US Department of the Interior
Bureau of Land Management

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

Western Great Basin - Warm Springs Valley/Western Great Basin

March 2015

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ACRONYMS AND ABBREVIATIONS

Acronym	Full Phrase
AML	appropriate management level
BBD	breeding bird density
BLM	United States Department of the Interior, Bureau of Land Management
°C	degrees Celsius
CAD	computer-aided dispatch
CDFW	California Department of Fish and Wildlife
COT	Conservation Objectives Team
EIS	environmental impact statement
ESR	emergency stabilization and rehabilitation
°F	degrees Fahrenheit
FIAT	Fire and Invasives Assessment Tool
Forest Service	United States Department of Agriculture, National Forest Service
FRG	fire regime group
GRSG	greater sage-grouse
HMA	herd management area
NAIP	National Agriculture Imagery Program
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act of 1969
NRCS	Natural Resources and Conservation Services
ODFW	Oregon Department of Fish and Wildlife
PAC	priority areas for conservation
PFC	proper functioning condition
PMU	population management unit
PPA	project planning area
PPH	preliminary priority habitat
RR	restoration and resilience
SEAT	single engine air tanker
USFWS	United States Fish and Wildlife Service
WAFWA	Western Association of Fish and Wildlife Agencies
WGB	Western Great Basin
WSA	wilderness study area

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SECTION 1
INTRODUCTION AND ASSESSMENT OBJECTIVES

1.1 EXECUTIVE OVERVIEW

The Western Great Basin/Warm Springs Valley assessment was developed using methods described in the FIAT Report (Greater Sage-Grouse Wildfire, Invasive Annual Grasses, and Conifer Expansion Assessment 2014). The developed implementable assessment is designed to identify strategies that ameliorate threats to Greater Sage-Grouse (GRSG; *Centrocercus urophasianus*) and their life cycle habitat. It incorporates emerging science, regional findings, and local knowledge and data.

This assessment area is a combination of two large Priority Areas for Conservation (PACs) from the United States Fish and Wildlife (USFWS) Conservation Objectives Team (COT) report (2013). These PACs are: (1) Western Great Basin, and (2) Warm Springs Valley/Western Great Basin. For ease of reading, this assessment name will be abbreviated hereafter as Western Great Basin or WGB.

The assessment authors have identified management opportunities that counter detrimental ecological trends in wildfire, invasive annual grasses, and conifer expansion. The Western Great Basin/Warm Springs Valley Fire and Invasives Assessment Tool (FIAT) identified the following:

- 2,745 miles of linear fuels treatments
- 875,126 acres of conifer treatment
- 979,024 acres of invasive plant treatment
- 1,342,314 acres of other treatments, including seedings
- 4,531,100 acres of 1st and 2nd priority post-fire rehabilitation, in addition to site-appropriate management strategies for fire operations and post-fire decisions

The Western Great Basin/Warm Springs Valley assessment is designed to be fully implementable at the local and regional level (see **Table 1-1**).

Table 1-1
Focal Habitat Acreage within Project Planning Areas (PPAs) in the Western Great Basin/ Warm Springs Valley Landscape

PPA	Acres of Focal Habitat within PPA	Percentage of Focal Habitat within PPA	Total Acres in the PPA
Beaty Butte	401,940	100	402,110
Black Rock	191,518	100	191,758
Bull Creek	66,155	100	66,250
Clover Flat	31,531	100	31,531
Cold Springs	71,973	100	71,973
Duck Flat	129,089	100	129,089
Frenchglen	128,222	69	185,568
Gravelly	29,384	91	32,297
Hart Mountain	241,664	100	241,678
High Rock	237,884	100	237,912
Horse Lake	93,351	100	93,351
Lone Willow	268,807	97	277,485
Madeline Plains	72,992	100	72,992
Madeline Plains Connectivity	0	0	140,589
Massacre	116,119	100	116,234
North Warner	245,202	84	293,401
Orejana West	124,781	100	124,781
Orejana East	123,603	41	299,670
Pueblo	72,027	54	134,261
Roaring Springs	62,800	83	75,810
Shaffer Mountain Connectivity	0	0	19,217
Sheldon	422,651	100	422,651
Shinn	412,492	100	412,692
South Warner	37,520	100	37,520
Trout Creek East	306,188	91	335,481
Trout Creek West	42,746	51	83,431
Virginia Ranges	98,117	99	98,675
Vya	234,786	100	234,890
Wall Canyon	227,838	89	255,948
Total for all WGB PPAs	**4,491,379**	**88**	**5,119,244**

1.2 BACKGROUND

The purpose of this assessment is to identify potential PPAs and management strategies within highly valued GRSG habitats. If implemented, the strategies would reduce the threats to GRSG. The COT report (USFWS 2013) and other scientific publications identify two primary threats to the sustainability of GRSG in the western portion of the species range: wildfire and conversion of sagebrush habitat to invasive annual grass-dominated vegetative communities. For this assessment, invasive species are limited to, and are hereafter referred to, as invasive annual grasses. Additionally, conifer expansion (also called encroachment) was identified as a threat and 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 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 impacts on GRSG from invasive annual grasses, wildfires, and conifer expansion. In addition, these assessments are designed to provide the 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 developed the FIAT assessment protocols. The FIAT process designed by this team involves two steps.

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

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

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

FIAT assessment areas roughly correspond to select PACs, which the COT identified in its report (USFWS 2013). In FIAT Step 1, the following assessment areas were identified:

1. Central Oregon
2. Northern Great Basin
3. Snake/Salmon/Beaverhead
4. Southern Great Basin
5. Western Great Basin/Warm Springs Valley

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

- PACs identified in the 2013 USFWS COT report (USFWS 2013)

- State-scale breeding bird density (BBD; (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)

1.3 Statement of Objectives

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 focal habitats for conservation and restoration
- Identify geospatially explicit management strategies to conserve GRSG habitats

1.4 Collaboration

The FIAT process requires partnership with cooperators, agencies, and others involved in land or wildlife management in the FIAT assessment areas. The Western Great Basin/Warm Springs Valley FIAT team collaborated with the BLM district teams, the USFWS, the Nevada Department of Wildlife (NDOW), the California Department of Fish and Wildlife (CDFW), the Oregon Department of Fish and Wildlife (ODFW), the Oregon Department of Forestry Eastern Oregon Area, Institute for Natural Resources/Sagecon, The Nature Conservancy (Oregon), and the Natural Resources Conservation Service (NRCS).

The team held twelve workshops: three in Susanville, California; two in Cedarville, California; one in Winnemucca, Nevada; two in Lakeview, Oregon; one each in Burns, Prineville, and Vale Oregon; and one in Reno (see **Table 1-2**).

Meeting attendees participated in the following:

- Reviewed FIAT Step 1 data for accuracy and applicability
- Incorporated refined local information, such as lek location, BBD, telemetry, vegetation, fire occurrence, and other data, to augment Step 1 findings
- Identified and described the extent of the PPAs, potential treatments, and appropriate management strategies in the four program areas

- Documented the rationale and local factors influencing the identification of management strategies

Team Leader Ken Collum (BLM California, Eagle Lake Field Office Manager) conducted outreach for participation via phone calls, e-mails, and direct conversations. From this outreach, more than 65 interagency participants contributed to the Western Great Basin/ Warm Springs Valley FIAT. During workshops, participants shared local data, such as lek information, seasonal habitat maps, and potential treatments already planned through partnerships outside of the FIAT. Collectively, multiple sources of data were combined to provide the basis for an integrated program of work in the Western Great Basin/Warm Springs Valley FIAT assessment area.

In addition to local data sets the largest contributor to the assessment was how the local team members used the data sets and their extensive knowledge of the PPAs.

A complete list of names and affiliations of meeting participants and contributors is in Appendix D.

1.4.1 Meetings

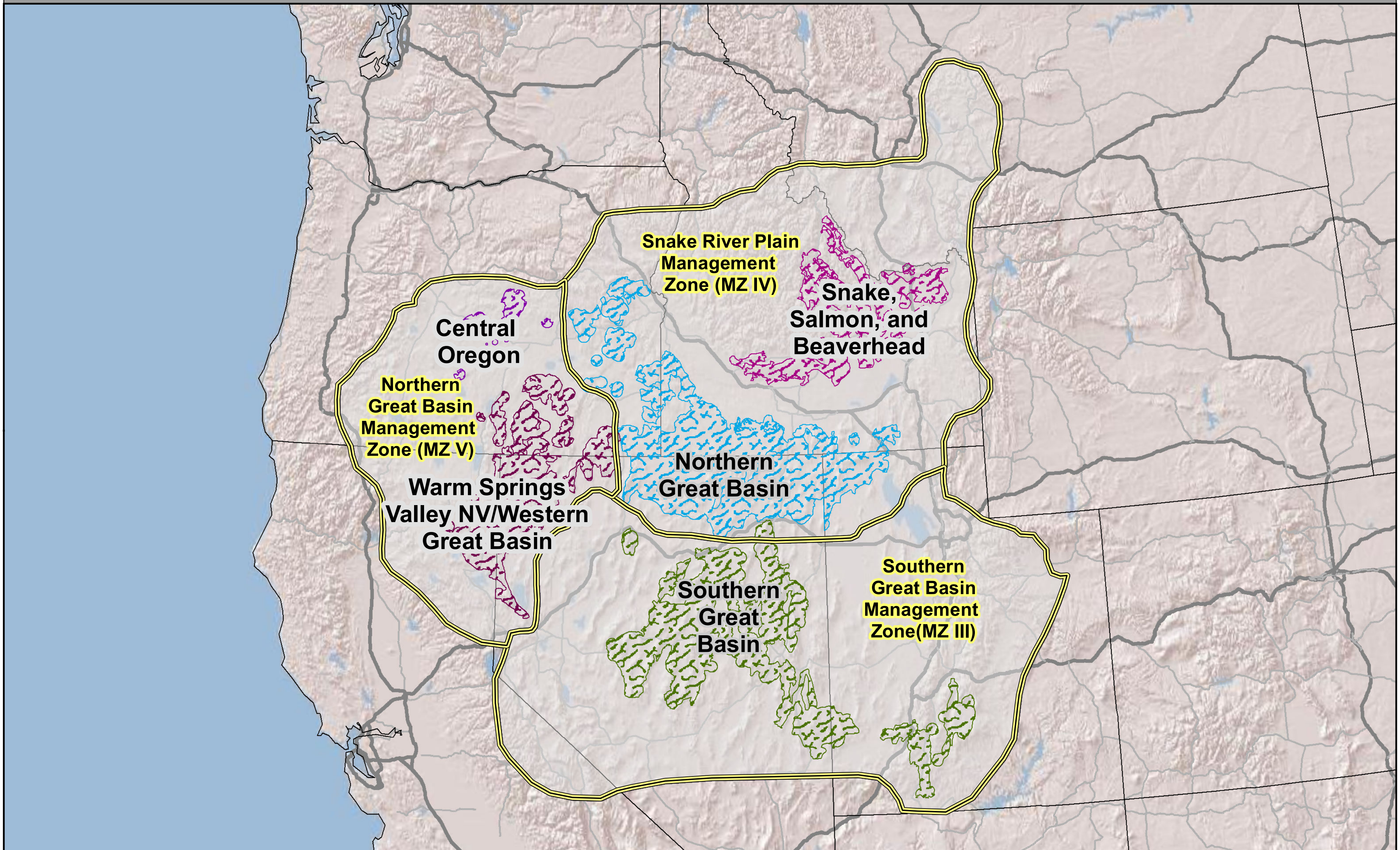
Table 1-2
List of Meetings

Date	Location
August 29	Susanville, California
September 16 to 18	Reno, Nevada
September 26	Cedarville, California
September 29	Prineville, Oregon
October 23	Lakeview, Oregon
October 16	Cedarville, California
November 12	Susanville, California
November 3	Burns, Oregon
November 4	Vale, Oregon
December 4	Winnemucca, Nevada
December 8	Susanville, California
December 9	Lakeview, Oregon
March 3	Burns, Oregon
March 4	Winnemucca, NV
March 9	Lakeview, OR
March 11	Susanville, CA

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

SECTION 2
DATA MANAGEMENT AND STEP-DOWN PROCESS

This section describes the data management method and process used for stepping down from Step 1 to Step 2.

2.1 EXAMINATION OF FIAT STEP 1 FINDINGS

FIAT Step 1 focal habitat identification was based on the compilation of existing state-level breeding bird density (BBD) data sets. BBD is a spatially dependent measure; for this reason, these initial data sets were plagued by a strong spatial bias of focal habitat, with limited representation of the extents of the five identified USFWS PACs.

The Step 1 data sets for PAC and BBD capture and mimic the established perimeters from local data sets. With minor adjustments from new data and geographic refining, these Step 1 data sets provide adequate parameters for Step 2 analyses.

The conifer data model is coarse and the amount of expansion is overrepresented. Initial evaluation shows that there is no local underrepresentation, which is as important. The conifer expansion data layer is easily refined at the local level, especially within focal habitat perimeters. The locally refined conifer data layers are critical to prioritizing conifer projects in or next to focal habitat and further incorporation of connectivity data.

Soil moisture temperature data is adequate to qualify priorities and treatments within the PPAs.

The assessment had the following limitations:

- Focal habitat was created with incomplete data because lek survey intensity, consistency, and repeatability do not conform to high statistical rigor.
- In more migratory GRSG populations, BBD-based focal habitat may not adequately capture winter habitat areas or other critical habitat areas.
- Telemetry data to better inform how GRSG use the landscape was limited
- Focal habitat represents a mid-scale characterization of habitat importance to only inform, not define, fine-scale management areas and treatments.
- Focal habitat typically captures the highest quality intact GRSG habitat; therefore, it would have improved the Step 2 assessment process if the potential of habitat restoration and fuels management activities outside of focal habitat had been assessed more.
- Focal habitat was the main focus for treatments in PPAs. Future efforts need to consider further habitat recovery/restoration and fuel treatments outside of focal habitats, which will be completely analyzed in the future.

2.2 Incorporation of Local Data

The Western Great Basin/Warm Springs Valley assessment team identified individual PPAs using the focal habitat boundaries developed as part of the FIAT Step 1 analysis. Conifer expansion, wildfire threat, sagebrush landscape cover, BBD, and additional local data were also used to define the PPA boundaries and inform each PPA assessment.

The local layers used GIS data from local, state, and federal partners, as follows:

- Forest Service
- USFWS
- BLM district offices
- Oregon Department of Fish and Wildlife
- NDOW
- California Department of Fish and Wildlife
- US Geological Survey
- NRCS
- The Nature Conservancy
- INR/Sagecon

2.2.1 Data Description

The types of local data used in this report were breeding and winter habitat and telemetry. Also used were data on the following:

- Fire history and occurrence
- Fire behavior, suppression, and threat modeling
- Fuel modeling
- LANDFIRE
- Vegetation occurrence, especially cheatgrass, and other GRSG biologically significant unit data
- Road layer and slope/aspect
- Elevation models
- Conifer expansion model
- Soil temperature and moisture data
- Land status (wilderness, wilderness study area)
- Weed location and type
- Ecological site inventories
- Satellite and National Agriculture Imagery Program (NAIP) imagery

2.2.2 Rationale for Selection

Data selection was based on quantity and quality of local data sets. All relevant data were analyzed to determine usefulness and robustness within each FIAT assessment.

The data availability and quality varied throughout the BLM and partner districts (regions). Quality vegetation data were highly variable but were critical to the assessments. Where actual vegetation data were sparse, local knowledge was critical to filling in the gaps. The local and regional data sets were only as good as the local expert's interpretation and use of them. The core data sets common and critical to quality assessments were as follows:

- Soil temperature and moisture
- Vegetation/conifer
- Slope/aspect (e.g., north slope, south slope)
- BBD/core habitat
- Telemetry
- Road, structure layer

- Previous and ongoing treatments
- Fire occurrence and history

2.3 National Data Layers

National data sets defining PACs and Western Association of Fish and Wildlife Agencies (WAFWA) management zones were initial data products used to define FIAT assessment areas. In addition, the following national data layers provided the initial, broad-scale characterization of conditions in the WGB assessment area. These data sources are fully described in the FIAT report.

2.3.1 Breeding Bird Density

The spatial depiction of breeding bird density (BBD) for the WGB FIAT assessment area comes from State-level analysis done by Doherty (2010). Because updated BBD data were not available for all three States, the Doherty (2010) 75percent BBD data from FIAT step 1 were utilized.

2.3.2 Conifer Expansion

The common conifer expansion layer used in WGB FIAT workshops to identify management opportunities was a product developed by Manier et al (2013), and the same layer used in FIAT step 1. In addition, the Oregon portions of the WGB utilized a SageCon layer which more accurately reflected conifer expansion in Idaho

2.3.3 Wildfire Threats

The primary data set used to characterize wildfire threat or probability was the large fire simulator (FSIM) burn probability layer. Based upon past trends in fire occurrence and size, the FSIM layer displays the relative likelihood for fire occurrence and large fire growth in the future. The data were classified into five classes, and the highest two burn probability classes (i.e., high and very high) were combined. The proportion of each PPA containing high and very high burn probability was used in identifying potential treatment opportunities and fire operations priorities. In addition, wildfire perimeters from GEOMAC were utilized in portraying past disturbance history and patterns.

2.3.4 Soil Moisture/Temperature Regime

A coarse layer characterizing soil temperature and moisture regimes was developed through the Chambers et al (2014) general technical report. Using soil subclasses and the most refined soil survey data available, a layer depicting the sage-grouse habitat matrix was developed. This layer intersected resilience categories with sagebrush landscape cover Sagebrush Landscape Cover

The sagebrush landscape cover layer used was developed by the BLM National Operations Center. It replaced the layer used in FIAT step 1 by utilizing a sagebrush data set which will be updated annually as part of the BLM's Disturbance and Monitoring project.

2.3.5 Other Data Layers

Additional data layers used in workshops and analysis for the WBG FIAT assessment include:

- The spatial depiction of the sage-grouse habitat matrix, which was a nine category geospatial product depicting both resilience class and percent sagebrush landscape cover;
- Lek data provided by ODFW and NDOW;
- Seasonal habitat data provided by ODFW, NDOW, and CDFW.
- Local monitoring and inventory data related to habitat use
- Telemetry data

2.4 Data Gaps Identified

This report is based on the best information available at the time of publication. The BLM recognizes there are areas where additional information would enhance the value of this report and further support implementation of FIAT objectives and overall GRSG conservation efforts.

Following are data gaps identified during the completion of the WGB FIAT assessment:

- Updated 75 percent BBD for California, Nevada, and Oregon, which reflects recent bird surveys and trends in habitat use;
- Higher definition conifer expansion layer, which makes distinction between true woodlands versus areas experiencing expansion;
- Comprehensive spatial layer of invasive annual grass distribution and cover.

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SECTION 3
ASSESSMENT AREA CHARACTERIZATION

3.1 WESTERN GREAT BASIN/WARM SPRINGS VALLEY ASSESSMENT AREA

The Western Great Basin/Warm Springs Valley assessment area consists of three populations or subpopulations in south-central Oregon, northeastern California, and northwestern Nevada. It represents the westernmost extent of the GRSG and contains a mix of habitat issues that have had long-term effects on GRSG populations. The range of GRSG in this region has continued to shrink over the last three decades, while some populations within the zone are relatively stable. When considered in its entirety, population changes from 1965 to 2004 are statistically undetectable (Connelly et al. 2004). The Western Great Basin/Warm Springs Valley assessment area is characterized as one of those supporting the highest densities of GRSG.

The northeast California/northwest Nevada/south-central Oregon subpopulation includes portions of west Humboldt and north Washoe Counties in Nevada, east Lassen and southeast Modoc Counties in California, and south Lake and Harney Counties in Oregon. This area also encompasses the Sheldon National Wildlife Refuge. The subpopulation includes a mix of extirpated, highly threatened, and relatively stable population management units (PMUs). In the COT Report (USFWS 2013), the USFWS generalizes threats to this subpopulation as isolation and small size, conifers, fire, weeds, annual grasses, livestock, and wild horses.

Overall, modeling for the northeast California/northwest Nevada/south-central Oregon subpopulation indicates that 56 percent of sagebrush habitats support 10 to 30 percent sagebrush cover, which is considered suitable habitat. Habitat condition trends, which include habitat treatments under current management, are projected to bring sagebrush habitats supporting 10 to 30 percent cover up to 45 percent in 50 years. The trend is down due to increasing annual grasses and conifer encroachment.

The south-central Oregon/north-central Nevada subpopulation of GRSG habitat is in Humboldt County, Nevada, north of Highway 140 and west of Highway 95; it also encompasses south Harney and Malheur Counties, Oregon, to the north. The subpopulation is continuous into Oregon and also includes the Trout Creek Mountains and the Hart Mountain National Antelope Refuge.

The subpopulation is considered a stronghold in the Western Great Basin/Warm Springs Valley. It contains one of the most densely populated winter ranges in Nevada. Fire activity is high, with total burned acreage of nearly 25 percent. In 2012, the Holloway Fire burned approximately 214,000 acres in the Nevada portion and another 245,000 acres in Oregon.

Modeling indicates that 30 percent of the assessment area contains 10 to 30 percent sagebrush cover, which is considered suitable habitat. Habitat condition trends, which include continued implementation of habitat treatments under current management, are projected to bring sagebrush habitats supporting 10 to 30 percent cover up to 35 percent in 50 years. Current vegetation treatments are an improving trend, though greatly impacted by recent fire activity. The COT Report (USFWS 2013) characterizes fire and annual grasses as substantial and imminent threats in this portion of the subpopulation; the report characterizes mining and infrastructure as substantial and not imminent.

The Warm Springs Population (Pah Rah and Virginia PMUs) habitat is entirely in southern Washoe County, Nevada. This area is bounded on the west by Highway 395, on the south by Long Valley, Interstate Highway 80, and the cities of Reno and Sparks, and on the east and the north by State Highway 446.

Wildfires have burned approximately 35 percent of this PMU, converting sagebrush-dominated shrublands into annual grasses and weeds. Wildfires that occurred from 1999 through 2001 were particularly devastating, burning some of the last strongholds of GRSG habitat left in both the Pah Rah and Virginia Mountain Ranges. GRSG in these two mountain ranges occur in small isolated pockets of suitable habitat in the northern Virginia Mountains. GRSG currently use an estimated 54,000 acres (15 percent) of the 356,034 acres in this PMU. Only 65 percent is under BLM administration, 24 percent is under private ownership, and nine percent belongs to the Pyramid Lake Indian Tribe.

Urbanization particularly in the Pah Rah Range threatens existing GRSG habitat. Modeling indicates that 60 percent of the remaining sagebrush habitats support 10 to 30 percent sagebrush cover, which is considered suitable habitat. Habitat condition trends, which include continued implementation of habitat treatments under current management, are projected to bring sagebrush habitats supporting 10 to 30 percent cover up to 56 percent in 50 years. Downward trends are slight and are due to treatment rates not keeping pace with annual grass expansion.

NDOW analyzed factors in these mountain ranges and found a high probability of extirpation within the next 20 years; only three active leks are known. Current population estimates based on these leks indicate declining numbers, with a spring breeding population of 150 to 200 GRSG. The COT Report (USFWS 2013) notes only two leks and characterizes the population at less than 200 males. It does not provide estimates for persistence.

The report highlights a myriad of threats, including fire infrastructure, weeds and annual grasses, conifer, energy, free-roaming horses and burros, recreation, and urbanization. The report identifies the population as "at risk" overall.

3.1.1 Vegetation

Sagebrush generally occurs throughout the Western Great Basin/Warm Springs Valley. Because it is a dominant vegetation type in the planning area, a high number of species have evolved specifically to thrive in sagebrush habitat.

Sagebrush types are generally found in a mosaic with other habitat types but can occur as large monotypic expanses. Sagebrush habitats generally occur between 4,500 and 10,000 feet and are widespread throughout the valley, foothill, and mountain environments (NDOW 2012b).

Annual precipitation ranges from eight to 30 inches, mostly in the form of snow. Temperatures range from -30 to 110 degrees Fahrenheit (°F). Sagebrush overstory structure can range from less than six inches on exposed, rocky slopes up to nine feet in drainages where basin big sagebrush has extended its roots into the water table. Sagebrush canopy, however, is generally between two and three feet high. Crown cover varies from one to 70 percent but commonly is between 20 and 40 percent (NDOW 2012b).

There are 27 recognized species and distinct subspecies of sagebrush in the planning area. Dominant species are: basin big sagebrush, (*Artemisia tridentata* ssp. *tridentata*) mountain big sagebrush, (*Artemisia tridentata* ssp. *vaseyana*) Wyoming big sagebrush, (*Artemisia tridentata* ssp. *wyomingensis*) low sagebrush, (*Artemisia arbuscula*) black sagebrush, (*Artemisia nova*). Codominant plant species are: bitterbrush, (*Prushia tridentata*) snowberry, (*Amelanchier* ssp.) yellow rabbitbrush, (*Chrysothamnus* ssp.) rubber rabbit brush, (*Ericameria* ssp.) snakeweed, (*Gutierrezia* ssp.) white sage, (*Artemisia ludoviciana* ssp.) spiny hopsage, (*Grayia spinosa*) bluebunch wheatgrass, (*Pseudoroegneria spicata*) bluegrass, (*Poa* ssp.) needle and thread, (*Hesperostipa comata*) Idaho fescue, (*Festuca idahoensis*) Indian ricegrass, (*Achnatherum hymenoides*) Great Basin wildrye, (*Leymus cinereus*) Indian paintbrush, (*Castilleja* ssp.) lupine, (*Lupinus* ssp.) buckwheat, (*Eriogonum* ssp.) globemallow, (*Sidalcea* ssp.) penstemon, (*Penstemon* ssp.)

The altitudinal distribution of sagebrush generally follows a pattern of basin big sagebrush in the valley floors or lower alluvial fans, Wyoming big sagebrush at mid-elevations, and mountain big sagebrush above 6,500 feet. Low and black sagebrush are both low-growing shrubs that rarely exceed heights of 15 inches. It grows primarily on shallow or poorly drained soils with a root restricting layer, interspersed throughout the greater sagebrush expanse in many elevation bands.

Commonly occurring trees in the planning area are Utah juniper, western juniper, mountain mahogany, ponderosa pine, and Douglas-fir. Aspen communities are dispersed throughout the planning area, and conifer forests dominate the higher elevations.

The planning area has a diverse aquatic environment from wetland, spring, meadow, seep, vernal pool, stream/river, and riparian communities. These provide invaluable water sources across the arid, cool desert landscape.

Sagebrush range in good condition supports an abundant understory of protein-rich bunchgrasses and forbs. The presence of this understory is critical to the needs of other wildlife species, including the sagebrush vole. The various shrew species that live in sagebrush depend on the productivity of the herbaceous component for the abundant production of their prey, as well as for cover.

3.1.2 Invasive Annual Grasses

Much of the planning area has been substantially altered or degraded since the nineteenth century by a combination of change agents. Despite being in one of the least developed regions of the country, the Western Great Basin sage steppe is one the most threatened ecosystems in the country. Major change agents that negatively affect GRSG are increases in both the frequency and intensity of wildfire, invasive annual grasses, the expansion of native juniper species, development, and livestock and wild ungulate grazing that exceeds land health standards. The aggregate effects of these change agents have altered the planning area's sagebrush, riparian, and forest habitats (Miller et al. 1994).

In the southern and lower elevations of the Western Great Basin much of the basin big sagebrush and Wyoming big sagebrush range lacks understory of native bunchgrasses and forbs that were historically present. Shrub cover has increased from what are generally regarded as the conditions before Euro-American contact. Nonnative annual grasses, most notably cheatgrass, have invaded big sagebrush range, bringing with them an accelerated fire interval for which sagebrush regeneration cannot compensate.

Low and black sagebrush are being similarly invaded by cheatgrass throughout the area. Medusahead in northern Nevada is an aggressive exotic grass that can tolerate the shallow clay soils of these ecological sites. It can have a similar negative impact through altered fire regime and is threatening the low sagebrush landscape. Over time, shrubland with high species diversity is being converted to annual grassland, with drastically reduced wildlife value (NDOW 2012b).

3.1.3 Conifer Encroachment

Pinyon and juniper species have expanded into the Western Great Basin due to range overgrazing in the nineteenth century and the first half of the twentieth century (Young and Sparks 2002) and fire suppression after the 1920s (Pyne 2004). Many true woodlands within a few miles of mines were harvested or thinned during the historic mining era of the late nineteenth century; however, many woodlands have repopulated the soils that supported them and continue to aggressively contribute to the expansion of trees into sagebrush range.

Pinyon and juniper expansion into sagebrush habitats drastically alters range structure and creates conditions difficult to restore. Pinyon and juniper expansion is also generally facilitated by regional warming (Grayson 1993; Tausch and Nowak 1999).

Currently there is considerable discussion about the need to manipulate the balance between woodland expansion and healthy sagebrush communities. This is because of the recent efforts to conserve GRSG and the habitat needs of pinyon and juniper obligates. One example is the pinyon jay, which is currently experiencing a four to six percent decline in population per year (GBBO 2010).

3.1.4 Fire Regime and History

Currently wildfire and invasive annual grasses are by far the greatest management concerns.

An overwhelming proportion of the Western Great Basin is predicted by this model to support annual grasses at 45 percent cover. Although disturbance drives the competitive success of these invasive annual grasses, future disturbances will continue in the present patterns. This is undoubtedly the most severe circumstance on an eco-regional scale in the western United States. Indicators suggest overall that substantial fire regime departure has occurred throughout the montane uplands (montane forest and shrubland vegetation) of the Western Great Basin.

The current landscapes of the Western Great Basin/Warm Springs Valley FIAT assessment area are highly altered from reference conditions, and face enormous challenges related to altered fire regimes and conversion to stable state ecological conditions. Altered fire regimes are most often reflected by changes in vegetation composition, vegetation structure, fire frequency, and fire severity when compared with reference conditions. Many factors interact to change fire regimes, including patterns of herbivory, annual grass establishment, disturbance frequency/severity, and human land management. The expansion of conifers described in the previous section is in part a consequence of the removal of fire during successional advancement. Conversely, the large-scale conversion to invasive annual grass communities has been largely driven by the interplay of soil disturbance and frequent wildfires. The current annual grass communities have a contagion effect on future wildfires, where the size and spread of future wildfires expands from existing annual grass “footprints”. Many mature western juniper trees have attained a high degree of fire tolerance, due to the thick bark they attain as they mature. Collectively, these consequences of altered fire regimes require unique management strategies to restore the desired vegetation communities and ecological function.

Known as fire regime departure in the fire analysis discussions, it reflects a similar spatial pattern to that provided by the invasive annual grass indicator.

While annual grasses and fire regime departure are linked processes on the landscape, invasive species are not yet fully coupled with fire regime departure. For example, fire frequency remains very low in some desert scrub types, while they appear to be accumulating invasive plant abundances.

Fire regime departure models for 2025 to 2060 indicate relative minor differences; thus, management priorities guided primarily by the analysis of current conditions should hold for the upcoming decades. Where current conditions suggest needs for habitat restoration and management focus, forecasts for upcoming decades for landscape condition and fire regime departure suggest those same management directions.

3.1.5 Soil/Moisture Regime (Resistance and Resilience)

Resistance and resilience regimes in the Western Great Basin/Warm Springs Valley vary dramatically depending on latitude and elevation. Typically the southern areas are predominantly warm, dry soil types that are at greatest risk for conversion to invasive annual grasses. The northern Western Great Basin tends to be higher elevation and exhibits more cool dry to moist soil types. This area is more resistant to invasive species (see **Tables 3-1 and 3-2**).

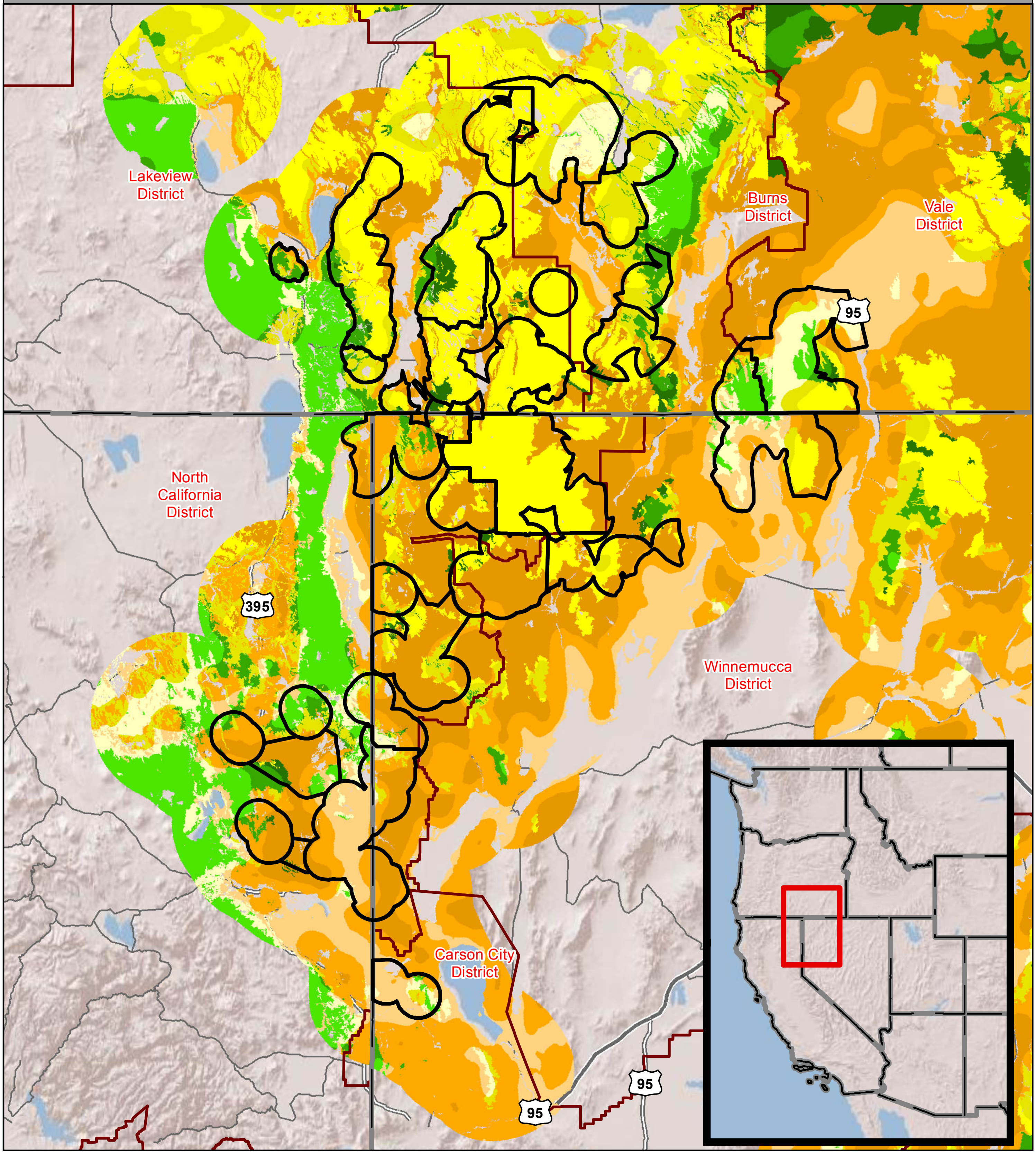
The resistance and resilience regimes where consolidated in Table 2 of the Chambers, et. al. (2014) General Technical Report. The table presents the resistance and resilience regimes in a nine cell matrix which corresponds to the equivalent GIS layer used during Step 2 analysis. The sage-grouse habitat matrix (Table 2) was a critical tool in evaluating management strategies and a focal point for collective understanding of the concepts during Step 2 workshops and presentations.

