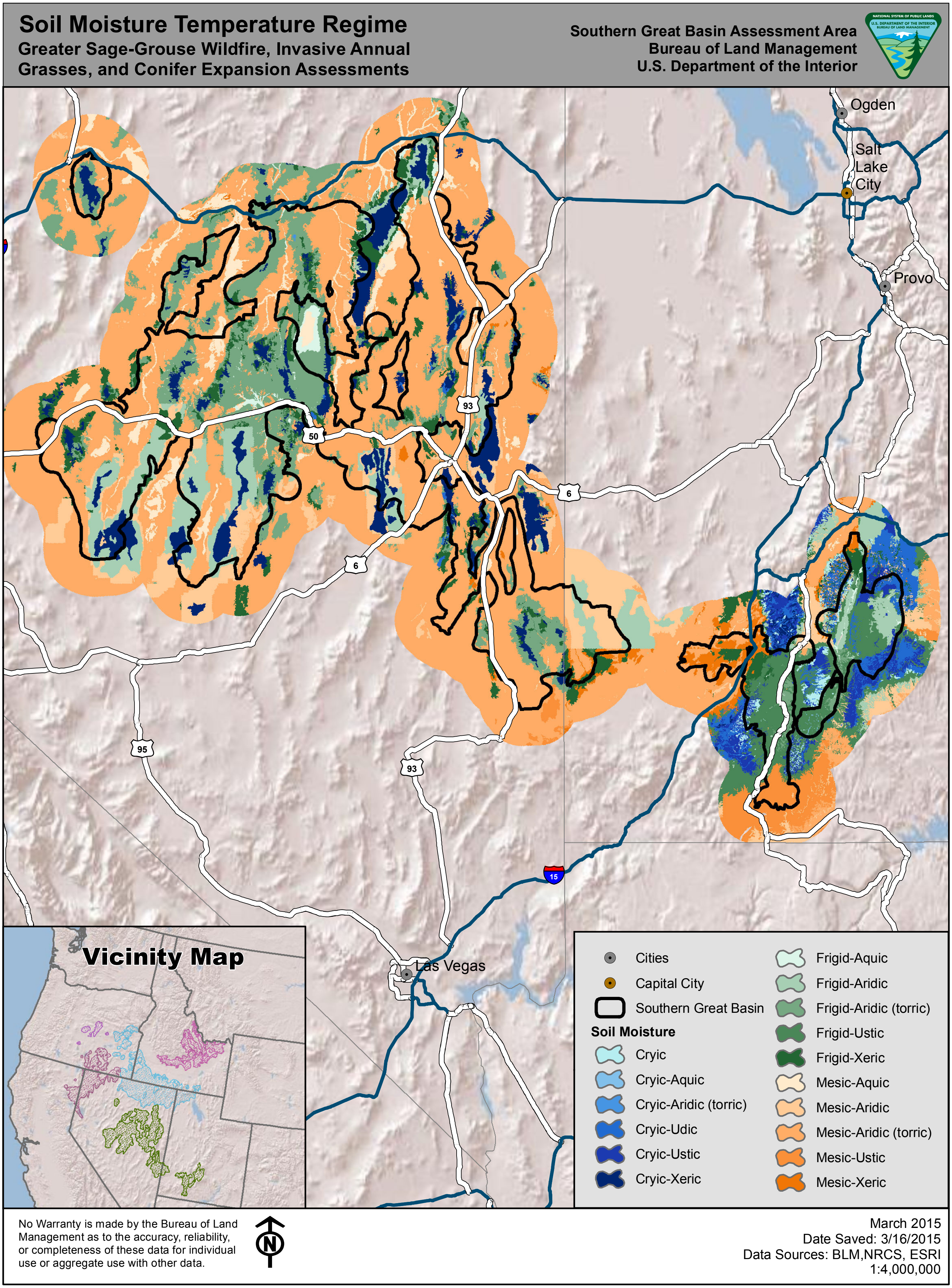
Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin Assessment Area
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

March 2015
Date Saved: 3/6/2015
Data Sources: Bureau of Land Management, ESRI
1:4,015,324



Soil Moisture Temperature Regime
Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments
Southern Great Basin Assessment Area
Bureau of Land Management
U.S. Department of the Interior
Ogden
Salt Lake City
Provo
Las Vegas
93
50
6
95
15
Vicinity Map
Cities
Capital City
Southern Great Basin
Soil Moisture
Cryic
Cryic-Aquic
Cryic-Aridic (torric)
Cryic-Udic
Cryic-Ustic
Cryic-Xeric
Frigid-Aquic
Frigid-Aridic
Frigid-Aridic (torric)
Frigid-Ustic
Frigid-Xeric
Mesic-Aquic
Mesic-Aridic
Mesic-Aridic (torric)
Mesic-Ustic
Mesic-Xeric
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.
N
March 2015
Date Saved: 3/16/2015
Data Sources: BLM,NRCS, ESRI
1:4,000,000

SECTION 4
FOCAL HABITAT AND PROJECT PLANNING AREAS

4.1 FOCAL HABITAT AND PROJECT PLANNING AREAS

4.1.1 Focal Habitat Areas Overview

Chambers et al. (2014) illustrated the step-down approach used for identifying and assessing priority GRSG habitats across large landscapes. They provided guidelines to identify effective management strategies and actions and habitat restoration needs across four primary federal agency program areas: fuels management, fire operations, habitat restoration and recovery, and post-fire rehabilitation.

The approach is based on widely available data and is described in Section 2.3. It provides consistency across millions of acres and includes the following:

- Priority areas for conservation (PACs)
- BBDs
- Habitat suitability, as indicated by the landscape cover of sagebrush (not leaf cover)
- R&R and dominant ecological types, as indicated by soil temperature and moisture regimes
- Habitat threats, as indicated by cover of cheatgrass, cover of pinyon-juniper, and fire history

Using this approach, the SGB team developed 20 PPAs in the FIAT process to reduce impacts on GRSG from invasive annual grasses, wildfires, and conifer expansion.

The results of Step 1 of the FIAT process, including geospatial data, were made available as the starting point for the assessment teams identified for Step 2. **Table 4-1** identifies the acres and elevations of each of the PPAs in Management Zone III of the SGB assessment area.

Table 4-1
Elevation and Acreage of Project Planning Areas

WAFWA Management Zone III Acres: 78,990,901		**Minimum Elevation: 1,500 Feet**	**Maximum Elevation: 14,200 Feet**
Project Planning Area	**Acres**	**Minimum Elevation**	**Maximum Elevation**
Sonomas	184,887	4,400	9,300
Reese River/Yomba/Desatoya	759,001	4,800	10,800
Cooks Creek	153,796	5,000	9,600
Punchbowl	709,226	4,700	10,800
Antelope Valley	267,842	6,200	10,400
Bates/Callahan	1,399,216	5,200	10,100
South Fork	535,299	4,800	10,200
Ruby	248,161	5,600	10,800
Table Mountain/Hamlin Valley	580,408	5,800	9,200
Cortez	71,011	4,800	8,600
Cherry Creek	427,668	5,800	10,200
Egan	422,527	6,000	10,100
Western White Pine	713,133	5,600	10,700
North Spring	335,980	5,800	10,200
Bald Hills	219,619	5,100	8,600
Panguitch	616,515	5,700	10,100
John's Valley	126,602	7,100	9,000
Parker Mountain	710,265	5,900	10,300
Long Valley	242,644	6,000	9,100
Steptoe Cave	348,462	5,700	10,900

Source: BLM Nevada State Office 2015

See **Figure 4-1**.

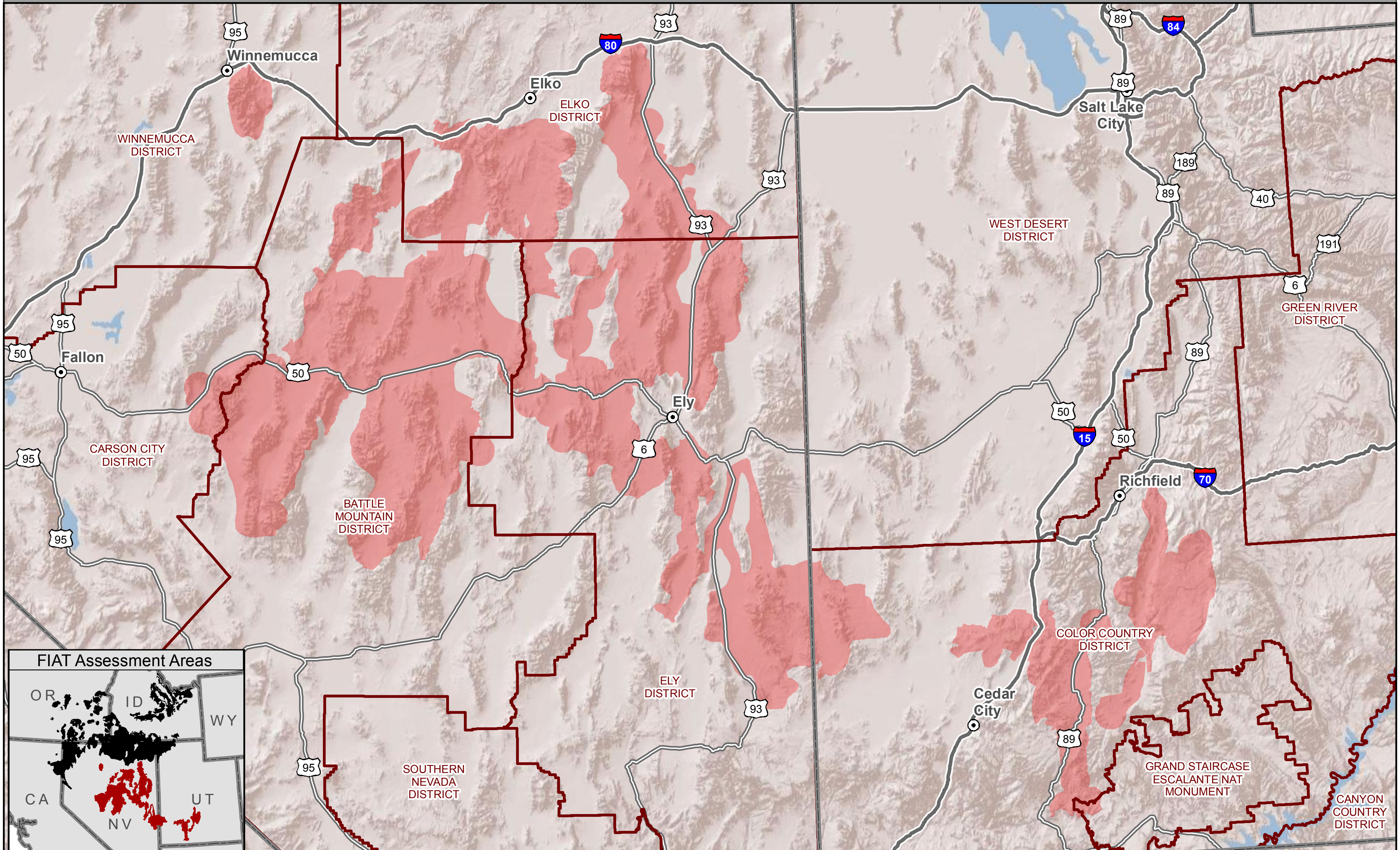
4.1.2 Project Planning Areas Overview

As described in Section 4.1.l, the primary purpose of the Southern Great Basin (SGB) assessment team was to assess and identify broad PPAs and associated proactive and reactive management strategies and associated vegetation treatments. Using the FIAT process, the team focused on four program areas: fuels management, fire operations, habitat restoration and recovery, and post-fire rehabilitation management. Twenty PPAs were established and spatially delineated. As this is an assessment, SGB PPAs and associated potential treatments are expected to need to be ground truthed and refined, possibly reducing the number of acres initially identified in this assessment.

Southern Great Basin Assessment Area

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Cities
Assessment Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,862,093

Starting with the focal habitats, the first step was to group them into smaller assessment areas with a specific name as an identifier. In Nevada, the team used biologically significant units (BSU); in Utah individual PACs were used because BSUs have not been delineated. BSUs were developed in collaboration with the SETT, NDOW, UDWR, and USGS. These areas are based on GRSG interactions between population management units to represent local GRSG population habitat and use areas in the subregion.

The next step was to develop PPAs for each smaller assessment area. Each PPA consists of primarily discrete focal habitat areas and is in one or more BSUs. PPAs sometimes crossed BSU boundaries and encompassed more isolated focal habitats if local knowledge deemed there was current or potential GRSG connectivity or similar management issues among them. For some PPAs, management strategies and actions and treatments were identified outside of focal habitats. The team based this on local knowledge that these areas are crucial to the long-term viability of GRSG populations in the larger PPAs. Areas outside of focal habitat that were identified for treatment typically include seasonal habitats essential to those GRSG populations or those that support connectivity between GRSG populations in the PPA.

Step 1 of the FIAT process was to develop a set of questions addressing Tables 2-4 in the Chambers et al. (2014) protocol for each program area. These questions were incorporated into assessment templates for each program area to identify goals, objectives, current conditions and trends, treatment opportunities, management strategies and actions, and prioritization criteria for the four program areas in each PPA.

The team leader developed templates for each of the management strategies. Team members used the templates as a guide for assessing each PPA. Generalized question topics were as follows:

- Where do the greatest wildfire risks occur?
- Where do opportunities exist for habitat restoration treatments?
- What types of fuels treatments should be implemented to reduce fire risk?

The list of management questions can be found below in Sections 4.1.4 and 4.1.5. Landownership was not a consideration when these assessments and fuelbreaks were restricted to existing roads. This was in order to minimize further disturbance and fragmentation and to reduce the likelihood of increasing invasive annual grass abundance.

The criteria identified in Step 1 of the FIAT process were followed for prioritizing treatments and management strategies and actions with the following exceptions:

- Fire suppression was always a Priority Order 1 for areas where habitat has been restored to protect that investment.
- Fuelbreaks and fire suppression areas were identified outside of focal habitats due to prevailing wind directions that could affect fire behavior and fire spread into a PPA.
- In some areas, fuelbreaks were placed outside of a PPA to take advantage of nearby existing roads.
- Based on the R&R GIS data, if a small area were designated as one priority (e.g., Priority Order 2) but was surrounded by a much larger contiguous area designated as a different priority (e.g., Priority Order 1), the GIS polygon delineated in the accompanying geodatabase encompassed both and used the priority of the larger spatial extent.

Other minor mapping deviations are identified in the individual PPA assessments.

4.1.3 Proactive Strategies

Fuels Management

Fuels management treatments are designed to change vegetation composition or structure or both to modify fire behavior characteristics to help in suppressing fire and reducing its extent. Types of fuels treatments considered are maintaining road rights-of-way clear of vegetation, mowing a fuelbreak clear of vegetation (width dictated by fuel type), shaded fuelbreaks, or follow-up chemical and seeding application where appropriate. Integrated management techniques, such as targeted grazing and conifer removal, were analyzed under the habitat restoration and recovery section and were not considered for the development of fuels treatments for this analysis.

Where opportunities exist for managed wildfire in higher resilient and resistant areas (1A, 1B, 1C habitats), fuelbreaks were identified to limit fire expansion into lower resistant areas (3B and 3C habitats). Habitat restoration projects were also identified in this interface with the primary objective of improving GRSG habitat, which also has a secondary objective of reducing fuels. These types of treatments are mowing along existing road systems, removing conifers (chaining, thinning, and mastication), restoring riparian areas, and shading fuelbreaks.

To determine fuels management treatments, a series of questions were answered to ensure consistency across all assessed PPAs, as follows:

- Where are the priority fuels management areas (spatially defined treatment opportunity areas that consider fire risk, fuels conditions, and focal habitats, including areas next to focal habitats)?

- Based on fire risk to focal habitats, what types of fuels treatments should be implemented to reduce this threat (for example, linear features that can be used as anchors during fire suppression)?
- Considering resistance and resilience concepts and the landscape context from Step 1, where should treatments be applied in and around focal habitats to
  - Constrain fire spread?
  - Reduce the extent of conifer expansion?
  - Augment future suppression by creating fuelbreaks or anchors for suppression?
- Based on opportunities for fire to improve or restore focal habitats, what types of fuels treatments should be implemented to complement managed wildfire by modifying fire behavior and effects?
- Are there opportunities to use a coordinated fuels management approach across jurisdictional boundaries?
- What fuel reduction techniques will be most effective that are in acceptable impact ranges of local GRSG populations, including grazing, prescribed fire, chemical, and biological and mechanical treatments? Will combinations of these techniques improve effectiveness (e.g., using livestock to graze fine fuels in a mowed fuelbreak in sagebrush)?

Habitat Restoration and Recovery

Habitat restoration and recovery projects use both active and passive techniques. Passive restoration treatments focus on changes in land use (e.g., improved livestock grazing practices) to achieve a desired outcome where a plant community has not crossed a biotic or physical threshold. Opportunities for passive restoration are managing livestock grazing, managing wild horses and burros, limiting soil-disturbing activities (*e.g.,* off-highway vehicles [OHVs]), limiting ROW corridors, and limiting mineral/energy development), and fencing.

Active restoration treatments are needed when species or structural groups are poorly represented in a plant community, and reseeding is required, often preceded by removing undesirable species.

For all PPAs, the following active restoration treatments apply:

- At the time of document preparation, spatial data were not available which portrayed the distribution of invasive annual grasses across the range of GRSG. Therefore, as part of the NEPA process, conduct inventory and monitoring to identify treatment needs related to invasive annual grasses. Management actions needed in

PPAs include: locating infestations, decreasing propagule pressure (especially along roadside areas), treating satellite infestations, and preventing future infestations.

- Plant species are the foundation of habitat and ecosystems. Central to the problem is that GRSG are declining due to a loss of habitat and native plant diversity and distribution. This problem cannot be fixed without restoring native plant communities and their distribution. However, not all native seed is equal and the source of native seed material is important to the success of habitat restoration and recovery. Therefore, seed collection of local or genetically appropriate seed and native plant material increase should always be a component of habitat restoration and recovery treatments.
- GRSG habitat in the PPAs is being lost due to conifer expansion. The removal of phases 1 and 2 conifers is important for maintaining connectivity between leks and improving sagebrush habitats. However, stand-alone conifer treatments may not equate to sagebrush ecosystem restoration; they may require integrating other strategies (e.g., treating invasive annual grasses or seeding) to achieve desired outcomes.

It is important to recognize that all natural systems vary in space and time, and historic processes becoming reestablished may not be likely. However, steps can be taken to increase resilience and ecological function over time.

After restoration, disturbance activities need to be limited to ensure that areas have proper time to recover and achieve restoration objectives. Restoration treatments may need to be repeated if they fail initially, and maintenance needs to be included with all proposed treatments. This is especially true in warm-dry soil temperature moisture regimes, where weather is often problematic for seeding and seedling establishment.

Finally, when identifying habitat restoration and recovery treatments, a series of questions were answered to ensure consistency across all assessed PPAs, as follows:

- Are there opportunities for habitat restoration treatments to protect, enhance, or maintain GRSG focal habitat, especially to restore connectivity of focal habitat?
- Considering the resistance and resilience GIS data layer (**Figure 4**) and the Sage-Grouse Habitat Matrix (Chambers et al. [in preparation], Table 2), where and why would passive or active restoration treatments be used?

- What are the risks and opportunities of restoring habitat with low resistance and resilience, including the warm-dry and cool-dry soil moisture and temperature regime areas?
- Are there opportunities to use a coordinated approach across jurisdictional boundaries to effectively restore habitat in focal habitats?

4.1.4 Reactive Strategies

Fire Operations

Fire operations management strategies are preparedness, prevention, and suppression. Response to wildfires on Forest Service lands, in and around identified priority GRSG habitat, will be consistent with Forest Plan direction. Areas identified as GRSG habitat is considered a high priority for protecting Forest Service lands.

To address fire operations, a series of questions was answered to ensure consistency across all assessed PPAs, as follows:

- Where are priority fire management areas (spatially defined polygons having the highest need for preparedness and suppression action)?
- Where are the greatest wildfire risks to focal habitats considering trends in fire occurrence and fuel conditions?
- Where do opportunities exist that could enhance or improve suppression capability in and around focal habitats?
  - For example, increased water availability through installation of helicopter refill wells or water storage tanks
  - Decreased response time stationing resources or staffing remote stations
- Should wildfire be managed (in accordance with land use plan objectives) for improving focal habitat (e.g., reducing conifer expansion), and if so where, and under what conditions?
- How can fire management be coordinated across jurisdictional boundaries to reduce risk or to improve focal habitats?

Post-Fire Rehabilitation

Post-fire rehabilitation management strategies are addressed through the BLM's Emergency Stabilization and Rehabilitation (ESR) Program and the Forest Service's Burned Area Emergency Response (BAER) Program. Policy limits applying funds from these programs for one to three years, thus treatments to restore or enhance habitats after this period are habitat restoration and recovery. For all PPAs, the following post-fire rehabilitation treatments apply:

- Target seeding on north- and east-facing microclimates in the areas designated 2B, 2C, 3B, and 3C would enhance probability of successful establishment
- To the extent practical, use locally adapted seeds and native plant materials appropriate to the location, conditions, and management objectives for vegetation management and restoration, including strategic sourcing for acquiring, storing, and using genetically appropriate seeds and other plant materials native to sagebrush-steppe ecosystems
- Use some form of ground preparation (such as drill seeding, aerial seeding and chaining, and harrowing); this is warranted and feasible on valley bottom areas designated 2B, 2C, 3B and 3C
- Before treatment, inventory areas appropriate for drill seeding and equipment use to remove archaeological constraints for prompt treatment
- Use herbicide to suppress cheatgrass growth and favor seeded species as part of the ESR treatment profile.
- Install erosion control structures in areas with high burn severity and risk for erosion
- Consider not reseeding after a wildfire those areas of higher resistance and resilience, which can be categorized as areas of higher elevation and precipitation 1A, 1B, and 1C; however, fire intensity, severity, and slope will dictate this on a case-by-case analysis.
- During the post-fire rehabilitation analysis, specialists should consider using fire resistant seed mixes and chemical application targeting invasive annual grasses and not using shrubs in strategic areas to build fuelbreaks to reduce the likelihood of future wildfire impacts on seeded or recovering areas

Finally, when identifying post-fire rehabilitation treatments, a series of questions were answered to ensure consistency across all assessed PPAs, as follows:

- Where are areas that are a high priority for post-fire rehabilitation to improve habitat connectivity if a wildfire were to occur?
- Which areas are more conducive (higher resistance or resilience) to recovery and may not need reseeding after a wildfire?
- What opportunities are there to build in fuelbreaks to reduce the likelihood of future wildfire impacts on seeded or recovering areas?
- Are there opportunities to use a coordinated approach across jurisdictional boundaries to implement rehabilitation practices?

Table 4-2
Southern Great Basin Project Planning Areas

Project Planning Area Name	BLM District Office	Forest Service Ranger District
Sonoma	Winnemucca	N/A
Reese River/Yomba/Desatoya	Carson City and Battle Mountain	Austin-Tonopah
Cooks Creek	Battle Mountain	N/A
Punchbowl	Battle Mountain	Austin-Tonopah
Antelope Valley	Battle Mountain	Austin-Tonopah
Bates/Callaghan	Battle Mountain	Austin-Tonopah
South Fork	Elko	Ruby Mountain
Ruby Valley	Elko	Ruby Mountain
Table Mountain/Hamlin Valley	Ely and Color Country	Not applicable (N/A)
Cortez	Elko	N/A
Cherry Creek	Elko and Ely	N/A
Egan South Butte	Ely	N/A
Western White Pine	Battle Mountain and Ely	Ely
North Spring Valley	Elko and Ely	Ely
Bald Hills	Color Country	N/A
Panguitch	Color Country	Powell
John's Valley	Color Country	Powell
Parker Mountain	Color Country	Richfield
Long Valley	Ely	N/A
Steptoe Cave	Ely	Ely

4.2 Southern Great Basin Project Planning Areas

Below are descriptions of each of the PPAs in the Southern Great Basin Assessment Area. Each PPA description includes a characterization of the PPA landscape, an examination of the proposed management strategies in the PPA, and a spatial depiction of the proposed treatments. Additional supporting information, such as PPA worksheets, meeting notes, and links to electronic geospatial data, is in **Appendices A, B, C, D and E**.

4.2.1 Sonoma

Project Planning Area Description

General Site Description:
The Sonoma PPA is in Humboldt and Pershing Counties in northern Nevada. The city of Winnemucca is next to the northwestern portion of the PPA. The area is composed of 184,887 acres, 121,355 acres (66 percent) of which are administered by the BLM and 63,532 acres (34 percent) are private lands. This relatively isolated PPA encompasses Sonoma Peak and nearby valley bottoms.

The Humboldt River borders the northern edge of the area, with Clear Creek and bracketing the PPA on the west and Ragan Creek on the east. Springs and seeps commonly occur throughout most of the mountains, but most of these areas are not meeting riparian health objectives. Elevations throughout the PPA range from 4,400 feet in valley bottoms to approximately 9,300 feet on top of Sonoma Peak.

Low R&R (3B and 3C) areas can be found in the valley bottoms of the PPA. Generally, mid-slope mid-elevation areas are characterized as 2A, 2B, and 2C habitats. High R&R areas (1A, 1B, and 1C) can be found in the higher elevations of the Sonoma Range. See **Table 4-3**.

Table 4-3
Sonoma GRSG Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	925	29,384	13,311	0	39,487	20,807	1,319	26,711	23,664	29,280
Percent of PPA	1	16	7	0	21	11	1	14	13	16

GRSG

This PPA has one lek complex consisting of six active leks and three pending active leks. For 2014, total peak male count was 32, with no leks monitored as trend leks. The leks are scattered north to south in a relatively small area along the spine of Sonoma Peak in the central to north-central portion of the PPA. Peak male counts range from two to seven males per lek.

Populations in this PPA are isolated due to conifer expansion, fire, invasive weeds, and human-made barriers. Sagebrush habitat next to the PPA is further limited due to unsuccessful post-fire reestablishment of sagebrush and conifer expansion into connectivity corridors. GRSG distribution patterns and movements are typical of the Great Basin, with wintering on valley bottoms and mountain benches and brood-rearing in riparian areas throughout the PPA.

Vegetation

The western edge of the PPA is dominated by large monocultures of annual grasses, surrounded by agricultural fields along the valley bottom. These areas are highly altered by invasive annual grasses and are likely to burn again. In the higher elevations, fire has not occurred, and habitats are healthy, based on soil temperature and moisture regimes, so they should be resilient to fire.

Vegetation in the PPA generally consists of valley bottoms of big sagebrush, consisting mainly of Wyoming and basin big sage, as well as areas of rabbitbrush. Upper elevations of the PPA consist of mountain big sagebrush and mixed mountain shrub species. In 2001, the Clear Creek fire burned approximately 53,000 acres. These areas are now predominantly annual grasslands, with some sagebrush recovery taking place in the more resilient areas. The southern portions of the PPA exhibit a high degree of coniferous woodland expansion, which has played a role in the isolation of the Sonoma PPA.

Invasive annual grasses dominate portions of past fires throughout the PPA. Other noxious weeds, such as scotch thistle, musk thistle, and hoary cress, have also expanded from past fire occurrences. Additional species include Russian knapweed, spotted knapweed, Canada thistle, and leafy spurge. See **Table 4-4**.

Table 4-4
Sonoma Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	102,124	35,010	9,493	14,681	1,623	6,728	10,183	4,953
Percent of PPA	55	19	5	8	1	4	6	3

Source: SynthMap [2008]

Fire

Fire occurrence has been a major issue in portions of the PPA, with past fire rehabilitation having mixed or poor success and observable invasive annual grass conversion. Since 1999 there have been 92 fires that burned a total of approximately 78,000 acres. The largest, the Clear Creek fire (2001) burned 53,246 acres. Another notable fire occurred, the Thomas fire in 2007, burned a total of 18,328 acres. There have been 15 human-caused ignitions that burned a total of 173 acres.

Fire regimes are a measure of historic fire return interval and severity; the condition class measures an area's departure from that fire regime. Fire regimes in the Sonoma PPA are 28 percent in fire regime III, 59 percent in fire regime IV, 13 percent in fire regime V, and the remainder in the other fire regimes. Two condition classes are largely present, with 86 percent in condition class III, 13 percent in condition class II, and very little in condition class 1; the remaining areas are not classified. See **Table 4-5**.

Table 4-5
Sonoma Summary of Burn Probability

High and very high burn probability in PPA (acres)	182,889
High and very high burn probability in PPA (percent)	99

Existing Treatments

In the Sonoma PPA, 27,470 acres have been treated. ESR conducted 26,778 acres of post-fire seeding treatments on nine fires: Pumpernickle, Clear Creek, Thomas Canyon, MM 185, Sheep, Gregg Canyon, Thomas, Elbow, and Adelaide. Some success has been observed in more resistant/resilient habitats (1A and 1B), but most of the burned and treated areas have become compromised by invasive annual grasses. Retreatment of these areas should be considered as a potential future management action.

The fuels program has treated 692 acres in the PPA, primarily linear fuelbreaks in and around Winnemucca.

Other Relevant Management Activities:
Livestock graze throughout the PPA and continue to generate resource conflicts with GRSG habitat. Livestock grazing in PPA is at reduced levels due to the ongoing drought.

Management Strategies

Fuels Management
R&R and fire occurrence data were used to identify areas for fuels management treatments in this PPA (see Appendix A, Maps). A significant amount of 3A habitat exists just outside the western edge of this area, creating high potential for future catastrophic wildfires. The primary fuels management focus is to protect habitat and past fire rehabilitation investments. Multiple roads and clearings present opportunities for use as fuelbreaks to slow fire progression across the 3A, 3B, and 3C habitats. Anchor points for suppression and priority fuels management treatments are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Sonoma PPA

- Rock Creek—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 3B habitat

Priority Order 2 treatment areas

- Grass Valley Road—Proposed linear fuelbreak along Grass Valley Road, designed to protect large expanses of 3A habitat and previous restoration/ESR treatments.

In this PPA, ownership is shared by federal and private lands. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-6** for a summary of miles of potential treatments in each priority order. See **Figure 4-2** for a graphic depiction of the proposed treatments and strategies in the Sonoma PPA.

Table 4-6
Sonoma Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	26	26	0	52

Habitat Restoration and Recovery
Priority Order 1 treatment areas

Sonoma nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon created for this assessment). Land administration or ownership is shared by the BLM and private landowners. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. See **Figure 4-3** for a graphic depiction of the proposed treatments and strategies in the Sonoma PPA.

Fire Operations
Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-7**. See **Figure 4-2** for a graphic depiction of the proposed treatments and strategies in the Sonoma PPA.

Table 4-7
Sonoma Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	77,386	18,107	89,395	184,887
Percent of PPA	42	10	48	100

The Desert Basin Zone Interagency Fire Program contains lands administered by the BLM and Forest Service. The main Winnemucca BLM Station is near the PPA. Response times in this PPA are generally fast, with good coverage from multiple resources: approximately 15 minutes for aircraft response and approximately an hour for ground response. A single engine air tanker (SEAT) is stationed in Winnemucca each season; additionally the Boise BLM Smokejumpers operate a satellite base from Winnemucca in times of high fire danger. Battle Mountain Air Tanker Base hosts SEATs throughout the summer that could easily respond to any fires in the PPA.

Opportunities exist to enhance and improve suppression capability in and around this PPA. To improve fire response time during lightning-caused fires, the travel time to the PPA may warrant stationing firefighting resources closer to the priority order 1 suppression areas as well as making prompt fire detection flights.

In addition, the Nevada BLM Fire Management and the University of Nevada Reno Seismological Lab are collaborating to install strategically placed cameras on mountaintops that will be used to detect and monitor fires. The cameras are set up to send live video over the internet so that fire detection and monitoring can be viewed in real time. In the areas that these cameras cover, fire detection will be quicker, allowing for faster firefighter response times. The cameras also will aid fire managers to monitor fire conditions and determine the appropriate number and type of firefighters needed.

Water sources for fire suppression are also generally plentiful on the west side of the PPA due to the proximity to Winnemucca; on the east, the water sources are limited to a few lakes and ponds and water obtained from local ranches. Sonoma Lake is available for use as a dip site in a more centralized location in the PPA. With few exceptions, use of these waters requires land use agreements.

In this PPA, the BLM Land Use Plan (LUP)/Fire Management Plan (FMP) does not allow for unplanned natural ignitions to be managed for multiple objectives. The degree by which this PPA has already been impacted by fire and invasive annual grasses coupled with the high percentage of low R&R habitats prevents the opportunity to manage fire to improve habitat.

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources, which also includes managing volunteers. Maintaining these agreements and establishing rangeland fire protection associations could enhance suppression in the PPA. Resources are managed, and will continue to be managed, through Geographic Area Coordination Centers (GACCs) to allocate firefighting assets. Multi-Agency Coordination (MAC) groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency GRSG habitat (3B and 3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting post-fire invasive annual grass establishment in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments are 2B and 2C designated habitat, which typically is found on the toe slopes (lower third of the slope) and alluvial fans around the Sonoma Range.
- Priority Order 3 treatments are high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A

habitats would not typically be treated, unless it reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-8**.

Table 4-8
Sonoma Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	77,386	18,107	89,395	184,887
Percent of PPA	42	10	48	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue implementing post-fire rehabilitation treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments, where necessary.

See **Table 4-9**.

Table 4-9
Sonoma Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Rock Creek Fuelbreak	26 mi.	X						W			N	P		LI		0-5	0-2
Grass Valley Road fuelbreak	25 mi.		X					W			N	P		LI		0-5	0-2
Pumpernickle fire rehabilitation								W		C				LI		0-5	0-2
Clear Creek								W		C				LI		0-5	0-2
Thomas Canyon								W		C				LI		0-5	0-2
MM 185								W		C				LI		0-5	0-2
Sheep								W		C				LI		0-5	0-2
Gregg								W		C				LI		0-5	0-2
Canyon								W		C				LI		0-5	0-2
Thomas								W		C				LI		0-5	0-2

Table 4-9
Sonoma Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Elbow								W		C				LI		0-5	0-2
Adelaide								W		C				LI		0-5	0-2
Sonoma nonnative treatment	No acres					I			I			P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.2 Reese River/Yomba/Desatoya

Project Planning Area Description

General Site Description

The Reese River/Yomba/Desatoya PPA, is part of the Smith/Reese FIAT Assessment Area, and is in Churchill, Nye, and Lander Counties, Nevada. The four major mountain ranges are Clan Alpine, Desatoya, Shoshone, and Toiyabe. The Desatoya and Clan Alpine Wilderness Study Areas (WSAs) are in the west portion of the area and the Arc Dome Wilderness is in the Toiyabe Range.

Elevations throughout the PPA range from 4,800 to 10,800 feet. The PPA is 759,001 acres, most of which is federally owned, with 61 percent administered by the BLM and another 37 percent by the Forest Service. Landownership for the remainder of the PPA is a small amount of land (4,600 acres) administered by the Bureau of Indian Affairs (BIA) and the rest is privately owned. Between the Shoshone and Toiyabe Ranges, the Reese River runs through Yomba Shoshone Tribal lands and several private parcels and ranches.

The less R&R areas (3B and 3C) are found in valley bottoms and on drier slopes. The 2A, 2B, and 2C areas are generally mid-slope mid-elevation areas, and the remaining acres are in the highly resistant and resilient category (1A, 1B, 1C) in the upper elevations. The north half of the Toiyabe Range is not highly resistant and resilient, even in the upper elevations. See **Table 4-10**.

Table 4-10
Reese River/Yomba/Desatoya Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	6,720	38,481	64,581	240	103,436	124,643	4,710	6,311	216,684	193,194
Percent of PPA	1	5	9	0	14	16	1	1	29	25

GRSG

The PPA has two lek complexes, consisting of 11 active leks and three pending active leks. However, 10 leks are not associated with a specific complex in NDOW data. For 2014, total peak male count was 427, with four leks monitored as trend leks.

Approximately 35 percent of peak male counts are associated with the Reese River Complex, which has five leks scattered throughout the Reese River Valley and 24 percent associated with the Indian Valley complex (only one lek). Connectivity between the Reese River and Indian Valleys is topographically limited.

The Desatoya Mountain Range has about 30 percent of the counts scattered among seven leks. Currently, the BLM is funding the USGS to document GRSG movement and habitat use in the Desatoya Mountains using GPS and VHF collars. This project is intended to better understand habitat use, identify key habitats, and determine movement patterns of GRSG between areas in the Desatoya Population Management Unit.

The remaining 10 percent of male counts are associated with one lek between the Smith Creek and Ione Valleys.

Conifer expansion has limited GRSG movement between the valleys as well as seasonal movements from lower to upper elevations. In the Reese River Valley, connectivity is constrained between the southernmost lek and the north leks. There are also constraints to connectivity between the Smith Valley leks and the leks to the east in the main part of the PPA.

Vegetation

Vegetation in the PPA consists of big sagebrush shrubland (53 percent), woodland (35 percent), black/low sagebrush (seven percent), and riparian (2 percent); the remaining communities are salt-desert scrub, grasslands, invasives and other vegetation types. At lower elevations (5,000 to 6,500 feet) the valleys tend to be dominated by black/low sagebrush and big sagebrush and mountain mahogany stands at higher elevations (7,000 to 9,500 feet), with woodlands between these bands. Conifers have expanded along alluvial fans and the valley bottoms and into higher elevation areas. There are some aspen stands scattered throughout the area.

Other than in the Edwards Creek Valley, invasive annual grasses and other weed species are confined to motorized areas along roads and have not yet spread across the landscape. In the Reese River Valley, tall whitetop and hoary cress occur primarily on private land in lower elevations. Musk thistle is found in the upper spring areas, with only small amounts of cheatgrass. The high elevation valleys are not as prone to invasive annual grasses. Invasives in the riparian areas are musk thistle and tall whitetop. These riparian areas are drying up due to down cutting of the Reese River and past and current agricultural practices. See **Table 4-11**.

Table 4-11
Reese River/Yomba/Desatoya Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	401,121	56,095	709	748	17,681	15,151	262,213	5,004
Percent of PPA	53	7	0	0	2	2	35	1

Source: SynthMap [2008]

Fire

Overall, fire occurrence is low in this area. From 1999 to 2014, 43 wildfires burned a total of 3,276 acres; the largest wildfire burned almost 2,000 acres. Of the 43 fires reported, only one has been confirmed to be human caused. Roughly half of the planning area is rated as either high or very high burn probability. The areas with higher burn probability are in the northern and western portions of the PPA in the lower elevations. Since 1999, less than a half percent of the area has experienced wildfire. Fires at higher elevations are typically of short duration due to elevation, topography, and higher annual precipitation.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in this PPA are as follows: 46 percent or 348,000 acres in fire regime III, 44 percent or 332,000 acres in fire regime IV, and the remaining acres in fire regime V. Seventy-three percent or 552,000 acres is in condition class III, 22 percent or 170,000 acres is in condition class II, and the remaining acres are in condition class I. This indicates that 95 percent of the PPA is altered from the natural range of fire return and intensity. See **Table 4-12**.

Table 4-12
Reese River/Yomba/Desatoya Summary of Burn Probability

High and very high burn probability in PPA (acres)	326,825
High and very high burn probability in PPA (percent)	43

Existing Treatments

In the last 10 years, there have been several projects implemented in or near the PPA. The Big Den Project, completed in 2012, treated approximately 2,500 acres of conifer expansion on the west side of the PPA, near Eastgate, Nevada. There have been approximately 3,000 acres of conifer expansion treated in the Desatoya Mountain Project in the last three years. According to the National Fire Plan Operating Reporting System (NFPORS), approximately 16,500 acres of treatments to benefit GRSG are planned in the Desatoya Mountain Project in the next five years. Conifer was recently removed by the Forest Service in the Indian Valley Project, treating approximately 3,600 acres by project completion. Fuels breaks have been implemented in the Yomba and Ione project areas, with 4,042 acres of sagebrush treatments occurring around Yomba and 140 acres of pinyon-juniper thinning around Ione.

Rehabilitation after the 2002 Buffalo and Pony Express fires was partially successful, with a higher degree of success on north- and east-facing slopes, which are generally considered cool-moist habitats. These fires were in the PPA around the Cold Springs Valley in Nevada. The rest of the PPA has had limited fire occurrence or rehabilitation needs.

Other Relevant Management Activities

Many roads occur in and around the PPA, potentially causing more impacts due to increased exposure and establishment of invasive species. Hiking and hunting around the Toiyabe Range is popular and receives high visitation throughout the year. From the late 1800s to about 1940 the Upper Reese River and Cloverdale areas were used as a focal agricultural area supplying the nearby mines with meat and other agricultural products to feed the miners. There were many hay fields and high numbers of livestock present at that time. Past use had a significant impact on the current condition of the GRSG habitat.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. These present opportunities for fuelbreaks to slow fire progression across largely 3C and 3B habitats and existing restoration and fire rehabilitation treatment areas throughout the PPA. Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Reese River/Yomba/Desatoya PPA

- Reese River Valley—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 3B habitat as well as multiple lek areas
- Ione Valley—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 3B habitat
- South Smith—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Campbell Creek—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats and lek areas
- Elkhorn Pass—Proposed linear fuelbreak along existing roads designed to protect areas of contiguous sagebrush cover, including 3B and 3C habitats
- Ione Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Highway 50—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 2B habitats
- Smith Creek Ranch Road—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat and lek areas
- Smith Creek West—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Camp Creek Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats and lek areas
- Highway 722—Proposed linear fuelbreak along existing roads designed to protect primarily 3B and 3C habitats

Lands in this PPA are administered by the BLM, Forest Service, and the BIA and some lands are privately owned. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-13** for a summary of miles of potential treatments in each priority order. See **Figure 4-4** for a graphic depiction of the proposed treatments and strategies in the Reese River/Yomba/Desatoya PPA.

Table 4-13
Reese River/Yomba/Desatoya Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	222	0	0	222

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- Reese River/Yomba/Desatoya nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Upper Reese River restoration—Restore hydrological function to degraded riparian areas in the Reese River Valley, including all laterals and upstream sections in largely 3C habitat
- Clan Alpine—Conifer expansion removal in phases 1 and 2 along the margins of the woodland; must meet wilderness management objectives
- Haypress—Conifer expansion removal in phases 1 and 2 and seeding if appropriate; must meet wilderness management objectives
- Shoshone—Conifer expansion removal in phases 1 and 2 with proximity or influence to springs and seeps to create movement corridors for GRSG
- Cloverdale treatment—Conduct conifer expansion removal in phases 1 and 2
- Porter Fan—Conifer expansion removal in phases 1 and 2 and seeding if appropriate

Priority Order 2 treatment areas

- Smith Creek Valley West—Install corridors to facilitate movement of GRSG from valley bottoms to summer habitats in the higher elevation, treat invasives, remove conifer expansion in phases 1 and 2 along benches, assess understory, and collect local seeds
- Indian Valley connector—3b and 3C habitat, remove pinyon-juniper, collect local seeds, assess understory
- Ione Indian Valley connectivity—Remove pinyon-juniper in phases 1 and 2 and use Forest Service Indian Valley
- Cloverdale connection—Remove pinyon-juniper to provide connectivity between two PPAs (narrow band dictated by topography that will go through BIA lands)

In this PPA, landownership is a mix of federal and private landowners, including the Yomba Indian Reservation. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-14** for a summary of acres of potential treatments in each priority order. See **Figure 4-5** for a graphic depiction of the proposed treatments and strategies in the Reese River/Yomba/Desatoya PPA.

Table 4-14
River/Yomba/Desatoya Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	119,235	36,895	0	156,130
Percent of PPA	76	24	0	100

Fire Operations
Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-15**. See **Figure 4-4** for a graphic depiction of the proposed treatments and strategies in the Reese River/Yomba/Desatoya PPA.

Table 4-15
Reese River/Yomba/Desatoya Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	416,831	127,744	214,426	759001
Percent of PPA	55	17	28	100

The BLM's Carson City and Battle Mountain Districts have jurisdiction over fire control activities on BLM-administered lands in the PPA, and the Humboldt-Toiyabe National Forest has jurisdiction on Forest Service lands. Ground response times are typically 30 to 120 minutes, depending on the location of the fire. A Forest Service engine based in Austin, Nevada, is the closest ground resource; other responding resources typically travel from Carson City and Eureka, Nevada. Aerial resources from Battle Mountain, Winnemucca, and Stead, Nevada, often beat ground resources to new fire starts, with response times between 15 and 45 minutes. Stationing ground resources at Centroid, Cold Springs, and Austin would improve suppression capability during times of lightning activity. There are also opportunities to host SEATs and helicopters with crews and buckets in Eureka during high fire danger times. This area is also identified to be a high priority for both ground and aerial patrols during times of lightning activity. Water sources for fire suppression are limited in the PPA, but there is a potential for stationing water sources at staging areas. There are several private sources of water, and there is a need for establishing land use agreements for using them before each fire season.

To achieve land and resource management objectives, current BLM LUP/FMPs and a Forest Service Land and Resource Management Plan (LRMP) allow for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response. This response to wildland fire in the Toquima and Desatoya Mountains is based on an evaluation of risks to firefighter and public safety; the circumstances under which the fire occurred, including weather and fuel conditions; natural and cultural resource management objectives; and resource protection priorities.

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also include managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency GRSG habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would include 2B and 2C designated habitats, which typically occur on the lower third of the slope, and alluvial fans around the mountain ranges.
- Priority Order 3 treatments are high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be treated unless they reconnect two or more habitats with over 25 percent sagebrush landscape cover.

See **Table 4-16**.

Table 4-16
Reese River/Yomba/Desatoya Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	416,831	127,744	214,426	759,001
Percent of PPA	55	17	28	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue to implement post-fire rehabilitation treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-17**.

Table 4-17
Reese River/Yomba/Desatoya Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Reese River Valley fuelbreaks	20 mi.	X						W			N	P		L1		0-5	0-2
Highway 722 fuelbreak	37 mi.	X						W			N	P		L1		0-5	0-2
Ione Valley fuelbreak	30 mi.	X						W			N	P		L1		0-5	0-2
South Smith fuelbreak	3 mi.	X						W			N	P		L1		0-5	0-2
Campbell Creek fuelbreak	9 mi.	X						W			N	P		L1		0-5	0-2
Elkhorn Pass Road fuelbreak	8 mi.	X						W			N	P		L1		0-5	0-2
Ione Road fuelbreak	29 mi.	X						W			N	P		L1		0-5	0-2
Highway 50 fuelbreak	52 mi.	X						W			N	P		L1		0-5	0-2
Smith Creek Ranch Road fuelbreak	28 mi.	X						W			N	P		L1		0-5	0-2
Smith Creek West fuelbreak	2 mi.	X						W			N	P		L1		0-5	0-2

Table 4-17
Reese River/Yomba/Desatoya Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Camp Creek Road fuelbreak	4 mi.	X						W			N	P		L1		0-5	0-2
Upper Reese River riparian restoration	64,702	X					R				N	P		L1		0-2	5+
Shoshone pinyon-juniper removal	10,329	X			C			W		C		P		L1		10-20	5+
Porter Fan pinyon-juniper removal	6,402	X			C			W	I			P		L1		10-20	3-5
Cloverdale pinyon-juniper removal	3,674	X			C			W	I			P		L1		10-20	3-5
Clan Alpine pinyon-juniper removal	3,610	X			C			W			N	P		L1		10-20	3-5
Haypress pinyon-juniper removal	30,520	X			C			W			N	P		L1		10-20	5+
Smith Creek Valley West pinyon-juniper removal	33,147		X		C	I		W			N	P		L1		10-20	5+
Cloverdale Connection pinyon-juniper removal	3,748		X		C			W			N	P		L1		10-20	3-5
Big Den pinyon-juniper removal	2,500				C			W		C		P		L1		10-20	Completed
Desatoya Mountains pinyon-juniper removal (completed)	3,000				C			W		C		P		L1		10-20	Completed
Desatoya Mountains pinyon-juniper removal (planned)	16,500	X			C			W		C		P	I	L1		10-20	5+

Table 4-17
Reese River/Yomba/Desatoya Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Indian Valley pinyon-juniper removal (in progress)	3,600	X			C			W		C		P	I	L1		10-20	3-5
Indian Valley connector	1589		X		C						N	P		L4		10-20	5+
Yomba/Ione pinyon-juniper removal (in progress)	4,182	X			C			W		C		P	I	L1		10-20	3-5
Ione Indian Valley connectivity (Forest Service)	No poly		X		C						P			L4		10-20	5+
Reese River/Yomba/ Desatoya nonnative treatment	No acres	X			I			W			N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.3 Cooks Creek

Project Planning Area Description

Geographic Overview

The Cooks Creek PPA is in the Central Great Basin FIAT Landscape Area in Lander County, Nevada. The PPA is located around the Shoshone Range, just south of Battle Mountain, Nevada. Elevations throughout the area range from 5,000 to 9,600 feet. The Cook Creek PPA is 153,796 acres; 73 percent of this area is administered by the BLM and the rest is privately owned.

Plant communities with lower R&R are found in valley bottoms and on drier slopes. The 2A, 2B, and 2C areas are primarily mid-slope and mid elevation, with the remaining areas in the highly resistant and resilient category (1A, 1B, 1C). These cool-moist areas are not contiguous, so the landscape is dominated by warm-dry vegetation types. See **Table 4-18**.

Table 4-18
Cooks Creek Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,769	1,792	4,512	871	6,892	42,992	25,448	143	18,549	48,828
Percent of PPA	2	1	3	1	4	28	17	1	12	32

GRSG

The PPA has three lek complexes consisting of five active and two pending active leks. For 2014, total peak male count was 129, with two leks being monitored as trend leks. About 86 percent of the peak male counts occurs at the Cooks Creek lek complex at the north end of Carico Lake Valley.

Vegetation

Vegetation in the PPA consists of big sagebrush shrubland (63 percent), black/low sagebrush (24 percent), woodland (five percent), invasives (three percent), and salt-desert scrub (two percent); the remaining communities are grasslands, riparian, and other vegetation types. At lower elevations (5,000 to 6,500 feet) the valleys tend to be dominated by black/low sagebrush and big sagebrush stands at higher elevations (7,000 to 9,500 feet). Woodlands are north of the main lek area; the rest of the area has little to no tree cover.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, invasive annual grasses dominate the western side of the PPA, in previous fire areas in the Reese River Valley. Invasive annual grasses are also present in the 75 percent BBD area, both inside and outside of previous fire areas. Sagebrush is naturally regenerating near unburned stands.

Even though invasive annual grasses are widespread, some success has been made with fire rehabilitation. Invasive annual grass monocultures occur mostly in previously burned areas along roads in the western portion of the PPA. These invasive annual grasses are degrading overall land health. See **Table 4-19**.

Table 4-19
Cooks Creek Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	96,021	37,313	2,594	4,530	654	3,733	7,825	972
Percent of PPA	63	24	2	3	0	2	5	1

Source: SynthMap [2008]

Fire

Overall, fire occurrence is moderate in this area. From 1999 to 2014, eight wildfires burned a total of 37,000 acres; the largest wildfire was 28,154 acres. Two of the eight wildfires were caused by humans, while six were naturally occurring. All of the large fires occurred during years with an invasive annual grass crop. Approximately 24 percent of the planning area has experienced wildfire since 1999.

Fire regimes are a measure of historic fire return intervals and fire severity; condition class measures an area's departure from that regime. Fire regimes in the Cooks Creek PPA are as follows: 51 percent or 79,000 acres is in fire regime IV, 34 percent or 52,000 acres is in fire regime III, and the remaining acres are in fire regime V. Eighty percent or 123,000 acres is in condition class III, 18 percent or 28,000 acres is in condition class II, and the remaining acres are in condition class I. This indicates that 98 percent of the PPA is altered from the natural range of fire return and intensity. See **Table 4-20**.

Table 4-20
Cooks Creek Summary of Burn Probability

High and very high burn probability in PPA (acres)	152,773
High and very high burn probability in PPA (percent)	100

Existing Treatments

Approximately 14,500 acres of the Antelope Complex was seeded with varying degrees of success after the fire in 2007. Other than this fire rehabilitation project, there are no other vegetation treatments that have been implemented in the PPA in the last 10 years. There are currently no fuels projects in this area due to it not being a high priority compared to other areas in the BLM district.

Other Relevant Management Activities

This area has a high incidence of mining exploration for gold and silver. Livestock graze throughout the PPA, but other than the need for rest after rehabilitation and restoration, this is not a major issue.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features for use as fuelbreaks to slow fire progression across largely 3C and 3B habitats and restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Cooks Creek PPA
- Red Rock Canyon—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitat and lek areas
- Elephant—Proposed linear fuelbreak along an existing road designed to protect 3C habitat and ESR treatments areas

Land is administered or owned by federal, state, and private entities throughout the PPA. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-21** for a summary of miles of potential treatments in each priority order. See **Figure 4-6** for a graphic depiction of the proposed treatments and strategies in the Cooks Creek PPA.

Table 4-21
Cooks Creek Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	26	0	0	26

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- Cooks Creek nonnatives treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Horse Mountain—Remove conifers near Horse Mountain on the margins of the woodland in phases 1 and 2; most of the project is in the BBD
- Cooks Creek riparian—Institute integrated vegetation management around riparian areas and springs, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area in 3C and 3B habitats

Priority Order 3 treatment areas:

- Antelope Complex—Strategically treat cheatgrass, collect sagebrush seeds, enable seedling grow out and island planting in the 2007

Antelope Complex, connecting two habitats that have more than 25 percent sagebrush over the landscape

In this PPA, land is administered by the BLM and is owned privately. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-22** for a summary of acres of potential treatments in each priority order. See **Figure 4-7** for a graphic depiction of the proposed treatments and strategies in the Cooks Creek PPA.

Table 4-22
Cooks Creek Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	12,968	0	28,154	41,122
Percent of PPA	32	0	69	100

Fire Operations

Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are centered on 3B and 3C areas in the northern and far southern part of the PPA. The 3C area on the northwest edge and the southeast corner (to include all areas in the Red Mountain Range) will be incorporated even though it is just outside of the PPA. All of the 2007 Antelope Complex treatments are included in this priority.
- Priority Order 2 suppression zones are in the 2B and 2C areas, which are mostly in the center of the PPA.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-23**. See **Figure 4-6** for a graphic depiction of the proposed treatments and strategies in the Cooks Creek PPA.

Table 4-23
Cooks Creek Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	84,555	56,803	12,437	153,796
Percent of PPA	55	37	8	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Fire suppression resources near the Cooks Creek PPA are the Battle Mountain BLM, Battle Mountain Air Base, and volunteer fire departments (VFDs). Response time for ground resources averages approximately one hour from Battle Mountain and less than 20 minutes for aerial firefighting resources. To improve fire response time during lightning-caused fires, the travel time to the PPA may warrant stationing firefighting resources closer to the 1st Priority suppression areas aircraft to promptly detect fires. In addition, water sources for fire suppression are limited in many areas of this PPA, and there are opportunities to supplement available water through additional water improvement projects. In addition, stationing temporary portable water sources will aid fire suppression in priority areas.

Current BLM LUPs/FMPs do not allow for unplanned natural ignitions to be managed for resource objectives. There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also include managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of low resiliency habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grasses.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would include 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority 3 treatments include high elevation fires in the PPA, categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabbed unless the treatment reconnects two or more habitats with more than 25 percent sagebrush landscape cover.

See **Table 4-24**.

Table 4-24
Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	84,555	56,803	12,437	153,796
Percent of PPA	55	37	8	100

Federal and state agencies currently have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-25**.

Table 4-25
Cooks Creek Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Red Rock Canyon fuelbreak	20 mi.	X						W			N	P		L1		0-5	0-2
Elephant fuelbreak	6 mi.	X						W			N	P		L1		0-5	0-2
Cooks Creek riparian	137	X					R				N	P		L1		0-2	0-2
Horse Mountain pinyon-juniper removal	12,831	X			C			W			N	P		L1		10-20	5+
Antelope Complex 2007 seeding	28,154			X		I					N	P		L1		0-5	3-5
Cooks Creek nonnative treatment	No acre	X				I					N	P		L1		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.4 Punchbowl

Project Planning Area Description

Geographic Overview

The Punchbowl PPA is primarily in Nye County, Nevada, with small portions in Lander and Eureka Counties. Dominant geographic features (from west to east) are the Toquima Mountain Range, Monitor Valley, Monitor Mountain Range, Little Fish Lake Valley, and the Antelope and Hot Creek Mountain Ranges.

There are numerous springs in the area, perennial streams and open waters are more limited. Special management areas are the Alta-Toquima and Table Mountain Wilderness, the Park Range and Antelope Range WSAs, all or part of the Seven Mile and Little Fish Lake Valley HMAs, and five wild horse territories. Elevations range from 4,700 feet along the west side of the Toquima Range to 10,800 feet in the Toquima Range. The total area is 709,226 acres. Ninety-eight percent of the land is under federal land management, 40 percent is administered by BLM and 58 percent by the Forest Service.

Low R&R areas (3B and 3C) can be found in the valley bottoms of the PPA. Generally, mid-slope mid-elevation areas are characterized as 2A and 2B habitats. High R&R areas (1A and 1B) can be found in the higher elevations.

See **Table 4-26**.

Table 4-26
Punchbowl Sage-Grouse Habitat Matrix Categories

R&R Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,418	70,396	23,245	0	83,903	133,436	2,412	26,456	132,055	233,906
Percent of PPA	0	10	3	0	12	19	0	4	19	33

GRSG

This PPA has nine lek complexes, consisting of 12 active leks and 12 pending active leks. For 2014, total peak male count was 437, with seven leks monitored as trend leks. Approximately 60 percent of peak male counts are associated with two lek complexes: 34 percent with the Willow Creek Complex in the northern portion of the PPA and 26 percent with the Corcoran Lek Complex in the southwest portion. With the exception of the Stoneberger Complex, the other complexes are scattered across the valley bottoms throughout most of the PPA.

This PPA supports a large concentration of GRSG and their habitat at the southern end of central Nevada and thus the southern end of the species range. Invasive species/noxious weeds, and conifer encroachment are the primary concerns in this PPA.

Vegetation

Vegetation in the PPA is very diverse, with sagebrush dominating the valleys and the uplands. Sagebrush stands tend to be even aged, with the understory ranging from good to nonexistent. Salt desert shrub generally occurs in the lower valley areas, and flats. Rabbitbrush can be found throughout, especially in disturbed areas. Upper elevations in the PPA contain mountain big sagebrush, mixed mountain shrub species, curleaf mountain mahogany, aspen, and limber pine.

Pinyon-juniper woodlands can be divided into areas where they are expanding into other vegetation types and areas that should be persistent woodlands. Areas of persistent pinyon-juniper woodlands can be found at the higher elevations in the Toquima, Monitor, and Antelope and Hot Creek Ranges. Conifer expansion is occurring in the shrub-dominated areas next to the persistent woodlands as trees migrate into these areas and infill them over time. Conifer expansion mainly occurs along valley bottoms and alluvial fans. SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass and invasive thistle species are confined to the roads and are not spreading across the landscape. See **Table 4-27**.

Table 4-27
Punchbowl Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	302,236	105,959	1,026	318	21,983	23,063	248,120	3,294
Percent of PPA	43	15	0	0	3	3	35	1

Source: SynthMap [2008]

Fire

Fire occurrence is very low throughout the PPA. From 1999-2014, 31 fires have occurred, the largest of which burned 6,182 acres. In total, 6,413 acres have burned since 1999, three of which were caused by humans and the rest were naturally occurring. See **Table 4-28**.

Table 4-28
Punchbowl Summary of Burn Probability

High and very high burn probability in PPA (acres)	0
High and very high burn probability in PPA (percent)	0

Fire regimes are a measure of historic fire return intervals and fire severity, with condition class measuring an area's departure from that regime. Fire regimes in the Punchbowl PPA are as follows: 62 percent in fire regime III, 34 percent in fire regime IV, four percent in fire regime V, and the remainder in the other fire regimes. All three condition classes are present, with 72 percent in condition class III, 18 percent in condition class II, nine percent in condition class I, and the remainder being unclassified.

Existing Treatments

Ongoing treatments in the PPA are generally either fuels management projects or GRSG habitat projects that focus on the removal of phase I pinyon-juniper in high priority areas. Fuels projects in the PPA have treated approximately 2,600 acres since 2004. The projects generally consisted of mowed fuelbreaks in sagebrush, followed by seedings, and pinyon-juniper thinning. The Forest Service burned some areas in the southern portion, but acreages are relatively small. Prescribed fire on public lands is limited to the southern portion of the Seven Mile project, in the northeast portion of the PPA. The phase I pinyon-juniper removal projects consist of "lop and leave" treatments to mitigate potential invasive annual grass invasion, stemming from restoration disturbance. All of these treatments have been successful.

Other Relevant Management Activities

While mining occurs throughout the PPA, the large mines are primarily found in the western portion of the PPA and include the Ann Project Barite Mine, which is planned to be on the west side of Monitor Valley, in Northumberland Canyon.

The combined habitat use from livestock, elk, and wild horse and burro grazing occurs throughout portions of the PPA and continues to generate resource conflicts with GRSG habitat. However, livestock are grazing in portions of this PPA at reduced levels due to the ongoing drought. Maintaining appropriate management levels (AMLs) in herd management areas and territories continues to be a habitat degradation issue.

Other land uses in the PPA are minerals exploration, power line ROWs, and potential oil and gas development. Solar and wind energy projects have been discussed in the past, but none have gone to development.