The key factors considered within the soil moisture regimes are elevation, slope aspect, and present day habitat conditions. Recent fire history (**Table 3-3**) has followed the resistance and resilience model, in which there is conversion to invasives in warm/dry soil type where invasives existed in the understory before disturbance. At higher elevations and on north slopes, invasives in the understory tend to be less, and after a disturbance they are manageable by an aggressive treatment strategy (See **Tables 3-4** through **3-10**).

Sage-Grouse Habitat Matrix

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

Western Great Basin and Warm Springs Valley
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

FIAT Project Planning Areas
State Boundary
BLM District Boundary

Resistance and Resilliency Classes

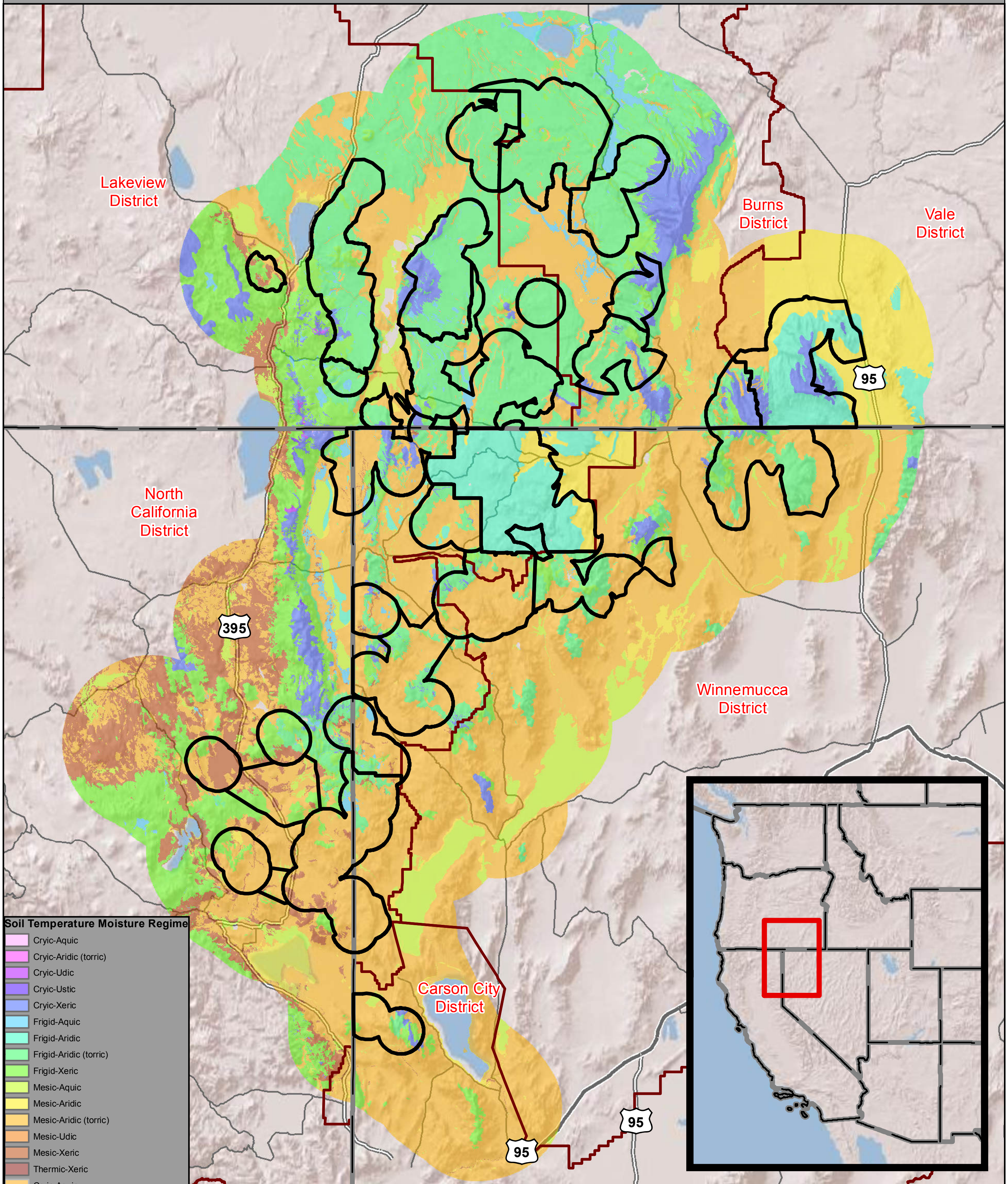
High and <25% sagebrush cover
High and 25-65% sagebrush cover
High and >65% sagebrush cover
Moderate and <25% sagebrush cover
Moderate and 25-65% sagebrush cover
Moderate and >65% sagebrush cover
Low and <25% sagebrush cover
Low and 25-65% sagebrush cover
Low and >65% sagebrush cover

March 2015
Date Saved: 3/26/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Soil Temperature and Moisture Regime

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

Western Great Basin and Warm Springs Valley
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

State Boundary
BLM District Boundary
FIAT Project Planning Areas

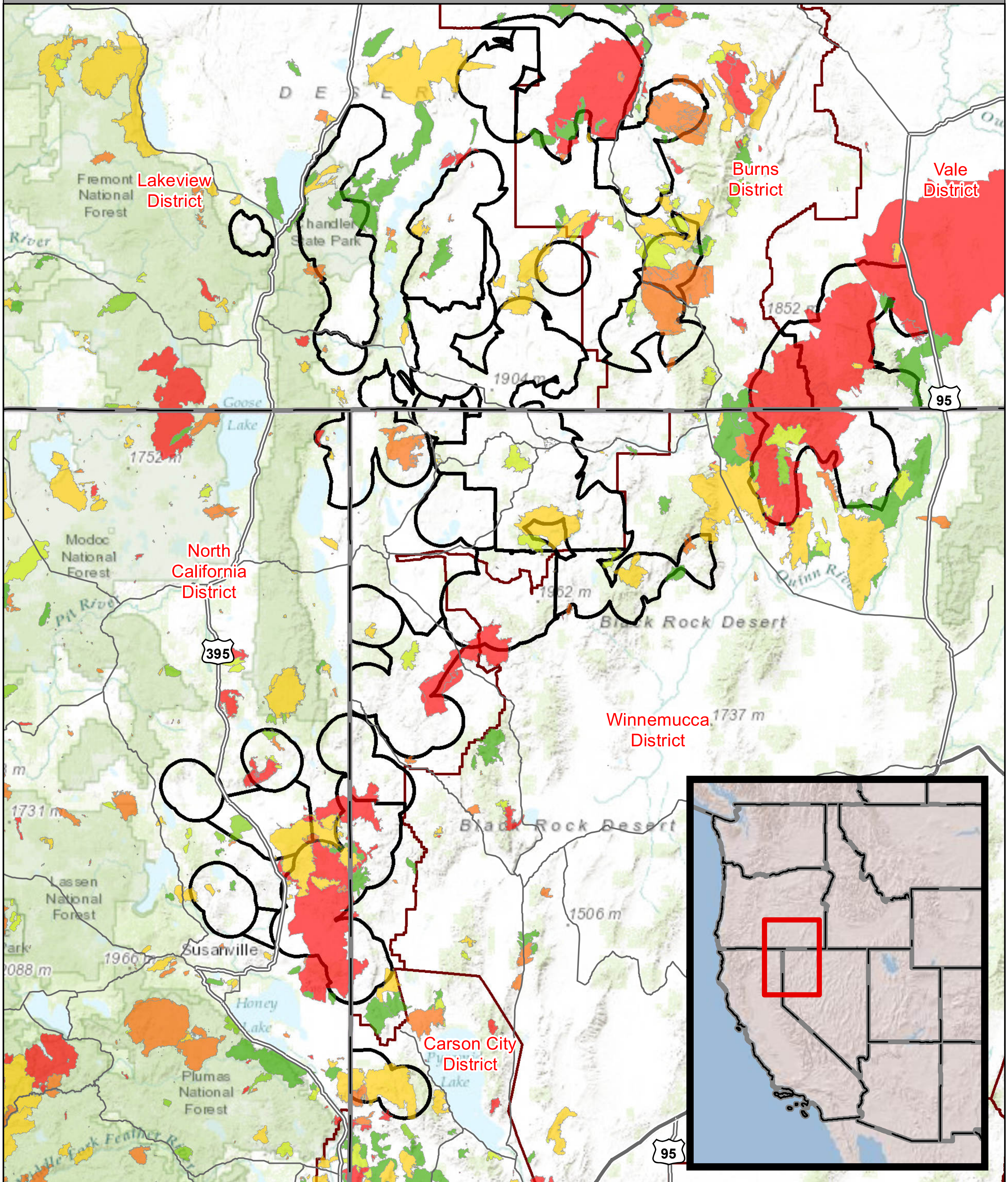
*Updated soil data for the Sheldon NWR unavailable.

March 2015
Date Saved: 3/26/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Fire History

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

Western Great Basin and Warm Springs Valley
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

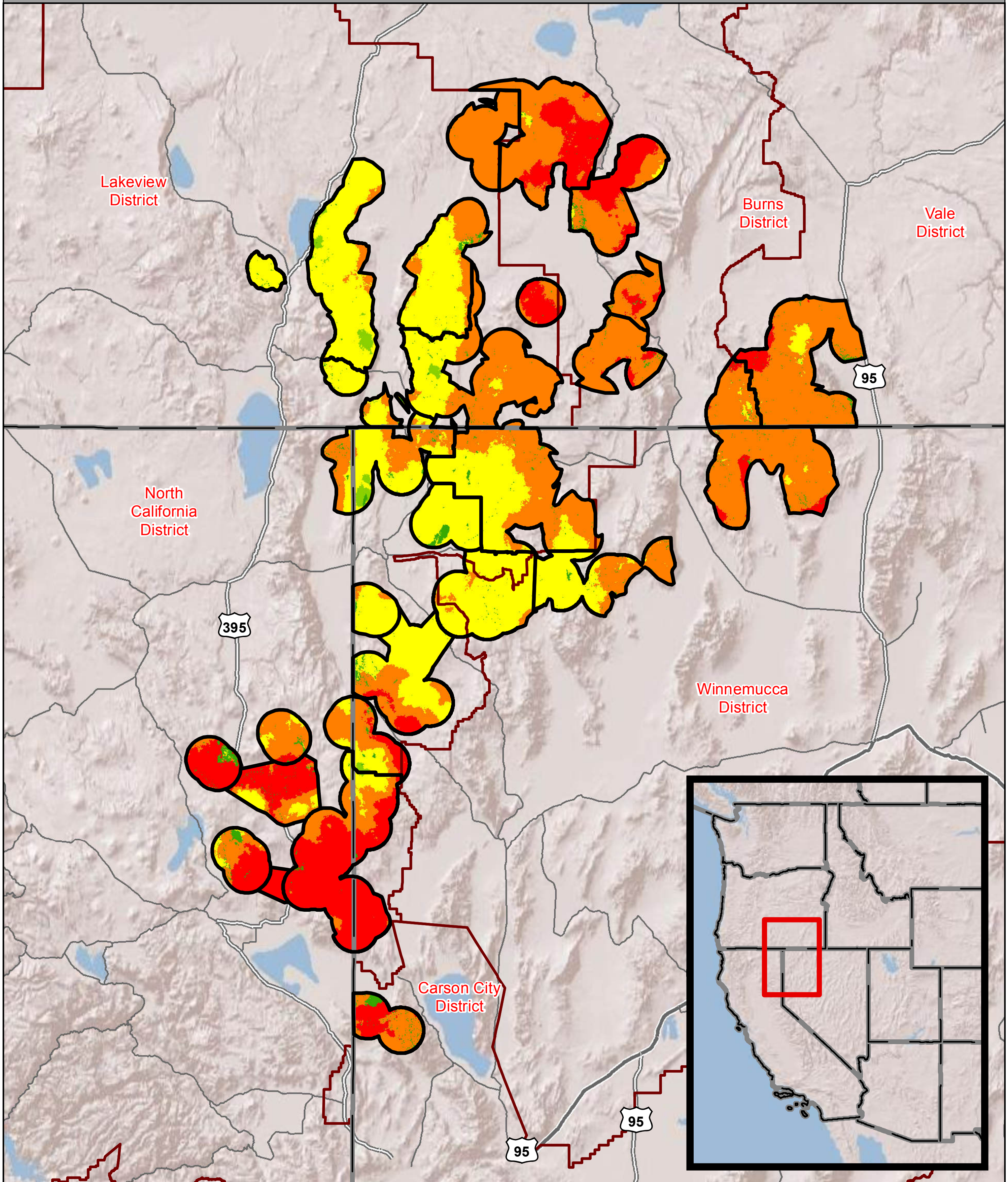
Fire History
- 1 - 5 Years old
- 6 - 10 Years old
- 11 - 15 Years old
- 16 - 20 Years old
- 21 - 25 Years old
- 26 - 30 Years old
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Burn Probability

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

Western Great Basin and Warm Springs Valley
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 or aggregate use with other data.

FIAT Project Planning Areas
State Boundary
BLM District Boundary

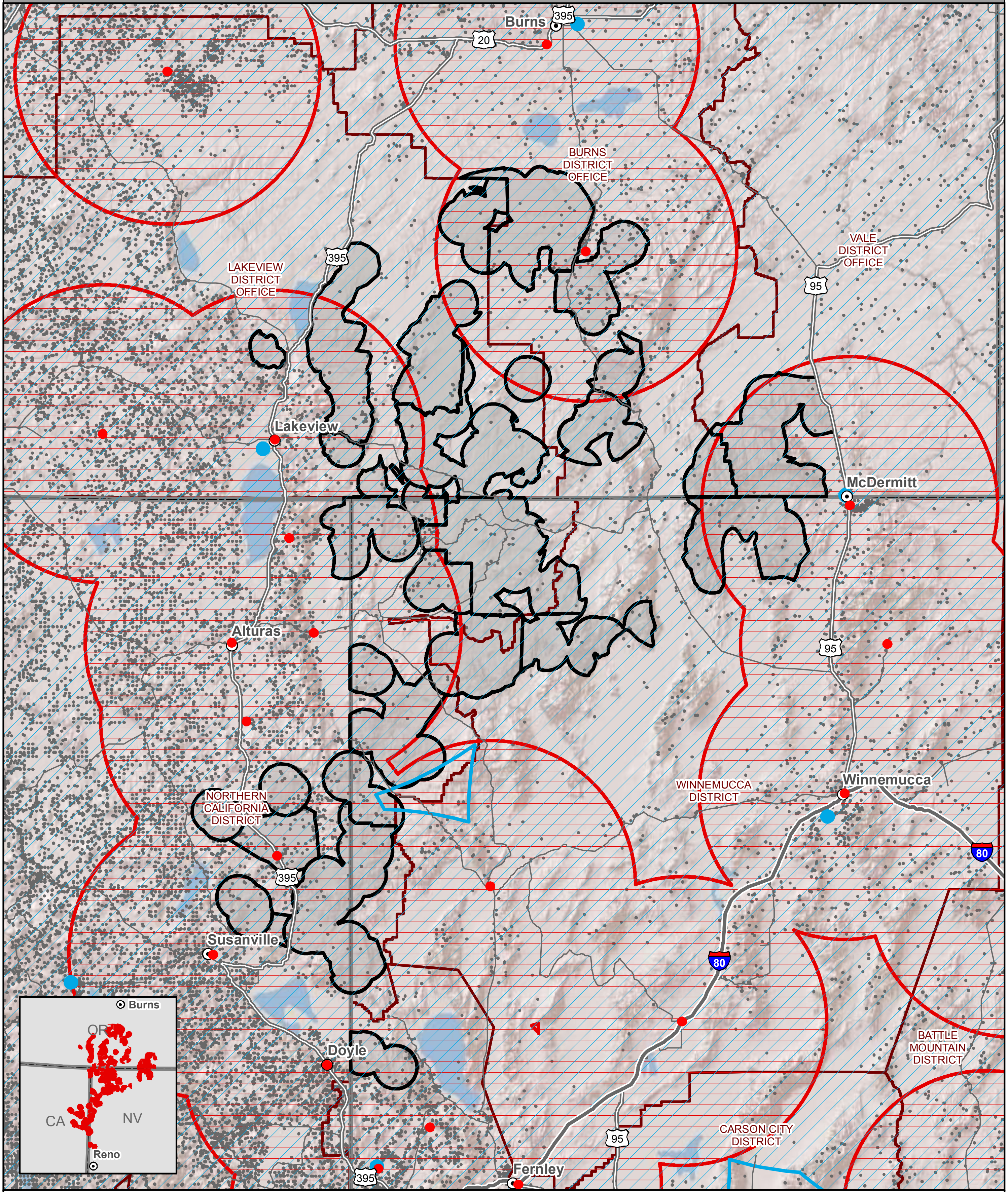
Burn Probability
Very High
High
Moderate
Low
Zero

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Fire Resource Response Times

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

Western 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

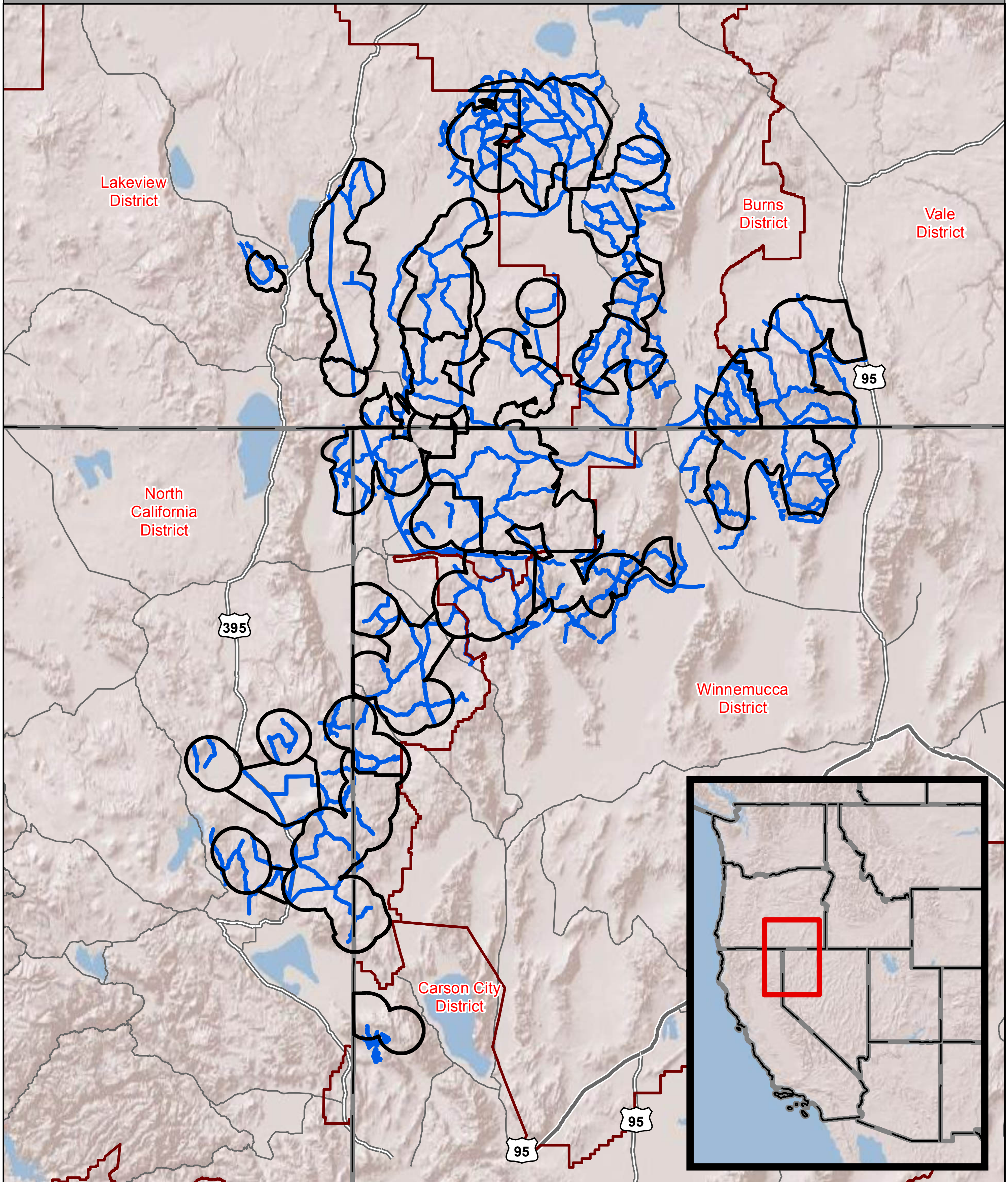
- Engine 60min Response
- Seat 30min Response
- Fire History '92-'15
- Fed Fire Station
- Seat Base
- Project Planning Area
- BLM District Boundary
- State Boundary
- Interstate Hwy
- US Route
- State Route

Date Saved: 3/23/2015
Data Sources: BLM, ESRI
1:2,600,636

Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

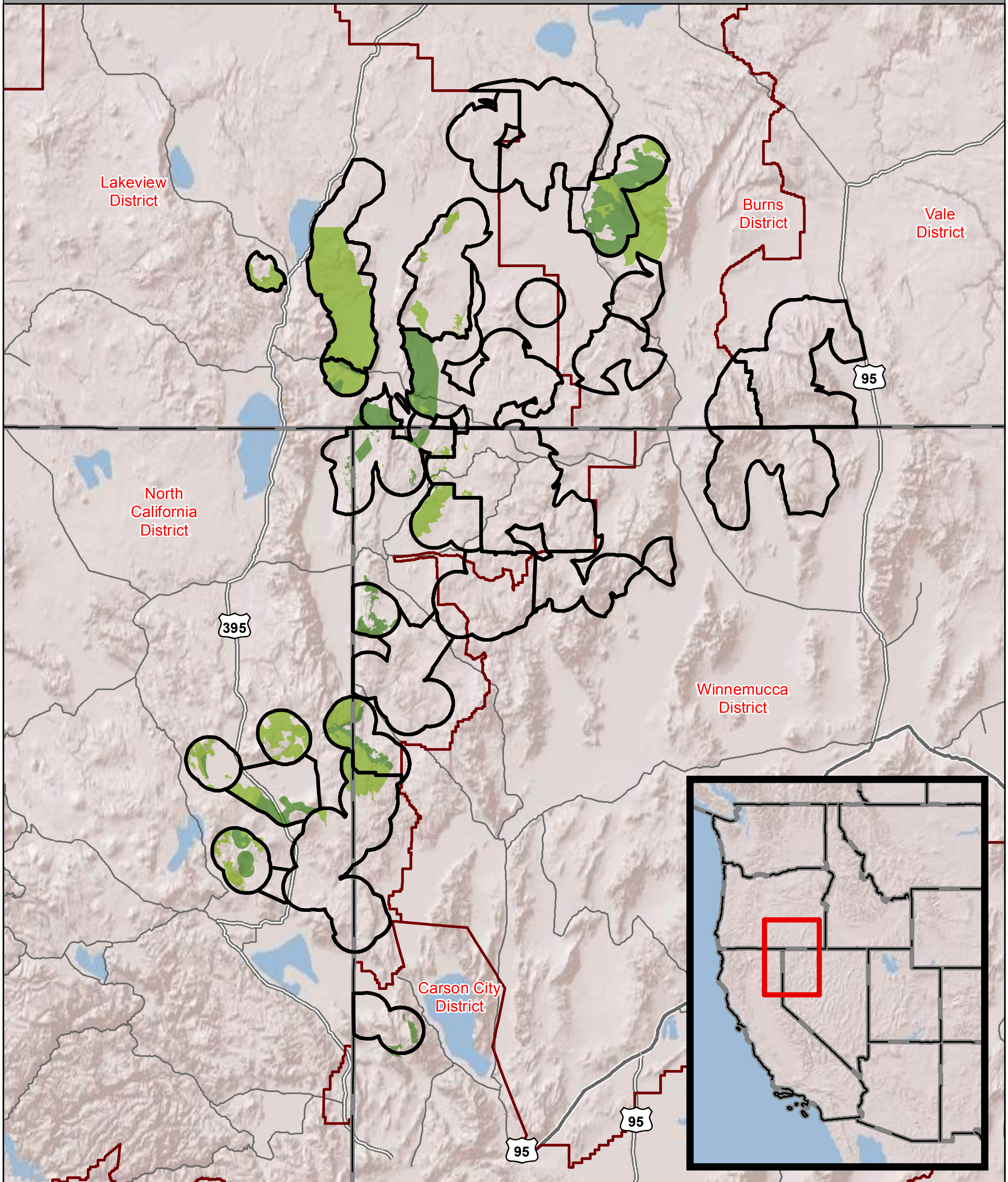
FIAT Project Planning Areas
State Boundary
BLM District Boundary
Fuel Break

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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 or aggregate use with other data.

FIAT Project Planning Areas
State Boundary
BLM District Boundary

Priority for Implementation

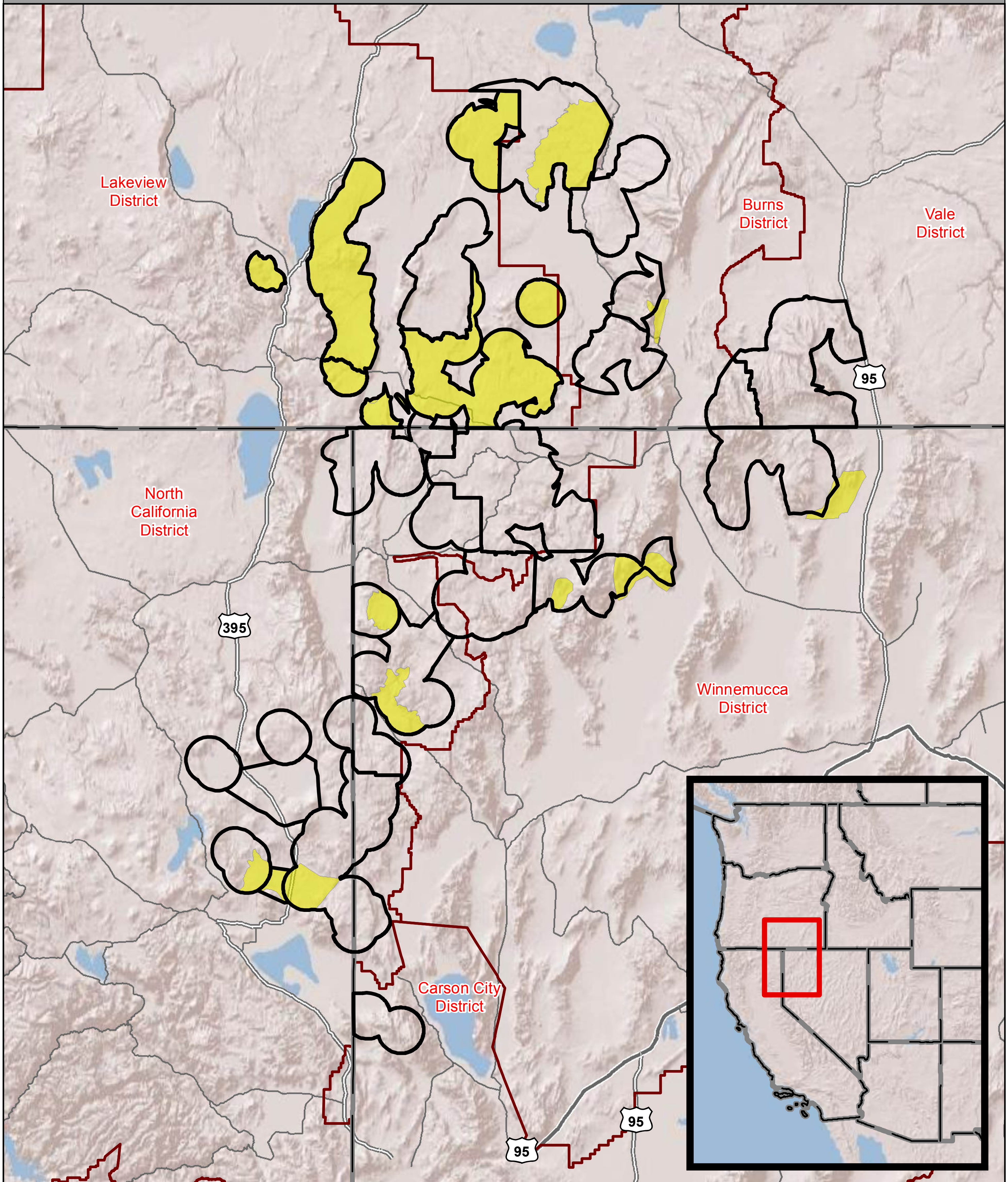
First | Second | Third

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

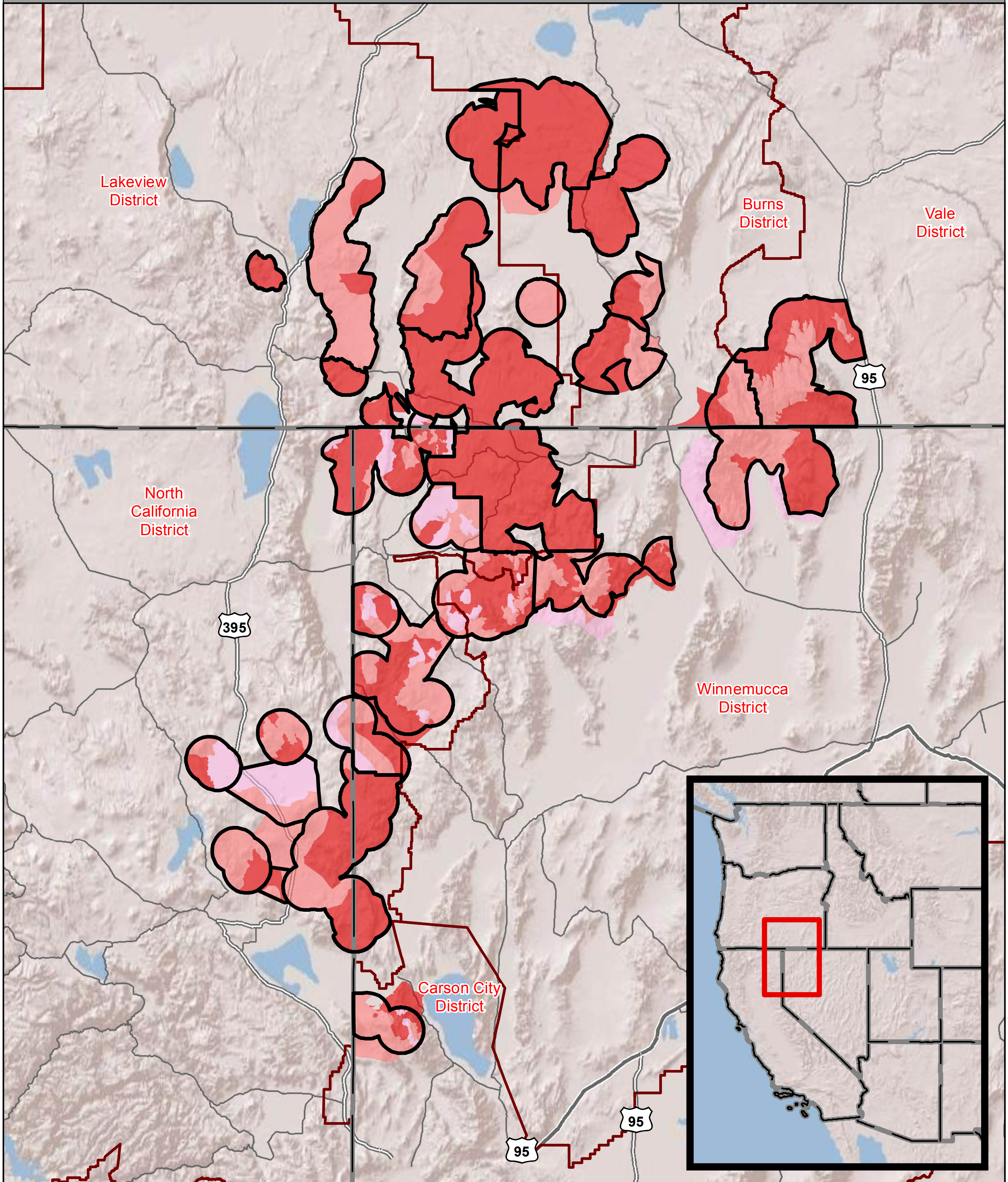
FIAT Project Planning Areas
State Boundary
BLM District Boundary
Habitat Restoration- Invasive Annual Grasses

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Fire Operations

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

Western Great Basin and Warm Springs Valley
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

FIAT Project Planning Areas
State Boundary
BLM District Boundary

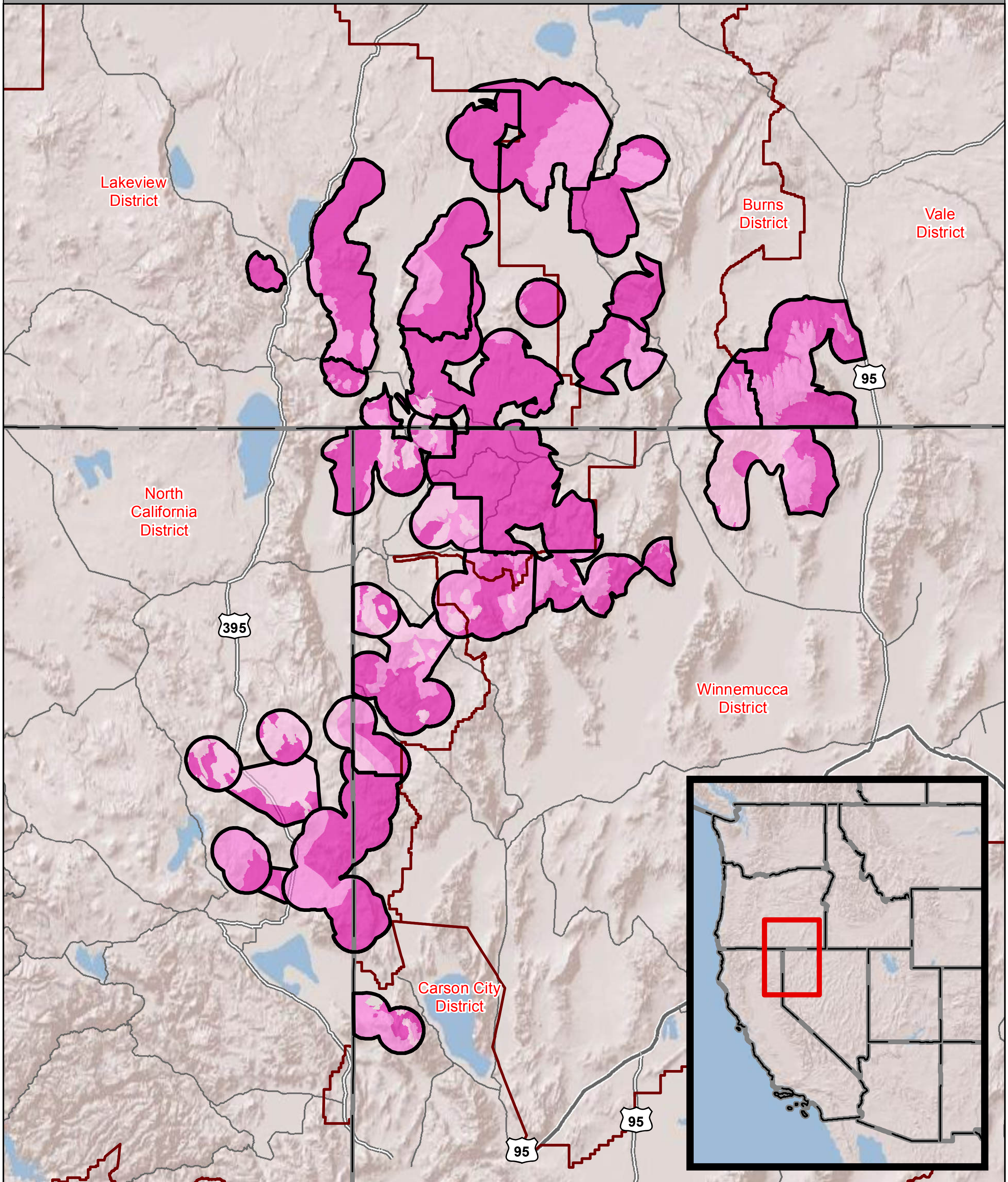
Priority
First
Second
Third

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

Post-Fire Rehabilitation (ESR) Priorities

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

Western Great Basin and Warm Springs Valley
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

FIAT Project Planning Areas
State Boundary
BLM District Boundary

Priority for Implementation

First Second Third

March 2015
Date Saved: 3/25/2015
Data Sources: BLM, ESRI Basedata
1:148,636

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) illustrates a step-down approach for identifying and assessing priority GRSG habitats across large landscapes and provides guidelines to identify effective management strategies/actions and habitat restoration needs across four primary federal agency program areas: fuels management, fire operations, habitat restoration/recovery, and post-fire-rehabilitation. The approach is based on widely available data, described in Section 2.3, to provide consistency across millions of acres and includes: (one) PACs, (two) BBDs, (three) habitat suitability as indicated by the landscape cover of sagebrush (not foliar cover), (four) resilience and resistance and dominant ecological types as indicated by soil temperature and moisture regimes, and (five) habitat threats as indicated by cover of cheatgrass, cover of piñon and juniper, and by fire history.

Using this approach, development and review teams were identified and tasked with initiating the FIAT process in an effort to reduce threats to GRSG resulting from impacts from invasive annual grasses, wildfires, and conifer expansion. Step 1 FIAT team members included individuals 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." Focal habitats are the portions of a PAC with important habitat characteristics and bird populations that are most impacted by the previously identified threats. See *Greater Sage-Grouse Wildlife, Invasive Annual Grasses & Conifer Expansion Assessment (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 assessment teams identified for Step 2 of the FIAT process.

4.1.2 Project Planning Areas Overview

As part of the FIAT Step 2 process, the Western Great Basin/Warm Springs Valley team assessed and identified broad PPAs and associated proactive and reactive management strategies and vegetation treatments focused on the four program areas (fuels management, fire operations, habitat restoration and recovery, and post-fire rehabilitation management). The team used focal habitats as the spatial starting point and through the Step 2 process. In Oregon, the "Core Habitat" layer that had been previously developed was used in the PPA assessments. In Nevada, NDOW developed a core habitat layer that was used. In California and NW Nevada connectivity corridors were analyzed based on local knowledge and telemetry data. All data layers extending the original focal habitat boundaries to include new data and/or was more inclusive of all seasonal GRSG habitat requirements.

Each PPA contains at least one focal habitat, and in many cases, several. For most PPAs, management strategies/actions and treatments were identified outside of focal habitats based on local knowledge that these areas are crucial to the long-term viability of GRSG populations within the PPA.

The team subsequently used a series of worksheet templates prepared for each program area to identify treatment opportunities for the four program areas within each PPA. For each District Office in the assessment area, team members participated in one or more in-person workshops to discuss and complete the assessment for each PPA. In order to consider the broadest spectrum of possible treatment opportunities, the team did not consider landownership when conducting these assessments. Additionally, the team restricted potential fuel breaks to existing roads in order to minimize further disturbance, fragmentation, and reduce the likelihood of increasing invasive annual grass abundance.

The local teams combined regional datasets, local datasets and local knowledge when developing management actions within the PPAs. The resilience and resistance data (matrix) and modelling was the underlying dataset on which the management strategies and actions were developed. Where detailed local data and knowledge was available it was incorporated into the assessments and further refined management priorities. In some PPAs the local habitat (vegetation) data and on ground knowledge was robust and drove the final strategies as a priority over the resilience and resistance data.

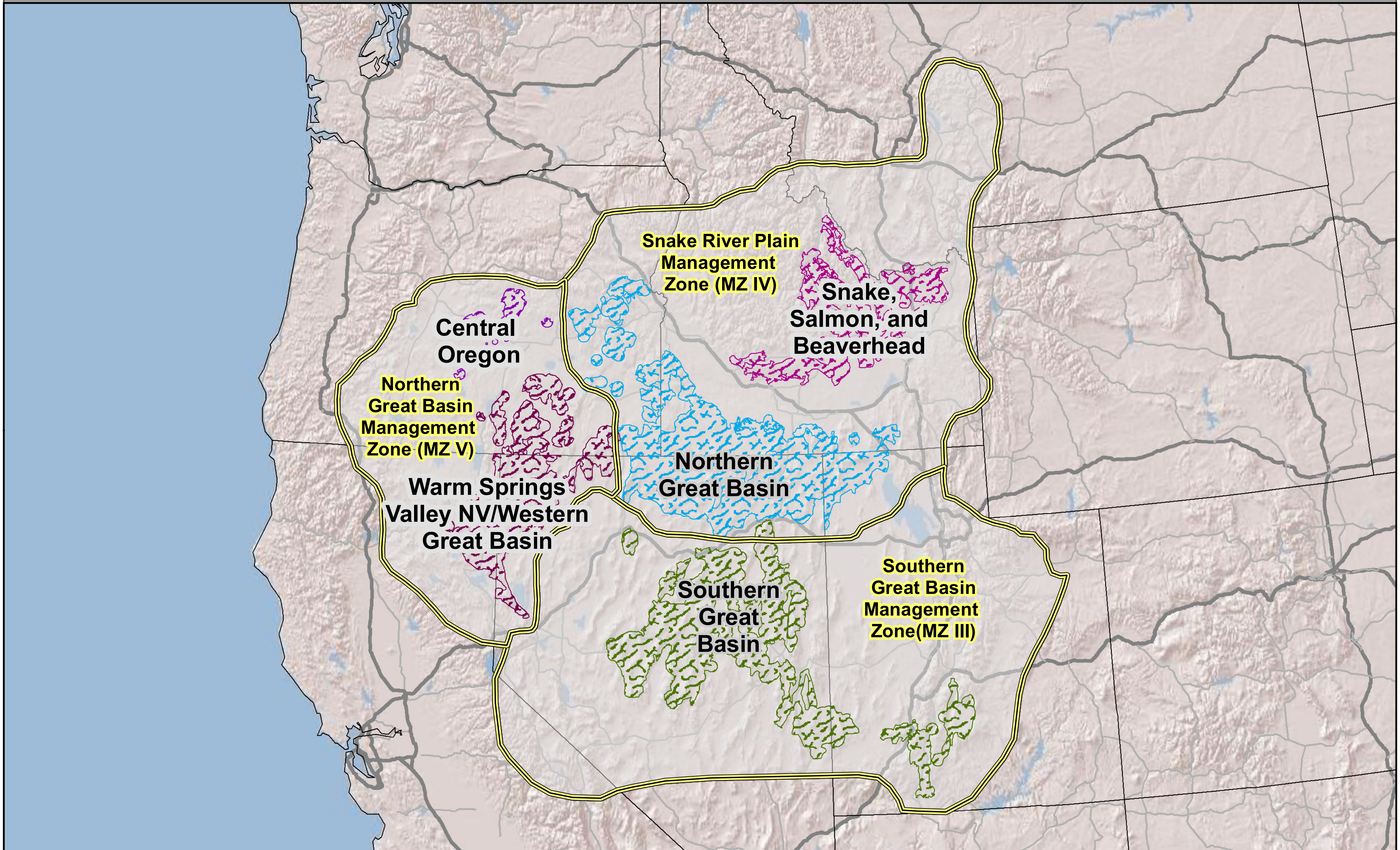
The other local datasets which drove habitat treatment decisions was elevation modelling, generally between 5,000 and 6,000 feet and aspect data for predictive treatment success.

See **Figure 4-1**, FIAT Assessment Teams (in relation to WAFWA Management Zones)

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

4.2 Western Great Basin/Warm Spring Valley Project Planning Areas

Below, are descriptions of each of the PPAs within the Western Great Basin/Warm Springs Valley Assessment Area. Each PPA description includes a 1) characterization of the PPA landscape, 2) examination of the proposed management strategies within the PPA, and 3) spatial depiction of the proposed treatments/management strategies. Additional supporting information is included in the appendix.

4.2.1 Frenchglen

Project Planning Area Description

General Site Description

The Frenchglen PPA is centrally located within the Burns District BLM and lies within the Andrews Resource Area near Frenchglen, OR. The Frenchglen PPA takes in the entirety of the Steens PAC and adjacent core GRSG habitat. The total size of the Frenchglen PPA is 185,397 acres and is comprised of: 151,182 acres of BLM, 30,578 acres of private, 2,979 acres of USFWS, and 658 acres of State ownership. Prominent land features found within this PPA boundary include: the Donner and Blitzen Wild and Scenic River, portions of the Steens Mountain Wilderness, and portions of the Steens Mountain Loop Road. The Malheur National Wildlife Refuge was not considered as part of the analysis area for active treatments, but was considered for protection through treatments established on BLM administered lands. Some identified treatments extend outside of the PPA boundary and are deemed necessary to protect the Frenchglen PPA and improve GRSG habitat connectivity. Primarily this pertains to fuel break treatments and improvement/maintenance of roadways to support fire operation activities, but also addresses conifer encroachment threats.

The general aspect of Steens Mountain is a gradual incline, rising in elevation from west to east on this lifted fault block geologic feature. Elevation within the Frenchglen PPA ranges from 4,500 ft. to nearly 7,000 ft and is predominantly characterized as having moderate resistance/resilience (see **Table 4-1**).

Table 4-1
Frenchglen Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	4,541	16,883	6,028	41	13,461	104,607	20,364	0	16,310	3,332
Percent of PPA	2	9	3	0	7	56	11	0	9	2

Sage-grouse

The general trend in GRSG population shows a slow decline within the Frenchglen PPA, based upon annual lek count data dating back to 2006. This downward trend could be attributed to a number of factors, which include but are not limited to; drought, wildfire, sagebrush die off (Aroga moth infestation), predation.

There are 10 active leks, five inactive leks, and one historic lek known to exist within the Frenchglen PPA (see **Table 4-2**).

Table 4-2
Greater Sage-Grouse Leks found within the Frenchglen Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
Bald Headed (HA0003-01)	Occupied (Active)
South Bridge Creek (HA0004-01)	Occupied (Active)
Indian Creek (HA0016-01)	Occupied Pending
Butler Hill (HA0044-01)	Occupied Pending
North Bridge Creek #1 (HA0098-01)	Unoccupied Pending
Ham Brown Lake #1 (HA0077-01)	Occupied (Active)
Ham Brown Lake #2 (HA0077-02)	Occupied (Active)
Ham Brown Lake #3 (HA0077-03)	Unoccupied Pending
Steens South Loop (HA0050-01)	Unoccupied Pending (Inactive)
P Hill Historic (HA0001-02)	Historic
Long Dam (HA0002-01)	Unoccupied Pending (Inactive)
Dry Creek Flat #2 (HA0002-02)	Occupied (Active)
Dry Creek Steens (HA0002-03)	Unoccupied Pending
North Bridge Creek #2 (HA0098-02)	Occupied Pending
Tombstone (HA0124-01)	Occupied Pending
Kueny Canyon (HA0126-01)	Occupied (Active)

Vegetation

Due to the elevation range within the Frenchglen PPA, from 4,500 ft. to nearly 7,000 ft., there are a large diversity of plant communities present. Generally speaking, this PPA is dominated by mountain big sagebrush plant communities, however, across this wide elevation range, which is further influenced by a substantial topographical/aspect, a diversity of other sagebrush communities can be found, including: Wyoming big sagebrush, basin big sagebrush, silver sagebrush, and low sagebrush (see **Table 4-3**).

Table 4-3
General Plant Associations based upon ESI Soil Types for Frenchglen PPA

Ecological Site Identification (ESI) Number	ESI Soil Type	General Plant Associations	Acres
023XY213OR	Sandy Loam 10-12	Basin Big Sage; Needleandthread; Ricegrass	494
024XY016OR	Loamy 8-10		7536
024XY018OR; 023XY212OR	Sandy Loam 8-10; Loamy 10-12		1853
024XY018OR; 024XY016OR	Sandy Loam 8-10; Loamy 8-10		5
		Total	**9888**

Table 4-3
General Plant Associations based upon ESI Soil Types for Frenchglen PPA

Ecological Site Identification (ESI) Number	ESI Soil Type	General Plant Associations	Acres
023XY418OR	Aspen 16-35	Mtn Big Sage; Low Sage; Fescues; Aspen	621
023XY501OR	Loamy 16-25; Misc Land Type		2770
023XY418OR; 023XY509OR	Aspen 16-35; Subalpine Slopes 16-35		610
		Total	**4000**
023XY216OR	Claypan 12-16	Mtn Big Sage; Low Sage; Idaho Fescue; Needlegrass	42971
023XY408OR	Rocky Ridges 12-16		315
023XY302OR	South Slopes 12-16; Misc Land Type		5119
023XY310OR	North Slopes 12-16		5327
023XY310OR	North Slopes 12-16; Misc Land Type		764
023XY318OR	Loamy 12-16		3495
023XY216OR; 023XY217OR	Claypan 12-16; Juniper Tableland 12-16		53300
023XY216OR; 023XY318OR	Claypan 12-16; Loamy 12-16		844
023XY318OR; 023XY216OR	Loamy 12-16; Claypan 12-16		6606
023XY318OR; 023XY408OR	Loamy 12-16; Rocky Ridges 12-16		3489
		Total	**122229**
024XY004OR	Dry Floodplain	Silver Sage; Big Sage; Wildrye; Nevada Bluegrass	3386
024XY008OR	Clayey Playette		4410
023XY200OR; 024XY008OR	Ponded Clay; Clayey Playette		1671
		Total	**9467**
023XY202OR	Swale 10-14	Wyoming Big Sage; Low Sage; Needlegrass; Bluebunch	18
023XY212OR	Loamy 10-12		5592
023XY214OR	Claypan 10-12		7478
023XY220OR	Clayey 10-12		10851
023XY300OR	South Slopes 8-12; Misc Land Type; South Slopes 8-12		2036
023XY212OR; 023XY220OR	Loamy 10-12; Clayey 10-12		9970
		Total	**35945**
023XY416OR	Basin Wet Meadow	Bulrush; Cattail; Creeping Wildrye; Basin Wildrye	803
023XY200OR	023XY200OR	Seasonal Floodplains, Dry Basins & Playas	702
Unknown	Rock Outcrop and Rubble Land	N/A	377
Unknown	Unknown	Unknown	1984

The primary annual grass within this PPA is cheatgrass, however there are some small isolated populations of medusahead rye, which have been identified along the southern edge of the Malheur National Wildlife Refuge and along lower portions of the Donner and Blitzen River near Page Springs Campground.

Juniper encroachment can be seen throughout the PPA and has been identified as the priority habitat restoration treatment for this PPA and will be further addressed in the Habitat Restoration section.

Fire

Fire history within the Frenchglen PPA has been fairly active with 24 fire starts and a total of 67,190 acres burned from wildfires since 1980, which illustrates its propensity to burn. The majority of acres burned in the northern portion of the PPA (north of the Steens Mountain Loop Road). The most notable of these fires was the Grandad fire that burned over 36,000 acres in 2006. Although these fires have resulted in annual grass issues on some of the lower elevations, they have also resulted in the benefit of pushing back conifer encroachment in some locations. Mortality of juniper trees has been disproportionate between wildfires, primarily attributed to the presence or absence of understory (ladder fuels) at the occurrence of the fire (see **Table 4-4**).

The eastern area of the PPA, in the 1A zone, is higher in elevation and as such currently has greater sagebrush cover and recovers more quickly than the rest of the PAC. A portion near the South Steens Loop Road burned in 2014; however, conditions there make it likely for good recovery without additional restoration activities.

Table 4-4
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	174,213
High and Very High Burn Probability in PPA (percent)	94.3

Management Strategies

Treatments

The majority of treatments associated with the Frenchglen PPA were either ESR projects tied to the numerous wildfires that have occurred in this area, or fuels treatments targeting conifer encroachment.

There are approximately 13,500 acres of this PPA in which fuels treatments have occurred. The majority of these acres came from the Moon Hill prescription, which was completed in the fall of 2014. This was a landscape scale broadcast burn targeting western juniper expansion. Much of this area is expected recover quickly to native perennial species; however there are some locations that received higher fire severity that will be seeded with perennial species. The overall goal of this project now that junipers have largely been removed from the landscape is succession back to a sage-steppe site. Returning this site to a sagebrush dominated system will likely take some time (10-20 years), and follow up actions such as seeding of sagebrush plugs may need to occur to augment succession.

The largest ESR project to occur within this PPA was following the Grandad Fire in 2006, however there have been other numerous other large (~1,000 acre) fires within this PPA that had follow up ESR projects. ESR projects account for the majority of the seeding (~23,800 acres) and weed treatments (32,200 acres) identified in the Burns District GIS Data.

Besides the completed fuels treatments within this PPA, there are a variety of planned fuels treatments to address conifer encroachment. Many of these planned treatments are cut/jackpot burn or cut/pile/burn type treatments that will largely leave the sagebrush component in-tact, and should have relatively quick recovery times in comparison to some of the broadcast burns in the area. These projects are part of the North Steens Ecosystem Restoration and have NEPA completed.

Other Relevant Management Activities

The regulatory environment within the Frenchglen PPA has effects on habitat management. Wilderness and WSA designations limit potential treatments and other programs that could enhance or protect GRSG habitat. Also, the South Steens Herd Management Area (HMA) is over Appropriate Management Level (AML) and has impacts on habitat and water sources within the PPA.

The South Steens HMA is located almost entirely within the Frenchglen PPA. The estimated population of free-roaming horses within this HMA is 572 and the AML High is 304 total horses. This data was collected during the 6/21/2012 census.

The Burns BLM District grazing management strategy is based upon a target utilization of <50 percent for native bunchgrass communities and <60 percent for nonnative seeding's using a modified Landscape Appearance method. This allows management to account for both site specific environmental variables (soil type, soil depth, slope, aspect, and elevation) and climatic variations (precipitation, and temperature), which influence annual production rates. Cattle are permitted to graze allotments during specified periods, but are removed early if target utilization is reached. Typically utilization doesn't exceed 35-40 percent on most allotments.

Fuels Management

Utilizing the existing road systems within and outside the perimeter of the Frenchglen PPA, a network of fuel breaks has been identified to: compartmentalize and establish anchor points for fire fighters to safely engage wildfires that may occur in this area in the future. Site specific treatment methods will be determined at the time of implementation and will utilize all available tools, such as mowing woody species, chemically treating herbaceous fuels (specifically annual grasses), and seeding desirable species, which could include nonnatives. These fuel breaks will be edge matched to any nearby fuel break treatments. The treatment purpose and need would include controlling invasive annuals and protecting sagebrush communities from large scale habitat conversion due to wildfire. Multiple roads have been identified and prioritized for treatment (see **Table 4-5**).

Priority 1 roads identified for establishing fuel breaks adjacent to are the Moon Hill road system and Lauserica Road. Priority 2 roads include: Tombstone Burnt Car Road, Steens Mtn Road, Burnt Car Road, Dust Bowl Road, West River Road, East Fish Creek Road, Dry Creek Road, Knox Spring Road, Dust Bowl Willow Spring Road, Waterhole P Hill Road, Savor Lake Road, and the Baily Waterhole Road.

Table 4-5
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	127.19	40.03	0	167.22

Habitat Restoration and Recovery

All treatments would occur in areas determined appropriate by an IDT. Actions may include cutting, limbing, brush beating, machine piling or hand piling, pile burning, and/or prescribed fire, depending on site specific conditions and the ability to conduct fuel removal treatments in a safe and effective manner. Chemical treatments will continue to be used to reduce fine fuels, specifically in the treatment of annual grasses. Other treatments may be used as they become available or meet the needs of specific sites. Using combinations of these treatments and having the ability to utilize the best tool for the area and time on specific sites should improve the overall effectiveness of fuel reduction techniques (see **Table 4-6**).

Changes in the historical fire regime are observed throughout Frenchglen PPA. A reduction in fire frequency has altered the dominant vegetation from Mountain Big Sagebrush/Perennial Grass communities to Juniper woodland. Currently there are 43,672 acres of juniper encroachment observed from the juniper encroachment data layer. Future priorities have been identified, focusing initially on areas of high GRSG abundance and expanding into historical/potential habitat once the core areas have been addressed. Priority 1 for habitat restoration treatments is all juniper encroachment within the PPA boundary and priority 2 is defined as all junipers surrounding the PPA as you move east up the elevation gradient of Steens Mountain. It is well documented that GRSG move up elevation gradients as vegetation at lower elevations senesces and the secondary priority was established to enhance and connect GRSG to this essential brood-rearing habitats that exist on Steens Mountain.

Table 4-6
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	103,669	108,956	0	212,624
Percent of PPA	55.87	58.71	0	114.58

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Local IDT will evaluate each treatment location to select a removal technique that is appropriate for the affected area. Continued management will be done post-treatment to help maintain desirable vegetation and historical fire regimes

Several fuels treatment projects have been ongoing in the Frenchglen PPA over the last eight years. To date, 16,625 acres have been prescribed burned, 148 acres of fuel breaks, 779 acres of juniper have been cut and hand piled, 372 acres have been cut and machine piled under the Blitzen Stewardship, and another 440 acres have been cut and machine piled. Future projects are planned to expand upon these recent project areas.

Due to the positive effects landscape burns can have at reducing conifer expansion, combined with the much lower cost/acre in comparison to other treatments, several prescribed "broadcast" fires have been conducted within the Frenchglen PPA. The most recent prescribed burn that occurred within this PPA was the Moon Hill Rx Burn which treated 10,500 acres of primarily phase 1 and 2 juniper encroachment on the northern portion of the PPA during the fall of 2014. The Burns District BLM seeded within the fire perimeter during the winter and continued monitoring will take place to evaluate success.

Restoration and recovery within the Frenchglen PPA for annual grass invasion is not the major priority. Treatments will focus on stopping the spread with the use of herbicide and biological thinning at times when perennial vegetation is dormant. Seeding of perennial grasses will take place in areas where the annual grass invasion has diminished the natural community and impaired the ecological function of the site.

During the summer of 2006 the Granddad fire burned over 32,000 acres within the Frenchglen PPA. It has left a large portion, primarily at the lower elevations, without adequate sagebrush cover. Additional treatment options for this area may include seeding or planting sagebrush plugs, in order to develop sagebrush islands, from which seedling recruitment can occur, eventually connecting the islands and creating a larger cohesive habitat area.

Seeding will take place on the areas affected by juniper removal treatments. Total area seeded will depend on the treatment method used (e.g. pile vs broadcast burn). It can potentially be used in areas where fire is not an aspect of the treatment if there is not an adequate amount of desirable herbaceous vegetation present due to juniper encroachment.

Targeted broadcast burn areas will be rested from grazing prior to treatment. This is so the site can accumulate sufficient fine fuels necessary to carry fire and to meet established burn objectives. Following any broadcast burn treatment, grazing would be suspended until established recovery metrics have been reached (i.e. 3 perennial grasses/m2).

Forage availability will be an issue when identifying areas for habitat restoration due to the required rest periods to achieve success. Range improvement projects will be contingent on allocation of alternative forage for designated permittees.

Fire Operations

Objectives of fire operations are to prevent areas in good condition from burning. Areas that have not burned are considered a higher priority than areas that have burned before. Dependent on location, wildfires within this PPA may be able to be managed for resource objectives (i.e. conifer reduction). Fire history within the Frenchglen PPA shows an elevated risk of catastrophic fire. For this purpose we have decided to list the entire area as priority 1 for fire operations (see **Table 4-7**).

Table 4-7
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	189,155	0	0	189,155
Percent of PPA	101.9	0	0	101.9

All roads identified for establishment of linear fuel breaks will be maintained/improved to facilitate faster response times for initial attack resources to aid in minimizing size of any wildfire occurrence within or near the PPA. Roads identified for maintenance/ improvement include: Tombstone Burnt Car Road, Steens Mountain Road, Burnt Car Road, Lauserica Road, Dust Bowl Road, West River Road, East Fish Creek Road, Dry Creek Road, Knox Spring Road, Dust Bowl Willow Spring Road, Moonhill Road, Waterhole P Hill Road, Savor Lake Road, and the Baily Waterhole Road.

A BLM guard station is located in the town of Frenchglen, OR and works as the initial attack resource within the PPA.

Post-Fire Rehabilitation Management

Some long term post-fire rehabilitation treatments are needed within some of the old burned areas within this PPA (i.e. Grandad Fire) (see **Table 4-8**). Treatment opportunities include chemically treating invasive annual grasses and seeding those areas with desirable perennial vegetation. Long term fire rehabilitation opportunities exist within interior portions of this burned area that are currently isolated from sagebrush seed sources. Establishment of

Table 4-8
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	146,051	39,515	0	185,566
Percent of PPA	78.7	21.3	0	100

"islands" of sagebrush by planting small patches (one-10 acres) of sagebrush plugs (which have been found to be much more successful than seeding), would accelerate succession back towards a sagebrush steppe system.

Future fires in this area would be able to utilize knowledge gained from past ESR projects in the area to develop treatments and prioritize treatment areas. Seeding efforts (associated with application of herbicides) would be focused in areas that already have a degree of annual grasses present. Priority 1 for post-fire rehabilitation within the Frenchglen PPA will be given to areas that have not recently burned, since vegetative response will be unknown. Priority 2 will be the acres that have previously burned as part of the Granddad Fire in 2006 because of the stable perennial grass community present from previous ESR, which will likely return post-fire.

Proposed Management

See **Table 4-9** for projects that have been identified presently within the NEPA planning process. See **Figures 4-2** through **4-5** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-9
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 (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]
Blitzen Stew 4 Seeding	147		X			X				X				I			3-5
Frenchglen Conifer Reduction Seeding	106,679	X				X					X			I			3-5
ODF 1 HP Seeding	790	X				X				X				I			3-5
Blitzen Stew 3 Seeding	615		X			X				X				I			3-5

Table 4-9
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 (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]
ODF 1 CHP Seeding	321	X				X				X				1			3-5
Moon Hill Juniper	130,050	X			X					X				1		10-15	3-5
Frenchglen Conifer Reduction Cutting	101,209	X			X					X				1		10-15	3-5
Blitzen Stew 5 Cutting	228	X			X					X				1		10-15	3-5
ODF 1 CHP Cutting	4,904	X			X					X				1		10-15	3-5
Frazier HP 1	27	X			X					X				1		10-15	3-5
Ruby Springs Private	126,958	X			X						X			1		10-15	3-5
Green Stripping EA	2,236	X	X					X	X					1		10	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.2 Orejana East

Project Planning Area Description

General Site Description

The Orejana East PPA addresses portions of the Dry Valley/Jack Mountain PAC administered by the Burns District BLM, and is approximately 45 miles south of Burns, OR. The Dry Valley/Jack Mountain PAC is extensive, crossing between Burns and Lakeview districts. The portions of this PAC administered by the Burns District are addressed under the "Orejana East PPA," while on the Lakeview District it is addressed under the "Orejana West PPA." Within the Burns BLM District, the Orejana East PPA is divided between two Resource Areas; the Andrews Resource Area administers roughly the southern two thirds of this PPA, while the Three Rivers Resource Area administers the northern third of this PPA.

The Orejana East PPA is roughly bounded by Rock Creek Road to the south, Hwy 205 to the east, the southern foothills to Harney Lake to the north, and the Lakeview/Burns BLM District boundary to the west. Keg Springs Valley is a central location to the Orejana East PPA, with major road systems that traverse this PPA being: Foster Flat Road, Jack Mountain Road, and Matties Arc Road. Like most of the other PPA's identified within the Burns District, the Orejana East PPA is a relatively remote location, with a very limited road system within. This PPA was extended slightly from the PAC boundaries to incorporate all Core/Preliminary Priority Habitat (PPH) GRSG habitat. This is the largest PPA within the Western Great Basin/Warm Springs Valley Assessment Area on the Burns District with a total acreage of 299,684 acres, which is dominantly BLM land (281,250 acres) with small inclusions of private land (totaling 18,434 acres) that are typically tied to water sources (see **Table 4-10**).

Table 4-10
Orejana East Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	12,656	3,295	481	408	96,992	49,420	111,163	5,243	14,778	5,233
Percent of PPA	4	1	0	0	32	16	37	2	5	2

Sage-Grouse

The general trend in GRSG population is slowly declining in the Orejanna East PPA based upon annual lek counts since 2008-2010. The Miller Homestead Fire burned over 147,145 acres within the PPA boundary during the summer of 2012. Although sagebrush cover has not had adequate time to recover, a robust herbaceous community has responded post-fire, converting intact habitat into seasonal habitat. There has also been a die off of sagebrush due to Aroga moth infestation; the extant of this die off is unknown at this time, in places it is extensive along the southern portion of the PPA.

The Orejana East PPA supports a large expanse of habitat that is utilized throughout the GRSG lifecycle. Although overall this habitat has lower productivity in comparison to the other PPA's on the Burns District, there are 12 active, and six inactive Leks within this PPA (see **Table 4-11**).

Table 4-11
Greater Sage-Grouse Leks found within the Orejana Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
Trainer Playa (HA0005-01)	Occupied (Active)
Jack Mountain #3 (HA0013-01)	Unoccupied Pending (Inactive)
Keg Springs (HA0040-01)	Occupied Pending
E. Duhaime Flat (HA0043-01)	Occupied Pending
Lavoy Tables (HA0045-01)	Occupied Pending
Buzzard Reservoir (HA0112-01)	Occupied (Active)

Table 4-11
Greater Sage-Grouse Leks found within the Orejana Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
North Twin Lakes (HA0031-01)	Occupied (Active)
Tucke #1 (HA0039-01)	Occupied Pending
Tucke #2 (HA0039-02)	Occupied Pending
Irish Lake (HA0052-01)	Unoccupied Pending
Antelope Reservoir Hines (HA0006-01)	Unoccupied (Inactive)
Mammoth (HA0009-01)	Unoccupied (Inactive)
Larry's (HA0010-01)	Occupied (Active)
On The Rim (HA0010-02)	Unoccupied (Inactive)
Jack Mountain #1 (HA0011-02)	Unoccupied Pending (Inactive)
Jack Mountain #2 (HA0011-01)	Occupied Pending
Jack Mountain #4 (HA0014-01)	Occupied Pending
Trainer Playa #2 (HA0005-02)	Occupied Pending(Active)

Vegetation

Overall, the Orejana East PPA is a mid-elevation (4,500-5,500 ft.) and precipitation (eight-14 inches annually) landscape that has moderate resistance/resilience. The habitat within this PPA is dominated by Wyoming and basin big sagebrush plant communities, with only six percent of the general plant communities falling in productive enough sites to support mountain big sagebrush (see **Table 4-12**).

Annual grasses are present across this PPA in varying densities. Typically, invasion of annual grasses into the understory are associated with travel corridors and water developments. Other disturbed areas (primarily old fire scars in the southern portions of the PPA) also exhibit more developed annual grass communities.

The majority of the Orejana East PPA outside the Miller Homestead Fire burned area is a sagebrush-steppe system, with varying influence of annual grasses in the understory. Generally speaking, the southern edge of this PPA has the highest risk for conversion to an annual grass system.

Table 4-12
General Plant Associations based upon ESI Soil types for Trout Creek East PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
023XY213OR	Sandy Loam 10-12	Basin Big Sage; Needleandthread; Ricegrass	10556
024XY016OR	Loamy 8-10		2855
024XY018OR	Sandy Loam 8-10		1247
024XY018OR; 023XY212OR	Sandy Loam 8-10; Loamy 10-12		3356
024XY018OR; 024XY016OR	Sandy Loam 8-10; Loamy 8-10		4857
		Total	**22871**

Table 4-12
General Plant Associations based upon ESI Soil types for Trout Creek East PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
023XY216OR	Claypan 12-17	Mtn Big Sage; Low Sage; Idaho Fescue; Needlegrass	1627
023XY302OR	South Slopes 12-16		1285
023XY316OR	Droughty Loam 11-13		432
023XY318OR	Loamy 12-16		6523
023XY310OR; 023XY300OR	North Slopes 12-16; South Slopes 8-12		4454
023XY216OR; 023XY217OR	Claypan 12-16; Juniper Tableland 12-16		5466
		Total	**19788**
023XY100OR	Lakebed	Silver Sage; Big Sage; Wildrye; Nevada Bluegrass	713
023XY200OR	Ponded Clay		7744
024XY004OR	Dry Floodplain		87
024XY008OR	Clayey Playette		488
024XY008OR; 024XY018OR	Clayey Playette; Loamy 8-10		1793
		Total	**10825**
023XY202OR	Swale 10-14	Wyoming Big Sage; Low Sage; Needlegrass; Bluebunch	1734
023XY212OR	Loamy 10-12		71003
023XY324OR	Shallow Swale 10-14		4172
023XY300OR	South Slopes 8-12		13442
023XY220OR	Loamy 10-12		27636
023XY214OR	Claypan 10-12		32397
023XY212OR; 023XY220OR	Loamy 10-12; Clayey 10-12		2170
023XY214OR; 023XY212OR	Claypan 10-12; Loamy 10-12		104160
023XY214OR; 023XY300OR	Claypan 10-12; South Slopes 8-12		2752
023XY215OR; 023XY212OR	Shallow Gr-L 10-12; Loamy 10-12		6334
023XY220OR; 023XY300OR	Clayey 10-12; South Slopes 8-12		10
023XY300OR; 023XY308OR	South Slopes 8-12; North Slopes 10-12		2705
		Total	**268514**
023XY104OR	Loamy Bottom	Bulrush; Cattail; Creeping Wildrye; Basin Wildrye	1045
024XY003OR	Sodic Bottom	Greasewood; Saltgrass; Basin Wildrye	20
024XY017OR	Shallow Loam 8-10	Shadscale; Wyoming Big Sage; Budsage; Spiny Hopsage	101
Unknown			1670

Fire

Prior to 2012, fire history within this extensive area was limited to smaller fires, predominately occurring in the southern portions of the PPA. Since 1980, fire records indicate that within the PPA 19 fire starts have occurred, burning a total of 171,695 acres. Although there were a couple of fairly large fires in the mid-

1980s that burned ~15,000 combined acres, the 2012 Miller Homestead Fire (which burned 147,145 acres within this PPA) is by far the biggest disturbance that has occurred in this area in recent history (see **Table 4-13**).