Stoneberger Canyon has major problems due to wild horses and past mining practices. Upper elevations of the mountains are in good shape, but vegetation in the canyons has little to no understory and is severely degraded. This is due to wild horses, which need to be controlled before any restoration begins. Proposed conifer treatments on 30,000 acres are in the early planning stages.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features, which present opportunities for fuelbreaks to slow fire progression across largely 3B and 3C habitats and restoration treatments throughout the PPA. Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Punchbowl PPA
- Little Fish Lake—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats

- Barley Creek—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- The Seven Mile Wash—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Toquima—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat

Lands in the PPA are administered by federal and state agencies or are owned privately. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-29** for a summary of miles of potential treatments in each priority order. See **Figure 4-8** for a graphic depiction of the proposed treatments and strategies in the Punchbowl PPA.

Table 4-29
Punchbowl Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	71	0	0	71

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations and are as follows:

Priority Order1 treatment areas:

- Monitor Valley BBD—Remove phases 1 and 2 pinyon-juniper within two miles of all active leks
- Little Fish Lake Valley BBD—Remove or thin pinyon-juniper in phases 1 and 2 areas around Little Fish Lake Valley must meet wilderness management objectives
- Punchbowl nonnative treatment—Inventory, treat, and monitor invasive species and noxious weeds (no polygon)
- Punchbowl riparian 1—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon
- Stoneberger pinyon-juniper removal (Forest Service)—Remove pinyon-juniper in phases 1 and 2 to create a corridor connecting Stoneberger to Pete's Summit

- Johnny Potts to White Rock Mountain—Remove pinyon-juniper in phases 1 and 2 to create a corridor connecting the Johnny Potts lek to habitat near White Rock Mountain

Priority Order 2 treatment areas

- Monitor Valley outside BBD—Remove pinyon-juniper in phase 1 and 2 within two miles of all active leks
- Little Fish Lake Valley outside BBD—Remove or thin pinyon-juniper in phases 1 and 2 areas around Little Fish Lake Valley must meet wilderness management objectives
- Monitor to Table Mountain—Remove pinyon-juniper to create corridors connecting the Monitor Valley leks to habitat near Table Mountain (no polygon)
- Punchbowl riparian 2—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Table Mountain—Remove or thin pinyon-juniper in phases 1 and 2 around the Table Mountain habitat area outside the BBD; would connect two habitats of more than 25 percent sagebrush over the landscape must meet wilderness management objectives

In this PPA, landownership is dominated by the Forest Service, with BLM-administered and private lands also. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. See **Table 4-30** for a summary of acres of potential treatments in each priority order. See **Figure 4-9** for a graphic depiction of the proposed treatments and strategies in the Punchbowl PPA.

Table 4-30
Punchbowl Habitat Restoration Potential Treatments

Priority Order	Priority Order1	Priority Order 2	Priority Order 3	Total
Acres	136,016	82,149	0	218,165
Percent of PPA	62	38	0	100

Fire Operations
Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.

- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-31**. See **Figure 4-8** for a graphic depiction of the proposed treatments and strategies in the Punchbowl PPA.

Table 4-31
Punchbowl Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	422,159	111,502	175,565	709,226
Percent of PPA	59	16	25	100

Opportunities exist to enhance or improve suppression capability in and around this PPA. The primary wildfire response in this PPA is provided by the BLM and Forest Service, with local VFDs responding as available. The BLM has a fire station in Eureka, Nevada, the Forest Service has a station in Austin, and local VFDs are in Round Mountain and Austin. Response times are highly variable, and are based on fire location; however, response times of two to four hours are common. To improve fire response time to lightning-caused fires, patrols and ground and aerial resources are already being stationed.

Water sources for fire suppression are limited to a few lakes and ponds and water obtained from local ranches and communities. With few exceptions, uses of these waters are done under land use agreements. There are limited opportunities to enhance or improve suppression capabilities through water improvements due to the limited water availability in the PPA.

In this PPA, to achieve land and resource management objectives, the Forest Service's LRMP allows for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response.

Opportunities exist for managing unplanned natural ignitions for resource benefit on BLM-administered lands; however, management needs to meet resource objectives and be approved in a BLM LUP. Areas on BLM-administered lands that would benefit are primarily in the higher elevations and in the pinyon-juniper woodlands. This response to wildland fire is based on the following:

- An evaluation of risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes managing volunteers.

Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would include 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would include high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabbed unless the treatment reconnects two or more habitats with more than 25 percent sagebrush landscape cover.

See **Table 4-32**.

Table 4-32
Punchbowl Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	422,159	111,502	175,565	709,226
Percent of PPA	59	16	25	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue to implement post-fire rehabilitation across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify them where necessary.

See **Table 4-33**.

Table 4-33
Punchbowl Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Toquima fuelbreak	5 mi.	X						W			N	P		LI		1-2	0-2
Barley Creek fuelbreak	15 mi.	X						W			N	P		LI		1-2	0-2
Little Fish Lake fuelbreak	36 mi.	X						W			N	P		LI		1-2	0-2
Seven Mile Wash fuelbreak	15 mi.	X						W			N	P		LI		1-2	0-2
Little Fish Lake Valley (BBD) pinyon-juniper removal	28,148	X			C			W			N	P		LI		10-20	5+
Monitor Valley (BBD) pinyon-juniper removal	92,408	X			C			W			N	P		LI		10-20	5+
Johnny Potts to White Rock Mountain pinyon-juniper removal	3,439	X			C			W			N	P		LI		10-20	3-5
Stoneberger pinyon-juniper rem1oval	12,022	X			C			W			N	P		LI		10-20	5+
Punchbowl nonnative treatment, seeding	No Acres	X				I					N	P		LI		0-5	3-5
Table Mountain pinyon-juniper removal	45,001		X		C						N	P		LI		10-20	5+
Monitor Valley (outside BBD) pinyon-juniper removal	17,852		X		C			W			N	P		LI		10-20	5+

Table 4-33
Punchbowl Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Little Fish Lake Valley (outside BBD) pinyon-juniper removal	19,296		X		C			W			N	P		L1		10-20	5+
Monitor to Table Mountain Corridors	No Acres		X		C			W			N	P		L1		10-20	3-5
Punchbowl riparian 1	No Acres						R				N	P		L1		0-2	0-2
Punchbowl riparian 2	No Acres						R				N	P		L1		0-2	0-2

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.5 Antelope Valley

Project Planning Area Description

Geographic Overview

The Antelope Valley PPA is in Eureka, Nye, and White Pine Counties in northern Nevada. The city of Eureka is next to the northeastern portion of the PPA. This relatively isolated PPA is centered on Antelope Valley, bracketed on the west by the Monitor Range and on the east by the Mahogany Hills/Fish Creek Range. Northern and southern boundaries for this PPA are Highway 50 and Nine Mile Peak. Numerous springs, seeps, and ephemeral streams commonly occur throughout most of the mountains; however, most of these areas are not meeting riparian health objectives. Elevations throughout the PPA range from 6,200 feet in valley bottoms to approximately 10,400 feet on the crest of the Monitor Range. The area is composed of 267,842 acres of which 212,803 acres (80 percent) are administered by the BLM and 53,195 acres (20 percent) are Forest Service lands. There are 1,844 acres of private lands.

Most of the 3C and 2C habitat encompasses the valley bottoms and low-lying hills in the central portions of the PPA. The higher elevations of the Monitor Range and portions of the Antelope Range contain the bulk of the 1A, 1B, 2A, and 2B habitats and are typified by mountain sagebrush and mountain shrub communities. See **Table 4-34**.

Table 4-34
Antelope Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,053	36,832	7,312	5	32,186	47,067	66,254	697	27,039	47,397
Percent of PPA	1	14	3	0	12	18	25	0	10	18

GRSG

This PPA has become isolated due to conifer expansion, fire, and invasive annual grasses. The main priority for this PPA is to reestablish connectivity with other lek complexes and GRSG populations farther south in Little Fish Lake Valley and around Table Mountain. There are three lek complexes consisting of three active and four pending active leks. For 2014, total peak male count was 108, with one lek monitored as a trend lek. About 65 percent of the male counts are associated with the West Antelope Valley lek complex in the northwest part of the PPA. This is followed by 30 percent in the Little Smoky Valley complex in the southwest part of the PPA and 5.5 percent in the Fenstamaker wash complex in the east-central part of the PPA.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of Wyoming and basin big sage, as well as areas of rabbitbrush. The mid-elevation zone is dominated by pinyon-juniper species. Upper elevations of the PPA consist of mountain big sagebrush and mixed mountain shrub species. The southern and eastern portions of the PPA exhibit a high degree of conifer expansion.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, invasive annual grasses are present in the understory, but not dominant throughout the PPA. Invasive species and noxious weeds like musk thistle do not significantly threaten habitat and are presently limited to the vicinity of travel corridors and riparian habitat. See **Table 4-35**.

Fire

Fire occurrence is low in this PPA; since 1999, there have been only eight fires. A total of 4,042 acres burned, which is only 1.5 percent of the PPA. The largest fire occurred in 2013, burned 4,028 acres, and was human caused.

Table 4-35
Antelope Valley Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	100,131	69,297	16	33	3,838	23,071	71,055	279
Percent of PPA	37	26	0	0	1	9	27	0

Source: SynthMap [2008]

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Antelope Valley PPA are as follows: 52 percent in fire regime III, 40 percent in fire regime IV, seven percent in fire regime V, and the remainder in the other fire regimes. Seven percent of the area is in condition class I, 17 percent in class II, 76 percent in class III, and the remainder is not classified. See **Table 4-36**.

Table 4-36
Antelope Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	19,459
High and very high burn probability in PPA (percent)	7

Existing Treatments

The Forest Service is removing conifers in the area; lower elevation are receiving conifer treatments, with prescribed burning in higher elevations. The Willow Creek fire burned in 2013, and approximately 1,000 acres were seeded by aircraft in the winter of 2014. The Seven Mile Project is in the southern portion of the PPA and includes 4,023 acres of mowing, mastication, and prescribed fire.

Other Relevant Management Activities

Livestock grazing and wild horse and burro populations occur throughout the PPA and continue to generate resource conflicts with GRSG habitat. Livestock in PPA are grazing at reduced levels due to the ongoing drought. Maintaining the AML in herd management areas continues to be an issue.

Other land uses in the PPA are minerals exploration, power line ROWs, and potential oil and gas development. Solar and wind energy projects have been discussed in the past, but none have gone to development.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to spatially identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. These areas present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA. Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Antelope Valley PPA
- Willow Creek Ranch—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Indian Creek—Proposed linear fuelbreak that extends off Willow Creek Ranch fuelbreak to the northwest, along existing roads designed to protect large expanses of 3B and 3C habitats

Priority Order 2 treatment areas

- Antelope Valley Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 2C habitat
- Antelope Valley East—Proposed linear fuelbreak along existing roads designed to protect large expanses of 2C habitat

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-37** for a summary of miles of potential treatments in each priority order. See **Figure 4-10** for a graphic depiction of the proposed treatments and strategies in the Antelope Valley PPA.

Table 4-37
Antelope Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	17	30	0	47

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations, as follows:

Priority Order 1 treatment areas

- Antelope Valley PPA nonnative treatment—Inventory, treat, and monitor nonnative invasive species (no polygon).

- Antelope Valley riparian 1—Implement integrated vegetation management around riparian areas and springs in 3C areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Little Smoky Valley West—Pinyon-juniper removal in phases 1 and 2 along valley floor and mountain benches
- Antelope Valley Road West—Pinyon-juniper removal in phases 1 and 2

Priority Order 2 treatment areas

- Antelope Valley riparian 2—Implement integrated vegetation management around riparian areas and springs in 3B areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Fenstermaker pinyon-juniper removal—Pinyon-juniper removal in Phase 1 and phase 2 outside BBDs.

Priority Order 3 treatment areas:

- Antelope Range—Pinyon-juniper removal in phases 1 and 2; corridor creation to connect the Antelope Valley lek to habitat on Antelope Peak and to connect Antelope Valley to Little Smoky Valley

In this PPA, land is mostly administered by the BLM and the Forest Service, with some private lands also present. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-38** for a summary of acres of potential treatments in each priority order. See **Figure 4-11** for a graphic depiction of the proposed treatments and strategies in the Antelope Valley PPA.

Table 4-38
Antelope Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	11,652	10,217	13,037	34,907
Percent of PPA	33	29	37	100

Fire Operations

Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments

- Priority Order 2 suppression zones are areas of 2B and 2C habitat
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats

See **Table 4-39**. See **Figure 4-10** for a graphic depiction of the proposed treatments and strategies in the Antelope Valley PPA.

Table 4-39
Antelope Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	131,332	90,593	45,917	267,842
Percent of PPA	49	34	17	100

Fire suppression in the PPA is provided by the BLM and Forest Service for federal lands and Eureka and Nye Counties for private lands. Station locations in and near the PPA are the Eureka BLM, Eureka VFD, and the Austin Forest Service. Response time in this PPA is generally one to two hours, with coverage from multiple resources. In addition, the Battle Mountain Air Tanker Base and Eureka Airport can host SEATs throughout the summer and could easily respond to any fires in the PPA.

Patrols are already occurring during periods of lightning activity to improve suppression capability. There are also opportunities to host SEATs and helicopters with crews and buckets in Eureka during times of high fire danger. This area is also identified to be a high priority for both ground and aerial patrols during lightning activity.Water sources for fire suppression are limited in the PPA, but there is potential for stationing water sources at staging areas. There are several private sources of water, and there is a need for establishing land use agreements for using these sources before each fire season.

In addition, the Nevada BLM Fire Management and University of Nevada Reno Seismological Lab are working in conjunction to install strategically placed cameras on mountaintops, which will be used for fire detection and monitoring. The cameras are set up to send live video over the Internet so that fire detection and monitoring can be viewed in real time. In the areas that these cameras cover, fire detection will be quicker, will allow for faster firefighter response times, will help fire managers to monitor fire conditions, and will help inform fire managers with sending the appropriate number and type of suppression resources.

In this PPA, the current Forest Service LRMPP/FMP allows for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response to achieve land and resource management objectives. These areas are found primarily in the higher elevations and in the pinyon-juniper woodlands in the Monitor and Antelope Ranges. This response to wildland fire is based on an evaluation of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt post-fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass from becoming established.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA, categorized as 1B and 1C habitats; the remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-40**.

Table 4-40
Antelope Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	131,332	90,593	45,917	267,842
Percent of PPA	49	34	17	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue to implement post-fire rehabilitation across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-41**.

Table 4-41
Antelope Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Willow Creek Ranch fuelbreak	13 mi.	X						W			N	P		L1		0-5	0-2
Indian Creek fuelbreak	4 mi.	X						W			N	P		L1		0-5	0-2
Antelope Valley Road. fuelbreak	25 mi.		X					W			N	P		L1		0-5	0-2
Antelope Valley East fuelbreak	5 mi.		X					W			N	P		L1		0-5	0-2
Little Smokey Valley West pinyon-juniper removal	3,444	X			C			W			N	P		L1		10-20	3-5
Antelope Road West pinyon-juniper removal	8,209	X			C			W			N	P		L1		10-20	3-5
Antelope Valley riparian 1	(no acres)	X					R				N	P		L1		0-2	0-2
Fenstermaker pinyon-juniper removal	10,217		X		C			W			N	P		L1		10-20	5+
Antelope Valley riparian 2	(no acres)		X				R				N	P		L1		0-2	0-2
Antelope Range pinyon-juniper removal	13,037			X	C			W			N	P		L1		10-20	5+
Seven Mile Project	4,023	X			C	I		W		C			I	L1		10-20	0-2
Antelope Valley PPA nonnative treatment	no acres	X				I					N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.6 Bates/Callaghan

Project Planning Area Description

Geographic Overview

The Bates-Callaghan PPA is in Lander and Eureka Counties, Nevada. Dominant geographic features (from west to east) are the Shoshone Mountain Range, Lower Reese River Valley, Toiyabe Range, Grass Valley, Simpson Park Range, Bean Flat, Kobeh Valley, Roberts Mountains, and the Sulphur Spring Range. Special management areas are the Simpson Park and Roberts Mountain WSAs and all or part of eight HMAs (New Pass-Ravenswood, South Shoshone, Bald Mountain, Callaghan, Rocky Hills, Roberts Mountain, Fish Creek, and Hickison).

Elevations range from approximately 5,200 feet along the Reese River to 10,187 feet at the top of Mount Callaghan. The total area is 1,399,216 acres. Ninety-two percent of the land is under BLM administration, less than one percent by Forest Service and seven percent are privately owned. There are numerous springs in the area, with perennial streams and open waters being more limited. See **Table 4-42**.

Table 4-42
Bates/Callaghan Sage-Grouse Habitat Matrix Categories

R&R Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	91,543	44,059	151,196	6,343	39,597	228,957	297,419	15,938	130,858	331,854
Percent of PPA	7	3	11	0	3	21	21	1	9	24

GRSG

This PPA has 13 lek complexes, consisting of 44 active and 15 pending active leks. For 2014, total peak male count was 1,023, with nine leks being monitored as trend leks. About 65 percent of the male counts are associated with two lek complexes, about 35 percent with the South Grass Valley lek complex in the west central part of the PPA, followed by 31 percent in the Three Bar complex in the east-central part of the PPA. The rest are scattered throughout the PPA.

GRSG tend to nest in the valleys and move to higher elevations to access summer brood-rearing habitat. This is the largest PPA and contains the highest estimated abundance of GRSG in the southern Great Basin FIAT assessment area.

A NDOW-funded University of Nevada Reno research project titled Mortality Relationships (Effects of Utility Scale Transmission Line on Sage-Grouse Population Dynamics) was initiated in 2004 on the Falcon to Gondor transmission line; a manuscript is being prepared for peer review. The overarching goal of this study was to assess the impact of the transmission line on GRSG population dynamics. A summary of the preliminary results can be found in the NDOW's Nevada Sage-Grouse Conservation Project December 2014 Final Performance Report. An additional ongoing study in the Grass Valley area is being conducted by USGS and funded by Ormat Technologies. This study seeks to assess impacts from geothermal energy development on GRSG populations.

Vegetation

Vegetation in the PPA is very diverse, with sagebrush dominating the valleys and the uplands. Sagebrush stands tend to be even aged, with the understory ranging from good to nonexistent. Salt desert scrub generally occurs in the lower valley areas, and flats. Rabbitbrush can be found throughout, especially in disturbed areas. Upper elevations in the PPA contain mountain big sagebrush, mixed mountain shrub species, curleaf mountain mahogany, aspen, and limber pine. Pinyon-juniper woodlands can be divided into areas where they are expanding into other vegetative types and areas that should be persistent woodlands. Areas of persistent pinyon-juniper woodlands can be found at the higher elevations in the Shoshone Mountain Range, Toiyabe Mountain Range, Simpson Park Range, Roberts Mountains, and the Sulphur Spring Range. Conifer expansion is occurring in the shrub-dominated areas next to the persistent woodlands as trees migrate out into these areas and infill them over time.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, the primary invasive species of concern for this PPA is cheatgrass as it is a primary driver of large fires and fire risk. Most wildfires that have occurred since 1999 are dominated by cheatgrass, with very mixed results from previous ESR efforts.

Cheatgrass is also prevalent in the understory of many of the shrub stands and pinyon-juniper woodlands. Generally cheatgrass becomes less present as elevation increases. Other noxious weeds/invasive species do occur throughout the PPA, such as whitetop. See **Table 4-43**.

Table 4-43
Bates/Callaghan Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	818,627	208,489	12,059	8,394	12,929	62,342	234,905	41,292
Percent of PPA	56	15	1	1	1	5	17	3

Source: SynthMap [2008]

Fire

This PPA has a documented fire history going back to the early 1980s; however, a dramatic increase in fire occurrence and acres burned by wildfire has been seen since the 1999 fire season. Most of the acres that have been burned have occurred since 1999. Since then, ESR has been implemented on most of the fires with mixed success. Most of these large fires are still dominated by cheatgrass, especially at the lower elevations; this has resulted in some burned areas reburning multiple times since the first wildfire. Since 1999, 183 wildfires have burned 140,000 acres. Of these, only 20 fires grew in excess of 100 acres. The largest fire consumed more than 106,000 acres. See **Table 4-44**.

Table 4-44
Bates/Callaghan Summary of Burn Probability

High and very high burn probability in PPA (acres)	1,293,768
High and very high burn probability in PPA (percent)	93

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Bates-Callaghan PPA are as follows: 35 percent in fire regime III, 48 percent in fire regime IV, 15 percent in fire regime V, and the remainder in the other fire regimes. All three condition classes are present, with 79 percent in condition class III, 13 percent in condition class II, seven percent in condition class I, and the remainder being unclassified.

Existing Treatments

Existing vegetation treatments can be divided into those that are ongoing and those that have been completed. Past projects are several range improvement seedings implemented in the late 1960s to early 1970s in the Bean Flat, Kobeh Valley, and 3 Bars areas. The range improvement seedings removed sagebrush, followed by seeding with crested wheatgrass.

Due to the age of these projects and a lack of disturbance, these areas have generally returned to a shrub-dominated overstory, with a mix of natives and crested wheatgrass in the understory. ESR treatments have been implemented on most of the larger fires since 1999 and have had mixed success; however, some areas converted to cheatgrass and have since reburned. Most of these treatments were seeded by aircraft, using a mix of native and nonnative species, with the main objectives of impeding cheatgrass expansion and stabilizing the site. Areas where drill seeding treatments occurred are more likely to have invasive species/noxious weed issues post treatment.

Ongoing treatments in the PPA are generally either fuels management projects or GRSG habitat projects that focus on the removal of phase I pinyon-juniper in high priority areas. Fuels projects in the PPA have treated 18,348 acres since 2004 and have generally consisted of mowed fuelbreaks in sagebrush, followed by seedings and thinning of pinyon-juniper. Prescribed fire has been limited to the Red Hills project. The phase I pinyon-juniper removal projects consist of "lop and leave" pinyon-juniper to mitigate conifer expansion. All of these treatments have been successful.

The Forest Service has existing NEPA analysis for the McGinnis Hills project that includes up to 5,000 acres of treatment using chainsaw only for conifer removal. The Forest Service also has NEPA analysis in progress for the North Monitor vegetation project. This will focus on removing phases 1 and 2 pinyon-juniper in lower elevations and reducing conifers at higher elevations through mechanical treatments and prescribed fire.

Other Relevant Management Activities

In this PPA is the 3 Bars Draft EIS Landscape Restoration Project Area. The project does not focus on BBDs only; specialists also focused on healthy landscapes, incorporating telemetry data and seasonal use areas. These proposed treatments are incorporated into the treatment maps and tables.

While mining occurs throughout the PPA, the large-scale mines are primarily in the Eureka County portion of the PPA. These include the Mt. Hope mine and the Gold Bar/Atlas mine in the Roberts Mountains. In addition to the footprint of the mines, there are additional impacts on waters in the associated areas.

Livestock grazing and wild horse and burro populations occur throughout the PPA and continue to generate resource conflicts with GRSG habitat. Livestock grazing in PPA is at reduced levels due to the ongoing drought. Maintaining AML in herd management areas continues to be an issue.

Other land uses in the PPA are geothermal, minerals exploration, power line ROWs, and oil and gas development. Solar and wind energy projects have been discussed in the past, but none have gone to development.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. These present opportunities for fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatment areas throughout the PPA.

Specialists determined habitats that were categorized 2C to have more warm-dry soils with low R&R. These areas were elevated to Priority Order 1 based on the local assessment. Poor recovery from past disturbances in the area support the decision to elevate these areas. Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Bates/Callaghan PPA
- Ravenswood—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat

- Silver Creek—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Narrows—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3C habitat and previous rehabilitation investments
- Carico Proposed—Proposed linear fuelbreak along existing roads designed to protect areas of 3B and 3C habitats
- Grass Valley South—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3C habitat
- Highway 50 Bob Scott—Proposed linear fuelbreak along an existing road designed to protect intact habitat; also serves as a wildland-urban interface (WUI) fuelbreak for the town of Austin
- Highway 50 West Eureka—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B habitat
- Roberts Creek—Proposed linear fuelbreak along an existing road designed to protect large expanses of 2C (warm-dry) habitat
- Bean Flat—Proposed linear fuelbreak along an existing road designed to protect large expanses of 2C (warm-dry) habitat
- Bean Flat West—Proposed linear fuelbreak along an existing road designed to protect large expanses of 2C (warm-dry) habitat
- Gold Bar Road—Proposed linear fuelbreak along an existing road designed to protect large expanses of 2C (warm-dry) habitat that has been assessed as having low R&R
- Highway 278—Proposed linear fuelbreak along an existing road designed to protect large expanses of 2C (warm-dry) habitat; has a high fire occurrence and the fuelbreak is designed to protect previous rehabilitation investments
- Rye Patch—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Dry Creek—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Steiner—Goes north-south, meeting with Rye Patch Canyon fuelbreak at Grass Valley Road and protects large expanses of 3C habitat

Land throughout the PPA is under federal or state administration or is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-45** for a summary of miles of potential treatments in each priority order. See **Figure 4-12** for a graphic depiction of the proposed treatments and strategies in the Bates/Callaghan PPA.

Table 4-45
Bates/Callaghan Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	253	0	0	253

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations and are as follows:

Priority Order 1 treatment areas

- Bates/Callaghan nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- 3 Bars landscape restoration project (BBD)—Multiple treatment methods have been identified to restore several hundred thousands of acres of sagebrush and pinyon-juniper landscapes
- Sulphur Springs pinyon-juniper removal (BBD)—Pinyon-juniper removal in phases 1 and 2
- Reese/Grass to Callaghan—Pinyon-juniper phases 1 and 2 removal to create a corridor connecting the Reese River Valley and Grass Valley leks to habitat on Mount Callaghan
- Grass/Bean to Bates—Pinyon-juniper removal to create a corridor connecting the Grass Valley and Bean Flat leks to habitat on Bates Mountain; removal of phases 1 and 2 pinyon-juniper within two miles of all active leks
- Bates Callaghan Riparian 1—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Grass Valley Crested wheatgrass treatment (Forest Service)—Reestablish native plants in seedings in 3B and 3C habitats through an integrated management approach; use locally collected seed sources where opportunities exist
- Ravenswood pinyon-juniper removal: pinyon-juniper removal in phases 1 and 2.
- Reese River East pinyon-juniper removal—Pinyon-juniper removal in phases 1 and 2

- Callaghan pinyon-juniper removal—Remove phase I pinyon-juniper within two miles of all active leks
- East Simpson pinyon-juniper removal—Pinyon-juniper removal in phases I and 2
- Simpson Park pinyon-juniper removal—Pinyon-juniper removal in phases I and 2
- Grimes Hills pinyon-juniper removal—Pinyon-juniper removal in phases I and 2

Priority Order 2 treatment areas

- 3 Bars landscape restoration project (outside BBD)—Multiple treatments methods have been identified to restore several hundred thousand acres of sagebrush and pinyon-juniper landscapes
- Bates Callaghan riparian 2—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Trail Canyon fire 1999—Assess restoration efforts; consider chemical control of cheatgrass and using locally collected seed or seedlings; also include collecting sagebrush seeds, seedling grow out, and island planting in the 1999 Eureka Complex; this treatment is incorporating areas of over 25 percent sagebrush cover over the landscape because it is very highly valued GRSG habitat, even with the loss of sagebrush from the previous fire. Investing money in restoration will greatly benefit GRSG, which need sagebrush through their entire life cycle. Without restoration in this area, future natural sagebrush recruitment is unlikely; must meet wilderness management objectives.
- Sulphur Springs pinyon-juniper removal (outside BBD)—Pinyon-juniper removal in phases I and 2
- Bean Flat crested wheat—Reestablish native plants in crested wheatgrass seedings with locally collected seed or seedlings in 2C habitats

Priority Order 3 treatment areas:

- Table Mountain—Chemical treatment of cheatgrass in fire area, followed by native seeding, priority for burned areas at risk of conversion to cheatgrass-dominated community, primarily in 1C habitat

In this PPA, BLM-administered land dominates, with Forest Service and private lands also present. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-46** for a summary of acres of potential treatments in each priority order. See **Figure 4-13** for a graphic depiction of the proposed treatments and strategies in the Bates/Callaghan PPA.

Table 4-46
Bates/Callaghan Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	112,553	110,141	802	223,496
Percent of PPA	50	49	0	100

Fire Operations

This PPA contains a high percentage of habitats with low R&R that sustain large fire growth, particularly on high fire danger days. During years with high invasive annual grass fuel loads, large fire growth risk increases exponentially. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones include the valleys in the PPAs with 3B, 3C, 1B, and 1C habitats that are close to 3C habitats due to continuous 3C habitat throughout the PPA. Areas north of Highway 50 near Austin have been included under Priority Order 1 due to telemetry data and poor recovery from past fires.
- Specialists determined habitats that were categorized 2C to be more warm-dry soils with low R&R. These areas were elevated to Priority Order 1 based on the local assessment. Poor recoveries from past disturbances in the area support this decision.
- Priority Order 3 suppression zones are the remaining areas of 1A, 1B, 1C, 2A, and 3A habitats not listed above.

See **Table 4-47**. See **Figure 4-12** for a graphic depiction of the proposed treatments and strategies in the Bates/Callaghan PPA.

Table 4-47
Bates/Callaghan Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	850,604	265,513	283,099	1,399,216
Percent of PPA	61	19	20	100

Fire stations are Battle Mountain BLM ground and air base, Eureka BLM, and Eureka VFD. Generally, response times to this PPA are 15 to 30 minutes for aviation resources and one to two hours for ground resources.

Opportunities exist to enhance and improve suppression capabilities in and around this PPA. Currently the BLM and Forest Service provide fire suppression in the PPA for federal lands, and Eureka and Lander Counties protect private lands. Station locations in and near the PPA are the Eureka BLM, Eureka VFD, and the Austin Forest Service. Response time for ground resources in this PPA is generally one to two hours with coverage from multiple resources.

In addition, the Battle Mountain Air Tanker Base and Eureka Airport can host SEATs throughout the summer and could easily respond to any fires in the PPA in 15 to 30 minutes. Patrols occur during periods of lightning activity to improve suppression capability. There are also opportunities to host helicopters with crews and buckets in Eureka during times of high fire danger. This area is also identified to be a high priority for both ground and aerial patrols during lightning activity. Stationing firefighting resources during times of lightning activity is warranted in this PPA due to the long response times.

In addition, the Nevada BLM Fire Management and University of Nevada Reno Seismological Lab are working to install strategically placed cameras on mountaintops, which will be used for fire detection and monitoring. The cameras are set up to send live video over the Internet so that fire detection and monitoring can be viewed in real time. In the areas that these cameras cover, fire detection will be quicker, allowing for faster firefighter response times. This will help fire managers monitor fire conditions and to send the appropriate number and type of firefighters.

Water sources for fire suppression in this PPA are limited to a few lakes and ponds and water from local ranches and communities. With few exceptions, these waters are used under land use agreements. Agencies can continue to expand and maintain land use agreements with private property owners for water. There is a potential for stationing portable water sources near areas of 3B and 3C habitat during times of high fire danger.

Managing unplanned ignitions to meet the objectives of land and resource management has not yet been approved in a LUP. However, opportunities for fire exist at higher elevations and in the pinyon-juniper woodlands to meet GRSG resource objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on the following:

- Evaluations of risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources, which also include managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable low resiliency habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation and limiting invasive annual grass establishment post fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA, categorized as 1B and 1C habitats; the remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-48**.

Table 4-48
Bates/Callaghan Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	850,604	265,513	283,099	1,399,216
Percent of PPA	61	19	20	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-49**.

Table 4-49
Bates/Callaghan Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Ravenswood fuelbreak	36 mi.	X						W			N	P		LI		0-5	0-2
Silver Creek fuelbreak	6 mi.	X						W			N	P		LI		0-5	0-2
Narrows fuelbreak	21 mi.	X						W			N	P		LI		0-5	0-2
Carico fuelbreak	13 mi.	X						W			N	P		LI		0-5	0-2
Highway 50 Bob Scott Pass fuelbreak	15 mi.	X						W			N	P		LI		0-5	0-2
Grass Valley South fuelbreak	19 mi.	X						W			N	P		LI		0-5	0-2
Highway 50 West Eureka fuelbreak	44 mi.	X						W			N	P		LI		0-5	0-2
Roberts Creek fuelbreak	15 mi.	X						W			N	P		LI		0-5	0-2
Bean Flat fuelbreak	21 mi.	X						W			N	P		LI		0-5	0-2
Bean Flat West fuelbreak	9 mi.	X						W			N	P		LI		0-5	0-2
Gold Bar Road fuelbreak	11 mi.	X						W			N	P		LI		0-5	0-2
Steiner fuelbreak	7 mi.	X						W			N	P		LI		0-5	0-2
Rye Patch fuelbreak	17 mi.	X						W			N	P		LI		0-5	0-2
Dry Creek fuelbreak	7 mi.	X						W			N	P		LI		0-5	0-2
Highway 278 fuelbreak	12 mi.	X						W			N	P		LI		0-5	0-2
Grass Valley CWG seeding	13,801	X				I					N	P		LI		0-5	3-5
Ravenswood pinyon-juniper removal	9,482	X			C			W			N	P		LI		10-20	3-5
Reese River East pinyon-juniper removal	24,102	X			C			W			N	P		LI		10-20	5+
Callaghan pinyon-juniper removal	22,568	X			C			W			N	P		LI		10-20	5+

Table 4-49
Bates/Callaghan Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]		Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely		
Simpson Park pinyon-juniper removal	5,829	X			C			W			N	P		LI		10-20	3-5
East Simpsons pinyon-juniper removal	28,085	X			C			W			N	P		LI		10-20	5+
Sulphur Springs pinyon-juniper removal	2,721	X			C			W			N	P		LI		10-20	3-5
Grimes Hills pinyon-juniper removal	2,652	X			C			W			N	P		LI		10-20	3-5
Reese/Grass to Callaghan Corridor pinyon-juniper removal	1,624	X			C			W			N	P		LI		10-20	3-5
Grass/Bean to Bates corridor pinyon-juniper removal	1,688	X			C			W			N	P		LI		10-20	3-5
Bean Flat Crested Wheat seeding	49,679		X			I					N	P		LI		0-5	5+
Trail Canyon Fire 1999 seeding	59,072		X			I					N	P		LI		0-5	3-5
Sulphur Spring pinyon-juniper removal	1,390		X		C						N	P		LI		10-20	3-5
Table Mountain seeding	802			X		I					N	P		LI		0-5	3-5
Bates/Callaghan riparian 1	No Acres	X					R				N	P		LI		0-2	0-2
Bates/Callaghan riparian 2	No Acres		X				R				N	P		LI		0-2	0-2
3 Bars Landscape Restoration Project (inside BBD)	No Acres	X			C	I	R	W	I					LI		10-20	5+

Table 4-49
Bates/Callaghan Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
3 Bars Landscape Restoration Project (outside BBD)	No Acres		X		C	I	R	W	I					L1		10-20	5+
McGinnis Hills treatments (Forest Service)	5,000	X			C			W		C			I	L1		10-20	0-2
North Monitor vegetation treatments (Forest Service)	No Acres	X			C			W	I				I	L1		10-20	3-5
Bates/Callaghan nonnative treatment	No acres	X				I					N	P		L1		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.7 South Fork

Project Planning Area Description

General Site Description

The South Fork PPA is in Elko and northern Eureka Counties, Nevada. It is composed of 535,297 acres, 341,195 acres of which (64 percent) are administered by the BLM, 33,893 acres (six percent) are administered by the Forest Service, and 160,211 acres (30 percent) are private lands.

Elevations throughout the PPA generally range from 4,800 feet in valley bottoms to approximately 10,200 feet on top of the Ruby Mountains. This area encompasses the Piñon Range, north Sulphur Spring Range, Cedar Ridge, and portions of the Ruby Mountains. Mountain ranges are typically oriented north to south, with large valley bottoms between ranges.

Huntington Creek is the primary stream in the PPA; most streams in the PPA feed this waterway, which terminates at the South Fork of the Humboldt River. The other major stream in the western portion of the PPA is Pine Creek. Springs and seeps commonly occur throughout most of the mountains; however, most of these areas are not meeting riparian health objectives.

Most of the 3C habitat encompasses the valley bottoms and low-lying hills in the PPA. The benches of the Piñon Range, Cedar Ridge, Sulphur Springs, and Ruby Mountains contain most of the 3B and 2B habitats and are primarily limited with sagebrush cover either due to past fires or in some cases conifer expansion. The higher elevations of the Ruby Mountains contain the remaining 1B and 1C habitats and are typified by mountain sagebrush and mountain shrub communities. See **Table 4-50**.

Table 4-50
South Fork Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	10,360	19,604	33,409	1,599	112,166	108,584	23,753	63,117	84,569	78,137
Percent of PPA	2	4	6	0	21	21	4	12	16	15

GRSG

This South Fork PPA has three lek complexes, consisting of 18 active leks and seven pending active leks. For 2014, total peak male count was 460, with two leks monitored as trend leks. Approximately 91 percent of peak male counts are associated with one lek complex. However, this complex has 21 leks somewhat evenly distributed throughout the center and southeast part of the PPA. The other two complexes are relatively close together in the northern part of the PPA.

This is the stronghold for GRSG south of I-80 in Elko County. Fire and invasive species remain the biggest concerns in the PPA. Leks are generally located on mountain benches, with most along the east side of the Piñon Range. Populations were dramatically reduced following the fires of 1999 that burned over 250,000 acres in the PPA. Large areas of habitat are still fragmented due to the limited sagebrush establishment post fire. GRSG distribution patterns and movements are typical of those in the Great Basin. GRSG winter on valley bottoms and mountain bench locations; summer brood-rearing habitat is in riparian areas at higher elevations throughout the PPA.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of mainly Wyoming and basin big sagebrush, as well as areas of rabbitbrush. Upper elevations of the PPA consist of mountain big sagebrush and mixed mountain shrub species. Small patches of curleaf mountain mahogany and aspen are in the Piñon and Ruby Mountains. In 1999, the Sadler fire burned approximately 200,000 acres and consumed several thousand acres of pinyon-juniper in the Sulphur Springs and Piñon Ranges. These areas are now predominantly perennial grasslands, with some sagebrush recovery taking place. The Cedar Ridge area is predominantly dominated by phase 2 and 3 pinyon-juniper. The areas south of Harrison Pass also have some conifer expansion mixed in with mountain shrub communities.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass dominates portions of past fires throughout the PPA. Medusahead has also been documented on Forest Service lands in the Harrison Pass area but is currently isolated to small areas and is being treated.

Other noxious weeds such as scotch thistle, musk thistle, and hoary cress have also expanded from past fire occurrences. Other noted species are Russian knapweed, spotted knapweed, Canada thistle, and leafy spurge. In the Harrison area some allotments are dominated by other undesirable grass types, such as bulbous bluegrass, which is an invader species primarily attributed to historic overgrazing by livestock.

Large areas of the PPA were converted to crested wheatgrass seedings in the 1950s and 1960s. Most of this occurred in Huntington Valley (approximately 90,000 acres) on both BLM-administered and Forest Service Lands. There is evidence that some big sagebrush species are reestablishing in these seedings and are showing evidence of GRSG use. See **Table 4-51**.

Table 4-51
South Fork Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	268,667	58,286	37,895	121,756	9,928	2,961	27,294	8,139
Percent of PPA	50	11	7	23	2	1	5	1

Source: SynthMap [2008]

Fire

The PPA has been heavily impacted by fire; since 1999, there have been 162 fires that have burned approximately 450,000 acres. In 1999, more than 285,000 acres burned, with the Sadler fire alone consuming nearly 200,000 acres. Before 1999, this area had very limited fire history and the fires that did occur were small. There has been a higher occurrence of fires in the recent past, and the potential for future fires is high due to the conversion to cheatgrass coupled with higher recreation use. Some areas have burned more than once since 1999. See **Table 4-52**.

Table 4-52
South Fork Summary of Burn Probability

High and very high burn probability in PPA (acres)	525,075
High and very high burn probability in PPA (percent)	98

Fire regimes are a measure of historic fire return interval and severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the South Fork PPA are 31 percent in fire regime III, 68 percent in fire regime IV, and the remaining area in the other fire regimes. Two condition classes are largely present, with 87 percent in condition class III, 11 percent in condition class II, with very little in in condition class 1; the remaining area is not classified.

Existing Treatments

Large ESR seeding has occurred over most of the PPA following the 1999 fire season; a moderate number of additional ESR treatments have occurred since then. Most of these treatments were aerial seedings of native and nonnative species, with the main objectives to impede cheatgrass expansion and stabilize sites. In areas where terrain allowed, drill seeding treatments occurred where that cheatgrass and other invasives were likely to establish.

Reseeding has had varied success, but areas such as Pine Valley have not been properly managed for livestock grazing, and many acres have been converted to monocultures of cheatgrass. Other ESR treatments in the PPA have focused on controlling noxious weeds; these treatments are being continued by government agencies and local weed conservation districts. The Elko BLM has completed fuelbreaks totaling 3,500 acres (31 miles) in the Dixie Creek, Sadler Basin, and Bobs Flat areas to help reduce the future spread of catastrophic fire.

Other Relevant Management Activities

Mineral exploration occurs throughout most of the northern portion of the Piñon Range, and fracking is beginning to be used in the Huntington Valley area.

Harrison Pass is a high public use area that experiences watershed issues due to a new highway. Federal highways have seeded the Harrison Pass area more than once; however road cuts still contain cheatgrass. Dispersed camping in this area have been degrading habitat and has led to the continued expansion of cheatgrass and medusahead. The Forest Service is planning NEPA analysis in this priority watershed for 2016 to 2020.

The Red Rock wild horse herd management area (HMA) falls in the southern portion of the PPA. Current numbers of horses have been attributed to riparian area damage on springs and seeps.

Massive seeding to replenish a diminished seed bank have had marginal success. Limited control on livestock grazing in these areas has compromised benefits of post-fire rehabilitation throughout the BLM Elko District. In addition, habitat for Lahontan cutthroat, a federally protect species, has also been impacted.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along roads and natural features in the PPA. These present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the South Fork PPA
- Bald Mountain Mine Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 3B habitat
- Huntington Creek West—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat
- Red Rock Ranch—Proposed linear fuelbreak along existing road designed to protect existing ESR treatments
- Porter Creek—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat and lek areas
- Bunker Hill Road—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat and lek areas
- Huntington Creek South—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Highway 278 South—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B habitat
- Emigrant—Proposed linear fuelbreak along existing road off Emigrant Pass to protect 2B habitats and previous ESR investments that are recovering

Priority Order 2 treatments

- Highway 278 North—Proposed linear fuelbreak along existing roads designed to protect large expanses of 2B habitat

- Rain Mine Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and some 2B and 2C habitats
- North Pine—Proposed linear fuelbreak along existing road designed to protect large expanses of 2C habitat and lek areas

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-53** for a summary of miles of potential treatments in each priority order. See **Figure 4-14** for a graphic depiction of the proposed treatments and strategies in the South Fork PPA.

Table 4-53
South Fork Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	81	23	0	104

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations, as follows:

Priority Order 1 treatment areas

- South Fork nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- South Fork PPA riparian 1—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Toyn Creek pinyon-juniper removal—Pinyon-juniper removal and thinning in phases 1 and 2 on slopes between Toyn Creek and Corral Canyon
- Corral—Pinyon-juniper removal
- Corral Canyon crested wheatgrass restoration—Reestablish native plants in crested wheatgrass seedings using locally collected seed and seedlings in 3B and 3C habitats
- Grindstone fire 1986—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in primarily 3C habitat

- Carlin 2005—Chemical treatment of cheatgrass in fire area, followed by native seeding, priority for burned areas at risk of conversion to cheatgrass-dominated community in 3B habitat

Priority Order 2 treatment areas

- South Fork PPA riparian 2—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- South Fork Native Plant 2 3B—Sagebrush seed collection, seedling grow out, and island planting
- Sadler fire complex 1999 (BBD)—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in several different habitat types
- Webb fire 2006—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community, located in primarily 2A habitat.
- Palisade fire 1998—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community, located in primarily 2A habitat
- Rain fire 1999—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in primarily 2B habitat
- Dixie Creek fire 1992—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community primarily in 2C habitat
- Ferdleford fire 1998—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in 2B and 2C habitats
- Bullion fire 1987—Chemical treatment of cheatgrass in fire area, followed by native seeding planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in 2B and 2C habitats

- Harrison fire—Implement integrated vegetation management, focusing on reducing invasive annual grasses and noxious weeds and encouraging sagebrush reestablishment in 2B habitat
- Party fire 2007—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in 2B habitat
- Harrison Pass Watershed weed treatment—Noxious weed treatments throughout the Harrison Pass Priority Watershed (no polygon)

Priority Order 3 treatment areas

- South Fork PPA riparian 3—Implement integrated vegetation management around riparian areas and springs, in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Rose fire 1999—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community in 2A habitat
- Sadler fire complex 1999 (outside BBD)—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community located in several different habitat types
- Cedar Ridge South—Assess pinyon-juniper phases 1 and 2 expansion in and surrounding WSA
- Cedar Ridge North—Assess pinyon-juniper phases 1 and 2 expansion in and surrounding WSA

In this PPA, land administration is shared primarily by the BLM, Forest Service, BIA, and private landownership. Through existing and future partnerships, there are opportunities to use a coordinated approach across these boundaries. State and federal agencies currently work across jurisdictional lines on landscape projects. The ability of NRCS to work on private lands also allows for treatments to be coordinated across boundaries.

See **Table 4-54** for a summary of acres of potential treatments in each priority order. See **Figure 4-15** for a graphic depiction of the proposed treatments and strategies in the South Fork PPA.

Table 4-54
South Fork Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	9,241	143,893	162,697	315,831
Percent of PPA	3	45	52	100

Fire Operations

In the PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. High recreation use in the PPA increases the risk of human-caused ignitions. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are 2B and 2C habitat.
- Priority Order 3 suppression zones are 1A, 1B, 1C, 2A, and 3A habitats. Cedar Ridge and Red Springs WSA were placed in this priority order based on wilderness characteristics management.

See **Table 4-55**. See **Figure 4-14** for a graphic depiction of the proposed treatments and strategies in the South Fork PPA.

Table 4-55
South Fork Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	276,559	102,925	155,815	533,229
Percent of PPA	52	19	29	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. The Northeast Nevada Interagency Fire Management Program contains lands administered by the BLM, Forest Service, and BIA. Firefighting resources in or near the PPA are the Carlin BLM station, Elko BLM Fire Station, and the Jiggs, Ruby Valley, and Pine Valley VFDs. Response time in this PPA from ground resources is anywhere from a few minutes to an hour, with good coverage from multiple resources. The Elko Regional Airport also hosts a BLM exclusive use type 3 helicopter and BLM air attack platform, which can greatly improve response time throughout the entire PPA. In addition, the Battle Mountain and Wells Air Tanker Bases host SEATs throughout the summer and could easily respond to any fires in the PPA in approximately 30 minutes. The Elko Regional Airport can also be set up as a temporary SEAT base during times of high fire danger.

In addition, the PPA has several areas of water availability for fire suppression—ponds, reservoirs, and streams. Agencies can continue to expand and maintain land use agreements with private property owners for availability of water. There is potential for stationing portable water sources near areas of 3B and 3C habitat during periods of high fire danger.

The management of unplanned ignitions to meet the objectives of land and resource management has not yet been approved in a LUP. However, opportunities exist at higher elevations in the Ruby Mountains to meet GRSG objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources, which also includes the management of volunteers. Maintenance of these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C and 3B) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA, categorized as 1B and 1C habitats; the remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-56**.

Table 4-56
South Fork Post-Fire Rehabilitation Management Priorities

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	276,559	102,925	155,815	535299
Percent of PPA	52	19	29	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-57**.

Table 4-57
South Fork Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Highway 278 South fuelbreak	7 mi.	X						W			N	P		LI		0-5	0-2
Bunker Hill fuelbreak	11 mi.	X						W			N	P		LI		0-5	0-2
Bald Mountain Mine fuelbreak	12 mi.	X						W			N	P		LI		0-5	0-2
Huntington Creek West fuelbreak	13 mi.	X						W			N	P		LI		0-5	0-2
Red Rock Ranch fuelbreak	8 mi.	X						W			N	P		LI		0-5	0-2
Porter Creek fuelbreak	12 mi.	X						W			N	P		LI		0-5	0-2
Huntington Creek South fuelbreak	11 mi.	X						W			N	P		LI		0-5	0-2
Emigrant fuelbreak	7 mi.	X						W			N	P		LI		0-5	0-2
Highway 278 North fuelbreak	7 mi.		X					W			N	P		LI		0-5	0-2
Rain Mine Road fuelbreak	16 mi.		X					W			N	P		LI		0-5	0-2
North Pine fuelbreak	7 mi.		X					W			N	P		LI		0-5	0-2

Table 4-57
South Fork Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Grindstone fire 1986	2,127 acres	X				I					N	P		L4		0-5	3-5
Carlin fire 2005	5,001 acres	X				I					N	P		L4		0-5	3-5
Corral Canyon crested wheatgrass	1,283 acres	X				I					N	P		L4		0-5	3-5
Toyn Creek pinyon-juniper removal	830 acres	X			C			W			N	P		L1		10-20	3-5
South Fork riparian 1	(no acres)	X					R				N	P		L1		0-2	0-2
Webb fire 2006	14,513 acres		X			I					N	P		L1		0-5	3-5
Ferdelford fire 1988	3,986 acres		X			I					N	P		L1		0-5	3-5
Palisade fire 1998	4,312 acres		X			I					N	P		L1		0-5	3-5
Rain fire 1999	10,003 acres		X			I					N	P		L1		0-5	3-5
Party fire 2007	4,245 acres		X			I					N	P		L1		0-5	3-5
Dixie Creek fire 1992	13,363 acres		X			I					N	P		L1		0-5	3-5
Bullion fire 1987	5,272 acres		X			I					N	P		L1		0-5	3-5
Hastings fire 2005	1,180 acres		X			I					N	P		L1		0-5	3-5
Harrison fire 2007	562 acres		X			I					N	P		L1		0-5	3-5
Sadler Complex 1999 1	86,455 acres		X			I					N	P		L1		0-5	3-5
South Fork riparian 2	(no acres)		X				R				N	P		L1		0-2	0-2
Sadler Complex 1999 2	97,343 acres			X		I					N	P		L4		0-5	3-5

Table 4-57
South Fork Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Rose fire 1999	48,331 acres			X		I					N	P		L1		0-5	3-5
Cedar Ridge South pinyon-juniper removal	9,452 acres			X	C						N	P		L1		0-5	3-5
Cedar Ridge North pinyon-juniper removal	7,571 acres			X	C						N	P		L1		10-20	3-5
South Fork riparian 3	(no acres)			X			R				N	P		L1		0-2	0-2
Harrison Pass Watershed weed treatment (Forest Service)	(no acres)		X			I			I				I	L1		0-5	3-5
South Fork native plant 2	(no acres)					I					N			L4		0-5	3-5
South Fork nonnative treatment	No acres	X				I					N			L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:

1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective

[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.8 Ruby Valley

Project Planning Area Description

Geographic Overview

The Ruby Valley PPA is in Elko and northern White Pine Counties, Nevada. It is composed of 248,161 acres: 135,496 acres of BLM-administered lands, 47,215 acres of Forest Service lands, and 65,411 acres of private lands. Elevations throughout the area range from 5,600 feet in the valley bottoms to above 10,800 feet on the mountaintops. This area encompasses the northern portion of Ruby Valley, and portions of the Ruby and East Humboldt Mountain Ranges. The eastern extent of the PPA is portions of Clover Valley and Valley Mountain.

Mountain ranges are typically oriented north to south, with large valleys between ranges. The Franklin River is the main waterway in this PPA and runs north to south through most of the area. The Ruby Mountains and East Humboldt Range have numerous perennial water sources—streams, springs and seeps—with water availability diminishing farther east. In wet years Franklin River can produce year-round flows that feed Franklin Lake, but this does not commonly occur.

See **Table 4-58**.

Table 4-58
Ruby Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	20,712	6,284	30,620	0	0	38,273	0	0	40,098	112,174
Percent of PPA	8	3	12	0	0	15	0	0	16	45

Most of the 3C habitat encompasses the valley bottoms and low-lying hills and comprises the bulk of the habitat in the PPA. The benches of the Ruby Mountains and East Humboldt Range contain most of the 3B habitats and are primarily limited by conifer encroachment; the higher elevations of the Ruby and East Humboldt Ranges contain the remaining 1A, 1B, 1C, and 2B habitats.

Sage-Grouse

Ruby Valley PPA has four lek complexes, consisting of nine active leks and six pending active leks. However, two pending active leks are not associated with a specific complex in the NDOW data. For 2014, total peak male count was 288, with three leks monitored as trend leks. Approximately 57 percent of peak male counts are associated with complexes in the southern portion of the PPA, 31 percent with the complexes in the northwestern portion, and the remainder in the east-central portion.

Conifer expansion and agriculture practices are the major threats to GRSG in this PPA. Leks are generally on the valley floors. GRSG movement largely consists of birds nesting near lek sites and along the benches of the mountains, with brood-rearing along riparian corridors in the Ruby and East Humboldt Mountain Ranges. Winter habitat is primarily found along the valley floor and mountain benches near the leks.

Populations are relatively stable, with very few fires occurring in the area. Conifer expansion occurs along the south end of the east Humboldt Range and eastern portion of Ruby Valley. The upper elevations on the south end of the East Humboldt Range are primarily in phase 2 and 3 conifer expansion/infilling; this is impacting GRSG connectivity between the lower elevation nesting habitat and the upper elevation summer brood rearing habitat. GRSG leks on the eastern portion of Ruby Valley are being impacted by phase I pinyon-juniper conifer expansion, which is likely having a negative effect. Another issue limiting GRSG habitat is the increase in agricultural practices that are taking place on private lands in Ruby Valley.

Vegetation

The PPA is composed of several different types of vegetative communities. The valley bottoms are largely made up of Wyoming and black sagebrush, with patches of winterfat, that have been typically severely been degraded due to historic livestock grazing. These valley bottoms generally have limited herbaceous understory.

As elevation increases along the benches of the Ruby and East Humboldt Mountains, vegetation transitions into a mountain shrub community, consisting of mountain and basin big sagebrush, antelope bitterbrush, and serviceberry. Curleaf mountain mahogany and aspen stands are also found at higher elevations, along with an array of riparian vegetation.

Large stand losses of Wyoming sagebrush have been documented along the east benches of the East Humboldt Range, a result of past Aroga moth infestations. The extent of the die-off has not been fully recognized as far as the percent mortality or extent; however, it seems to be isolated.

Pinyon-juniper stands occur largely in the southern portion of the East Humboldt Range and the eastern portion of Ruby Valley (western slopes of Valley Mountain).

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, invasive annual grasses, such as cheatgrass, do not occur widely in the PPA and are not a primary concern. Most disturbed sites in the lower elevations are more likely to be invaded by halogeton, as evidence has shown in most of the past burned areas. The most notable area of cheatgrass presence exists in the 2001 Egbert Fire on the southeast end of the East Humboldt Range. Small isolated pockets of noxious weeds occur in the area, including hoary cress, Canada thistle, and scotch thistle.

Large areas of the PPA were converted to crested wheatgrass seedings in the 1950s to 1970s. Most of these seedings occurred in Ruby Valley on both BLM-administered land and private lands. There is some evidence that sagebrush species are reestablishing in these seedings and are showing evidence of GRSG use. See **Table 4-59**.

Table 4-59
Ruby Valley Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	121,908	48,548	4,318	1,825	13,168	15,489	27,179	15,616
Percent of PPA	49	20	2	1	5	6	11	6

Source: SynthMap [2008]

Fire

The Ruby Valley PPA has had very low fire occurrence. There were only three recorded large fires, which burned a total of 3,050 acres; the largest of these fires burned only 1,955 acres. Due to the influence of the Ruby and East Humboldt Ranges and summer monsoon moisture patterns, Ruby Valley typically receives more moisture than other areas in Elko County; thus it has had a lower fire occurrence over time. When fires occur, they typically are wind driven and are suppressed after one burning period due to the fuel types that are found there. Fires in this PPA are not driven by invasive annual grasses.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Ruby Valley PPA are as follows: 33 percent in fire regime III, 53 percent in fire regime IV, 14 percent in fire regime V, and the remainder in other fire regimes. Three condition classes are largely present, with 13 percent in condition class I, 13 percent in condition class II, 66 percent in condition class III, and the remainder not being classified. See **Table 4-60**.

Table 4-60
Ruby Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	219,997
High and very high burn probability in PPA (percent)	89

Existing Treatments

Past treatments in the Ruby Valley PPA largely consist of crested wheatgrass seedings during the 1950s through the early 1970s. These seedings converted large amounts of black sagebrush and Wyoming sagebrush into nonnative grass seedings in an effort to provide forage for livestock. Overtime, sagebrush has reoccupied many of these seedings.

There have been some small-scale conifer treatments completed on the south end of the East Humboldt Range through hand thinning in the early 1990s and a relatively small two-way chaining project that was implemented on the southeast end of Valley Mountain in 2005. The main objective of these treatments was for forest health and to promote sagebrush recruitment in important mule deer transition range. These treatments had minimal benefits to GRSG due to the size of the projects. Woodcutting and selective cutting by permit is allowed and ongoing on Forest Service lands.

Due to the lack of fire, there have been only a few ESR treatments completed in the PPA. Two main areas were drill seeded: the 2000 Egbert fire area and the 2013 North Valley fire area. Objectives of these treatments were to meet the biological needs of GRSG and mule deer and to prevent the increase of invasive species, such as halogeton. Other treatments in the area have been focused on the control of noxious weeds and are still being continued throughout most of the PPA by government agencies and local weed conservation districts.

Other Relevant Management Activities

Current grazing management has been identified as a factor of riparian areas not meeting objectives on both BLM- and Forest Service-administered lands.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA that present opportunities for use as fuelbreaks. This would be to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Ruby Valley PPA
- CCC North Ruby Valley Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat and lek areas
- SR 229—Proposed linear fuelbreak along existing road designed to protect large expanses of 3B and 3C habitats and lek areas
- Highway 93—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat and lek areas

- North Valley Mountain—Proposed linear fuelbreak along existing road to protect large expanses of 3C habitat and existing ESR treatments
- Old Sprucemont Road—Proposed linear fuelbreak along an existing road to protect large expanses of 3C habitat and an existing lek
- South Valley Mountain Bend—Proposed linear fuelbreak along an existing road to protect large expanses of 3B and 3C habitat and habitat improvement projects

Priority Order 2 treatment areas

- NF-41—Proposed linear fuelbreak along existing road to protect 2B habitat and important brood rearing habitat

Priority Order 3 treatment areas

- NF-108—Proposed linear fuelbreak along existing road to protect 1A habitat and important brood rearing habitat

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify them where necessary.

See **Table 4-61** for a summary of miles of potential treatments in each priority order. See **Figure 4-16** for a graphic depiction of the proposed treatments and strategies in the Ruby Valley PPA.

Table 4-61
Ruby Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	61	2	2	65

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- Ruby Valley nonnative treatment: Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Valley Mountain—Removal of phase 1 pinyon-juniper in the Valley Mountain area

- Franklin River—Reestablish native plants in crested wheatgrass seedings using locally collected seed or seedlings located in 3C habitat
- East Humboldt—Pinyon-juniper removal and thinning in phases 1 and 2 areas on valley bottoms and alluvial fans next to East Humboldt Range
- Black Sage—Removal of phase 1 pinyon-juniper within two miles of the Black Sage lek complex
- Ruby Valley leks—Removal of phase 1 pinyon-juniper within two miles of the Ruby Valley lek complexes (no polygon)
- Ruby Valley riparian 1—Implement integrated vegetation management around riparian areas and springs, in possible conjunction with riparian fencing, pipelines, and troughs to expand the 3B and 3C riparian vegetation area (no polygon)

Priority Order 2 treatment areas

- Forest Service riparian improvement—Implement integrated vegetation management around riparian areas and springs in possible conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Egbert—Chemical treatment of cheatgrass in fire area, followed by native seed planting, priority for burned areas at risk of conversion to cheatgrass-dominated community located in 2B habitat
- Ruby Valley riparian 2—Implement integrated vegetation management around riparian areas and springs, in possible conjunction with riparian fencing, pipelines, and troughs to expand the 2B and 2C riparian vegetation area (no polygon)

In this PPA, land is primarily administered by the BLM, Forest Service, and BIA; the rest is privately owned. Through existing and future partnerships, there are opportunities to use a coordinated approach across these boundaries. State and federal agencies currently work across jurisdictional lines to accomplish landscape projects. The ability of the NRCS to work on private lands also allows for treatments to be coordinated across boundaries.

See **Table 4-62** for a summary of acres of potential treatments in each priority order. See **Figure 4-17** for a graphic depiction of the proposed treatments and strategies in the Ruby Valley PPA.

Table 4-62
Ruby Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	54,881	2,202	0	57,083
Percent of PPA	96	4	0	100

Fire Operations

In this PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. These areas are all but the high elevations in the Ruby and Humboldt Ranges and agriculture fields in the valley bottoms. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are 2B and 2C habitat.
- Priority Order 3 suppression zones are 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-63**. See **Figure 4-16** for a graphic depiction of the proposed treatments and strategies in the Ruby Valley PPA.

Table 4-63
Ruby Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	152,405	38,167	57,589	248,161
Percent of PPA	62	15	23	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. The Northeast Nevada Interagency Fire Program contains lands administered by the BLM, Forest Service, and BIA. Stations in and near the PPA are the Wells BLM station, the Jiggs, Ruby Valley, and Clover Valley VFDs, and the Ruby Lake USFWS station. Generally, response times in this PPA are rather short for both ground and aerial firefighting resources. Aerial resource flight times for the Elko BLM exclusive use helicopter or SEATs from Wells Air Base are less than 20 minutes. Ground resource response times from the nearest BLM fire stations to the PPA are anywhere from 30 to 60 minutes. Ruby Lake National Wildlife Refuge has one type-6 fire engine near the PPA, as well as resources at the Ruby Valley VFD.