Table 4-13
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	294,852
High and Very High Burn Probability in PPA (percent)	98.8

Changes in the historical fire regime are observed throughout the Orejanna PPA, primarily with the occurrence of the Miller Homestead fire in 2012. Large scale wildfires are occurring on the Burns District BLM at an accelerated pace, causing the vegetation at lower elevations to change from Wyoming big sagebrush/perennial grass communities to annual grass dominated communities. This issue will be addressed further in the Fuels Management section (e.g. fuel breaks, bio-thinning) and the Habitat Restoration and Recovery section (e.g. herbicide, seeding, bio-thinning). The primary goal for the Orejana East PPA is to keep the area from re-burning, which will lead to a monoculture of annual grass.

This area was burned in 2012 by the Miller Homestead fire, which burned 160,800 acres of predominately PPH/core GRSG habitat, of which 147,145 acres were located in the southeastern portion of the PPA. The southern portions of the PPA by Rock Creek Lane have high levels of cheatgrass and a high probability of cheatgrass establishment and spread following disturbance. The northern end of the fire was seeded under ESR and showing signs of success. The area is on a successional pathway back to a sage-steppe system. The 2013 moisture year was beneficial to ESR operations and there are some sagebrush seedlings emerging. GRSG are still using the area, although numbers have dropped from those observed prior to the Miller Homestead Fire. The northern portion of the PPA has not burned in recent history. Much of the sagebrush in this area has become decedent with a limited understory. Generally speaking, repeated fires within the PPA would result in conversion to invasive grasses.

Management Strategies

Treatments

To inhibit spread of annual grasses found between the Rock Creek Ranch Road and the southern edge of the PPA, projects have been identified to utilize herbicides (imazapic) and seeding (natives and nonnatives) to help develop a resilient plant community. Northern portions of the PPA have been identified for some mosaic sagebrush mowing to develop a multi-age class stand of sagebrush. Currently much of this area is covered by decedent sagebrush with an understory that ranges from healthy native grasses to a dominantly annual grass understory. Under the West Warm Springs Allotment CCA treatments are planned to break up a primarily contiguous decedent sagebrush stand, and develop a multiple age class stand with a higher proportion of herbaceous grasses and small forbs available to GRSG during the brood-rearing stage. Treatments planned to accomplish this may include: sagebrush mowing, herbicide application and seeding.

Other Relevant Management Activities

The Warm Springs HMA is located almost entirely within the Orejana East PPA. The estimated population of horses and burros within the HMA is 253 and 27 respectively. The AML high is 202 animals. This data was recorded during the 9/08/2014 census.

The Burns BLM District grazing management strategy is based upon a target utilization of <50 percent for native bunchgrass communities and <60 percent for nonnative seeding's using a modified Landscape Appearance method. This allows management to account for both site specific environmental variables (soil type, soil depth, slope, aspect, and elevation) and climatic variations (precipitation, and temperature), which influence annual production rates. Cattle are permitted to graze allotments during specified periods, but are removed early if target utilization is reached. Typically utilization doesn't exceed 35-40 percent on most allotments.

Fuels Management

Utilizing the existing road systems within and outside the perimeter of the Orejana East PPA, a network of fuel breaks has been identified to: compartmentalize and establish anchor points for fire fighters to safely engage wildfires that may occur in this area in the future. Site specific treatment methods will be determined at the time of implementation and will utilize all available tools, such as mowing woody species, chemically treating herbaceous fuels (specifically annual grasses), and seeding desirable species, which could include nonnatives. These fuel breaks will be edge matched to any nearby fuel break treatments. The treatment purpose and need would include controlling invasive annuals and protecting sagebrush communities from large scale habitat conversion due to wildfire. Multiple roads have been identified and prioritized for treatment, (See Map).Roads identified for establishing fuel breaks include: N Mater Lake Road, Smoke Hollow Road, Upper Smokey Flat Road, Flybee Moon Lake Road, North loop Road, Buzzard Road, Foster Lake Road, Matties Ark Foster Road, Taylor Cabin Road, Jerry Lake Road, Keg Springs Valley Road, West Rock Ford Lane, Lonetree Lake Road, Dunn Lake Reservoir Road, Boulder Reservoir Road, Bellanbaugh Road, Burnt Bridge Road, West Rockhound Lane Road, Tucky Road, Sand Vally Augustine Road, and the Duhaime Road.

There is no one fuel reduction technique that will be most effective throughout the area and within the acceptable impact ranges of GRSG populations, however, combinations of techniques such as, biological thinning and prescribed fire within higher resistant/resilience areas has potential to reduce risk of catastrophic wildfire. Biological thinning (livestock grazing to reduce fine fuels) is a valid option, allowing livestock to be directed to areas in need of fine fuel reduction while preventing overall utilization from exceeding a 50 percent utilization maximum (ocular estimate method) for desirable, perennial species while allowing for maximum consumption of targeted invasive annual grasses. Biological thinning is authorized under 43 CFR 4190.1, which allows a full force and effect decision to be made when BLM determines that vegetation, soil or other resources on the public lands are at substantial risk of wildfire due to drought, fuels buildup, or other reasons. Recent wildfires have been increasing in size and intensity, causing large scale habitat conversion. In the case of the Miller Homestead Fire, the fire started along the southern portion of PPA, which is invaded by annual grasses. This buildup of continuous fine fuels allowed the fire to grow quickly and made it difficult to stop. For example, it may be necessary to develop a fuel break, treat noxious weeds or a monoculture of invasive grasses during these times (see **Table 4-14**).

Grazing will be used and explored as an overall fuels reduction (productive years) tool and to maintain fuels breaks/greenstrips.

Table 4-14
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	139.81	52.77	84.47	277.05

Habitat Restoration and Recovery

The primary habitat restoration focus for the Orejana East PPA is to reestablish sagebrush within the Miller Homestead Fire. Multiple sagebrush island locations were identified through ESR, but funding was not acquired to completely address the 147,145 acres of the burn.

The northwest portion of the Orejana East PPA has large expanses of decadent sagebrush that has limited understory vegetation. A proposed mosaic brush beating treatment (followed by annual grass herbicide application and seeding if determined necessary due to concerns about annual grasses) is planned under the West Warm Springs Allotment Candidate Conservation Agreement. This treatment would be accomplished through a two phase implementation process. In the first phase brush beating would occur in a generally linear pattern across the project area (ex. North to South), across a small scale (~five percent of the landscape). This first phase of implementation would be monitored for the first few growing seasons. If determined necessary, herbicides and seedings would be utilized to combat annual grasses. In the second phase (contingent upon success in phase 1) brush beating would occur perpendicular to the first phase, providing a "cross-hatched" appearance and creating pockets of older sagebrush (untreated areas), new sagebrush growth and perennial grasses (phase 1 strips) and new forb and perennial grasses (phase 2 strips). The intent of this treatment is not only to create more habitat diversity within this relatively "homogenous" area, but also break up canopy fuel continuities to moderate fire behavior in the occurrence of a wildfire. This project will be coordinated with the Lakeview district which is planning similar projects in the north east portion of the Orejana West PPA.

Habitat restoration at the lower elevations within the Orejana East PPA, along the southern portion, will focus primarily on areas invaded by annual grasses. By using the ILAP data layer we were able to identify 27,795 acres of effected habitat. Treatment will focus on stopping the spread with the use of herbicide and biological thinning at times when perennial vegetation is dormant. Seeding of perennial grasses will take place in areas where the annual grass invasion has diminished the natural community and impaired the ecological function of the site (see **Table 4-15**).

Additional habitat restoration treatment areas include the southeast portion of the PPA (west of highway 205, north of Rock Creek Road, and east of Jack Mountain Road). This portion of this PPA is subject to conifer encroachment. Conifer encroachment is not a major priority for this PPA; however, juniper treatments would be prioritized based upon proximity to active lek locations (i.e. greater than one mile). Treatments in this area would include juniper cutting and piling, both machine and hand piling. The piles would be burned and seeded with a native and desirable nonnative seed mix. The use of herbicide treatments would also occur to reduce the risk of nonnative invasive species establishing in the area.

Table 4-15
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	308,936	0	0	308,936
Percent of PPA	103.09	0	0	103.09

Fire Operations

All roads associated with linear fuel treatments will be maintained/improved to facilitate faster initial attack for fire operations. Also to benefit fire operations, four water developments locations have been identified throughout the PPA. Two are located in the southern portion of the PPA and would be retrofits to existing wells for fire operations purposes (e.g. helitank installation, additional cisterns). The other two locations are located in the northern portion of the PPA and would need to be fully developed to ensure they have adequate capacity to support fire operation's needs (see map). Over all, this area is very water limited, and establishing reliable water sites would greatly enhance fire suppression resources abilities to suppress fires at smaller acreages.

The first priority for fire operations within the Orejana East PPA is the western portion, bordering the Lakeview district BLM, where intact sagebrush stands are still present. Also under the first priority are areas south of the PPA boundary that are invaded by annual grasses and pose a threat to the intact communities to the north. The secondary priority is located within the previously burned Miller Homestead Fire, where an existing community of perennial grasses is present, which should respond positively post-fire (see **Table 4-16**).

Over all, this area is very water limited, and establishing reliable water sites would greatly enhance fire suppression resources abilities to suppress fires at smaller acreages.

The first priority for fire operations within the Orejana East PPA is the western portion, bordering the Lakeview district BLM, where intact sagebrush stands are still present. Also under the first priority are areas south of the PPA boundary that are invaded by annual grasses and pose a threat to the intact communities to the north. The secondary priority is located within the previously burned Miller Homestead Fire, where an existing community of perennial grasses is present, which should respond positively post-fire.

Table 4-16
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	314,350	44,266	0	358,616
Percent of PPA	104.9	14.8	0	119.7

Post-Fire Rehabilitation Management

Post-fire rehabilitation treatments will continue within the Miller Homestead Fire boundary. Treatment opportunities include spraying (imazapic) and seeding areas subject to annual grass invasion. Long term fire rehabilitation opportunities exist within interior portions of this burned area that are currently isolated from sagebrush seed sources. Establishment of "islands" of sagebrush by seeding small patches (one-10 acres) of sagebrush plugs (which have been found to be much more successful than seeding), would accelerate succession back towards a sagebrush steppe system (see **Table 4-17**).

Table 4-17
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	149,459	150,211	0	299,670
Percent of PPA	49.9	50.1	0	100

Future fires in this area would be able to utilize what has been learned from the Miller Homestead Fire ESR plan to develop treatments, and prioritize treatment areas. Seeding efforts (associated with application of herbicides) would be focused in areas that already have a degree of annual grasses present. Priority 1 for post-fire rehabilitation within the Orejana East PPA will be given to areas that have not recently burned, since vegetative response will be unknown. Priority 2 will be the acres that have previously burned in the Miller Homestead

Fire because of the stable perennial grass community present from previous ESR, which will likely return post-fire.

Proposed Management

See **Table 4-18** for projects that have been identified presently within the NEPA planning process. See **Figures 4-6** through **4-11** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-18
Project Planning Area Treatment Summary Table

Name/Type (Treatment Description)	Acres/Miles (Treatment Description)	1st (Priority)	2nd (Priority)	3rd (Priority)	Conifer (C) (Threats Addressed)	Invasive annual grasses (I) (Threats Addressed)	Riparian (R) (Threats Addressed)	Wildfire (W) (Threats Addressed)	Initiated (I) (NEPA)	Completed (C) (NEPA)	Needed (N) (NEPA)	Pending Funding (P)[1] (Treatments – Time Frame)	Implementing (I)[1] (Treatments – Time Frame)	Likely (Treatments – Certainty of Effectiveness[1])	Unlikely (Treatments – Certainty of Effectiveness[1])	Maintenance Time Frame (Years)[2]	Completion Time Frame (0-2, 3-5, 5+ years)[3]
Miller Homestead Weed Treatment	706	X				X		X		X				1			0-2
Orejana East Rehab	28,980		X			X		X			X			1			3-5
Green Stripping EA	5,798	X	X	X				X	X					1		10	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.3 Roaring Springs

Project Planning Area Description

General Site Description

The Roaring Springs PPA is in the northern portion of the "Pueblos/S Steens" PAC, with the division between this PPA and the Pueblos PPA being Hwy 205. The Pueblos/S Steens PAC has been broken into two PPAs due to the much higher proportion of private land within this PAC north of Hwy 205; predominately owned by the Roaring Springs Ranch. There is a total of 74,859 acres within this PPA, with 59,557 acres being held privately and 15,302 acres of land managed by BLM. The Roaring Springs PPA is located on the south end of the Steens Mountain within the Burns District Office, Andrews Resource area, and is approximately 85 miles to the south of Burns, OR. The rough physical boundaries to this PPA are: Hwy 205 to the south and west, the East Steens Road to the east, and Skull Creek Drainage to the north.

According to the GRSG Habitat Matrix Model, Roaring Springs PPA is identified as having a large percentage of land in high and moderate resistant/resilience habitat types with greater than 25 percent landscape cover of sagebrush habitat (see **Table 4-19**).

Table 4-19
Roaring Springs Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	722	0	28,630	109	0	32,559	9,737	0	2,618	1,434
Percent of PPA	1	0	38	0	0	43	13	0	3	2

Due to the large amount of private land in the Roaring Springs PPA, no extensive fuels treatments were identified. However, several roads were identified as being logical areas to invest in establishment of fuel breaks to aid fire suppression resources as anchor points/defendable barriers. Out of all the identified PPA within the Burns district, this area is considered to be a low priority for fire operations due to much of this PPA being higher elevation, moderate-high resistant/resilient sites that would likely come back to GRSG habitat through natural succession. Most of the PPA on the east side (southeast face of the Steens Mountain) is within the Steens Mountain Wilderness. The District plans to coordinate with the landowner to plan out treatments that would complement treatments conducted on adjacent BLM-administered lands. Currently, the landowner is working on the land, treating it for invasive annual grasses and conifer encroachment. The landowner has also conducted some of their own telemetry and GRSG studies. The Burns District BLM will look into the possibility of becoming cooperators with Roaring Spring ranch for treatment activities within this PPA.

Sage-Grouse

There has not been enough lek count data collected in the Roaring Springs PPA to establish a general trend in GRSG population. It is assumed that any of the areas that had a fire in them within the last ten years are no longer in usable nesting habitat, though they may provide seasonal habitat. There has been a die off of sagebrush due to Aroga moth infestation; the extant of this die off is unknown at this time, in places it is extensive.

There are eight active leks within the boundaries of this PPA (see **Table 4-20)**.

Table 4-20
Greater Sage-Grouse Leks found within the Roaring Springs Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
Pic Swale (HA0100-01)	Occupied Pending
Skull Creek (HA0114-01)	Occupied Pending
Echart Creek (HA0115-01)	Occupied Pending
Long Hollow (HA0028-01)	Unoccupied Pending
Jims Lek (HA0119-01)	Occupied Pending
V Lake #2 (HA0125-02)	Occupied Pending
V Lake #1 (HA0125-01)	Occupied Pending
Coon Canyon (HA0136-01)	Occupied Pending

Vegetation

The Roaring Springs PPA has a healthy population of GRSG with seven identified active leks within its boundary. The Roaring Springs PPA contains a diverse GRSG habitat, ranging in elevation from ~4,700 ft. - 7,000 ft. in elevation. Habitat within this PPA spans from low resistant/resilient Wyoming sagebrush dominated plant communities to high resistant/resilient mountain sagebrush communities. Resistance/resilience data clipped to the Roaring Springs PPA indicates that 59 percent of this area is high resistant/resilient, 39 percent is low resistant/resilient, and the remaining six percent is unavailable (see **Table 4-21**). All of the acres addressed in this PPA are listed as Core/PPH GRSG habitat.

Table 4-21
General Plant Associations based upon ESI Soil types for Roaring Springs PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
024XY012OR	Sandy 6-10	Basin Big Sage; Needleandthread; Ricegrass	54
024XY110OR	Dunes		462
024XY018OR; 023XY212OR; 024XY016OR	Sandy Loam 8-10; Loamy 10-12		1944
		Total	**2460**
023XY216OR	Claypan 12-16	Mtn Big Sage; Low Sage; Idaho Fescue; Needlegrass	4853
023XY416OR	Wet Meadow		247
024XY016OR	Loamy 12-16		63
023XY216OR; 023XY318OR	Claypan 12-16; Loamy 12-16		6649
023XY316OR; 023XY216OR	Droughty Loam 11-13; Claypan 12-16		156
023XY318OR; 023XY216OR	Loamy 12-16; Claypan 12-16		7306
023XY312OR; 023XY404OR; 023XY310OR; 023XY302OR	North Slopes 12-16; Shallow North 12-16; Deep North 12-18; South Slopes 12-16		10999
		Total	**30273**

Table 4-21
General Plant Associations based upon ESI Soil types for Roaring Springs PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
023XY212OR	Loamy 10-12	Wyoming Big Sage; Low Sage; Needlegrass; Bluebunch	4662
023XY214OR; 023XY212OR	Claypan 10-12; Loamy 10-12		1051
023XY220OR	Clayey 10-12		9999
023XY300OR	South Slopes 8-12; Misc Land Type		3554
023XY308OR	North Slopes 10-12; Misc Land Type		3623
		Total	**22889**
	Subalpine Meadow	Mtn Big Sage; Low Sage; Fescues; Aspen	14
023XY418OR; 023XY509OR	Aspen 16-35; Subalpine Slopes 16-35		2137
023XY501OR; 023XY507OR	Loamy 16-25; Claypan 16-25		15088
		Total	**17239**
024XY113OR	Sodic Fan 6-10	Greasewood;Shadscale;Spiny Hopsage;Basin Big Sage	598
Misc Land Type			474

Fire

Recent fire history within the Roaring Springs PPA has been quite active with 12 starts that have burned a total of 61,518 acres since 1980. Although the majority of the land within this PPA is high resistant/resilient with a low risk for annual grass invasion, the lower elevations of this PPA that have burned (particularly those between the East Steens road and Steens Mountain) have issues with annual grass dominance. This area not only lacks the habitat requirements for GRSG, but also poses the risk for increased probability of additional starts that would likely go up Steens Mountain and impact higher elevation, more productive GRSG habitat (see **Table 4-22**).

Table 4-22
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	73,767
High and Very High Burn Probability in PPA (percent)	98.1

Changes in the historical fire regime are observed throughout the Roaring Springs PPA. In the upper elevations, reduction in fire frequency has altered the dominant vegetation from Mountain Big Sagebrush/Perennial Grass communities to Juniper. Currently 9,609 acres of juniper encroachment have been identified on the Juniper Encroachment layer. Future treatments have been identified, focusing initially on areas of high GRSG abundance and expanding into historical/potential habitat once the core areas have been addressed. Local Identification Teams (IDT) will evaluate each treatment location to select a removal technique that is appropriate for the affected area. Continued management will be done post-treatment to help maintain desirable vegetation and historical fire regimes. In the lower elevations, large scale wildfires are occurring at an accelerated pace, causing the vegetation at lower elevations to change from Wyoming big sagebrush and perennial grass communities to annual grass dominated communities. This issue will be addressed further in the Fuels Management section (e.g. fuel breaks, bio-thinning) and the Habitat Restoration and Recovery section (e.g. herbicide, seeding, bio-thinning).

Management Strategies

Other Relevant Management Activities
The Burns BLM District grazing management strategy is based upon a target utilization of <50 percent for native bunchgrass communities and <60 percent for nonnative seeding's using a modified Landscape Appearance method. This allows management to account for both site specific environmental variables (soil type, soil depth, slope, aspect, and elevation) and climatic variations (precipitation, and temperature), which influence annual production rates. Cattle are permitted to graze allotments during specified periods, but are removed early if target utilization is reached. Typically, utilization does not exceed 35-40 percent on most allotments.

Fuels Management
Of the 9,609 acres of juniper encroachment identified, we will focus our treatment areas initially on the areas of high GRSG abundance. Once these areas are properly addressed we will expand our treatments into historical/potential habitat regions. On the lower elevation sites that are experiencing a higher frequency of fire we are planning to implement fuel breaks. This should help maintain the integrity of healthy ecosystems by limiting spread in high risk environments (see **Table 4-23**).

Table 4-23
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	45.93	0	0	45.93

Fuel breaks will be implemented outside of the PPA along the east rim down at the base along East Steens Road and Bone Creek Road. Disturbance to this area will be prevented and create a fuel/invasive annual grasses break to keep the annual grasses from creeping up the rim into the GRSG habitat, using herbicides where appropriate. The elevation changes in the area will provide good natural breaks. This treatment will be carried out over one to five years.

Roads identified for green striping within the Roaring Springs PPA include: Skull Creek Long Hollow Road, Skull Creek Road, Three Springs Road, Echart Grade Road, Smith Flat Huffman Camp Road, Carlson Creek Road, and Bone Creek Road. These roads have been selected for full green stripping and seeding using all of the tools available- chemical and mechanical treatments, and leaving the potential for nonnative seeding use open. The majority of this area falls within private property. Coordinating with private landowner and NRCS will be required to complete this activity.

There is no one fuel reduction technique that will be most effective throughout the area and within the acceptable impact ranges of GRSG populations. Combinations of methods will produce the best results with the smallest impact. Biological thinning (livestock grazing to reduce fine fuels) is a valid option, allowing livestock to be directed to areas needing fine fuel reduction while preventing overall utilization from exceeding a 50 percent utilization maximum (ocular estimate method) for desirable, perennial species while allowing for maximum consumption of targeted invasive annual grasses. Biological thinning is authorized under 43 CFR 4190.1, which allows a full force and effect decision to be made when BLM determines that vegetation, soil or other resources on the public lands are at substantial risk of wildfire due to drought, fuels buildup, or other reasons. Biological thinning will be authorized after seed set when grasses become dormant, putting the site at substantial risk of wildfire. Biological thinning would not be allowed when perennial species enter the boot stage until perennial grasses leave the flowering and seed development stage. There may be exceptions to this on a case by case basis, for example, it may be necessary to develop a fuel break, treat noxious weeds or a monoculture of invasive grasses during these times.

All treatments would occur in areas determined appropriate by an IDT, Actions may include cutting, limbing, brush beating, machine piling or hand piling, pile burning, and/or prescribed fire, depending on site specific conditions and the ability to conduct fuel removal treatments in a safe and effective manner. Chemical treatments will continue to be used to reduce fine fuels, specifically in the treatment of annual grasses. Other treatments may be used as they become available or meet the needs of specific sites. Using combinations of these treatments and having the ability to utilize the best tool for the area and time on specific sites should improve the overall effectiveness of fuel reduction techniques.

Habitat Restoration and Recovery

Seeding will take place on the areas affected by juniper removal. Total area seeded will depend on the treatment method used (e.g. pile vs broadcast burn). These treatments are an option in areas where fire is not already an aspect of the treatment (see **Table 4-24**).

Table 4-24
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	22,419	0	0	22,419
Percent of PPA	29.57	0	0	29.57

Restoration and recovery at lower elevations will focus primarily on areas invaded by annual grasses. By using the ILAP layer we were able to identify 10,677 acres of effected habitat. Treatment will focus on stopping the spread with the use of herbicide and biological thinning at times when perennial vegetation is dormant. Seeding of perennial grasses will take place in areas where the annual grass invasion has diminished the natural community and impaired the ecological function of the site. In areas where the shrub component has been removed due to wildfire, planting of sagebrush plugs to form habitat islands is a viable option for restoring this component to the landscape. Within this PPA several acres of wildfire have been identified as possible sagebrush planting areas. Forage availability will be an issue when identifying areas for habitat restoration. During seeding treatments the area will need to be rested from grazing for two seasons post-seeding to allow full establishment. Range improvement projects will be contingent on allocation of alternative forage for designated permittees.

In 2014 Carlson Creek was inventoried by a BLM Hydrologist for restoration purposes. Ten head cuts were identified. Due to fire intensity in the Carlson Creek drainage most of the vegetation holding these headcuts together burned, several of these headcuts are adjacent to riparian areas that provide critical late season brood rearing habitat for GRSG. If funding becomes available these headcuts will be addressed in the spring of 2015 before they are able to spread up stream. If the spread occurs over a few years it would cause the water table to drop, as a result these critical areas could be lost.

Fire Operations

Due to the large amount of private property in this PPA suppression actions are largely at the discretion of the landowner.

All roads listed for establishing fuel breaks will require maintenance to facilitate more rapid response to wildfires. This action will be addressed under the fire operations management strategy.

This PPA has 44,058 acres of low resistance and resilience, which is 58.8 percent of the total acres. There is a need to prioritize fire operations for this PPA due to the high percentage of acres with low resistance and resilience (see **Table 4-25**).

Prioritization is also contingent on the amount of intact habitat that is present in the PPA, which makes wildfire in the Roaring Springs PPA a Burns BLM District concern.

Table 4-25
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	40,240	35,570	0	75,809
Percent of PPA	53.1	46.9	0	100

Roads identified for improvement/maintenance within the Roaring Springs PPA include: Skull Creek Long Hollow Road, Skull Creek Road, Three Springs Road, Echart Grade Road, Smith Flat Huffman Camp Road, Carlson Creek Road, and Bone Creek Road. The majority of this area falls within private property. Coordinating with private landowners and NRCS will be required to complete this activity.

Post-Fire Rehabilitation Management

In 2014 the Bone Creek Basin Fire burned 14,700 acres along the eastern edge of the Roaring Springs PPA. Approximately 7,300 acres of this fire burned within this PPA. Currently the Bone Creek Basin Fire ESR project will aerially treat approximately 2,671 acres of Preliminary Priority Sage-grouse habitat (PPH) Treatment will concentrate on annual grass invasion post-fire and seeding a mixture of native grass. An additional 1016 acres of Preliminary General Sage-grouse Habitat (PGA) located adjacent to this PPA will also be seeded (see **Table 4-26**).

Table 4-26
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	75,810	0	0	75,810
Percent of PPA	100	0	0	100

Proposed Management

See **Table 4-27** for projects that have been identified presently within the NEPA planning process. See **Figures 4-12** through **4-16** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-27
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 (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]
Roaring Springs Annual Grass	2,360	X				X					X			1			3-5

Table 4-27
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 (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]
Bone Creek Basin Fire Seeding	2,125	X				X		X		X				1			0-2

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.4 Pueblo

Project Planning Area Description

General Site Description

The Pueblos PPA is located in the southwest corner of the Burns District BLM, within the Andrews Resource Area, and is approximately 95 miles south of Burns, OR. A small portion of this PPA (~30 acres) extends in to the Lakeview District BLM, but is land administered by the Burns District BLM. Even though the entirety of the Pueblos/South Steens PAC is within Burns BLM District administered land it has been divided into two PPA due to private ownership north of Hwy 205. The northern PPA was named “Roaring Springs PPA” and is comprised of all acres north of Hwy 205 within the Pueble/South Steens PAC. The southern portion of the PAC is named Peublos PPA and is comprised of all acres south of Hwy 205 within the PAC.

The Pueblos PPA extends south from Hwy 205 and west from the Fields-Denio Highway to the Basque Hills region, encompassing the northern section of the Pueblo Mountains, Lone Mountain, and the Funnel Canyon-Oregon End Road area to the west. The Pueblos PPA was extended to the southeast and southwest to cover all adjacent Core Habitat areas outside the Pueblos/South Steens PAC boundary south of Hwy 205. GRSG habitat within the PPA is intact and in good condition (see **Table 4-28**).

Table 4-28
Pueblos Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	548	0	10,002	6,737	0	26,163	56,230	0	5,880	28,701
Percent of PPA	0	0	7	5	0	19	42	0	4	21

Sage Grouse

This PPA is considered to be a stronghold for GRSG due to prime intact habitat. The Pueblos PPA is 133,903 acres in total, with 127,958 acres of BLM and 5,945 acres of private ownership within. The entirety of this PPA is within Core GRSG habitat.

The Pueblos PPA supports a healthy GRSG population, with a diverse habitat that accommodates the yearly needs of this species. There are 16 active leks, five inactive leks. One lek was observed for the first time in this PPA therefore, there is no available data. General GRSG population trends show a decline in the Pueblos PPA. This is based upon annual lek counts since 2006-2008 (see **Table 4-29**).

Table 4-29
Greater Sage-Grouse Leks found within the Pueblo Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
Bradley Lake (HA0018-01)	Unoccupied Pending (Inactive)
Fields Basin (HA0018-02)	Occupied (Active)
Fields Creek (HA0019-01)	Unoccupied Pending (Inactive)
Rincon (HA0019-02)	Unoccupied Pending (Inactive)
Box Canyon #1 (HA0038-01)	Occupied Pending
South Catlow (HA0079-01)	Occupied Pending
Square Mountain (HA0080-01)	Occupied Pending
South Rincon (HA0081-01)	Unoccupied Pending
Mahogany Point (HA0094-01)	Occupied Pending
Funnel Canyon #1 (HA0113-01)	Occupied Pending
Funnel Canyon #2 (HA0113-02)	Unoccupied Pending
Pearl Wise (HA0018-03)	Unoccupied Pending (Inactive)
Box Canyon #2 (HA0038-02)	Unoccupied Pending
Rock Knoll HA0038-03)	Unoccupied Pending
Ram (HA0117-01)	Occupied Pending
Ladycomb #1 (HA0036-01)	Unoccupied Pending
Ladycomb #2 (HA0036-02)	Unoccupied Pending
Cone Reservoir (HA0019-03)	Unoccupied Pending (Inactive)
East Square Mountain (HA0127-01)	Occupied Pending
Shipley #1 (HA0138-01)	Occupied Pending
Shipley #2 (HA0138-02)	No Data
South Rincon #2 (HA0081-02)	Occupied Pending

Vegetation

Much of this PPA is located at high elevations (5,800 ft and above) and mostly supports cool dry soils. Understory composition varies due to the changes in elevation. General plant associations based upon Ecological Site Inventory (ESI) soil types can be found in **Table 4-30** below. The southern portion of this PPA is the largest contiguous tract of sagebrush-steppe with a predominately healthy understory remaining on the Burns District.

Conifer encroachment is not a major concern in this area. If encroachment is observed standard removal procedures will be applied.

Table 4-30
General Plant Associations based upon ESI Soil types for Pueblo PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
024XY016OR	Loamy 8-10	Basin Big Sage; Needleandthread; Ricegrass	677
024XY018OR; 023XY212OR	Sandy Loam 8-10; Loamy 10-12		4990
		Total	**5667**
023XY216OR	Claypan 12-16	Mtn Big Sage; Low Sage; Idaho Fescue; Needlegrass	1921
023XY318OR	Loamy 12-16		2227
023XY404OR	Deep North 12-18; Misc Land Type		2186
023XY416OR	Wet Meadow		51
023XY310OR	North Slopes 12-16		2052
023XY216OR; 023XY318OR	Claypan 12-16; Loamy 12-16		7290
023XY310OR; 023XY300OR	North Slopes 12-16; South Slopes 8-12		7868
023XY310OR; 023XY312OR	North Slopes 12-16; Shallow North 12-16		4767
023XY312OR; 023XY404OR	Shallow North 12-16; Deep North 12-18		5321
023XY316OR; 023XY216OR	Droughty Loam 11-13; Claypan 12-16		8350
		Total	**42032**
024XY020OR	Shrubby Loam 8-10	Shadscale; Wyoming Big Sage; Budsage; Spiny Hopsage	3933
024XY033OR; 024XY032OR	North Slopes 6-10; South Slopes 6-10		2299
		Total	**6233**
023XY202OR	Swale 10-14	Wyoming Big Sage; Low Sage; Needlegrass; Bluebunch	332
023XY212OR	Loamy 10-12		19729
023XY214OR	Claypan 10-12		2431
023XY220OR	Clayey 10-12		8430
023XY300OR	South Slopes 8-12		6034
023XY214OR; 023XY212OR	Claypan 10-12; Loamy 10-12		4995
023XY212OR; 023XY220OR	Loamy 10-12; Clayey 10-12		24604
023XY300OR; 023XY310OR	South Slopes 8-12; North Slopes 12-16		11324
		Total	**77879**
010XY005OR	Loamy Bottom	Bulrush; Cattail; Creeping Wildrye; Basin Wildrye	98
024XY010OR	Clay Basin 6-8	Greasewood; Saltgrass; Basin Wildrye	523

Table 4-30
General Plant Associations based upon ESI Soil types for Pueblo PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
024XY113OR; 024XY013OR	Sodic Fan 6-10; Low Sodic Terrace 6-10	Greasewood; Shadscale; Spiny Hopsage; Basin Big Sage	1381
Unknown			60

Fire

Large scale wildfires are occurring at an accelerated pace, causing the vegetation at lower elevations to change from Wyoming big sagebrush/perennial grass communities to annual grass dominated communities. This issue is evident in the lower elevation areas that were burned during the Pueblo Fire in 2006, which burned over 32,000 acres along the northeastern corner of the PPA (see **Table 4-31**).

Table 4-31
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	131,934
High and Very High Burn Probability in PPA (percent)	98.6

There has been substantial disturbance from recent wildfires to the habitat in the northern portion or the PPA, however, in documented fire section of the PPA, large scale wildfires have been absent from the southern portions of this PPA. Considering the recent large scale disturbance to GRSG habitat from large wildfires in the Northern Great Basin, the habitat within the Pueblos PPA is extremely important and deserves protection from near-future wildfires. Accordingly, from the Fire Operations perspective, the Pueblos PPA has been identified as the highest priority PPA within the Burns District. BLM. Due to the remoteness of this area, there are also some projects identified in this assessment to aid Fire Operations, such as linear fuel breaks, road maintenance, initial attack resources, and water developments. These potential treatments will be discussed in more detail with in the Fire Operations, Fuels Management, and Habitat Restoration and Recovery sections.

The southern portion of this PPA is the largest contiguous tract of sagebrush with a predominately healthy understory remaining on the Burns District. This area is considered the highest priority to prevent a large wildfire from occurring on the Burns District. All though in recent fire history the northern 3rd of this PPA was impacted (predominately by the Pueblos Fire), the southern portions of this PPA have been largely undisturbed by wildfires. Fire records from 1980-pressent show that there have been 13 fires reported within the boundary of the Pueblos PPA. From these fires, 46,476 acres have burned within the Pueblos PPA since 1980, with the bulk of these acres (32,208 acres) coming from the Pueblos Fire in 2006, which burned in the northern portion of this PPA and extends across Hwy 205 into the Roaring Spring PPA. The burned areas with higher elevation (higher resistance and resilience) are recovering, but a large portion of the area is not doing well, with invasive annual grasses hindering native perennial.

Management Strategies

Management Activities

The Burns District BLM grazing management strategy is based upon a target utilization of <50 percent for native bunchgrass communities and <60 percent for nonnative seeding's using a modified Landscape Appearance method. This allows management to account for both site specific environmental variables (soil type, soil depth, slope, aspect, and elevation) and climatic variations (precipitation, and temperature), which influence annual production rates. Cattle are permitted to graze allotments during specified periods, but are removed early if target utilization is reached. Typically utilization doesn't exceed 35-40 percent on most allotments.

Fuels Management

Utilizing the existing road systems within and outside the perimeter of the Pueblos PPA, a network of fuel breaks has been identified to compartmentalize and establish anchor points for fire fighters to safely engage wildfires that may occur in this area in the future. Site specific treatment methods will be determined at the time of implementation and will utilize all available tools, such as mowing woody species, chemically treating herbaceous fuels (specifically annual grasses), and seeding desirable species, which could include nonnatives. These fuel breaks will be edge matched to any nearby fuel break treatments. The treatment purpose and need would include controlling invasive annuals and protecting sagebrush communities from large scale habitat conversion due to wildfire. Multiple roads have been identified and prioritized for treatment (see **Table 4-32**).

Table 4-32
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	109.14	44.81	0	153.95

Changes in the historical fire regime are observed throughout the Pueblos PPA. In the upper elevations, reduction in fire frequency has altered the dominant vegetation from Mountain Big Sagebrush/Perennial Grass communities to Juniper. Currently there are 2,341 acres of juniper encroachment observed from the Juniper Encroachment layer. Future treatments have been identified, focusing initially on areas of high GRSG abundance and expanding into historical/potential habitat once the core areas have been addressed. Local IDT will evaluate each treatment location to select a removal technique that is appropriate for the affected area. Continued management will be done post-treatment to help maintain desirable vegetation and historical fire regimes. In the lower elevations, large scale wildfires are occurring at an accelerated pace, causing the vegetation at lower elevations to change from Wyoming big Sagebrush/Perennial Grass communities to Annual Grass dominated communities.

Fire Operations

This area has been listed as the highest priority of the identified PPA within the Burns District BLM for fire operations due to the large contiguous tract of largely undisturbed GRSG habitat. This area is a challenge from the fire suppression perspective due to the overall remoteness, rough condition of existing roads, and a lack of reliable water sources. The Burns District BLM will make this area the focus and emphasis area for initial attack and prepositioning of resources during a high fire potential, including aviation resources. Treatments to enhance fire operation capabilities for this area will include creating water sources for ground and aviation suppression resources to utilize during fire operations and improving/maintaining the road systems within this PPA to reduce the response time of initial attack resources.

Two proposed well development locations have been identified for the Pueblos PPA that will not only act as a fire operations resource, but also as a grazing management tool to help with cattle distribution. They are both located on the remote western side of the PPA where water resources are highly limited.

First priority for fire operations has been given to the portion of the PPA west of the Rincon Flat Road, extending outside of the PPA boundary and the second priority has been given to the remaining eastern portion, extending to the Fields-Denio Road. First priority was given to the western portion for a variety of reasons, which include the sites lower resistance/resilience, fire spread history (wildfires are usually driven by a westerly wind in this region), and remoteness (see **Table 4-33**).

Table 4-33
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	100,631	55,576	0	156,207
Percent of PPA	75.0	41.4	0	116.4

All roads identified for linear fuel breaks will be maintained/improved under the Fire Operations Management Strategy. This will improve initial attack response for any additional wildfire starts that occur in the area. Roads identified for improvement/maintenance for response of suppression resources include: Stergen Cabin Road, Funnel Canyon Oregon End Road, Catlow Valley Road, Domingo Pass Road, Ten Cent Meadows Road, Gusher Well Road, Rincon Oregon End Pueblo Road, and Lone Mountain Road.

Habitat Restoration and Recovery

The majority of the Pueblos PPA consists of intact GRSG habitat and will require minimal amounts of habitat restoration in order to maintain it as a stronghold. The first priority for the PPA is to reestablish sagebrush within the perimeter of the Pueblo Fire, which burned in 2006. Planting of sagebrush plugs would be consistent with the other fire restoration projects in the Burns District BLM (e.g. planting of "islands" to reestablish the shrub component within burn scar) (see **Table 4-34**).

Table 4-34
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	22,412	0	22,412
Percent of PPA	0	16.69	0	16.69

Potential restoration and recovery at lower elevations within the PPA will focus on areas invaded by annual grasses, specifically within the Pueblo Fire perimeter. Treatment will focus on stopping the spread with the use of herbicide and biological thinning at times when perennial vegetation is dormant. Seeding of perennial grasses will take place in areas where the annual grass invasion has diminished the natural community and impaired the ecological function of the site.

In portions of the Pueblos PPA mosaic brush beating treatments have been considered to establish a multiple age class stand of sagebrush. This treatment would increase diversity of habitat and leave a more resilient landscape in the occurrence of a wildfire. Much like the fuel breaks identified to be constructed off major roads to aid fire suppression resources, associated treatments/tools to the mosaic sagebrush mowing would need to be available (mechanical, chemical, and potential for nonnative seeding) dependent on site specifics.

Forage availability will be an issue when identifying areas for habitat restoration. During seeding treatments the area will need to be rested from grazing for two seasons post-seeding to allow full establishment. Range improvement projects will be contingent on allocation of alternative forage for designated permittee's. In portions of the Pueblos PPA mosaic brush beating treatments have been considered to establish a multiple age class stand of sagebrush. This treatment would increase diversity of habitat and leave a more resilient landscape in the occurrence of a wildfire. Much like the fuel breaks identified to be constructed off major roads to aid fire suppression resources, associated treatments/tools to the mosaic sagebrush mowing would need to be available (mechanical, chemical, and potential for nonnative seeding) dependent on site specifics.

The Pueblo/Lone Mountain Allotment, which is 222,000 acres, is currently divided into two pastures. One pasture covers the eastern half of the allotment and the other covers the western half. This allotment may be considered for division into quadrants in effort to move cattle more effectively throughout the allotment.

Post-Fire Rehabilitation Management

If the Pueblos PPA burned, the western portion would be most susceptible to cheatgrass invasion and would be priority 1 for ESR treatments. Potential locations for herbicide and seeding to prevent the spread of invasive annuals would be identified by an IDT. Depending on the scale of the wildfire, sagebrush plugs could be planted to restore the shrub component to the landscape (see **Table 4-35**).

Table 4-35
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	84,610	49,650	0	134,260
Percent of PPA	63	37	0	100

The second priority for post-fire rehabilitation would be the remaining eastern portion of the PPA. The area is mostly characterized as a highly resistant/resilient site and should naturally recover from fire. If the area has problems recovering, an IDT will identify potential treatment areas.

Proposed Management

See **Table 4-36** for projects that have been identified presently within the NEPA planning process. See **Figures 4-17** through **4-21** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-36
Project Planning Area Treatment Summary Table

Treatment Description: Name/Type	Treatment Description: Acres/Miles	Priority: 1st	Priority: 2nd	Priority: 3rd	Threats Addressed: Conifer (C)	Threats Addressed: Invasive annual grasses (I)	Threats Addressed: Riparian (R)	Threats Addressed: Wildfire (W)	NEPA: Initiated (I)	NEPA: Completed (C)	NEPA: Needed (N)	Treatments: Time Frame: Pending Funding (P)[1]	Treatments: Time Frame: Implementing (I)[1]	Treatments: Certainty of Effectiveness[1]: Likely	Treatments: Certainty of Effectiveness[1]: Unlikely	Treatments: Maintenance Time Frame (Years)[2]	Treatments: Completion Time Frame (0-2, 3-5, 5+ years)[3]
Pueblo Fire ESR	7,357	X				X				X				1			0-2
Pueblo Seeding Brush Beat	1,005		X					X			X			1			3-5
Green Stripping EA	3,211	X	X					X	X					1		10	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.5 Trout Creek East

Project Planning Area Description

General Site Description

The Trout Creek East PPA is in the southwest portion of the district and extends into the Burns District. The PPA is being extended down to highway 95 to incorporate nearby core habitat.

The PPA is located in southeastern Oregon, bordered by Nevada to the south, highway 95 to the east, the Vale District boundary to the west and Whitehorse road to the north. McDermitt, Nevada is the closest town to the southeast. The Oregon Canyon and Blue mountains are located within the PPA.

This area has high elevation areas with generally frigid soils above 4,500ft and mesic soils below 4,500ft. The mesic soils tend to have a higher risk for fire, annual invasives, and conifer, so the district intends to target their funding efforts there. Above 4,500ft there is a natural resilience to fire and invasives and a good possibility of natural return after fire (see **Table 4-37**).

Table 4-37
Trout Creek East Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	12	41,826	4,796	2,489	117,769	35,131	44,087	24,591	41,892	22,888
Percent of PPA	0	12	1	1	35	10	13	7	12	7

Sage-Grouse

The PPA is entirely Greater GRSG PPH surrounded by preliminary general habitat. Within the planning area, there are 65 leks, 42 are occupied pending, one unoccupied, 17 unoccupied pending, and five with no data.

This area was also largely burned by the Holloway fire of 2012 and treatment efforts have not had a positive outcome. The GRSG population dropped heavily after this fire, but the habitat is coming back well in the higher elevations.

Vegetation

The northeastern area of the PPA borders salt desert shrub, and the eastern area of the PPA from the Holloway Fire polygon to highway 295 along the Nevada border is comprised of the caldera area which has a high concentration of Lahontan sagebrush. Further studies need to be done on the Lahontan sagebrush in order to understand the fire regimes, flammability, recovery potential, and resilience to invasive annuals. Lahontan sage is considered to be a hybrid of low sagebrush and black sagebrush, was once considered a special status species before 50-60k acres of it was discovered.

At the upper elevations of the planning area significant rainfall and cooler temperatures result in a broad mosaic of low sagebrush, mountain big sagebrush communities, and a mountain shrub type composed of snowberry, bitterbrush, *Cenaothus*, and mountain big sagebrush. Grass and forb understories include Idaho fescue, western needlegrass, bluebunch wheatgrass, and Sandberg bluegrass. Numerous inclusions of small wet meadows and riparian strings are found at the upper elevations. Dropping in elevation, a transition zone is encountered which is composed primarily of Wyoming big sagebrush, bluebunch wheatgrass, and Thurber's needlegrass communities with a wide variety of forbs and occasional stands of basin wildrye in well drained, rocky sites. The lower elevations consist predominately of a broad mosaic of salt desert shrub and Wyoming big sagebrush with basin big sagebrush communities in drainage bottoms.

Management Strategies

Other Relevant Management Activities

The Trout Creek East Project Planning Area contains portions of five Wilderness Study Areas (Twelvemile Creek, Fifteenmile Creek, Oregon Canyon, Willow Creek, and Disaster Peak. There are no Wild Horse and Burro HMAs within the PPA. Livestock (cattle) grazing occurs throughout the PPA. There are no transmission lines or wind energy facilities within the PPA.

Treatments and Fire

This area was also largely burned by the Holloway fire of 2012 and treatment efforts have not had a positive outcome. The GRSG population dropped heavily after this fire, but the habitat is coming back well in the higher elevations. Invasive annual grasses are observed in lower elevation areas and have the opportunity to creep up into the higher elevation areas. ESR efforts after the Holloway fire have included bitterbrush, mountain big sagebrush, and Wyoming sagebrush plugs along with riparian amendments. The fire took out many of the mahogany and aspen in the area so large woody species treatments are not needed. There are treatments that have occurred outside of the PPA along the eastern boundary. Treatments in this area include prescribed burns, mechanical removal, and re-vegetation efforts. So far these treatments have resulted in more resilient grass, but not more grass overall (see **Table 4-38**).

Table 4-38
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	312,199
High and Very High Burn Probability in PPA (percent)	93.5

Fuels Management

This area has WSA designations, but fuels treatments have been selected disregarding them. The District has identified several major roads (Whitehorse Road, Little Whitehorse Road, Oregon Canyon Road and Oregon Canyon –

Zimmerman Ranch Road) within the PPA have been selected for mowing, full green stripping, and improving access for firefighting resources. Green stripping may use native or nonnative seed may be utilized within green strips.

Roads will be monitored and treated for invasive annuals, but these treatments are low priority due to the general lack of invasion within the area (see **Table 4-39**).

Additionally sagebrush islands will be monitored and managed adaptively. Islands that are doing well and expanding on their own will be seeded to aid expansion. Islands that seem to be at risk for annual grass invasives or conifer encroachment will be treated by creating a one-mile buffer around the island and then seeded to promote correct vegetation communities.

Create an elevation based buffer in effort to keep invasive annual grasses out of higher elevation areas. Treatments may include greenstripping and herbicide application.

Due to the recent burn this area is not in need of conifer or other large woody species treatments.

Table 4-39
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	46.67	115.87	0	162.54

Habitat Restoration and Recovery
Continue efforts to seed, plug, and other treatments heavily within the transition zone of 4,000-5,000ft after ESR efforts in order to maintain high elevation habitat and try to bring back lower elevation habitat.

Areas that are being treated under ESR for the allotted 3 year window, the developed project area will then step into a longer term treatment plan under habitat restoration and recovery. ESR treatments will be carried through and will include all treatment methods available (see **Table 4-40**).

Table 4-40
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	53,512	17,549	0	71,060
Percent of PPA	15.95	5.23	0	21.18

Fire Operations
White Horse Butte is located outside of the Holloway fire and is comprised of 3a and 3b habitat with healthy and intact Wyoming sagebrush. This area is the

highest priority of the PPA due to the intact sagebrush and being adjacent to the Holloway fire.

The portion of the caldera area that has not previously burned will be protected as much as possible due to the healthy habitat in the area. Fire operations would focus on preventing the area from burning and quick suppression if fire gets into the area. This area and its habitat will be a focus habitat area for the next 15 years in effort to keep habitat while the Holloway area recovers. Currently, this habitat in the caldera area is the last remaining portion of habitat in the planning area in the Vale district.

In addition to the intact caldera area, fire operations within this PPA would prioritize the protection of sagebrush islands within the Holloway fire, second only to life and property, in effort to maintain core GRSG habitat. After a fire the remaining islands and new seeding sites will be identified. The identified sites will be sent through the ESR process and then into longer term monitoring and maintenance.

The caldera area that has previously burned will be protected initially, but if this area converts to a more frequent fire cycle then it will be abandoned in favor of using funds in higher priority sites, such as the Holloway fire polygon. This is due to low success rates of reestablishment of sagebrush in the caldera area.

The 12-mile ranch area will also be protected, but only if no other area is currently burning. This is due to poor habitat conditions, the distance of the lek from other leks (connectivity), and lack of confirmation that this lek is occupied. This area would become a higher priority if the fire threatens to burn into the adjacent Holloway area.

Since water is scarce, developing water re-fill sites for engines and/or helicopter use throughout the PPA will be implemented as much as possible to provide additional water resources for suppression efforts. The decision on location of these sites, what type of infrastructure will be constructed, and their order of priority has been deferred to a later date.

This PPA is a long drive distance from established facilities where suppression resources are housed. To facilitate a more effective suppression response, staging of resources in or near the PPA or McDermitt, Nevada will be considered during anticipated events, depending on district-wide fire activity and the availability of resources.

In addition to the pre-positioning of resources, establishing fire breaks to compartmentalize the area to minimize fire spread will be constructed and maintained. These fire breaks may consist of road improvements to existing travel corridors and/or fuel reduction buffer zones implemented by the use of mechanical and/or chemical means (see **Table 4-41**).

Table 4-41
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	216,062	11,9419	0	335,481
Percent of PPA	64.5	35.5	0	100

Post-Fire Rehabilitation Management

An ESR plan was developed following the Holloway Fire in 2012. The primary treatment utilized was to allow for natural recovery of vegetative resources and deferment of livestock grazing for two full growing seasons. Monitoring has indicated that this has been successful in reestablishment of vegetative resources including mountain big sagebrush.

An evaluation of post-fire rehabilitation needs will be undertaken at the time of any new fires that occur within the PPA. Specific treatments are unknown at this time but are likely to include natural recovery in resilient areas. In areas that are less resilient potential treatments could include seeding of sagebrush and native/nonnative vegetation, deferment of livestock grazing, and noxious weed control activities (see **Table 4-42**).

Table 4-42
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	216,650	119,416	0	336,066
Percent of PPA	64.5	35.5	0	100

Proposed Management

See **Table 4-43** for projects that have been identified presently within the NEPA planning process. See **Figures 4-22** through **4-25** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-43
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 (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]
Sagebrush Planting	500	X						X		X			X	X			0-2

Table 4-43
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 (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]
Seed Scatter	54,000			X				X		X					X	25	Will not Imple-ment
Shrub Planting (Bitterbrush)	3,000			X				X		X				X		25	5+ (Natural Revege-tation)
Shrub Planting (Mountain Mahogany)	7,000			X				X		X				X		5	5+ (Natural Revege-tation)

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.6 Trout Creek West

Project Planning Area Description

General Site Description

The Trout Creek West PPA is located in the southeast corner of the Burns BLM District, in the Andrews Resource Area, and is approximately 110 miles to the southeast of Burns, OR. The Trout Creek West PPA falls within the Trout Creek PAC which extends across Winnemucca, Burns, and Vale Districts. The Trout Creek PAC extends from the Nevada border north towards Flagstaff Butte. West to east this PAC extends from Grassy Basin, Red Mountain, and Chalk Canyon over towards the Sherman Field and the Trout Creek Mountain Road on the Burns District. The PAC then continues east towards Oregon Canyon on the Vale District. The boundary to the Trout Creek East PPA was defined using the district boundaries and contains delineated by all of the area from the Trout Creek PAC that is administered by the Burns District, BLM. The total size for this PPA is 89,894 acres with 73,756 acres being BLM, 13,589 acres of private, and 2,549 acres being undetermined (most of which are Winnemucca BLM District, BLM acres that are administered by Burns District BLM). For this assessment, the Trout Creek West PPA has been extended out from the Trout Creek PAC to include adjacent core habitat on the Burns District. Also, some treatments extend outside the PPA boundary, as they have been deemed necessary to protect the Trout Creek PAC. Examples include fuel break related treatments, fire operations management, as well as annual grass control treatments (see **Table 4-44**).

Table 4-44
Trout Creek West Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	358	39,770	3,961	315	12,583	11,538	584	6,849	3,346	4,128
Percent of PPA	0	48	5	0	15	14	1	8	4	5

Sage Grouse
The Trout Mountains have been home to one of the highest density GRSG populations within the state of Oregon. The entirety of the Trout Creek West PPA is listed as Primary Priority Habitat / Core GRSG habitat. There are 13 active leks and three lek that we have no data on found within the boundaries of this PPA (see **Table 4-45** below). In 2012 the Holloway Fire had a substantial impact on the Trout Creek Mountains GRSG population, burning 461,050 acres that was of predominately GRSG habitat. The Holloway Fire started on Winnemucca BLM District in Nevada and burned up through the Burns District BLM and then over to on to the Vale District BLM; negatively effecting GRSG populations across these three BLM Districts. Following the Holloway Fire, an Emergency Stabilization and Rehabilitation (ESR) project was coordinated between the three BLM Districts that this fire burned across the lower elevation sites (~<5,800 ft.….typically the low resistant/resilient sites), with invasive annual grasses being the primary concern. Treatments have been undertaken, and are planned to address lower elevation sites; primarily utilizing herbicides (imazapic) to address invasive annual grass issues.

There has not been enough lek count data collected in the Trout Creek West PPA to establish a general trend in GRSG population (two years of data), but there appears to be a reduction in numbers. There has been a die off of sagebrush are still present due to Aroga moth infestation; the extant of this die off is unknown at this time, in places it is extensive.

Table 4-45
Greater Sage-Grouse Leks found within the Trout Creek West Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
Little Trout #1 (HA0089-01)	Unoccupied Pending
Table Mountain #1 (HA0090-01)	No Data
LC Spring (HA0091-01)	No Data
No Name #1 (HA0092-01)	Unoccupied Pending
No Name #2 (HA0093-01)	Occupied Pending

Table 4-45
Greater Sage-Grouse Leks found within the Trout Creek West Project Planning Area

Lek Name/ ODFW Site ID	Conservation Status
No Name #3 (HA1030-01)	Unoccupied Pending
No Name #4 (HA1031-01)	Unoccupied Pending
East Fork Trout Creek (HA0147-01)	Occupied Pending
Center Ridge #3 (HA0088-03)	Occupied Pending
Sheep Camp Spring (HA1045-01)	No Data
Center Ridge #1 (HA0088-01)	Unoccupied Pending
Stony Spring (HA0129-01)	Occupied Pending
Center Ridge #2 (HA0088-02)	Occupied Pending
Center Ridge #4 9HA0088-04)	Occupied Pending
No Name #5 (HA0092-05)	Occupied Pending

Vegetation

This area once held the best GRSG habitat in the state, however in 2012 most of the Trout Creek PAC burned on the Burns, Winnemucca, and Vale Districts BLM as part of the Holloway Fire. However, within the Trout Creek West PPA most of the GRSG habitat in the higher elevations has been rebounding positively from this large scale disturbance (see **Table 4-46**). Following the Holloway Fire, an Emergency Stabilization and Rehabilitation (ESR) project was coordinated between the three effected BLM Districts. The treatments carried out from this plan were largely effective; especially in higher elevations. The higher elevation sites are on the successional pathway back to a sage-steppe system, however treatments such as seeding islands of sagebrush plugs are planned to accelerate succession. The primary areas of concern within the Holloway fire remain on the lower elevation sites (~<5,800 ft. which are characterized as lower resistant/resilient sites), with invasive annual grasses being the primary concern. Treatments have been undertaken, and are planned to address lower elevation sites; primarily utilizing herbicides (imazapic), biothinning, and seeding to address invasive annual grass issues.

Table 4-46
General Plant Associations based upon ESI Soil types for Trout Creek East PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
023XY509OR	Misc Land Type;Subalpine Slopes 16-35	Mtn Big Sage; Low Sage; Fescues; Aspen	589
023XY418OR	Aspen 16-35		175
023XY501OR	Loamy 16-25;Misc Land Type		1861
023XY507OR	Claypan 16-25		2211
023XY418OR; 023XY509OR	Aspen 16-35;Subalpine Slopes 16-35		4066
023XY510OR; 023XY507OR	Rocky Ridges 16-35;Claypan 16-25		1164
		Total	**10066**

Table 4-46
General Plant Associations based upon ESI Soil types for Trout Creek East PPA

Ecological Site Identification Number	ESI Soil Type	General Plant Associations	Acres
023XY216OR	Claypan 12-16	Mtn Big Sage; Low Sage; Idaho Fescue; Needlegrass	1047
023XY301OR	Droughty S Slopes 11-13;Misc Land Type		2081
023XY314OR	Gravelly N Slopes 12-16		3079
023XY318OR	Loamy 12-16		5895
023XY404OR	Deep North 12-18;Misc Land Type		7325
023XY406OR	Swale 12-16		2353
023XY312OR; 023XY310OR	Shallow North 12-16;North Slopes 12-16		3535
023XY404OR; 023XY312OR	Deep North 12-18;Shallow North 12-16		7157
023XY302OR; 023XY216OR; 023XY404OR	South Slopes 12-16;Claypan 12-16;Deep North 12-18		6362
023XY302OR; 023XY404OR; 023XY418OR	South Slopes 12-16;Deep North 12-18;Aspen 16-35		3514
023XY312OR; 023XY404OR; 023XY418OR	Shallow North 12-16;Deep North 12-18;Aspen 16-35		827
		Total	**43175**
023XY220OR	Clayey 10-12	Wyoming Big Sage; Low Sage; Needlegrass; Bluebunch	6872
023XY300OR	South Slopes 8-12;Misc Land Type		4506
023XY212OR; 023XY220OR	Loamy 10-12;Clayey 10-12		7186
023XY214OR; 023XY212OR	Claypan 10-12;Loamy 10-12		8492
023XY300OR; 023XY214OR	South Slopes 8-12;Claypan 10-12		3897
		Total	**30953**
024XY015OR; 024XY017OR	Desert Loam 6-10;Shallow Loam 8-10	Shadscale; Wyoming Big Sage; Budsage; Spiny Hopsage	236
024XY017OR	Shallow Loam 8-10		1641
		Total	**1877**
023XY509OR	Rock Outcrop And Rubble Land	N/A	258
024XY016OR	Loamy 8-10	Basin Big Sage; Needleandthread; Ricegrass	3057
010XY005OR; 024XY003OR	Loamy Bottom;Sodic Bottom	Bulrush; Cattail; Creeping Wildrye; Basin Wildrye	87
Unknown			379

Fire

Fire history up to 2012 in the area consisted of a low frequency of starts (four in the last 10 years) with medium sized fires (typically <1000 acres). Typically thunderstorms miss the Trout Creek Mountains, or when they do cross this area, they are wet storms. 2012 was an exception to this rule; not just in this localized area, but across the Northern Great Basin Region as a whole.

Although much of the higher elevation ground in this PPA has been recovering from the 2012 Holloway Fire and is on the successional pathway back to a sagebrush dominate ecosystem (with big sagebrush naturally reestablishing at some sites already), lower elevations (~<5,800 ft.) are lest resilient and are more subject to annual grass invasion. The possibility of re-burning is the biggest threat to this PPA since it would further set back recovery. Within the Holloway ESR Plan, prioritized portions of the fire were sprayed using plateau in the fall of 2014 with additional acres planned for 2015. This is the last year of funding under the Holloway ESR Plan. There may be a need for follow-up herbicide treatments on lower elevation sites (see **Table 4-47**).

Table 4-47
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	78,739
High and Very High Burn Probability in PPA (percent)	94.5

Management Strategies

Treatments
All ongoing treatments within the Trout Creek West PPA are part of the Holloway ESR Plan and will be presented in more detail within the Habitat Restoration and Post-Fire Rehabilitation sections.

Other Relevant Management Activities
The Burns BLM District grazing management strategy is based upon a target utilization of <50 percent for native bunchgrass communities and <60 percent for nonnative seeding's using a modified Landscape Appearance method. This allows management to account for both site specific environmental variables (soil type, soil depth, slope, aspect, and elevation) and climatic variations (precipitation, and temperature), which influence annual production rates. Cattle are permitted to graze allotments during specified periods, but are removed early if target utilization is reached. Typically utilization doesn't exceed 35-40 percent on most allotments.

Fuels Management
Several major roads within the Trout Creek West PPA have been selected for establishment and maintenance of linear fuel breaks. These fuel breaks are the first priority fuels management treatments for this PPA and may include the use of full green strips to help contain future wildfires. Having the ability to utilize all available tools, such as, chemical treatments, mechanical treatments, and seeding of desirable vegetation (including nonnative species) will allow managers to better accomplish FIAT goals. Site specifics of this project would be determined at the time of implementation by an IDT (see **Table 4-48**).

Table 4-48
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	78.20	42.25	0	120.45

Roads listed for establishing linear fuel breaks include: Willow Butte Loop, Chalk Creek Road, Whitehorse Ranch Lane, Trout Creek Mtn Road, Cottonwood Creek Road, Grassy Basin Road, Long Canyon Road, Cottowood Fields Road, BLM Connection Road, Holloway No Name Road.

Much of this area is at a high risk for cheatgrass conversion, especially if the fire frequency is accelerated. Currently annual grass dominance drops out around 5,500 ft. in elevation dependent on aspect, but if this area was to experience another large scale wildfire it is likely annual grasses would expand further into the PPA. In addition to green stripping roads, treatments could include green stripping along elevation lines, which could aid targeted grazing treatments and keep wildfire starts at lower elevations from spreading up Trout Creek Mountains.

Habitat Restoration and Recovery
Restoration and recovery at lower elevations within the Trout Creeks PPA will first prioritize areas invaded by annual grasses. Treatments will focus on stopping the spread of annual grasses with the use of herbicide and biological thinning at times when perennial vegetation is dormant. Seeding of perennial grasses will take place in areas where the annual grass invasion has diminished the natural community and impaired the ecological function of the site (see **Table 4-49**).

Table 4-49
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	35,900	0	35,900
Percent of PPA	0	43.03	0	43.03

Also within the priority area are areas where the shrub component has been removed due to wildfire. Planting of sagebrush plugs to form habitat islands is a viable option for restoring this component to the landscape. Seeding and planting plugs of sagebrush and bitterbrush, especially around the sagebrush island have occurred and are planned to occur. The Burns District BLM wants to consider setting up an annual budget that is used specifically for planting plugs within the large burned areas, which persist after catastrophic wildfires. Currently, the landscape trend is that there is always some place to plant plugs, and the district thinks having a separate budget for this will help habitat restoration and recovery. The sagebrush plugs have a higher rate of success than both seeds and seed agglomerates and would be the preferred technique, unless future research develops a better solution for reestablishment of sagebrush. Natural recovery of sagebrush is taking place at higher elevations, which allows planting treatments to focus on the lower elevation sites. If there is a change in the natural recovery (e.g. re-burn) that effects sagebrush establishment then priority areas may be redefined.

Fire Operations

This area is considered just as important as the Pueblos PPA for fire suppression, and suppression efforts would be focused here if possible. Currently much of the area that burned in the 2012 Holloway fire is recovering, and another large scale wildfire in the area would likely lead to a substantial expansion of annual grasses, and possibility of conversion to an annual grass dominated/short fire return interval site. Although many areas of the Holloway Fire completely burned off all above ground vegetation, effectively resetting succession, within the Trout Creek West PPA there are some large unburned islands, as well as some isolated smaller islands. Due to the value these islands offer to GRSG currently, and also as seed sources to future expansion of sagebrush back into burned areas, protection of these islands is a high priority for fire operations within the Burns District BLM. However, priority 1 for this PPA was given to low elevation areas in the western portion, those with lower resistance/resilience and that are currently invaded by annual grasses, since wildfire starts in this region have the ability to rapidly spread across the entire PPA. In general, this area will be a high priority area for suppression using all of the methods available, including prepositioning and aviation resources.

All roads identified for establishing linear fuel breaks will be maintained/improved under the Fire Operations Management Strategy. This will improve initial attack response for any additional wildfire starts that occur in the area (see **Table 4-50**).

Table 4-50
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	48,319	55,682	0	104,001
Percent of PPA	57.9	66.7	0	124.7

Post-Fire Rehabilitation Management

Through the Holloway ESR Plan, prioritized portions of the fire were herbicided using imazapic in the fall of 2014 with additional acres planned for 2015. This is the last year of funding under the Holloway ESR Plan And there may be a need for follow-up herbicide treatments on lower elevation sites. These areas will continue to be the priority under FIAT, with all low and moderately resistant/resilient sites being priority 1 and would be treated using herbicide, seeding, and planting treatments. The second priority will be given to the higher resistance/resilience sites; however, if there is an issue with the natural recovery of sagebrush following future fires then the priority areas may be redefined (see **Table 4-51**).

Table 4-51
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	31,717	51,696	0	83,413
Percent of PPA	38.0	62.0	0	100

Proposed Management

See **Table 4-52** for projects that have been identified presently within the NEPA planning process. See **Figures 4-26** through **4-29** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-52
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 (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]
Holloway ESR Seeding	40,336	X				X		X		X				1			0-2
Little Trout Creek Seeding	3,903		X			X					X			1			3-5
Green Stripping EA	2,146	X	X					X	X					1		10	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.7 Beaty Butte

Project Planning Area Description

General Site Description

The Beaty Butte PPA is located in the southeast corner of the Lakeview Resource Area and is in both eastern Lake County and western Harney County. The entire project area consists of 412,286 acres and is divided out into the following ownerships: 363,557 acres of BLM, 23,678 acres of private, and 14,360 of State Lands. There is a wide range of elevation within the project area ranging from 4,465-8,012 feet with majority of the aspect being south and east.

The majority of the soil type across the project area is classified as warm/cool and dry, which is considered low resistance to annual grass invasion. Some of the highest elevations are classified as cool/cold and moist soils, with high resistance to annual grass invasions (see **Table 4-53**).

Table 4-53
Beaty Butte Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	13,735	0	0	13,252	0	1,077	319,123	0	2,806	52,118
Percent of PPA	3	0	0	3	0	0	79	0	1	13

Sage-Grouse

The GRSG population is stable to slightly declining. This area likely provides the seasonal life requisites for breeding, brood rearing, and winter habitat.

According to the PAC there is approximately 643,612 acres of PPH (100 percent) within the PPA; however, current weed infestations and juniper encroachment may limit GRSG habitat. The population within the Beaty Butte PPA exhibits both migratory and resident seasonal movements. Areas around Hart Mountain and west toward the Warner Mountains provide some of the best GRSG habitat (see **Table 4-54**).