Water sources are generally moderately available, with the most water being found on the western portion and becoming drier farther east and south in the PPA. Human-made water sources are available at Ruby Lake National Wildlife Refuge. Natural water sources are Ruby Lake and Franklin Lake. During drought years, these may need to be supplemented with stationed temporary/portable water sources. Agencies can continue to expand and maintain land use agreements with private property owners for water availability. There is a potential for stationing portable water sources at staging area near 3B and 3C habitat during periods of high fire danger.

In this PPA, the current BLM LUP/FMP does not allow for managing unplanned natural wildfire ignitions. However, the current Forest Service LRMP/FMP does allow for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response, to achieve land and resource management objectives. Opportunities for this type of management are in the upper elevations of the Ruby and East Humboldt mountains that are classified as 1B and 1C habitat with pinyon-juniper expansion. Decisions to manage wildfires for resource benefits are made on a case-by-case basis. They are based on the following:

- Evaluations of risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources, which also include managing volunteers. Maintenance of these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive species establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA, categorized as 1B and 1C habitats; the remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-64**.

Table 4-64
Ruby Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	152,405	38,167	57,589	248,161
Percent of PPA	62	15	23	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-65**.

Table 4-65
Ruby Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
CCC/North Ruby Valley Road fuelbreak	18 mi.	X						W			N	P		L1		0-5	0-2
Highway 229 fuelbreak	7 mi.	X						W			N	P		L1		0-5	0-2
Highway 93 fuelbreak	8 mi.	X						W			N	P		L1		0-5	0-2
Old Sprucemont Road fuelbreak	11 mi.	X						W			N	P		L1		0-5	0-2
North Valley Mountain fuelbreak	9 mi.	X						W			N	P		L1		0-5	0-2
South Valley Mountain Bend	8 mi.	X						W			N	P		L1		0-5	0-2
NF 41 Road fuelbreak	2 mi.		X					W			N	P		L1		0-5	0-2
NF 108 Road fuelbreak	2 mi.			X				W			N	P		L1		0-5	0-2

Table 4-65
Ruby Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Franklin River crested wheatgrass enhancement	15,246 acres	X				I					N	P		L1		0-5	3-5
Black sage pinyon-juniper removal	4,138 acres	X			C			W			N	P		L1		10-20	3-5
East Humboldt pinyon-juniper removal	19,044 acres	X			C			W			N	P		L1		10-20	5+
Valley Mountain pinyon-juniper removal	16,453 acres	X			C			W			N	P		L1		10-20	5+
Ruby Valley leks pinyon-juniper removal	(no acres)	X			C			W			N	P		L1		10-20	3-5
Ruby Valley riparian 1	(no acres)	X					R				N	P		L1		0-2	0-2
Egbert fire	2,202		X			I					N	P		L1		0-5	3-5
Forest Service riparian improvement	(no acres)		X				R				N	P		L1		0-2	0-2
Ruby Valley riparian 2	(no acres)		X				R				N	P		L1		0-2	0-2
Ruby Valley nonnative treatment	(no acres)	X				I					N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:

1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective

[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)

[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.9 Table Mountain/Hamlin Valley

Project Planning Area Description

General Site Description

The Table Mountain/Hamlin Valley PPA is in the Southeastern Nevada FIAT Assessment Landscape Area in Lincoln County in Nevada and Beaver and Iron Counties in Utah. The Table Mountain/Hamlin Valley focal habitat is composed of 580,408 acres, 525,362 acres (91 percent) of which is administered by the BLM, 35,080 acres (six percent) is private, and 19,966 acres (three percent) is administered by the States of Nevada and Utah. Elevations throughout the PPA generally range from 5,800 feet in the valley bottoms to 9,200 feet in the mountains. This area encompasses the Wilson Creek Range in Nevada, Indian Peak Range in Utah, and Hamlin Valley in both Nevada and Utah. Numerous springs and seeps commonly occur throughout the benches and higher elevations. Camp Valley Creek and Eagle Valley Creek are in the Table Mountain/Hamlin Valley PPA, which is the southernmost extent and distribution of GRSG habitat in Nevada.

Most of the 3B R&R habitat encompasses the lower elevations and benches in the PPA. The 3C habitat is restricted to the valley bottoms and 3A encompasses low to mid-elevations in the PPA. The 1A and 1B habitat encompasses the higher elevations. The 2A, 2B, and 2C habitats are along benches and the lowest portion of the valley in both Nevada and Utah.

See **Table 4-66**.

Table 4-66
Table Mountain/Hamlin Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	765	56,424	12,589	0	183,764	23,412	489	78,828	133,413	90,723
Percent of PPA	0	10	2	0	32	4	1	14	23	16

GRSG

<u>Nevada Leks</u>

This PPA is approximately 580,408 acres and has four lek complexes, consisting of nine active leks and three pending active leks. For 2014, total peak male count was 153, with two leks monitored as trend leks. Approximately 54 percent of peak male counts are associated with the Little Spring Valley complex in the southwestern part of the PPA, 33 percent are associated with the Hamlin Valley complex in the northeastern part of the PPA, with the remaining 13 percent being associated with the Table Mountain and Lake Valley complexes in the northwest part of the PPA.

Utah Leks

On the Utah portion of this PPA there are four occupied leks, with a ten-year average of 82 males. Approximately 65 percent of the ten-year average is associated with three leks in the southeastern portion of the PPA, with the remaining males associated with one lek in the northeastern part of the PPA.

Conifer expansion and degradation of riparian areas are major threats to GRSG in this PPA. Most leks are on the benches and in the higher elevations of Table Mountain. Distribution patterns and movements are typical of the Great Basin, with wintering and nesting habitat in the valley bottoms and along benches, and brood-rearing habitat in riparian areas at higher elevations. Although not documented, local biologists expect there is GRSG movement between the Nevada and Utah populations.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of basin sagebrush and Wyoming big sagebrush, as well as rabbitbrush. The sagebrush in some areas has limited herbaceous understory, but sagebrush seedlings are growing in the interspaces. Winterfat occurs in the valley bottoms, but in some areas is being overtaken by halogeton. The benches typically consist of black sagebrush, with pinyon-juniper expansion in high elevation mountain sage communities.

According to vegetation data, most of the PPA is categorized as woodland (57 percent) and big sagebrush shrubland (37 percent). SynthMap and GAP vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. In Utah, cheatgrass data was provided by the UDWR. Also, based on local knowledge, cheatgrass is in the understory, but is typically limited to areas with previous disturbance (burn scars) and along roadsides. Noxious weeds, such as musk thistle, scotch thistle, Dalmatian toadflax, spotted knapweed, puncturevine, diffuse knapweed, and bull thistle are found typically along roads and previously disturbed areas. See **Table 4-67**.

Table 4-67
Table Mountain/Hamlin Valley Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	216,332	11,970	871	2,772	12,920	2,919	328,295	4,029
Percent of PPA	37	2	0	0	2	0	57	1

Source: SynthMap [2008]

Fire

There is high fire occurrence in this PPA. Since 1999, there have been 185 fires that burned approximately 62,000 acres. The largest, the Coyote fire, burned 15,716 acres in 2000. Of the 185 fires, 17 have burned more than 100 acres. Most of the fires were caused by lightning.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring departure from the fire regime. Fire regimes in the Table Mountain/Hamlin Valley habitat PPA are as follows: 53 percent in fire regime III, 46 percent in fire regime IV, and the remainder in the other fire regimes. Three condition classes are present: 65 percent in condition class III, 30 percent in condition class I, and five percent in condition class II. The fire regime is altered primarily due to conifer expansion and invasive annual grasses. See **Table 4-68**.

Table 4-68
Table Mountain/Hamlin Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	571,705
High and very high burn probability in PPA (percent)	99

Existing Treatments

Extensive ESR treatments exist in the PPA due to the high fire occurrence. There are several past fuels management projects that have improved GRSG habitat by means of conifer removal in encroached and expanding areas. Major emphasis is placed on returning these sites to sagebrush for GRSG use. In Nevada, watershed assessments have already been completed and identified projects to improve GRSG habitat. Treatments are being implemented throughout Lake Valley and Hamlin Valley in both Nevada and Utah. Initial monitoring of these projects is showing positive results. Maintenance of these projects will be essential to keep meeting GRSG habitat objectives. In Nevada, NEPA analysis is completed for the Meadow Spring and Middle Spring corridors for removing phases 1 and 2 pinyon-juniper. These are part of the Hamlin Valley Habitat Improvement Project. In Utah, NEPA analysis is completed for the Hamlin Valley Vegetative Enhancement Project (192,253 acres) to remove phase 1 and 2 pinyon-juniper, to create fuelbreaks, and to create seral class diversity in shrub-steppe.

Other Relevant Management Activities

The Eagle HMA encompasses the Table Mountain/Hamlin Valley PPA and current numbers have been attributed to damage to springs and seeps. This area has been historically overgrazed, degrading seeps, springs, and perennial herbaceous vegetation throughout the PPA.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA that present opportunities for use as fuelbreaks. The purpose is to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Table Mountain/Hamlin Valley PPA
- West Hamlin—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3C habitat
- Camp Valley—Proposed linear fuelbreak along an existing road designed to protect two active leks located in 3B habitat
- Spanish George—Proposed linear fuelbreak along existing roads designed to protect of 3C and 3B habitat
- Atchison Creek—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B habitat
- Meadow Spring—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B habitat

Priority Order 3 treatment area

- Cedar Flat—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat outside of the BBD

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify the fuelbreaks, where necessary.

See **Table 4-69** for a summary of miles of potential treatments in each priority order. See **Figure 4-18** for a graphic depiction of the proposed treatments and strategies in the Table Mountain/Hamlin Valley PPA.

Table 4-69
Table Mountain/Hamlin Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	55	0	44	99

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations, as follows:

Priority Order 1 treatment areas

- Table Mountain-Hamlin Valley nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Table Mountain-Hamlin Valley leks—Phase I conifer removal in phases I and 2 within two miles of leks (no polygon)
- Nevada-Utah Hamlin Bench 1—Conifer phases I and 2 removal and thinning on valley bottoms, alluvial fans, and benches. NEPA analysis is completed on the Utah side, authorizing implementation
- Meadow Valley Wash—Conifer phases I and 2 removal and thinning on valley bottoms, alluvial fans, benches
- Table Mountain-Hamlin Valley riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Hamlin Valley GRSG treatments—Assess and treat cheatgrass and reestablished native plants in Hamlin Valley GRSG restoration treatments in 3B and 3C habitats
- Meadow Valley Wash seedings—Assess and reestablish native plants in crested wheatgrass seedings in 3B habitat

Priority Order 2 treatment areas

- Table Mountain-Hamlin Valley riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Cave and Lake A-2—Conifer phases I and 2 removal and thinning, hand cutting, and prescribed burn
- Hamlin Valley corridors—Create corridors connecting nesting to summer habitat from Hamlin Valley, Nevada, to Table Mountain. Use expertise of local biologists and site visits (no polygon)
- Cave and Lake S-10—Conifer phases I and 2 removal and thinning on the bench in Lake Valley and create a corridor from nesting to summer habitat from Lake Valley to Table Mountain; NEPA analysis in progress
- Table Mountain—Conifer phases I and 2 removal and thinning in summer habitat
- Nevada-Utah Hamlin Bench 2—Conifer phases I and 2 removal and thinning on valley bottoms, alluvial fans, benches. NEPA analysis is completed on the Utah side, authorizing implementation

- Middle Spring Corridor—Create corridor connecting Hamlin Valley to Pine Valley
- West Pine Valley— Removal of phases 1 and 2 conifers along valley bottoms and alluvial fans

Priority Order 3 treatment areas

- Coyote wildfire areas—Assess for cheatgrass establishment and potential reestablishment of native plants, using locally collected seed and seedlings; Treatment would reconnect habitats greater than 25 percent sagebrush cover across the landscape in 2A and 2B habitats
- Table fire—Assess wildfire for cheatgrass establishment and potential reestablishment of native plants, using locally collected seed and seedlings in 2B habitat
- White Rock fire—Assess for cheatgrass establishment and potential reestablishment of native plants using locally collected seed and seedlings; monitor sagebrush establishment in the fire perimeter; treatment would connect two habitats of greater than 25 percent sagebrush cover over the landscape in 1A, 2A, 3A, and 2B habitats
- Eagle fire—Assess for cheatgrass establishment and potential reestablishment of native plants, using locally collected seed and seedlings in 1A, 2A, and 3A habitats; this fire provides a corridor between two BBD areas surrounded mainly by phase 3 pinyon-juniper; establishing sagebrush in this fire will support long-term movement corridors for GRSG
- Buster fire—Assess for cheatgrass establishment and potential reestablishment of native plants, using locally collected seed and seedlings in 1A, 2A, 3B and 3A habitats
- Table Mountain-Hamlin Valley riparian 3—Implement integrated vegetation management around riparian areas and springs in 1A, 2A, and 3A, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- South Hamlin Valley seedings—Assess and reestablish native plants in crested wheatgrass seedings; moved to priority 3 treatment, based on telemetry data and local information; these systems are currently functioning as breeding and nonbreeding habitat (no polygon)
- Paradise fire—Assess for cheatgrass establishment and potential reestablishment of native plants, using locally collected seed and seedlings in 1A, 2A, and 3A habitats

- Arrowhead corridor—Create corridor connecting Hamlin Valley to Pine Valley

In this PPA, land is predominantly administered by the BLM and is owned by states and private entities. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. See **Table 4-70** for a summary of acres of potential treatments in each priority order. See **Figure 4-19** for a graphic depiction of the proposed treatments and strategies in the Table Mountain/Hamlin Valley PPA.

Table 4-70
Table Mountain/Hamlin Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	130,199	110,611	55,887	296,697
Percent of PPA	44	37	19	100

Fire Operations

Large fires have occurred in this PPA in recent years, and there are large continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. In years with heavy invasive annual grass fuel loading, the risk of large fires increases exponentially. Therefore, it is not surprising that 99 percent of the PPA is ranked as having high/very high burn probability. Due to this, priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are 2B and 2C habitat.
- Priority Order 3 suppression zones are 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-71**. See **Figure 4-18** for a graphic depiction of the proposed treatments and strategies in the Table Mountain/Hamlin Valley PPA.

Table 4-71
Table Mountain/Hamlin Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	305,697	10,600	264,111	580,408
Percent of PPA	53	2	45	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Generally, response times to this PPA by Nevada resources are 10 minutes for aviation from Panaca. Aerial firefighting resources (SEATs, smokejumpers, a helicopter with bucket and crew) can respond to any point in the planning area from either Panaca or Ely. SEAT bases can be set up in Panaca, Mesquite, and Ely for fast response in times of high fire danger. Ground resources responding from either the BLM Pony Springs Station or the BLM Caliente Station would generally take anywhere from a few minutes to approximately one hour. Response times to this PPA by Utah resources are 25 minutes for aviation and over two hours for ground resources. To improve fire response time during lightning activity, stationing firefighting resources closer to first priority suppression areas is recommended.

In addition, there is a potential for stationing water sources at designated staging areas in the northern portion of the PPA. The standpipe at Pony Springs BLM fire station can be used for suppression in the northern portion of this PPA.

In the Nevada portion of this PPA, current Ely BLM LUP/FMP allows for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response to achieve land and resource management objectives. However, the Cedar City BLM LUP/FMP does not allow for the management of unplanned natural ignitions in the Utah portion of this PPA. In Nevada, decisions to manage wildfires for resource benefits are made on a case-by-case basis. They are based on the following:

- Evaluations of risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also include the management of volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.

- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA, categorized as 1B and 1C habitats; the remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-72**.

Table 4-72
Table Mountain/Hamlin Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	305,697	10,600	264,111	580,408
Percent of PPA	53	2	45	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-73**.

Table 4-73
Table Mountain/Hamlin Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Table Mountain-Hamlin Valley leks pinyon-juniper removal	No Acres	X			C			W			N	P		L1		10-20	3-5

Table 4-73
Table Mountain/Hamlin Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
West Hamlin fuelbreak	13 mi.	X						W			N	P		L1		0-5	0-2
Camp Valley fuelbreak	15 mi.	X						W			N	P		L1		0-5	0-2
Meadow Spring fuelbreak	7 mi.	X						W		C		P		L1		0-5	0-2
Atchison Creek fuelbreak	8 mi.	X						W		C		P		L1		0-5	0-2
Spanish George fuelbreak	12 mi.	X						W		C		P		L1		0-5	0-2
Cedar Flat Fuelbreak	44 mi.			X				W			N	P		L1		0-5	0-2
Hamlin Valley GRSG treatment	14,531	X				I					N	P		L1		0-5	3-5
Meadow Valley Wash seedings	9,017	X				I					N	P		L1		0-5	3-5
Meadow Valley Wash pinyon-juniper removal	45,376	X			C			W			N	P		L1		10-20	5+
Nevada-Utah Hamlin Bench pinyon-juniper removal 1	61,274	X			C			W		C		P		L1		10-20	5+
Table Mountain pinyon-juniper removal	11,219		X		C			W		C		P		L1		10-20	5+

Table 4-73
Table Mountain/Hamlin Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Cave and Lake S-10 pinyon-juniper removal	11,632		X		C			W		C		P		LI		10-20	5+
Cave and Lake A-2 pinyon-juniper removal	3,300		X		C			W		C		P		LI		10-20	3-5
NV-UT Hamlin Bench pinyon-juniper removal 2	84,460		X		C			W		C		P		LI		10-20	5+
Coyote wildfire area seeding	22,432			X		I					N	P		LI		0-5	3-5
Table fire seeding	8,643			X		I					N	P		LI		0-5	3-5
Eagle fire 2002 seeding	8,528			X		I					N	P		LI		0-5	3-5
Buster fire 2002 seeding	4,402			X		I					N	P		LI		0-5	3-5
White Rock fire seeding	6,250			X		I					N	P		LI		0-5	3-5
Paradise fire seeding	5,632			X		I				C		P		LI		0-5	3-5
Table Mountain-Hamlin Valley riparian 1	No Acres	X					R				N	P		LI		0-2	0-2
Table Mountain-Hamlin Valley riparian 2	No Acres		X				R				N	P		LI		0-2	0-2

Table 4-73
Table Mountain/Hamlin Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Table Mountain-Hamlin Valley riparian 3	No Acres			X			R				N	P		L1		0-2	0-2
Hamlin Valley Corridor pinyon-juniper removal	No Acres		X		C						N	P		L1		10-20	3-5
South Hamlin Valley Seedings	No Acres			X		I				C		P		L1		0-5	3-5
Middle Spring Corridor pinyon-juniper removal	No Acres		X		C					C		P		L1		10-20	3-5
Arrowhead Corridor pinyon-juniper removal	No Acres			X	C					C		P		L1		10-20	3-5
West Pine Valley pinyon-juniper removal	No Acres		X		C					C		P		L1		10-20	3-5
Table Mountain-Hamlin Valley nonnative treatment	(no acres	1									N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.10 Cortez

Planning Area Description

Geographic Overview

The Cortez PPA is in Eureka County, Nevada, in the Central Great Basin Assessment Area. It is composed of 71,010 acres, 65,563 acres (92 percent) of which is administered by the BLM and 5,447 acres (eight percent) are private lands.

This area encompasses the southern end of the Cortez Range and portions of Crescent Valley and Pine Valley. The Cortez Range is oriented southwest to northeast and is a typical mountain type of the Great Basin. There are several perennial streams that occur through the PPA; however, most are severely degraded due to grazing from feral horses, coupled with permitted livestock grazing. Springs and seeps commonly occur throughout most of the mountain ranges, but most are not meeting riparian health objectives. Elevations throughout the PPA generally range from 4,800 feet in valley bottoms to approximately 8,600 feet.

Most of the habitat contained in the Cortez PPA is categorized as 2B and is generally found throughout mid- to high mountain elevations. The valley bottoms and toe slopes of the Cortez Mountains are composed of 3A, 3C, and 2C habitats. The remaining 1A, 1B, and 2A habitats are at the uppermost elevations of Mount Tenabo and the Fourmile Canyon area. However, historic overuse by cattle and horses has likely compromised the R&R of these upper elevations sites. Continued abusive grazing practices could cause vegetation communities to cross a threshold and shift these areas to invasive annual grass-dominated sites following any future disturbances. See **Table 4-74**.

Table 4-74
Cortez Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	1,514	729	6,877	0	753	40,059	7,627	0	8,962	4,490
Percent of PPA	2	1	10	0	1	56	11	0	13	6

GRSG

This PPA has one lek complex consisting of two active leks. For 2014, total peak male count was 89, with one lek monitored as a trend lek. The peak male counts are almost evenly distributed between the two leks, which are on the eastern side of the Cortez Range along east-facing benches.

The biggest threats to GRSG in this PPA are invasive annual grass-wildfire cycle, past and present grazing practices (livestock coupled with feral horses), and mining exploration expanding to development. GRSG populations were dramatically reduced following the fires of 1999 and 2000. Large areas are still fragmented due to the limited amount of post-fire sagebrush regrowth.

Seasonal GRSG movements are typical of the Great Basin, with birds nesting near leks on mountain benches, brood-rearing habitat occurring along riparian corridors throughout the Cortez Range in the mid- to upper elevations, and winter habitat found along the mountain bench near lek areas.

Vegetation

Vegetation in the PPA generally consists of valleys of salt desert scrub that transitions to communities of Wyoming big sagebrush, intermixed with basin big sagebrush in alluvial fans, as well as areas of rabbitbrush. Mountain bench vegetation consists of low sagebrush along ridgetops and Wyoming sagebrush occurring regularly through mid-elevation areas. Vegetation in the upper elevations above 6,000 feet generally consists of mountain big sagebrush, intermixed with low sagebrush. Isolated patches of aspen also exist in upper elevations along riparian areas. The very south end of the PPA includes areas of conifer woodlands, consisting of pinyon-juniper. These woodlands can be found in Mill Canyon and Fourmile Canyon and on portions of Mount Tenabo.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass is largely present in most of the low- to mid-elevations of the PPA. It is specifically found in previously burned areas and areas near water sources that have been heavily grazed over the past several decades. Previous fires in the PPA are now predominantly perennial grasslands, mixed with cheatgrass at lower elevations. Limited sagebrush recovery has taken place in the low- to mid-elevations, with moderate recovery taking place in the upper mountain sagebrush communities. Russian thistle, tumble mustard, and clasping pepperweed can also be found throughout the lower elevations burned areas, specifically in Crescent Valley.

Both lentic and lotic riparian resources were severely degraded in 2014 by approximately 2,500 feral horses, coupled with permitted livestock grazing. Aerial observations of these areas during spring 2014 showed that most drainage bottoms were composed of cheatgrass and other invasives, such as scotch thistle. Also, areas around springs were mainly bare ground with very little residual riparian vegetation and signs of severe watershed damage. See **Table 4-75**.

Table 4-75
Cortez Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	29,826	18,821	653	2,122	307	2,413	5,045	11,761
Percent of PPA	42	27	1	3	0	3	7	17

Source: SynthMap [2008]

Fire

The PPA was heavily impacted by wildfire in 1999 and 2000, which burned a total of 18,785 acres. Twenty-five percent of the planning area has experienced wildfire since 1999. The largest fire occurred in 2000 and burned over 14,000 acres. Before 1999, this area had very limited fire history, and fires were small in extent. The future fire risk is high due to the conversion of cheatgrass and areas of heavy sagebrush, with an understory of invasive annual grasses. The burn probability map indicates nearly all of the planning area is categorized as either high or very high.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Cortez PPA are as follows: 60 percent in fire regime III, 35 percent in fire regime IV, five percent in fire regime V, and the remainder in other fire regimes. All condition classes are present, with 17 percent in condition class II, 81 percent in condition class III, very little in condition class I; the remainder is not classified.

See **Table 4-76**.

Table 4-76
Cortez Summary of Burn Probability

High and very high burn probability in PPA (acres)	70,397
High and very high burn probability in PPA (percent)	99

Existing Treatments

ESR seeding have occurred over approximately 10,000 acres of the PPA following the 1999 and 2000 fire season. Treatment types consisted of aerial seeding of nonnative and native species to impede cheatgrass expansion and stabilize sites. The establishment of forage kochia in portions of the burned area was excellent, and is suppressing cheatgrass. However, very little sagebrush has returned to these burned areas, and it is not likely to return due to the extent of cheatgrass in the understory. The burned areas have not been properly managed for livestock grazing (including feral horses), and many acres remain at risk of being converted to monocultures of cheatgrass.

Other treatments in the area have been focused on controlling noxious weeds, and government agencies and local weed conservation districts are continuing this is continuing throughout most of the PPA.

Other Relevant Management Activities

Mineral exploration and mining development continues in the southern portion of the PPA, further fragmenting important intact sagebrush habitat.

Staff from the Elko BLM completed a feral horse census in summer 2014; horse numbers were documented at 2,445. These horses are privately owned, although very few of them have brands and are legally the responsibility of the State of Nevada. BLM staff observed horses intermixed with cattle near water sources and documented signs of severe overuse.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features. These features in the PPA present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Cortez PPA
- East Cortez—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C and 3B habitats; the area has a history of large fires, leading to fuelbreak design going outside of the PPA to protect intact sagebrush habitat that birds also use
- West Cortez—Proposed linear fuelbreak along existing roads designed to protect large expanses of 2B and 3B habitats

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatment where necessary.

See **Table 4-77** for a summary of miles of potential treatments in each priority order. See **Figure 4-20** for a graphic depiction of the proposed treatments and strategies in the Cortez PPA.

Table 4-77
Cortez Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	9	0	0	9

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations, as follows:

Priority Order 2 treatment areas

- Cortez nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Beowawe—Sagebrush seed collection, seedling grow out, and island planting in the 2000 Beowawe fire area, located in 2B habitat

Priority Order 3 treatment area

- Buckhorn 2 fire—Sagebrush seed collection, seedling grow out, and island planting in the 1996 Buckhorn 2 fire area, located in 1B and 2B habitats

In this PPA, the land is administered by the BLM and is in private hands. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-78** for a summary of acres of potential treatments in each priority order. See **Figure 4-21** for a graphic depiction of the proposed treatments and strategies in the Cortez PPA.

Table 4-78
Cortez Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	0	14,242	2,381	16,623
Percent of PPA	0	86	14	100

Fire Operations

In this PPA, there are large continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. Because of this, 100 percent of this PPA is ranked as having high/very high burn probability. The priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are 3B and 3C habitat and areas where sagebrush communities have successfully reestablished through seedings or other rehabilitation investments
- Priority Order 2 suppression zones 2B and 2C habitat
- Priority Order 3 suppression zones 1B and 1C habitats and areas where management strategies are designed to reconnect habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-79**. See **Figure 4-20** for a graphic depiction of the proposed treatments and strategies in the Cortez PPA.

Table 4-79
Cortez Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	20,968	42,700	7,342	71,011
Percent of PPA	30	60	10	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Generally, response times from the Elko or Carlin BLM stations, which are nearest to this PPA, are anywhere from one to two hours. VFDs are also next to the PPA in Crescent Valley.

During fire season, aircraft can respond within 30 minutes due to the location of multiple air tanker, helicopter, and smokejumper bases in Eureka, Battle Mountain, and Elko. The Elko Regional Airport hosts an exclusive use Type 3 helicopter and air attack platform which can greatly improve response time throughout the entire PPA. In addition, the Battle Mountain Air Tanker Base hosts SEATs throughout the summer and could easily respond to any fires in the PPA.

Other resources are trained mine personnel from the Cortez Mining District. This includes available equipment, such as dozers and water tenders that are next to the PPA and would work with on-scene incident commanders. Stationing resources in Crescent Valley and or Carlin, Nevada, during periods of high fire activity would be warranted. The Elko Regional Airport could also be used as a temporary SEAT base during times of high fire danger.

Limited water sources are an issue in this PPA. Frenchie Creek, Sodhouse Creek, and nearby mining operations at the south end of the Cortez Range have available water that could be used to help meet suppression needs. There is a potential for increased water availability by installing helicopter refill wells or water storage tanks and for decreased response time by stationing resources or staffing remote stations.

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting post-fire invasive annual grass establishment in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-80**.

Table 4-80
Cortez Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	20,968	42,700	7,342	71,011
Percent of PPA	30	60	10	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-81**.

Table 4-81
Cortez Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
East Cortez fuelbreak	21 mi.	X						W			N	P		LI		0-5	0-2
West Cortez fuelbreak	8 mi.	X						W			N	P		LI		0-5	0-2

Table 4-81
Cortez Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Beowawe fire seeding	14,242		X			I					N	P		L1		0-5	3-5
Buckhorn 2 fire seeding	2,381			X		I					N	P		L1		0-5	3-5
Cortez nonnative treatment	(no acres)	X				I					N	P		Li		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.11 Cherry Creek

Project Planning Area Description

Geographic Overview

The Cherry Creek PPA encompasses central and northern portions of Butte Valley and the northern Steptoe Valley. It also includes portions of the Cherry Creek and Medicine Ranges in Elko and White Pine Counties. The PPA totals 427,668 acres in size, 97 percent of which is under BLM jurisdiction and three percent a mix of BIA-administered lands and private lands.

Elevations throughout the PPA range from 5,800 feet at the valley bottom near Currie to over 10,000 feet on the peaks of the Cherry Creek Range. The latter has a typical basin and range orientation of north to south.

The area is relatively dry and is limited to scattered springs and seeps throughout the PPA. Stream riparian habitat is minimal, with only McDermid Creek and Taylor Canyon as major drainages. Odgers and Phalen Creeks at the base of the mountain ranges provide the important habitat component of outflow. Riparian areas are not meeting riparian health objectives, with the exception of some areas excluded from livestock and wild horse use. These large BLM-developed exclosures can be found in the upper portions of the

Currie Allotment in upper Taylor Canyon, Cottonwood Canyon, and along Odgers Creek in Butte Valley. Some of these exclosures are consistently breached by livestock and are not meeting riparian health objectives.

Most of the 3C and 3B habitat encompasses the valley bottoms and low-lying hills and comprises the bulk of the habitat in the PPA. The 3A areas in the PPA are made of higher elevation conifer woodlands on east-facing slopes. Cheatgrass is not likely to be dominant or a serious threat on these sites due to the increased elevation and precipitation.

The higher elevations of the Cherry Creeks, Medicine Range, and the northern Butte Range contain the remaining 2A, 2B, 1A, 1B, and 1C habitats. See **Table 4-82**.

Table 4-82
Cherry Creek Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,769	1,792	4,512	871	6,892	42,992	25,448	143	18,549	48,828
Percent of PPA	7	7	4	0	2	3	0	7	50	22

GRSG

This PPA has five lek complexes, consisting of nine active and one pending active lek. For 2014, total peak male count was 246, with five leks being monitored as trend leks. About 20 percent of the peak male counts occur at two leks at the north end of Steptoe Valley; the rest of the birds use leks at mountain bench and valley locations in both North Steptoe and Butte Valley.

The upper elevations of the Cherry Creek Range provide most of the brood-rearing habitat; however, lower elevation riparian areas associated with large spring complexes on both public and private lands also provide important brood rearing habitat. Radio telemetry studies also show that there is connectivity between the North Steptoe and Butte Valley PPAs. However, continued pinyon-juniper expansion has significantly reduced the size and number of corridors that provide this connectivity.

Vegetation

The area is typified by large intact sagebrush communities throughout valley bottoms, consisting of mainly Wyoming sagebrush and rabbitbrush, with basin big sagebrush in the drainages and swales. Mountain benches in the area are typically dominated by black sagebrush, with little to no herbaceous understory. Salt desert scrub communities are found at the lowest elevations of the PPA in the vicinity of Currie, while large tracts of winterfat are in Butte Valley near the White Pine and Elko County line.

Woodland habitats and conifer expansion can be found along the toe slopes and mid-elevation areas of the Cherry Creek and Medicine Ranges, with mixed conifer forests at the higher elevations on north- and east-facing slopes. Mountain mahogany is also dispersed throughout the upper elevations of the Cherry Creeks and is generally found mixed with other mountain shrub species. Aspen stands occur along major drainages and at higher elevations in the Cherry Creek Range as well as snow bank areas.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, invasive plant species (including cheatgrass and halogeton) are limited to disturbed areas. Noxious weeds, such as hoary cress, musk thistle, Canada thistle, tall whitetop, bull thistle, and scotch thistle, are also present in the PPA, predominantly along roadsides and previous areas of disturbance.

Large areas of crested wheatgrass have been developed next to ranches on public and private lands. The BLM has made some of the more recent seedings (1980s and 1990s) to modify livestock grazing in mountainous areas and to improve riparian habitats for wildlife, including GRSG. See **Table 4-83**.

Table 4-83
Cherry Creek Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	182,162	98,447	1,455	903	4,687	15,305	120,487	4,059
Percent of PPA	43	23	0	0	1	4	28	1

Source: SynthMap [2008]

Fire

Fire occurrence throughout the PPA has been low over the last 40 years, with the largest fires occurring before 1999. Since then, 21,339 acres have burned in five percent of this PPA. The largest fire was in 2000 and burned nearly 8,500 acres. As is typical, higher elevation fires have responded positively to fire, while lower and mid-elevations impacted by fire can have a high occurrence of cheatgrass.

Fire regimes have been altered due to a lack of fire. The fire occurrence is low; in 2013 a fire was managed for resource benefit. Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Cherry Creek PPA are as follows: 46 percent in fire regime III, 35 percent in fire regime IV, 19 percent in fire regime V, and the rest in other fire regimes. Three condition classes are largely present, with 13 percent in condition class I, 15 percent in condition class II, 71 percent in condition class III, and the rest not being classified. See **Table 4-84**.

Table 4-84
Cherry Creek Summary of Burn Probability

High and very high burn probability in PPA (acres)	333,330
High and very high burn probability in PPA (percent)	71

Existing Treatments

Previous treatments have been focused on three different areas: fuels treatments associated with the WUI near the town of Cherry Creek, crested wheatgrass seeding associated with grazing management, and some ESR associated with the more recent fires in the Medicine, Butte, and Cherry Creek Ranges. Government agencies and local weed conservation districts are continuing weed control throughout the PPA.

Other Relevant Management Activities

Grazing management continues to be an area of concern, especially related to riparian areas. Exclosures constructed to keep livestock off important riparian areas are continually breached on the northeast portion of the Cherry Creek Range.

Two wild horse HMAs are in the PPA. The crest of the Cherry Creek Range separates the Maverick Medicine HMA to the west and the Antelope Valley HMA to the east. Both HMAs are over AML, and habitat damage has been documented in relation to this.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features that exist in the PPA that present opportunities for use as fuelbreaks to slow fire progression across largely 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Cherry Creek PPA
- West Taylor—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B and 3C habitat on the very northern end of the PPA
- Butte Valley Loop—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B habitat

- Butte Mountain—Proposed linear fuelbreak along an existing road designed to protect 3B habitats and the Butte Fire rehabilitation treatments
- Middle Butte Valley—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B and 3C habitat
- Medicine Range—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitat, past ESR treatments, and future habitat restoration projects
- West Cherry Creek—Proposed linear fuelbreak along an existing road designed to protect the Cherry Creek Range (Primarily 3B, and 3C habitats)

Priority Order 2 treatment area

- East Taylor Canyon—Proposed linear fuelbreak along an existing road designed to protect large expanses of 3B and 1A habitats on the very northern end of the PPA

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary. See **Table 4-85** for a summary of miles of potential treatments in each priority order. See **Figure 4-22** for a graphic depiction of the proposed treatments and strategies in the Cherry Creek PPA.

Table 4-85
Cherry Creek Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	123	7	0	130

Habitat Restoration and Recovery
The opportunities for habitat restoration treatments in the PPA have been determined using the following R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Cherry Creek nonnative Treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Cherry Creek leks—Remove phases 1 and 2 pinyon-juniper within two miles of the Butte Valley and East Valley leks (no polygon)
- East Medicine Bench—Remove/thin pinyon-juniper in phase 1 and 2 areas on valley bottoms and alluvial fans next to East Medicine Range

- Cherry Creek Basin—Remove/thin conifers in phase 1 and 2 areas in summer habitats
- Cherry Creek Basin riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Cherry Creek Bench—Remove/thin pinyon-juniper in phase 1 and 2 areas on valley bottoms and alluvial fans adjacent to Cherry Creek Range (bench areas)
- Snow Creek Seeding—Reestablish native plants in crested wheatgrass seeding using locally collected seed or seedlings in 3B habitat
- Butte fire—Assess fire rehabilitated areas, such as the Butte fire acreage, for possible cheatgrass invasion and reestablishment of native plants in 3B habitat
- Butte Mountain Bench—Remove/thin pinyon-juniper in phase 1 and 2 areas on valley bottoms and alluvial fans next to Butte Mountain Bench
- Odgers riparian restoration—Complete passive and active restoration along Odgers creek through livestock grazing management and wild horse exclusion in 3B habitats

Priority Order 2 treatment areas

- Cherry Creek WUI—Assess and strategically treat cheatgrass in 2A and 2B habitats
- Cherry Creek Basin riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- High Bald Peaks—Remove/thin conifers in phase 1 and 2 areas in summer habitats in the Medicine Range (High Bald Peak)

Priority Order 3 treatment area

Medicine Range corridors—Assess creating or enhancing corridors from nesting to summer habitat in the Medicine Range (no polygon); in this PPA, landownership is shared by the BLM, BIA, and private entities. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-86** for a summary of acres of potential treatments in each priority order. See **Figure 4-23** for a graphic depiction of the proposed treatments and strategies in the Cherry Creek PPA.

Table 4-86
Cherry Creek Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	82,377	20,481	0	102,859
Percent of PPA	80	19	0	100

Fire Operations

In this PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones areas of 2B and 2C habitat.
- Priority Order 3 suppression zones areas of 1A, 1B, 1C, 2A, and 3A habitats

See **Table 4-87**. See **Figure 4-22** for a graphic depiction of the proposed treatments and strategies in the Cherry Creek PPA.

Table 4-87
Cherry Creek Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	314,506	10,824	102,338	427,668
Percent of PPA	74	3	24	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. The area has shared jurisdiction between the Ely District BLM and the Northeast Nevada Interagency Fire Program. Station locations are quite distant in Wells and Ely, with a VFD in Ruby Valley. This PPA is fairly remote; response times are 30 minutes for aviation resources and exceed 60 minutes for ground resources in most locations. To address lightning-started fires, stationing both ground and aerial resources could enhance suppression capabilities.

Additionally, the Bald Mountain mine is next to this PPA. The BLM trains the mine's heavy equipment operators in fire suppression so that they can quickly respond. Additionally the Wells Airport hosts SEATs for part of the summer. The USFWS also maintains an engine at Ruby Lake National Wildlife Refuge.

Water for fire suppression can be found in ponds associated with large springs scattered throughout the area, generally on private lands. Water sources for fire suppression are at Paris Ranch, Stratton Ranch, and Odger's Spring.

In this PPA, the Ely BLM LUP/FMP allows for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response. This is to achieve land and resource management objectives in the Cherry Creek Mountains. The potential for managing natural fires exists in upper elevations to meet GRSG management objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis; they are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes the management of volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be in 2B and 2C habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-88**.

Table 4-88
Cherry Creek Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	84,555	56,803	12,437	153,796
Percent of PPA	74	3	34	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-89**.

Table 4-89
Cherry Creek Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
West Taylor Canyon fuelbreak	3 mi.	X						W			N	P		L1		0-5	0-2
Butte Valley fuelbreak	40 mi.	X						W			N	P		L1		0-5	0-2
Middle Butte Valley fuelbreak	16 mi.	X						W			N	P		L1		0-5	0-2
Butte Mountain fuelbreak	7 mi.	X						W			N	P		L1		0-5	0-2
Medicine fuelbreak	15 mi.	X						W			N	P		L1		0-5	0-2
East Taylor Canyon fuelbreak	7 mi.	X						W			N	P		L1		0-5	0-2
West Cherry Creek fuelbreak	42 mi.	X						W			N	P		L1		0-5	0-2
Snow Creek seeding	4,171	X				I					N	P		L1		0-5	3-5
Butte fire	5,802 acres	X				I					N	P		L1		5	0-2

Table 4-89
Cherry Creek Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Cherry Creek Basin riparian 1	(no acres)	X					R				N	P		LI		0-2	0-2
Cherry Creek Bench pinyon-juniper removal	35,341 acres	X			C			W			M	P		LI		10-20	5+
East Medicine Bench pinyon-juniper removal	11,054 acres	X			C			W			M	P		LI		10-20	5+
Cherry Creek Leks pinyon-juniper removal	(no acres)	X			C			W			M	P		LI		10-20	3-5
Butte Mountains pinyon-juniper removal	5,126 acres	X			C			W			M	P		LI		10-20	3-5
Cherry Creek Basin pinyon-juniper removal	14,422 acres	X			C			W			N	P		LI		10-20	5+
Odgers riparian restoration	6,462 acres	X					R				N	P		LI		0-2	0-2
Cherry Creek WUI	11,837 acres		X			I					N	P		LI		0-5	3-5
High Bald Peaks pinyon-juniper removal	8,645 acres		X		C			W			N	P		LI		10-20	3-5
Cherry Creek Basin riparian 2	(no acres)		X				R				N	P		LI		0-2	0-2
Medicine Range Corridors pinyon-juniper removal	(no acres)			X	C			W			N	P		LI		10-20	3-5

Table 4-89
Cherry Creek Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Cherry Creek nonnative treatment	(no acres)	X				I					N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.12 Egan South Butte

Project Planning Area Description

Geographic Overview
The Egan South Butte PPA is in White Pine County, Nevada. It is composed of 422,527 acres, 399,046 (94 percent) of which is administered by the BLM, 22,830 acres (five percent) is private, and 652 acres (less than one percent) is administered by the BIA. Elevations throughout the PPA generally range from 6,000 feet in the valley bottom to 10,100 feet in the mountains. This area encompasses the southern portion of Butte Valley, with the Butte Mountains to the west, the Cherry Creek Range to the north, and the Egan Range to the east. The PPA also extends east over the Egan Range to incorporate the western bench of Steptoe Valley. Most springs and seeps are in the higher elevations.

In the lower elevations of Butte Valley are 3B and 3C R&R habitats, with 2A, 2B, and 2C habitats encompassing the benches and mid-slope mid-elevation areas in the PPA. The 1A, 1B, and 1C habitats encompass the higher elevations of the PPA. See **Table 4-90**.

GRSG
This PPA has five lek complexes, consisting of 11 active leks and one pending active lek. For 2014, total peak male count was 215, with 4 leks monitored as trend leks. Approximately 63 percent of peak male counts are associated with

Table 4-90
Egan South Butte Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	25,807	30,051	17,708	0	29,776	46,259	235	34,170	127,031	111,490
Percent of PPA	6	7	4	0	7	11	0	9	31	26

the South Butte Valley Lek Complex on the western side of the Egan Range. The fewest number of males are associated with the lek complexes on the eastern side of the Egan Range (Egan Bench 12 percent and Dry Canyon 5.5 percent).

Conifer expansion is a major threat to GRSG in the lower and higher elevations of this PPA. Leks occur along benches and in valley bottom areas. Distribution patterns and movements are typical of the Great Basin, with wintering and nesting in the valleys and along benches, and brood-rearing at the higher elevations. The birds in Steptoe and Butte Valleys typically move to summer brood-rearing habitat on Telegraph Peak of the Egan Range. In Steptoe Valley, GRSG also use private meadows and agricultural fields.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of basin sagebrush and Wyoming big sagebrush, as well as rabbitbrush. The sagebrush in some areas is monotypic, with limited herbaceous understory. The benches typically consist of black sagebrush with extensive conifer expansion in Egan Basin and South Butte Valley. The west bench of South Steptoe Valley has minimal conifer expansion. Upper elevations of the PPA consist of woodlands and mountain big sagebrush communities, also with conifer expansion. There are also several crested wheatgrass seedings in the PPA.

According to SynthMap vegetation data, most of the Egan South Butte PPA is categorized as big sagebrush shrubland (45 percent) and woodland (31 percent). SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass is in the understory but is typically limited to areas with previous disturbance (burn scars) and along roadsides. Halogeton is also present in previously disturbed areas. Noxious weeds such as hoary cress, musk thistle, spotted knapweed, tall whitetop, bull thistle, scotch thistle, and Russian knapweed are also in the PPA, predominantly along roadsides and previous disturbances. See **Table 4-91**.

Fire

Overall, fire occurrence is low in this area. From 1999 to 2014, 44 wildfires—all are believed to be caused by lightning—burned a total of 2,632 acres; the largest wildfire burned 1,558 acres in 2007. Forty of the fires burned less than 100 acres.

Table 4-91
Egan South Butte Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	188,301	56,068	1,275	667	4,653	36,706	130,810	3,919
Percent of PPA	45	13	0	0	1	9	31	1

Source: SynthMap [2008]

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring departure from the fire regime. Fire regimes in the Egan South Butte habitat PPA are as follows: 42 percent in fire regime III, 34 percent in fire regime IV, 23 percent in fire regime V, and the remainder in the other fire regimes. Three condition classes are present, with 68 percent in condition class III, 16 percent in condition class II, and 15 percent in condition class I. See **Table 4-92**.

Table 4-92
Egan South Butte Summary of Burn Probability

High and very high burn probability in PPA (acres)	287,095
High and very high burn probability in PPA (percent)	68

Existing Treatments

There are several projects completed to enhance GRSG habitat. The Combs Creek project used hand thinning to treat 4,000 acres of scattered conifer. Planned projects include the Egan Range, and NEPA analysis has been completed.

Past treatments have improved GRSG habitat in Butte Valley by removing conifers along the benches of the Butte Mountains and the Egan Range. Additional fuelbreaks have been constructed along the US Interstate 93 corridor east of the emphasis area. Due to the number of fuels treatments in the PPA, they are expected be beneficial. The treatments were chaining, hand thinning, and burning, with the objective of returning the site to a sagebrush steppe community.

Other Relevant Management Activities

The Triple B HMA encompasses the South Butte Egan PPA. Numbers are above herd management levels and are a concern for habitat and fire restoration.

A portion of Southwest Intertie Project will be passing through the South Butte Egan PPA. As of this assessment, this transmission line has not been constructed, but it would have a very negative impact on GRSG habitat and populations if constructed.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. They present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Egan South Butte PPA
- South Butte—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Hunter Point—Proposed linear fuelbreak along existing road designed to protect large expanses of 3C habitat and lek areas

Priority Order 2 treatment area

- County Road 27—Proposed linear fuelbreak along existing road designed to protect large expanses of 2A and 3B habitat and lek areas.

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-93** for a summary of miles of potential treatments in each priority order. See **Figure 4-24** for a graphic depiction of the proposed treatments and strategies in the Egan South Butte PPA.

Table 4-93
Egan South Butte Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	74	19	0	93

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using the following R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Egan South Butte nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Egan-South Butte leks—Remove phase 1 and 2 conifers within two miles of the valley leks (no polygon created)
- South Butbte—Remove/thin conifers in phase 1 and 2 areas on valley bottoms/alluvial fans in South Butte Valley
- Telegraph (BBD)—Remove/thin conifers in summer habitats in the upper elevations of the Telegraph area in phase 1 and 2 pinyon-juniper
- Lower Butte seeding—Assess the Lower Butte fire area for crested wheatgrass dominance and reestablishment of native plants, using locally collected or genetically appropriate seed and seedlings in 3B and 3C habitats
- Egan South riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- Egan Basin (BBD)—Remove/thin conifers in phase 1 and 2 areas on valley bottoms/alluvial fans in Egan Basin; includes maintaining and expanding the nine-mile chaining to widen the corridor between Butte Valley and Egan Basin
- Bull Canyon prescribed—Consider chemical control of cheatgrass and using locally collected or genetically appropriate seed or seedlings in the Bull Canyon area in 3B habitat
- Baughman—Remove phase 1 and 2 conifers in the Thirty Mile area
- Thirty Mile—Remove phase 1 and 2 conifers in summer habitat in the Thirty Mile area

Priority Order 2 treatment areas

- Egan-South Riparian 2—Implement integrated vegetation management around riparian areas and springs in 3B areas in conjunction with riparian fencing, pipelines, and troughs
- Steptoe Ranch seedings—Assess and reestablish native plants in crested wheatgrass seedings using locally collected seed or seedlings
- Egan Basin (outside BBD)—Remove/thin conifers in phase 1 and 2 areas on valley bottoms/alluvial fans in Egan Basin; includes maintaining and expanding the nine-mile chaining. Widen the corridor between Butte Valley and Egan Basin

- Telegraph corridors—Where possible, create corridors connecting nesting to summer habitat from Butte Valley to Telegraph Area (polygon not created)
- Egan South riparian—Implement integrated vegetation management around riparian areas and springs in 2B and 2C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- North Egan seeding—Assess nonnative dominance and reestablished native plants using locally collected or genetically appropriate seed and seedlings in 2B habitats
- South Egan seeding—Assess nonnative dominance and reestablish native plants using locally collected or genetically appropriate seed and seedlings in 2B habitat
- Telegraph (outside BBD)—Remove/thin conifers in phase 1 and 2 summer habitats in the upper elevations of the Telegraph area

In this PPA, landownership is shared by the BLM, BIA, and private. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-94** for a summary of acres of potential treatments in each priority order. See **Figure 4-25** for a graphic depiction of the proposed treatments and strategies in the Egan South Butte PPA.

Table 4-94
Egan South Butte Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	48,023	16,337	0	64,360
Percent of PPA	75	25	0	100

Fire Operations

In this PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. High recreation use in the PPA increases the risk from human-caused ignitions. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-95**. See **Figure 4-24** for a graphic depiction of the proposed treatments and strategies in the Egan South Butte PPA.

Table 4-95
Egan South Butte Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	244,558	44,857	133,113	422,527
Percent of PPA	58	11	32	100

Opportunities exist to enhance or improve suppression capability in and around this PPA. Response times for ground resources are approximately 60 minutes from the Ely BLM office. Firefighting aircraft can respond from Eureka or Ely within 20 minutes. McGill, Ely, Lackawanna, and White Pine County VFDs can assist with fire suppression. Response can range from a few minutes up to two hours, depending on the location. Ely also has an air base with a helicopter fire crew, smokejumper, and satellite base and could be used as a temporary SEAT base. During times of lightning activity, stationing both ground and air resources would improve suppression capability.

Multiple creeks in the northern and southeastern portion of the PPA are water sources that can be used for fire suppression. Stationing water sources at staging areas during times of lightning activity would aid suppression capability.

In this PPA, the BLM's LUP/FMP allows for natural ignitions to be managed in the Telegraph Peak area for multiple objectives through appropriate response. This is to achieve land and resource management objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which includes the management of volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resources at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency 3C and 3B habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency 3C and 3B habitats and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-96**.

Table 4-96
Egan South Butte Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	244,558	44,857	133,113	422,527
Percent of PPA	58	11	32	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-97**.

4.2.13 Western White Pine

Project Planning Area Description

General Site Description

This area encompasses much of western White Pine County and a small portion of Eureka County. The area totals 713,133 acres, 76 percent of which is under BLM jurisdiction, 21 percent is under Forest Service jurisdiction, and 3 percent is private land.

Table 4-97
Egan South Butte Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
South Butte fuelbreak	59 mi.	X						W			N	P		L1		0-5	0-2
Hunter Point fuelbreak	5 mi.	X						W			N	P		L1		0-5	0-2
County Road 27 fuelbreak	19 mi.		X					W			N	P		L1		0-5	0-2
Egan-South Butte leks pinyon-juniper removal	No Acres	X			C			W			N	P		L1		10-20	3-5
South Butte	18,397	X			C			W			N	P		L1		10-20	5+
Telegraph (BBD)	5,835	X			C			W			N	P		L1		10-20	3-5
Lower Butte seeding	2,538	X				I					N	P		L1		3-5	3-5
Egan South riparian 1	No Acres	X					R				N	P		L1		0-2	0-2
Egan Basin	8,124	X			C			W			N	P		L1		10-20	3-5
Bull Canyon prescribed	2,712	X				I					Y	P		L1		3-5	0-2
Baughman	2,528	X			C			W			N	P		L1		10-20	3-5
Thirty Mile	7,889	X			C			W			N	P		L1		10-20	3-5
Egan Basin (outside BBD)	7,857		X		C			W			N	P		L1		10-20	3-5
Telegraph Corridors	No Acres		X		C			W			N	P		L1		10-20	3-5
Egan South riparian 2	No Acres		X				R				N	P		L1		0-2	0-2
North Egan seeding	1,264		X			I					N	P		L1		0-5	3-5
South Egan seeding	1,103		X			I					N	P		L1		0-5	3-5
Telegraph (outside BBD)	6,114		X		C			W			N	P		L1		10-20	3-5
Combs Creek	4,000				C			W		C			I	L1		10-20	5+
Egan South Butte nonnative treatment	(no acres)	X				I					N	P		L1		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

The area is centered on the White Pine Range, with portions of the Pancake Range and Diamond Range included. Topographic features are typical of the Great Basin, with north-south trending mountain ranges separated by broad valleys. While the occurrence of stream riparian habitat is limited, water is fairly well distributed throughout mountainous habitat, especially in the White Pine and Diamond Ranges. Water sources at valley locations in the PPA are few. Elevations range from 5,600 feet in Newark Valley to over 10,700 feet in the White Pine Range.

The primary habitats in this PPA are rated as 3B and 3C and are found in the valley bottoms. These areas are typified by large monocultures of single age sagebrush stands, with little to no herbaceous understory. Generally the habitats categorized as 2A, 2B, and 2C can be found along mid-slope mid-elevation areas throughout the PPA. The remaining 1A, 1B, and 1C habitats are in higher elevations in the White Pine Mountains. See **Table 4-98**.

Table 4-98
Western White Pine Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	8,033	45,695	43,962	0	36,071	57,981	91	57,595	234,165	229,540
Percent of PPA	1	6	6	0	5	8	0	8	33	33

GRSG

This PPA has nine lek complexes, consisting of 22 active leks. For 2014, total peak male count was 418, with 10 leks monitored as trend leks. Approximately 28 percent of peak male counts are associated with the Jakes Valley South complex in the eastern to northeastern part of the PPA; 24 percent are associated with the South Newark Valley lek complex in the central-northern part of the PPA, with the other seven complexes being widely distributed across the PPA.

While leks generally follow the typical distribution of valley and mountain bench locations, several large leks in the PPA are found at mountainous locations in the White Pine Range and Diamond Range. Generally in this PPA, GRSG winter and nest in the valley bottoms. Telemetry data indicates that nesting occurs near leks but also at higher elevation mountain locations, suggesting that some female GRSG move to mountain locations soon after breeding. Most of summer brood rearing takes place at higher elevation sites in close association with riparian areas. Telemetry indicates connectivity between populations in this PPA, especially for birds that use Jakes and Newark Valleys and the White Pine Range.

Vegetation

Most of the PPA is categorized as big sagebrush shrubland (38 percent) and woodland (28 percent). Distribution of species is typical of the Great Basin and

Central Nevada. The high elevation of valley locations limits salt desert scrub occurrence, as can be seen in **Table 4-99**. Sagebrush species occupy all elevation ranges of the PPA, with black sagebrush and Wyoming big sagebrush occupying lower and mid-elevations and mountain big sagebrush dominating higher elevations. Winterfat is also present in significant amounts in portions of Jakes and Newark Valleys.

Table 4-99
Western White Pine Major Vegetation Categories

Vegetation Category	Big sagebrush shrubland	Black/low sagebrush	Grassland	Invasives	Riparian	Salt desert scrub	Woodland	Other
Acres	270,192	181,328	643	891	4,606	50,517	196,142	8,386
Percent of PPA	38	25	0	0	0	7	28	1

Source: SynthMap [2008]

Conifers are expanding throughout mid- to high elevations down to the toe slopes of the valley floors. Higher elevations of the White Pine and Diamond Ranges have aspen and mixed conifer stands, intermixed with mountain mahogany, antelope bitterbrush, serviceberry, and cliffrose.

Cheatgrass and halogeton are found in small isolated areas of disturbance, primarily along roadway systems and other areas of human development, such as power lines and pipelines. The 2012 Pinto fire burned approximately 2,880 acres just east of Eureka in the Diamond Mountains. Although ESR treatments were implemented, mixed recovery has been observed, as cheatgrass has expanded through portions of the burned area.

Other noxious weeds occur sporadically throughout the PPA, such as hoary cress, musk thistle, Canada thistle, tall whitetop, bull thistle, scotch thistle, Russian knapweed, spotted knapweed, poison hemlock, and black henbane. These species are also typically found along roadsides and previously disturbed areas.

SynthMap vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. It indicates that only 891 acres (less than one percent) of invasive species occur in the PPA. This is likely an underestimation of what is in the PPA, due to the recent Pinto and Spanish Gulch fires.

Invasive species will continue to expand at lower elevations with any disturbances, including inappropriate livestock grazing. See **Table 4-99**.

Fire

History shows that fire occurrence is low in most of the PPA, with only some moderate activity occurring more recently around the town of Eureka. Since 1999 there have been 216 fires, most caused by lightning, an collectively burned approximately 7,000 acres. The largest, the Pinto fire in 2012, burned 2,880 acres. Of the 216 fires, only six have burned more than 100 acres.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the West White Pine PPA are as follows: 67 percent in fire regime III, 23 percent in fire regime IV, eight percent fire regime V, and the remainder are not categorized. Three condition classes are largely present with 73 percent in condition class III, 20 percent in condition class II, and five percent condition class 1, and the remainder are not classified. See **Table 4-100**.

Table 4-100
Western White Pine Summary of Burn Probability

High and very high burn probability in PPA (acres)	124,791
High and very high burn probability in PPA (percent)	18

Existing Treatments
On BLM-administered lands, there are very few past fuels management projects that have occurred in the PPA. However, in the Newark/Huntington Valley Watershed Assessment restoration and fuels treatments have been proposed for the PPA. Treatments range from prescribed fire, thinning, chaining, mastication, seeding, and removing conifers, with the objective of returning the site to sagebrush steppe. Chemical treatments are also part of the proposal to help meet GRSG habitat objectives.

In addition ESR treatments have occurred throughout the PPA. Those completed included aerial seeding, chaining, and hand planting bitterbrush. Success varies based on topography and elevation. Mixes of native and nonnative plants were used in the treatments. The recent treatments are showing some initial signs of success, but ample time and livestock closures are still needed to determine the outcome.

The Forest Service has implemented multiple habitat enhancement projects funded through the Southern Nevada Public Land Management Act (SNPLMA) in the White Pine Range portion of the PPA. Ongoing treatments focus on hand cutting conifer in phases 1 and 2 at the lower and upper elevations.

*Other Relevant Management Activities*The USGS is monitoring GRSG as a result of mining activities and infrastructure development (power lines) in the Pancake Range and west of the White Pine Range near Hamilton. Mineral, oil, and gas exploration continues near Green Springs and in south Jakes Valley, mostly along eastern areas of the PPA. The new ON Line power line was recently completed and runs north to south through the east side of the PPA.

High elevation riparian sites are impacted by wild horses throughout the PPA. Horses associated with the Diamond Mountain HMA have the potential to impact future treatments. The Forest Service is developing the Monte Cristo HMA EA to authorize wild horse removal.

Recreation is growing, leading to additional fire disturbance or other activities, will expand invasive species, particularly cheatgrass.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along roads and natural features in the PPA. These present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Western White Pine PPA
- Illipah East—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Illipah North—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B habitat
- Pancake—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Bacon—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Eggs—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- White River North—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats

Priority Order3 treatment area

- Highway 50—Proposed linear fuelbreak along the highway designed to protect previous ESR treatments

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-101** for a summary of miles of potential treatments in each priority order. See **Figure 4-26** for a graphic depiction of the proposed treatments and strategies in the Western White Pine PPA.

Table 4-101
Western White Pine Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	95	0	17	112

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- Western White Pine nonnative treatment—Inventory, treat, and monitor nonnative invasive species (no polygon)
- Western White Pine leks—Remove phases 1 and 2 pinyon-juniper within two miles of the valley leks (no polygon)
- Jakes Valley—Remove/thin pinyon-juniper in phase 1 and 2 areas on valley bottoms/alluvial fans and remove pinyon-juniper to open up corridor near southern 75 percent BBD; this will connect two habitats with greater than 25 percent sagebrush cover over the landscape
- East Pancake—Remove/thin pinyon-juniper on benches in phases 1 and 2.
- Western White Pine riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon)
- Pinto Creek seeding—Assess crested wheatgrass dominance and reestablished native plants using locally collected seed and seedlings in 3B habitat
- South Newark Valley—Remove phase 1 and 2 pinyon-juniper along mountain bench
- Halstead seeding—Assess crested wheatgrass dominance and reestablished native plants using locally collected seed and seedlings in 3B and 3C habitats

- Fernando seeding—Assess crested wheatgrass dominance and reestablished native plants using locally collected seed and seedlings in 3B habitat
- Mokomoke Mountain (BBD)—Assess suitability for pinyon-juniper removal in phases 1 and 2
- McQueen seeding—Assess crested wheatgrass dominance and reestablished native plants using locally collected seed and seedlings in 3B habitat

Priority Order 2 treatment areas

- Mokomoke Mountain (outside BBD)—Assess suitability for pinyon-juniper removal in phases 1 and 2
- White Pine Range corridors—Where possible, create corridors connecting nesting to summer habitat from Jakes Valley and Newark Valley to White Pine Range to Telegraph Area (no polygon)
- Western White Pine riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C habitats, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- 2012 Pinto fire—Assess restoration, consider chemical control of cheatgrass, and use locally collected seed and seedlings in 2A and 2B habitats
- Lampson (Forest Service)—Past treatments make this a priority order 2; this area has previously burned and is highly used by GRSG; reassess burn areas, cooperating with private partners, and concentrate on repairing riparian function; this is in 1A and 2B habitats

Priority Order 3 treatment areas

- Western White Pine riparian 3—Implement integrated vegetation management around riparian areas and springs in 1B and 1C habitat, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- Cathedral fire 2007 (Forest Service)—Assess restoration, consider chemical control of cheatgrass, and use locally collected seed and seedlings primarily in 3A habitat
- Gardner seeding—Assess and reestablish native plants in crested wheatgrass seedings using locally collected seed or seedlings

In this PPA, landownership is shared by the BLM, Forest Service, and private interests. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-102** for a summary of acres of potential treatments in each priority order. See **Figure 4-27** for a graphic depiction of the proposed treatments and strategies in the Western White Pine PPA.