Table 4-54
Beaty Butte Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1105-01	Mc Reservoir	Occupied
LA1113-01	Guano #4	Occupied
LA1140-01	Blizzard	Occupied
LA1160-01	Rattlesnake Draw #1	Occupied
LA1164-01	Flook Burn	Occupied
LA1160-02	Rattlesnake Draw #2	Occupied
LA1124-02	Lookout #2	Occupied
LA1124-01	Lookout #1	Occupied
LA1119-01	Hilltop #1	Occupied
LA1119-03	Hilltop #3	Occupied
LA1119-02	Hilltop #2	Occupied
LA1103-02	Swede Knoll #2	Occupied
LA1103-03	Swede Knoll #3	Occupied
LA1103-01	Swede Knoll #1	Occupied
LA1105-02	Mc Reservoir #2	Occupied
LA1140-03	Blizzard #3	Occupied
LA1124-04	Lookout #4	Occupied
LA1140-02	Blizzard #2	Occupied
LA1140-05	Blizzard #5	Occupied

Table 4-54
Beaty Butte Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1124-03	Lookout #3	Occupied
LA1108-06	Spanish Flat #6	Occupied
HA0021-05	Buckaroo #5	Occupied Pending
HA0103-01	Bench Top	Occupied Pending
LA1101-01	Poker Jim Lake	Occupied Pending
LA1102-01	Deer Creek	Occupied Pending
LA1110-01	Gibson Lake Road	Occupied Pending
LA1111-01	Sentinel Point #1	Occupied Pending
LA1112-01	Northwest Long Lake	Occupied Pending
LA1114-01	North Badger Hole	Occupied Pending
LA1116-01	Wool Lake	Occupied Pending
LA1122-01	South Boundary	Occupied Pending
LA1123-01	Clover Swale #4	Occupied Pending
LA1108-02	Spanish Flat #2	Occupied Pending
LA1108-01	Spanish Flat #1	Occupied Pending
LA1144-01	Sagehen #8	Occupied Pending
LA1157-01	South Teddy's Rim	Occupied Pending
LA1193-01	Fred's Pond	Occupied Pending
LA1219-01	West School Section Lake	Occupied Pending
LA1222-01	Antelope Butte Lakeview	Occupied Pending
LA1224-01	Rocky Canyon #2	Occupied Pending
LA1228-01	Potholes	Occupied Pending
HA0107-05	Bald Mountain #5	Occupied Pending
HA0107-01	Bald Mountain #1	Occupied Pending
HA0023-01	Juniper	Occupied Pending
HA0021-01	Buckaroo #1	Occupied Pending
HA0021-02	Buckaroo #2	Occupied Pending
HA0020-01	North Buckaroo Pass	Occupied Pending
LA1117-03	Lower Snyder #3	Occupied Pending
LA1104-03	North Poker Jim #3	Occupied Pending
LA1229-01	Hen Hill #1	Occupied Pending
LA1233-01	Swede Paiute #1	Occupied Pending
LA1233-02	Swede Paiute #2	Occupied Pending
HA0021-06	Buckaroo #6	Occupied Pending
LA1158-01	Paxton #1	Occupied Pending
LA1120-01	Black Canyon #1	Occupied Pending
LA1109-03	Desert Lake	Occupied Pending
LA1130-01	Morgan	Occupied Pending
HA0021-07	Buckaroo #7	Occupied Pending
LA1113-02	Guano #4 South	Occupied Pending
LA1109-06	Corral Creek 4	Occupied Pending
LA1117-04	Lower Snyder #4	Occupied Pending
LA1117-05	Reservoir Lake North	Occupied Pending
LA1238-01	Wool Lake North	Occupied Pending
LA1108-03	Spanish Flat #3	Unoccupied Pending
LA1109-01	Water Canyon	Unoccupied Pending
LA1108-05	Spanish Flat #5	Unoccupied Pending
LA1115-01	Wildlife Lake	Unoccupied Pending
LA1118-01	North Mc Reservoir	Unoccupied Pending

Table 4-54
Beaty Butte Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1111-02	Sentinel Point #2	Unoccupied Pending
LA1123-02	Clover Swale #3	Unoccupied Pending
HA1011-01	Southeast Spalding Reservoir	Unoccupied Pending
LA1132-01	Northeast Badger Hole #1	Unoccupied Pending
LA1133-01	Rocky Canyon #3	Unoccupied Pending
LA1138-01	School Section Lake	Unoccupied Pending
LA1108-04	Spanish Flat #4	Unoccupied Pending
LA1146-01	North Teddy's Rim	Unoccupied Pending
LA1155-01	West Long Lake #1	Unoccupied Pending
LA1159-01	Northeast Badger Hole #2	Unoccupied Pending
LA1161-01	Southwest Flook Lake	Unoccupied Pending
HA1028-01	West South Corral Spring	Unoccupied Pending
LA1181-01	Dobyn's Rim	Unoccupied Pending
LA1197-01	Rocky Canyon #1	Unoccupied Pending
LA1198-01	Spalding Ranch East	Unoccupied Pending
LA1199-01	Fairy Flat	Unoccupied Pending
HA1025-01	East Paradise	Unoccupied Pending
LA1205-01	South Little Juniper	Unoccupied Pending
LA1206-01	Southeast Little Juniper	Unoccupied Pending
LA1211-01	East Long Lake	Unoccupied Pending
LA1214-01	Northeast Long Lake	Unoccupied Pending
LA1220-01	East Gibson Lake	Unoccupied Pending
LA1225-01	Lower Robinson	Unoccupied Pending
LA1227-01	West Long Lake #2	Unoccupied Pending
LA1123-03	Clover Swale #2	Unoccupied Pending
LA1123-04	Clover Swale #1	Unoccupied Pending
HA0107-03	Bald Mountain #3	Unoccupied Pending
HA0107-02	Bald Mountain #2	Unoccupied Pending
HA0107-04	Bald Mountain #4	Unoccupied Pending
HA0107-06	Bald Mountain #6	Unoccupied Pending
HA0021-03	Buckaroo #3	Unoccupied Pending
HA0021-04	Buckaroo #4	Unoccupied Pending
LA1117-01	Lower Snyder #1	Unoccupied Pending
LA1117-02	Lower Snyder #2	Unoccupied Pending
LA1104-01	North Poker Jim #1	Unoccupied Pending
LA1104-02	North Poker Jim #2	Unoccupied Pending
LA1229-02	Hen Hill #2	Unoccupied Pending
LA1175-01	South Poker Jim #1	Unoccupied Pending
LA1175-02	South Poker Jim #2	Unoccupied Pending
LA1158-02	Paxton #2	Unoccupied Pending
LA1120-02	Black Canyon #2	Unoccupied Pending
LA1103-04	Homestead #1	Unoccupied Pending
LA1103-05	Homestead #2	Unoccupied Pending
LA1232-01	Flook Meadow	Unoccupied Pending
LA1109-02	Corral Creek	Unoccupied Pending
LA1221-01	Northeast Swede Knoll	Unoccupied Pending
LA1109-04	Corral Creek 2	Unoccupied
LA1109-05	Corral Creek 3	Unoccupied
LA1146-02	Lone Lek	Unoccupied

Table 4-54
Beaty Butte Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1104-04	North Poker Jim #4	Unoccupied
LA1140-04	Blizzard #4	Unknown

Vegetation

The sagebrush cover across the PPA is currently intact with some areas in the east portion of the PPA beginning to have closed canopy cover consisting of big sagebrush and Wyoming big sagebrush. The higher elevations are dominated by low sagebrush with little invasive annual grass understory. However, the lower elevation areas with big sagebrush and Wyoming big sagebrush have a high amount of invasive annual grass invasion. The Westside of the PPA has conifer encroachment; however, conifer encroachment across the entire project area is low.

Invasive Species

Cheatgrass is presents in trace amounts within the understory of the lower elevation vegetation, and reduces over 6,000 feet in elevation. Some areas in the northeast have high coverage of cheatgrass. Higher amount of cheatgrass are present in past burned areas where restoration activities did not take place. Other nonnative invasive annual grasses, such as Medusahead rye (*Taeniatherum caput-medusae)* and North Africa Grass *(Ventenata dubia),* have not been documented in the PPA. However, due to the soil type and elevation these species could easily invade this PPA. Other noxious weeds are present in the Beaty Butte PPA. Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*), Russian knapweed (*Acroptilon repens*), hoary cress (*Cardaria spp.*) are scattered in small infestations near water developments and along roads.

Small isolated infestations of noxious weeds and nonnative invasive species will be controlled using an early detection, rapid response program and integrated weed management program. The goal will be to eradicate the infestations while they are still isolated infestations. For large infestations, such as cheatgrass, the goal will be to contain and reduce the populations with high priority near leks. Other priorities will be along roads to prevent invasive annual grasses and other weeds from spreading to un-infested areas. All staff and contractors will be encouraged to keep all of their vehicles and equipment clean and free of weeds.

Areas that have converted to annual grass monocultures will be low priority for treatment, but if funding becomes available these areas may be treated in an effort to convert them back to more productive habitat.

For future restoration efforts seed will be collected from both native grasses and forbs. The seed can be directly planted or grown into seedlings and can be used for habitat and recovery projects. To ensure seed availability and viability a professional long term seed storage facility needs to be installed at the Lakeview District.

Conifer reduction from fuels treatments will also increase the quality of GRSG habitat. Reducing conifer cover allows the understory to increase while decreasing perch sites for aerial predators.

Treatments would include spraying and seeding along fire break areas. Areas that have potential for overstory closure may benefit by some brush mowing or reduction to assist in understory recovery. These projects will initially be conducted on as a small scale pilot to ensure the restoration efforts are effective before larger scale projects are implemented.

Fire

The current fire regime falls in a category IV, however, shorter intervals than 35 years may occur. There have been several large fires within and adjacent to the Beaty Butte PPA. The majority of past fires have converted to annual grass dominated vegetation that is not considered GRSG habitat. The majority of the soil types across the project area are classified as warm/cool and dry, which is considered low resistance to annual grass invasion. Some of the highest elevations are classified as cool/cold and moist soils, with high resistance to annual grass invasions (see **Table 4-55**).

Table 4-55
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	89,169
High and Very High Burn Probability in PPA (percent)	71.7

Fire Regime IV (Stand Replacement, 35–100+ Years)

Mountain and sage shrublands, semi-desert shrub and grasslands, mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter stand replacement intervals of less than 35 years may occur.

Climate conditions and time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and resilient to disturbance.

Management Strategies

Treatments

Noxious weeds within the PPA have been managed through the Lakeview Resource Area Integrated Weed Management Plan, however no effective herbicide was available for control of annual grass species, therefore they have been unmanaged in the PPA. New herbicides have recently become available to assist in managing the nonnative invasive winter annual grass species and thousands of acres could be improved within GRSG habitat by removing these grasses.

Other Relevant Management Activities or Issues

The Beaty Butte PPA has a high and generally stable population of GRSG. It also has good connectivity to adjacent habitat. The remoteness of the area is a concern for fire protection and lack of water.

The Beaty Butte HMA lies within the Beaty Butte PPA and has an AML of 100-250 head of horses.

Free-roaming horses on Butte HMA were last counted during the first week of June 2014. This inventory was conducted by specialists from Lakeview BLM, Sheldon-Hart Mtn. National Wildlife Refuge Complex, and the US Geological Survey. The Simultaneous Double-Count aerial inventory method was utilized to provide a statistically valid population estimate with confidence intervals. This method provides an estimate of sighting probabilities (the likelihood horses are observed during the count) which is then used to correct raw count data (the actual number of horses observed during the inventory) to account for undercounts (horses not counted because they were not seen on an inventory).

The data collected during this inventory has been sent to the US Geological Survey-Fort Collins Science Center for statistical analysis. The current population estimate (1,287 horses) is based on raw count data from the survey, which is likely a slight undercount of the actual population of the HMA.

At 1,287 horses the Beaty Butte HMA is currently over five times the high end of the AML. These numbers negatively impact GRSG habitat restoration and rehabilitation efforts.

Fuels Management

The main management activities will focus on juniper treatments. Juniper treatments would occur in the western part of the PPA. The encroachment is phase I and phase II and starting to spread into the flatter sagebrush areas. Mechanical and hand treatments will be used for removal. No fuel breaks have been implemented in this area, but green striping and other fuel breaks have been proposed by the Beaty Butte working group. Some seeding on BLM lands has occurred in the NE corner of the Priority Planning Area, but most surrounding areas are infested with cheatgrass (see **Table 4-56**).

Table 4-56
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	48.70	92.27	0	140.97

Fuels treatments will be coordinated across property jurisdictional boundaries and ownership by partnering with Hart Mt. and Sheldon Refuges, Neighboring Burns BLM District, Private landowners and the NRCS.

Firebreaks or green-stripping along existing roadways would provide a fuel break and safe zone from which to fight fire. Some possible roads would be the 6152-0-00, 6132-0-00, 6162-0-A0, 6156-0-00, 7116-0-00, 6176-0-00 and 6176-0-G0. One of the suggested species for green stripping is Sandburg's bluegrass (*poa secunda)*.

Habitat Restoration and Recovery
Opportunities to restore, protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and >6,000 feet elevation. Restoration treatments would be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity because of lack of precipitation for plant growth and drier conditions from southerly aspects. Portions of this PPA are located on the border of Hart Wildlife Refuge, adjacent Districts and privately owned parcels, therefore a coordinated approach will be used in restoration efforts (see **Table 4-57**).

Table 4-57
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	85,404	403,687	0	489,091
Percent of PPA	21.24	100.39	0	121.63

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Fire Operations
Most of the PPA acreage is 1st priority as it is intact sagebrush and is considered intact, priority habitat. Most of the area is at the low end of 2C with minor inclusions of 3C. This area is a GRSG priority for the Lakeview District, BLM. The isolate portion of the PPA, to the northeast, is 2nd priority based on a previous fire and the smaller area of intact habitat and operations (see **Table 4-58**).

Table 4-58
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	346,878	55,236	0	402,115
Percent of PPA	86.3	13.7	0	100

Post-Fire Rehabilitation Management

The majority of the Beaty Butte PPA consists of warm/cool and dry soils, which would not be resistant to annual grasses or resilient to fires. However, there are several sections of the PPA with high elevation over 6,000 feet with low sage that would be more resilient to annual grasses. These areas would allow for a more passive post-fire rehabilitation management. If there are known annual grass infestations documented these sites will likely require herbicide applications with Imazapic post-fire. Natural restoration will be allowed and monitoring will take place, results will dictate if active restoration is needed (see **Table 4-59**).

Table 4-59
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	376,769	15,003	10,358	402,131
Percent of PPA	93.7	2.6	3.7	100

For the areas in lower elevations Treatment opportunities include spraying all areas impacted to reduce invasive annual grasses from establishing and seeding the following year. This will help native vegetation reestablish and thrive. Thinning and drilling would occur post-fire where applicable. Generally, under the FIAT construct higher elevation areas and low sage sites do not need as much management due to their higher resistance and resilience than Wyoming sage sites. Areas less than 6,000 feet in elevation with warm/cool dry soils generally require the highest post-fire rehabilitation due to the low resistance and resiliency. Areas with new invasions will be high priority for management actions for the first five years post-fire. If annual grasses are not controlled and native plants are not established within this five year period the productivity of the site and the GRSG habitat will decline.

Proposed Management

See **Table 4-60** for projects that have been identified presently within the NEPA planning process. See **Figures 4-30** through **4-35** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-60
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 (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]
Invasive Annual Grass Management	401,507		X			X			X			X		X		5-20	1-5
Other Invasive Plant Management	50	X					X		X				X	X		5-20	1-5
Coleman 1		X			X					X			X	X		5	3-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.8 Clover Flat

Project Planning Area Description

General Site Description

The location of the Clover PPA falls within the Lakeview BLM District Resource area (Lake County, Oregon) and is approximately 20 miles north of Lakeview. The Clover Flat PPA encompasses a total of 31,531 acres, and consists of the following ownerships: 16,312 acres of BLM, 14,935 acres of private, and 284 of National Forest System Lands. Elevation ranges from 4,281-5,876 feet with predominately north and east aspects. The topography is a gently sloping hilltop plateau with steep rocky sides (50-60 percent). The area receives 10-12 inches of precipitation, with most of the precipitation occurring during the winter in the form of snow. Some precipitation occurs during the summer and fall in the form of thunderstorms but this precipitation is ineffective for plant growth.

The majority of the assessment area consists of cool and moist soils. Generally, the cool and moist soils exhibit moderately high resilience to disturbance and moderate resistance to invasive annual grasses; natural sagebrush recovery is likely to occur. On the east and north east portion on the assessment area there are areas of warm and dry soils, and there are also small pockets of warm and moist soils throughout the PPA. The warm and moist soils show moderate resilience to disturbance and moderately low resistance to invasive annual grasses. The areas of warm and dry soils represent the highest risk of GRSG habitat loss as these areas have low resilience and resistance. Recovery of sagebrush is not likely to occur naturally within this soil moisture and temperature regime (see **Table 4-61**).

Table 4-61
Clover Flat Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	1,400	1,070	14,958	72	381	6,921	0	81	6,648	0
Percent of PPA	4	3	47	0	1	22	0	0	21	0

Sage-Grouse

According to the PAC there is approximately 31,531 acres of PPH (100 percent) within the PPA; however, current weed infestations and juniper encroachment may limit GRSG habitat (see **Table 4-62**). The current ESI data layer covers 51.5 percent of the PPA (approximately 16,257 acres).

Table 4-62
Clover Flat Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1121-01	Red Knoll Reservoir	Occupied
LA1121-02	Tucker Hill Medusahead	Occupied
LA0928-01	Juniper Creek	Occupied
LA1180-01	Red Knoll Northwest	Unoccupied-Pending
LA1135-01	O'Leary Reservoir	Historical

GRSG abundance within the PPA is showing a slow decline, due in part, to the conversion and establishment of non-suitable habitat. Conifer encroachment and annual invasive species are key drivers in plant community conversions. This population is relatively isolated and further loss of habitat may extirpate GRSG from the PPA.

Vegetation

Vegetation within the project area varies substantially from the high elevation forests to low elevation marsh and grasslands. Native plants within the general area of the PPA, are considered to be in good vegetative condition. Medusahead infestations are present and occur in the PPA, Typical vegetation for the project area consists of rolling hills and benches covered with low and mountain big sagebrush. In the warm-dry soils there is an invasive annual grass understory while in the cool-moist soils there is a native bunchgrass understory.

In addition to displacing plant communities such as sagebrush and being implicated in the increasing distribution of invasive plants such as cheatgrass (*Bromus tectorum*), encroaching woodlands also increase fuel loads, thereby leading to changes in fire regimes. Across the PPA conifer expansion into sagebrush types at mid to high elevations also result in a reduction of the native grass, forb, and shrub species associated with these types. Currently conifer expansion into the PPA is impacting approximately 9,000 acres, and includes all ownership types. The NRCS has implemented conifer reduction starting in 2012, approximately 10,000 acres have been treated in and around the PPA.

Dominant Native Vegetation

Vegetation within the project area varies substantially from the high elevation forests to low elevation marsh and grasslands. Native plants within the general area of the PPA, except for the medusahead infestations, are considered to be in good vegetative condition. Typical vegetation for the project area consists of rolling hills and benches covered with low and mountain big sagebrush. There is scattered juniper on some of the rocky ridges and scattered across the upper elevations. Some scattered ponderosa pine extends down from the highest elevations and is mixed with juniper woodlands. The soils are thin but support tall sagebrush, as well as low sagebrush, and diversity increases in the steep rocky areas near the hill tops where juniper, gooseberry and long-flowered snowberry can be found. Native bunchgrasses in the area are bluebunch wheatgrass, Idaho fescue, needle-and-thread grass, Thurber's needlegrass, great basin wildrye, Sandberg bluegrass, squirrel-tail and Indian rice grass. Other shrubs include green rabbitbrush, spiny hopsage, and gray horsebrush. Medusahead as well as other introduced species are prevalent, including mediterranean sage, thistle, tumble mustard, cheatgrass, and bur buttercup. In areas where there is no medusahead infestation, forbs are abundant, including desert parsley, milkvetch, lupine, arrow-leaf balsamroot, death camas, larkspur, saxifrage, clover and desert primrose, as well as the cultural plants mentioned below.

Invasive Plants

The current local invasive plant data has documented 5,396 acres of medusahead rye in 105 separate infestation sites. There are also other invasive species such as Mediterranean sage (55 documented acres), Canada thistle (two acres), bull thistle (six acres), and cocklebur species (12 acres). Other nonnative invasive winter annual grass species cheatgrass and North African wire grass are known to exist within the PPA, however no formal survey has taken place to map these species.

Fire

The current fire regime falls in the category IV; however, shorter intervals than 35 years can probably occur. There is a variety of soil temperature moist regimes including cool-moist soils, warm-moist soils, and warm-dry soils. The GRSG population is stable to slightly declining. This area likely provides the seasonal life requisites for breeding, brood rearing, and winter habitat (see **Table 4-63**).

Table 4-63
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	0.0
High and Very High Burn Probability in PPA (percent)	0.0

Fire Regime IV (Stand Replacement, 35–100+ Years)
Mountain and sage shrublands, semi-desert shrub and grasslands, mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter stand replacement intervals less than 35 years may occur.

Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and resilient to disturbance.

Management Strategies

Treatments
Within the PPA one fire has been documented consisting of 78 acres. In addition one recent prescribed burn was implemented as a fuels project to reduce the thatch of invasive annual grass species. This project burned 430 acres and was followed up with glyphosate applications and reseeding/transplanting efforts

Annual grass reduction and containment projects have taken place on BLM and adjacent ownerships. These projects have consisted of herbicide applications, burning and re-seeing efforts. The BLM treatments have been less successful due to the lack of effective herbicides available to the BLM in the past.

Other Relevant Management Activities or Issues
The GRSG population in this PPA is isolated with apparent poor connectivity and high risk of extirpation. Large pockets of invasive annual grasses exist within this area. Existing juniper and encroachment is a concern for fire and habitat loss.

Fuels Management
The main management activities will focus on juniper treatments. This will prevent a fire from spreading to or coming from the nearby Fremont National Forest (see **Table 4-64**).

Table 4-64
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	29.37	0	0	29.37

Fuel's Management activities include:

- Phase I and phase II Juniper treatments (removal)
  - Pre-burn evaluation to determine if the risk of cheatgrass or other invasive weeds is minimal.
  - The reduction of juniper expansion will also aid in improving the GRSG habitat.
- Green striping along Clover Flat Road using seed appropriate to the ecoregion when available (20-30 feet width should be sufficient considering the existing road). Fire breaks or green-stripping along existing roadways to provide a fuel break and safe zone from which to fight fire. One of the suggested species for green stripping is Sandburg's bluegrass (*poa secunda).*
  - Use native species like Sandburg's bluegrass unless there is no native species available in which crested wheat may be used in fuel breaks where annual grasses are prevalent.
- Fuel treatments will be coordinated across jurisdictional boundaries and private ownership by partnering with the US Forest Service, Private landowners and the NRCS.

Habitat Restoration and Recovery
Opportunities for habitat restoration to protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have: 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and >6,000 feet elevation. Restoration treatments would be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity because of lack of precipitation for plant growth and drier conditions from southerly aspect. This PPA is not located on the border of any other district for coordination of projects; however, there are several private landowners and the US Forest Service that could participate in cooperative restoration efforts.

Key threats to GRSG habitat are invasion of exotic grasses, large-scale wildfires, and encroachment of conifers. The priority for the PPA includes containment of current invasive annual grasses. Opportunities for habitat restoration and recovery within the PPA could be implemented; however other areas may be more effective at providing important connectivity and offer chances for GRSG population expansion. There is limited information regarding GRSG connectivity to other PPAs. In general, restoration and rehabilitation within the area has had mixed results. Clover Flat is comparatively lower priority compared to the North Warner PPA.

Invasive Plant Management

For areas that are not infested with invasive species, an aggressive early detection rapid response effort will be needed to keep these invasive annual grass species from invading intact plant communities.

The most successful and efficient method for managing weeds is prevention of invasion. To help with prevention a cooperative weed management area was established, which promotes education and early detection of new sites before they become too large and costly to manage. Systematic and strategic detection surveys should be developed and conducted in a manner maximizing the likelihood of finding new patches before they expand. Once small patches are located, seed production should be stopped and the weeds should be eradicated.

The already present nonnative invasive winter annual grass species are a high risk for the current GRSG habitat. In order to contain and control these winter annual grass species large scale vegetation restoration efforts will need to take place and consist of herbicide application and re-seeding efforts. Approximately 5,396 will need to have herbicide applications followed by reseeding/transplant restoration effort. The main goal of the treatment will not be to completely eradicate all existing infestations, since with infestations may already be too large and costly to eradicate. However, successful containment would be feasible by applying herbicides and restoration efforts. The most successful containment strategy will be to boarder spray infestations, Planting aggressive plants as a barrier, establish seed feeding biological control agents, and grazing weeds to minimize seed production.

Areas with an adequate understory of desired vegetation should be identified and prioritized as high for control since they have higher likelihood of successful rehabilitation than areas where the desired species are completely displaced. The seeding of perennial herbaceous species may be required where cover, density and species composition of these species in inadequate. Seeding and/or transplanting sagebrush for restoring GRSG habitat will also be needed. Success will likely require more than one intervention due to low and variable precipitation. The species of choice should include these with similar niche as the invasive weeds. The goal should be to maximize niche occupation with desired species.

Since there is such a large amount of nonnative winter annual grass species within in this project area and some of the areas that would be targeted for annual grass removal is with in warm/dry soils there is a risk that the restoration activities may not be highly successful. However, containment of the large infestation is a must to prevent the large infestations from continually spreading across the jurisdictional boundaries to private and other federally managed lands. There are many private landowners along with the US Forest Service that have been working diligently to contain their infestation. The project would greatly complement the work that is already being implemented to reduce annual grasses within the PPAs.

During all restoration activities all equipment should remain clean and as weed free as possible. The Lakeview District implements a Weed Prevention Program that is updated every few years to help the staff prevent spreading weeds and invasive species. The BLM weed program should strive to keep weed infestations along roads low, which will prevent future spreading.

Juniper treatment of phase I and phase II has been shown to be highly effective at maintaining native shrubs and native bunch grasses, while functionally restoring sagebrush landscapes on many ecological sites. Juniper should be removed near leks in areas where conifer expansion exceeds a four percent threshold. The removal of slash for phase I and Phase II juniper projects in areas with intact sagebrush communities hand pile burning is the most appropriate method. Mechanical treatment for juniper reduction would not occur due to the risk of disturbance on the warm-dry and cool-dry soils. Burning should take place in the winter months when soil tends to be frozen but the moisture content of the trees is low. Seeding prior to juniper treatment should be considered when current perennial grass community is in poor condition or if exotic annual grasses are present. Broadcast seeding prior to soil disturbance or under slash may increase the chances of establishment. Length of rest from grazing following treatment will depend of understory composition at the time of treatment and response of desirable vegetation following treatment. This typically varies from less than one to more than three years (see **Table 4-65**).

Table 4-65
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	31,531	17,941	0	49,472
Percent of PPA	100.00	56.90	0	156.90

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Fire Operations

The PPA is all considered Priority 1 due to the small operational size, proximity to the Forest Service and private agricultural communities and lands (see **Table 4-66**).

Table 4-66
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	31,524	0	0	31,524
Percent of PPA	100	0	0	100

Post-Fire Rehabilitation Management

- Natural sagebrush recovery is not likely, especially in the warm/dry soils. Perennial herbaceous species are typically inadequate for recovery. Risk of invasive annual grasses is high. Since there is already a large amount of invasive annual grasses present within and around the assessment area. Fire restoration plans should include application of imazapic to prevent larger infestation from establishing.
- Areas that have higher elevations with cool/ moist soils may need to be restored by imazapic applications followed by natural recovery of the present native vegetation.
- Areas with cool/warm dry soils or areas with previous annual grass invasions will need additional restoration efforts. After imazapic applications, seeding perennial herbaceous species will be required where cover, density and species composition of these species isin inadequate for recovery. Seeding and/or transplanting sagebrush as soon as possible is necessary for rehabilitating GRSG habitat.
- Follow up treatments of imazapic will be needed to continue to reduce the invasive annual grass species for several years after the fire due to the large seed bank that is already present in the assessment area.
- Once native grasses and shrubs have been successfully restored, native forb species could be incorporated to improve GRSG habitat and plant diversity. Treatments would be focused near the center of the assessment area around leks. Thinning and drilling would occur where applicable in the following years after the fire.
- Vehicles used in or around these medusahead sites would be washed before leaving the site in an effort to reduce the spread of medusahead seed.
- During the restoration process custom seed mixed could be used to make fuels breaks along roads. This would help prevent/ slow down future large fires within the PPA.
- Local seed will be collected and grown out for restoration projects. Seed collection and local storage would provide tools for active restoration. Seeding or transplanting of sagebrush may be needed to accelerate establishment of sagebrush species. Livestock grazing rest will be needed until the restored native plants are strong enough to with stand grazing.
- Fire restoration efforts would be coordinated with private landowners and the adjacent US Forest Service managed properties. To reduce herbicide application cost, the same commercial applicator could be used across the ownerships. Land managers

could use similar or complementary seed mixes and share equipment during restoration efforts (see **Table 4-67**).

Table 4-67
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	31,529	0	0	31,529
Percent of PPA	100	0	0	100

Potential Seed Species

Grasses:

- Bottlebrush squirreltail *Sitanion hystrix* (*Elymus elymoides*)
- Idaho fescue *Festuca idahoensis*
- Bluebunch wheatgrass *Agropyron spicatum* (*Pseudoroegneria spicata*)
- Great Basin wild rye *Elymus cinereus* (*Leymus cinereus*)
- Tridicale *Triticum aestivum* x *Secale cereale*
- Regreen *Triticum aestivum* x *Elytrigia elongata*
- Cereal Rye Secale Cereale
- Crested Wheatgrass *Agropyron cristatum*

Forbs:

- Milkvetch *Astraglus purshii*, *A. obscurus*, *A. filipes*
- Big-headed clover *Trifolium macrocephalum*
- Phlox *Phlox longifolia*, *A. diffusa P gracilis* (*Microsteris gracilis*)
- Desert parsley *Lomatium macrocarpum*, *L. nevadense*
- *L. nudicaule*, *L. canbyi*
- Hawksbeard, *Crepis acuminatum*
- False dandelion *Agoserus heterophylla* and other species
- *Arabis Arabis* species
- Buckwheat *Erigonum corymbosus*, *E. umbellatum*
- Blue Mt prairie clover *Petalostemon ornatum* (*Dalea ornate*)
- Alfalfa *Medicago sativa*
- Small Burnet *Sanguisorba minor*

Shrubs:

- Low sagebrush *Artemisia arbuscula*
- Green rabbit brush *Chrysothamnus viscidiflorus*
- Gray horsebrush *Tetradymia canescens*

Proposed Management

See **Table 4-68** for projects that have been identified presently within the NEPA planning process. See **Figures 4-36** through **4-40** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-68
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 (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]
Clover Flat Fuels 1	32	X			X						X	X		X		5	3-5
Past Invasive Annual Grass Control	1,200	X				X				X			I	X		5-20	0-5
Clover Flat Invasives 1	31,530	X				X			X			X		X		5-20	3-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.9 Gravelly

Project Planning Area Description

General Site Description

The planning location of the Gravelly PPA falls within the Lakeview BLM District and is near the Nevada/ Oregon border. The Gravelly PPA is a total of 29,421 acres, and consists of the following ownerships: 26,737 acres of BLM and 5,561 acres of private. The majority of precipitation falls as snow, with higher elevations receiving greater depths of snow. Total annual precipitation ranges from 11-21 inches. Elevation ranges from 4,462 to 6,600 feet, with predominately north facing aspects.

The dominant soils are warm/cool and dry with low resilience. Effective precipitation limits site productivity. Decreases in site productivity, herbaceous perennial species, and ecological conditions further decrease resilience. Resistance due to the soil type is moderate to low. The PPA has a high climate suitability to cheatgrass and other invasive annual grasses. Resistance generally decreases as soil temperature increases, but establishment and growth are highly dependent on precipitation (see **Table 4-69**).

Table 4-69
Gravelly Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	3,816	0	786	856	0	8,292	9,103	0	5,102	4,342
Percent of PPA	12	0	2	3	0	26	28	0	16	13

Sage-Grouse

Available GRSG telemetry data shows an exchange of birds with the South Warner Planning Project Area and frequently move into the Vya PPA in Nevada and California. GRSG seasonal habitat use within the PPA includes breeding, brood-rearing, and winter refuge. The population trend is stable; however, conifer encroachment if left unchecked will continue to impact the surrounding area (see **Table 4-70**).

Table 4-70
Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1209-01	Gravelly 87	Occupied
LA1106-02	Gravelly 89	Occupied
LA1106-01	Terry Spring	Occupied Pending
LA1152-01	Gravelly 78	Unoccupied Pending
LA1154-01	East May Lake	Unoccupied Pending
LA1156-01	Gravelly 91	Unoccupied Pending
LA1187-01	Gravelly 79	Unoccupied Pending
LA1188-01	Gravelly 88	Unoccupied Pending
LA1213-01	Gravelly 80	Unoccupied Pending

Vegetation

Elevation ranges from 5,000-6,000 feet and drops from the state line going north. The main concern is the conifer encroachment in areas. Some cheatgrass occurs in the understory of sagebrush, but tends to only be in disturbance areas such as along roads. Some perennial pepperweed occurs in the southwest corner of the PPA.

Dominant Native Vegetation

The ESI also compares the current plant composition to a defined Potential Natural Plant Community for the identified soil type and precipitation zone. About 19 percent of the PPA is in the mid-seral condition and 32 percent is in the late seral condition. Most of the late seral acreage is in the low sagebrush/Sandberg's bluegrass type. The 18 percent in the early seral stage are shrub communities with either no understory or cheatgrass understory. These communities are in the northern part of Coleman Lake Pasture and close to the private irrigated meadows in Warner Valley. These areas were heavily grazed historically resulting in the loss of perennial grasses. These communities are now stable, but would require brush control and reseeding to restore the perennial grass understory and improve the ecological condition rating (see **Table 4-71**).

Table 4-71
Gravelly PPA Vegetation Types

Vegetation Type	Acres	Percent of Planning Area
Grasses		
AGSP* Bluebunch wheatgrass	69	T
DISP Inland saltgrass	484	1
Grass Total	**553**	**1**
Shrubs		
CHVI-Green rabbitbrush	274	1
Shrubs/Grasses		
ATCO-BRTE Shadscale saltbush/cheatgrass	563	2
ATCO-SIHY Shadscale saltbush /bottlebrush squirreltail	1296	3
GRSP-SIHY Spiney hopsage//bottlebrush squirreltail	576	2
SAVE-DISP Greasewood/ Inland saltgrass	292	1
Shrub/Grass Total	**2,727**	**7**
Low sagebrush/Grass		
ARAR-POSE Low sagebrush/Sandberg bluegrass	12,407	34
Big Sagebrush		
ATTR2 Big Sagebrush	3,123	8
Big Sagebrush/Grass		
ARTR2-AGSP Big Sagebrush/blue bunch wheatgrass	727	2
ARTR2-BRTE Big Sagebrush/cheatgrass	2,762	7
ARTR2-POSE Big Sagebrush/ Sandberg bluegrass	2,748	7
Big Sagebrush/Grass Total	**6,237**	**17**
Wyoming Big Sagebrush/Grass		
ARTRW-BRTE Wyoming big sagebrush/cheatgrass	367	1
Mountain Big Sage/Grass		
ARTRV-POA++Mountain big sagebrush/bluegrass	863	2
Tree		
JUOC- ARTR2-AGSP Western Juniper/big sagebrush/bluebunch wheatgrass	247	1
Total Vegetation	**26,798**	**72**
Playa	2,103	6
Inclusions**	4,805	13
Incomplete	3,309	9
Planning Area Total	**37,015**	

Invasive Plants

The following noxious weed species are known to exist across the PPA: halogeton *(Halogeton glomeratus (*m. Bieb.) C.A. Mey), Russian knapweed *(Acroptilon repens (L.) DC.),* bull thistle *(Cirsium vulgare* (Savi) Ten.*),* hoary Cress *(Cardaria draba (L.) Desv.),* perennial pepperweed (*Lipidium latifolium* L.), Mediterranean sage (*Salvia aethiopis* L.), Canada thistle (*Cirsium arvense* (L.)Scop.), spiny cocklebur (*Xanthium spinosum* L.), Scotch thistle *(Onopordum acanthium* L.) and Dyer's woad *(Isatis tinctoria* L.). The majority of these noxious weeds are present along roads, right-of-ways, riparian areas, and exclosures.

There are several spring exclosures within the allotments that have large Canadian thistle infestations. These areas are currently being managed through biological *(Ceutorhynchus litura and Urophora cardui),* chemical, mechanical and cultural control methods.

One of the largest infestations of invasive species is located on the south east portion of the PPA and is perennial pepperweed. The majority of the infestation is located on private land and through the Lake County Cooperative Weed Management Area, this infestation is being contained.

Mountain and Sage Shrublands, Semi-desert Shrub and Grasslands

Mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter intervals than 35 years can probably occur (see **Table 4-72**).

Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and giving them a greater potential to burn more often than semi-desert systems.

Table 4-72
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	12,033
High and Very High Burn Probability in PPA (percent)	37.9

Past Fires and Fuels Projects

One historic fire consisting of 170 acres took place over 20 years ago in the PPA.

Management Strategies

Treatments

Nonnative invasive species are currently being managed under an integrated weed management plan that promotes early detection, rapid response for controlling small isolated infestations. Annual grass reductions are also promoted within this integrated weed management plan. Currently the Perennial pepperweed located in the southeast corner of the PPA is being managed through the Lake County Cooperative Weed Management Areas to prevent the spread across the PPA.

Other Relevant Management Activities or Issues

The Gravelly PPA has a high population of GRSG and good connectivity to adjacent areas. Threats to this PPA are juniper encroachment and cheatgrass.

Fuels Management

The main management activities would be focused on Juniper treatments. Conifer reduction areas occur along the Stateline and going to the northern parts of the PPA. All encroachment is in phase I and phase II. Piling with machinery in the nearby South Warner Pac has been successful and does not appear to be spreading cheatgrass, but more baseline data is needed to ensure success in future treatments (see **Table 4-73**).

Table 4-73
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	14.60	9.65	0	24.25

Fuel's Management activities include:

- Fuels treatments will be coordinated across property jurisdictional boundaries and ownership by partnering with the neighboring Cedarville Resource Area, Private landowners and the NRCS.
- A combination of fuels reduction techniques will be used such as mechanical juniper reduction using hand cutting and mechanical piling of trees, prescribed fire to treat the cut juniper.

Habitat Restoration and Recovery

Opportunities for habitat restoration to protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and >6,000 feet elevation. Restoration treatments would be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity due to lack of precipitation for plant growth and drier conditions from southerly aspect. This PPA is located on the border of

Nevada and private landowners, and a coordinated approach can be used inis restoration efforts.

For areas that are not infested with invasive species, an aggressive early detection rapid response effort will be needed to keep nonnative invasive annual grass species from invading intact plant communities.

The most successful and efficient method for managing weeds is prevention of invasion. To help with prevention a cooperative weed management area was established, which promotes education and early detection of new sites before they become too large and costly to manage. Systematic and strategic detection surveys should be developed and conducted in a manner maximizing the likelihood of finding new patches before they expand. Once small patches are located, seed production should be stopped and the weeds should be eradicated.

The present nonnative invasive winter annual grass presence within the PPA is moderate with the majority of the infestations being located in the lower elevations of the northern portion of the PPA. These annual grasses pose a high risk to current GRSG habitat. In order to contain and control these winter annual grass species herbicide applications followed up with restoration efforts are necessary (see **Table 4-74**).

Table 4-74
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	27,260	33,205	0	60,464
Percent of PPA	84.40	102.81	0	187.21

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Fire Operations

Priority 1 for the area is the 3C and 2C habitat interface which is intact sagebrush and beyond the PPA to the east which would have the potential of carrying fire into the larger intact habitat of the Beaty Butte PPA. 2nd Priority is on the south edge at the border with the Surprise Field Office and is typically 1B and 1C habitat areas at higher elevation. Also a 2nd Priority is a small, developed agricultural area to the north side of the PPA (see **Table 4-75**).

Table 4-75
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	39,730	2,795	0	42,525
Percent of PPA	123.0	8.7	0	131.7

Post-Fire Rehabilitation Management

If a fire occurred, the areas with Wyoming big sagebrush would likely convert to annual invasives. Post-fire treatments would include herbicide application of the pre-emergent chemical imazapic to any burnt Wyoming big sagebrush stands, or areas with invasive annual grass species documented. Burned areas would be seeded in a mosaic pattern to mimic natural stands. Adaptive management methods will be implemented. Treatments of imazapic will be needed to continue to reduce the invasive annual grass species. The imazapic application should take place soon after the fire. Inactive and follow up treatments may be applied for several years after the fire. Seeding perennial herbaceous species will be required where cover, density and species composition of these species is inadequate for recovery. Seeding and/or transplanting sagebrush following fire is necessary to combat cheatgrass and annual conversions in GRSG habitat. Once native grasses and shrubs have been successfully restored, native forb species can be incorporated to improve GRSG habitat and plant diversity. Thinning and drilling will occur where applicable in the following years after the fire. All fire restoration efforts will be coordinated with adjacent landowners and agencies. Different states have different guidelines regarding herbicide applications. This PPA is on the Nevada boarder therefore herbicide applications may differ across Nevada and Oregon. Sharing information and techniques will be helpful for all parties involved (see **Table 4-76**).

Table 4-76
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	16,123	13,408	2,766	32,297
Percent of PPA	49.9	41.5	8.6	100

Proposed Management

See **Table 4-77** for projects that have been identified presently within the NEPA planning process. See **Figures 4-41** through **4-45** for a graphic depiction of the proposed treatments and strategies in the PPA.

4.2.10 North Warner

Project Planning Area Description

General Site Description

The planning location of the North Warner PPA falls within the Lakeview BLM District and is approximately 50 miles Northeast of Lakeview. The North Warner PPA encompasses a total of 293,401 acres, and consists of the following ownerships: 222,520 acres of BLM; 63,207 acres of private; 7,022 acres of state; and 654 acres of National Forest System Lands. The majority of precipitation falls as snow, with higher elevations receiving greater depths of snow. Total annual precipitation ranges from 11-21 inches. Elevation ranges from 4,249-8,389.

Table 4-77
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 (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]
Invasive Annual Grass Species	32,297	X				X				X		X	X	X		5-20	0-5
Current/ Past Invasive Plant Management	25	X					X			X			X	X		5-20	0-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

The majority of the North Warner PPA is classified as having cool and dry soils where resilience is low. Effective precipitation limits site productivity. Decreases in site productivity, herbaceous perennial species, and ecological conditions further decrease resilience. Resistance due to the soil type is moderate to low. The PPA has high climate suitability to cheatgrass and other invasive annual grasses. Resistance generally decreases as soil temperature increases, but establishment and growth are highly dependent on precipitation (see **Table 4-78**).

Table 4-78
North Warner Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	5,598	1,552	32,068	4,917	106	36,139	185,757	0	1,377	25,887
Percent of PPA	2	1	11	2	0	12	63	0	0	9

Sage-Grouse

Sage-grouse population trend is stable within the North Warner PPA, available telemetry data shows an exchange of birds to the South Warner Planning Area; these two planning areas provide habitat connectivity. The North Warner PPA provides the necessary seasonal life requisites for GRSG and is an important

1 population stronghold. Maintaining and protecting the existing intact habitat will
2 likely continue to sustain the stable abundance of GRSG (see **Table 4-79**).

Table 4-79
Greater Sage-Grouse Leks found within the bounds of the North Warner Project Planning Area

ODFW Site ID	Lek Name	Conservation Status
LA1126-01	Honey Creek North	Occupied Pending
LA1141-01	Paddy's Lake Northeast	Occupied Pending
LA1142-01	Horn Spring	Unoccupied Pending
LA1143-01	Lynch Cow Camp	Occupied
LA1165-01	Fish Lake Southeast	Occupied Pending
LA1173-01	Taylor Ranch South #1	Occupied Pending
LA1173-02	Taylor Ranch South #2	Occupied Pending
LA1176-01	South Honey Creek #1	Occupied
LA1176-02	South Honey Creek #2	Occupied
LA1176-03	South Honey Creek #3	Occupied
LA1177-01	Rabbit Creek North #1	Occupied
LA1177-02	Rabbit Creek North #3	Occupied
LA1183-01	Mule Lake East #1	Occupied Pending
LA1186-01	Sid Luce Reservoir East #1	Occupied Pending
LA1195-01	Drakes Flat Powerline	Occupied
LA1234-01	Lane	Occupied Pending
LA1234-02	Lane #2	Unoccupied
LA1153-01	North Abert Rim #1	Occupied Pending
LA1153-02	North Abert Rim #3	Occupied Pending
LA1153-04	North Abert Rim #4	Occupied Pending
LA1179-01	Fish Creek Warner	Occupied Pending
LA1192-01	Radio Tower South #1	Occupied Pending
LA1192-02	Radio Tower South #2	Occupied Pending
LA1196-01	Fish Lake Northeast	Occupied Pending
LA1208-01	Crump Reservoir	Occupied Pending
LA1208-03	Crump Reservoir South	Occupied Pending
LA1208-04	Crump Reservoir Southeast	Occupied Pending
LA1210-01	Binkey Lake West	Occupied Pending
LA1226-01	Binkey Lake North	Occupied Pending
LA1236-01	Clover Creek	Occupied Pending
LA1129-01	South Miners Draw	Unoccupied Pending
LA1134-01	Lynch Cow Camp Spring #4	Unoccupied Pending
LA1136-01	South Commodore Ridge	Unoccupied Pending
LA1145-01	Lf1	Unoccupied Pending
LA1151-01	Fitzgerald Ranch South	Unoccupied Pending
LA1166-01	Featherbed Lake East	Unoccupied Pending
LA1167-01	Twin Lakes East #1	Unoccupied Pending
LA1167-02	Twin Lakes East #2	Unoccupied Pending
LA1167-03	Twin Lakes East #3	Unoccupied Pending
LA1172-01	Cement Springs	Unoccupied Pending
LA1178-01	Windy Hollow Draw East	Unoccupied Pending
LA1182-01	Twin Lakes Northeast	Unoccupied Pending
LA1185-01	Southwest Bull Lake	Unoccupied Pending
LA1189-01	Dent Draw	Unoccupied Pending
LA1190-01	South Anthony Spring	Unoccupied Pending

Table 4-79
Greater Sage-Grouse Leks found within the bounds of the North Warner Project Planning Area

ODFW Site ID	Lek Name	Conservation Status
LA1194-01	East Luce Reservoir	Unoccupied Pending
LA1203-01	East Lynch Cow Camp Spring	Unoccupied Pending
LA1216-01	South Lynch Cow Camp Spring	Unoccupied Pending
LA1230-01	Mcdowell Creek	Unoccupied Pending
LA1208-02	Crump Reservoir West	Occupied Pending

Vegetation

Vegetation is predominately low sage and Wyoming big sagebrush in the higher elevation areas. There are scattered infestations of cheatgrass across the PPA. Within the historic burned area small controllable infestations of medusahead have begun to invade and are high priority to contain and control within the project area. Trace amounts of North African wire grass, a new invasive species to the Lakeview Resource Area, have also begun to invade the project area and will be controlled through an early detection rapid response program.

Dominant Native Vegetation

There is high connectivity in the far northern areas of the PPA. Vegetation is predominately low sagebrush and Wyoming big sagebrush in the higher elevation areas. Aspect will be important to consider in areas along the forest fringe.

Invasive Plants

The North Warner PPA is considered one of the highest priorities for control, and containment of winter annual grass species. Some medusahead and cheatgrass are present within the area. Extensive surveys for invasive annual grass species began three years ago and approximately one third of the PPA has been mapped for annual grasses. The known invasive winter annual grasses are medusahead rye, North Africa grass and cheatgrass. All of the annual greases that have been documented are considered small enough that they can be contained and controlled. The majority of infestations are residing in past wildfires and along transportation corridors.

Besides invasive winter annual grasses, other nonnative invasive species have been documented within the North Warner PPAs. There is a large amount of Mediterranean sage and whitetop species that are invading the PPA. Both of these species have potential to degrade GRSG habitat if control measures are not taken to reduce the populations. Several thistle species such as Canada thistle, bull thistle and Scotch thistle are scattered across the PPA, many in riparian areas and near water developments.

Fire

The current fire regime falls in the category IV however, shorter intervals than 35 years can probably occur. The northern portions of the PPA have had multiple wildfires covering over 15,000 acres. These areas have been converted to crested wheat seedings and are being invaded by invasive annual grasses. The majority of the North Warner PPA is classified as warm/cool and dry soils, with the high elevation areas consisting of cool/cold and moist soils (see **Table 4-80**).

Table 4-80
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	21,833
High and Very High Burn Probability in PPA (percent)	7.5

Mountain and sage shrublands, semi-desert shrub and grasslands
are classified under Fire Regime IV; however, shorter intervals than 35 years can probably occur. Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and giving them a greater potential to burn more often than semi-desert systems

Past Fire and Fuels
The Snyder Creek Restoration Project took place in this PAC starting in 2007 and was completed in 2011. The project area is characterized by checkerboard ownership of BLM and private lands made up of sage, bitterbrush, mahogany, bunchgrasses and aspen. All of these areas are experiencing juniper encroachment at the phase I or phase II level.

The project was designed as a landscape restoration project that included 3,425 acres of BLM administered lands and 984 acres of private land. Working with private landowners, the Watershed Council and NRCS Lakeview BLM was able to cut and burn across ownership boundaries to effectively treat the entire watershed. The treatment included hand and mechanical treatments with burning occurring one to two years after the cutting. The objectives for the burning were to reduce the cut juniper by 40-80 percent and to remove all of the limbs to below four feet eliminating potential raptor perches. Juniper was jackpot burned when snow was present or the ground was frozen. This helped protect the native vegetation. During the 2010 GRSG brood rearing season GRSG broods were observed using the treatment area.

Management Strategies

Treatments

Invasive species surveys are occurring across the entire North Warner PPA. High priority areas have large nonnative invasive annual grass populations. The goal of this survey project is to develop a containment/management plan for the existing invasive species. Treatments will consist of herbicide applications followed by restoration if needed. Canada thistle has become an issue in many of the riparian areas and springs within the PPA. Biological control agents have been releases and are being monitored annually for success.

Other Relevant Management Activities or Issues

Within the North Warner PPA, the overall management goal is to maintain and protect existing intact habitat. The highest threats within the PPA are juniper encroachment and nonnative invasive annual grasses.

Fuels Management

The main management activities will focus on juniper treatments. Juniper treatments will occur in the southern two thirds of the PPA. Encroachment is in phase I and phase II stages and starting to spread into lower elevation rangeland. Mechanical and hand treatments will be applied. At this time no fuel breaks have been identified, however, green striping and fuel breaks are appropriate options for this PPA (see **Table 4-81**).

Table 4-81
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	0	167.22	0	167.22

Fuel's Management activities include:

- Green striping along power line road, the Snyder Creek road and several main roads in the northern part of the PPA using seed appropriate to the ecoregion when available (20-30 feet width should be sufficient considering the existing road). Firebreaks or green-stripping along existing roadways to provide fuel breaks and safe zones from which to fight fire. One of the suggested species for green stripping is Sandburg's bluegrass (*poa secunda).*
- Fuel treatments will be coordinated across property jurisdictional boundaries and ownership by partnering with the US Forest Service, private landowners and the NRCS.

Habitat Restoration and Recovery

Opportunities for habitat restoration to protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and at elevations greater than 6,000 feet. Restoration treatments will be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity due to a lack of precipitation for plant growth and drier conditions from southerly aspect. This PPA is not located on the border of any other district for coordination of projects; however, there are several private landowners and the US Forest Service that could participate in cooperative restoration efforts.

Phase I and phase II juniper treatments are planned throughout the area.

- Phase I and phase II Juniper treatments (removal)
  - Pre-burn evaluation to determine that the risk of cheatgrass or other invasive weed is minimal.
  - The reduction of juniper expansion will also aid in improving the GRSG habitat.

Invasive Species

The area currently has a very manageable amount of nonnative winter annual grass infestation. The majority of the infestations are small and wide spread. The Most successful and efficient method for managing invasive species is prevention of invasion. To prevent invasion of invasive species all roads will be surveyed and any invasive species found will be managed to prevent future spread. All BLM staff will follow the most updated weed prevention schedule to prevent spreading weeds during restoration activities.

The areas that have been surveyed and have existing invasive infestations should be aggressively managed and contained through the BLMs Integrated Weed Management Program. The majority of the invasive annual grasses are infesting the warm/cool and dry soils. Control efforts will consist of herbicide applications, biological control efforts, and manual control of small infestations followed by re-seeding efforts.

All invasive annual grass control efforts will be coordinated with the other landowners within the PPA (Private, State and Federal). Currently, the Lake County Cooperative Weed Management Area has been assisting all of the landowners in planning weed control and restoration efforts within the PPA.

Key Threats to GRSG habitat are invasions of nonnative invasive annual grasses, large-scale wildfires, and encroachment of conifers. Several opportunities for habitat restoration and recovery within PPA could be implemented (see **Table 4-82**).

Table 4-82
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	488,835	0	488,835
Percent of PPA	0	166.61	0	166.61

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Fire Operations

Priority 1 areas for fire operations are on the eastern edge of the PPA at the interface between 2C (west) and 3C (east) GRSG habitat designations. These are areas of Wyoming Big Sage at lower elevations that would carry fire into the adjacent low and mixed sage areas. The rest of the PPA, which is the second priority is at higher elevation and further to the west is bounded by a west facing escarpment. The habitat to the west, at higher elevations, is at less risk and at mid-elevation to the east is low and mixed sage which typically does not carry fire (see **Table 4-83**).

Table 4-83
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	44,057	249,344	0	293,401
Percent of PPA	15.0	85.0	0	100

Post-Fire Rehabilitation Management

The areas that are in higher elevation (over 5,500) and cool/cold and moist soils are going to be the most resistant to annual grasses and have the highest likelihood of recovering naturally as long as annual grasses have not invaded the area prior to the fire. These areas will be allowed passive restoration, and will be monitored to see if additional restoration is needed.

For areas with warm/cool and dry soils, an active restoration approach will be need. These areas will be prone to annual grass invasions after fires, therefore imazapic applications will be applied as soon as possible after the fire is no longer active. These applications should be made before the annual grasses have a chance to germinate. To encourage competition against annual grasses native grasses or favorable species will be seeded the following year once annual grasses have been controlled and native grasses have been established. Forbs and shrub species that GRSG prefer will be incorporated through additional seeding or hand planning plugs. Treatments will focus near the center of the PPA around leks.

If fires occur across jurisdictional boundaries, restoration activities should be coordinated with the adjacent landowner or land managing agency (see **Table 4-84**).

Table 4-84
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	232,690	60,715	0	293,405
Percent of PPA	79.3	20.7	0	100

Proposed Management

See **Table 4-85** for projects that have been identified presently within the NEPA planning process. See **Figures 4-46** through **4-50** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-85
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 (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]
Invasive Annual Grass Species	293,398	X				X			X				X	X		5-20	0-5
Current Other Invasive Species Management	100	X					X	X		X			X			5-20	0-5
Snyder Creek 1	1351	X			X					X			X	X		5	3-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.11 Orejana West

Project Planning Area Description

General Site Description

The Orejana West PPA is located in the north east section of the Lakeview District, on the border of the Lakeview and Burns District Boundary. The PPA consist of a total of 123,869 acres broken out by the following ownerships:

122,187 acres of BLM, 761 acres of private, and 1,833 acres of State owned lands.

Elevation within the PPA ranges from 4,478 feet to 5,597 feet with predominantly southeast aspect. The area receives 10-12 inches of precipitation, with most of the precipitation occurring during the winter in the form of snow. Some precipitation occurs during summer and fall in the form of thunderstorms but this precipitation is ineffective for plant growth.

Almost the entire PPA is classified as warm/cool and dry soils with very small areas consisting of cool and moist soils located in drainages. The dominant vegetation is Wyoming big sagebrush *(Artemisia triedentata Nutt. Ssp. wyomingensis)* which has a closing canopy leading to very little understory.

Currently there is a very low amount of invasive species; however, due to the elevation and soil types annual grasses could easily invade this PPA. Only one large fire has taken place within the PPA, however it was 4,858 acres. Conifer expansion is very low in the Orejana West PPA.

Past projects consist of fuel breaks along the roads. The purpose of the fuel breaks in this project area was to create more defensible fire breaks within large tracts of Wyoming big sagebrush habitat. This will increase the ability to contain future wildfire and reduce overall fire size. The current fire regime falls into category IV; however, shorter intervals than 35 years can probably occur. The Orejana West PPA is considered a high priority for sage steppe due to all of the large fires that have taken place east of the planning area (see **Table 4-86**).

Table 4-86
Orejana West Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	2,363	0	0	1,387	0	2,666	103,840	0	2,624	11,902
Percent of PPA	2	0	0	1	0	2	83	0	2	10

Sage-Grouse

According to the PAC there is approximately 270,774 acres of PPH (100 percent) within the PPA. Intact sagebrush with canopy closure, within the PPA, may be compromising understory health; significant loss of habitat (~160,741 acres) occurred during a recent fire east of the PPA. GRSG habitat within the PPA generally provides the seasonal life requisites for sustained population abundance. Conifer encroachment and invasive annuals do not appear to be limiting GRSG populations; however, decadent stands of Wyoming big sagebrush are affecting the understory structures necessary during the breeding season for screening protection (see **Table 4-87**).

Table 4-87
Lek Status

ODFW Site ID	Lek Name	Conservation Status
HA0007-01	Loggerhead	Occupied
HA0041-01	Basin	Occupied Pending
HA0042-01	Monument Reservoir	Occupied Pending
HA0007-02	East Loggerhead	Unoccupied Pending
HA0031-01	North Twin Lakes	Unoccupied Pending

Dominant Native Vegetation

Orejana West PPA is predominately Wyoming big sagebrush, few amounts of cheatgrass (*Bromus tectorum*) have returned after mowing treatments in the past. Fire suppression activities in the past have had an effect on the current vegetation community in that they have been allowed to succeed further towards late successional stages. The Wyoming big sagebrush communities have a closed canopy that has led to the reduction of many of the perennial grasses and forbs that historically served as the understory in this plant community.

Invasive Plants/ Soil Temperature and Moisture Regime

In areas where fuel breaks were created, cheatgrass has invaded, however across the entire planning area invasive species are considered low. Due to the Warm/Cool and Dry soils that dominate the planning area and the closing canopy. It is likely that cheatgrass and other nonnative invasive annual grass species will degrade the habitat if they become established and expand.

Mountain and Sage Shrublands, Semi-desert Shrub and Grasslands

Mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter intervals than 35 years can probably occur.

Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and giving them a greater potential to burn more often than semi-desert systems.

The invasion of cheatgrass into Wyoming big sagebrush/native grassland associated vegetation has altered wildfire dynamics throughout the Great Basin by providing fuel continuity and increasing the fire fuels that carry fires.

Fire History

There has only been one fire consisting of 4,858 acres that has taken place within the Orejana West PPA (see **Table 4-88**).

Table 4-88
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	124,080
High and Very High Burn Probability in PPA (percent)	99.9

Past Treatments

Fuels break mowing has occurred in the recent past along all of the major roads in the PPA.

Management Strategies

Other Relevant Management Activities or Issues

The West Orejana PPA is in close proximity to lost habitat from past fire activity. It is in the highest priority for fire protection due to remoteness and lack of water. There is an interest to conduct test mowing to modify and improve decadent sagebrush to encourage understory growth, and to create firebreaks.

Fuels Management

Fuels break mowing has occurred in the recent past along all of the major roads in the PPA. Conifer encroachment is not a major concern in this area. The main management activities would be focused on the maintenance of the mowed fuel breaks (see **Table 4-89**).

Table 4-89
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	0	258.76	0	258.76

Fuels Management activities may include:

- Green striping along the mowed fire break roads using seed appropriate to the ecoregion when available (20-30ft width should be sufficient considering the existing road). To provide a fuel break and safe zone from which to fight fire. One of the suggested species for green stripping is Sandburg's bluegrass (*poa secunda).*
  - Establish strips no larger than 50 feet on either side of the road will provide foraging for grouse and provide >100 feet of fuel break.
  - Use native species like Sandburg's bluegrass unless there is no native species available in which crested wheat may be used in fuel breaks where annual grasses are prevalent.

- Monitoring for annual grasses will take place within the fuels break areas and selective herbicide application will be made to reduce any annual grass establishments that invade the firebreaks.
- Mowing equipment should all be cleaned prior to entering the PPA to prevent spreading weed seeds from previous projects.

- A combination of fuels reduction techniques will be used such as grazing the mowed fuel breaks to reduce fine fuel build up and green stripping in mowed fuel lines to improve the effectiveness of the fuel breaks.
- Fuels treatments will be coordinated across property jurisdictional boundaries and ownership by partnering with the Neighboring Burns BLM District, Private landowners and the NRCS.

Habitat Restoration and Recovery

Opportunities for habitat restoration to protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and greater than 6,000 feet elevation. Restoration treatments would be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity because of lack of precipitation for plant growth and drier conditions from southerly aspect. This PPA is located on the border of the Burns District, along with private landowners, and a coordinated approach can be used is restoration efforts (see **Table 4-90**).

Table 4-90
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	249,601	0	0	249,601
Percent of PPA	200.03	0	0	200.03

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Due to the thick canopy cover of the Wyoming big sagebrush, small chemical treatments or mowing projects would be researched. These types of treatments would reduce canopy cover and allow native grasses and forbs to reestablish either naturally or through re-seeding/planting efforts. The risk to mowing strips or island to break up the canopy would be additional disturbance in the project area with in the warm/cool and dry soils, which would lead to additional annual grass expansion. To prevent annual grasses from invading the mowed areas, herbicide application may need to follow mowing.

Invasive Plant Management

Since the project area has a low invasive annual grass and noxious weed populations this PPA, these species would be managed through an early detection and rapid response when found. For small isolated infestations of annual grass infestations the most appropriate treatment method would be selective herbicide treatments. For large infestations an integrated weed management strategies will be used to reduce and contain infestations.

Fire Operations

The entire PPA is priority 1 for suppression and protection due to intact (unburned) sagebrush and, at present, controllable cheatgrass in the understory. The Juniper fire encroached with a finger into the area and is the present source of invasives. The PPA is uniform in geography and vegetation and cannot be further prioritized base on resource values. The area is remote and the development of a water source would be beneficial to suppression activities (see **Table 4-91**).

Table 4-91
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	124,781	0	0	124,781
Percent of PPA	100	0	0	100

Post-Fire Rehabilitation Management

Wildfires in low elevation sagebrush habitats may burn nearly all vegetation leading the area unsuitable for sagebrush dependent species for a number of years. This is particularly true in Wyoming big sagebrush types. The historic Wyoming big sagebrush/native grassland vegetation has not been successfully rehabilitated despite large amounts of time and money spent to restore the burned areas. One of the biggest risks to Wyoming big sagebrush communities after drastic wildfires is annual grass invasion. It is crucial to prevent these annual grasses from established within the first two years after the fire. Treatment opportunities would include spraying all areas impacted to reduce invasive species. To restore a Wyoming big sagebrush community it will take several years and methods for success to be achieved and success will greatly depend on moisture available the years following the fire. Following the herbicide application the area will need to be monitored to see if native grasses will be able to recover naturally. Seeding of native species may be needed and if a large shrub component is destroyed during the fire seedling shrubs may also need to be planted. For additional success in rehabilitation projects native seed will be collected near the project area and grown out. Grass and valuable GRSG forbs would both be collected. To assure that the local seed would be available and viable for restoration projects; local seed storage would be needed. Rest from grazing after the fire will be needed until the restored plants have the ability to withstand grazing activities (see **Table 4-92**).

Table 4-92
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	124,781	0	0	124,781
Percent of PPA	100	0	0	100

Proposed Management

See **Table 4-93** for projects that have been identified presently within the NEPA planning process. See **Figures 4-51** through **4-55** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-93
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 (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]
Orejana West Fuels 1		X						X		X			X	X		5	3-5
Orejana West Invasive Annual Grass Management	124,800		X			X			X			X		X		5-20	3-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.12 South Warner

Project Planning Area Description

General Site Description

The planning location of the South Warner PPA falls within the Lakeview BLM District Resource area and is approximately 50 miles east of Lakeview. The South Warner Project Area has a total of 37,513 acres, and consists of the following ownerships: 28,400 acres of BLM, 8,554 acres of private, 221 acres of State, and 304 of National Forest System Lands. The PPA is located in the semiarid rain-shadow region east of the Cascade Mountains and is characterized by cool temperatures, light precipitation, and moderate winds. This area has both maritime and continental climate patterns, with most of the weather patterns moving inland on cyclonic low pressure fronts off the Pacific Coast. Maritime air masses are blocked by the Cascade Mountain Range and the Warner Mountains. This results in the east side of the Warner Mountains receiving slightly less precipitation than the west side. The majority of precipitation falls as snow, with higher elevations receiving greater depths of snow. Some precipitation occurs during the summer and fall in the form of thunderstorms but this precipitation is ineffective for plant growth. Total annual precipitation ranges from 11-21 inches. Elevations within the Project Area range from 4,485-6,368 feet with the average elevation around 5,700 feet. Eighty-three percent the Project Area lies at elevations above 5,700 feet

Temperature also varies widely, both seasonally and by elevation. Summer highs can exceed 100 degrees F in the lower elevations and winter lows below 0 degrees F can occur at all elevations. Freezing temperatures can occur any time of the year, especially at higher elevations. Higher elevation areas have a progressively shorter growing season, especially above the 6,000 foot elevation.

The majority of the PPA is dominated by 25 percent- >65 percent sagebrush with warm/cool and dry soils. With dominant soils of this type natural sagebrush recovery is not likely. Perennial herbaceous species are typically inadequate for recovery and risk or an invasive annual grass is high.

In the canyon lands and high elevation areas there are some pockets of cool/cold and moist soils. These soils usually have natural sagebrush recovery. Perennial herbaceous species are sufficient for recovery. The risk of invasive annual grasses is typically low (see **Table 4-94**).

Table 4-94
South Warner Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	4,019	274	5,301	594	63	22,698	3,855	0	717	0
Percent of PPA	11	1	14	2	0	60	10	0	2	0

Sage-Grouse

The GRSG population is stable. Available GRSG telemetry data shows that this area is used for all the life requisites including breeding, brood-rearing, and winter habitat. Movement of GRSG occurs between the South Warner PPA, Gravelly PPA, North Warner PPA, and the Vya PPA in Nevada and California. Therefore seasonal movements between these planning areas are important for connectivity (see **Table 4-95**).

Table 4-95
Lek Status

ODFW Site ID	Lek Name	Conservation Status
LA1125-01	Big Reservoir North #1	Occupied
LA1137-01	Parsnip Creek	Occupied
LA1125-02	Big Reservoir North #2	Unoccupied-Pending
LA1147-01	Lucky Reservoir	Unoccupied-Pending
LA1204-01	Joe Lake	Unoccupied-Pending
LA1223-01	North Big Lake	Unoccupied-Pending

Vegetation

Vegetation within the project area varies substantially from the high elevation forests to low elevation marsh and grasslands. Native plants within the general area of the PPA, except for the medusahead infestations, are considered to be in good vegetative condition. Typical vegetation for the project area consists of rolling hills and benches covered with low and mountain big sagebrush. In the warm-dry soils there is an invasive annual grass understory while in the cool-moist soils there is native bunchgrass understory.

In addition to displacing plant communities such as sagebrush and being implicated in the increasing distribution of invasive plants such as cheatgrass (*Bromus tectorum*), encroaching woodlands also increase fuel loads, thereby leading to changes in fire regimes. Conifer expansion in the PPA into sagebrush types at mid to high elevations also result in a reduction of the native grass, forb, and shrub species associated with these types. Currently, juniper expansion is impacting GRSG nesting and brood rearing habitats within the Project Area by reducing available nesting cover, reducing native grass and forb cover, providing raptor perches for aerial predators, and providing cover for coyotes and other terrestrial predators. There are 43,000 acres of juniper within the PPA. Over 35,000 acres of juniper are encroaching into bitterbrush and sagebrush-steppe habitats, low sagebrush habitats, and aspen stands. Of the 43,000 acres of juniper within the Project Area, there are 8,000 acres in phase I conditions, 30,000 acres in phase II conditions and 4,000 acres in phase III conditions. Currently the South Warner Juniper Removal Project is taking place within the PPA. The South Warner Juniper Removal Project is currently taking place on 115,000 acres of shrub-steppe habitat within and surrounding the PPA. The NRCS has implemented conifer reduction starting in 2012, the amount of treated acres in and around the PPA are unknown.

The understory is in good condition. Some cheatgrass is in the area, but not widespread.

Dominant Native Vegetation

Three vegetation types dominate the Project Area: upland forest, riparian, and sagebrush/grassland steppe. Wetlands, special status plants, and noxious weeds are also present and are described in more detail below.

Sagebrush-Steppe

The dominant vegetation in the PPA is low sagebrush-bunchgrass and mountain big sagebrush-bunchgrass with juniper as an overstory. Some basin big sagebrush and Wyoming big sagebrush stands exist within the PPA, but these are limited to the lower elevations on the north and east sides and make up a small amount of the total area.

Other shrub communities that occupy smaller percentages of the Project Area, but may be very important include: silver sagebrush, mountain mahogany, antelope bitterbrush, and some small stands of mixed pine and fir. There are also small inclusions of important plant populations such as snowberry and aspen. All of these unique vegetation types are very important habitat for GRSG, mule deer, elk, and other species.

The most common grasses found in the understory include Sandberg's bluegrass, bottlebrush squirreltail, Idaho fescue, bluebunch wheatgrass, and Thurber's needlegrass. These grass species are often found growing together, but one or two are usually the dominant species at a given site depending on soils, topography and previous disturbance. In low sagebrush the dominant grasses are Sandberg's bluegrass, bottlebrush squirreltail, and Idaho fescue. In mountain big sagebrush, the dominant grasses are bluebunch wheatgrass, Idaho fescue, bottlebrush squirreltail, and Sandberg's bluegrass. Within juniper/low sagebrush/grass, the dominant grasses are Idaho fescue, and bottlebrush squirreltail. Within juniper/mountain big sagebrush/grass, the dominant grasses are Thurber's needlegrass, bottlebrush squirreltail and bluebunch wheatgrass.

Invasive Plants

Noxious weeds such as hoary cress (whitetop), Canada thistle, bull thistle, diffuse knapweed, spotted knapweed, field bindweed, Mediterranean sage, yellow toadflax, and perennial pepperweed have been identified in several areas within the Project Area. These infestation areas are small in size and located mainly in riparian corridors. Canada thistle has become pervasive in the riparian portion of the Project Area.

Currently there have not been extensive surveys completed for annual grass species within the PPAs. Cheatgrass occurs in several isolated patches scattered across the Project Area. Ecological sites most at risk of domination by cheatgrass within the Project Area are located on east and south facing slopes. There are two sites where cheatgrass is abundant within the Project Area. The first is a long strip of land along the base of South Warner rim. This area is the lowest in elevation within the Project Area and is east facing. The second site is a small area located on the western edge of the Project Area. This site is also east facing, but is not currently dominated by cheatgrass. During 2014 field surveys Japanese brome and North Africa Grass were both found in dry creek beds within the PPA. The documented sites were estimated to be less than 30 acres, however due the location, there is a high probability for spread. Due to warn dry soil types with in the majority of the PPA there is a high risk of invasive annual grasses to spread in this area.

Fire

The current fire regime falls in the category IV however, shorter intervals than 35 years can probably occur. One fire consisting of 568 acres has been documented in the PPA. There is a variety of soil temperature moist regimes including cool-moist soils, cool-dry soils, and small inclusion of warm-dry soils. The warm-dry soils show low resistance and resilience to invasive annual grasses; however within the PPA these areas are relegated to steep slopes and canyons and are not likely used by GRSG. Intermittent smaller fires have occurred in the recent past (see **Table 4-96**).

Table 4-96
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	198
High and Very High Burn Probability in PPA (percent)	0.5

Mountain and Sage Shrublands, Semi-desert Shrub and Grasslands

Mountain shrublands, semi-desert shrub and grasslands, and sage shrublands are classified under Fire Regime IV; however, shorter intervals than 35 years can probably occur.

Climate conditions and the time needed for an adequate fuel complex to develop are likely factors that control fire frequency in these ecosystems. Therefore, in the driest and least productive systems, such as the semi-desert shrub and grasslands, fuel load is the more limiting factor. In these systems, vegetation develops very slowly under conditions of scant rainfall and poor soils. Bare ground is prevalent even in the more productive of these sites. There is a lack of information about fire regimes for semi-desert shrub and grasslands. Fire may not be a primary disturbance in these ecosystems.

Mountain shrubland ecosystems occur at higher elevations and moister climates, making them more productive and giving them a greater potential to burn more often than semi-desert systems

Fire regimes affect nutrient cycling in semi-arid forests. Nitrogen, which burns (volatizes) at a relatively low temperature, is affected by fuel loading (Johnson et al. 1998). Soil heating at 20 tons/acre of woody fuel loading exceeds nitrogen's low volatilization temperature of (392° Fahrenheit (F)) 200 degrees Celsius (C). At this temperature soil surface nitrogen is at risk of burning off the site (Brown et al. 2003; Johnson et al. 1998). Twenty tons per acre of woody fuel occurs with scattered pole and limbs, which is easily achieved with juniper expansion onto sagebrush-grass rangelands. The risk of soil heating increases as juniper expansion onto sagebrush- grassland and pine forest become denser.