Table 4-102
Western White Pine Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	99,229	54,754	3701	157,683
Percent of PPA	63	35	2	100

Fire Operations

In this PPA, there are large continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. During years with heavy invasive annual grass fuel loading, the large fire risk potential increases exponentially. Highway 50 bisects most of the PPA, increasing the potential for human-caused fires along the highway corridor. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-103**. See **Figure 4-26** for a graphic depiction of the proposed treatments and strategies in the Western White Pine PPA.

Table 4-103
Western White Pine Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	557,487	36,455	119,192	713,133
Percent of PPA	78	5	17	100

Opportunities exist to enhance or improve suppression capability in and around this PPA. Ground resource response times from the nearest BLM fire stations to Priority 1 suppression areas vary from 10 minutes to 2 hours and 30 minutes. Two VFDs are also close to the PPA. Aerial firefighting resources (SEATs, smokejumpers, and a helicopter with bucket and crew) can respond to any point in the PPA from either Eureka or Ely within 20 minutes. SEAT bases can also be set up in Eureka and Ely for fast response. During lightning activity, stationing aerial and ground resources would improve suppression capability.

In this PPA, water sources exist at the Illipah Reservoir, Eureka River, and White River. There is also a potential for stationing water sources at designated staging areas. Various other ponds are usually associated with private property.

In this PPA, Ely BLM LUP/FMPs and Forest Service/LRMPs do allow for unplanned natural ignitions to be managed for resource objectives through various options. However, the Battle Mountain BLM LUP/FMP does not allow for management of natural ignitions. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources. This also includes the managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency 3B and 3C habitats elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated, unless the treatment were to reconnect two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-104**.

Table 4-104
Western White Pine Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	557,487	36,455	119,192	713,113
Percent of PPA	78	5	17	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-105**.

Table 4-105
Western White Pine Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Illipah East fuelbreak	9 mi.	X						W			N	P		L1		0-5	0-2
Illipah North fuelbreak	10 mi.	X						W			N	P		L1		0-5	0-2
Pancake fuelbreak	25 mi.	X						W			N	P		L1		0-5	0-2
Bacon fuelbreak	13 mi.	X						W			N	P		L1		0-5	0-2
eggs fuelbreak	10 mi.	X						W			N	P		L1		0-5	0-2
White River North fuelbreak	28 mi.	X						W			N	P		L1		0-5	0-2
Highway 50 fuelbreak	17 mi.			X				W			N	P		L1		0-5	3-5
Western White Pine leks	No Acres	X			C						N	P		L1		10-20	3-5
Jakes Valley	48,272	X			C						N	P		L1		10-20	5+

Table 4-105
Western White Pine Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
East Pancake	8,628	X			C						N	P		L1		10-20	3-5
Western White Pine riparian 1	No Acres	X			C		R				N	P		L1		0-2	0-2
Pinto Creek seeding	1,283	X				I					N	P		L1		5-10	0-2
South Newark Valley	18,036	X			C						N	P		L1		10-20	5+
Halstead seeding	989	X				I					N	P		L1		0-5	3-5
Fernando seeding	902	X				I					N	P		L1		0-50	3-5
Mokomoke Mountain 1	19,075	X			C						N	P		L1		10-20	5+
McQueen seeding	2,045	X				I					N	P		L1		0-5	3-5
Western White Pine nonnative	(no acres	X				I					N	P		L4		10-20	5+
Mokomoke Mountain 2	51,297		X		C						N	P		L1		10-20	5+
White Pine Range Corridors	No Acres		X		C						N	P		L1		10-20	5+
Western White Pine riparian 2	No Acres		X				R				N	P		L1		0-2	0-2
2012 Pinto Fire	2,880		X			I		W		C			I	L1		0-5	3-5
Lampson fire riparian restoration (Forest Service)	577		X			I		W		C			I	L1		0-5	3-5
Western White Pine riparian 3	No Acres			X			R				N	P		L1		0-2	0-2

Table 4-105
Western White Pine Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Cathedral fire 2007 (Forest Service)	3,701			X		I		W		C		P		L1		0-5	3-5

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.14 North Spring Valley

Project Planning Area Description

Geographic Overview
The North Spring Valley PPA of the Schell Antelope FIAT Assessment Landscape Area is in White Pine County, Nevada. The PPA is composed of 335,980 acres, 249,973 (74 percent) of which are administered by the BLM, 75,517 (23 percent) are administered by the Forest Service, and 10,489 (three percent) are on private lands. Elevations throughout the PPA generally range from 5,800 feet in the valley bottom to 10,200 feet in the mountains. This area encompasses North Spring Valley, with the Schell Creek Range to the west and Antelope Range to the east. Most of springs and seeps occur in the higher elevations.

Most of the 3B and 3C R&R habitat encompasses the lower elevations and benches, with 3B comprising the bulk of the habitat in the PPA. The 1A, 1B, and 1C habitats encompass the higher elevations of the PPA. The 2A, 2B, and 3A habitats are scattered in mid-slope mid-elevation areas throughout the PPA. See **Table 4-106**.

GRSG
This PPA has two lek complexes, consisting of 14 active leks. For 2014, total peak male count was 201, with four leks monitored as trend leks. Approximately 93 percent of peak male counts are associated with the North

Table 4-106
North Spring Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,888	33,084	8,411	0	23,464	25,026	0	39,094	134,127	68,887
Percent of PPA	1	10	3	0	7	7	0	12	40	21

Spring Valley Lek Complex. However, the leks and associated birds are spread across the valley bottoms throughout most of the PPA. The fewest number of males are associated with the North Becky Complex in the northern portion of the PPA, which consists of only one lek and seven percent of the peak male count.

Conifer expansion is a major threat to GRSG in this PPA. Distribution patterns and movements are typical of the Great Basin, with wintering and nesting in the valleys and along benches and brood-rearing at higher elevations and in the valley. Birds tend to remain centralized in this PPA.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of basin sagebrush and Wyoming big sagebrush, as well as rabbitbrush. The sagebrush in some areas is monotypic, with limited herbaceous understory. The benches typically consist of black sagebrush with extensive conifer expansion along benches. Upper elevations of the PPA consist of mountain big sagebrush and mixed mountain brush species.

According to SynthMap vegetation data, most of the PPA is categorized as woodland (42 percent) and big sagebrush shrubland (41 percent). SynthMap does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass is present in the understory but is typically limited to areas with previous disturbance (burn scars) and along roadsides. Noxious weeds, such as hoary cress, musk thistle, Canada thistle, tall whitetop, bull thistle, scotch thistle, and Russian knapweed are also in the PPA, predominantly along roadsides and previous disturbances. Additionally, yellow spine thistle and New Mexico thistle are invading some sites in this PPA.

SNPLMA funds are currently being utilized to treat some of these areas in the drainages on the east side of the mountains. Extensive inventories of thistle species are also taking place. See **Table 4-107**.

Fire

There is a high occurrence of fire in this PPA, mostly within the last three years. Since 1999 there have been 33 fires that burned a total of 13,236 acres. The 2012 North Creek Fire burned 2,300 acres, the 2014 Lages fire burned approximately 7,676 acres, and the 2014 Sampson fire burned 760 acres of

Table 4-107
North Spring Valley Major Vegetation Categories

Vegetation Category	Big sagebrush shrubland	Black/low sagebrush	Grassland	Invasives	Riparian	Salt desert scrub	Woodland	Other
Acres	138,447	27,570	266	43	5,627	17,652	140,713	5,488
Percent of PPA	41	8	0	0	2	5	42	2

Source: SynthMap [2008]

GRSG habitat. The ESR plans for these fires incorporate seeding of sagebrush, along with perennial grasses and forbs to rehabilitate important GRSG habitat. The 2004 Sampson fire was seeded with perennial grasses, and rehabilitation was deemed successful.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring departure from the fire regime. Fire regimes in the North Spring Valley habitat PPA are as follows: 77 percent in fire regime III, 12 percent in fire regime IV, 11 percent in fire regime V, and the remainder in the other fire regimes. Three condition classes are present, with 66 percent in condition class III, 19 percent in condition class II, and 14 percent in condition class I. See **Table 4-108**.

Table 4-108
North Spring Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	70,431
High and very high burn probability in PPA (percent)	21

Existing Treatments

There are numerous completed conifer treatments along the east and west benches of the PPA. These are the North Spring Valley Prescribed Burn (approximately 9,000 acres), North Antelope Stewardship (approximately 2,100 acres; thinning and seeding), and the Stonehouse Project (approximately 15,000 acres). Treatment includes hand-cutting, chaining, lop and scattering, sagebrush mowing, and seeding.

GRSG have been documented strutting in the lower elevations of the Stonehouse project area. Treatment objectives are predominantly to remove pinyon-juniper expansion and increase sagebrush and the herbaceous understory. NEPA analysis is taking place in the North Schell Restoration Project.

Past treatments have improved GRSG habitat in the Spring Valley by removing conifers along the benches of the Schell Creek Range. Sagebrush treatments are designed to increase the herbaceous understory. In addition, the Forest Service is also implementing treatments aimed at removing conifer expansion on the west side of the Schell Creek Range. Treatments include mastication, hand thinning, and burning, with the objective of returning the site back to a sagebrush steppe community.

Other Relevant Management Activities
The Antelope HMA encompasses the North Spring Valley PPA. Numbers are above herd management levels and are a concern for habitat and fire restoration. If possible, treatments should be temporarily fenced until vegetation objectives are met.

Management Strategies

Fuels Management
R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along roads and natural features in the PPA. These present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the North Spring Valley PPA
- Chicken Knoll Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B habitat and existing habitat improvement treatments
- Spring Valley Road—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitat and existing habitat improvement projects

Priority Order 2 treatment area

- Schellbourne Pass—Proposed linear fuelbreak along existing roads designed to protect large expanses of 2B and 3A habitats and past habitat improvement treatments

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-109** for a summary of miles of potential treatments in each priority order. See **Figure 4-28** for a graphic depiction of the proposed treatments and strategies in the North Spring Valley PPA.

Table 4-109
North Spring Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	43	11	0	54

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using the following R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- North Spring Valley nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Lages fire—Assess restoration efforts and consider chemical control of cheatgrass using locally collected seed or seedlings
- North Spring Valley leks—Remove phase 1 and 2 pinyon-juniper within two miles of the valley leks (no polygon)
- North Schell Creek Range—Remove/thin conifers in phase 1 and 2 areas in summer habitats in the upper elevations, must meet wilderness management objectives
- Kalamazoo Pass—Remove/thin conifers in phase 1 and 2 areas in summer habitats in the upper elevations
- North Spring Valley riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas, in conjunction with riparian fencing, pipelines, and troughs, to expand the riparian vegetation area (no polygon created)
- North Schell Restoration Project (Forest Service)—Hand thin pinyon-juniper in phases 1 and 2 and seed native plant species

Priority Order 2 treatment areas

- Antelope Range—Remove/thin conifers in phase 1 and 2 areas in summer habitats in the upper elevations outside the BBD
- North Spring Valley riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C habitats, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- 2004 Sampson Creek fire—Assess fire rehabilitation areas, such as the 2004 Sampson fire, for possible cheatgrass invasion and need for reestablishing native plants in 3A habitats

Priority Order 3 treatment area

North Spring Valley riparian 3—Implement integrated vegetation management around riparian areas and springs in 1B and 1C, in conjunction with riparian fencing, pipelines, and troughs, to expand the riparian vegetation area (no polygon created). In this PPA, landownership is shared by the BLM, Forest Service, and private entities. Through existing partnerships, there are opportunities for a coordinated approach across these boundaries.

See **Table 4-110** for a summary of acres of potential treatments in each priority order. See **Figure 4-29** for a graphic depiction of the proposed treatments and strategies in the North Spring Valley PPA.

Table 4-110
North Spring Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	32,273	17,207	0	49,480
Percent of PPA	65	35	0	100

Fire Operations

In this PPA, there are large continuous 3B and 3C areas that could sustain large fire growth during high fire risk days. High recreation use in the PPA increases the risk from human caused ignitions. Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-111**. See **Figure 4-28** for a graphic depiction of the proposed treatments and strategies in the North Spring Valley PPA.

Table 4-111
North Spring Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	259,181	8,563	68,236	335,980
Percent of PPA	77	3	20	100

There are opportunities to enhance and improve suppression capability in and around this PPA. The response time from the nearest BLM fire station in Ely is approximately one hour. A few VFDs are also located nearby. Aerial firefighting resources can respond from either Eureka, Wells, or Ely within 20 minutes.

During lightning activity, stationing both ground and air resources would improve suppression capability.

Creeks on the northern and the south-eastern area of the PPA are used as water sources. Stationing water sources at staging areas would improve suppression capability.

In this PPA, current Ely BLM LUP/FMPs and the Forest Service LRMP/FMPs allow for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response. This is to achieve land and resource management objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes the management of volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation activities, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-112**.

Table 4-112
North Spring Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	259,181	8,563	68,236	335,980
Percent of PPA	77	3	20	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. There are opportunities to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary.

See **Table 4-113**.

Table 4-113
North Spring Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Chicken Knoll fuelbreak	12 mi.	X						W			N	P		L1		0-5	0-2
Spring Valley fuelbreak	31 mi.	X						W			N	P		L1		0-5	0-2
Schellbourne Pass fuelbreak	11 mi.		X					W			N	P		L1		0-5	0-2
North Schell Creek pinyon-juniper removal	10,074	X			C			W			N	P		L1		10-20	5+
Kalamazoo Pass pinyon-juniper removal	22,199	X			C			W			N	P		L1		10-20	5+
North Spring Valley Leks pinyon-juniper removal	(no acres)	X			C			W			N	P		L1		10-20	3-5
North Spring Valley nonnative treatment	(no acres	X				I					N	P		L4		10-20	5+

Table 4-113
North Spring Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
North Spring Valley riparian 1	(no acres)	X					R				N	P		L1		0-2	0-2
Sampson Creek fire 2004	1,284 acres		X			I					N	P		L1		0-5	3-5
Antelope Range pinyon-juniper removal	15,923		X		C			W			N	P		L1		10-20	5+
North Spring Valley riparian 2	(no acres)		X				R				N	P		L1		0-2	0-2
North Spring Valley riparian 3	(no acres)			X			R				N	P		L1		0-2	0-2
North Schell Restoration Project (Forest Service)	73,539	X			C	I		W		C			I	L1		10-20	5+
Lages		X						W		C			I	L1		0-5	0-3
2014 Sampson fire		X						W		C			I	L1		0-5	0-3

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.15 Bald Hills

Project Planning Area Description

Geographic Overview

The Bald Hills PPA is in Beaver and Iron Counties, Utah. This area is approximately five miles southwest of Beaver, Utah. US Interstate 15 borders the eastern edge of the PPA, and Highway 130 is just to the west of the PPA. Aside from the Beaver River in the northeast corner of the PPA, there are limited riparian resources, including limited seeps or springs. Elevations range from 5,100 feet to 8,600 feet The PPA is 219,619 acres; most of the area is federally owned, with 189,492 acres (86 percent) administered by the BLM.

Landownership for the remainder of the PPA is the State of Utah 10 percent (21,853 acres) and private ownership four percent (8,274 acres). The PPA boundary was extended to the west to include areas where habitat restoration has been made in order to protect those investments.

Generally, the R&R of habitat in this area follows the elevation gradient. Twenty-seven percent of the habitat is classified as 2A and 2B. See **Table 4-114**.

Table 4-114
Bald Hills Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	0	21,695	3,720	16	15,317	8,507	652	60,187	101,459	8,067
Percent of PPA	0	10	2	0	7	4	0	27	46	4

GRSG

This PPA has eight occupied and two undetermined leks, with a ten-year average of 86 males. Approximately 47 percent of the male counts are associated with leks in the eastern part of the PPA, 30 percent in the west-central, 20 percent in the south-central part, and the remainder three percent are associated with one lek in the north-central part of the PPA.

Generally in the PPA, winter range is at the lower elevations, while breeding and nesting habitat is found at higher elevations. This population is regarded as stable, with a high potential for growth. GRSG in this area show resiliency to known threats, as stated in the COT report.

Vegetation

According to GAP Vegetation data, most of the PPA is categorized as big sagebrush shrubland (48 percent) and woodland (47 percent). GAP vegetation data does not categorize areas with cheatgrass or other invasive species in the understory; cheatgrass mapping data was provided by the UDWR for this PPA. Based on local knowledge, cheatgrass is present in the understory but is typically limited to areas with previous disturbance and along roadsides. Reseeding in the PPA has been successful, but some cheatgrass has become reestablished in the understory. Another invasive species, scotch thistle, is in the upper elevations. Conifers are encroaching across all elevation gradients throughout the PPA and adjacent areas. See **Table 4-115**.

Table 4-115
Bald Hills Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	106,149	1,365	6,051	20	115	579	103,420	1,440
Percent of PPA	48	1	3	0	0	0	47	1

Source: GAP

Fire

The Bald Hills PPA has a high fire frequency across its southern portion; 104 fires burned a total of 58,434 acres, which is nearly 27 percent of the PPA. The largest of these fires occurred in 2012, burning 19,778 acres in the planning area. The topography in this area consists of southwest to northwest trending ridgelines that align with prevailing winds. This leads to rapid fire spread and higher fire intensities. Some of these areas are difficult to access for firefighting.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an areas departure from that fire regime. Fire regimes in the Bald Hills PPA are as follows: one percent in fire regime I, 30 percent in fire regime III, 67 percent in fire regime IV, one percent in fire regime V, and the remainder in other fire regimes. All three condition classes are present, with 80 percent in condition class III, 10 percent in condition class II, and eight percent in condition class I, with the remainder not classified. See **Table 4-116**.

Table 4-116
Bald Hills Summary of Burn Probability

High and very high burn probability in PPA (acres)	214,376
High and very high burn probability in PPA (percent)	98

Existing Treatments

Since 2003, treatments in or near the focal habitat have focused on addressing the threat of conifer expansion. Projects have included mastication, lop and scatter, chaining, prescribed fire, and seeding. As reported in NFPORS, total 62,879 acres were treated in the Greenville Bench area. Historic crested wheatgrass and sagebrush seedings are also present; there have been no chemical treatments in the PPA. The prescribed fire, Greenville Bench, was conducted in 2007, and an additional 30,000 acres are planned for prescribed fire in the PPA in areas of high R&R habitats.

Management Strategies

Fuels Management

No new fuels treatments have been identified because of the extensive existing fuels treatments in this PPA. Mastication, dixie harrow, and hand thinning, in combination with seeding, are fuels treatments that have been effective in this area. Invasive Annual Grass Treatment includes: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Bald Hills PPA.

Ownership in this PPA includes federal, state, and private lands. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

Habitat Restoration and Recovery

The opportunities for habitat restoration in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- Bald Mountain nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Black Mountain—Remove phase 1 conifer within two miles of the valley leks; strategically remove phase 2 on valley bottoms, alluvial fans, benches, and low rolling hills
- Buckhorn Flat—Remove conifers (mostly covered by the South Beaver EA)

Priority Order 2 treatment areas

- Black Mountain—Remove phase 1 conifers within two miles of the valley leks; strategically remove Phase 2 on valley bottoms, alluvial fans, benches, and low rolling hills
- Buckhorn Flat—Remove conifers (mostly covered by the South Beaver EA)

Priority Order 3 treatment area

- Greenville Bench—Sagebrush island planting in previous and future fires

In this PPA, landownership is federal, state, and private. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. The Utah Watershed Restoration Initiative (UWRI), a partnership between federal and state agencies, nongovernment organizations, and private individuals, has been established. It leverages funds and provides a framework for working across jurisdictional boundaries.

See **Table 4-117** for a summary of acres of potential treatments in each priority order. See **Figure 4-30** for a graphic depiction of the proposed treatments and strategies in the Bald Hills PPA.

Table 4-117
Bald Hills Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	56,949	49,050	21,241	127,240
Percent of PPA	45	39	17	100

Fire Operations

In this PPA, powerful winds funnel in some of the drainages, which may contribute to fire spread and large fire growth. Some of this terrain is difficult to access. Additionally, 98 percent of the PPA has high or very high burn probability. Due to this, the priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1B and 1C habitats and areas where management strategies are designed to reconnect habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-118**. See **Figure 4-31** for a graphic depiction of the proposed treatments and strategies in the Bald Hills PPA.

Table 4-118
Bald Hills Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	179,439	4,685	35,495	219,619
Percent of PPA	82	2	16	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Fire suppression operations are set up through an interagency structure, improving coordination of operations across jurisdictional boundaries. The BLM, Forest Service, BIA, National Park Service (NPS), State of Utah Forestry, Fire, and State Lands Division (includes VFDs) are included under the Color Country Interagency Fire Program.

Generally, response times to this PPA are 15 minutes for aviation resources and 30 minutes for ground resources. The Color Country Air Center is in Cedar City, Utah, with an Air Attack Platform and Air Tanker Base that can support heavy air tankers and SEATS. Stationing both air and ground resources would improve suppression capability.

Water sources for fire suppression are limited in much of the PPA. Developing water sources, such as constructing storage tanks or modifying livestock wells, would aid in suppression.

In this PPA, the BLM's LUP/FMP allows for unplanned natural ignitions to be managed for multiple objectives: by full suppression response, to achieve land and resource management objectives, or a combination of both. This response to wildland fire is based on an evaluation of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

Acres of wildfire managed for resource objectives have exceeded the current FMP, and additional acres will not be managed in the PPA.

Administration and ownership in this PPA is a mix of BLM and private lands, with interagency efforts among the BLM, BIA, NPS, Forest Service, VFDs, and the State of Utah Forestry, Fire, and State Lands. There is a local interagency operating agreement through Utah Forestry, Fire, and State Lands, which allows for cooperative fire suppression response. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation activities, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire. Due to this, the priority post-fire rehabilitation areas in this PPA are as follows:

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment

reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-119**.

Table 4-119
Bald Hills Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	179,439	4,685	35,495	219,619
Percent of PPA	82	2	16	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue to implement post-fire rehabilitation across all jurisdictional boundaries through partnerships. For example, through the UWRI partnerships, there are opportunities to use a coordinated approach across these boundaries. The Great Basin Research Center and associated seed warehouse in Ephraim, Utah, is important in this coordinated approach and source for local seed.

See **Table 4-120**.

Table 4-120
Bald Hills Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Buckhorn Flat	15,293	X			C			W				P		LI		10-20	0-2
Buckhorn Flat	5,141		X		C			W		C		P		LI		10-20	2-3
Black Mountain	41,656	X			C			W		C		P		LI		10-20	0-2
Black Mountain	43,909		X		C			W		C		P		LI		10-20	2-3
Greenville Bench sagebrush planting	21,241			X		I					N	P		LI		0-5	3-5

Table 4-120
Bald Hills Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Bald Mountain nonnative treatment		X				I					N	P		L1		10-20	5+

[1] State if treatment, once completed, is likely or unlikely to be effective. Provide rationale using these codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = Based upon professional opinion, treatment is likely to be effective
[2]Describe frequency of maintenance necessary to continue effectiveness (years)
[3]Identify potential treatment completion timeframe, considering NEPA adequacy, relative priority, and local ranking factors

4.2.16 Panguitch

Project Planning Area Description

Geographic Overview
The Panguitch PPA is in Piute, Iron, Garfield, and Kane Counties, Utah. Most of this PPA is intersected by State Road 20 and is centralized around leks in the Buckskin, Bear, and Dog Valleys. The Sevier River runs along the east side of the PPA. Aside from the Sevier River, there are limited riparian areas, primarily only springs and seeps. Elevations throughout the PPA range from 5,700 feet to 10,100 feet.

The PPA encompasses 724,621 acres; most of the area is federally owned with 44 percent (316,727 acres) administered by the BLM and 26 percent (187,318 acres) by the Forest Service. Landownership for the remainder of the PPA is State of Utah six percent (41,822 acres) and private ownership 25 percent (178,754 acres).

The PPA boundary was extended to protect areas where habitat has been restored; to incorporate new telemetry data, which show that GRSG migrate over large areas to the south of 75 percent BBD to winter habitat; and to incorporate winter habitat use data, which suggest peak male lek attendance data is underrepresented in the southern portions of the PPA.

Generally, the R&R of habitat in this area follows the elevation gradient: lower R&R at lower elevations and higher R&R at higher elevations. Seventy-five percent of the PPA is in 1A and 1B. See **Table 4-121**.

Table 4-121
Panguitch Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	13,519	250,641	61,590	0	74,819	101,836	2,871	147,450	8,788	0
Percent of PPA	2	38	9	0	11	15	0	22	1	0

GRSG

This PPA has 17 occupied and five undetermined leks, with a ten-year average of 399 males. Approximately 88 percent of the male counts are associated with leks in the valleys of the northern half of the PPA between, US Highway 89 and US Interstate 15. The most southern leks are near Alton, Utah.

GRSG populations are distributed north-south in a series of linked valleys and benches and are constrained by mountains and canyons. There are nine leks close to the PPA. Limited telemetry data supports the COT report findings, which indicate connectivity exists from these leks to ones in the PPA. Movement of GRSG from one valley or bench to another between seasons is crucial to meet seasonal habitat requirements.

Habitat restoration and recovery projects in this PPA and surrounding areas have multiple objectives for GRSG, one of which is reducing impacts of conifer expansion and increasing connectivity between the leks in Dog Valley, Panguitch, and Alton.

The surrounding areas have had several landscape-scale projects that focused on removing pinyon-juniper. Current and proposed projects in this area are to remove phase I conifer and to strategically remove phase II conifer on valley bottoms, alluvial fans, benches, and rolling hills. Telemetry data in this area support the increase in conifer removal projects. GRSG have been shown to use these treatment areas in the first year after completion.

Vegetation

According to GAP vegetation data, most of the PPA is categorized as big sagebrush shrubland (33 percent) and woodland (55 percent). Lower elevations are characterized by black, mountain, and Wyoming sagebrush communities; upper elevations are characterized by aspen, pinyon-juniper, and ponderosa pine. GAP vegetation data do not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass and scotch thistle are present in disturbed areas in this PPA. See **Table 4-122**.

Table 4-122
Panguitch Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	236,646	14,924	6,361	18	2,477	210	396,484	65,405
Percent of PPA	33	2	1	0	0	0	55	9

Source: GAP

Fire

The Panguitch PPA has had 360 fires since 1999, only nine of which burned more than 100 acres. The largest fire, in 1999, consumed approximately 2,900 acres. This PPA is influenced by late monsoonal moisture, and most fires are started by lightning.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Panguitch PPA are as follows: 14 percent in fire regime I, 31 percent in fire regime III, 38 percent in fire regime IV, 17 percent in fire regime V, and the remainder in other fire regimes. All three condition classes are present, with 48 percent in condition class III, 34 percent in condition class II, and 14 percent in condition class I, with the remainder not classified. See **Table 4-123**.

Table 4-123
Panguitch Summary of Burn Probability

High and very high burn probability in PPA (acres)	552,552
High and very high burn probability in PPA (percent)	77

Existing Treatments

Since 2003, treatments in or near the PPA have focused on addressing conifer expansion. Projects have included mastication, thinning, chaining, prescribed fire, and seeding, totaling 47,581 acres. NEPA analysis has been completed and covers a portion of the PPA, which includes a wide array of projects benefiting GRSG. Treatments in the Dog Valley, South Canyon, and Upper Kanab areas include both pinyon-juniper mastication and hand thinning. Historic crested wheatgrass seedings in the Dog Valley area are beginning to be reestablished, with sagebrush along the perimeters.

Other Relevant Management Activities

Utah prairie dog (*Cynomys parvidens*), a species endemic to southwest Utah, is present in much of the northern portion of the PPA.

In the Alton area, there is potential for the expansion of a coal mine, which is important to the local economy.

Management Strategies

Fuels Management

No new fuels treatments have been identified because of the extensive nature of fuelbreaks and low fire occurrence in the PPA. Maintaining these treatments will be required to maintain effectiveness. Mastication, dixie harrow, and hand thinning in combination with seeding have been effective fuels treatments in this area. Invasive Annual Grass Treatment includes: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Panguitch PPA.

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using the following R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Panguitch nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Dog Valley pinyon-juniper removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on valley bottoms, alluvial fans, and benches
- Alton riparian—Implement integrated vegetation management around riparian areas and springs, in conjunction with riparian fencing, pipelines, and troughs, to expand the riparian vegetation area (no polygon)

Priority Order 2 treatment areas

- Panguitch riparian—Implement integrated vegetation management around riparian areas and springs, in conjunction with riparian fencing, pipelines, and troughs, to expand the riparian vegetation area (no polygon)
- Dog Valley pinyon-juniper removal—Remove phase 1 pinyon-juniper within two miles of the valley leks, and strategically remove phase 2 on valley bottoms, alluvial fans, and benches

Priority Order 3 treatment areas

- Buckskin Valley 1—Assess areas for crested wheatgrass dominance and reestablish native plants using locally collected or genetically appropriate seed and seedlings

- Buckskin Valley 2—Assess areas for crested wheatgrass dominance and reestablish native plants using locally collected or genetically appropriate seed and seedlings
- Bear Valley 1—Assess areas for crested wheatgrass dominance and reestablish native plants using locally collected and genetically appropriate seed and seedlings
- Bear Valley 2:—Assess areas for crested wheatgrass dominance and reestablish native plants using locally collected and genetically appropriate seed and seedlings
- Dickison Hill—Assess failed seeding for potential reestablishing native plants using locally collected seed and seedlings

In this PPA, landownership is federal, state and private. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. The Utah Watershed Restoration Initiative (UWRI), a partnership between federal and state agencies, nongovernmental organizations, and private individuals, has been established. It leverages funds and provides a framework for working across jurisdictional boundaries.

See **Table 4-124** for a summary of acres of potential treatments in each priority order. See **Figure 4-32** for a graphic depiction of the proposed treatments and strategies in the Panguitch PPA.

Table 4-124
Panguitch Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	279,663	174,072	7,746	461,481
Percent of PPA	60	38	2	100

Fire Operations
Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-125**. See **Figure 4-33** for a graphic depiction of the proposed treatments and strategies in the Panguitch PPA.

Table 4-125
Panguitch Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	90,715	100,866	533,040	724,621
Percent of PPA	13	14	74	100

Opportunities exist to enhance and improve suppression capabilities in and around this PPA. Generally, response times are 30 minutes for aircraft and an hour for ground resources. Fire suppression operations are currently set up through an interagency structure, improving coordination of operations across jurisdictional boundaries. The Color Country Interagency Fire Program includes the BLM, Forest Service, BIA, NPS, State of Utah Forestry, Fire, and State Lands Division (includes VFDs), and Arizona Strip BLM Field Office. There are also aviation resources at Air Center in Cedar City, Utah, which includes Air Attack Platform and Air Tanker Base that can support heavy air tankers and SEATs. Response times are longer, with BLM resources traveling from Cedar City, Kanab, or Richfield, Utah. The Forest Service has resources in Panguitch.

A variety of water sources for fire suppression exist in or near the PPA. Maintaining land use agreements to use water developments on private lands, such as ponds and reservoirs, is important.

In this PPA, the BLM's LUP/FMP allows for unplanned natural ignitions to be managed for resource objectives through varied options of appropriate response; this is to achieve land and resource management objectives. This response to wildlife fire is based on an evaluation of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

The potential for managing wildfire for resource benefit is very low and would be considered only under optimal environmental conditions and operational parameters.

Administration or ownership in this PPA is a mix of BLM, State of Utah, Forest Service, and private lands, with interagency efforts among the BLM, BIA, NPS, Forest Service, VFDs, and the State of Utah Forestry, Fire, and State Lands. There is a local interagency operating agreement through Utah Forestry, Fire, and State Lands, which allows for cooperative fire suppression response. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, lower resiliency habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment were to reconnect two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-126**.

Table 4-126
Panguitch Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	90,715	100,866	533,040	724,621
Percent of PPA	13	14	74	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue to implement post-fire rehabilitation treatments across all jurisdictional boundaries through partnerships. Through the UWRI partnerships, there are opportunities to use a coordinated approach across these boundaries. The Great Basin Research Center and associated seed warehouse in Ephraim, Utah, is important in this coordinated approach and source for local seed.

See **Table 4-127**.

Table 4-127
Panguitch Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Dog Valley pinyon-juniper removal 1	279,663	X			C			W		C		P	I	L1		10-20	5+
Dog Valley pinyon-juniper removal 2	174,072		X		C			W		C		P	I	L1		10-20	5+
Buckskin Valley seeding 1	1,418			X		I				C		P		L1		0-5	3-5
Buckskin Valley seeding 2	1,760			X		I				C		P		L1		0-5	3-5
Bear Valley seeding 1	1,758			X		I					N	P		L1		0-5	3-5
Bear Valley seeding 2	604			X		I					N	P		L1		0-5	3-5
Dickison Hill seeding	2,206			X		I				C		P		L1		0-5	3-5
Panguitch riparian	No Acres		X				R				N			L1		0-2	0-2
Alton Riparian	No Acres	X					R				N			L1		0-2	0-2
Panguitch nonnative treatment	(no acres)	X				I					N			L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.17 John's Valley

Project Planning Area Overview

Geographic Overview

The John's Valley PPA is in Garfield County, Utah, next to the north side of Bryce Canyon National Park. John's Valley is confined on the west side by Mount Dutton and on the east side by Boulder Mountain. There are some streams on the east slope of Mount Dutton such as Hunt, Prospect, and

Cottonwood Creeks, but seeps and springs are the main hydrological features in this PPA.

Elevations throughout the focal habitat area range from 7,100 feet to 9,000 feet. The PPA encompasses 126,602 acres, most of which, 58 percent (73,003 acres) is administered by the Forest Service, two percent by the BLM (2,900 acres), and two percent by NPS (3,097 acres). Landownership for the remainder of the PPA is as follows: State of Utah 22 percent (27,705 acres) and private ownership 15 percent (18,896 acres).

The PPA boundary was extended to the northwest to protect areas where habitat has been restored and to include numerous satellite leks.

The John's Valley PPA represents the two ends of the R&R spectrum. Most of the habitat in this area is composed of higher R&R (1A and 1B) at 83 percent, with only 15 percent in low R&R (3A and 3B) at lower elevations. See **Table 4-128**.

Table 4-128
John's Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,538	51,139	34,443	0	16,620	20,775	0	65	21	0
Percent of PPA	3	40	27	0	13	16	0	0	0	0

GRSG

This PPA has seven occupied and three undetermined leks, with a ten-year average of 114 males. The leks are relatively close together in the northern two-thirds. Although this PPA is next to the Panguitch PPA, it is believed to be genetically isolated due to topography.

Vegetation

According to GAP vegetation data, most of the PPA is categorized as big sagebrush shrubland (54 percent) and woodland (32 percent). GAP vegetation data does not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass is present in the understory but is typically limited to areas with previous disturbance and along roadsides. Another invasive species, scotch thistle, is in the upper elevations. Conifers are encroaching along the benches and foothills throughout the PPA; this appears to be limiting GRSG habitat. See **Table 4-129**.

Fire

The John's Valley PPA has had very low fire occurrence, with only 30 fires burning a total of five acres. The 2002 Sanford Fire (77,000 acre) was the largest in this area, but it was north of the PPA. This PPA is influenced by late monsoonal moisture, and most fires are started by lightning.

Table 4-129
John's Valley Major Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/Low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	68,599	27	3,640	0	1,406	56	40,475	11,944
Percent of PPA	54	0	3	0	1	0	32	10

Source: GAP

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the John's Valley PPA are as follows: 34 percent in fire regime I, nine percent in fire regime III, 19 percent in fire regime IV, 35 percent in fire regime V, and the remainder in other fire regimes. All three Condition Classes are present, with 43 percent in condition class III, 49 percent in condition class II, two percent in condition class I, and the remainder is not classified.

Fire frequency is low in the assessment area; cheatgrass has altered the fire regime in isolated areas. See **Table 4-130**.

Table 4-130
John's Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	252
High and very high burn probability in PPA (percent)	0.2

Existing Treatments

Past treatments primarily focused on conifer expansion were mechanical treatments such as chaining, mastication, and hand thinning. No ESR or fuels projects exist in the PPA. The nonnative crested wheatgrass seedings conducted in the past were successful; sagebrush has become established along the edges of these treatments.

Other Relevant Management Activities

In this PPA, Utah prairie dogs are present and are being managed. Bonneville cutthroat trout are also found in the streams of this PPA.

Management Strategies

Fuels Management

No new fuels treatments have been identified because of the extensive nature of existing fuels treatments in this PPA. Mastication, dixie harrow, and hand thinning in combination with seeding have been effective. Invasive Annual Grass Treatment includes: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the John's Valley PPA.

Land throughout the PPA is under federal or state administration of is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify where necessary. See **Table 4-131** for a summary of miles of potential treatments in each priority order. See **Figure 4-34** for a graphic depiction of the proposed treatments and strategies in the John's Valley PPA.

Table 4-131
John's Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	0	0	0	0

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations. These opportunities are as follows:

Priority Order 1 treatment areas

- John's Valley nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- John's Valley pinyon-juniper removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on valley bottoms, alluvial fans, benches

Priority Order 2 treatment areas

- John's Valley pinyon-juniper removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove of phase 2 on valley bottoms, alluvial fans, benches
- John's Valley riparian—Implement integrated vegetation management around riparian areas and springs, in conjunction with fences, pipelines, and troughs to expand the riparian vegetation area; assess riparian and upland habitat along Hunt Creek, Prospect Creek, and Cottonwood Creek (no polygon created)
- Tom Bess invasive species—Assess and treat invasive species along the Tom Bess road corridor (no polygon created)

Priority Order 3 treatment areas

- John's Valley historic chaining—Assess areas for crested wheatgrass dominance and reestablishment of native plants using locally collected or genetically appropriate seed and seedlings

In this PPA, landownership is federal, state and private. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries. The UWRI has been established, which leverages funds and provides a framework for working across jurisdictional boundaries. The riparian habitat along Hunt, Prospect, and Cottonwood Creeks needs to be assessed and an integrated vegetation management plan developed.

See **Table 4-132** for a summary of acres of potential treatments in each priority order. See **Figure 4-35** for a graphic depiction of the proposed treatments and strategies in the John's Valley PPA.

Table 4-132
John's Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	37,119	40,641	1,620	79,381
Percent of PPA	47	51	2	100

Fire Operations

Priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully become reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-133**. See **Figure 4-34** for a graphic depiction of the proposed treatments and strategies in the John's Valley PPA.

Table 4-133
John's Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	21	20,775	105,805	126,602
Percent of PPA	0	16	84	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Fire suppression operations are set up through an interagency structure, improving coordination of operations across jurisdictional boundaries; these agencies are the BLM, Forest Service, BIA, NPS, and the State of Utah Forestry, Fire, and State Lands Division (includes VFDs). Generally, response times to this PPA are 40 minutes for air resources and 45 minutes for ground resources. NPS at Bryce Canyon also has two engines that can rapidly respond to fires. Aviation resources in the PPA are the Air Center at Cedar City, Utah, which includes an Air Attack Platform and Air Tanker Base, which can support heavy air tankers and SEATS. St. George also houses a type III exclusive use helicopter and crew, which could respond to fires in this PPA.

Minimal water sources exist in or near the PPA for use as dip sites during initial attack. Existing land use agreements need to be maintained for continued use of existing water developments on private lands (ponds and reservoirs).

In this PPA, the current Forest Service LRMP allows for natural ignitions to be managed for multiple objectives either by full suppression response or to achieve land and resource management objectives. This response to wildland fire is based on an evaluation of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

Acres of wildfire managed for resource objectives have exceeded the current FMP, and additional acres will not occur in the PPA.

This PPA is under the administration of the Forest Service and the BLM or is private lands. There are interagency efforts between the BLM, BIA, NPS, Forest Service, VFDs, and the State of Utah Forestry, Fire, and State Lands. There is a local interagency operating agreement through Utah Forestry, Fire, and State Lands, which allows for cooperative fire suppression response. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

Currently, there are no existing ESR projects in the PPA. However, priority post-fire rehabilitation areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1B and 1C habitats and areas where management strategies are designed to reconnect habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-137**.

Table 4-134
John's Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	21	20,775	105,805	126,602
Percent of PPA	0	16	84	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post fire rehabilitation seamlessly across the landscape. Opportunities exist to continue this across all jurisdictional boundaries through partnerships. Through the UWRI partnerships, there are opportunities to use a coordinated approach across these boundaries. The Great Basin Research Center and associated seed warehouse in Ephraim, Utah, is important in this coordinated approach and source for local seed.

See **Table 4-135**.

Table 4-135
John's Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
John's Valley pinyon-juniper removal	37,119	X			C			W		C		P		LI		10-20	3-5
John's Valley pinyon-juniper removal	40,641		X		C			W		C		P		LI		10-20	3-5
John's Valley historical chaining	1,620			X		I				C		P		LI		0-5	3-5
John's Valley riparian	No Acres		X				R				N	P		LI		0-2	3-5
Tom Bess invasive species	No Acres		X			I					N	P		LI		0-2	3-5

Table 4-135
John's Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
John's Valley nonnative treatment	(no acres	X				I					N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.18 Parker Mountain

Project Planning Area Description

General Site Description

The Parker Mountain PPA is in Garfield, Piute, Sevier, and Wayne Counties, Utah. Grass Valley and Parker Mountain are central features. The Fremont River runs through the northeast portion, and springs and seeps commonly occur throughout most of this area. Elevations range from 5,900 feet to 10,300 feet.

The PPA is 710,265 acres, most of which, 38 percent (270,440 acres) is administered by the BLM and another 30 percent (215,912 acres) by the Forest Service. Landownership for the remainder of the PPA is State of Utah 21 percent (147,463 acres) and private ownership 11 percent (75,677 acres).

The PPA boundary was extended to protect areas where habitat has been restored.

Generally, the R&R of habitat in this area follows the elevation gradient: lower R&R at lower elevations and higher R&R at higher elevations. Fifty-two percent of the habitat is classified as having high R&R and thirty percent as having low R&R. See **Table 4-136**.

Table 4-136
Parker Mountain Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	125,560	55,605	62,767	85,469	102,365	163,190	77,093	29,634	8,583	0
Percent of PPA	18	8	9	12	14	23	11	4	1	0

GRSG

The Parker Mountain PPA has 39 occupied and two undetermined leks, with a ten-year average of 891 males. Approximately 90 percent of the male counts are associated with 37 leks, which are relatively close together on Parker Mountain. The exception is one somewhat isolated lek in the northeastern part. The remainder of the leks are in Grass Valley and on Monroe Mountain.

GRSG population abundance and number of leks in this PPA is the greatest in Utah. Numerous previous and ongoing restoration projects were and are intended to increase connectivity between Parker Mountain, Grass Valley, and Monroe Mountain. Increases in GRSG distribution in the PPA are considered to be a result of BLM and Forest Service restoration.

The surrounding areas have had several landscape-scale projects that focused on removing phase I conifers in the valley bottoms and strategically removing phase II conifers on valley bottoms, alluvial fans, benches, and low rolling hills.

Vegetation

According to GAP vegetation data, most of the PPA is categorized as big sagebrush shrubland (63 percent) and woodland (28 percent). GAP vegetation data do not categorize areas with cheatgrass or other invasive species in the understory. Based on local knowledge, cheatgrass is present in isolated areas in the understory, but it is typically limited to areas with previous disturbance and along roadsides. Other invasive species are Canada and musk thistle. Conifers are encroaching along the benches and foothills throughout the assessment area, which appears to be a factor limiting connectivity between the leks. See **Table 4-137**.

Table 4-137
Parker Mountain Major Vegetation Categories

Vegetation Category	Big sagebrush shrubland	Black/low sagebrush	Grassland	Invasives	Riparian	Salt desert scrub	Woodland	Other
Acres	446,609	754	3,657	0	4,494	156	197,301	54,409
Percent of PPA	63	0	1	0	1	0	28	8

Source: GAP [2011]

Fire

Fire occurrence is low and there have been no large fires on Parker Mountain. Since 1999 there have been 106 fires that burned a total of 98 acres. The largest fire occurred in 2006 and burned 43 acres. Fires in this area are usually only a single tree that is hit by lightning; larger fires are human caused.

This PPA is typically influenced by late monsoonal moisture.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Parker Mountain PPA are as follows: six percent in fire regime I, 32 percent in fire regime III, 39 percent in fire regime IV, 22 percent in fire regime V, and the remainder in other fire regimes. All three condition classes are present, with 34 percent in condition class III, 49 percent in condition class II, and 12 percent in condition class I, with the remainder not classified. Fire regimes are moderately altered in the PPA. See **Table 4-138**.

Table 4-138
Parker Mountain Summary of Burn Probability

High and very high burn probability in PPA (acres)	256,934
High and very high burn probability in PPA (percent)	36

Existing Treatments

In the PPA and surrounding area, 27,502 acres of habitat have been treated. Treatments that have undergone NEPA analysis are prescribed fires, lop and scatter, hand thinning, mechanical, and chemical treatments. These have been ongoing for over 20 years. Treatment goals in this area are to maintain vigorous sagebrush stands in a diversity of seral classes and to reduce phase I and phase 2 conifer encroachment.

No ESR treatments exist in the PPA due to the low fire occurrence; however several restoration projects have been completed (see Restoration and Recovery Section).

Other Relevant Management Activities

There are timber sales throughout the Parker Mountains. There are also prairie dogs and large antelope herds.

Management Strategies

Fuels Management

No new fuels treatments have been identified because of extensive existing fuelbreaks and low fire occurrence in the PPA. Mastication, chaining, dixie harrow, and hand thinning, in combination with seeding, have been effective fuels management treatments in this area. Invasive Annual Grass Treatment include: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Parker Mountain PPA.

Land throughout the PPA is under federal and state administration or is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-139** for a summary of miles of potential treatments in each priority order. See **Figure 4-36** for a graphic depiction of the proposed treatments and strategies in the Parker Mountain PPA.

Table 4-139
Parker Mountain Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	0	0	0	0

Habitat Restoration and Recovery

The opportunities for habitat restoration treatments in the PPA have been determined using the following R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Parker Mountain nonnative treatment—Inventory, treat, and monitor nonnative invasive species (no polygon)
- Parker Mountain conifer removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on valley bottoms, alluvial fans, and benches; remove mixed conifer encroachment
- Grass Valley conifer removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on alley bottoms, alluvial fans, and benches

Priority Order 2 treatment areas

- Parker Mountain conifer removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on alley bottoms, alluvial fans, and benches; remove mixed conifer encroachment into Aspen
- Grass Valley conifer removal—Remove phase 1 pinyon-juniper within two miles of the valley leks and strategically remove phase 2 on alley bottoms, alluvial fans, and benches
- Parker Mountain riparian—Implement integrated vegetation management around riparian areas and springs in, conjunction with riparian fencing, pipelines, and troughs, to expand the riparian vegetation area (no polygon created)

- South Narrows seeding—Assess failed seeding for potential reestablishment of native plants using locally collected or genetically appropriate seed and seedlings

No Priority Order 3 treatment areas were identified.

In this PPA, landownership is distributed between the BLM, Forest Service, and the State of Utah. Private lands are also present. Through partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-140** for a summary of acres of potential treatments in each priority order. See **Figure 4-37** for a graphic depiction of the proposed treatments and strategies in the Parker Mountain PPA.

Table 4-140
Parker Mountain Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	104,396	297,429	0	401,825
Percent of PPA	26	74	0	100

Fire Operations

Conversion to cheatgrass monocultures in areas of low R&R is of concern. In addition, 36 percent of this PPA is ranked as having high or very high burn probability. Due to this, the priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-141**. See **Figure 4-36** for a graphic depiction of the proposed treatments and strategies in the Parker Mountain PPA.

Table 4-141
Parker Mountain Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	51,413	217,856	440,996	710,265
Percent of PPA	7	31	62	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Generally, response times are an hour for air resources and 40 minutes for ground resources. Stationing both air and ground resources would improve suppression capability.

Fire suppression operations are set up through an interagency structure, improving coordination of operations across jurisdictional boundaries. The BLM, Forest Service, BIA, NPS, State of Utah Forestry, Fire, and State Lands Division (includes VFDs) and Arizona Strip BLM is also included under the Color Country Interagency Fire Program. There are nearby VFDs in Koosharem, Loa, Bicknell, and most of the towns in Wayne County; there is a Forest Service engine in Teasdale and a five-person initial attack force in Loa. In addition, there are aviation resources at the Air Center in Cedar City, which includes an Air Attack Platform and Air Tanker Base that can support heavy air tankers and SEATS.

Water sources for fire suppression are available throughout the PPA at Fish Lake, Sevier River, and multiple smaller reservoirs. Maintaining land use agreements to use water developments on private lands (such as ponds and reservoirs) would also enhance suppression capabilities.

In this PPA, the BLM LUP/FMP allows for natural ignitions to be managed for land and resource management objectives through varied options of appropriate response. This response to wildfire is based on an evaluation of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

The potential for managing wildfire for resource benefit is very low and would be considered only under optimal environmental conditions and operational parameters.

Land in this PPA is administered by the BLM, the State of Utah, and the Forest Service; the rest is private lands. There is interagency cooperation among the BLM, BIA, NPS, Forest Service, VFDs, and the State of Utah Forestry, Fire, and State Lands. The local interagency operating agreement through Utah Forestry, Fire, and State Lands allows for cooperative fire suppression response. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, lower resiliency habitat elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA. Due to this, the priority post-fire rehabilitation areas in this PPA are as follows:

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment were to reconnect two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-142**.

Table 4-142
Parker Mountain Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	51,413	217,856	440,996	710,265
Percent of PPA	7	31	62	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation treatments seamlessly across the landscape. Opportunities exist to continue this across all jurisdictional boundaries through partnerships. Through the UWRI partnerships, there are opportunities to use a coordinated approach. The Great Basin Research Center and associated seed warehouse in Ephraim, Utah, is important in this coordinated approach and is source for locally collected seed.

See **Table 4-143**.

4.2.19 Long Valley

Project Planning Area Description

Geographic Overview

The Long Valley PPA is in the Butte/Buck/White Pine FIAT Assessment Landscape Area. It is north of US Highway 50 in western White Pine County. Land administration in the 242,644-acre PPA is dominated by the BLM (98 percent) and USFWS (one percent); private land holdings are less than one percent.

Table 4-143
Parker Mountain Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Parker Mountain pinyon-juniper/ conifer removal	44,762	X			C			W			N	P		L1		10-20	5+
Grass Valley pinyon-juniper removal	59,634	X			C			W			N	P		L1		10-20	5+
South Narrows seeding	3,050		X			I		W		C		P		L1		0-5	3-5
Grass Valley pinyon-juniper removal	189,552		X		C			W			N	P		L1		10-20	5+
Parker Mountain pinyon-juniper/ conifer removal	104,826		X		C			W			N	P		L1		10-20	5+
Past Treated Projects	27,502	X			C	I		W		C		P		L1		5-15	5+
Parker Mountain nonnative treatment	(no acres)	X				I					N	P		L4		10-20	5+
Parker Mountain riparian	No Acres		X				R				N	P		L1		0-2	0-2

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

Elevations in the PPA range from 6,000 feet in Long Valley to 9,100 feet on Buck Mountain. The area encompasses much of central Long Valley, a small portion of south Ruby Valley and Newark Valley, portions of Buck Mountain, and the southern end of the Maverick Springs Range.

Springs and seeps sporadically cross the PPA, and most are not currently meeting riparian health objectives. The area is very dry, with any outflows from spring sources flowing only short distances. This PPA includes some areas that are outside the focal habitat identified in Step 1.

Most of the 3B and 3C habitat encompasses valley bottoms and low-lying hills in the PPA. Minor amounts of 3A habitats are categorized and are isolated to Alligator Ridge. Mid-slope, mid-elevation areas of the PPA are primarily categorized as 2A, 2B, and 2C habitats. The higher elevations of the Maverick Springs and South Ruby Mountains contain the remaining 1A, 1B, and 1C habitats and are typified by mountain sagebrush and mountain browse communities. See **Table 4-144**.

Table 4-144
Long Valley Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	13,883	3,854	3,411	0	10,166	23,085	242	15,068	75,304	97,630
Percent of PPA	6	2	1	0	4	10	0	6	31	40

GRSG

This PPA has two lek complexes consisting of eight active leks and one pending active lek. For 2014, total peak male count was 194, with one lek monitored as a trend lek. Approximately 60 percent of peak male counts are associated with the Buck Mountain lek complex in the southern portion of the PPA. The fewest males are associated with the South Ruby Complex in the northern portion of the PPA; this consists of only one lek and 11 percent of the peak male count. The remaining 29 percent of the peak male counts are associated with the Long Valley lek complex near the middle of the PPA.

Leks typically occur in the valleys. Summer brood-rearing habitat is lacking and limited to springs and seeps, with the highest concentration of summer use on Buck Mountain and on Ruby Lake National Wildlife Refuge (NWR). Telemetry information from the Blue Jay lek in Ruby Valley indicates a strong propensity for GRSG to use the upper elevations of Big and Little Bald Mountain, as well as at spring and seep areas associated with the Ruby Lake NWR during summer. Birds associated with the Long Valley leks are assumed to winter and assemble in leks at valley locations and to summer along spring riparian habitats on Buck Mountain and along Long Valley Slough.

Many of the riparian areas are not meeting riparian proper functioning condition, excluding Ruby Lake NWR. Wild horse populations are above AML and are thought to be a major contributing factor to riparian health issues in the PPA.

Vegetation

Salt desert scrub communities occupy the lowest and driest portions of the PPA. Vegetation transitions into sagebrush species as precipitation increases and currently dominates the landscape, from valley locations to mountaintops. Black sagebrush communities are intermixed in big sagebrush ecotypes and can be found throughout mountain benches and alluvial fans. As elevation and precipitation increases, mountain big sagebrush becomes the dominant shrub component, intermixed with areas of antelope bitterbrush and serviceberry. Winterfat communities can also be found on mountain alluvial settings throughout the Ruby and Long Valleys.

Pinyon-juniper woodlands are evident throughout most of the PPA, comprising 19 percent of vegetation in the area. Conifers are expanding throughout mid- to upper elevations of the Maverick Springs and South Ruby Ranges, down to valley floor locations along the mountain toe slopes. However, some recent fires have reduced the density and distribution of pinyon-juniper in some locations.

SynthMap vegetation data do not categorize areas with cheatgrass or other invasive species in the understory. Where fires have occurred, cheatgrass is present and continues to increase with each disturbance. Noxious weeds also found in the PPA are hoary cress, musk thistle, Canada thistle, bull thistle, scotch thistle, Russian knapweed, spotted knapweed, houndstongue, black henbane, and dyer's woad, predominantly along roadsides and previous disturbances. See **Table 4-145**.

Table 4-145
Long Valley Major Vegetation Categories

Vegetation Category	Big sagebrush shrubland	Black/low sagebrush	Grassland	Invasives	Riparian	Salt desert scrub	Woodland	Other
Acres	100,675	56,800	837	542	1,314	33,720	45,682	2,884
Percent of PPA	42	23	0	0	1	14	19	1

Source: SynthMap [2008]

Fire

Fire occurrence in this PPA is low. Since 1999, 27 fires have burned 7,800 acres. The 2004 Chrome fire is the largest; it burned approximately 5,163 acres on the north end of Big Bald Mountain in the South Ruby Range. While some cheatgrass is evident at lower elevations of the burn, ESR sagebrush treatment has been successful. Lightning is the main ignition source, with only one human-caused fire. Most of the fires are in the Maverick Springs and South Ruby Mountains. The area has a low fire occurrence due in part to the summer monsoonal moisture patterns, which can provide significant amounts of summer precipitation to the PPA. No fuelbreaks have been developed due to the lack fire occurrence.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring an area's departure from that fire regime. Fire regimes in the Long Valley PPA are as follows: 40 percent in fire regime III, 35 percent in fire regime IV, 23 percent fire regime V, and the remainder is not categorized. Three condition classes are largely present, with 76 percent in condition class III, 10 percent in condition class II, 13 percent in condition class I, and the remainder is not classified. Fire regimes in this area have been altered due to lack of fire. See **Table 4-146**.

Table 4-146
Long Valley Summary of Burn Probability

High and very high burn probability in PPA (acres)	188,069
High and very high burn probability in PPA (percent)	78

Existing Treatments

Limited treatment has occurred in the past in the Long Valley PPA. The most significant of the project work has been specific to pinyon-juniper chaining projects near Alligator Ridge and Mooney Basin. These joint projects of the BLM and NDOW in the 1980s and early 1990s were to remove conifers and reestablish sagebrush communities in important mule deer winter range. Some ESR work after the 2004 Chrome fire was aerial seeding followed by chaining; previously seeded areas were reseeded. Varied success has been seen throughout the treatment areas, with the most successful results being aerial seeding followed by chaining.

The Ely BLM and the Forest Service Ruby Mountains Ranger District have initiated the Overland Habitat Enhancement and Restoration Project. A small portion of this project area will be in the northern portion of the PPA. A decision is expected on this project in 2015. Overland Pass projects will be aimed at benefiting GRSG and will include chaining, prescribed fire, mastication, tree thinning, and some spring riparian enhancement. Treatments will also address noxious weed problems in the area.

There are no known fuels projects in the Long Valley emphasis area. Opportunities exist to expand the chaining projects, which will enhance both mule deer and GRSG habitats.

Other Relevant Management Activities

Major activities in the Long Valley PPA that continue to impact the health of GRSG habitat are mining exploration and development (Bald Mountain Mine including the Yankee and Alligator Ridge projects), livestock grazing management, and wild horse and burro management. Some oil and gas drilling has occurred in the PPA in the past.

Management Strategies

Fuels Management

R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. They present opportunities for use as fuelbreaks to slow fire progression across largely 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment areas

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Long Valley PPA
- Buck Mountain—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Long Valley—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3B and 3C habitats
- Sand Dune—Proposed linear fuelbreak along existing roads designed to protect large expanses of 3C habitat
- Station Butte—Proposed linear fuelbreak along county road designed to protect large expanses of 3C and 3B habitat and lek areas

Land throughout the PPA is under federal or state administration or is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships do exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-147** for a summary of miles of potential treatments in each priority order. See **Figure 4-38** for a graphic depiction of the proposed treatments and strategies in the Long Valley PPA.

Table 4-147
Long Valley Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	60	0	0	60

Habitat Restoration and Recovery

The following opportunities for habitat restoration \ in the PPA have been determined using R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Long Valley nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Long Valley leks—Remove phases 1 and 2 pinyon-juniper within two miles of the valley leks (no polygon)

- Mountain Spring—Pinyon-juniper removal/thinning in phases 1 and 2 within the BBD
- Long Valley Bench—Pinyon-juniper removal/thinning in phases 1 and 2 areas on valley bottoms and alluvial fans
- Little Willow Spring (BBD)—Pinyon-juniper removal/thinning in phases I and II in the BBD
- Mountain Spring riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)

Priority Order 2 treatment areas

- Mountain Spring riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- Little Willow Spring (outside BBD)—Pinyon-juniper removal/thinning in phases 1 and 2

Priority Order 3 treatment areas

- Historic fires—Assess cheatgrass abatement and subsequent native seeding (no polygon)
- Mountain Spring riparian 3—Implement integrated vegetation management around riparian areas and springs in 1B and 1C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)

In this PPA, administration is shared by the BLM and the USFWS and private landowners. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-148** for a summary of acres of potential treatments in each priority order. See **Figure 4-39** for a graphic depiction of the proposed treatments and strategies in the Long Valley PPA.

Table 4-148
Long Valley Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	37,516	10,953	0	48,469
Percent of PPA	77	23	0	100

Fire Operations

In this PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. Historically, this area has not experienced much fire activity. However, 78 percent of the PPA is ranked as having high or very high burn probability. Due to this, the priority fire management areas in this PPA are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-149**. See **Figure 4-38** for a graphic depiction of the proposed treatments and strategies in the Long Valley PPA.

Table 4-149
Long Valley Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	178,841	22,166	41,637	242,644
Percent of PPA	74	9	17	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. The Ely BLM District would have jurisdiction over fire control activities in the area. Response times are reasonable, given paved access on US Highway 50 and the Long Valley Road. Are firefighting resources (SEATs, smokejumpers, and a helicopter with bucket and crew) can respond to any point in the PPA, from either Eureka or Ely within 30 minutes. SEAT bases can also be set up in Eureka and Ely for fast response.

The closest fire station is in Eureka, Utah, which has approximately a one-hour response time, with some remote areas taking as long as two hours. VFDs are in Steptoe Valley and Ruby Valley. In addition, the Bald Mountain, Yankee, and Alligator Ridge mines are next to this PPA. BLM trains the mine's heavy equipment operators in fire suppression so they can quickly respond. During lightning activity, stationing resources would improve suppression capability, especially in 3B and 3C habitats.

Water availability for suppression resources exist at mine locations, as well as standpipes at Ruby Lake NWR and the Gallagher Fish Hatchery. Helicopter dip sites are also available at these locations. There is a potential for increased water availability by installing helicopter refill wells or water storage tanks.

In this PPA, the Ely BLM LUP/FMPs allow for unplanned natural ignitions to be managed for resource objectives, through varied options of appropriate response, to achieve land and resource management objectives. Decisions to manage wildfires for resource benefits are made on a case-by-case basis, based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression that exist through federal, state, and county firefighting resources, which also includes managing volunteers. Maintenance of these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitat (3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment reconnects two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-150**.

Table 4-150
Long Valley Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	178,841	22,166	41,637	242,644
Percent of PPA	74	9	17	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-151**.

Table 4-151
Long Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Buck fuelbreak	9 mi.	X						W			N	P		LI		0-5	0-2
Long Valley fuelbreak	28 mi.	X						W			N	P		LI		0-5	0-2
Sand Dune fuelbreak	13 mi.	X						W			N	P		LI		0-5	0-2
Station Butte fuelbreak	10 mi.	X						W			N	P		LI		0-5	0-2
Long Valley leks	No Acres	X			C			W			N	P		LI		10-20	3-5
Mountain Spring	13,544	X			C			W			N	P		LI		10-20	5+
Long Valley Bench	6,883	X			C			W			N	P		LI		10-20	3-5
Little Willow Spring (BBD)	17,089	X			C			W			N	P		LI		10-20	3-5
Mountain Springs riparian 1	No Acres	X					R				N	P		LI		0-2	0-2
Mountain Springs riparian 2	No Acres		X				R				N	P		LI		0-2	0-2

Table 4-151
Long Valley Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Little Willow Spring (outside BBD)	10,953		X		C			W			N	P		L1		10-20	5+
Long Valley nonnative treatment	(no acres	X				I					N	P		L4		10-20	5+
Historic fires	No Acres			X		I		W			N	P		L1		0-5	3-5
Mountain Spring riparian 3	No Acres			X			R				N	P		L1		0-2	0-2

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.20 Steptoe Cave

Project Planning Area Description

General Site Description

The Steptoe Cave Valley PPA is in the Central Great Basin FIAT Assessment Landscape Area south of Ely in White Pine and Lincoln Counties, Nevada. The Steptoe Cave Valley PPA is composed of 348,462 acres, 329,434 of which (95 percent) is administered by the BLM, 7,172 acres (two percent) is administered by the Forest Service, 9,893 acres (two percent) is private, and 1,964 acres (less than one percent) is administered by the State.

Elevations throughout the PPA generally range from 5,700 feet in the valley bottoms to 10,900 feet in the mountains. This area encompasses South Steptoe Valley and most of Cave Valley, with the Egan Mountain Range to the west and Schell Creek Range to the east. Mountain ranges are typically oriented north to south, with large valley bottoms between ranges. Springs and seeps occur along the benches and higher elevations. Willow Creek and Steptoe Creek are in South Steptoe Valley.

The 2B, 3B, and 3C R&R habitat categories encompass mainly the valley bottoms throughout the PPA. The mid-slope, mid-elevation areas are generally categorized as 2A, 2B, and 2C habitats. The higher elevations of the Egan and Schell Creek Ranges contain the remaining 1A, 1B, and 1C habitats. See **Table 4-152**.

Table 4-152
Steptoe Cave Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,229	59,760	3,410	0	21,438	7,806	0	78,338	135,660	38,821
Percent of PPA	1	17	1	0	6	2	0	22	39	11

GRSG

This PPA has two lek complexes, consisting of 12 active leks and two pending active leks. For 2014, total peak male count was 198, with four leks monitored as trend leks. Approximately 58 percent of peak male counts are associated with the South Steptoe lek complex in the northern part of the PPA, 35 percent are associated with the Cave Valley complex in the southern part and the remainder in the Bullwhack complex in the center of the PPA.

Conifer expansion and loss of diverse sagebrush habitat to crested wheatgrass seedings are the major threats to GRSG in this PPA. Most leks are in crested wheatgrass seedings and winterfat flats in the valley bottoms. Distribution patterns and movements are typical of the Great Basin, with wintering and nesting habitat in the valley bottoms and along benches, and brood-rearing in riparian areas at higher elevations and in other areas in the valleys.

Vegetation

Vegetation in the PPA generally consists of valley bottoms of basin sagebrush and Wyoming big sagebrush, as well as rabbitbrush. Sagebrush in some areas is monotypic, with limited herbaceous understory. Winterfat flats are scattered in the valley bottoms and are in fairly good condition. The benches typically consist of black sagebrush, with varying degrees of conifer expansion, especially along Bullwhack Summit, which is the boundary between South Steptoe and Cave Valleys. Upper elevations of the PPA consist of woodlands, mountain big sagebrush, and mixed mountain shrub species.

Large areas of the PPA were converted to crested wheatgrass seedings in the 1950s and 1960s (approximately 26,000 acres). Sagebrush is starting to return in some of these old seedings. Most of the leks in South Steptoe Valley are found in the crested wheatgrass seedings.

According to SynthMapdata, most of the PPA is categorized as big sagebrush shrubland (43 percent) and woodland (43 percent). SynthMap does not categorize areas with cheatgrass or other invasive species in the understory; based on local knowledge, cheatgrass is in the understory but is typically limited to areas with previous disturbance and along roadsides. Noxious weeds found typically along roads are hoary cress, black henbane, Russian knapweed, spotted knapweed, musk thistle, whitetop, and bull thistle. See **Table 4-153**.

Table 4-153
Steptoe Cave Major Vegetation Categories

Vegetation Category	Big sagebrush shrubland	Black/low sagebrush	Grassland	Invasives	Riparian	Salt desert scrub	Woodland	Other
Acres	147,837	23,421	541	4,387	3,182	16,170	150,905	1,729
Percent of PPA	43	7	0	1	1	5	43	0

Source: SynthMap [2008]

Fire

Fire occurrence is low in this PPA. Since 1999 there have been 74 ignitions that burned less than 1,000 acres. The largest, the Whipple fire of 1999, burned 315 acres inside the PPA. Of the 74 fires, only five burned more than 100 acres.

Fire regimes are a measure of historic fire return interval and fire severity, with condition class measuring departure from the fire regime. Fire regimes in the Steptoe Cave PPA are as follows: 55 percent in fire regime III, 43 percent in fire regime IV, and the remainder in the other fire regimes. Three condition classes are present with 72 percent in condition class III, 16 percent in condition class I, and 10 percent in condition class II. See **Table 4-154**.

Table 4-154
Steptoe Cave Summary of Burn Probability

High and very high burn probability in PPA (acres)	330,491
High and very high burn probability in PPA (percent)	93

Existing Treatments

Numerous treatments have been completed or are in progress in the PPA. In the Bullwhack Summit area, fuelbreaks were placed along roads; prescribed burns were conducted in 2004 and 2005. In 2009, GRSG habitat restoration in Cave Valley included two sagebrush treatments, with follow-up seeding. Numerous WUI treatments have been conducted in South Steptoe to protect private property and ROWs. Additional treatments have been completed in this PPA, with the objective of removing pinyon-juniper and increasing the shrub and herbaceous understory.

The BLM and Forest Service have completed NEPA analysis for additional proposed treatment areas that fall in the South Steptoe Cave habitat PPA. Most of these treatments are for pinyon-juniper removal along benches and mountain sagebrush in higher elevations.

Other Relevant Management Activities
The South Steptoe Travel Management Plan has closed numerous roads in the South Steptoe Cave habitat PPA, which may limit using some roads as fuelbreaks.

The northern portion of the Silver King HMA overlaps the PPA, but wild horses are seen very infrequently there.

Management Strategies

Fuels Management
R&R and fire occurrence data were used to identify areas for fuels management treatments in the PPA (see Appendix A, Maps). Fuels treatments were identified along existing roads and natural features in the PPA. These present opportunities for use as fuelbreaks to slow fire progression across 3B and 3C habitats and existing restoration and ESR treatments throughout the PPA.

Anchor points for suppression and priority fuels management treatments in this PPA are as follows:

Priority Order 1 treatment area

- Invasive Annual Grass Treatment: Inventory, monitor, and treat, as appropriate, invasive annual grasses in the Steptoe Cave PPA
- Bullwhack—Proposed linear fuelbreak along existing roads designed to protect one large expanse of 3B and 3C habitats and multiple high priority leks. The fuelbreak would incorporate existing crested wheatgrass seedings where feasible.

Land throughout the PPA is under federal or state administration or is private land. Opportunities exist to implement fuelbreaks across all jurisdictional boundaries through partnerships. Where partnerships do exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-155** for a summary of miles of potential treatments in each priority order. See **Figure 4-40** for a graphic depiction of the proposed treatments and strategies in the Steptoe Cave PPA.

Table 4-155
Steptoe Cave Fuels Management Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Miles	67	0	0	67

Habitat Restoration and Recovery

The following opportunities for habitat restoration treatments in the PPA have been determined using R&R priorities and other habitat considerations:

Priority Order 1 treatment areas

- Steptoe Cave nonnative treatment—Inventory, treat, and monitor nonnative invasive species in this PPA (no polygon)
- Steptoe Cave leks—Remove phases 1 and 2 conifers within two miles of the valley leks (no polygon)
- Willow Creek Extension—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedling, located in 3B and 3C habitat
- Willow Creek 1—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- Willow Creek 2—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- Cave Valley GRSG treatments—Assess restoration treatment success and re-treat with appropriate follow-up measures, including reestablishing native plants using locally collected seed and seedlings in 3C
- Steptoe/Cave riparian 1—Implement integrated vegetation management around riparian areas and springs in 3B and 3C areas in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- Ward seeding—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- South Steptoe seeding—Assess crested wheatgrass dominance and re-establishment of native plants using locally collected seed and seedlings, located in 3C habitat.
- Triangle Seeding: Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- Horse/Cattle Camp seeding—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3B habitat

- Unnamed vegetation treatment seeding 1—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- Unnamed vegetation treatment seeding 2—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3C habitat
- The Terrace (BBD)—Remove/thin conifers in phases 1 and 2.
- South Steptoe Bench (BBD): Remove/thin conifers on valley bottoms, alluvial fans, and benches in phases 1 and 2
- South Group seeding—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3B habitat.
- Patterson Pass seeding—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3B habitat
- Cave Valley Bench—Remove/thin conifers on valley bottoms, alluvial fans, and benches in phases 1 and 2

Priority Order 2 treatment areas

- Steptoe/Cave riparian 2—Implement integrated vegetation management around riparian areas and springs in 2B and 2C habitats, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- The Terrace (outside BBD)—Remove/thin conifers in phases 1 and 2
- South Steptoe Bench (outside BBD)—Remove/thin conifers on valley bottoms, alluvial fans, and benches in phases 1 and 2
- Cattle Camp—Remove phases 1 and 2 pinyon-juniper in and around leks; NEPA analysis has been completed for some portions

Priority Order 3 treatment areas

- Steptoe/Cave riparian 3—Implement integrated vegetation management around riparian areas and springs in 1B and 1C, in conjunction with riparian fencing, pipelines, and troughs to expand the riparian vegetation area (no polygon created)
- South Cattle Camp seeding—Assess crested wheatgrass dominance and reestablishment of native plants using locally collected seed and seedlings, located in 3A; this treatment would connect two areas of greater than 25 percent sagebrush cover over the landscape

Land in this PPA is administered by the BLM, the Forest Service, and the State or is private. Through existing partnerships, there are opportunities to use a coordinated approach across these boundaries.

See **Table 4-156** for a summary of acres of potential treatments in each priority order. See **Figure 4-41** for a graphic depiction of the proposed treatments and strategies in the Steptoe Cave PPA.

Table 4-156
Steptoe Cave Habitat Restoration Potential Treatments

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	68,493	50,315	1,858	120,666
Percent of PPA	57	42	2	100

Fire Operations

In this PPA, there are large, continuous 3C and 3B areas that could sustain large fire growth during high fire risk days. Historically, fire occurrence is low in this PPA; priority fire management areas are as follows:

- Priority Order 1 suppression zones are areas of 3B and 3C habitat and areas where sagebrush communities have been successfully reestablished through seedings or other rehabilitation investments.
- Priority Order 2 suppression zones are areas of 2B and 2C habitat.
- Priority Order 3 suppression zones are areas of 1A, 1B, 1C, 2A, and 3A habitats.

See **Table 4-157**. See **Figure 4-40** for a graphic depiction of the proposed treatments and strategies in the Steptoe Cave PPA.

Table 4-157
Steptoe Cave Fire Operations Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	185,619	7,704	155,139	348,462
Percent of PPA	53	2	45	100

Opportunities exist to enhance and improve suppression capability in and around this PPA. Generally, response times are approximately 30 minutes for air resources responding from either Ely or Panaca. Aerial firefighting resources can include SEATs, smokejumpers, and helicopter crews. Fire stations near the PPA are the BLM Ely and Pony Springs stations, with response times ranging from 30 minutes to two hours, depending on the location.

The Ely, McGill, Lackawanna, and Lund VFDs are nearby to assist with fire suppression. During lightning activity, stationing resources and continued aerial patrols would improve suppression capability.

There is a lack of water sources for fire suppression in the PPA. There is potential for stationing water sources at a designated staging area in the northern portion of the PPA. There is a standpipe at BLM's Pony Station that can be used as a water source for the southern portion of the PPA.

In this PPA, BLM LUP/FMPs and Forest Service LRMPs allow for natural ignitions to be managed for resource objectives through varied options. These opportunities are in the upper elevation areas on both the west and east sides of the PPA. Decisions to manage wildfires for resource benefits are made on a case-by-case basis and are based on evaluations of the following:

- Risks to firefighter and public safety
- The circumstances under which the fire occurred, including weather and fuel conditions
- Natural and cultural resource management objectives
- Resource protection priorities

There are multiple agreements for fire suppression through federal, state, and county firefighting resources, which also includes managing volunteers. Maintaining these agreements and establishing Rangeland Fire Protection Associations could enhance suppression capabilities in the PPA. Resources are managed and will continue to be managed through GACCs to allocate firefighting assets. MAC groups will also have the ability to coordinate resource at the local level.

Post-Fire Rehabilitation

The prevalence of highly desirable, low resiliency habitats (3B and 3C) elevates the need for prompt fire rehabilitation, with an emphasis on establishing sagebrush cover, promoting native vegetation, and limiting invasive annual grass establishment post-fire in this PPA.

- Priority Order 1 treatments would be centered on low resiliency habitats (3C and 3B) and any impacted fuels or restoration treatments.
- Priority Order 2 treatments would be 2B and 2C designated habitat, which typically occurs on the lower third of the slope, and alluvial fans.
- Priority Order 3 treatments would be high elevation fires in the PPA categorized as 1B and 1C habitats. The remaining 3A, 2A, and 1A habitats would not typically be rehabilitated unless the treatment were to reconnect two or more habitats with greater than 25 percent sagebrush landscape cover.

See **Table 4-158**.

Table 4-158
Steptoe Cave Post-Fire Rehabilitation Management Strategies

Priority Order	Priority Order 1	Priority Order 2	Priority Order 3	Total
Acres	185,619	7,704	155,139	348,462
Percent of PPA	53	2	45	100

Federal and state agencies have taken a coordinated approach for the last several years to implement post-fire rehabilitation seamlessly across the landscape. Opportunities exist to continue these treatments across all jurisdictional boundaries through partnerships. Where partnerships already exist, agencies will continue to maintain and modify treatments where necessary.

See **Table 4-159**.

Table 4-159
Steptoe Cave Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Bullwhack fuelbreak	67 mi.	X						W			N	P		L1		0-2	0-2
Steptoe Cave leks	No Acres	X			C			W			N	P		L1		10-20	3-5
Willow Creek Ext	3,967	X				I					N	P		L1		0-5	3-5
Willow Creek 1	998	X				I					N	P		L1		0-5	3-5
Willow Creek 2	11,065	X				I					N	P		L1		0-5	3-5
Cave Valley GRSG treatments	2,970	X				I				C		P		L1		10-20	3-5
Steptoe/ Cave riparian 1	No Acres	X					R				N	P		L1		0-2	0-2
Ward seeding	2,126	X				I					N	P		L1		0-5	3-5
South Steptoe seeding	3,201	X				I					N	P		L1		0-5	3-5
Triangle seeding	447	X				I					N	P		L1		0-5	3-5

Table 4-159
Steptoe Cave Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Horse/ Cattle Camp seeding	3,023	X				I					N	P		L1		0-5	3-5
Unnamed vegetation treatment seeding 1	2,380	X				I					N	P		L1		0-5	3-5
Unnamed vegetation treatment seeding 2	2,339	X				I					N	P		L1		0-5	3-5
South Group seeding	575	X				I					N	P		L1		0-5	3-5
The Terrace (BBD)	5,193	X			C			W			N	P		L1		10-20	3-5
South Steptoe Bench (BBD)	27,432	X			C			W			N	P		L1		10-20	5+
Patterson Pass	5,135	X				I					N	P		L1		0-5	3-5
Cave Valley Bench	7,542	X			C			W			N	P		L1		10-20	3-5
Steptoe riparian 2	No Acres		X				R				N	P		L1		0-2	0-2
The Terrace (outside BBD)	4,644		X		C			W			N	P		L1		10-20	3-5
South Steptoe Bench (outside BBD)	22,060		X		C			W			N	P		L1		10-20	5+
Cattle Camp	23,611		X		C			W	I			P		L1		10-20	5+
Steptoe riparian 3	No Acres			X			R					P		L1		0-2	0-2

Table 4-159
Steptoe Cave Project Planning Area Treatment Summary Table

Treatment Description		Priority			Threats Addressed				NEPA			Treatments					
												Time Frame		Certainty of Effectiveness[1]			
Name/Type	Acres/Miles	1st	2nd	3rd	Conifer (C)	Invasive annual grasses (I)	Riparian Degradation (R)	Wildfire (W)	Initiated (I)	Completed (C)	Needed (N)	Pending Funding (P)[1]	Implementing (I)[1]	Likely	Unlikely	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
South Cattle Camp seeding	1,438			X		I						P		L1		0-5	3-5
Steptoe Cave nonnative treatment	(no acre)	X				I					N	P		L4		10-20	5+

[1]If treatment, once completed, is likely or unlikely to be effective, the rationale for effectiveness uses the following codes:
1 = site conditions (soils, resilience, species composition, disturbances) make treatment effectiveness likely
2 = site conditions make treatment effectiveness unlikely
3 = continued current management (grazing, recreation, or other land uses) make likelihood of effectiveness low
4 = based on professional opinion, treatment is likely to be effective
[2]Describes the frequency of maintenance necessary to continue effectiveness (in years)
[3]Identifies the potential treatment completion time frame, considering NEPA adequacy, relative priority, and local ranking factors

SECTION 5
LOOKING AHEAD: IMPLEMENTATION, NEPA, AND MONITORING

5.1 IMPLEMENTATION STRATEGY

Management strategies identified in this assessment are broadly consistent with and fall in broader land use plan direction. FIAT Assessments are referenced in the appendices of each Subregional Environmental Impact Statement. As such, the potential implementation of all FIAT management strategies are fully subject to all direction and constraints in the overarching land use plans and treatment level NEPA. Topics such as noxious weed control and use of native seed for habitat restoration projects are included in this section to assist land managers in the selection of appropriate treatments as FIAT Step 2 Assessments are used to develop site specific treatments and conduct the appropriate NEPA analyses (e.g., Step 3).

The planning, implementation, and monitoring cycle for FIAT strategies are a multi-year process. **Figure 5-1** illustrates the sequence of FIAT steps, project implementation, and monitoring. In or near the focal habitats in the FIAT Assessment Areas, the identified management strategies occur across the spectrum of the planning process. Some FIAT management strategies have planning completed, are NEPA compliant, and are ready for implementation. Others are beyond the NEPA scoping phase, but planning is not yet complete. Finally, many potential treatments identified in this assessment were conceptualized in FIAT workshops, and in these cases planning has not been initiated.

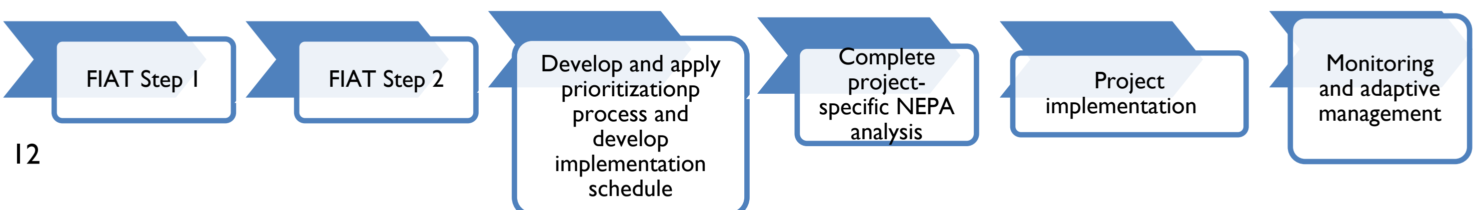
Prioritizing the sequence of project/treatment implementation is an important process, and may consider NEPA compliance, budgeting, unit capacity, and other factors such as immediacy of the threat to GRSG. Furthermore, this prioritization is a necessary step in order to produce an out-year program of work. This program of work is scheduled to follow the completion of FIAT Step 2 assessments. The program of work will portray the year(s) for implementation, scale of treatment, and type of treatment by program/management strategy area. See **Table 5-1**.

Figure 5-1 illustrates the sequence of FIAT steps, project implementation, and monitoring.

Table 5-1
Assessment Area Treatment Summary

Treatment Type	Acres				Miles			
	1st Priority	2nd Priority	3rd Priority	Total	1st Priority	2nd Priority	3rd Priority	Total
Habitat restoration	1,432,786	1,241,589	299,125	**2,973,499**				
Fuels treatments	15,827	1,507	758	**18,092**	1,310	117	63	**1,490**
Fire operations	4,764,282	1,388,664	3,014,314	**9,117,260**				
Post-fire treatments (ESR)	9,239	2,136	17,625	**17,625**				

Figure 5-1
Workflow for FIAT Project Identification, Planning, Implementation, and Adaptive Management



FIAT assessments were not designed to address project area practices, such as specific changes in management to promote habitat recovery and what types of seed mixtures to use, or to address invasive species other than invasive annual grasses. These activities are fully subject to all direction and constraints in the overarching land use plans and treatment level NEPA analysis; however, the suggestions below are provided to assist in the transition from FIAT Step 2 to the project planning and NEPA stage.

5.1.1 Habitat Restoration and Recovery

Habitat restoration and recovery are two approaches to rebuilding or maintaining GRSG habitats. Habitat restoration (e.g., active restoration) treatments are "on-the-ground" activities (e.g., seeding and controlling invasive annual grasses and conifer expansion); habitat recovery (passive approach) involves changes in management practices.

Opportunities for passive restoration include changing livestock grazing management to improve GRSG habitat, applying appropriate wild horse and burro management, spot treating weed infestations in treatment areas, and limiting or mitigating soil-disturbing activities (such as off-road vehicle use). These types of management changes were not specifically identified nor prioritized in the FIAT Step 2 stage.

Habitat restoration is expensive and requires time for plant establishment and recovery. Livestock grazing exclusion is a common practice to promote vegetation recovery or establishment after a surface-disturbing treatment or disturbance. Appropriate exclusion periods after habitat restoration should be considered and incorporated into the project planning/NEPA process. Similar consideration should be given to wild horses and burros and recreation as well.

It is also important to institute appropriate long-term management strategies that will maintain habitat restoration projects into the future. For example, livestock grazing management should be evaluated and changes implemented to ensure that species diversity in a successful restoration seeding is maintained over time.

Habitat restoration (also includes post-fire rehabilitation treatments) may need to be repeated if projects initially fail to meet restoration objectives. Therefore, retreatment options should be considered in all proposed actions and implemented if needed. This is especially true in warm-dry soil temperature/moisture regimes where climatic conditions are often problematic for new plant establishment or recovery.

See **Figure 5-2**.

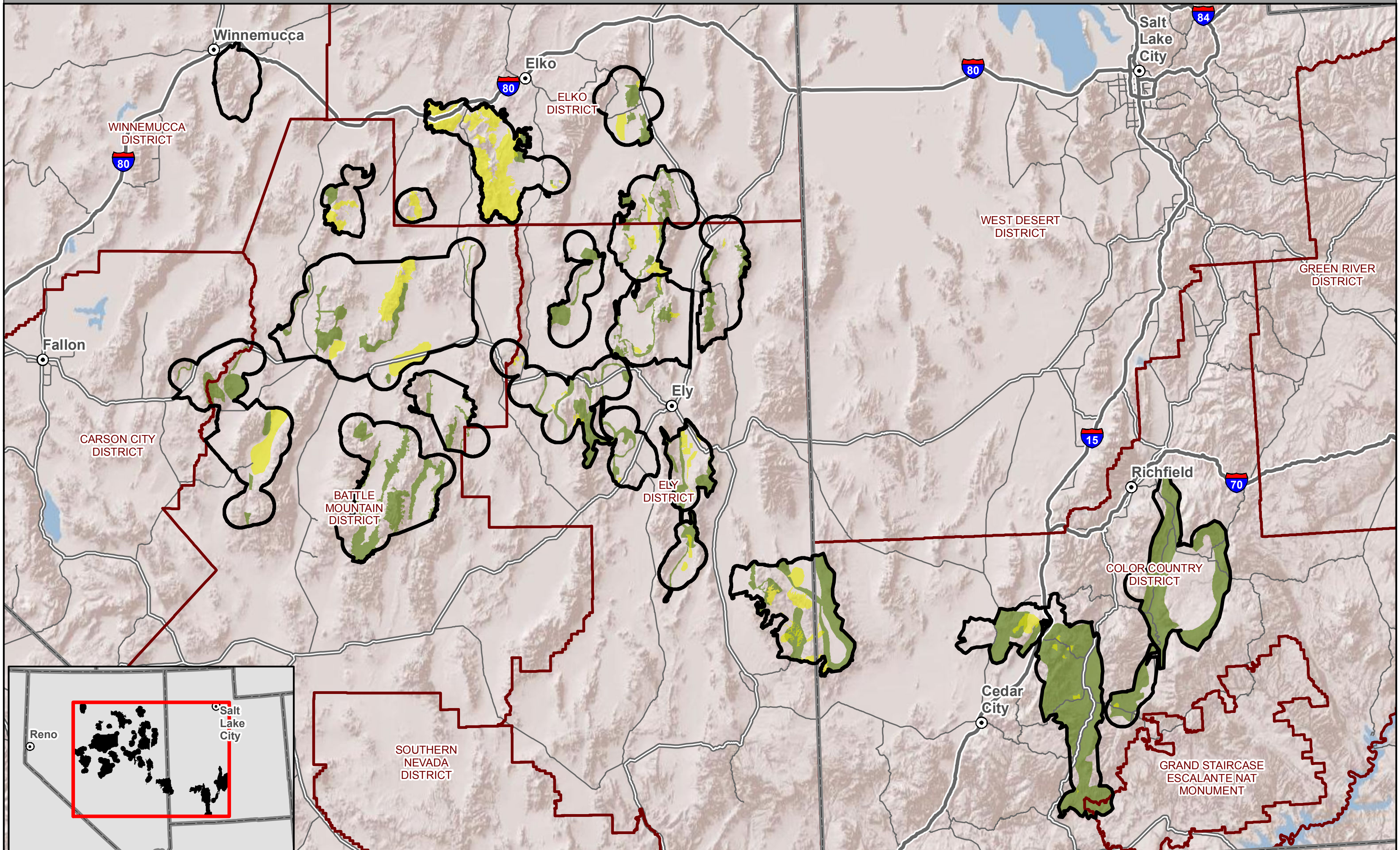
5.1.2 Use of Native Species for Habitat Restoration and Post-Fire Rehabilitation

The use of adapted native plant seed in restoration and post-fire rehabilitation projects is addressed in land use plans. To the extent practical and in concert with the appropriate land use plans, locally adapted seeds and native plant materials are recommended as appropriate to the location, conditions, and management objectives for vegetation management and restoration. This includes strategic sourcing for acquiring, storing, and using genetically appropriate seeds and other plant materials. Under certain circumstances, nonnative species may be needed to achieve site stabilization, fire breaks, and weed control, as transitional species for sequential restoration, and to meet restoration objectives (2015 Draft of the National Seed Strategy and Implementation Plan: 2015-2020).

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

Invasive Annuals
Conifer Expansion
Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

5.1.3 Invasive Species other than Invasive Annual Grasses

FIAT assessments address two categories of invasive species: annual grasses and conifer species expanding into sagebrush habitats. This does not negate the importance of controlling other noxious plants in sagebrush habitat; however, the FIAT assessment was not designed to address other invasive plants, including noxious plants. Therefore, locating infestations, decreasing propagule pressure (especially along roadside areas), treating satellite infestations, and preventing future infestations in focal habitats has not been addressed nor prioritized in these assessments.

Noxious weed risk is especially high in areas undergoing FIAT treatments that may disturb the soil or remove competitive vegetation. Accordingly, noxious weed management is an important consideration for all land treatments originating from the FIAT Assessment. Weed management in these treatment areas can be funded to include noxious weed inventories during the planning process, subsequent weed treatments (preferably before project implementation), and subsequent monitoring and follow-up weed treatments following project implementation.

5.1.4 Fuels Management: Fuelbreak

Project Planning Area	Name	Priority	Miles	Acres
Antelope Valley	Willow Creek Ranch	1	13	161
Antelope Valley	Indian Creek	1	4	55
Antelope Valley	Antelope Valley Road	2	25	302
Antelope Valley	Antelope Valley East	2	5	61
Bates Callaghan	Ravenswood	1	36	441
Bates Callaghan	Silver Creek	1	6	75
Bates Callaghan	Narrows	1	21	255
Bates Callaghan	Carico	1	13	153
Bates Callaghan	Highway 50 Bob Scott Pass	1	15	184
Bates Callaghan	Grass Valley South	1	19	225
Bates Callaghan	Highway 50 West Eureka	1	44	530
Bates Callaghan	Roberts Creek	1	15	178
Bates Callaghan	Bean Flat	1	21	256
Bates Callaghan	Bean Flat West	1	9	110
Bates Callaghan	Gold Bar Road	1	11	136
Bates Callaghan	Steiner	1	7	88
Bates Callaghan	Rye Patch	1	17	203
Bates Callaghan	Dry Creek	1	7	80
Bates Callaghan	Highway 278	1	12	141
Cherry Creek	West Cherry Creek	1	42	513
Cherry Creek	West Taylor Canyon	1	3	41
Cherry Creek	Butte Valley	1	40	486
Cherry Creek	Middle Butte Valley	1	16	190
Cherry Creek	Butte Mountain	1	7	89
Cherry Creek	Medicine	1	15	184

Project Planning Area	Name	Priority	Miles	Acres
Cherry Creek	East Taylor Canyon	2	7	83
Cooks Creek	Red Rock Canyon	1	20	237
Cooks Creek	Elephant	1	6	70
Cortez	East Cortez	1	21	250
Cortez	West Cortez	1	8	102
Egan	South Butte	1	59	720
Egan	Hunter Point	1	15	182
Egan	County Road 27	2	19	229
Long Valley	Buck Mountain	1	9	110
Long Valley	Long Valley	1	28	342
Long Valley	Sand Dunes	1	13	161
Long Valley	Station Butte	1	10	126
North Spring	Chicken Knoll	1	12	141
North Spring	Spring Valley	1	31	379
North Spring	Schellbourne Pass	2	11	133
Punchbowl	Toquima	1	5	61
Punchbowl	Barley Creek	1	15	184
Punchbowl	Little Fish Lake	1	36	437
Punchbowl	Seven Mile Wash	1	15	179
Reese R. Yomba Desatoya	Highway 50	1	52	628
Reese R. Yomba Desatoya	Camp Creek	1	4	54
Reese R. Yomba Desatoya	Highway 722	1	37	445
Reese R. Yomba Desatoya	Smith Creek Ranch	1	28	334
Reese R. Yomba Desatoya	Smith Creek Ranch West	1	2	29
Reese R. Yomba Desatoya	Ione Valley	1	30	365
Reese R. Yomba Desatoya	South Smith	1	3	41
Reese R. Yomba Desatoya	Campbell Creek	1	9	108
Reese R. Yomba Desatoya	Elk Horn Pass Road	1	8	102
Reese R. Yomba Desatoya	Ione Road	1	29	349
Reese R. Yomba Desatoya	Reese River Valley	1	20	242
Ruby	CCC North Ruby Valley Road	1	18	214
Ruby	Highway 229	1	7	86
Ruby	Highway 93	1	8	94
Ruby	Old Sprucemont Road	1	11	128
Ruby	North Valley Mountain	1	9	104
Ruby	South Valley Mountain Bend	1	8	92
Ruby	NF-41	2	2	27
Ruby	NF-108	3	2	20
Sonomas	Rock Creek	1	11	132
Sonomas	Rock Creek	1	6	72
Sonomas	Rock Creek	1	9	115
Sonomas	Grassy Valley Road Winnemucca	2	25	300
South Fork	Highway 278 South	1	7	88
South Fork	Bunker Hill	1	11	129
South Fork	Bald Mountain Mine Road	1	12	141
South Fork	Huntington Creek West	1	13	158
South Fork	Red Rock Ranch	1	8	100

Project Planning Area	Name	Priority	Miles	Acres
South Fork	Porter Creek	1	12	144
South Fork	Huntington Creek South	1	11	138
South Fork	Emigrant	1	7	86
South Fork	Highway 278 North	2	7	89
South Fork	Rain Mine Road	2	16	200
South Fork	North Pine	2	7	83
Steptoe Cave	Bullwhack	1	67	816
Table Mountain Hamlin Valley	West Hamlin	1	13	163
Table Mountain Hamlin Valley	Camp Valley	1	15	187
Table Mountain Hamlin Valley	Meadow Spring	1	7	85
Table Mountain Hamlin Valley	Atchison Creek	1	8	101
Table Mountain Hamlin Valley	Spanish George	1	12	142
Table Mountain Hamlin Valley	Cedar Flat	3	44	528
Western White Pine	Illipah East	1	9	112
Western White Pine	Illipah North	1	10	125
Western White Pine	Pancake	1	25	309
Western White Pine	Bacon	1	13	154
Western White Pine	Eggs	1	10	124
Western White Pine	White River North	1	28	336
Western White Pine	Highway 50	3	17	210

[1]Buffers are 50 feet on both sides of the centerline.

5.1.5 Habitat Restoration and Recovery

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Antelope Valley	Antelope Valley Road West	Pinyon-juniper removal	1	8,209	Assess and treat pinyon-juniper edge
Antelope Valley	Little Smoky Valley West	Pinyon-juniper removal	1	3,444	Assess and treat pinyon-juniper edge
Antelope Valley	Fenstamaker	Pinyon-juniper removal	2	10,217	Assess and treat pinyon-juniper edge
Antelope Valley	Antelope Range	Pinyon-juniper removal	3	13,037	Assess and treat pinyon-juniper edge
Bald Hills	Buckhorn Flat	Pinyon-juniper removal	1	15,293	Phase 1 and 2 pinyon-juniper removal
Bald Hills	Black Mountain	Pinyon-juniper removal	1	7	Phase 1 and 2 pinyon-juniper removal
Bald Hills	Black Mountain	Pinyon-juniper removal	1	41,649	Phase 1 and 2 pinyon-juniper removal
Bald Hills	Black Mountain	Pinyon-juniper removal	2	43,909	Phase 1 and 2 pinyon-juniper removal
Bald Hills	Buckhorn Flat	Pinyon-juniper removal	2	5,141	Phase 1 and 2 pinyon-juniper removal
Bald Hills	Greenville Bench	Planting	3	21,241	Sagebrush planting
Bates Callaghan	Grass Valley	Seeding	1	13,801	remove crested wheatgrass; plant natives

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Bates Callaghan	Ravenswood	Pinyon-juniper removal	1	9,482	Assess and treat pinyon-juniper edge
Bates Callaghan	Reese River East	Pinyon-juniper removal	1	24,102	Assess and treat pinyon-juniper edge
Bates Callaghan	Callaghan	Pinyon-juniper removal	1	22,568	Assess and treat pinyon-juniper edge
Bates Callaghan	Simpson Park	Pinyon-juniper removal	1	5,829	Assess and treat pinyon-juniper edge
Bates Callaghan	East Simpsons	Pinyon-juniper removal	1	28,085	Assess and treat pinyon-juniper edge
Bates Callaghan	Sulphur Spring	Pinyon-juniper removal	1	2,721	Assess and treat pinyon-juniper edge
Bates Callaghan	Grimes Hills	Pinyon-juniper removal	1	2,652	Assess and remove pinyon-juniper if needed
Bates Callaghan	Reese/Grass to Callaghan corridor	Pinyon-juniper removal	1	1,624	Remove pinyon-juniper from corridor
Bates Callaghan	Grass/Bean to Bates corridor	Pinyon-juniper removal	1	1,688	Remove pinyon-juniper from corridor
Bates Callaghan	Bean Flat	Seeding	2	49,679	Reestablish natives in crested stands
Bates Callaghan	Trail Canyon Fire 1999	Restoration	2	59,072	Restore previous post-fire rehabilitation area
Bates Callaghan	Sulphur Spring	Pinyon-juniper removal	2	1,390	Assess and treat pinyon-juniper edge
Bates Callaghan	Table Mountain	Seeding	3	802	Treat for cheatgrass
Cherry Creek	Snow Creek Seeding	Seeding	1	4,171	Establish natives in crested wheatgrass seeding
Cherry Creek	Butte Fire	Assessment	1	5,802	Assess fire rehabilitation and seed natives if needed
Cherry Creek	Cherry Creek Bench	Remove pinyon-juniper	1	35,341	Remove pinyon-juniper on benches
Cherry Creek	East Medicine Bench	Remove pinyon-juniper	1	11,054	Remove pinyon-juniper on benches
Cherry Creek	Butte Mountains	Remove pinyon-juniper	1	5,126	Remove pinyon-juniper on benches
Cherry Creek	Cherry Creek Basin	Conifer Removal	1	14,422	Remove conifers in summer habitat
Cherry Creek	Odgers Riparian Restoration	Restoration	1	6,462	Passive and active restoration
Cherry Creek	Cherry Creek WUI	Chemical	2	11,837	Assess and treat BRTE
Cherry Creek	High Bald Peaks	Remove pinyon-juniper	2	8,645	pinyon-juniper removal to open up summer habitat
Cooks Creek	Cooks Creek Riparian	Restoration	1	137	Riparian vegetation treatment

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Cooks Creek	Horse Mountain	Remove pinyon-juniper	1	12,831	Remove phase I and II pinion-juniper and within 2 miles of leks use chemical treatments and native seeding treatments to remove cheatgrass and dispose of woody material through sales or pile burning
Cooks Creek	Antelope Complex 2007	Seeding	3	28,154	Island planting Antelope Complex
Cortez	Beowawe Fire 2000	Restoration	2	14,242	Restoration of previously post-fire rehabilitation area
Cortez	Buckhorn 2 Fire 1996	Restoration	3	2,381	Restore previous post-fire rehabilitation area
Egan	Lower Butte Seeding	Seeding	1	2,538	remove crested wheatgrass; plant natives
Egan	Bull Canyon prescribed	Chemical/seeding	1	2,712	Treat BRTE; seed with natives
Egan	Egan Basin	Remove pinyon-juniper	1	8,124	Remove pinyon-juniper along benches; maintain 9-mile chain
Egan	South Butte	Remove pinyon-juniper	1	18,397	Remove pinyon-juniper along benches
Egan	Baughman	Treat pinyon-juniper	1	2,528	Phase 1 and 2 pinyon-juniper treatment
Egan	Thirty Mile	Remove pinyon-juniper	1	7,889	Phase 1 and 2 pinyon-juniper treatment in summer habitat
Egan	Telegraph	Remove/thin conifers	1	5,835	Remove/thin conifers
Egan	North Egan Seeding	Seeding	2	1,264	Remove crested wheatgrass; plant natives
Egan	South Egan Seeding	Seeding	2	1,103	Remove crested wheatgrass; plant natives
Egan	Telegraph	Remove/thin conifers	2	6,114	Remove/thin conifers
Egan	Egan Basin	Remove pinyon-juniper	2	7,857	Remove pinyon-juniper along benches; maintain 9-mile chain
John's Valley	John's Valley pinyon-juniper removal	Remove pinyon-juniper	1	37,119	Phase 1 and 2 pinyon-juniper removal
John's Valley	John's Valley pinyon-juniper removal	Remove pinyon-juniper	2	40,641	Phase 1 and 2 pinyon-juniper removal
John's Valley	John's Valley historical chaining	Assessment	3	1,620	Assess crested wheatgrass seeding and plant natives
Long Valley	Mountain Spring	Remove pinyon-juniper	1	13,544	Remove/thin pinyon-juniper in summer habitat
Long Valley	Little Willow Spring	Remove pinyon-juniper	1	17,089	Remove/thin pinyon-juniper in summer habitat

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Long Valley	Long Valley Bench	Remove pinyon-juniper	1	6,883	pinyon-juniper thin/removal along valley bottoms
Long Valley	Little Willow Spring	Remove pinyon-juniper	2	10,953	Remove/thin pinyon-juniper in summer habitat
North Spring	North Schell Creek	Remove/thin conifers	1	10,074	Remove/thin conifers in summer habitat
North Spring	Kalamazoo Pass	Remove/thin conifers	1	22,199	Remove/thin conifers in summer habitat
North Spring	Sampson Fire 2004	Assessment	2	1,284	Assess BRTE and native plantings
North Spring	Antelope Range	Remove/thin conifers	2	15,923	Remove/thin conifers in summer habitat
Panguitch	Black Knoll	Treatment	0	296	Treat cheatgrass
Panguitch	Dog Valley	Remove pinyon-juniper	0	124,907	Phase 1 and 2 pinyon-juniper removal
Panguitch	Dog Valley	Remove pinyon-juniper	1	279,663	Phase 1 and 2 pinyon-juniper removal
Panguitch	Dog Valley	Remove pinyon-juniper	2	174,072	Phase 1 and 2 pinyon-juniper removal
Panguitch	Buckskin Valley 1	Assessment	3	1,418	Assess crested seedings and plant natives
Panguitch	Buckskin Valley 2	Assessment	3	1,760	Assess crested seedings and plant natives
Panguitch	Bear Valley 1	Assessment	3	1,758	Assess crested seedings and plant natives
Panguitch	Bear Valley 2	Assessment	3	604	Assess crested seedings and plant natives
Panguitch	Dickison Hill	Assessment	3	2,206	Assess failed seeding and reseed
Parker Mountain	Parker Mountain	Remove pinyon-juniper and conifers	1	44,762	Phase 1 and 2 pinyon-juniper and mixed conifer treatment
Parker Mountain	Grass Valley	Remove pinyon-juniper	1	59,634	Phase 1 and 2 pinyon-juniper treatment
Parker Mountain	South Narrows Seeding	Seeding	2	3,050	Assess failed seeding; reestablish native plants
Parker Mountain	Grass Valley	Remove pinyon-juniper	2	189,552	Phase 1 and 2 pinyon-juniper treatment
Parker Mountain	Parker Mountain	Remove pinyon-juniper and conifers	2	104,826	Phase 1 and 2 pinyon-juniper and mixed conifer treatment
Punchbowl	Fish Lake Valley	Remove pinyon-juniper	1	28,148	Between 7,000 and 7,400 feet
Punchbowl	Monitor Valley	Remove pinyon-juniper	1	92,408	Between 7,000 and 7,400 feet
Punchbowl	Johnny Potts to White Rock Mountain	Remove pinyon-juniper	1	3,439	
Punchbowl	Stoneberger	Remove/thin pinyon-juniper	1	12,022	

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Punchbowl	Table Mountain	Remove pinyon-juniper	2	45,001	Remove/thin pinyon-juniper
Punchbowl	Monitor Valley	Remove pinyon-juniper	2	17,852	Between 7,000 and 7,400 feet
Punchbowl	Fish Lake Valley	Remove pinyon-juniper	2	19,296	Between 7,000 and 7,400 feet
Reese R. Yomba Desatoya	Upper Reese River	Restoration	1	64,702	Restore hydrologic function
Reese R. Yomba Desatoya	Shoshone	Remove pinyon-juniper	1	10,329	Around springs and streams
Reese R. Yomba Desatoya	Porter Fan	Remove pinyon-juniper	1	6,402	Treat/thin phase 1 and 2 pinyon-juniper along benches
Reese R. Yomba Desatoya	Cloverdale	Remove pinyon-juniper	1	3,674	Phase 1 and 2 pinyon-juniper removal
Reese R. Yomba Desatoya	Clan Alpine	Remove pinyon-juniper	1	3,610	Phase 1 and 2 pinyon-juniper removal
Reese R. Yomba Desatoya	Haypress	Remove pinyon-juniper	1	30,520	Phase 1 and 2 pinyon-juniper removal
Reese R. Yomba Desatoya	Smith Creek Valley West	Remove pinyon-juniper	2	33,147	Phase 1 and 2 pinyon-juniper removal
Reese R. Yomba Desatoya	Cloverdale Connect	Remove pinyon-juniper	2	3,748	Around springs and streams
Ruby	Franklin River	Seeding	1	15,246	Establish natives in crested wheatgrass
Ruby	Black Sage	Remove pinyon-juniper	1	4,138	Phase 1 pinyon-juniper removal
Ruby	East Humboldt	Remove pinyon-juniper	1	19,044	Phase 1 pinyon-juniper removal
Ruby	Valley Mountain	Remove pinyon-juniper	1	16,453	Phase 1 pinyon-juniper removal
Ruby	Egbert	Chemical/seeding	2	2,202	Chemical treatment of cheatgrass in Egbert fire area followed by native seeding and planting
South Fork	Grindstone Fire 1986	Restoration	1	2,127	Restore previous post-fire rehabilitation area
South Fork	Carlin Fire 2005	Restoration	1	5,001	Restore previous post-fire rehabilitation area
South Fork	Corral	Seeding	1	1,283	Native grass/forbs and sagebrush seeding
South Fork	Toyn Creek	Remove pinyon-juniper	1	830	Pinyon-juniper phase I and II removal/thinning
South Fork	Webb Fire 2006	Restoration	2	14,513	Restore previous post-fire rehabilitation area
South Fork	Ferdelford Fire 1988	Restoration	2	3,986	Restore previous post-fire rehabilitation area
South Fork	Palisade Fire 1998	Restoration	2	4,312	Restore previous post-fire rehabilitation area
South Fork	Rain Fire 1994	Restoration	2	10,003	Restore previous post-fire rehabilitation area

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
South Fork	Party Fire 2007	Restoration	2	4,245	Restore previous post-fire rehabilitation area
South Fork	Dixie Creek Fire 1992	Restoration	2	13,363	Restore previous post-fire rehabilitation area
South Fork	Bullion Fire 1987	Restoration	2	5,272	Restore previous post-fire rehabilitation area
South Fork	Hastings Fire 2005	Seeding	2	1,180	Treat for cheatgrass and pinyon-juniper
South Fork	Harrison Fire 2007	Seeding	2	562	May be in a forest service priority watershed
South Fork	Sadler Complex 1999	Restoration	2	86,455	Restore previous post-fire rehabilitation area
South Fork	Sadler Complex 1999	Restoration	3	97,343	Restore previous post-fire rehabilitation area
South Fork	Rose Fire 1999	Restoration	3	48,331	Restore previous post-fire rehabilitation area
South Fork	Cedar Ridge South	Remove pinyon-juniper	3	9,452	Assess pinyon-juniper encroachment in and surrounding WSA
South Fork	Cedar Ridge North	Remove pinyon-juniper	3	7,571	Assess pinyon-juniper encroachment in and surrounding WSA
Steptoe Cave	Willow Creek Ext	Seeding	1	3,967	Remove crested wheatgrass; seed natives
Steptoe Cave	Ward Seeding	Seeding	1	2,126	Remove crested wheatgrass; seed natives
Steptoe Cave	Willow Creek 1	Seeding	1	998	Remove crested wheatgrass; seed natives
Steptoe Cave	South Steptoe	Seeding	1	3,201	Remove crested wheatgrass; seed natives
Steptoe Cave	Willow Creek 2	Seeding	1	1,165	Remove crested wheatgrass; seed natives
Steptoe Cave	Unnamed veg treatment 1	Seeding	1	2,380	Remove crested wheatgrass; seed natives
Steptoe Cave	Triangle	Seeding	1	447	Remove crested wheatgrass; seed natives
Steptoe Cave	Unnamed veg treatment 2	Seeding	1	2,339	Remove crested wheatgrass; seed natives
Steptoe Cave	Horse/Cattle Camp	Seeding	1	3,023	Remove crested wheatgrass; seed natives
Steptoe Cave	South Group Seeding	Seeding	1	575	Remove crested wheatgrass; seed natives
Steptoe Cave	Patterson Pass Seeding	Seeding	1	5,135	Remove crested wheatgrass; seed natives
Steptoe Cave	Cave Valley SG treatments	Assessment	1	2,970	Assess and re-treat due to lack of success
Steptoe Cave	South Steptoe Bench	Remove pinyon-juniper	1	27,432	Remove/thin pinyon-juniper along benches
Steptoe Cave	Terrace	Remove/thin conifers	1	5,193	Remove/thin conifers

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Steptoe Cave	Cave Valley Bench	Remove pinyon-juniper	1	7,542	Remove/thin pinyon-juniper along benches
Steptoe Cave	Cattle Camp	Remove pinyon-juniper	2	23,611	Remove/thin Phase 1 and 2 pinyon-juniper
Steptoe Cave	Terrace	Remove/thin conifers	2	4,644	Remove/thin conifers
Steptoe Cave	South Steptoe Bench	Remove pinyon-juniper	2	22,060	Remove/thin pinyon-juniper along benches
Steptoe Cave	South Cattle Camp	Seeding	3	1,438	Remove crested wheatgrass; seed natives
Steptoe Cave	Terrace	Remove/thin conifers	3	420	Remove/thin conifers
Table Mountain Hamlin Valley	Hamlin Valley Sage-Grouse Treatment	Assessment	1	14,531	Assess and treat cheatgrass
Table Mountain Hamlin Valley	Meadow Valley Wash Seedings	Assessment	1	9,017	Assess within seeding areas
Table Mountain Hamlin Valley	Meadow Valley Wash	Remove pinyon-juniper	1	45,376	Remove phase 1 and 2 pinyon-juniper
Table Mountain Hamlin Valley	NV-UT Hamlin Bench	Remove pinyon-juniper	1	61,274	Remove phase 1 and 2 pinyon-juniper
Table Mountain Hamlin Valley	Table Mountain	Remove pinyon-juniper	2	11,219	Remove/thin pinyon-juniper phase I and II
Table Mountain Hamlin Valley	Cave and Lake S-10	Remove pinyon-juniper	2	11,632	Phase I and II and corridor
Table Mountain Hamlin Valley	Cave and Lake A-2	Remove pinyon-juniper	2	3,300	Remove/thin pinyon-juniper phase I and II
Table Mountain Hamlin Valley	NV-UT Hamlin Bench	Remove pinyon-juniper	2	84,460	Remove phase 1 and 2 pinyon-juniper
Table Mountain Hamlin Valley	Coyote Wildfire Area	Assessment	3	22,432	Assess for cheatgrass
Table Mountain Hamlin Valley	Table Fire	Assessment	3	8,643	Assess for cheatgrass and reestablish natives
Table Mountain Hamlin Valley	Eagle Fire 2002	Assessment	3	8,528	Assess for cheatgrass establishment
Table Mountain Hamlin Valley	Buster Fire 2002	Assessment	3	4,402	Assess fire rehabilitation
Table Mountain Hamlin Valley	White Rock Fire	Assessment	3	6,250	Assess for cheatgrass and reestablish natives
Table Mountain Hamlin Valley	Paradise Fire	Assessment	3	5,632	Assess for cheatgrass and reestablish natives
Western White Pine	Pinto Creek Seeding	Seeding	1	1,283	Remove crested wheatgrass; plant natives
Western White Pine	Halstead Seeding	Seeding	1	989	Remove crested wheatgrass; plant natives
Western White Pine	Fernando Seeding	Seeding	1	902	Remove crested wheatgrass; plant natives
Western White Pine	McQueen Seeding	Seeding	1	2,045	Remove crested wheatgrass; plant natives

Attribute Table from GIS

Project Planning Area	Project Name	Treatment Type	Priority	Acres	Notes
Western White Pine	Jakes Valley	Remove pinyon-juniper	1	48,272	Treat/thin phase 1 and 2 pinyon-juniper along benches
Western White Pine	South Newark Valley	Remove pinyon-juniper	1	18,036	Treat/thin phase 1 and 2 pinyon-juniper along benches
Western White Pine	East Pancake	Remove pinyon-juniper	1	8,628	Treat/thin phase 1 and 2 pinyon-juniper along benches
Western White Pine	Mokomoke Mountain	Remove pinyon-juniper	1	19,075	Assess for potential pinyon-juniper thinning
Western White Pine	Lampson Fire 2007	Restoration	2	577	Enhance riparian function
Western White Pine	Pinto Fire 2012	Assessment	2	2,880	Assess fire rehabilitation and seed natives if needed
Western White Pine	Mokomoke Mountain	Remove pinyon-juniper	2	51,297	assess for potential pinyon-juniper thinning
Western White Pine	Cathedral Fire 2007	Assessment	3	3,701	Chemically treat cheatgrass in burned areas

5.1.6 Fire Operations

Project Planning Area	Protection Order Priority	Acres
Antelope Valley	1	131,332
Antelope Valley	2	90,593
Antelope Valley	3	45,917
Bald Hills	1	179,439
Bald Hills	2	4,685
Bald Hills	3	35,495
Bates Callaghan	1	850,604
Bates Callaghan	2	265,513
Bates Callaghan	3	283,099
Cherry Creek	1	314,506
Cherry Creek	2	10,824
Cherry Creek	3	102,338
Cooks Creek	1	84,555
Cooks Creek	2	56,803
Cooks Creek	3	12,437
Cortez	1	20,968
Cortez	2	42,700
Cortez	3	7,342
Egan	1	244,558
Egan	2	44,857
Egan	3	133,113
John’s Valley	1	21
John’s Valley	2	20,775
John’s Valley	3	105,805
Long Valley	1	178,841
Long Valley	2	22,166

Project Planning Area	Protection Order Priority	Acres
Long Valley	3	41,637
North Spring	1	259,181
North Spring	2	8,563
North Spring	3	68,236
Panguitch	1	54,724
Panguitch	2	100,123
Panguitch	3	506,667
Parker Mountain	1	51,413
Parker Mountain	2	217,856
Parker Mountain	3	440,996
Punchbowl	1	422,159
Punchbowl	2	111,502
Punchbowl	3	175,565
Reese R. Yomba Desatoya	1	416,831
Reese R. Yomba Desatoya	2	127,744
Reese R. Yomba Desatoya	3	214,426
Ruby	1	152,405
Ruby	2	38,167
Ruby	3	57,589
Sonomas	1	77,386
Sonomas	2	18,107
Sonomas	3	89,395
South Fork	1	276,559
South Fork	2	102,925
South Fork	3	155,815
Steptoe Cave	1	185,619
Steptoe Cave	2	7,704
Steptoe Cave	3	155,139
Table Mountain Hamlin Valley	1	305,697
Table Mountain Hamlin Valley	2	10,600
Table Mountain Hamlin Valley	3	264,111
Western White Pine	1	557,487
Western White Pine	2	36,455
Western White Pine	3	119,192

5.1.7 Post-Fire Rehabilitation

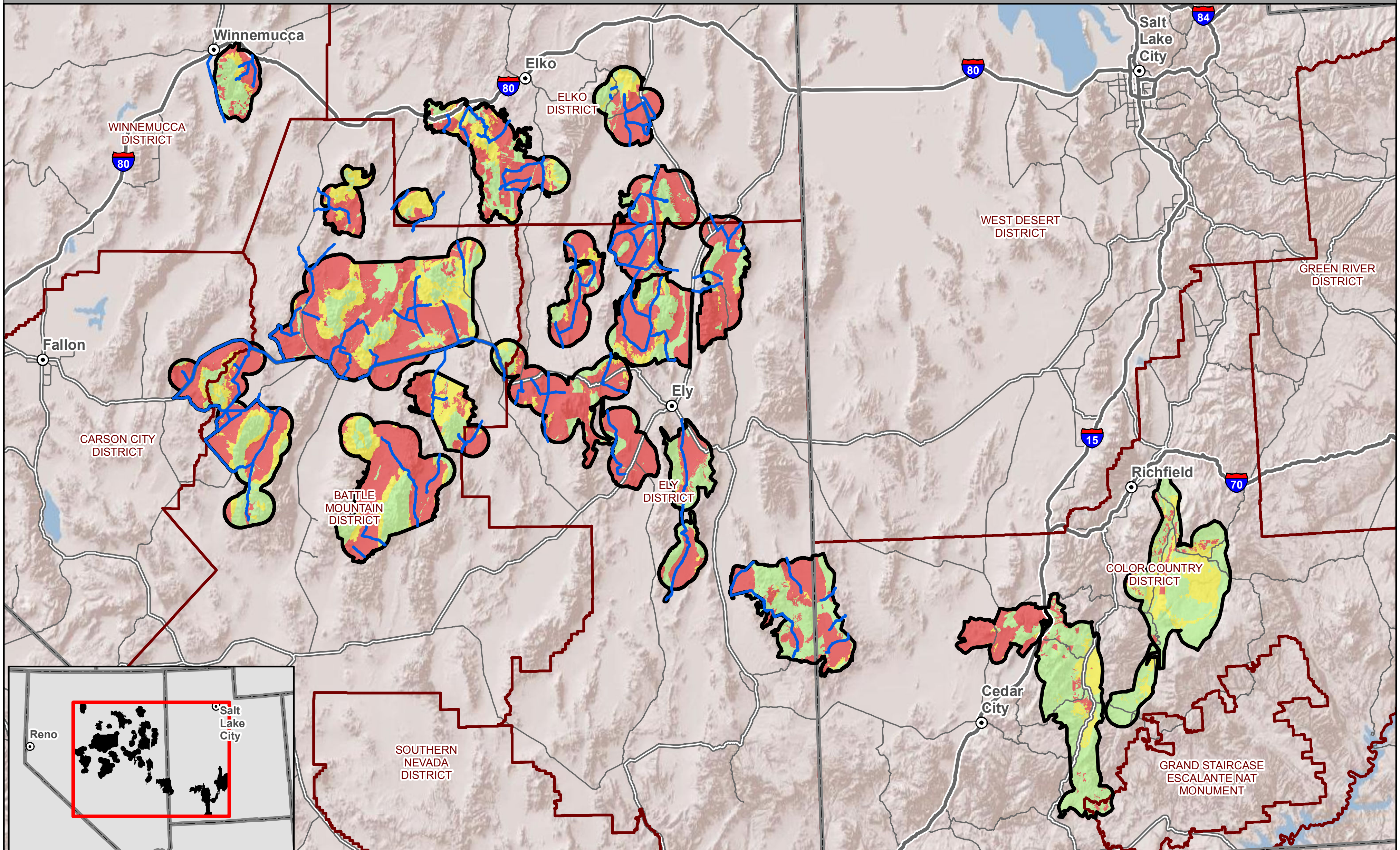
Project Planning Area	Fire Name	Fire Year	Fire Acres	Treatment Type	Treatment Acres	Priority	Notes
North Spring	Lages	2014	9,239	Assessment	9,239	1	Assess BRTE and native plantings
North Spring	Samson	2014	2,136	Assessment	2,136	2	Assess BRTE and native plantings
Table Mountain/Hamlin Valley	White Rock	2012	6,250	Assessment	6,250	3	Assess for cheatgrass establishment

See **Figure 5-3**.

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

Priority 1
Priority 2
Priority 3
Fuel Break
Project Planning Area
State Boundary
BLM District Boundary
Interstate Hwy
US Route
State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:2,782,791

5.2 Monitoring and Adaptive Management

Once implemented, projects and treatments identified in this assessment will follow the same monitoring protocols as non-FIAT management actions, in accordance with overarching guidance in land use plans. Specifically, monitoring that evaluates the implementation and effectiveness of FIAT management strategies will follow The Greater Sage-Grouse Monitoring Framework (BLM/Forest Service 2014).

In this framework, monitoring and evaluating the individual FIAT actions, as with all projects designed to enhance or restore GRSG habitats, will use the approved fine- and site-scale monitoring methods of the BLM Core Terrestrial Indicators and Methods (from the AIM-Monitoring: A component of the Assessment, Inventory, and Monitoring [AIM] Strategy), Interpreting Indicators of Rangeland Health (BLM Technical Reference 1734-6), and the Sage-Grouse Habitat Assessment Framework (HAF-BLM Technical Reference 6710-1 in press).

Fine- and site-scale monitoring methods for the Forest Service are those listed for the BLM and Forest Service Rangeland Ecosystem Analysis and Monitoring Handbook, Chapter 40—Rangeland Trend Monitoring and Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems Vol. 1 and 2.

During the annual broad- and mid-scale monitoring of GRSG habitats, the FIAT actions will be assessed as they relate to GRSG habitat measures of sagebrush availability, human disturbance levels, and sagebrush conditions. Monitoring results from the implemented FIAT actions can provide information to adapt future actions if necessary to enhance and restore GRSG habitats.

Wildfires will be evaluated at the end of the fire season to determine if they have occurred in FIAT focal habitats and if so, if they have affected the prioritization or potential implementation of previously identified management strategies. For example, fuelbreak locations may need to be adjusted if a wildfire were to occur in an area previously identified as a high priority for sagebrush maintenance. Surrounding areas with intact sagebrush stands may now be a higher priority for fuelbreaks than the burned area.

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SECTION 6
LIST OF PREPARERS

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Kyra Walton Reid	USFS
Steve Foree	NDOW
Dawn Davis	USFWS
Sarah Kulpa	USFWS
Ted Koch	USFWS
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Amy Cordle	EMPSi
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SECTION 7
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Appendix A
Maps

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
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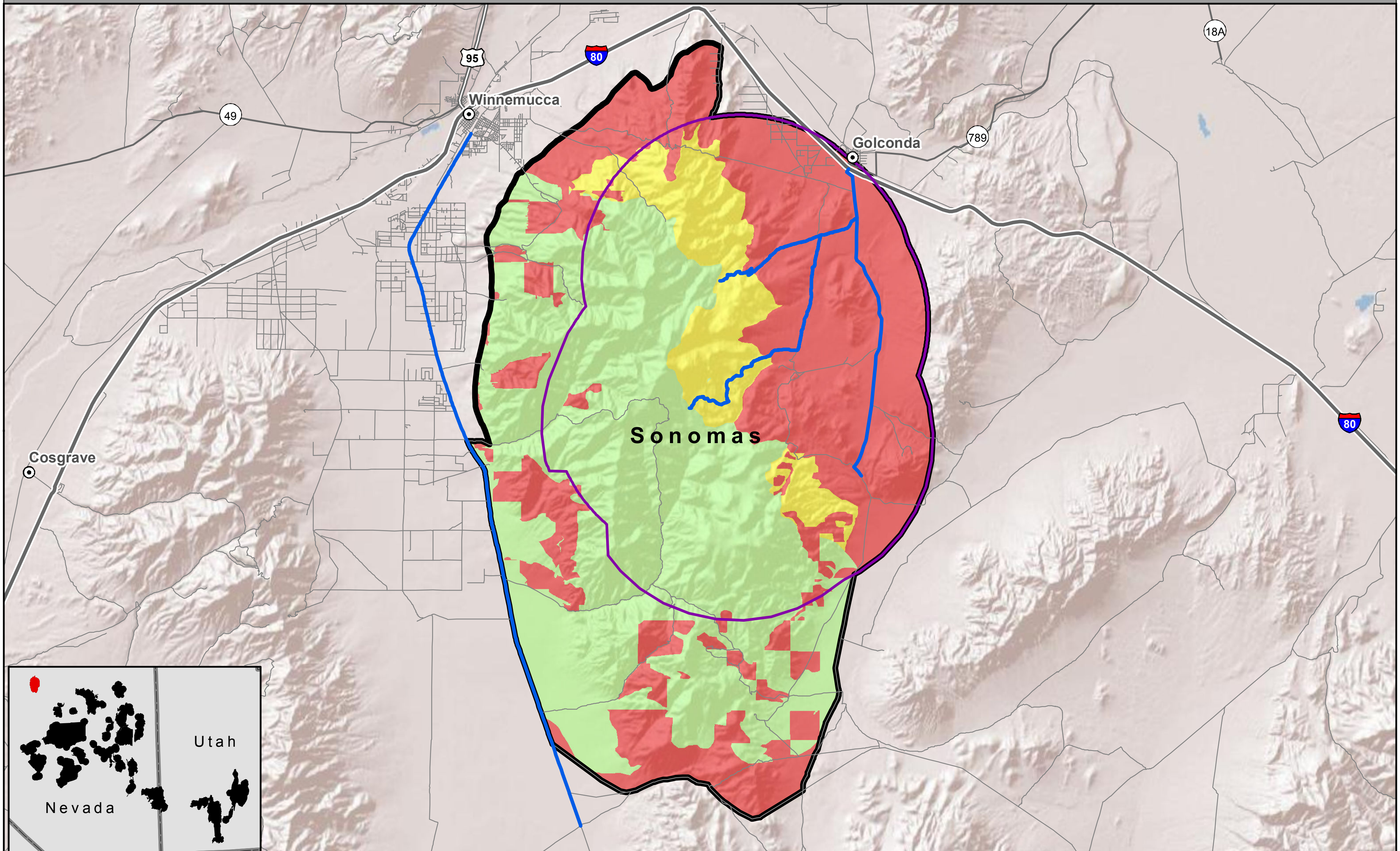

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N

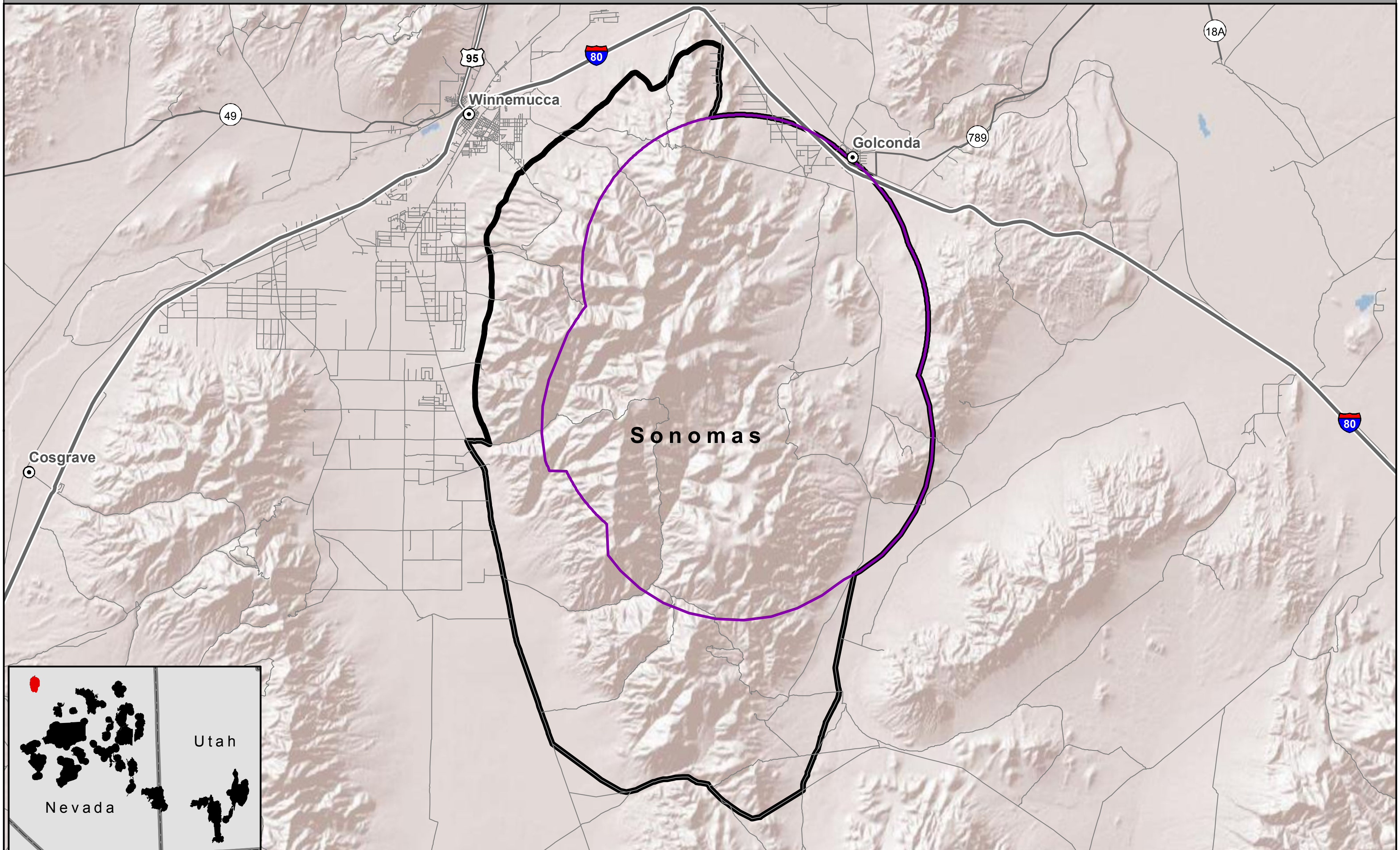
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:282,120

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
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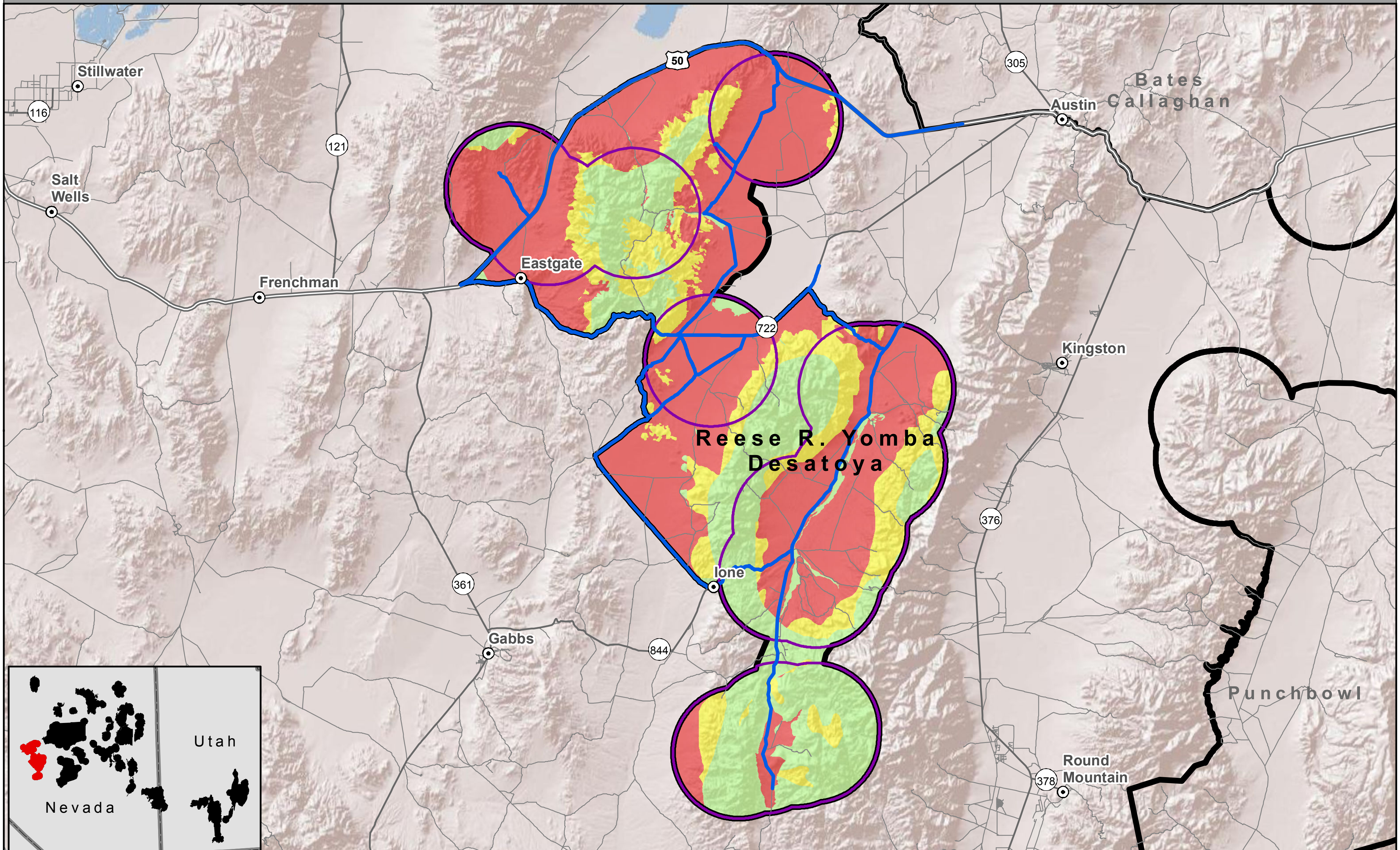

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Habitat Restoration & Recovery Potential Treatment Areas

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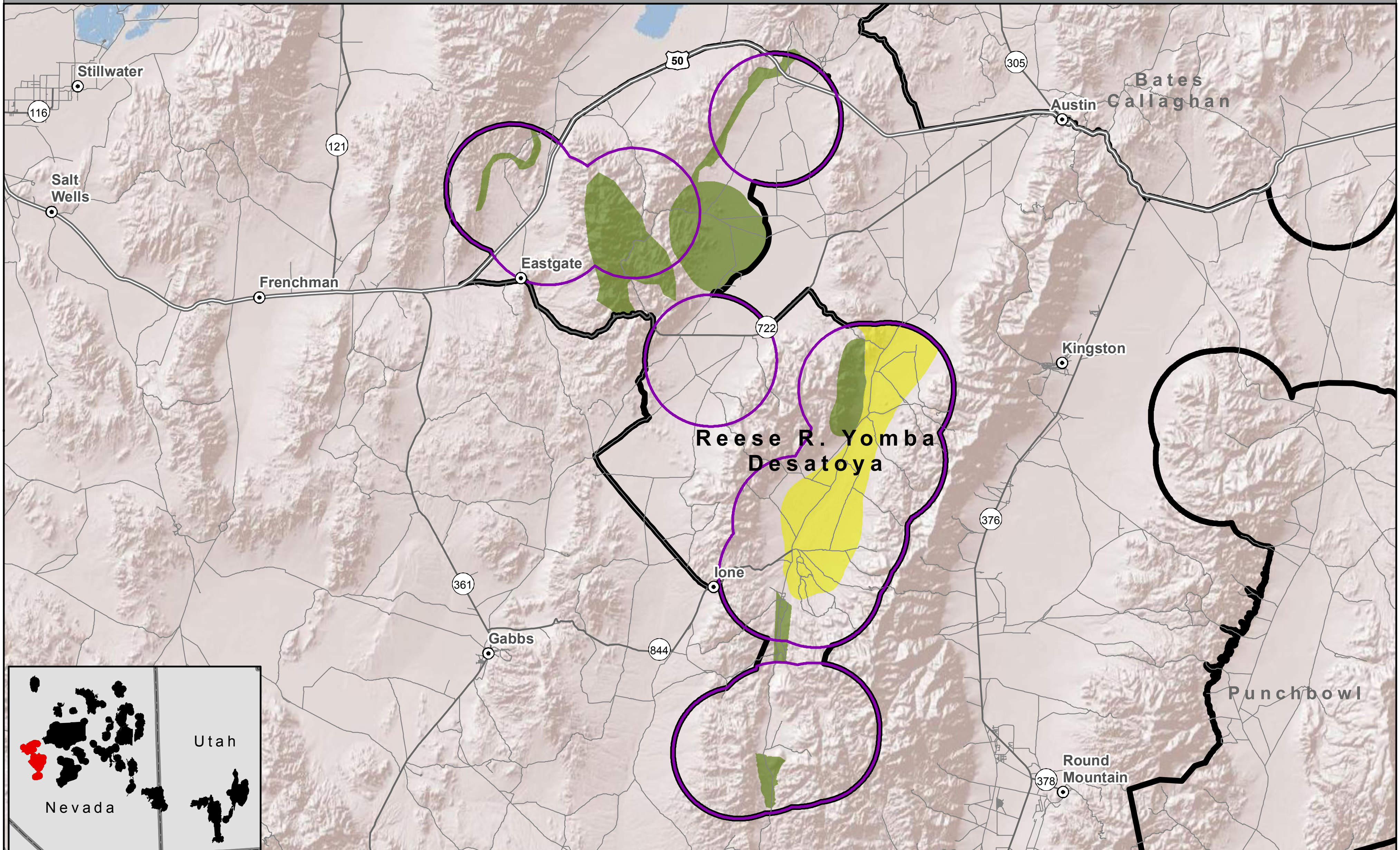

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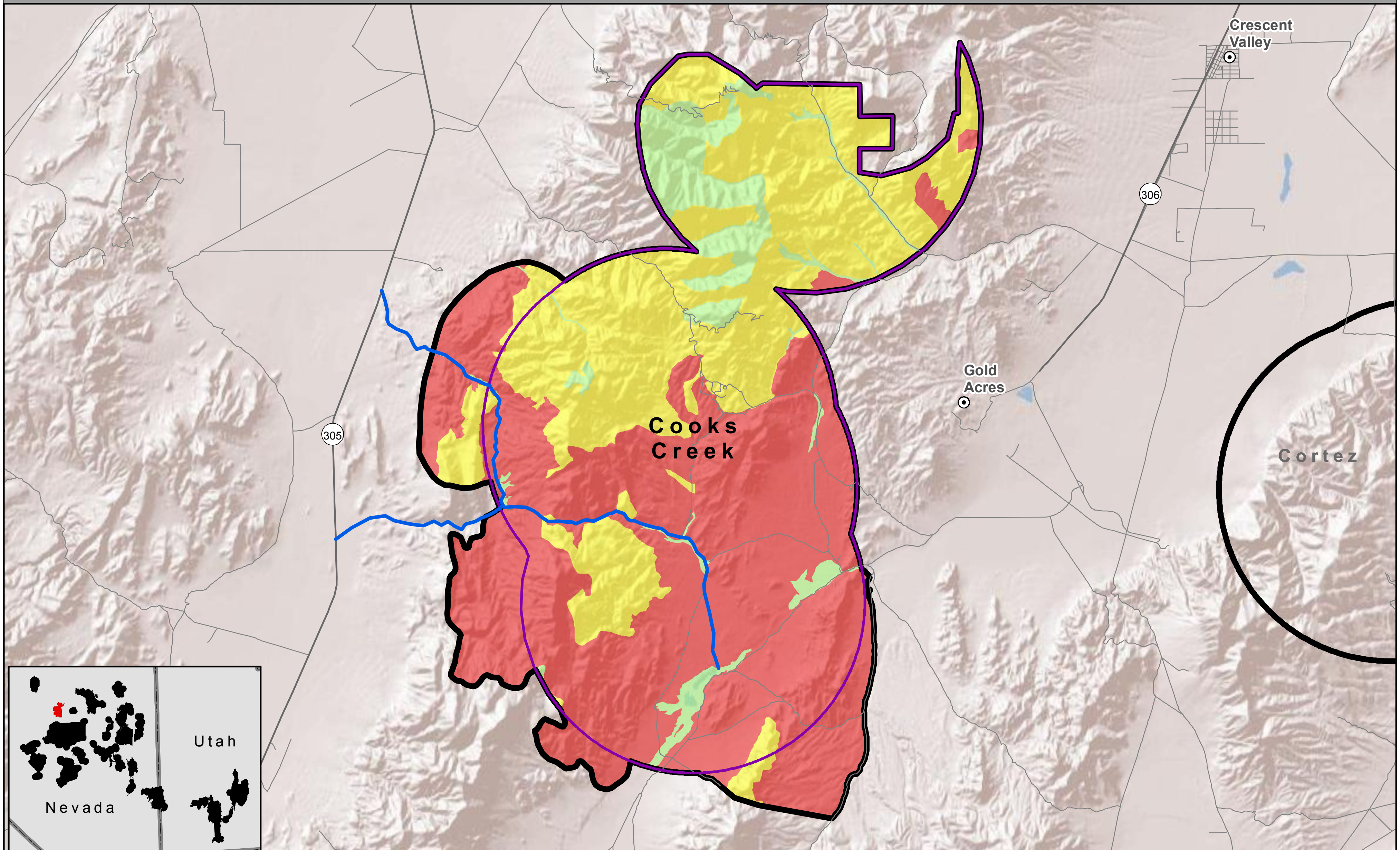

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Habitat Restoration & Recovery Potential Treatment Areas

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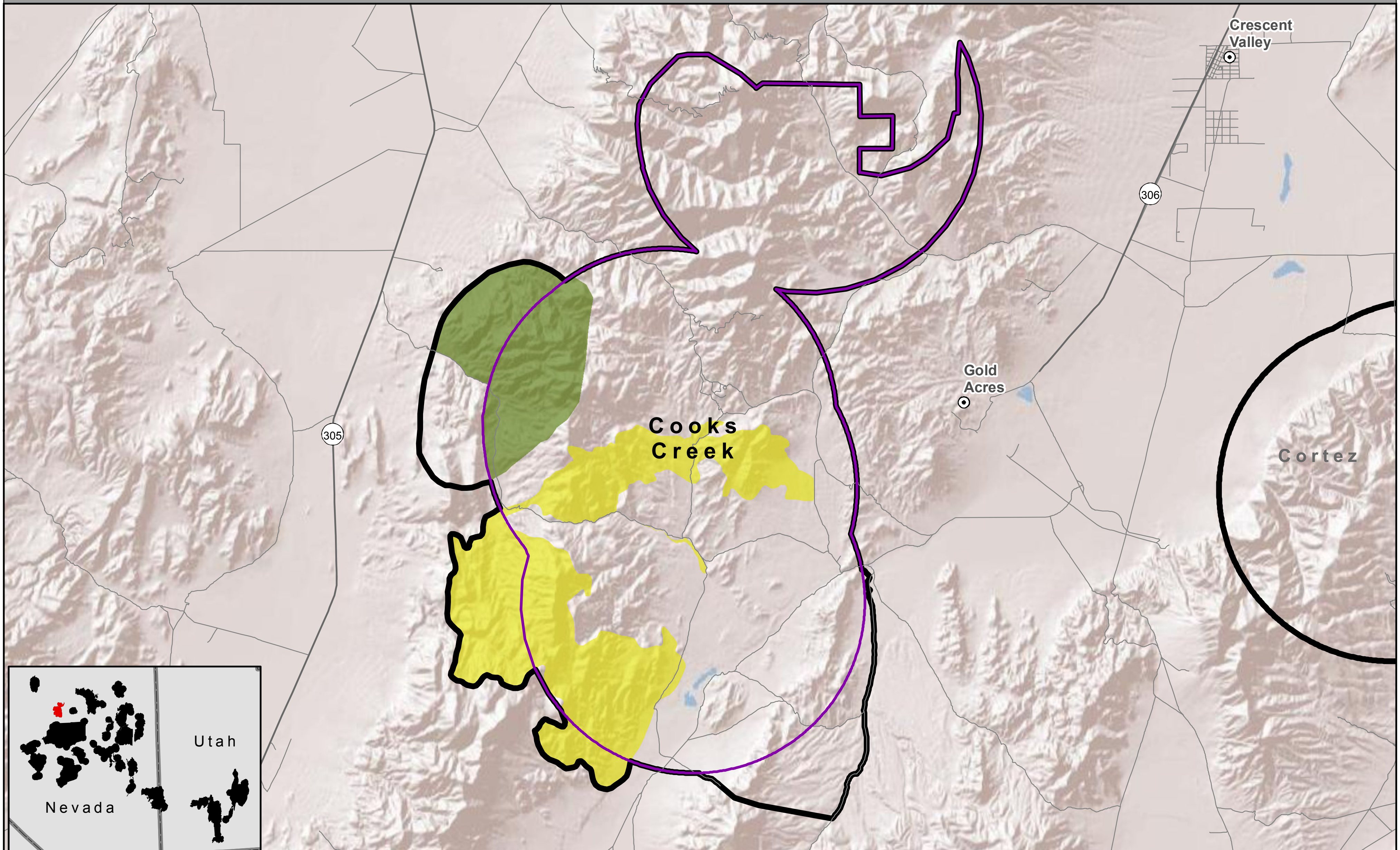

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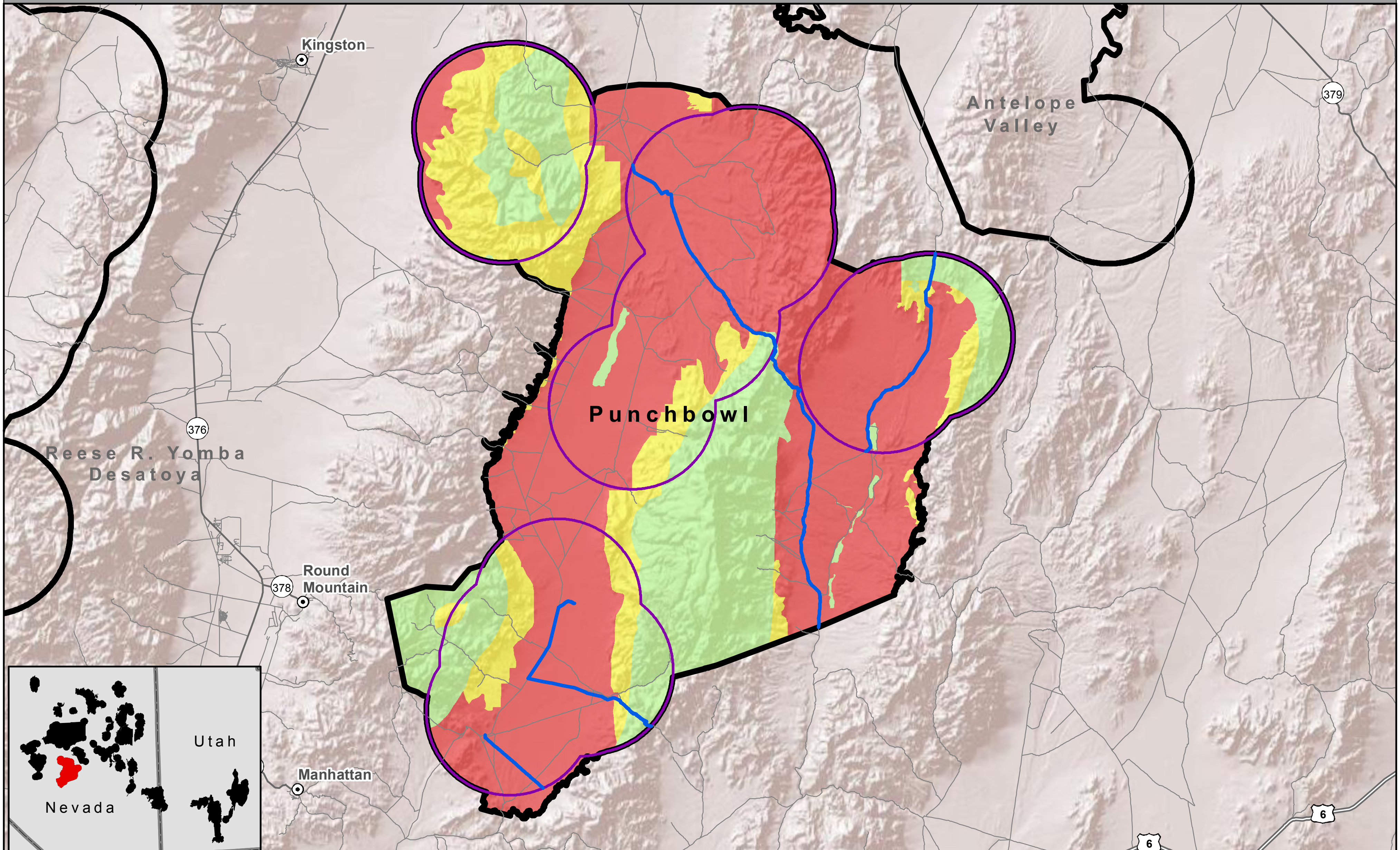

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1:532,500

Habitat Restoration & Recovery Potential Treatment Areas

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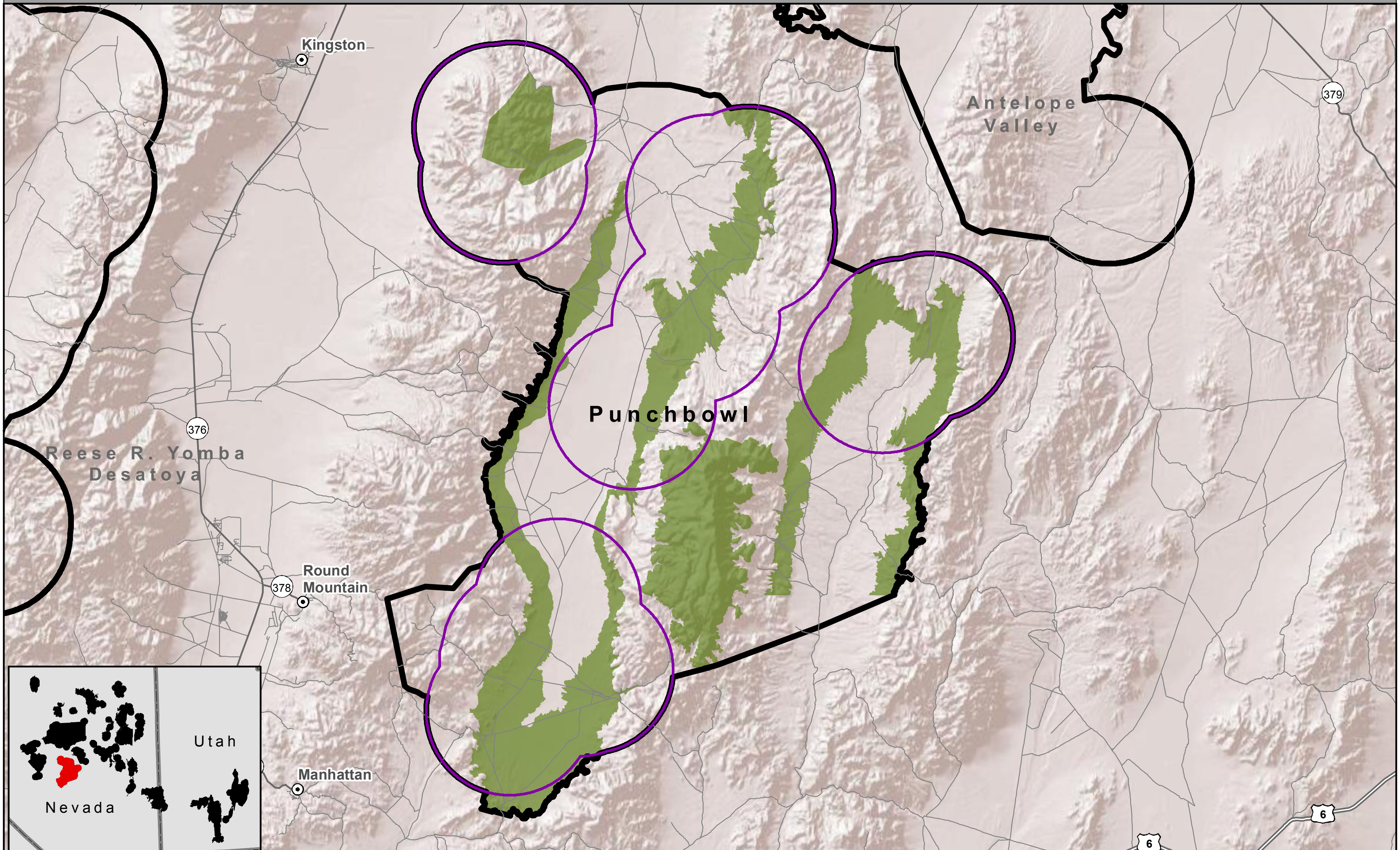

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Fire Operations/ESR Priority & Fuels Management

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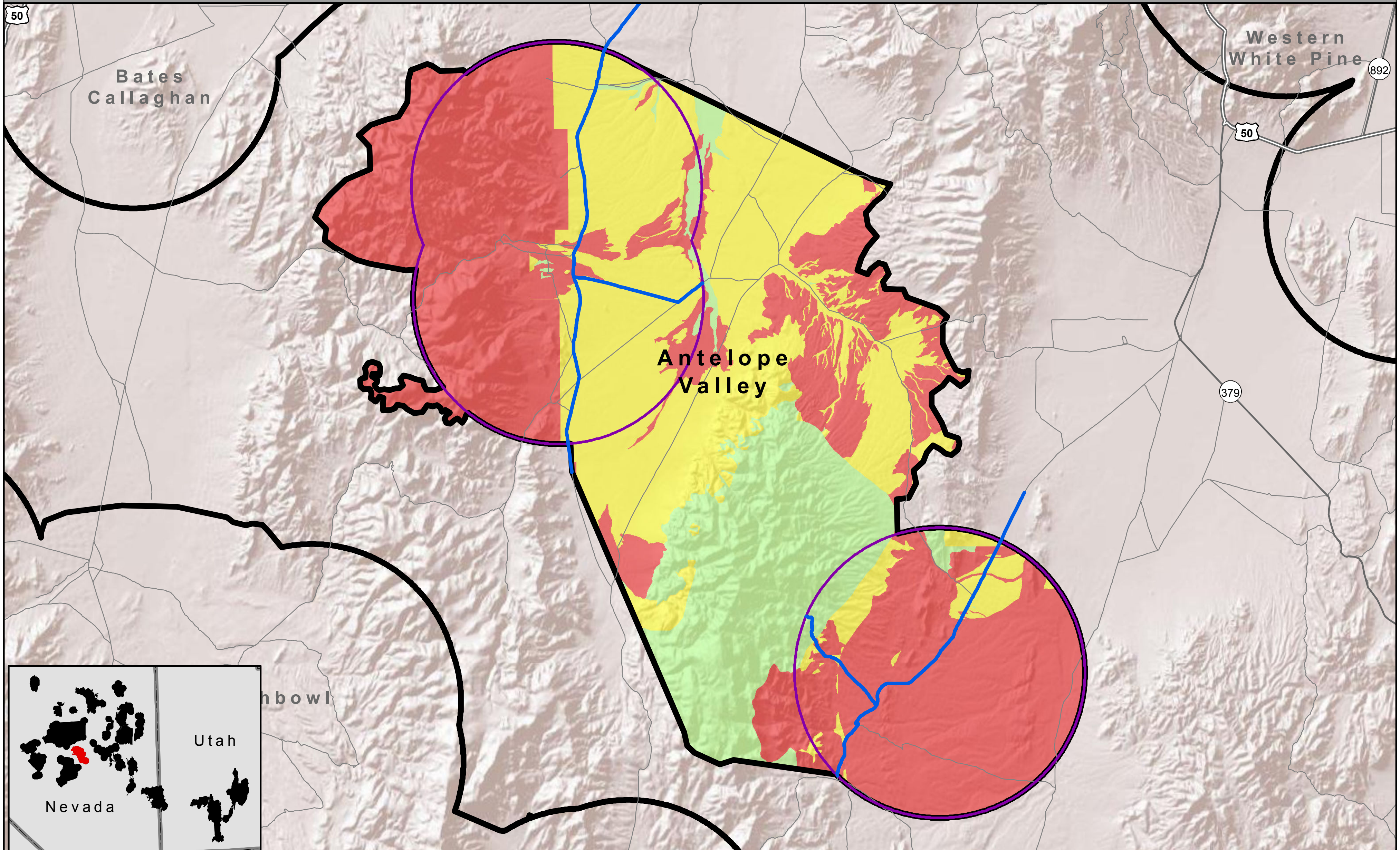

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Priority 2
Priority 3
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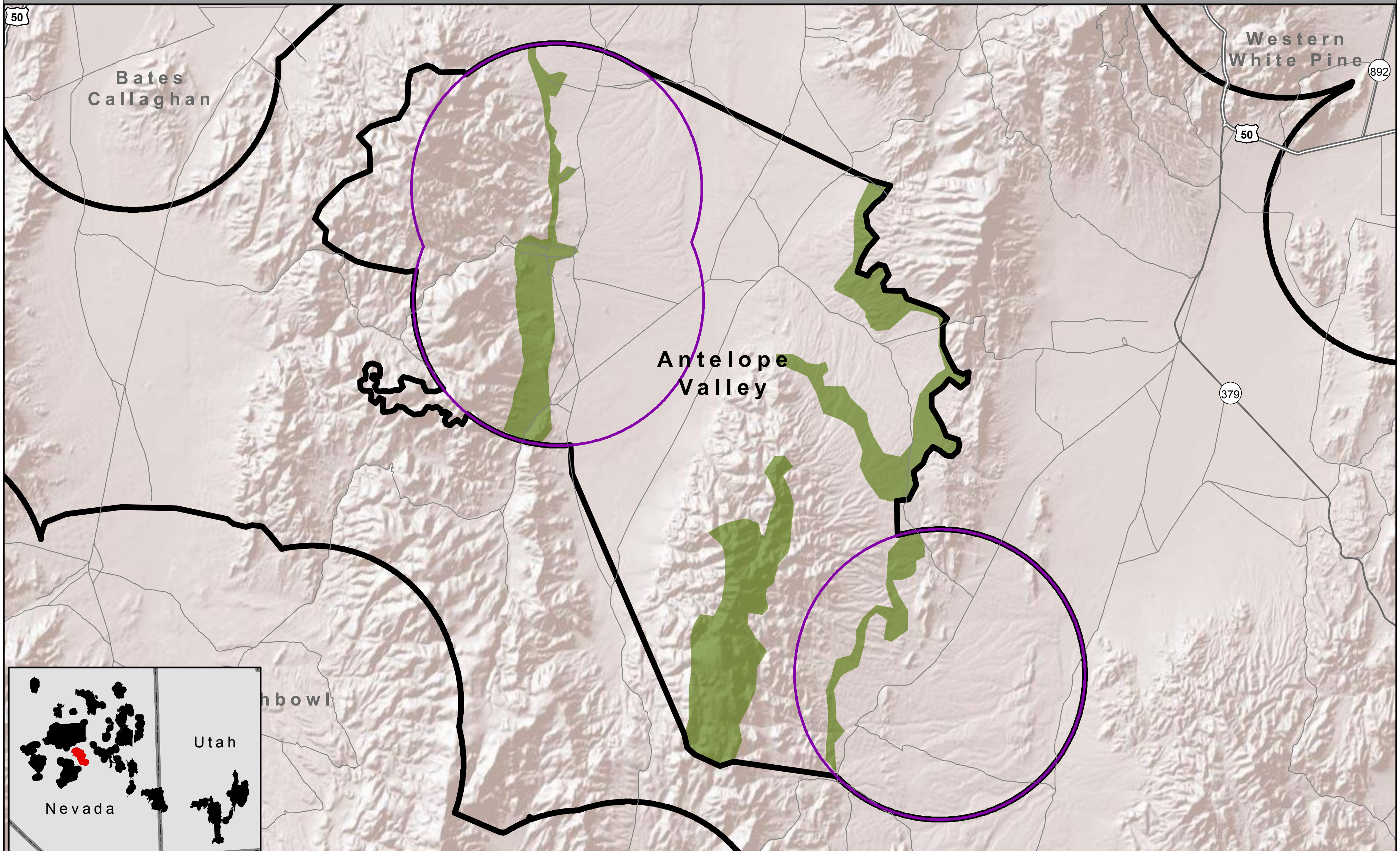
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:305,640

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

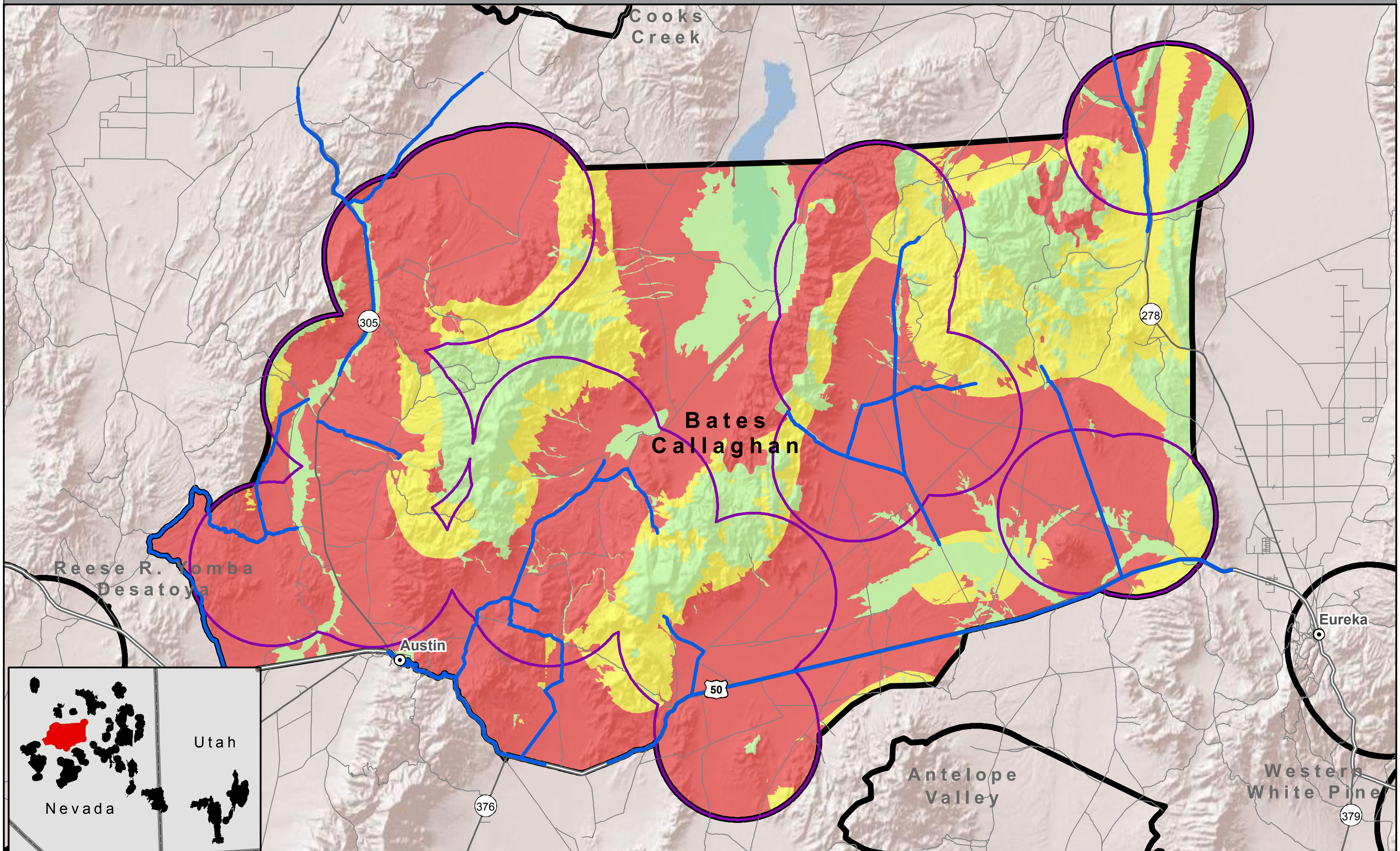
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:305,640

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

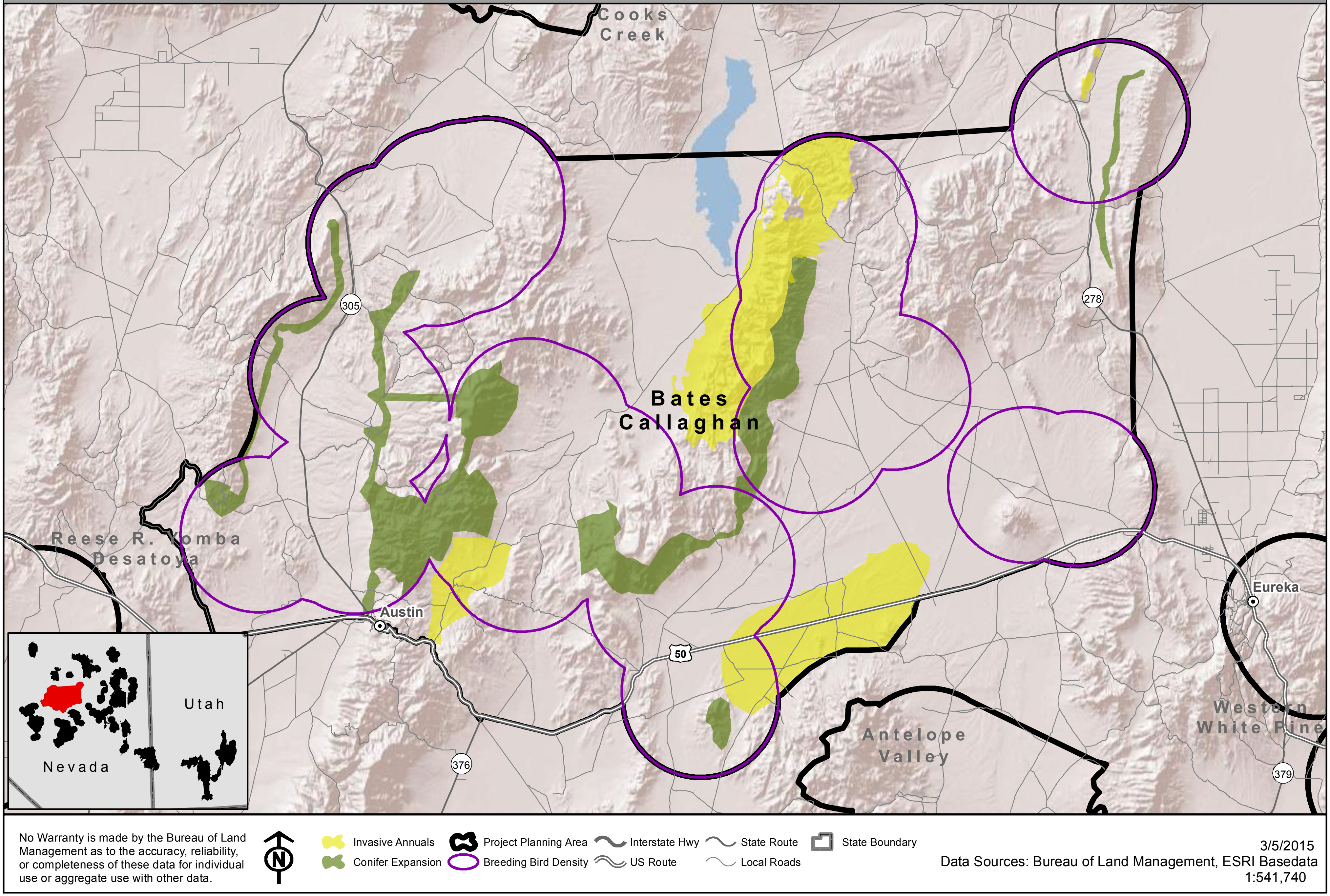
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:541,450

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



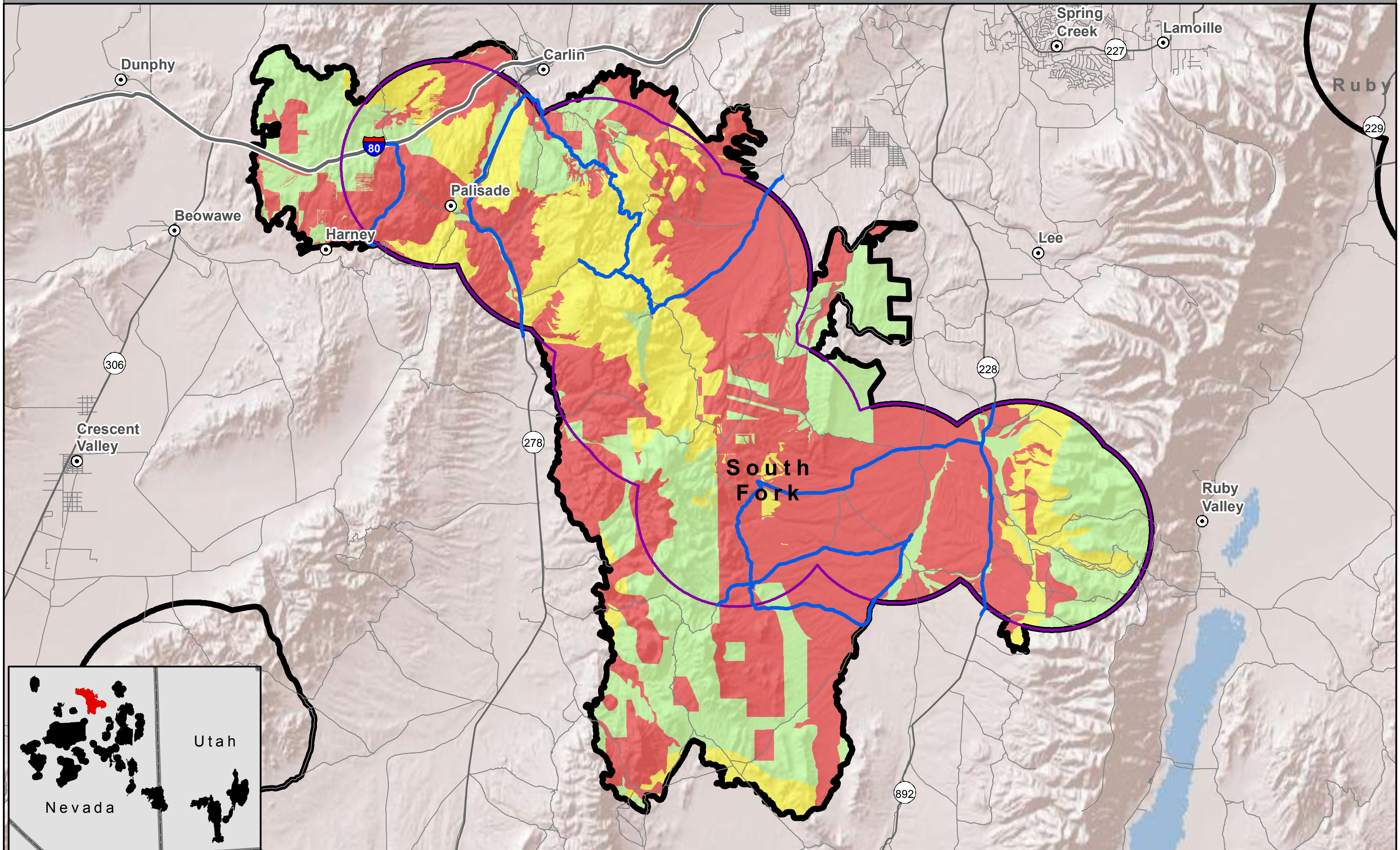
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:541,740

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

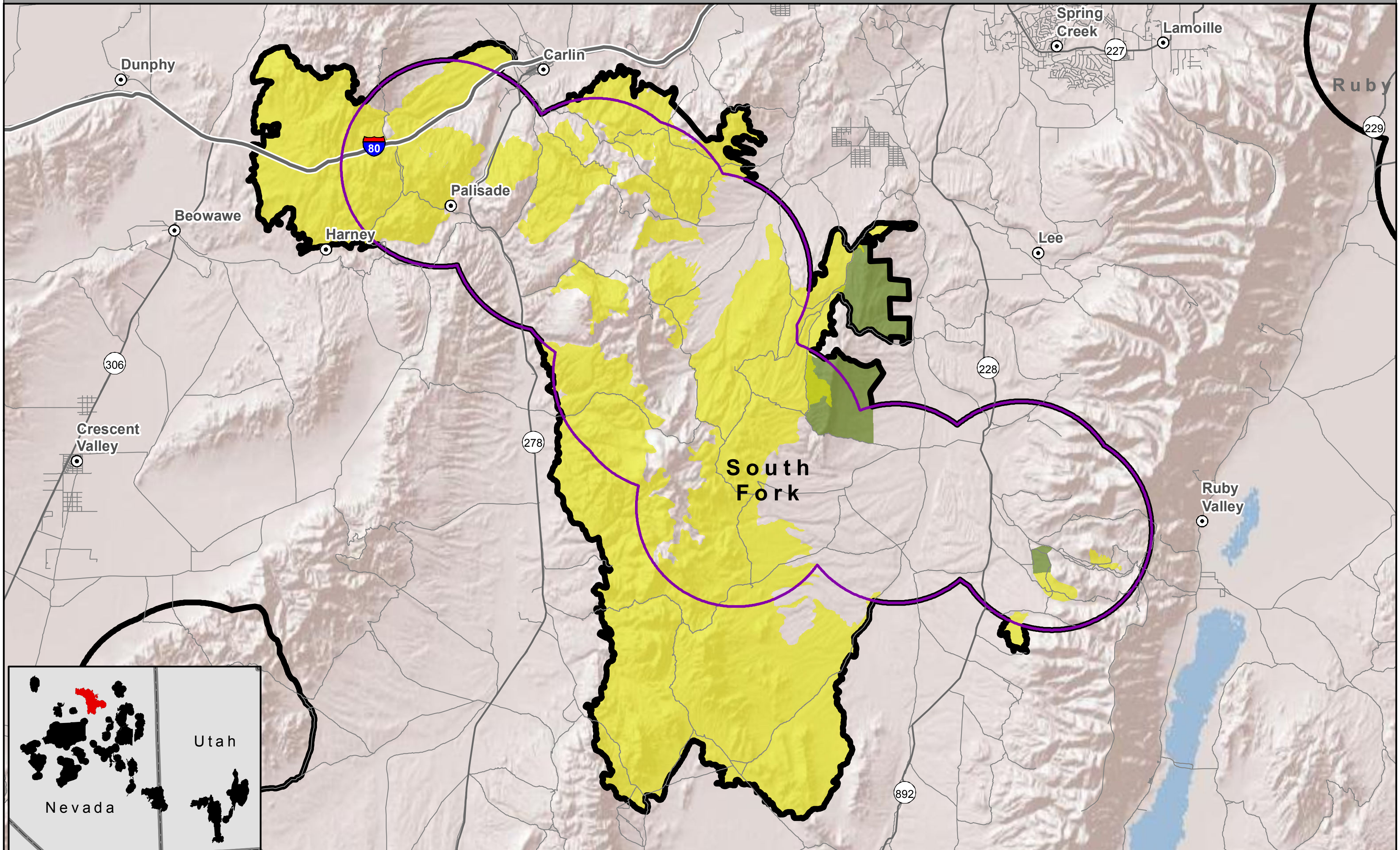
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:444,930

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

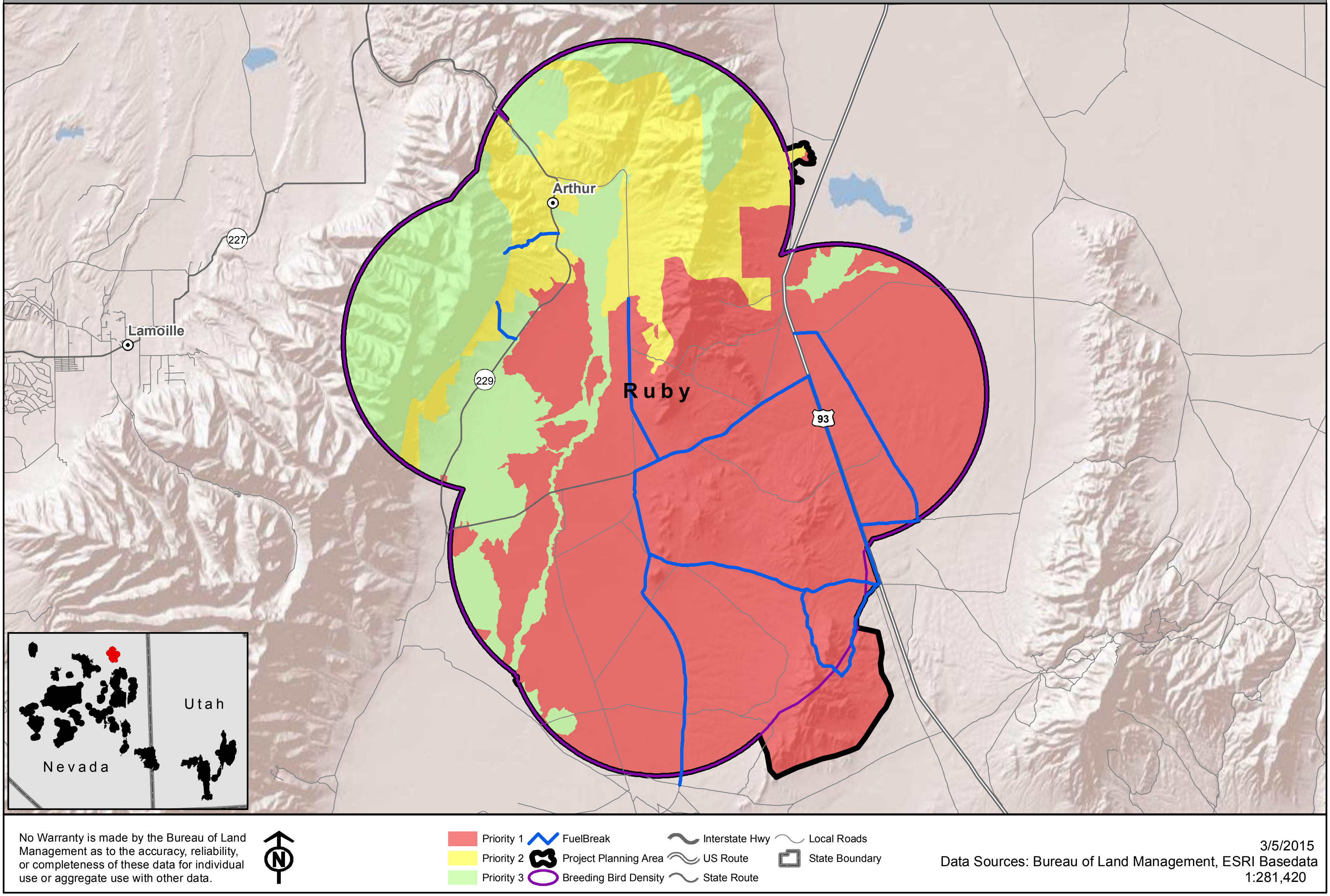
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:444,930

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



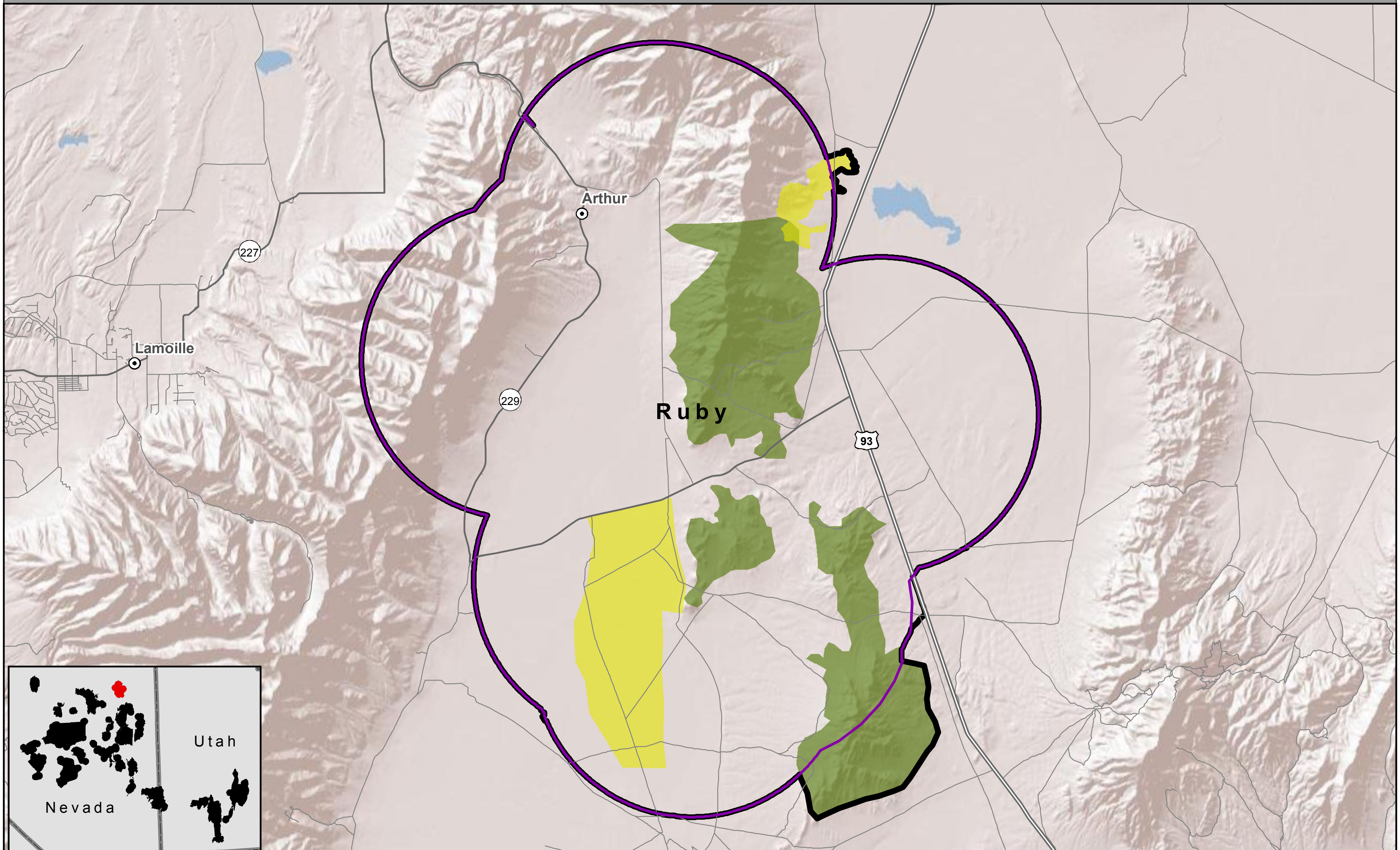
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:281,420

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

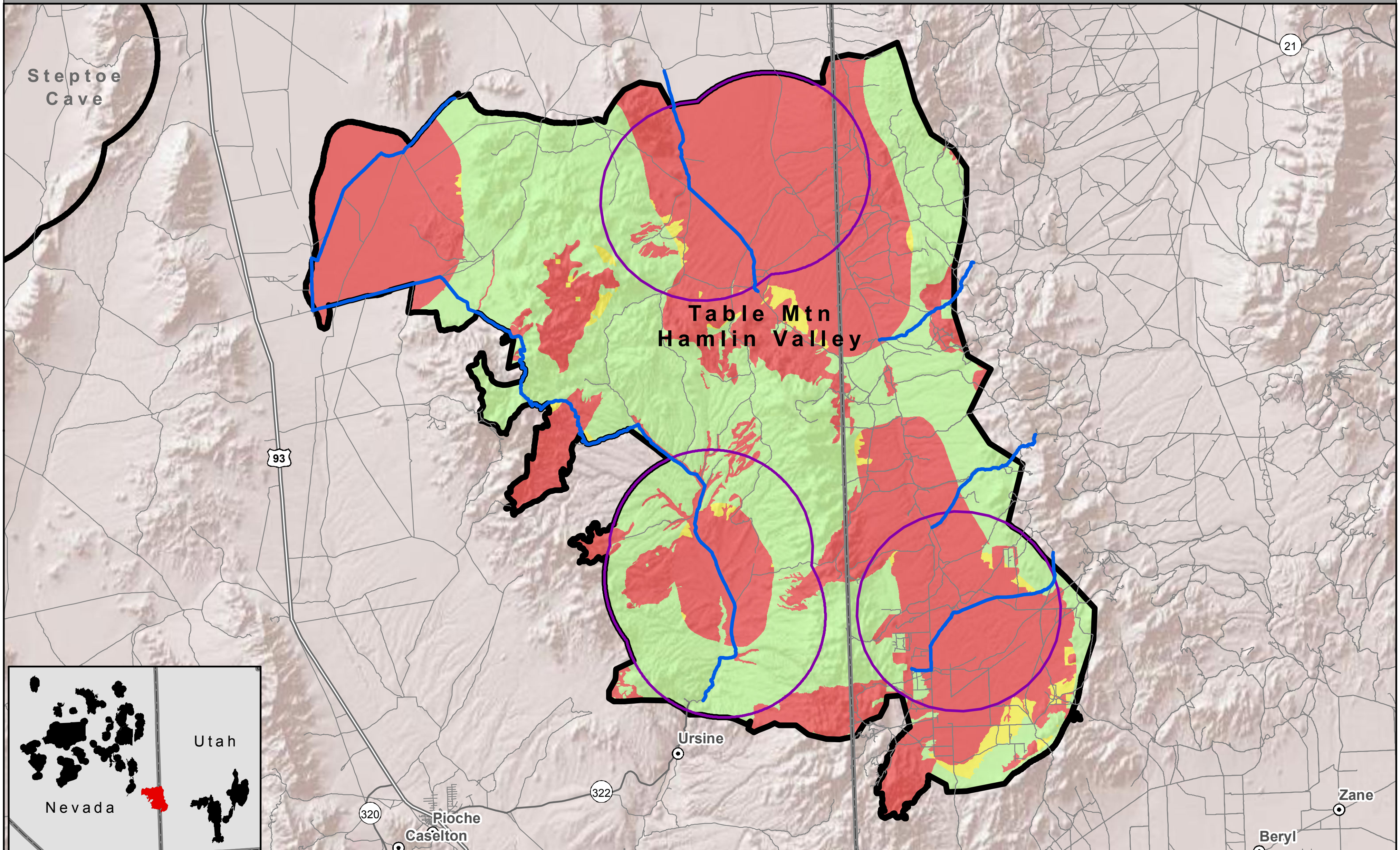
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:281,420

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

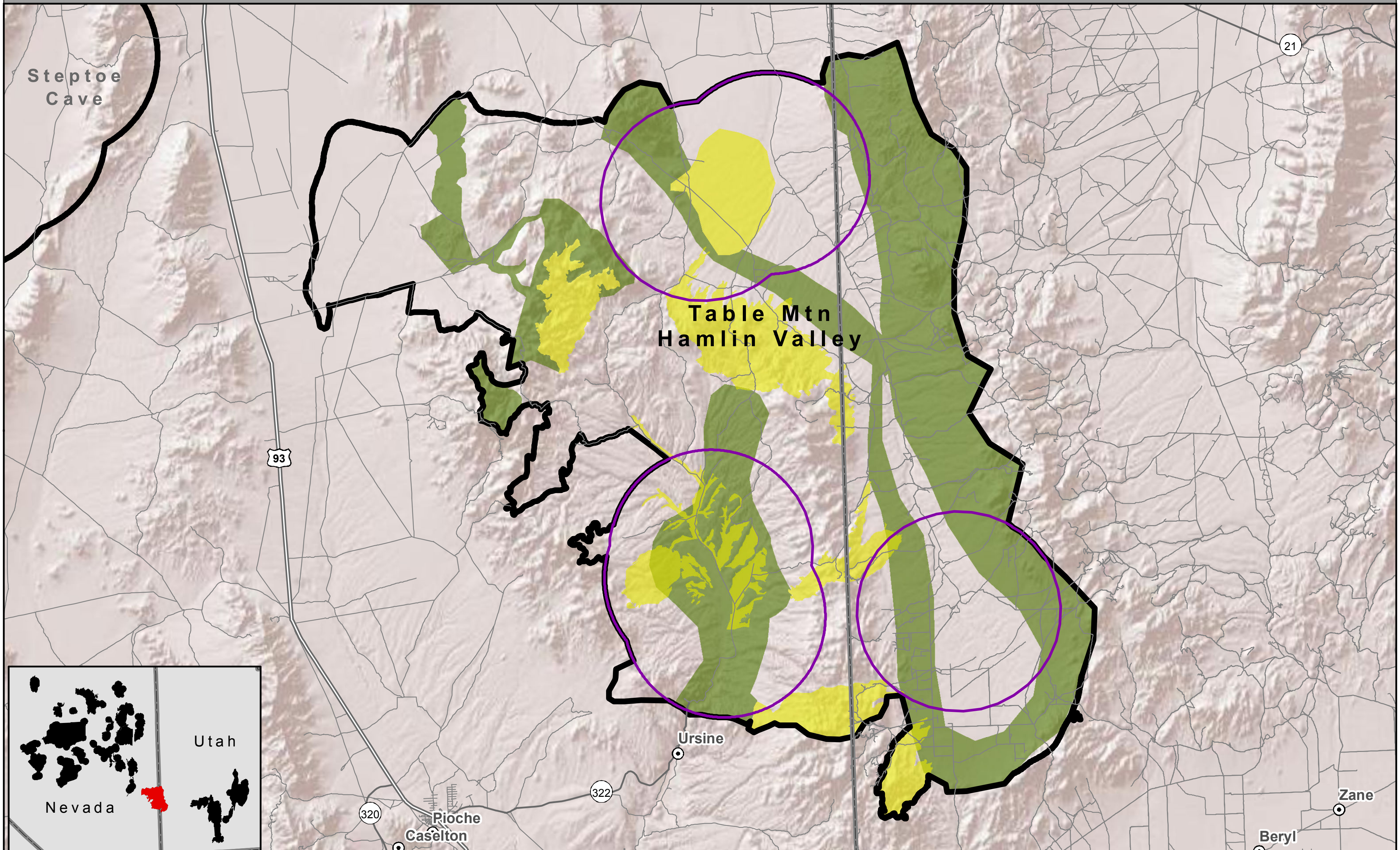
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:440,000

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

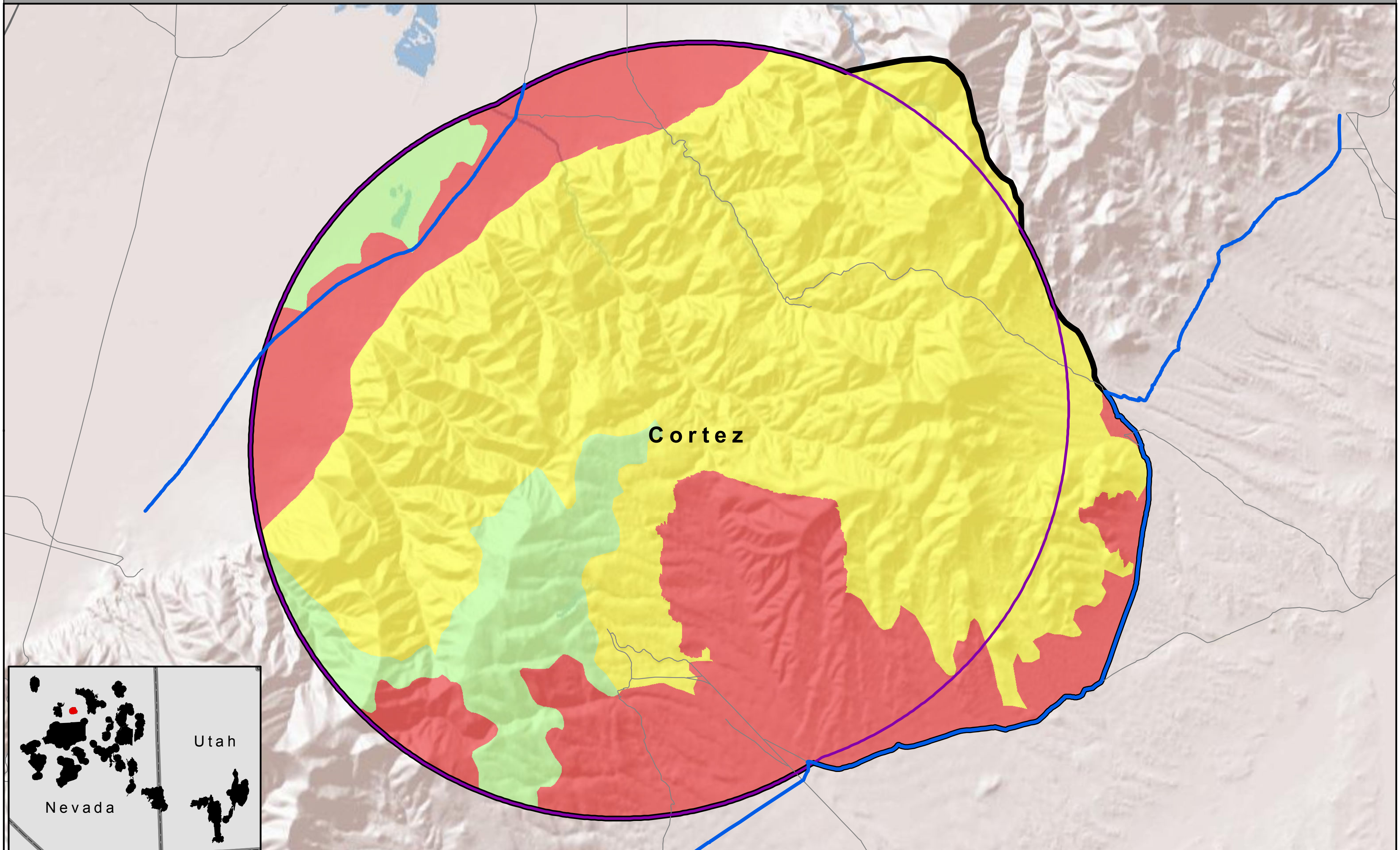
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:440,000

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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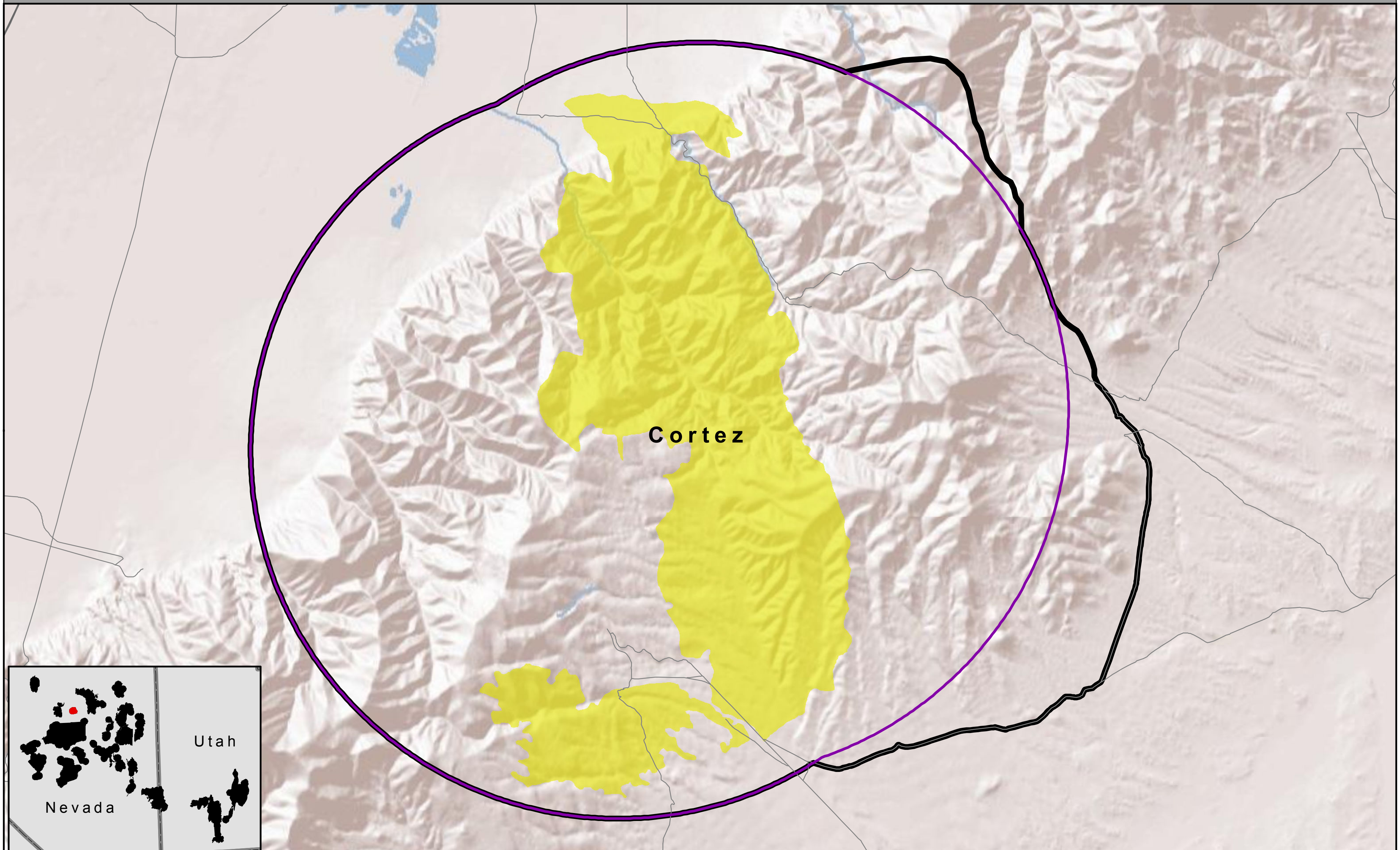
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:120,630

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

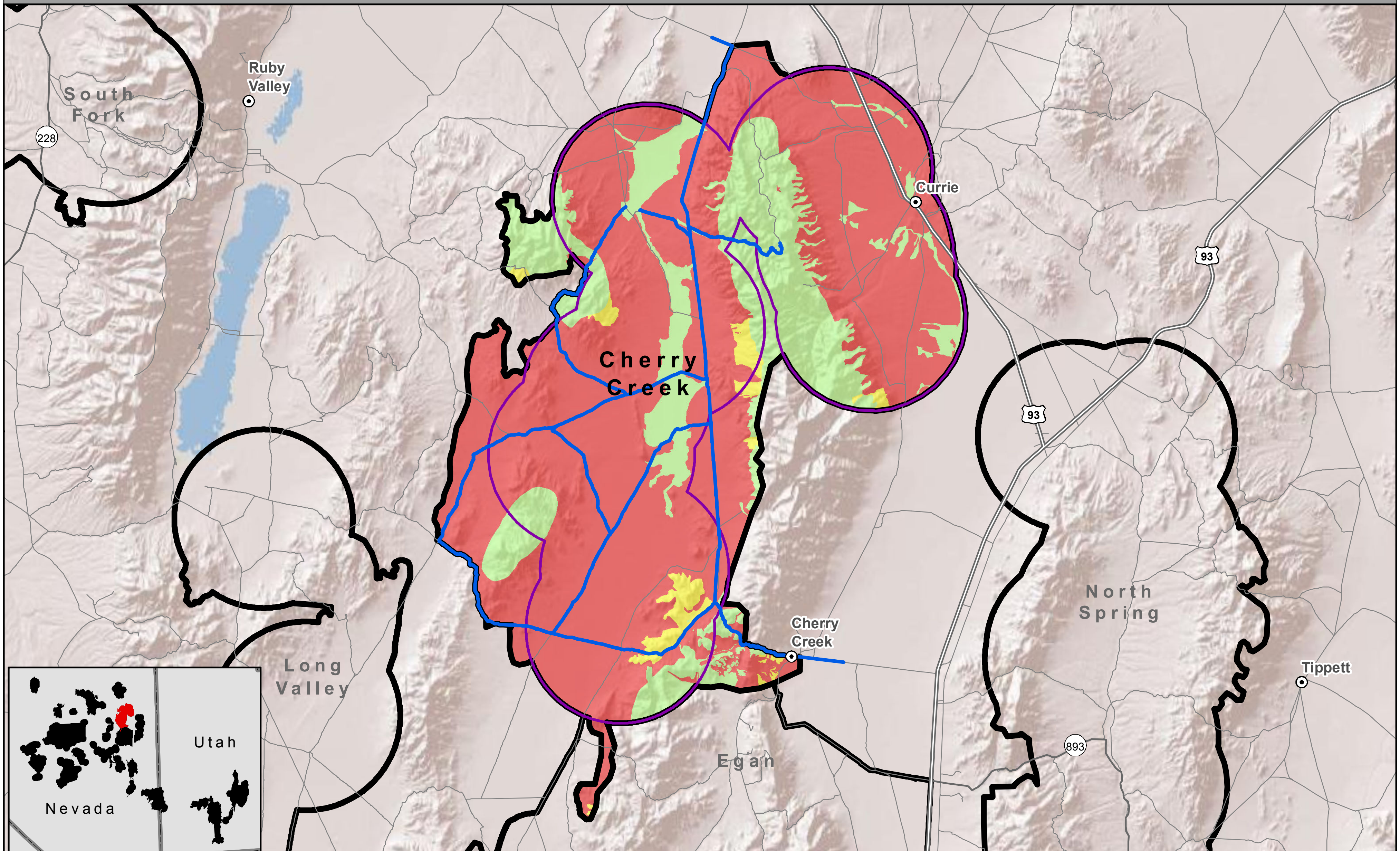
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:120,630

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

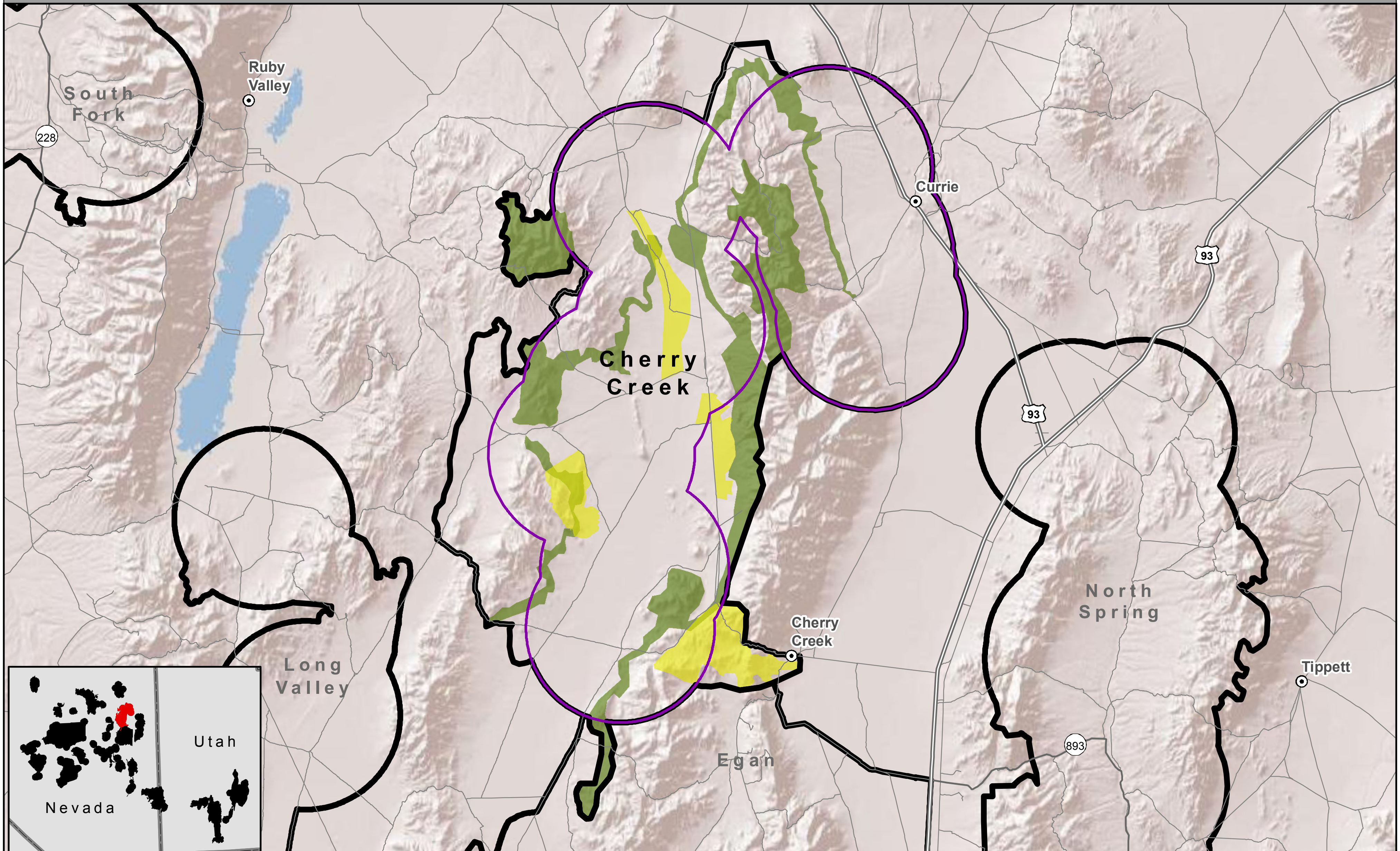
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:470,410

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

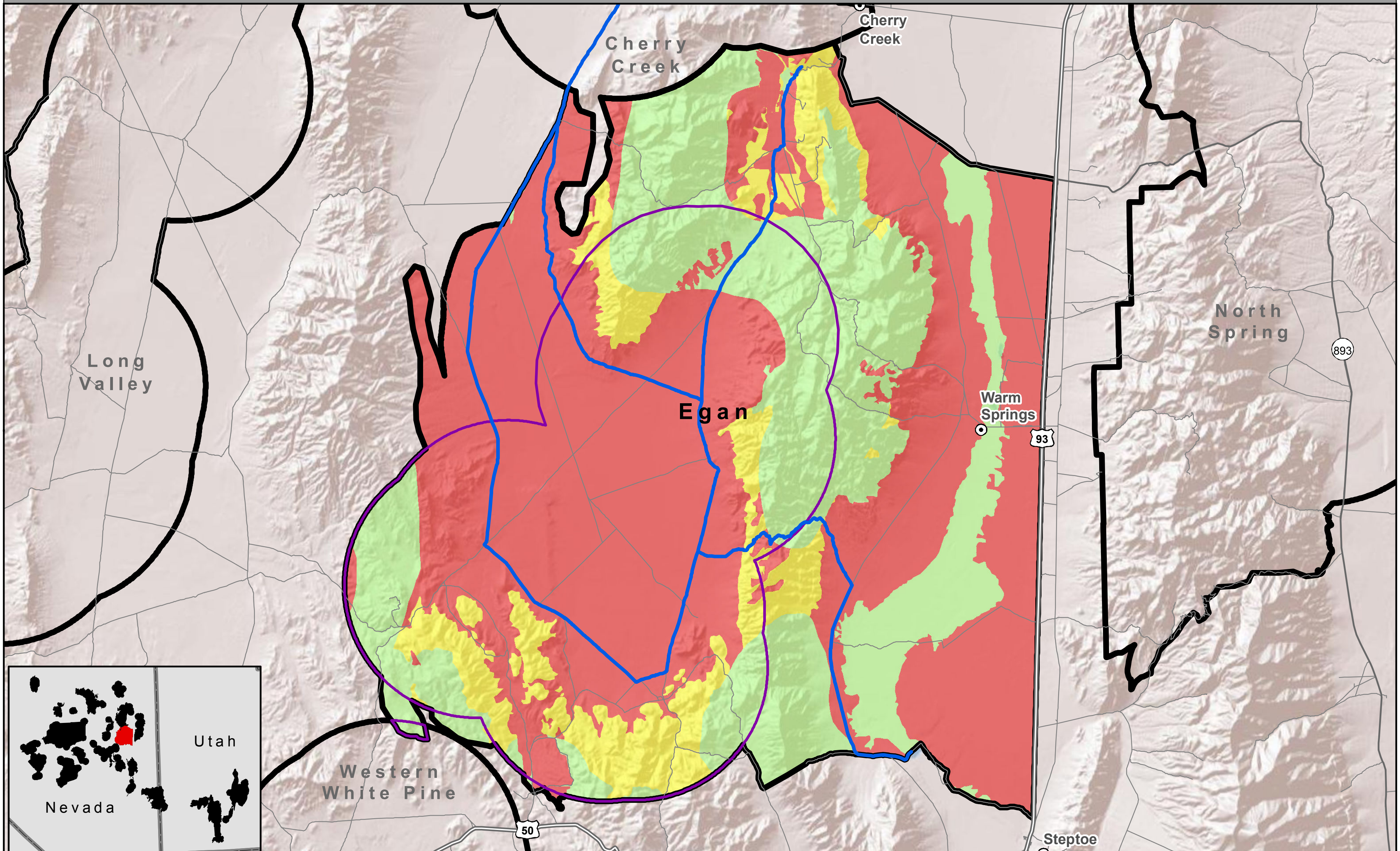
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:470,410

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

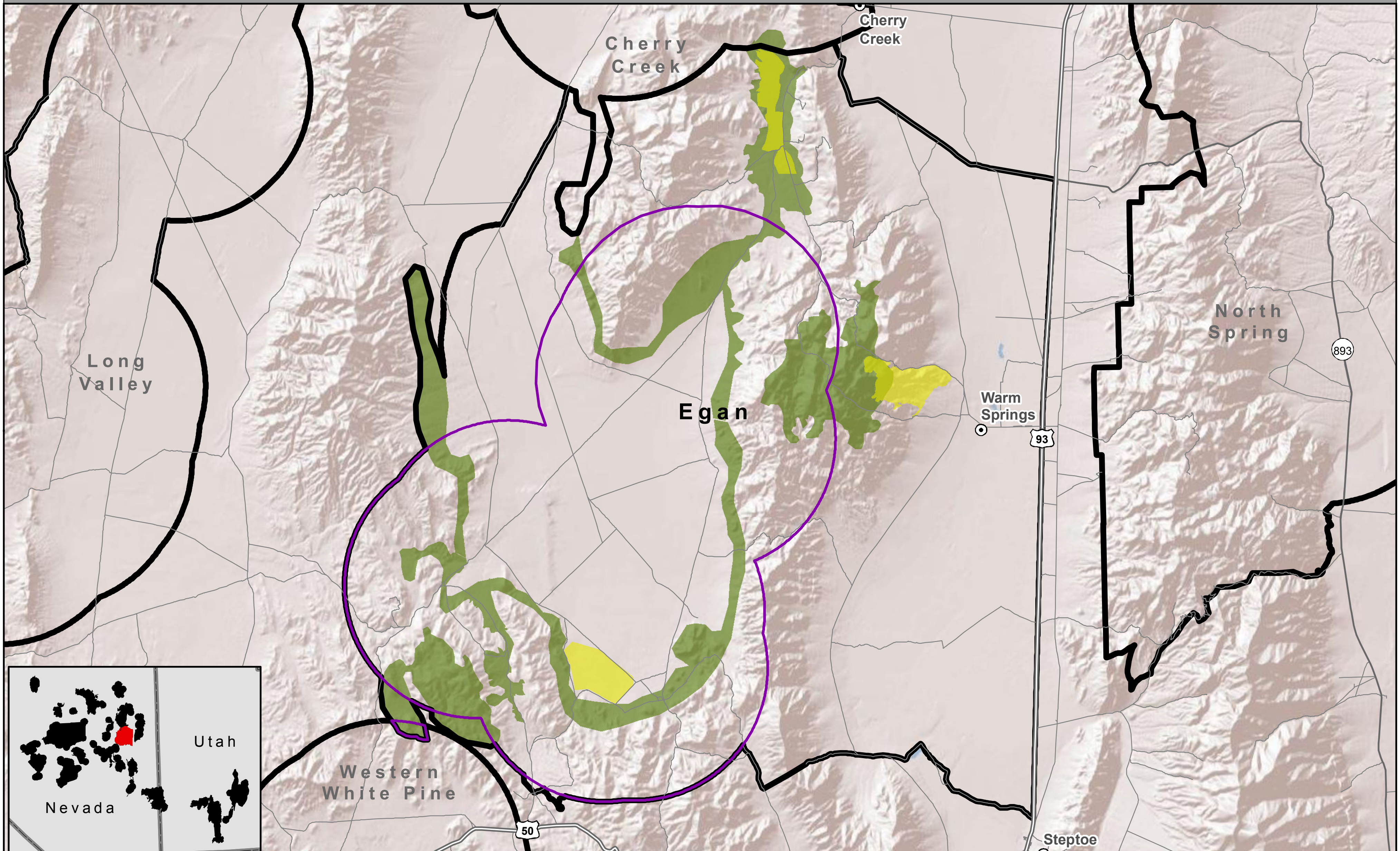
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:335,200

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

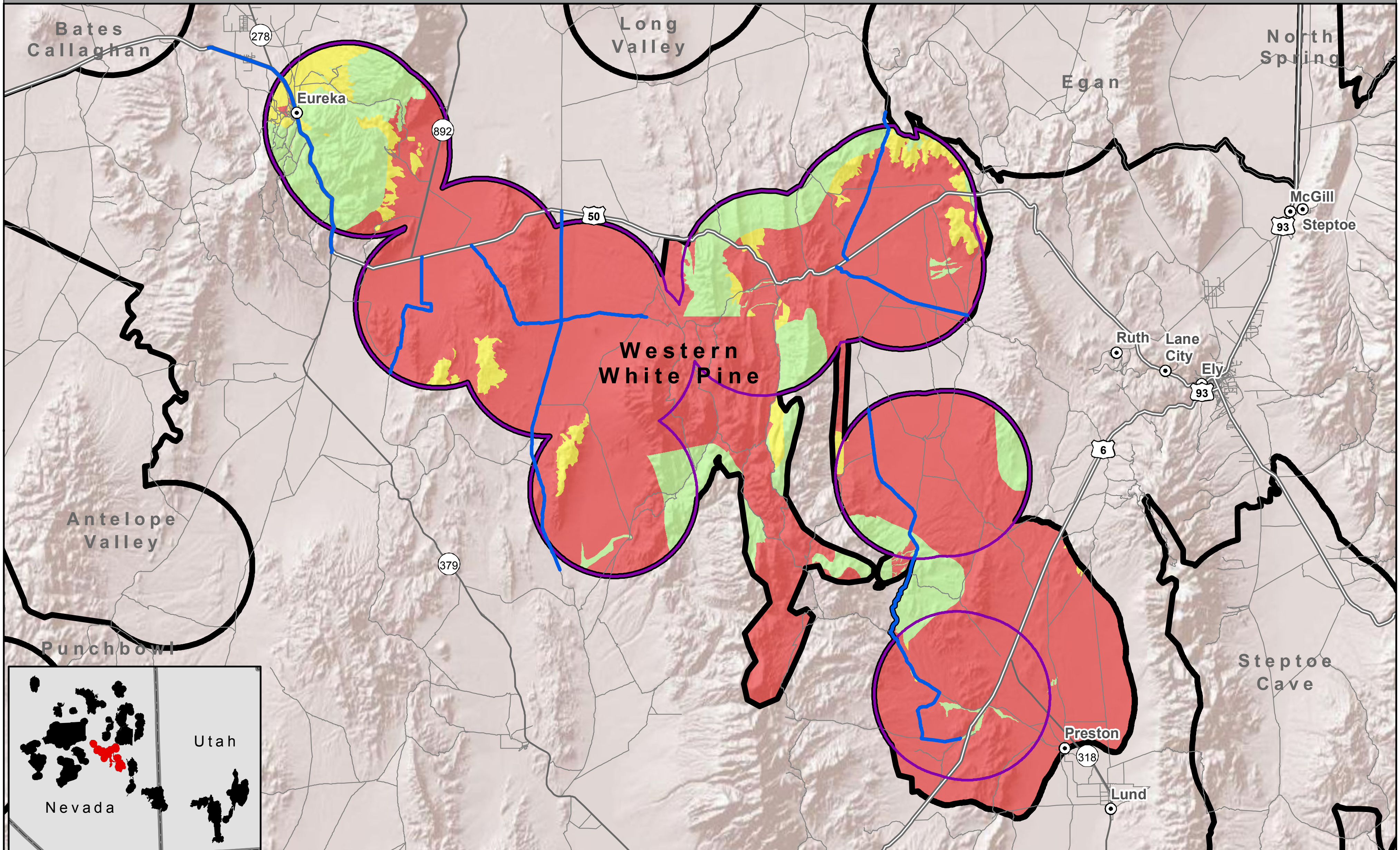
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:335,200

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

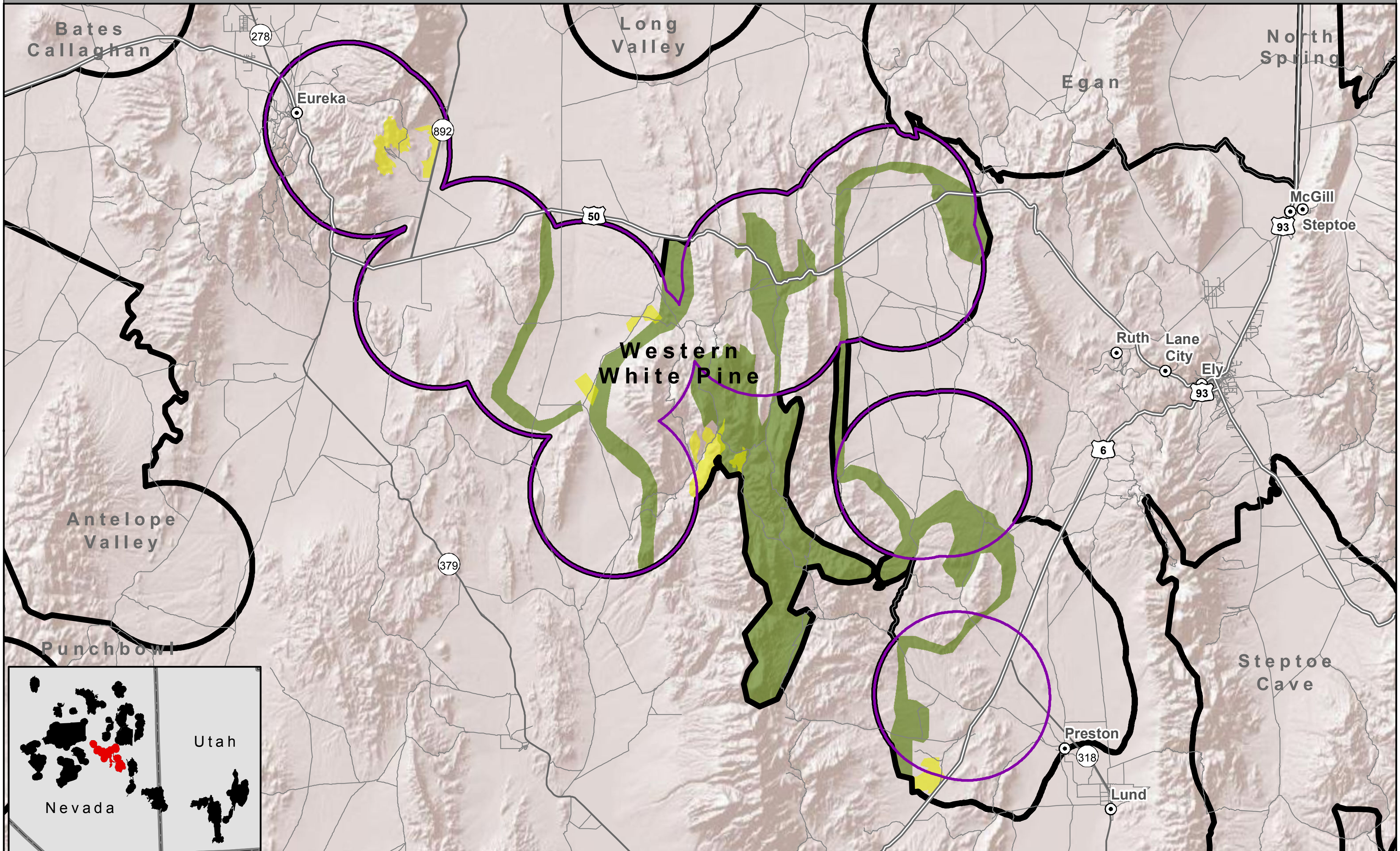
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:535,820

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

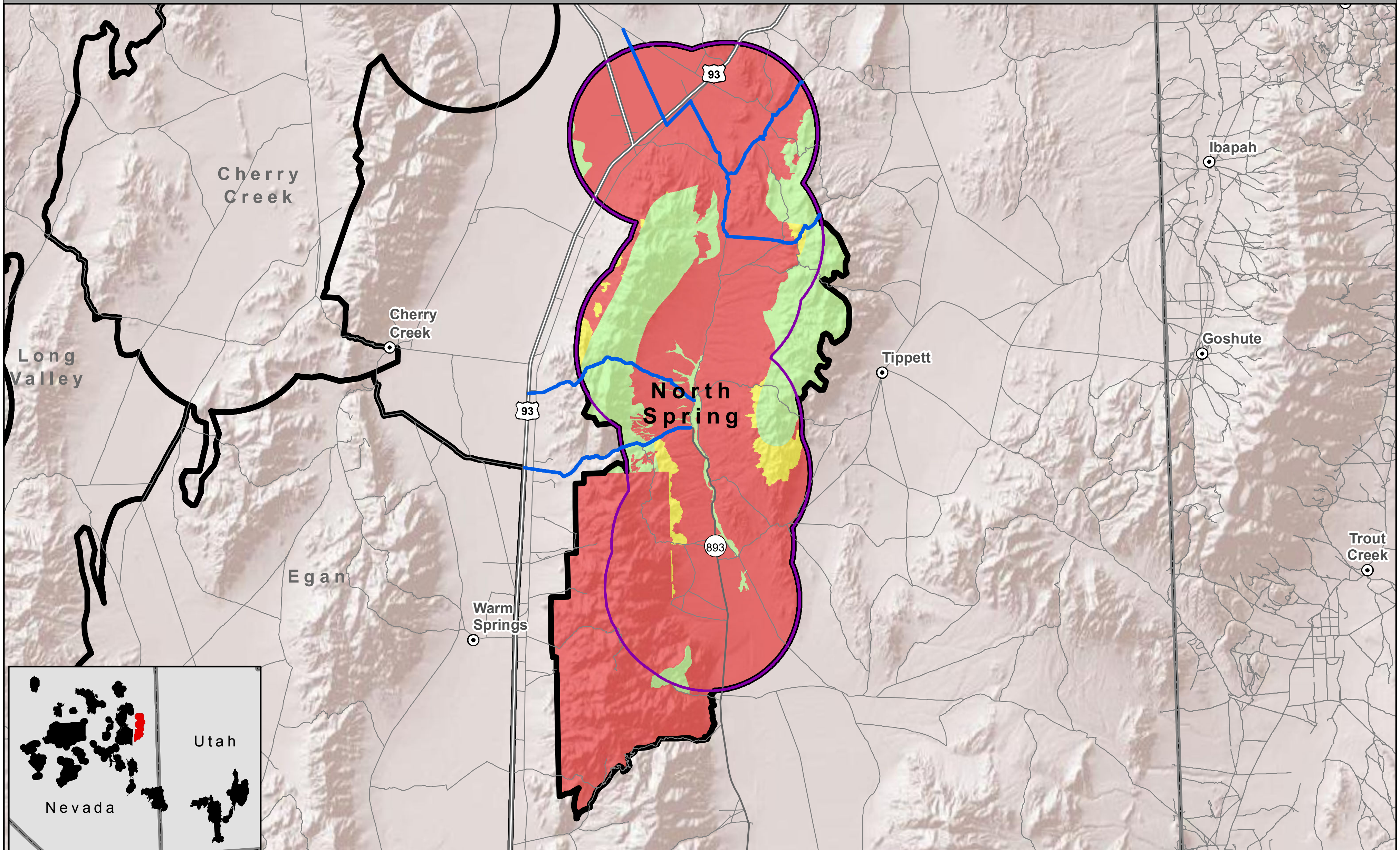
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:535,820

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

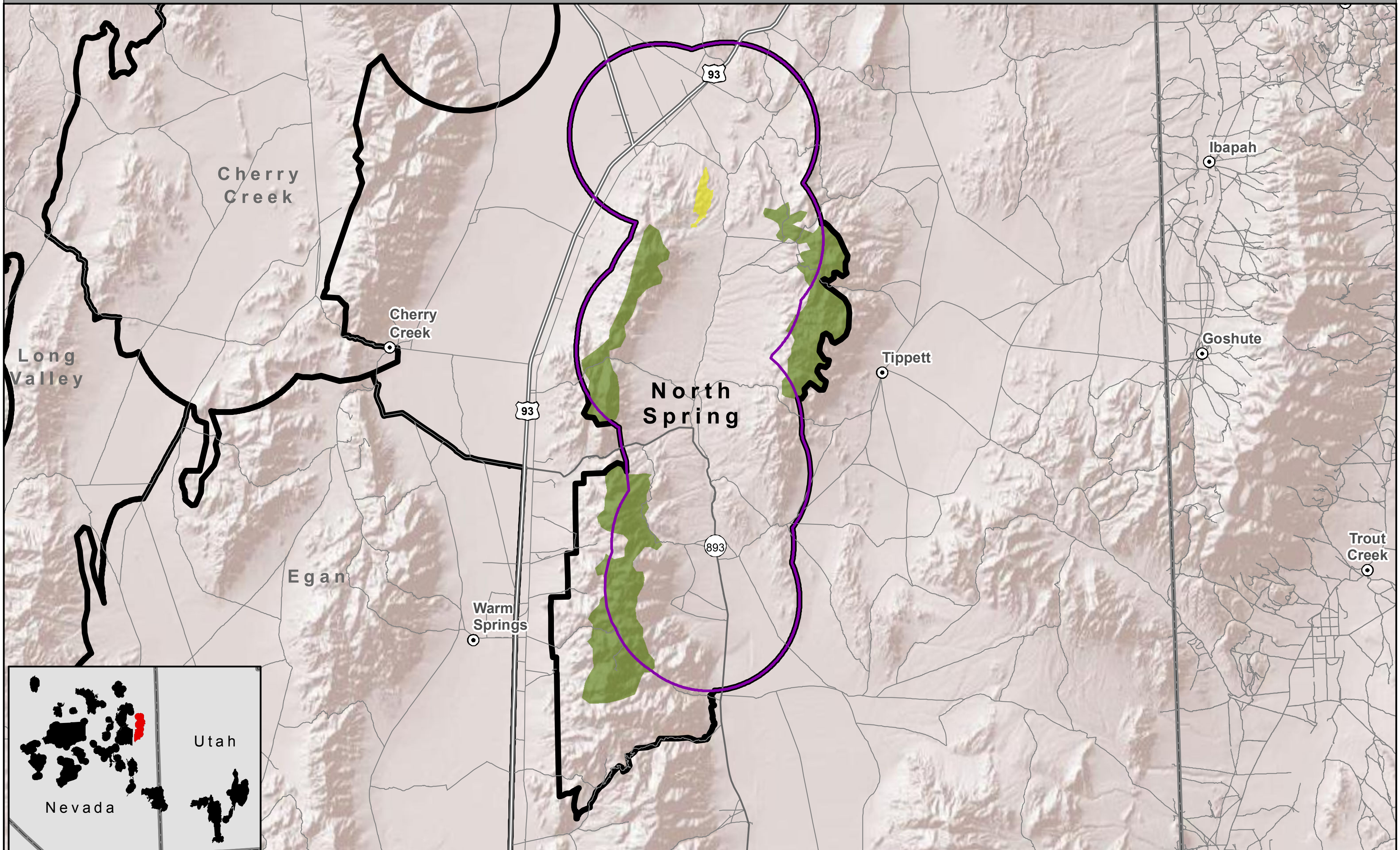
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:487,130

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

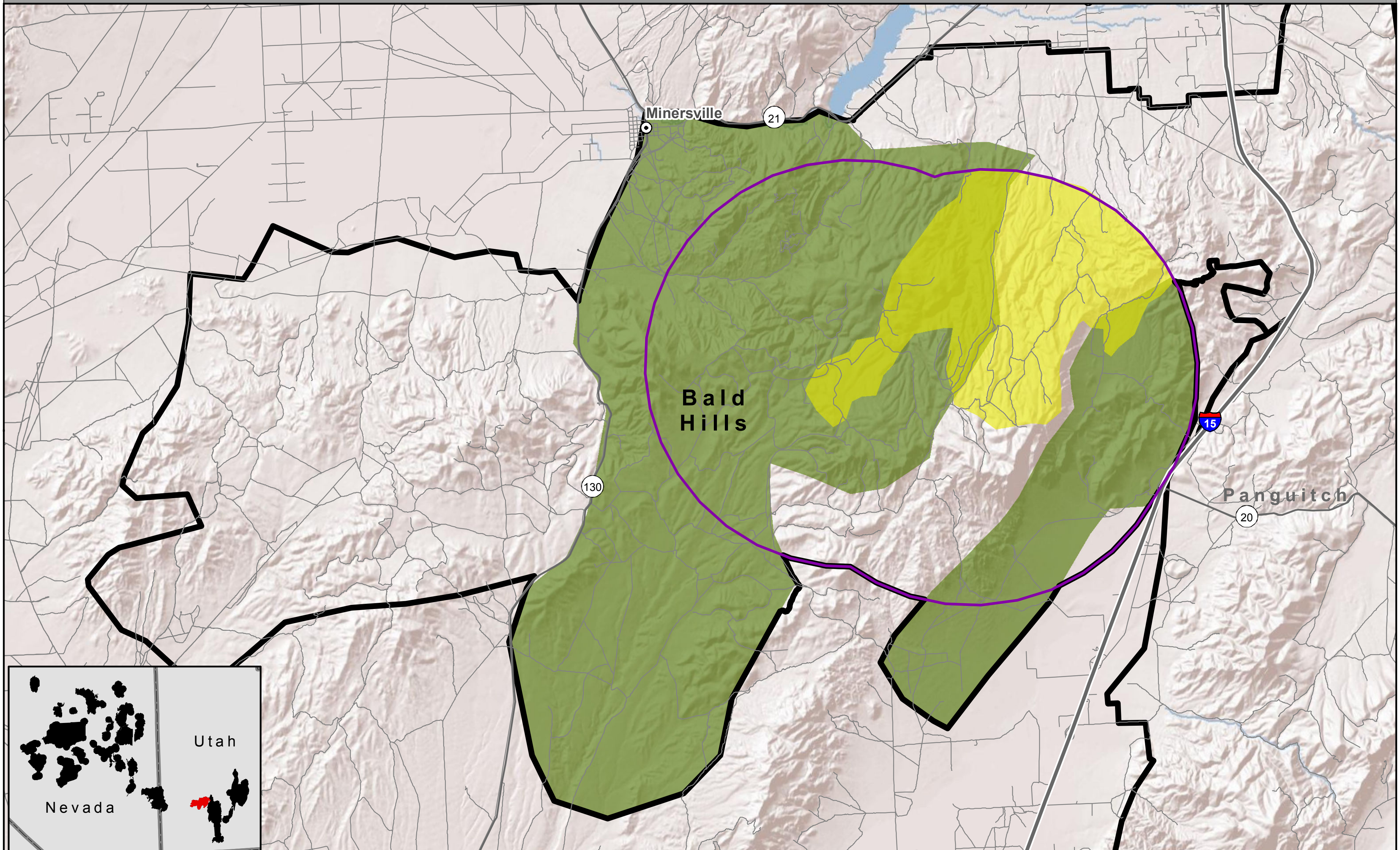
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:487,130

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

N

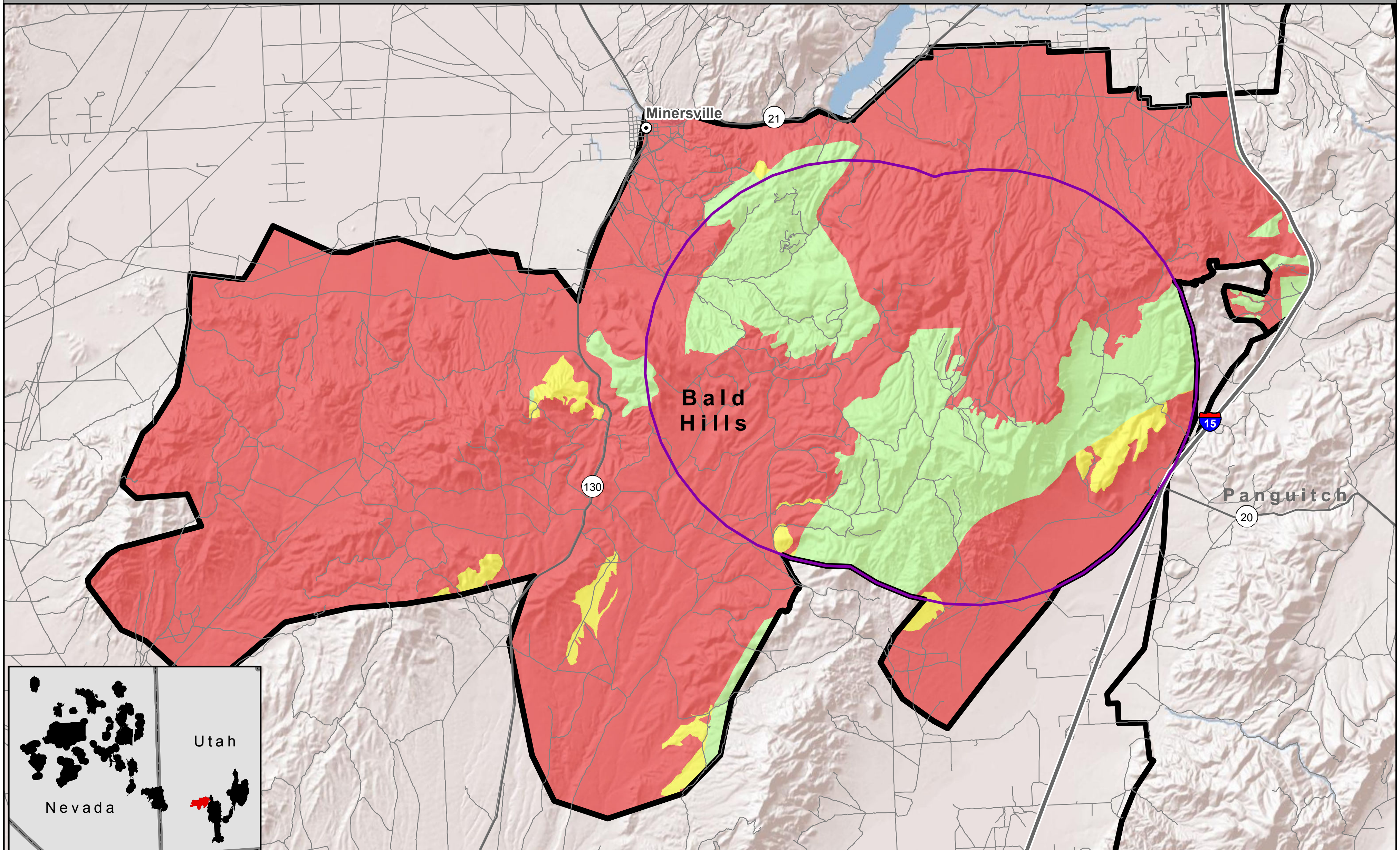
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:215,900

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

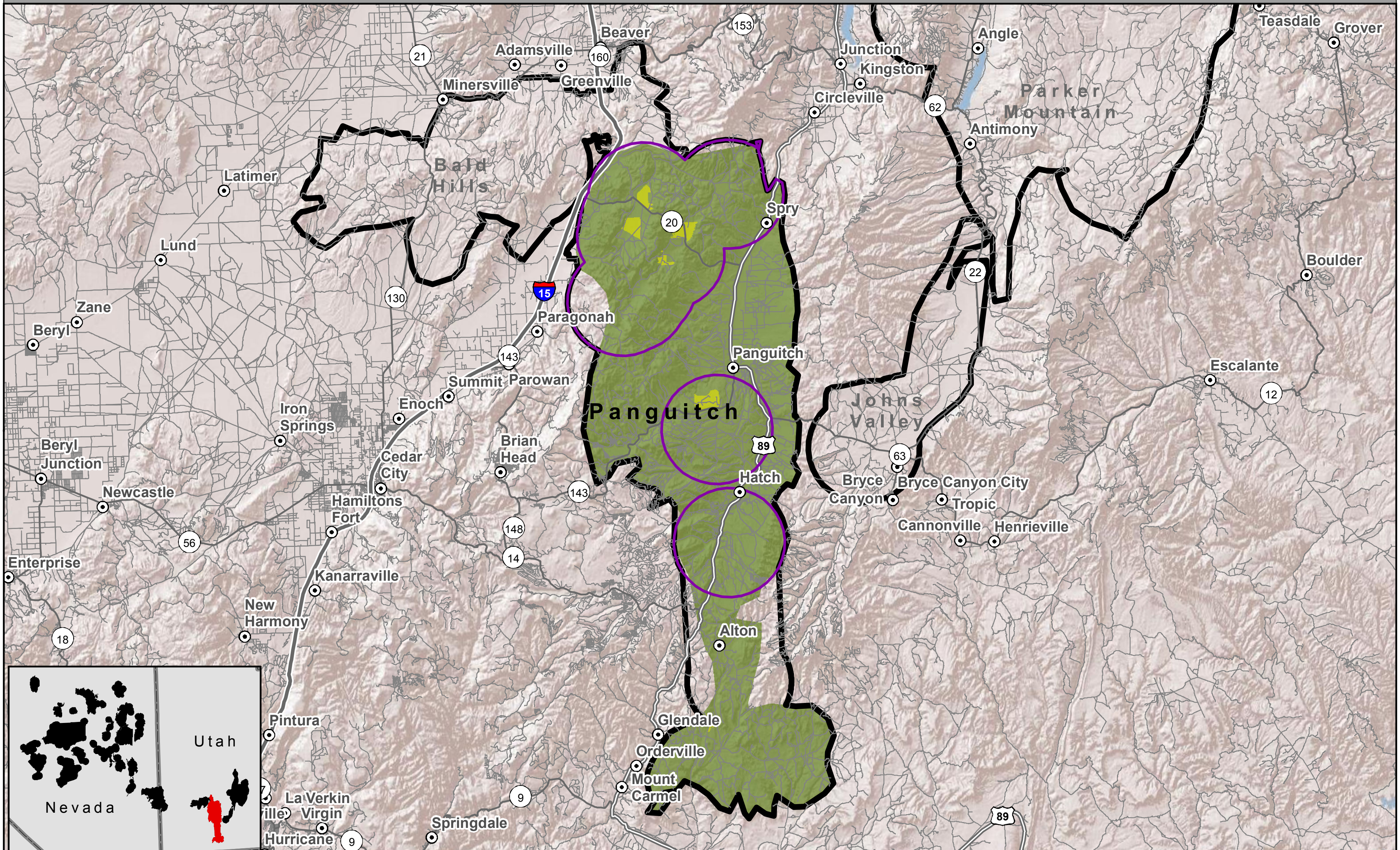
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:215,900

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

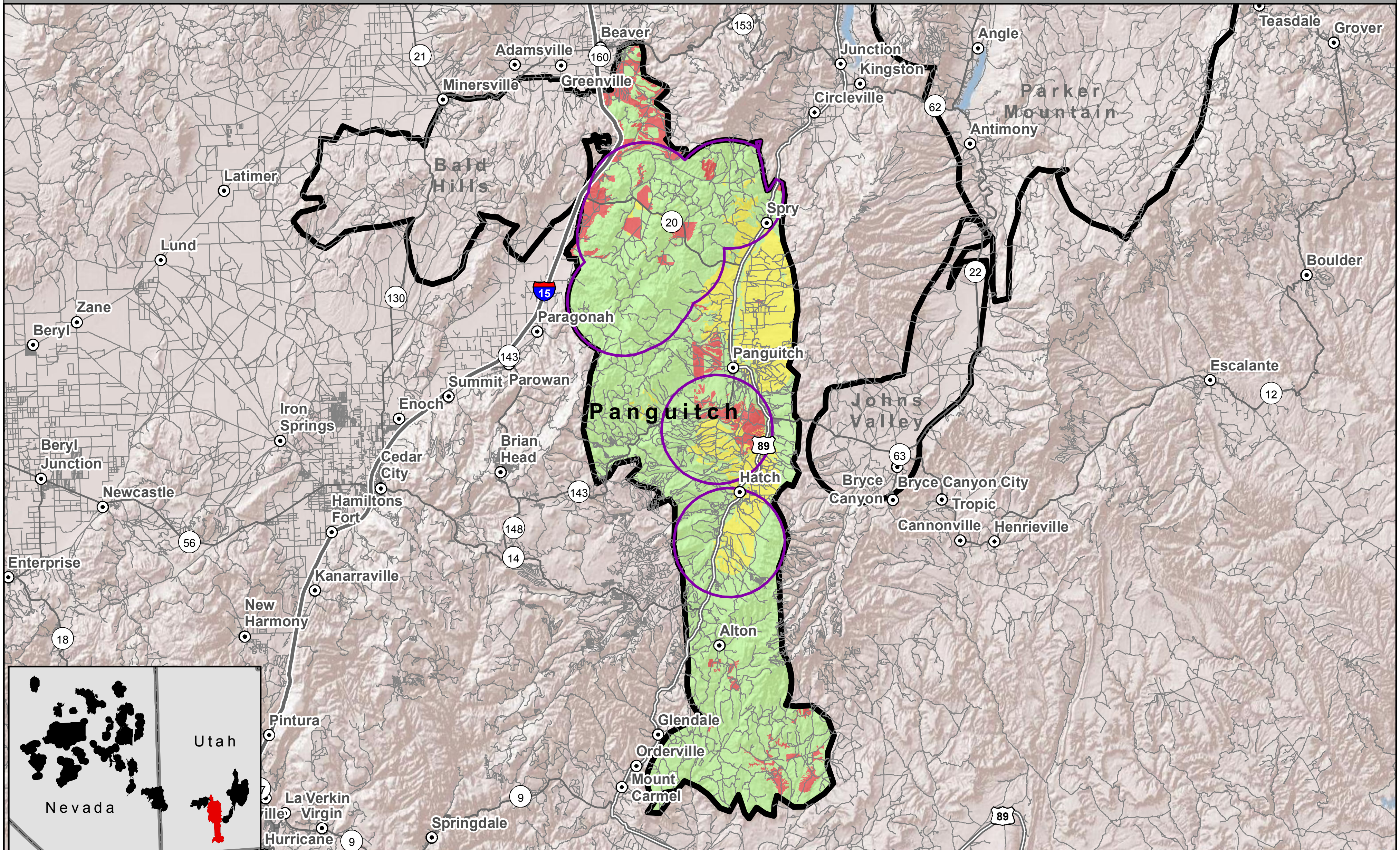
Invasive Annuals	Project Planning Area	Interstate Hwy	State Route
Conifer Expansion	Breeding Bird Density	US Route	Local Roads
		State Boundary	

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:807,120

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

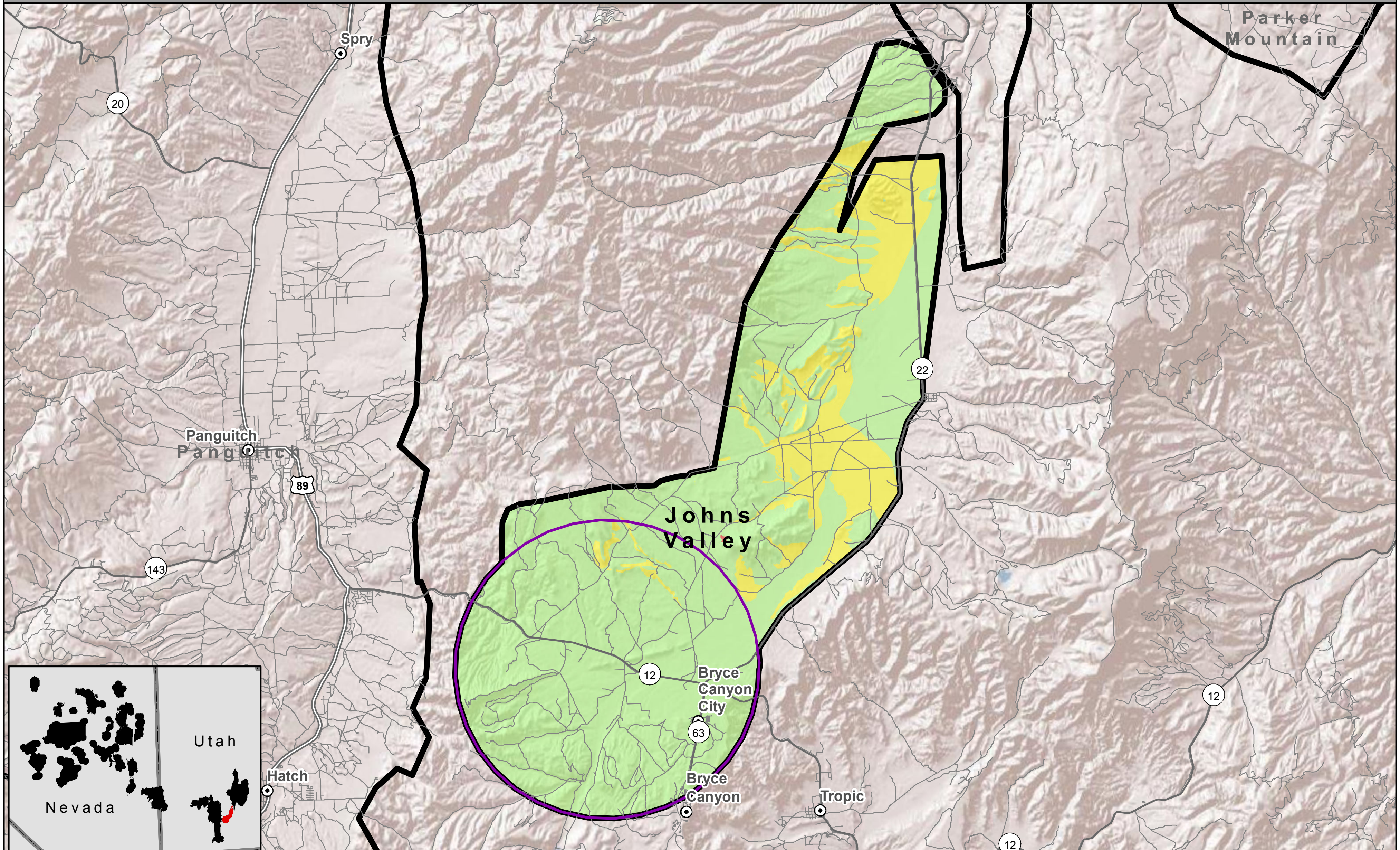
- Priority 1
- Priority 2
- Priority 3
- FuelBreak
- Project Planning Area
- Breeding Bird Density
- Interstate Hwy
- US Route
- State Route
- Local Roads
- State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:807,120

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

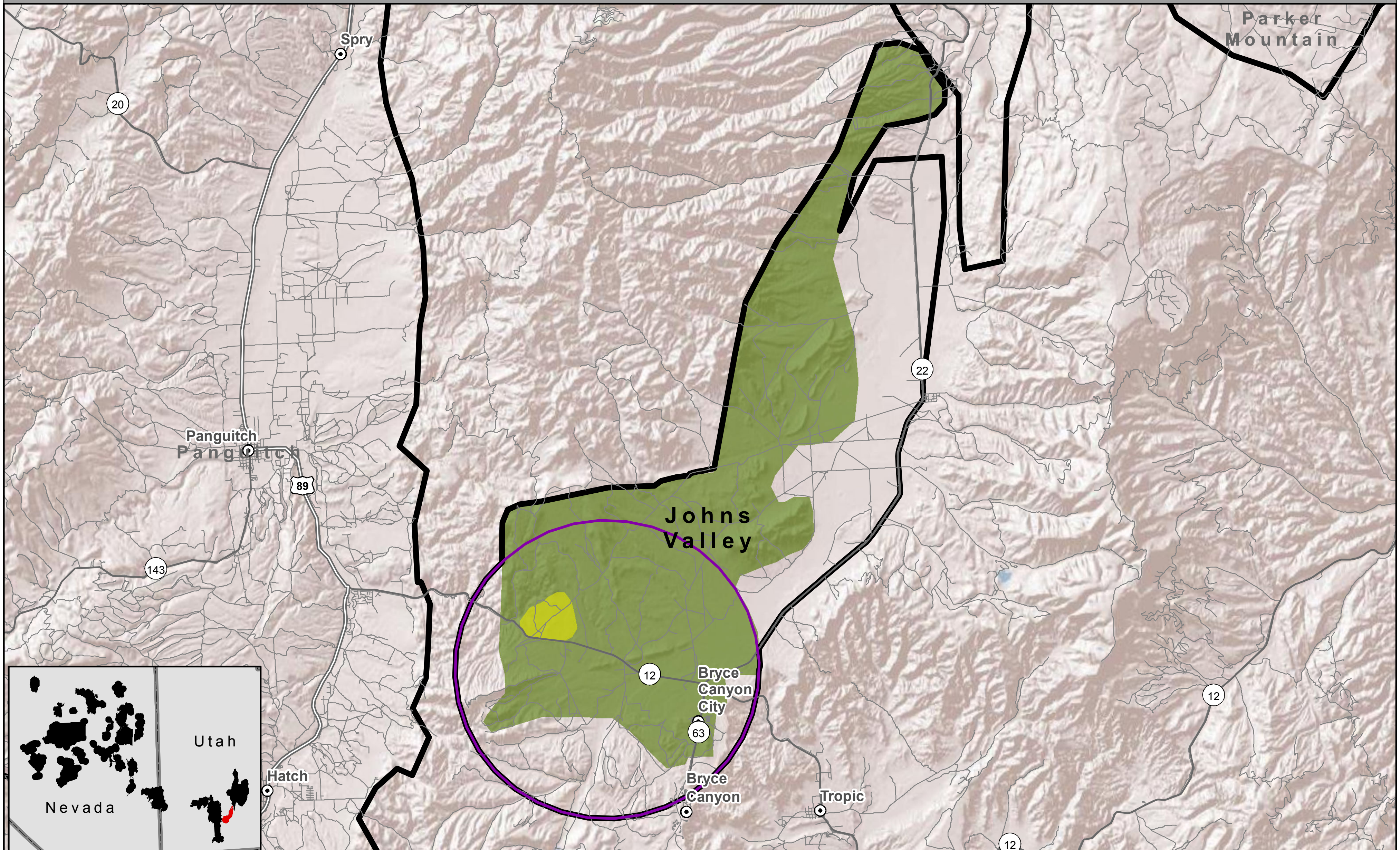
Priority 1 | FuelBreak | Interstate Hwy | Local Roads
Priority 2 | Project Planning Area | US Route | State Boundary
Priority 3 | Breeding Bird Density | State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:294,860

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

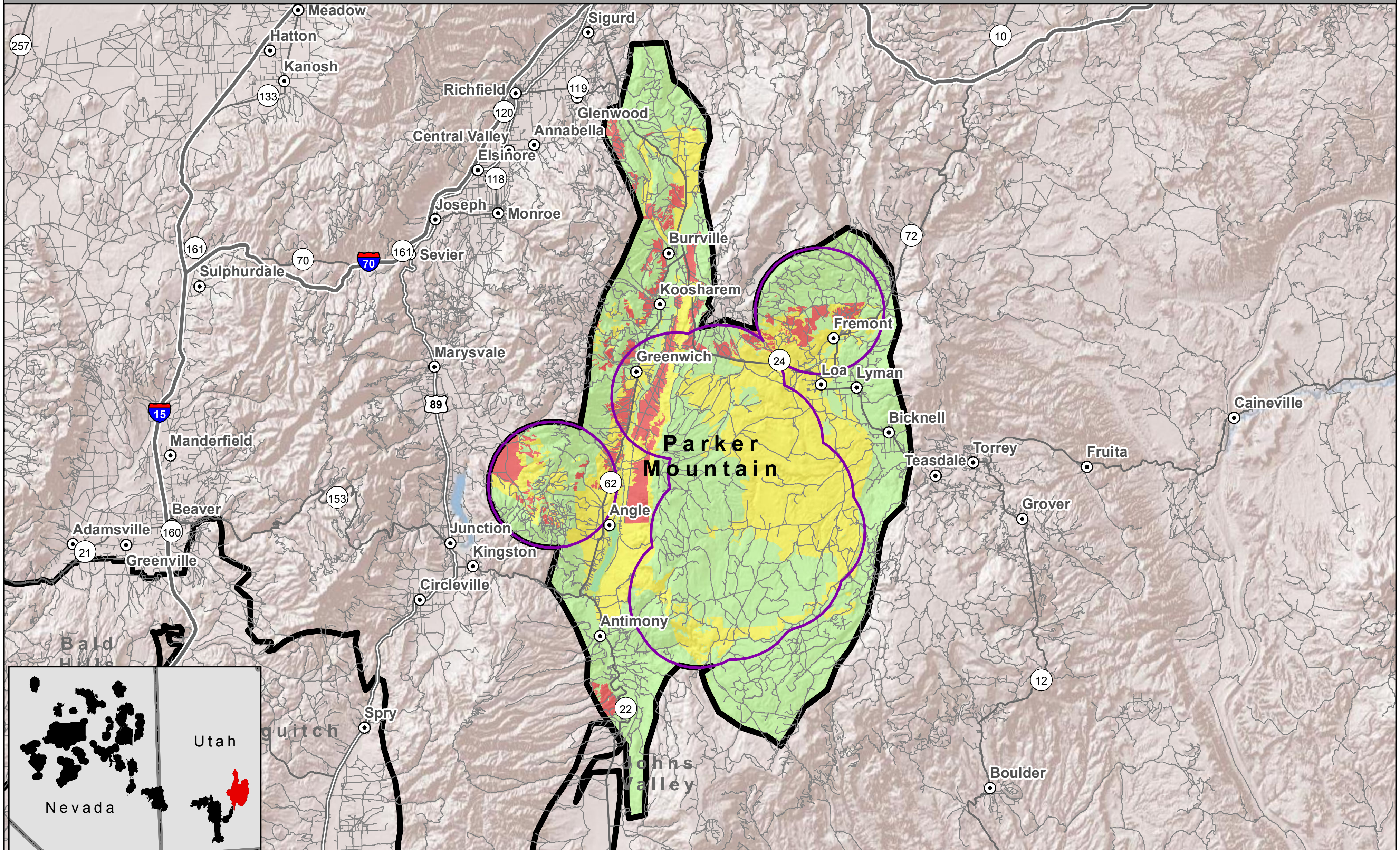
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:294,860

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

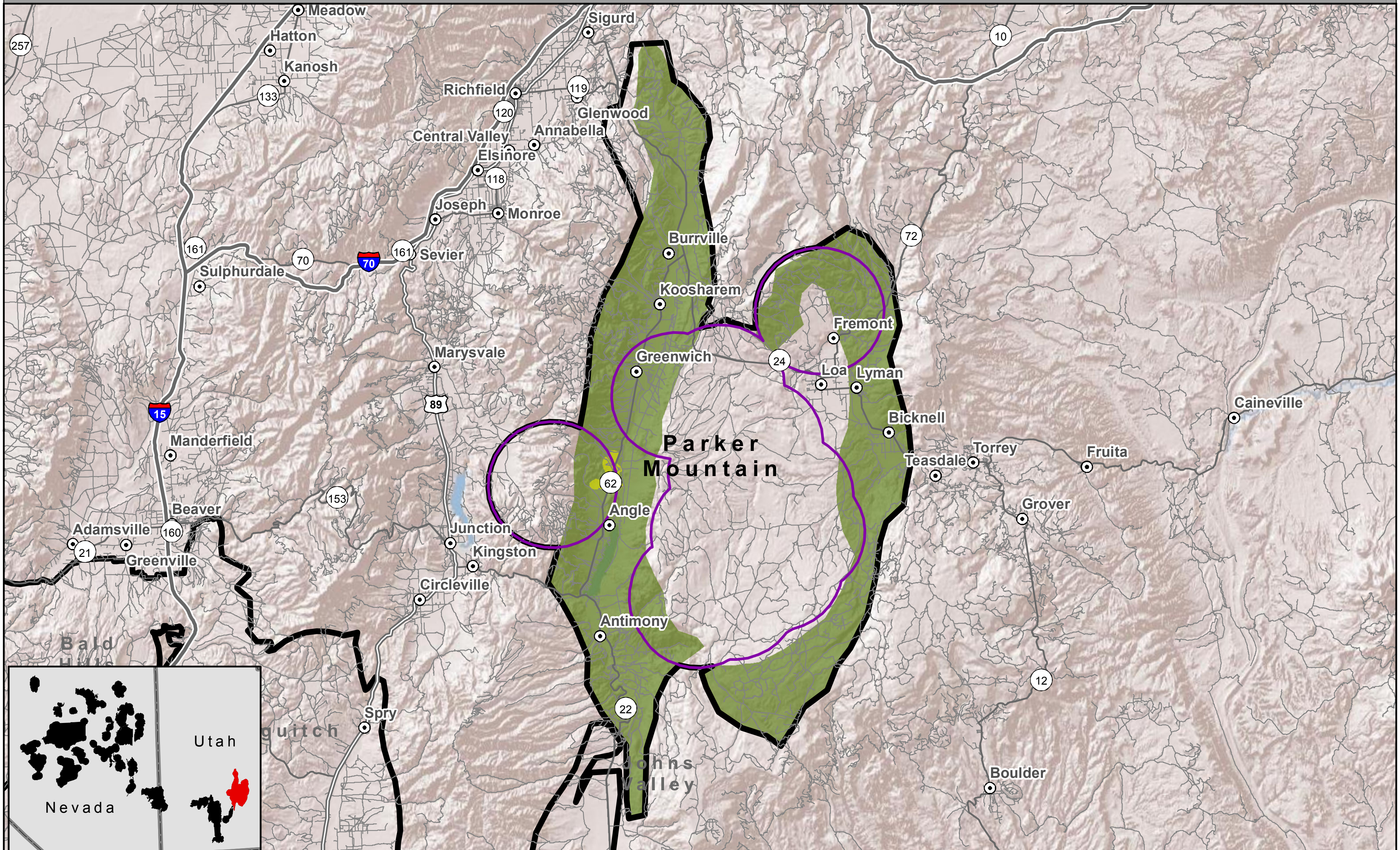
Priority 1 — FuelBreak — Interstate Hwy — Local Roads
Priority 2 — Project Planning Area — US Route — State Boundary
Priority 3 — Breeding Bird Density — State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:696,390

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

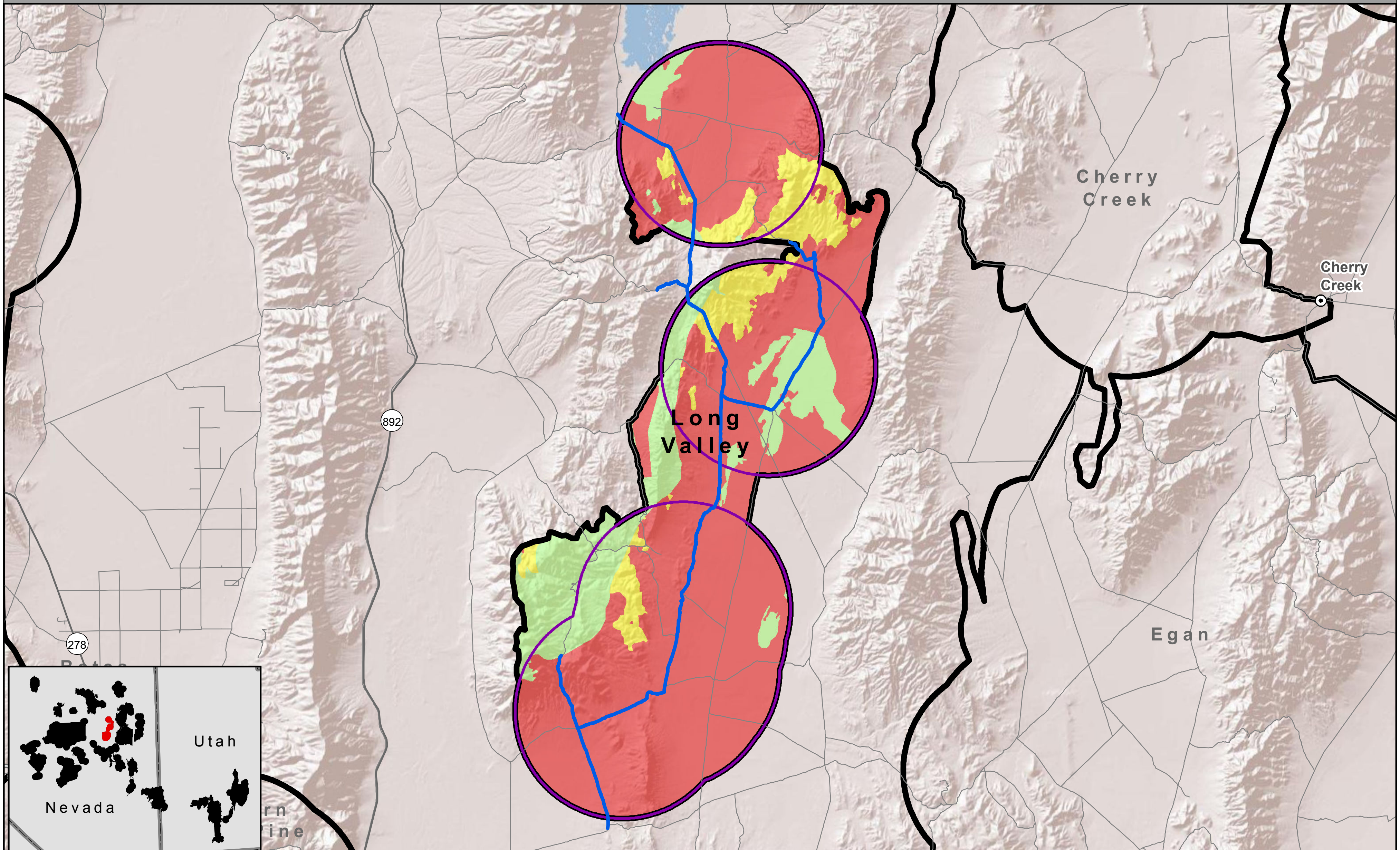
Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:696,390

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

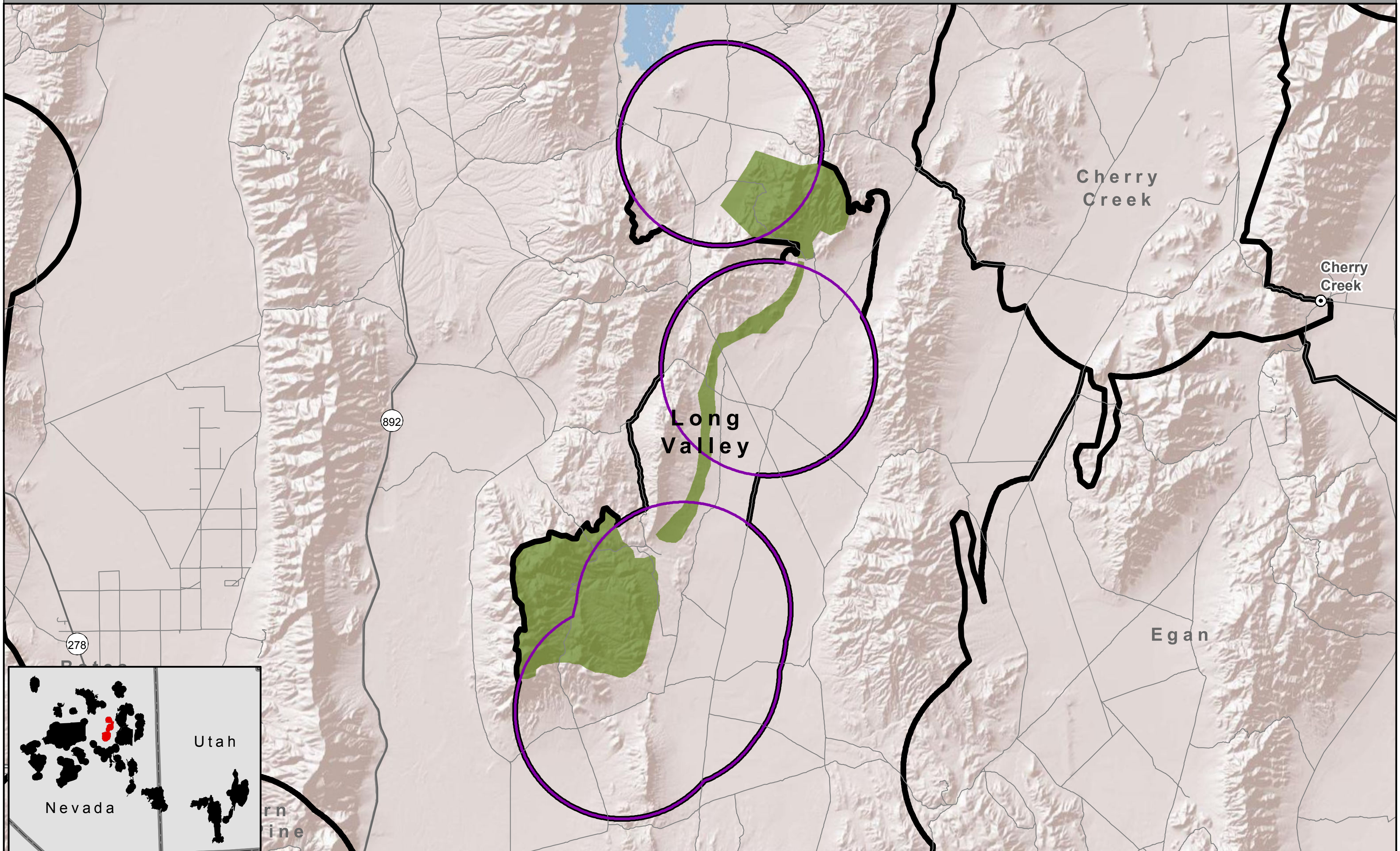
Priority 1
Priority 2
Priority 3
FuelBreak
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:413,650

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

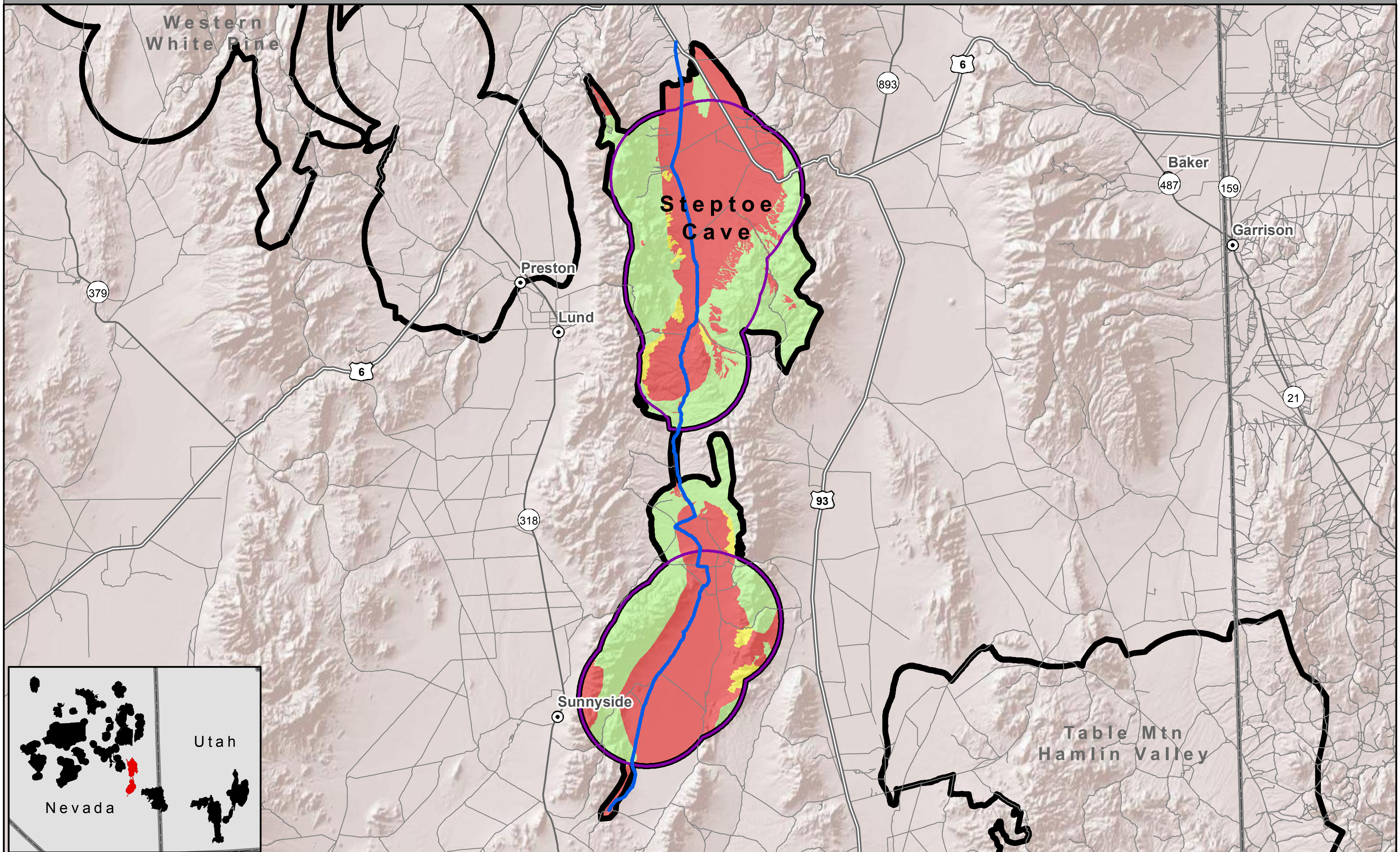
- Invasive Annuals
- Conifer Expansion
- Project Planning Area
- Breeding Bird Density
- Interstate Hwy
- US Route
- State Route
- Local Roads
- State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:413,650

Fire Operations/ESR Priority & Fuels Management

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

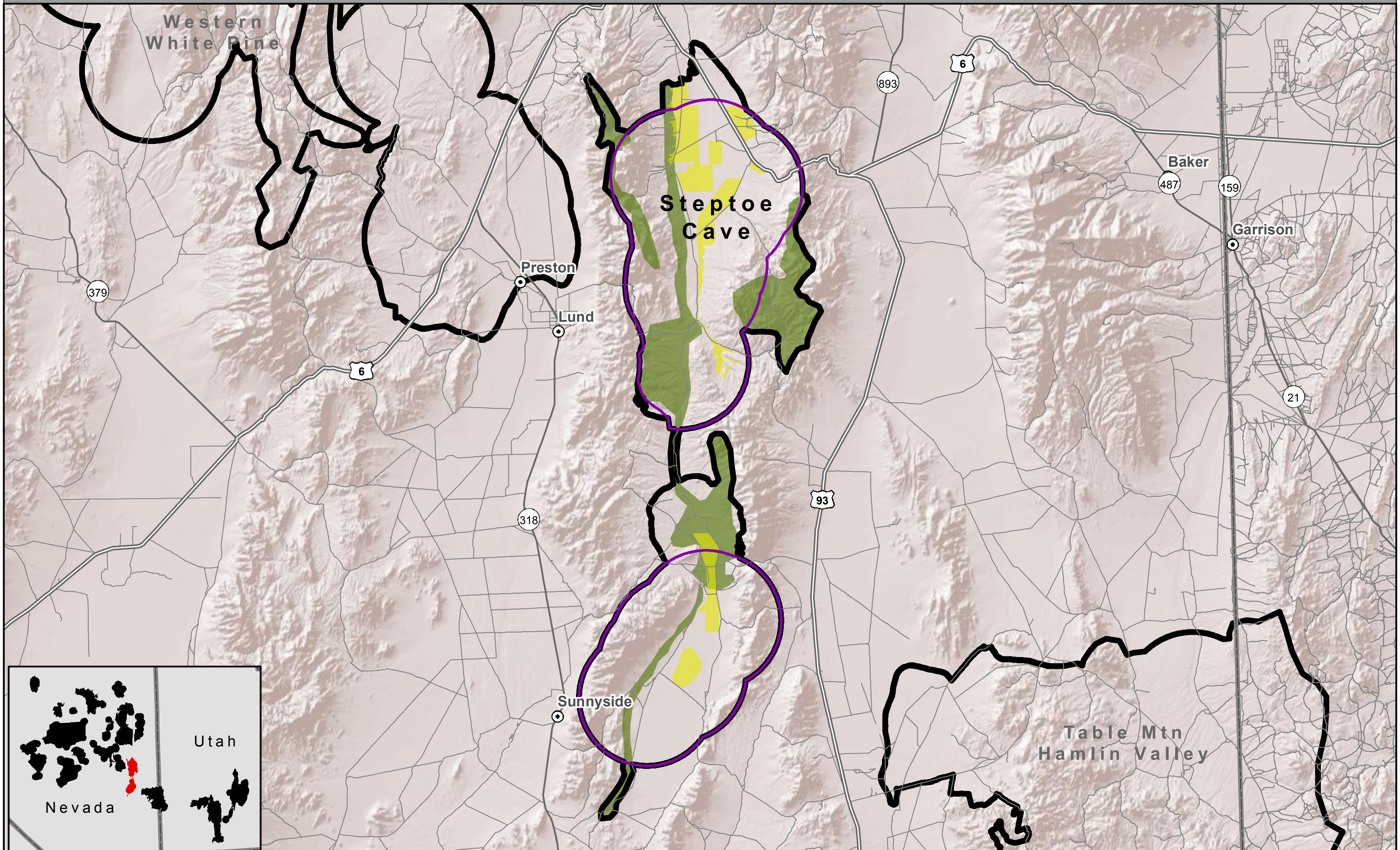
Priority 1 | FuelBreak | Interstate Hwy | Local Roads
Priority 2 | Project Planning Area | US Route | State Boundary
Priority 3 | Breeding Bird Density | State Route

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:653,010

Habitat Restoration & Recovery Potential Treatment Areas

Greater Sage-Grouse, Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessments

Southern Great Basin
Bureau of Land Management
U.S. Department of the Interior



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N

Invasive Annuals
Conifer Expansion
Project Planning Area
Breeding Bird Density
Interstate Hwy
US Route
State Route
Local Roads
State Boundary

3/5/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:653,010

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Appendix B

List of Data Layers

Data Sources for Maps

Dataset	Description	Link
Geomac fire perimeters	Walters, S.P.; Schneider, N.J.; Guthrie, J.D. 2011. Geospatial Multi-Agency Coordination (GeoMAC) wildland fire perimeters, 2008. Data Series 612. Washington, DC: U.S.	http://pubs.er.usgs.gov/publication/ds612
WFDSS fire perimeters	Butler, B. B.; Bailey, A. 2013. Disturbance history (Historical wildland fires). Updated 8/9/2013. Wildland Fire Decision Support System. Online: https://wfdss.usgs.gov/wfdss/WFDSS_Home. shtml [Accessed 5 March 2014].	https://wfdss.usgs.gov/wfdss/WFDSS_ Home.shtml or https://wfdss.usgs.gov/wf dss/ WFDSSData_Downloads.sht
Piñon and juniper land cover	U.S. Geological Survery (USGS) National Gap Analysis Program. 2004. Provisional digital land cover map for the southwestern United States. Version 1.0. Logan, UT: Utah State University, College of Natural Resources, RS/ GIS Laboratory.	http://earth.gis.usu.edu/swgap/landcover. html
Piñon and juniper land cover	U.S. Geological Survey (USGS). 2013: LANDFIRE 1.2.0 Existing Vegetation Type layer. Updated 3/13/2013. Washington, DC: U.S. Department of the Interior, Geological Survey. Online: http:// landfire.cr.usgs.gov/viewer/. [Accessed 13 March	http://www.landfire.gov/Nati onal ProductDescriptions21.php
Nevada invasive annual grass index	Peterson, E. B. 2006. A map of invasive annual grasses in Nevada derived from multitemporal Landsat 5 TM imagery. Carson City, NV: State of Nevada, Department of Conservation and Natural Resources, Nevada	http://heritage.nv.gov/node/1 67
Owhyee upland annual grass index	Peterson, E. B. 2007. A map of annual grasses in the Owyhee Uplands, Spring 2006, derived from multitemporal Landsat 5 TM imagery. Carson City, NV: State of Nevada, Department of Conservation and Natural Resources, Nevada Natural Heritage	http://heritage.nv.gov/sites/default/ files/library/anngrowy_text_print.pdf
Soil data (SSURGO)	Soil Survey Staff. 2014a. Soil Survey Geographic (SSURGO) Database. United States Department of Agriculture, Natural Resources Conservation Service. Online: http://sdmdataaccess.nrcs.usda. gov/. [Accessed 3 March 2014a].	http://www.nrcs.usda.gov/wps/ portal/nrcs/detail/ soils/survey/? cid=nrcs142p2_0 53627

Soil data (STATSGO)	Soil Survey Staff. 2014b. U.S. General Soil Map (STATSGO2) Database. United States Department of Agriculture, Natural Resources Conservation Service.	http://sdmdata acc ess.nrcs.usda.g ov/ .
FIAT Step I Conifer Expansion Model	FIAT Step I Conifer Expansion Model	fiat_conifer_expansion_s outh ern_great_basin.zip
FIAT Step I Sagebrush Cover Model (3 Class)	FIAT Step I Sagebrush Cover Model (3 Class)	fiat_step_one_sagebrush _moving _window_percentage_so uthe rn _great_basin.zip
Monitoring EVT Sagebrush Cover Model (3 Class)	NOC Sagebrush Layer with the 5 KM moving window analysis.	blm_sagebrush_moving_ wind ow _analysis_southern_great _basin.zip
GeoMac Fire Perimeters	Extracted from GeoMAC for the years 2000-2013. For each assessment area, extracted all fire perimeters that intersect the 15mile buffer. Note for FIAT teams: the data is not clip the data to the assessment area, any multi-part polygon associated with a given fire may include a feature outside the AOI, so assessment teams can decide to clip or use entire polygons.	fire_perim2000-2013_sgb.zip
SW-ReGAP	Geological Survey, Gap Analysis Program (GAP). May 2011. National Land Cover, Version 2US	http://gapanalysis.usgs.gov /gaplandcover/data/
Step 2	Description	Link
Fuel_Breaks	Step 2 priority areas for fuels breaks based upon resistance and resilience and roads	
Spatial wildfire occurrence data for the United States, 1992-2012 [FPA_FOD_20140428] (2nd Edition)	Used in step 2 to calculate total ignitions in PPAs. Years used are 1999-2012.	http://dx.doi.org/ 10.2737/RDS-2013-0009.2

BLM NV Fire Perimeters	Used in step 2 to supplement GEOMAC data.	http://www.blm.gov/nv/st/en/prog/more_programs/
BLM WFMI Fire Occurrence data	Used in step 2 for years 2013 and 2014. This data was merged with FPA FOD.	https://www.nifc.blm.gov/cgi/Wfmi Home.cgi
Fuels_Management	Step 2 priority areas for fuels management actions based upon resistance and resilience	
Habitat_Restoration_Recovery	Step 2 priority areas for habitat restoration and fuels management actions based upon resistance and resilience	
Post_Fire_Rehabilitation	Step 2 priority areas for post fire actions based upon resistance and resilience	
Project_Planning_Area	The dataset was developed to support the National Sage-Grouse Planning Strategy Nevada and northeastern California planning region. This dataset was a base dataset integrated into the alternatives. The West Sage-Grouse Planning area, with subdivisions, as identified by the BLM's Sage-Grouse Planning team in 2011.	
Breeding Bird Density 75 pct	25%, 50% (buffered to 6.4km) and 75% and 100% population kernel based on the Doherty model, buffered to 8.5km. Male lek counts (strutting field: YEARAV) were averaged to create a population percentage for the Subregion and the Population/Sub-population areas (subregion: % of	

Breeding Bird Density 75 pct_New	NDOW Breeding Bird Density updated in 2014	
Contours 100_Focal_Habitat	This dataset is maintained by the NOC for all BLM usage.	
Fire Perimeters MTSB 1984to 2014	Data collected from the MTBS (monitoring Trends in Burn Severity) website. http://www.mtbs.gov/nationalregional/intro.html	
LEKS 2014 Active and Inactive	Point locations representing known greater sage-grouse lek sites managed and monitored by the Nevada Department of Wildlife and it's partner agencies (e.g. CDFG, BLM). These data have been collected since the 1950s and are continuously updated to represent the best available information on known sage-grouse breeding grounds (leks) throughout Nevada. These data are collected in the field using handheld GPS units during helilcopter and ground survey efforts.	

NDOW GSG Telemetry 2014	NDOW GSG Telemetry 2014 – These data were provided by NDOW for the use of the Bureau of Land Management for internal use to understand areas within the Virginia and Pah Rah PMU that are actively being used by Sage Grouse. Description This point dataset represents radio tracking and telemetry data recording the movements of Sage Grouse as presented by NDOW. Credits Nevada Department of Wildlife Staff AND Data provided by USGS showing radio collar and GPS tracking telemetery for Bi State Sage Grouse Populations in the Pine Nut Mountains 2011 to 2013, Virginia/Pah Rah PMU from 2009-2012 Also telemetry data from Ely DO, BMDO.	

Region III Priority Areas for Conservation	The PACs identify important areas for the long term persistence of Sage-Grouse and areas to focus conservation efforts. Description This polygon data set represents the Sage-Grouse Priority Areas for Conservation (PACs) for Nevada as identified in the 2013 Sage-Grouse Conservation Objectives Team (COT) Report. Nevada PACs extrapolated from Nevada State Sage-Grouse Management Areas and combined with the Nevada portion of the Bi-State Sage-Grouse Population. PACs represent areas identified as essential for the long-term conservation of the Sage-Grouse. The COT determined that the PACs are key for the conservation of the species range wide. Credits US FWS | State of Nevada | USGS	
Sagebrush PJ Conifer Interface Int Dis	These data were compiled for use in the National Sage-grouse Planning effort west-wide (baseline) cumulative effects analysis (CEA). Source datasets were acquired from numerous sources including BLM State Offices responding to the WO 300 data call from November 2011 through May 2012, BLM and USFS data stewards, various state and federal agencies, and other sources outside the BLM. National Operations Center, Bureau of Land Management	
SG_MgntZone_ver2_200610-18_albers	Combined with Sagebrush (Sagebrush-MW5K)	

	Map was created to evaluate fire and invasive priority landscapes within greater sage-grouse habitat The basis for using this map was	
Resilience/Resistance (Soil_Sage)	Soil_Sage is Temperature and Moisture and Sage brush cover combined for Resilience/resistance 1A- 3C These data are intended to portray soil moisture and temperature regimes across the greater sage-grouse distribution. The data was derived from NRCS SSURGO data and where gaps NRCS STATSGO – Credits NRCS, Steve Campbell, A. Wuenschel see Table 4 in Chambers et al. In prep.).	
Vegetation_Treatment_Acres completed	Summary The boundaries of vegetation treatments performed by the BLM, are important to the fire community, land health, range improvements, forest management, invasive species control, emergency stabilization, and to the BLM as a whole. They provide the locations of actions that have been taken to meet land health objectives whether through fuels reduction, emergency stabilization, and burned area rehabilitation, changing vegetation composition or controlling weeds. This data will provide the standard template for storage of treatment polygons representing the tract of land where a unique treatment is completed. Description This data set will be a warehouse of completed vegetation treatment areas and associated attribute information for the BLM. Each system that currently maintains vegetation treatments will provide treatment area information on a regular basis to the treatment area data set. People who conduct vegetation treatments on BLM-managed land including Invasive Species Treatments, Emergency Stabilization and Rehabilitation Treatments, Range Improvement Treatments, Fuels Treatments and/or Forest Treatments	
Vegetation_Treatment_Acres Proposed	NFPORS and other local perimeter data developed from other programs	

BLM Nevada State Office fire perimeter history	Fire Operations Fire Perimeter data developed by Mike Boomer for WFDSS	
National SMA	SurfaceManagementAgency: The Surface Management Agency (SMA) Geographic Information System (GIS) dataset depicts Federal land for the United States and classifies this land by its active Federal surface managing agency. The SMA feature class covers the continental United States, Alaska, Hawaii, Puerto Rico, Guam, American Samoa and the Virgin Islands. A Federal SMA agency refers to a Federal agency with administrative jurisdiction over the surface of Federal lands. Jurisdiction over the land is defined when the land is either: Withdrawn by some administrative or legislative action, or Acquired or Exchanged by a Federal Agency. This layer is a dynamic assembly of spatial data layers maintained at various federal and local government offices. The GIS data contained in this dataset represents the polygon features that show the boundaries for Surface Management Agency and the surface extent of each Federal agency's surface administrative jurisdiction. SMA data depicts current withdrawn areas for a particular agency and (when appropriate) includes land that was acquired or exchanged and is located outside of a withdrawal area for that agency. The SMA data do not illustrate land status ownership pattern	

Local Roads	Resource Management Planning to display roads across the state of nevada. The goal of the dataset is to display the best information for roads through the state. Starting with the BLM 100k roads, roads that had been GPSed by BLM offices were added to the layer. Then the dataset was checked for gaps between roads that should be connecting and correct topology erros that existed. The next step will be to tie in the NDOT surveyed roads and make sure all roads that are correctly connected to these main roads. BLM roads will be continually GPSed and have their information updated. State Highways are not complete in labeling. Description Publication transportation dataset showing both BLM inventoried and non-inventoried roads in Nevada. This dataset contains a feature class for Ground Transportation Linear Features (GTLF)	
Corridors_HV_BLM	High Voltage Corridors. Electricity transmission line corridors also known as major transmission lines. Collected from the respective transmission right of way analysis and planning.?	
Fuels_treatment_Project	Shapefile created by BLM to display previous and current Fuels treatments in the Color Country District?	
Fuels_Treatments Color Country	Shapefile created by BLM to display previous and current Fuels treatments in the Color Country District??	
Nest_brood_Hamlin Valley_kernel density	Kernal density map image created by Utah State University?	\\blm\dfs\ut\loc\GisData\ut\so\projects\Wildlife\FIAT\layers_work

nonbreeding_HamlinValley_kernal_density	Kernal density map image created by Utah State University.?	\\blm\dfs\ut\loc\GisData\ut\so\projects\Wildlife\FIAT\layers_work
Parker_trt	Shapefile created by the BLM displaying previous treatments within the Parker Mountain FIAT Assessment and surrounding areas.?	\\blm\dfs\ut\loc\Workspace\ut\fm\mcrane\FIAT\parker_trt.shp
SAGR_Leks_2013	Utah Division of Wildlife Resources	
UT_Contour_100ft	DEM	
5 Class Burn Probability Map Derived from FSIM Modeling	5 Class Burn Probability Map Derived from FSIM Modeling	fsim_5_cat_sgb.zip
FIAT Region Boundary	This data is approved to use in the Step 2 assessment. These boundaries have been modified from the COT-base PAC boundaries, and include FWS recommended PACs.	southern_great_basin.zip
FIAT Region Boundaries buffered to 15 miles.	Step 2 approved, FIAT Region boundaries buffered to 15 miles.	southern_great_basin_buffer_15_miles.zip
BLM Resistance Resilience Matrix	BLM. Intersect Soil Moisture Temp Regimes Reclass with 3 Class Sagebrush Cover to create a spatial depiction of the Table 2 Matrix	blm_resistance_resilience_southern_great_basin.zip

FIAT Resistance Resilience Matrix	FIAT. Intersect Soil Moisture Temp Regimes Reclass with 3 Class Sagebrush Cover to create a spatial depiction of the Table 2 Matrix	fiat_resistance_resilience_southern_great_basin.zip
Aspect data from the 30m NED	Aspect data from the 30m NED	ned_1_arc_sec_southern_great_basin_aspect.zip
Soil Moisture Temp Regimes	Soil Moisture Temp Regimes	smtr_southern_great_basin_pac.zip
SYNTH Map	Peterson E. B. (2008) A Synthesis of Vegetation Maps for Nevada (Initiating a 'Living' Vegetation Map) Documentation and geospatial data, Nevada Natural Heritage Program, Carson City, Nevada	http://heritage.nv.gov/contact

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Appendix C

Soil Temperature and Moisture Regime Attribute Table

Soil temperature and moisture regime with moisture subclass	Common Name	Original FIAT R&R Categories	Revised FIAT R&R Categories
Cryic/Aridic-Typic	Cold/dry		2
Cryic/Aridic bordering on Xeric	Cold/dry bordering on moist		1
Cryic/Ustic-Typic	Cold/summer moist		1
Cryic/Xeric	Cold/moist	1	1
Cryic/Xeric-Typic	Cold/moist		1
Cryic/Xeric bordering on Aridic	Cold/moist bordering on dry		1
Frigid/Aridic	Cool/dry	3	2
Frigid/Aridic-Typic	Cool/dry		2
Frigid/Aridic bordering on Ustic	Cool/dry bordering on summer moist		2
Frigid/Aridic bordering on Xeric	Cool/dry bordering on moist		2
Frigid/Xeric	Cool/moist	1	1
Frigid/Xeric-Typic	Cool/moist		1
Frigid/Xeric bordering on Aridic	Cool/moist bordering on dry		2
Frigid/Ustic bordering on aridic	Cool/summer moist bordering on dry		2
Frigid/Ustic-Typic	Cool/summer moist	1	1
Mesic/Aridic	Warm/dry	3	3
Mesic/Aridic-Typic	Warm/dry		3
Mesic/Aridic bordering on Ustic	Warm/dry bordering on summer moist		3
Mesic/Aridic bordering on Xeric	Warm/dry bordering on moist		3
Mesic/Ustic bordering on Aridic	Warm/summer moist bordering on dry		3
Mesic/Xeric	Warm/moist	2	2
Mesic/Xeric-Typic	Warm/moist		2
Mesic/Xeric bordering on Aridic	Warm/moist bordering on dry		3

The above table of soil attributes (soil temperature/moisture regimes) and Resistance/Resilience assignments were used in the original and revised FIAT reports. Soil survey spatial and tabular data were obtained for the Project Planning Areas from the Geospatial Data Gateway (http://datagateway.nrcs.usda.gov/). Gridded Soil Survey Geographic (gSSURGO) file geodatabases were used to display a 10-meter raster dataset. Where SSURGO data were unavailable, gaps were filled in using the State Soil Geographic database (STATSGO2). The attributes of the soil component with the highest component percentage (dominant component) were used to characterize the temperature and moisture regime. Only temperature and moisture regimes applicable to sagebrush ecosystems were displayed. For additional details, see Chambers et al. 2014, and Maestas and Campbell 2014.

Fact Sheet

Mapping Potential Ecosystem Resilience and Resistance across Sage-Grouse Range using Soil Temperature and Moisture Regimes


A cool and moist (frigid/xeric) mountain big sagebrush site in Nevada (left) compared to a warm and dry (mesic/aridic) Wyoming big sagebrush site in Oregon (right) illustrates the natural variability in site potential across sagebrush ecosystems. Mapping soil temperature and moisture regimes can help depict this gradient and indicate potential ecosystem resilience and resistance. Photos: Jeremy Maestas

Background

Our ability to address threats to sage-grouse and the sagebrush steppe can be greatly enhanced by understanding ecosystem resilience to disturbance and resistance to invasive species (Chambers et al. 2014a,b). A recent breakthrough in the practical application of resilience and resistance concepts has been linking *soil temperature and moisture regimes* to sagebrush ecosystem responses to disturbance and annual grass invasion.

Potential resilience and resistance to invasive annual grasses reflect the biophysical conditions of an area, and soil temperature and moisture regimes provide a useful indicator of these conditions at multiple scales. Resilience to disturbance typically increases with higher resource availability and more favorable environmental conditions for plant growth and reproduction. Thus areas with warm (*mesic*) soil temperature and dry (*aridic*) soil moisture regimes typically have low potential resilience, while those with cool (*frigid*) to moderately cold (*cryic*) soil temperature and relatively moist (*xeric* to *ustic*) soil moisture regimes have high potential resilience. Resistance to exotic annual grasses, like cheatgrass, is strongly influenced by climate suitability for establishment and persistence. Cheatgrass germination, growth and reproduction appear to be optimal under relatively warm and dry to moist regimes (*mesic/aridic* or *xeric*), limited by low and sporadic precipitation under dry regimes (*aridic*), and generally constrained by colder regimes (*frigid* to *cryic*). These relationships are modified by effects of: (1) elevation, landform, slope, aspect, soil characteristics, and resulting vegetation composition and structure, and (2) the ecological condition of an area (Figure 1. Chambers et al. 2014a,b)

Soil climate data (temperature and moisture) are fundamentally important in classifying and mapping soils, and as such, are widely collected as part of the National Cooperative Soil Survey program. This provides us with the ability to map temperature and moisture regimes across the range of sage-grouse to better understand potential resilience and resistance along a diverse environmental gradient.

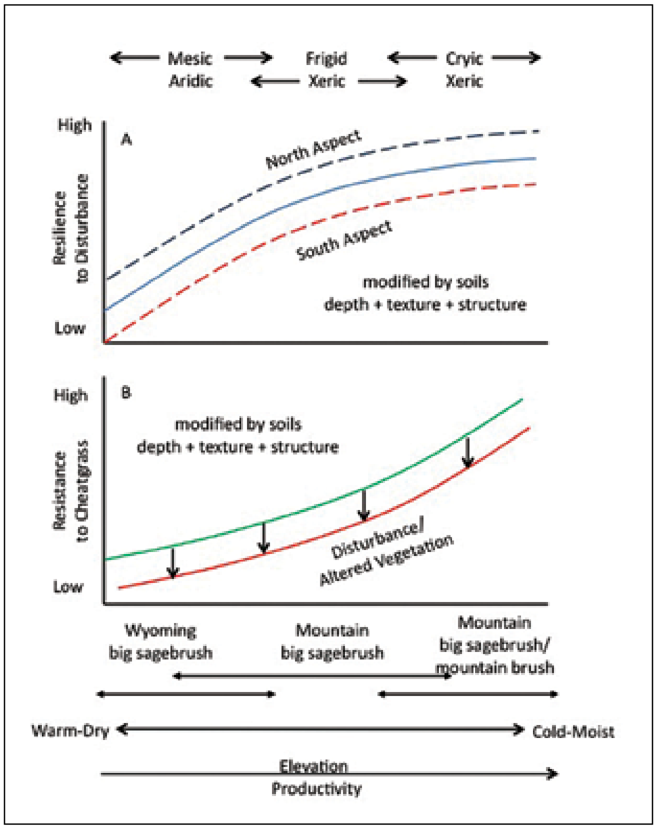

Figure 1. Example of resilience to disturbance (A) and resistance to cheatgrass (B) over a soil temperature and moisture regime gradient in the western portion of the sagebrush ecosystem. Dominant ecological types occur along a continuum from Wyoming big sagebrush communities on warm and dry sites to mountain big sagebrush/mountain brush communities on cold and moist sites (modified from Chambers et al. 2014a,b).

Resilience is the capacity of an ecosystem to regain its fundamental structure, processes and functioning when altered by stressors like drought, and disturbances like altered fire regimes. It is a measure of the ability of an ecosystem to *recover* after stress or disturbance.

Resistance is the capacity of an ecosystem to retain its fundamental structure, processes and functioning despite stresses, disturbances or invasive species, or to remain largely unchanged.

Resistance to invasion is the capacity of an ecosystem to limit the establishment and population growth of an invading species.

New product assembles available data for rangewide use

While soil temperature and moisture regimes can be found in published soil surveys, a single dataset aggregating all available data was compiled to facilitate broad scale analyses and to provide a simple decision support tool for field practitioners. Available soils data from across Sage-Grouse Management Zones (Stiver et al. 2006) were compiled from two primary sources: 1) completed and interim soil surveys (SSURGO), and 2) state soils geographic databases (STATSGO2).

SSURGO – Soil Survey Geographic Database

SSURGO is the most detailed soil survey product produced by the National Cooperative Soil Survey. Information was collected through field inventory and interpretation at scales ranging from 1:12,000 to 1:63,360, with 1:24,000 being the most common. SSURGO datasets consist of spatial data, tabular data, and information about how the data were created. Soil survey maps are linked in the database to information about the component soils and properties for each soil map unit.

For this rangewide product, Gridded Soil Survey Geographic (gSSURGO) file geodatabases were used to display a 10-meter raster dataset. State gSSURGO datasets were then clipped to the extent of the Sage-Grouse Management Zones and merged.

STATSGO2 – State Soil Geographic Database

The Digital General Soil Map of the United States or STATSGO2 is a broad-based inventory of soils and non-soil areas that occur in a repeatable pattern on the landscape and that can be cartographically shown at a scale of 1:250,000. The dataset was created by generalizing more detailed soil survey maps. Where more detailed soil survey maps were not available, data on geology, topography, vegetation, and climate were assembled and related to Land Remote Sensing Satellite (LANDSAT) images. Soils of similar areas were studied, and the probable classification and extent of the soils were determined. STATSGO2 was used in areas of the Sage-Grouse Management Zones where more detailed SSURGO was currently not available.

Where can I access the product?

The aggregated soils data product can be downloaded free-of-charge on the Landscape Conservation Management and Analysis Portal (LCMAP):

https://www.sciencebase.gov/catalog/folder/538e5aa9e4b09202b547e56c

How to work with the files in a Geographic Information System (GIS)

Rangewide layer for rapid application

The data product includes a file geodatabase named *SoilMoistureTemperatureRegimes.gdb* that contains a single raster dataset merging best available SSURGO and STATSGO2 across Sage-Grouse Management Zones. The attribute table includes the temperature and moisture regime for the map unit dominant condition. A layer file named *SoilMoistTempLayer.lyr* can be used to quickly create a fully symbolized map with a legend of the predominant temperature and moisture regimes across sagebrush ecosystems (Figure 2).

Detailed data for more in-depth analyses

Separate geodatabases providing more detailed information are also available for both SSURGO and STATSGO2 data. These products allow users to explore the data in more depth at finer scales. An example of how to work with one of the geodatabases is provided here.

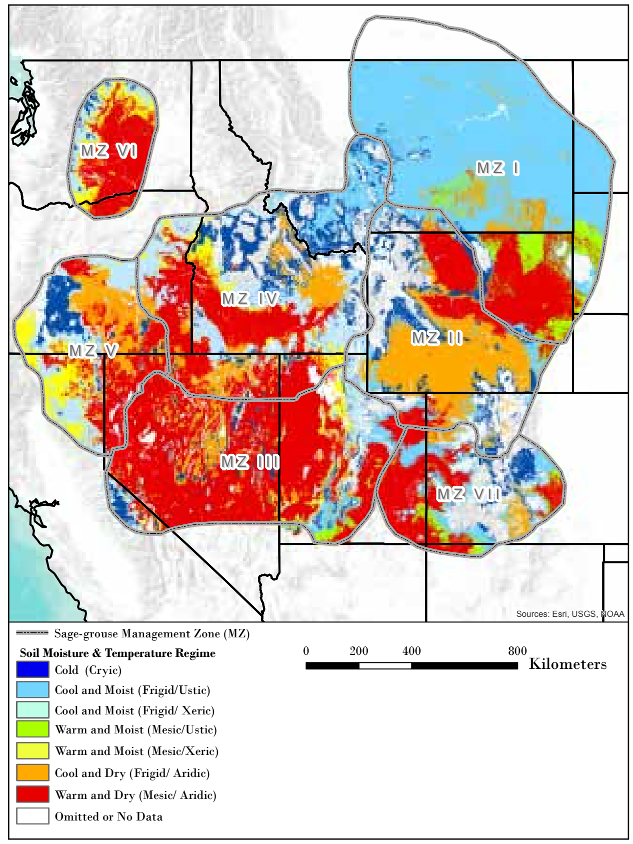

Figure 2. New soils product provides ability to depict potential ecosystem resilience and resistance across the range of sage-grouse using soil temperature and moisture regimes. For more information on interpretation, see Chambers et al. 2014b.

The file geodatabase named *SGMZ_SSURGO_temp_moist_regimes_v2.gdb* contains a raster dataset with all the SSURGO spatial data that is currently available in the Sage-Grouse Management Zones. There are two tables in this file geodatabase that can be joined to the raster dataset using the common mukey field. The table named *SSURGO_SGMZ_temp_moist_dom_cond_v2* contains the temperature and moisture regime and moisture subclass for the dominant condition in each map unit. The table named *SSURGO_SGMZ_temp_moist_components_v2* has data for each major component, including things like soil type, precipitation range, temperature-moisture regimes and subclasses, and ecological sites. When this table is joined to the raster dataset, the data for the dominant component will be in the attribute table. The *Identify* tool in ArcGIS can be used to display many attributes of the dominant component.

For an even finer grain look, the *SSURGO_SGMZ_temp_moist_components_v2* table can be opened to determine the ecological site and temperature and moisture regimes that are associated with each component in a map unit, rather than just the dominant component.

For More Information

Data Contact

Steve Campbell, USDA-NRCS Soil Scientist, 503-273-2421, steve.campbell@por.usda.gov

Background on SSURGO and STATSGO data: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/geo/

Access to soil surveys: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Acknowledgements

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Chambers, J. C.; Pyke, D. A.; Maestas, J. D.; Pellant, M.; Boyd, C. S.; Campbell, S. B.; Espinosa, S.; Havlina, D. W.; Mayer, K. E.; Wuenschel, A. 2014b. Using resistance and resilience concepts to reduce impacts of invasive annual grasses and altered fire regimes on the sagebrush ecosystem and greater sage-grouse: A strategic multi-scale approach. Gen. Tech. Rep. RMRS-GTR-326. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 73 p.

Stiver, S. J.; Apa, A. D.; Bohne, J. R.; Bunnell, S. D.; Deibert, P. A.; Gardner, S. C.; Hilliard, M. A.; McCarthy, C. W.; Schroeder, M. A. 2006. Greater Sage-grouse Comprehensive Conservation Strategy. Unpublished report on file at: Western Association of Fish and Wildlife Agencies, Cheyenne, WY.

Displaying Dominant Condition Vs. Dominant Component

It is important to understand some fundamental concepts in how soils are mapped in order to properly interpret information provided. Soils and their properties change over a continuous gradient but soils are described in map units. Soil map units commonly contain more than one "component" (soil types or miscellaneous areas such as rock outcrops) with unique data associated with each component. When spatially displaying soil survey information, a decision has to be made as to how to aggregate the component data to the map unit. The two most common aggregation methods are to display either *dominant component* or *dominant condition.* The example below illustrates the difference between these two methods:

Soil map unit: Alpha-Beta-Gamma complex, 8 to 30 percent slopes

Component Name	% of Map unit	Temperature/ Moisture Regime	Aggregation Method
Alpha	45	Warm and Dry (Mesic/Aridic)	Dominant Component
Beta	30	Cool and Dry (Frigid/Aridic)	Dominant Condition
Gamma	25	Cool and Dry (Frigid/Aridic)	

This map unit is on highly dissected hill slopes with a complex pattern of northerly and southerly aspects. The Alpha component is on southerly aspects and the Beta and Gamma components are on cooler northerly aspects. The temperature and moisture regime for the dominant component is Warm and Dry (mesic/aridic) since the Alpha component comprises the highest percentage of the map unit. The dominant condition is Cool and Dry (frigid/aridic) since the Beta and Gamma components cumulatively comprise 55 percent of the map unit, exceeding the 45 percent of the Alpha component. For the majority of soil map units, but not all, the dominant component and dominant condition results are identical. This product provides aggregated data in both dominant condition and component tables to allow users access to advantages of each approach.

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Appendix D
Meeting Locations and Participants

Meeting Place	Date	Attendees	Agency
Reno, NV	10/15/2014 through 10/17/2014 and 12/16/2014 through 12/18/2014 and 01/13/2015 through 01/15/2015		
		Sean Cottle	EMPSi
		Sandy Gregory	BLM
		Michael Boomer	BLM
		Matt Madariaga	BLM
		Tyson Gripp	BLM
		John Wilson	BLM
		Kent Bloomer	BLM
		Coreen Francis	BLM
		Leisa Wesch	BLM
		Ryan Elliott	BLM
		Mace Crane	BLM
		Mark Coca	BLM
		Joe Tague	BLM
		Ted Koch	USFWS
		Sarah Kulpa	USFWS
		Lee Corum	USFWS
		Thad Heater	NRCS
		Cheri Howell	USFS
Battle Mountain, NV	10/28/2014 through 10/30/2014 and 12/10/2014		
		Sean Cottle	EMPSi
		Sandy Gregory	BLM
		Stephen Levitt	BLM
		John Wilson	BLM
		Mark Coca	BLM
		Mace Crane	BLM
		Todd Erdody	BLM
		Chad Lewis	BLM
		Tyson Gripp	BLM

		Tyrus Mizer	BLM
		Nancy Herms	BLM
		Coreen Francis	BLM
		Michael Boomer	BLM
		Chad Lewis	BLM
		Brock Uhlig	BLM
		Kyra Walton Reid	USFS
		Brett Glover	USFS
		Cheri Howell	USFS
		Caine Daugherty	USFS
		Mike Podborny	NDOW
		Jeremy Lutz	NDOW
		Steve Foree	NDOW
		Sarah Kulpa	USFWS
Cedar City, UT	11/18/2014 through 11/20/2014		
		Sandy Gregory	BLM
		Coreen Francis	BLM
		John Wilson	BLM
		Christine Pontarolo	BLM
		Mace Crane	BLM
		Michael Boomer	BLM
		Brad Washa	BLM
		Stephen Levitt	BLM
		Tyson Gripp	BLM
		Paul Briggs	BLM
		Chris McVicars	BLM
		Melanie Mendenhall	BLM
		Nancy Herms	BLM
		Lisa Church	BLM
		Carson Gubler	BLM
		Tyrus Mizer	BLM
		Nick Howell	BLM
		Sheri Whitfield	BLM
		Kent Dastrup	BLM
		Steve Foree	NDOW

		Sarah Kulpa	USFWS
Richfield, UT	12/3/2014 through 12/5/2014		
		Sean Cottle	EMPSi
		Sandy Gregory	BLM
		Tyson Gripp	BLM
		Stephen Levitt	BLM
		Robin Naeve	BLM
		John Wilson	BLM
		Coreen Francis	BLM
		Melanie Mendenhall	BLM
		Christine Pontarolo	BLM
		Bradley Washa	BLM
		Lisa Church	BLM
		Carson Gubler	BLM
		Nick Howell	BLM
		Tyrus Mizer	BLM
		Verlin Smith	BLM
		Brant Hallows	BLM
		Mace Crane	BLM
		Ron Rodriguez	USFS
		Lee Woolsey	UT NRCS
		Jay Martini	UT FWS
		Sarah Kulpa	USFWS
		Jason Vernon	UDWR

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