Past Fire and Fuels
There has only been one fire consisting of 568 acres that has taken place within the South Warner PPA. Currently the South Warner Juniper Removal Project is taking place within the PPA. Removal of juniper is currently taking place on 115,000 acres of shrub-steppe habitat.

Management Strategies

Treatments
Juniper reduction has occurred in this area, and a five-10 year maintenance plan will need to be implemented to maintain the projects. Seeding burnt piles would occur. Native grasses mostly come back after the reduction has occurred. Mechanical and hand treatments have occurred. Lopping and piling and burning seem to be most successful.

Currently the nonnative invasive species are being managed within the PPA through the most updated Integrated Weed Management program. Currently the noxious weed infestations within the PPA are low compared to many other areas across the resource areas. However, due to the large amount of cheatgrass across the Resource Area it has not been a priority to control. In the future small isolated patched will be added to the annual weed treatment plan and large infestations will be a priority to contain.

Other Relevant Management Activities or Issues
The South Warner PPA has high value GRSG habitat and good connectivity. There is a concern and interest to protect and maintain the investment of past treatments.

Fuels Management
The main management activities would be focused on possible green stripping along the pipeline and the power line but both areas already make a fairly defendable fuel break (see **Table 4-97**).

Table 4-97
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	0	149.59	0	149.59

Fuel's Management activities include:

- Green striping along power line and pipe line using seed appropriate to the ecoregion when available (20-30 feet width should be sufficient considering the existing road). Fire breaks or green-stripping along existing roadways to provide a fuel break and safe zone from which to fight fire. One of the suggested species for green stripping is Sandburg's bluegrass (*poa secunda).*

  - Establish strips no larger than 50 feet on either side of the road will provide foraging for grouse and provide >100 feet of fuel break.
  - Use native species like Sandburg's bluegrass unless there is no native species available in which crested wheat may be used in fuel breaks where annual grasses are prevalent.
- Fuels treatments were coordinated across property jurisdictional boundaries and ownership by partnering with the Private landowners and the NRCS. Any maintenance treatments would involve the same level of coordination.
- A combination of fuels reduction techniques was used such as mechanical juniper reduction using both hand cutting and mechanical piling of trees, prescribed fire for fuel reduction of the cut juniper and grazing that reduces fine fuel build up in the existing fuel breaks. Maintenance treatments would most likely involve hand cutting small juniper coming back in but we would not want to limit our treatment options.

Habitat Restoration and Recovery

Opportunities for habitat restoration to protect, enhance, or maintain GRSG habitat and connectivity generally exists in areas that have 1) warm/dry or cool/dry soils, 2) elevation below 6,000 feet, and/or 3) are of higher fire risk due to remoteness and lack of water. Threats from weeds and fire are less in other soil types and >6,000 feet elevation. Restoration treatments would be dictated by these factors. Risks to restoring areas with warm/dry or cool/dry soils include reduced productivity because of lack of precipitation for plant growth and drier conditions from southerly aspect. This PPA is not located on the border of any other district for coordination of projects; however, there are several private landowners and the US Forest Service that could participate in cooperative restoration efforts.

Key threats to GRSG habitat are invasion of exotic grasses, large-scale wildfires, and encroachment of conifers.

The most effective time to remove young juniper and restore sagebrush-steppe communities (in terms of both cost and desired vegetative response) is during phases I and II. Once a stand transitions to phase III, the understory is not adequate to carry a fire, nor is there an adequate seed source in the soil of desirable native understory plant species. Cheatgrass and other nonnative invasive species often take over phase III sites when the juniper canopy is removed without additional intensive work to the site such as seeding with native species.

Improve nesting, brood rearing and winter habitats for GRSG through a reduction of post-settlement juniper. This includes, but not limited to maintaining mature big sage with intact native understory grasses, maintain brood rearing habitats around springs, seeps, and meadows, and avoiding activities that would cause the long term spread of nonnative grasses or noxious weeds. Remove juniper to promote the maintenance and health of sagebrush, native grasses and forbs in GRSG habitats.

Areas treated by prescribed fire would be rested from livestock grazing for a minimum of two growing seasons to allow the cool season bunchgrasses- which are especially vulnerable to grazing after treatment- to capitalize on resource availability created by the disturbance. However, reintroduction of livestock to a disturbed area prior to the native or reseeded plant community becoming established, regardless of the number of years of rest afforded the site, can result in failed rehabilitation efforts and increased levels of nonnative invasive annual grasses, therefore grazing should be deferred until resource objectives are met as determined by a BLM interdisciplinary team.

The South Warner PPA has relatively low noxious weeds/ nonnative invasive annual grass species when compared to several other areas across the Lakeview Resource Area. The majority of the infestations could be eradicated through use of effective herbicides followed up by following the most updated integrated weed management plan. Small isolated patches of Africa wire grass (*Ventenata dubia*) have recently detected along the main road entering the PPA. This species has recently begun invading the Lakeview RA and is currently a high priority for containment and control. Cheatgrass is likely scattered across the PPA in moderately infested areas, however no formal survey has currently taken place within this PPA. Early detection and rapid response for nonnative invasive annual grasses and other noxious weeds would be the highest priority for this PPA (see **Table 4-98**).

Table 4-98
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	8,561	66,481	0	75,043
Percent of PPA	22.82	177.19	0	200.01

*Acreage percentages that are greater than 100 are due to different treatment types (ex; Conifer and Invasives) that share the same ground.

Fire Operations

The entire PPA is Priority 1 due to a large investment in long term habitat restoration and recovery in juniper reduction and seedings (see **Table 4-99**).

Table 4-99
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	37,522	0	0	37,522
Percent of PPA	100	0	0	100

Post-Fire Rehabilitation Management

Areas that are a high priority for post-fire rehabilitation will be areas lower than 6,000 feet in elevation containing warm/cool and dry soils. These areas would be very likely invaded by nonnative winter annual grass species. To prevent invasion the fire would be sprayed with imazapic to prevent annual grasses from germinating as soon as possible one the fire is no longer active. Seeding/transplanting success will depend on site characteristics, annual invasive and post-treatment precipitation. Areas that are accessible should be drilled seeded using native seed compatible with the local ecoregion. Less accessible areas should be broadcast seeded. Hand planning of bitter brush and sagebrush species will also occur.

Areas that are not accessible, areas with cool/cold and moist soils, or areas over 6,000 feet will be evaluated to see if natural restoration will be adequate. Since the annual invasive are currently low within this PPA, a preventative treatment herbicide application of imazapic would assist in preventing new invasions of annual grasses after fires.

All large areas burned should be allowed at least two growing seasons of rest from grazing (see **Table 4-100**).

Table 4-100
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	29,143	8,377	0	37,520
Percent of PPA	77.7	22.3	0	100

Proposed Management

See **Table 4-101** for projects that have been identified presently within the NEPA planning process. See **Figures 4-56** through **4-60** for a graphic depiction of the proposed treatments and strategies in the PPA.

4.2.13 Vya

Project Planning Area Description

General Site Description

The Vya PPA is located in northeastern Modoc County, California and northwestern Washoe County, Nevada. The area is comprised of 234,885 acres of which 186,001 acres (79 percent) are administered by the BLM, 530 acres (greater than one percent) are administered by the US Forest Service, 850 acres (greater than one percent) are private lands, and 47,360 acres (20 percent) are under unknown jurisdiction. The PPA extends west to the eastern slopes of the Warner Mountains, east to the western slopes of Massacre Rim, south towards Long Valley, and north to Twelvemile Creek which is located on the California-

Table 4-101
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 (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 Warner Fuels 1	24,670	X			X					X			X	X		5	3-5
Cahill Allotments Invasive Plant Management	250	X				X	X			X			X	X		5-20	0-5
South Warner Invasive Annual Grass Management	37,519		X			X			X	X			X	X		5-20	0-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

Nevada border. The PPA includes a small portion of the Warner Mountain range, the Larkspur Hills, Mosquito Valley, the northern portion of Long Valley, Coleman Valley, Macy Flat, Horse Lake Rim, and the western slopes of Massacre Rim. Mountain ranges are typically oriented north to south, medium to large valley bottoms between the ranges; however, there is a large plateau that extends from the Oregon border south towards Fortynine Mountain, west towards surprise valley, and east to long valley. There are numerous ephemeral drainages located within the PPA. There are two perennial streams that lie within the PPA, Twelve mile creek and Cottonwood creek. Twelvemile creek is situated in the northwestern portion of the PPA and Cottonwood Creek is located within the Little Coleman Canyon drainage in the northeastern portion of the PPA. Springs and seeps commonly occur throughout most of the PPA; however most of these areas are not meeting riparian health objectives. Elevations throughout the PPA generally range from 4,455 feet in valley bottoms to approximately 8,268 feet on top of the Warner Mountains. The majority of the PPA ranges from 5200 feet to just over 6,300 feet in elevation. The most drastic changes in elevation occur on the northwestern portion of the PPA (see **Table 4-102**).

Table 4-102
Vya Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	7,652	2,600	19,903	7,686	73	32,673	23,358	144	102,164	38,636
Percent of PPA	3	1	8	3	0	14	10	0	43	16

Majority of the PPA is dominated by 3B and 3C habitat; however, there is a small percentage of 1B and 1C habitats within the PPA. 1B habitat is primary located on plateaus adjacent to Mosquito Lake which is located in the central portion of the PPA. 3B and 3C habitat is primarily characterized as a mixture of big and low sagebrush species occurring on slopes below 5,500 feet. A portion of the PPA burned during the 2005 and 2014 fire seasons. Approximately 22,000 acres burned during the Barrel Fire and an additional 13,184 acres of public land was burned during that Coleman Fire. A portion of the Coleman fire burned through the old burn scar of the Barrel fire which occurred during the 2005 fire season. Primary vegetation consisted of a mix of big and low sagebrush sites between 4800 feet and 6200 feet in elevation on all aspects.

Sage-Grouse

The Vya PPA is adjacent to the Massacre Planning Area (to its southeast). There are eleven active leks within the planning area. Most leks are found on mountain benches or on dry lake beds in areas where sagebrush height is less than six inches in height. However, GRSG have been recorded strutting in sagebrush that exceeds twelve inches in height. The majority of the leks within the Vya PPA are located within the larkspur hills which are located in the western portion of the PPA. There are several leks that occur in Mosquito Valley and near Macy Flat. Mosquito Valley is located in the central portion of the PPA and Macy Flat is located in the far northeastern portion of the PPA. Lek attendances for the eleven active leks in the PPA have been in a slow decline for the past several years. So far, fire has only impacted the central and eastern portions of the PPA, leaving the majority of the PPA largely intact. Fire, invasive species, and especially juniper, remain the biggest concerns in this planning area; however, fires in the lower elevations have had limited to no restoration success. Radio telemetry data from the late 1990s and current data confirm that birds in the northern and central part of the planning area travel between California, Oregon and Nevada. Due to the proximity of the Sheldon Refuge to the east, it is very likely there is some connectivity to birds there as well. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottom and mountain bench locations and brood rearing occurring within riparian areas throughout the PPA. The planning area is known to be used by GRSG year round.

Vegetation

The planning area is inhabited by a variety of terrestrial and aquatic plant communities. Most of the area exceeds 5500 feet in elevation and vegetation is predominately low sagebrush and mountain big sagebrush with other mountain shrub species including antelope bitterbrush and western snowberry Riparian species and small isolated aspen communities exist in riparian areas which are prevalent throughout the planning area. Recent fuels reduction treatments have reduced the presence of western juniper. In 2005, the Barrel Fire burned approximately 25,400 acres, with a large portion of the acres burned occurring within the Vya planning area boundaries. Portions of the Barrel fire are recovering well due to high elevations under cool/moist temperature regimes; however, approximately 15,250 acres were subsequently burned during the Coleman fire in 2014. Roughly 2,000 acres have been seeded with big sagebrush, antelope bitterbrush and native perennial grasses. 2,000 acres in the Fee and Larkspur allotments were seeded in the 1980's with crested wheatgrass.

Cheatgrass dominates small portions of past fires at low elevations throughout the planning area especially near Lake Annie. Wildfire prevention is key in order to prevent cheatgrass invasion from lower elevations. Other noxious weeds such as Bull thistle, Canada thistle, Dyers woad occurring as small populations have been documented.

Fire

More than fifty fire ignitions are known to have occurred in this planning area since 1980. Most fires were natural caused starts that burned within a very short time period although some were man caused fires. Most fires within the PPA have been relatively small in size (greater than one acre); however, there have been several large fires that have occurred within the planning area. The two largest fires have been the 2005 Barrel Fire and the 2014 Coleman Fires which burned in the northern portions of the planning area. The Coleman Fire burned through a large portion of the 2005 Barrel Fire burn scar. Altogether about 28,360 acres have burned since 1980 in this planning area with most of the planning area remaining largely intact. At elevations below 5,500 feet, heavy cheatgrass infestations are generally observed. These large populations of cheatgrass in the lower elevation will continue to pose a threat to remaining intact habitat for GRSG. Although there have been no fuel breaks created per se, several large juniper reduction projects with limited pile burning have occurred within the planning area (see **Table 4-103**).

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 within the Vya PPA area are as follows: 77 percent in Fire Regime III, 19 percent in Fire Regime IV, and the remaining in the other Fire Regimes. Two condition classes are largely present with 55 percent in Condition class II and 40 percent in Condition class I, with very little in within condition class III and the remaining not being classified.

Table 4-103
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	97,563
High and Very High Burn Probability in PPA (percent)	41.6

The Susanville Interagency Fire Center contains the BLM, FOREST SERVICE, NPS, and CALFIRE. Station locations within and near the planning area include Surprise BLM station, Alturas BLM station, FOREST SERVICE Warner Mountain station, CALFIRE Alturas station, and the Likely Fire Protection District station. Response time within this planning area is generally fast, with good coverage from multiple resources. Air tankers and helicopters may respond from a number of locations including California, Oregon, Idaho and Nevada. There are several air tanker bases in California that rotate air tankers throughout the summer that can typically respond quickly to the planning area. The nearest air tanker base is located at the Redding Air Base in Redding, California. This air base is managed by the US Forest Service.

Management Strategies

Treatments

Some ESR seeding has occurred in the PPA, primarily on the Barrel and Coleman fires. The majority of these treatments were aerial seedings of native/nonnative species with the main objective to impede cheatgrass expansion and stabilize sites. Drill seeding in areas where this type of treatment was feasible. Treatments were developed for areas were the likelihood of cheatgrass and other invasives would potentially invade the disturbed sites. Seeding efforts on the Barrel Fire were marginally successful; however, natural recovery of perennial grasses and sagebrush were remarkably good. In contrast, seeding efforts on the Coleman fire have yet to be monitored; therefore, success or failure of the treatments has yet to be determined. After three years of severe drought, natural recovery of sagebrush is likely to be marginal at best, therefore, a concerted effort has taken place to aerial seed a large portion of the Coleman fire with Wyoming and mountain sagebrush to establish these shrub species back into the ecosystem and to reduce the amount of time that it would normally take for these species to reoccupy these disturbed sites.Other ESR treatments in the area have been focused on the control of noxious weeds, broadcast seeding of native shrubs and perennial grasses, and planting of bitterbrush and sagebrush seedlings.

Other Relevant Management Activities

There is no known current or planned mineral exploration in the planning area. Some small gravel pits occur.

One large 750kV transmission power line crosses the PPA, running north to south. A 42 inch natural gas pipeline was finished in 2011 and follows closely the route of the transmission power line.

Although there are no wild horse and burro management areas in the planning area, there are some scattered horses.

Livestock grazing is the most noticeable management activity that occurs throughout the planning area with approximately 230 miles of fence and over 100 water developments related to livestock grazing having been built. The planning area encompasses approximately 20 allotments in the northern part of the Surprise Valley Resource Area.

Fuels Management

Fuels treatments have been occurring in the PPA since the Late 1990's. Calcutta, Smiling Dog Spring, Stateline, Susila, and Toney ranch habitat restoration projects have already been completed within the PPA. The Horse Lake habitat restoration project is currently in progress with an additional 8,000 acres planned to be treated in the following years.

There are few natural fuel breaks within the PPA. The Ruby Pipeline runs through the center of the PPA. The pipeline is approximately 150 feet wide and is devoid of any vegetation for a large portion of the pipeline. Efforts have been made to reestablish vegetation along the pipeline; however, they have been marginally successful. In addition to the pipeline, there are numerous roads that run through the PPA that would act as manmade fuel breaks in the event of a wildfire (see **Table 4-104**).

Table 4-104
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	52.98	58.63	0	111.61

First order priority phase 1 and 2 juniper removal across much of the Vya PPA.

First order priority fuel breaks include:

- Highway 34
- Barrel Springs Road
- Improvements on old two track roads as minor fuel breaks

Identify opportunities to utilize a coordinated approach across jurisdictional boundaries

Habitat Restoration and Recovery

Within the Vya planning area, juniper reduction projects and ESR related seeding has occurred. Over 1,000 acres of juniper have been treated so far and an additional 100,000 acres have been analyzed under the Vya programmatic EA for reduction and habitat restoration over a ten year period of time. Success of these projects has been largely undetermined due to the fact that monitoring data for treatments has only been collected over the past five years. However, with the little monitoring data that has been collected, some improvement has been documented and observed after post juniper removal projects have been implemented. Principle species that have been documented returning to once dominated juniper woodlands include; bottlebrush squirreltail (*Elymus elymoides*), Sandberg's bluegrass (*Poa secunda*), and lupine (*Lupinus spp.*).

With regards to ESR seeding's, success of seeding's during the Barrel Fire were reported as being relatively unsuccessful. This was largely determined by qualitative means and not quantitative means. On the Coleman Fire, approximately 458.18 acres of perennial grasses and forbs were seeded in four allotments impacted by the fire. This was accomplished largely by the use of dozers and range drills. Drill rates varied between five lbs/acre and 7.5 lbs/acre. Success is yet to be determined on these seeding's due to the fact that no monitoring data has been collected to determine if the seeding's were successful or not. In addition to drill seeding, over 2000 acres of aerial seeding will be taking place in February of 2015. A mix of sagebrush seed, perennial grasses, and forbs are planned to be seeded at a rate of four lbs/acre over the four allotments affected by the fire. Monitoring of this treatment will begin in the summer of 2015.

In addition to aerial seeding and drill seeding, approximately 35 acres within the Coleman Fire will be hand planted with a mixture of Wyoming sagebrush and bitterbrush seedlings. A total of 14,200 seedlings are set to be planted sometime in the spring.

Success on south facing slopes, especially below 5,500 feet in elevation, is likely to be dominated by cheatgrass. Unfortunately, it is likely that the seed bank was not destroyed during the Coleman fire which will put added pressure to try and maintain connectivity within the planning area. Success of treatments on north facing slopes will likely recover naturally. This has been documented on the Lost Fire which occurred during the 2012 fire season.

The Surprise Resource Staff is committed to reducing juniper densities on sage-steppe ecosystems and into riparian communities, as well as, to address any issues that arise with regards to maintaining connectivity within the Vya planning area. As it stands now, the Vya planning area remains largely intact, if the seedings are successful on south facing slopes, then there is a chance of some recovery on those portions damaged by the Coleman Fire.

Coordination of projects with government agencies (primarily the NRCS) and private landowners in this area has been frequent and this coordination of efforts will be continued (see **Table 4-105**).

Table 4-105
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	26,950	873	0	27,823
Percent of PPA	11.47	0.37	0	11.85

Fire Operations

High Priority for Suppression (see **Tables 4-106** and **4-107**)

- Big sagebrush sites below 5500 ft. primarily in the W. Fire suppression is crucial here because pure stands of cheatgrass will likely result if a fire occurs.
- Vya Mountain which is an important GRSG area. Also, if it burns it will burn SW towards drier areas.
- Previously burned areas especially the North slopes of the Coleman Fire to prevent the cycle of return fires.

Moderate Priority for Suppression

- Big sagebrush sites above 5500 ft. in order to prevent the spread of cheatgrass which is present in pure stands nearby at lower elevations.
- North slopes above 5500 ft.
- Coleman Fire Low sagebrush area because it has a lower burn probability.

Low Priority for Suppression

- Low sagebrush sites which have a lower burn probability primarily in the SE region.

Table 4-106
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Wyoming Sagebrush (3b) < 5500 ft.	High	8,896.7
Low Sagebrush < 5500 ft. (3c)	High	46,365.2
North Slope > 5500 ft.	Medium	45,972.7
Big Sagebrush > 5500 ft.	Medium	8,778.4
Low sagebrush > 5500 ft.	Low	68,227.2
Coleman Fire Low Sage > 5500 ft.	Medium	5,162.6
Coleman Fire North Slope > 5500 ft.	High	10,019.3
Mountain Big Sagebrush > 5500 ft.	Medium	9,635.0
Mixed Sagebrush < 5500 ft.	High	4,454.6
Mixed Sagebrush > 5500 ft.	Medium	12,174.4
Salt Desert Scrub and Grassland >5500 ft.	Medium	4,447.0
Mountain Big Sagebrush < 5500 ft.	High	9,094.2

Table 4-107
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	164,396	29,982	40,526	234,904
Percent of PPA	70.0	12.8	17.3	100

Post-Fire Rehabilitation Management

High Priority for ESR (see **Tables 4-108** and **4-109**):

- Big Sagebrush species greater than 5,500 ft elevation, but excluding southern aspects
- Wyoming Big sagebrush

Lower elevation Wyoming Big sagebrush composition flanks the SW region of the planning area and higher elevation Big Sagebrush communities are generally in the SE. Pre-burned areas are also a high priority for ESR in order to attempt to stop reoccurring fires. The area in and around the Coleman fire perimeter are a high priority.

Moderate Priority for ESR:

- Areas less than 5,500 ft
- Southern aspects

The majority of habitat below 5,500 ft can be found in the west part of the planning area.

Low Priority for ESR

- Low Sagebrush greater than 5,500 ft
- Northern aspects greater than 5,500 ft
- There are some communities of Low sagebrush above 5,500 ft throughout the planning area. Additionally the dry lake beds are not considered for ESR.

Table 4-108
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	151,551	30,188	53,144	234,883
Percent of PPA	64.5	12.9	22.6	100

Table 4-109
Fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
Wyoming Sagebrush < 5500 ft.	High	8,896.7
Low Sagebrush < 5500 ft.	Moderate	46,365.2
North Slope > 5500 ft.	Low	45,972.7
Big Sagebrush > 5500 ft.	High	8,778.4
Low sagebrush > 5500 ft.	Low	68,227.2
Coleman Fire Low Sage > 5500 ft.	High	5,162.6
Coleman Fire North Slope > 5500 ft.	Moderate	10,019.3
Mountain Big Sagebrush > 6000 ft.	High	9,635.0
Mixed Sagebrush < 5500 ft.	Moderate	4,454.6
Mixed Sagebrush > 5500 ft.	Moderate	10,517.7
Mixed Mountain Sagebrush < 5500 ft.	Moderate	1,656.7
Mixed Sagebrush > 5500 ft.	High	4,446.9
Salt Desert Scrub and Grassland >5500 ft.	Low	4,447.0

Proposed Management

See **Table 4-110** for projects that have been identified presently within the NEPA planning process. See **Figures 4-61** through **4-65** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-110
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 (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]
Vya Green Stripping	2,730	X						W			N	P		L1		5-7	5+
Vya Green Stripping	3,026		X					W			N	P		L1		5-7	5+
Vya Conifer Treatments	24,286		X		C						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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.14 Bull Creek

Project Planning Area Description

General Site Description

The Bull Creek Project PPA is located in western Washoe County, Nevada. The area is comprised of 66,250 acres of which 65,110 acres (98 percent) are administered by the BLM and 1,139 acres (two percent) are administered by an undetermined entity. The area encompasses the Hay's Mountain Range on the western side of the planning area and several large valley and dry lake beds on the eastern portion of the planning area. Mountain ranges are typically oriented north to south, with large valley bottoms between ranges. There are several ephemeral drainages within the planning area; however, there are no perennial streams within the planning area. Springs and seeps commonly occur throughout most of the mountains; however there are some areas within the planning area that are not meeting riparian health objectives. Elevations throughout the planning area generally range from 4,469 feet in valley bottoms to approximately 7,677 feet on near the top of the Hay's Mountain Range (see **Table 4-111**).

Table 4-111
Bull Creek Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	1,587	0	1,846	1,190	0	7,494	7,688	0	21,422	25,023
Percent of PPA	2	0	3	2	0	11	12	0	32	38

The majority of the Bull Creek planning area is comprised of 3B and 3C habitat types. These habitat types tend to be low resistance and low resilience to invasive species and/or disturbances.

Sage-grouse

The Bull Creek PPA is adjacent to the Wall Canyon and Duck Flat Planning Areas. The Bull Creek Planning Area lies entirely in the Massacre PMU. The Bull Creek planning unit contains three known active GRSG leks. Leks within the Bull Creek planning area are predominantly found on mountain benches or plateaus adjacent to Boulder Flat with typical vegetation within the leks consisting of low sagebrush and perennial grasses. GRSG that are utilizing these leks, tend to be observed strutting in sagebrush with an average height of less than six inches. These leks are primarily located west of Boulder Flat which is located in the eastern portion of the planning area. Population trends within the planning area are generally trending downward. The planning area remains largely intact, with very little of the planning area being impacted by fires or other disturbances. There currently is no GPS or telemetry data on GRSG movements within the bull creek planning area. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottoms and mountain bench locations. Brood rearing generally occurs within the riparian areas throughout the focal area. The planning area is known to be used by GRSG year round. Currently, fire, invasive weeds, and juniper encroachment in to sage-steppe ecosystems remain the biggest concerns within the Massacre planning area.

Vegetation

Vegetation in the planning area consists mainly of Wyoming big sagebrush and perennial bunch grass communities at lower elevations and on west facing slopes. Upper elevations of the planning area throughout the Hays canyon range consist of low sagebrush, including Lohantan, black and early mountain big sagebrush and mixed mountain brush species. Juniper encroachment exists at a current state of phase I and II through the central region in areas with cool/dry to cool/moist soil temperature/moisture regimes versus the outskirts which are warm/dry.

Cheatgrass is mixed in with native perennial grasses throughout the area; however, no notable pure stands of cheatgrass exist. No populations of other noxious weeds exist within this project site.

Fire

The planning area has not been heavily impacted by fire except for the Buzz Fire, occurring in 2001. Historically, just 2,206 acres in the Bull Creek area has been burned or approximately three percent of the total planning area. Fires that have occurred within the bull creek planning area have all been naturally caused starts that burned within a very short time period. Prior to 1999, this area had very limited fire history and what fires did occur were generally small in size. However, there has been a higher occurrence of fires in the recent past and the potential for future fires is high due to the conversion of cheatgrass coupled with higher amounts of recreational use (see **Table 4-112**).

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 within the Bull Creek PPA are as follows: 64 percent in Fire Regime III, 28 percent in Fire Regime IV, and the remaining in the other Fire Regimes. Two condition classes are largely present with 51percent in condition class I, and 45 percent in condition class II, with very little in condition class III, a small amount classified as barren and the remaining not being classified.

Table 4-112
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	6,071
High and Very High Burn Probability in PPA (percent)	9.2

Existing Treatments

There have not been any small or large scale ESR seedings within the Bull Creek planning area. However, there have been several juniper reduction projects completed within the planning area. This juniper reduction project is located within the Willow Creek drainage and Hay's Canyon which is located on the northern and central portions of the planning area.

Management Strategies

Other Relevant Management Activities
The planning area is located within an area that is intensively managed for livestock grazing. There are four grazing allotments located within the planning area, 30 water developments and 39 miles of fencing. Additionally, portions of the planning area are actively used for recreational activities such as hunting, fishing, hiking, or sightseeing. There is a population of California bighorn sheep that is actively managed by both the SFO staff and the NDOW. There are no horse management areas within the planning area or mining activities.

Fuels Management
Over 2,000 acres of juniper have been treated within the planning area. These projects have been aimed at sage steppe restoration and to reduce juniper encroachment into riparian areas. There are several juniper reduction projects planned within the planning area; however, the National Environmental Policy Act (NEPA) process has yet to be completed on them. A prescribed burn is planned to reduce juniper along the Hay's Mountain range to reduce the risk of predation on California bighorn sheep (see **Table 4-113**).

Table 4-113
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	3.52	19.76	0	23.28

First order priority phase 1 and 2 juniper removals include:

- Table Lakes area
- Eastern slopes of the Hay's Range

First order priority fuel breaks include:

- Hay's Canyon road

Second order priority fuel breaks include:

- Subsequent roads that could be improved upon to be made into fuel breaks

Habitat Restoration and Recovery
Restoration efforts have been focused on preserving higher elevation habitat. Juniper reduction treatments have taken place to protect riparian habitat and

future juniper removal treatments are planned throughout the area. Mechanical treatment will be the primary method used to reduce disturbance and spread of invasive annuals. Prescribed burn has been proposed at high elevations in the Hays Range. This area is highly resistant and resilient therefore, would recover well. There are opportunities to work with permittees and the NRCS to coordinate juniper treatments.

There may be seeding opportunities on the east side in areas where the perennial grass understory has been lost due to heavy grazing (see **Table 4-114**).

Table 4-114
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	53,501	0	0	53,501
Percent of PPA	80.76	0	0	80.76

Fire Operations

High Priority for Suppression (see **Tables 4-115** and **4-116**)

- Wyoming Big sagebrush sites with little potential for recovery
- Salt Scrub or Water at low elevations on the W edge of the area because fire could easily spread into areas with more suitable habitat.

Moderate Priority for Suppression

- Higher elevations on north slopes that have a greater recovery potential.

Low Priority for Suppression

- Low sagebrush at high elevations which is less likely to burn, and has the greatest potential for recovery.

Table 4-115
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	117,952	107,913	34,886	260,751
Percent of PPA	61.5	56.3	18.2	136

Table 4-116
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Low Sagebrush > 5500 ft.	Low	12,667.0
Wyoming Big Sagebrush > 5500 ft.	High	22,066.3
Salt Scrub or Water < 5500 ft.	High	10,924.7
Mountain Big Sagebrush > 5500 ft.	Medium	892.3
Mixed Sagebrush > 5500 ft.	Medium	5,206.4

Post-Fire Rehabilitation Management

High Priority for ESR

- Big Sagebrush species greater than 5,500 ft. excluding southern aspects.
- Wyoming Big sagebrush

Wyoming sagebrush and mixed sagebrush areas in the NE have a greater chance of recovering with treatment due to elevation however, recovery will depend on aspect (see **Tables 4-117** and **4-118**).

Table 4-117
Post-Fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
Low Sagebrush > 5500 ft.	Low	12,667.0
3B Wyoming Big Sagebrush > 5500 ft.	High	22,066.3
Salt Scrub or Water < 5500 ft.	Low	10,924.7
Mountain Big Sagebrush > 5500 ft.	Moderate	892.3
Mixed Sagebrush > 5500 ft.	High	5,206.4
North Slope > 5500 ft.	Low	43,702.6
South Slope > 5500 ft.	Moderate	45,495.0

Table 4-118
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	20,998	6,717	38,540	66,255
Percent of PPA	31.7	10.1	58.2	100

Moderate Priority for ESR

- Areas less than 5,500 ft.
- Southern aspects

South slopes on the S end of the PPA above 5,500 ft. do not have a strong chance of recovery but due to the elevation might have some success with treatment after fire.

Low Priority for ESR

- Low sagebrush greater than 5,500 ft.
- Northern aspects greater than 5,500 ft.

These areas are high resilience and resistance areas with a strong potential for natural recovery.

Proposed Management

See **Table 4-119** for projects that have been identified presently within the NEPA planning process. See **Figures 4-66** through **4-70** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-119
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 (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]
Bull Creek Green Stripping	184	X						W			N	P		L1		5-7	5+
Bull Creek Green Stripping	1,016		X					W			N	P		L1		5-7	5+
Bull Creek Invasive Weeds Treatments	32,235	X				I					N	P		L1		5-7 if follow-up is neces-sary	5+
Bull Creek Conifer Treatments	21,265		X		C						N	P		L1		10 to 20	5+
Bull Creek Green Stripping	184	X						W			N	P		L1		5-7	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.15 Wall Canyon

Project Planning Area Description

General Site Description

The Wall Canyon PPA is located in northwestern Washoe County, Nevada. The area is comprised of 255,947 acres of which 245,251 acres (96 percent) are administered by the BLM, 147 acres (greater than one percent) administered by the State of Nevada, and 10,549 acres (four percent) are undetermined lands. The PPA encompasses the southern end of the Hays Mountain range, Wall Canyon creek and adjacent tributaries, Cherry Mountain, and the lands surrounding the eastern slopes of the Hay's Mountain range and Cherry Mountain which is primarily dominated by large plateaus. Mountain ranges are typically oriented north to south, with large valley bottoms between ranges. There is only one perennial stream located within the PPA which is located near the southern portion of the PPA. The stream is called Wall Canyon Creek and feeds into a large reservoir at the bottom of the canyon that is commonly used for recreational activities such as hunting and fishing. In addition, the water from the reservoir is used exclusively for irrigation. Springs and seeps commonly occur throughout most of the mountains; however most of these areas are not meeting riparian health objectives. Elevations throughout the PPA generally range from 4,469 feet in valley bottoms to approximately 7,923 feet on top of the Hay's Mountain range (see **Table 4-120**).

Table 4-120
Wall Canyon Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	1,496	0	1,929	2,462	3	33,442	34,251	423	26,272	155,668
Percent of PPA	1	0	1	1	0	13	13	0	10	61

The majority of the PPA is comprised of 3B and 3C habitat which is characterized as being low resistance and low resilience to disturbances and invasives. Habitat classified as 1B and 1C habitat can be found within the southern portion of the Hay's Range which is located in the southwestern portion of the PPA.

Sage-grouse

The Wall Canyon PPA is adjacent to three other planning areas in the Surprise PPA group with good connectivity to at least two of them. The Wall Canyon planning area lies within two PMUs. The planning area is largely within the Massacre Population management unit; however, a small portion of the planning area is within the Buffalo-Skedaddle Population Management Unit. There are ten active leks within the planning area. Leks within the Wall Canyon planning area are predominantly found on mountain benches or plateaus in the southern portion of the planning area with typical vegetation within the leks consisting of low sagebrush and perennial grasses. GRSG that are utilizing these leks tend to be observed strutting in sagebrush with an average height of less than six inches. Population trends within the planning area are generally trending downward. The planning area remains largely intact; however, a portion of the planning area was burned during the 2012 Lost Fire. This area has largely recovered naturally; however, sagebrush cover is still lacking in the affected areas and will not likely become a major vegetative component for many years to come. There is currently no GPS or radio telemetry data to show that GRSG within the Wall Canyon planning area are interacting with GRSG populations within the Duck Flat and High Rock planning areas. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottoms and mountain bench locations. Brood rearing generally occurs within the riparian areas throughout the PPA. The planning area is known to be used by GRSG year round. However, recent GPS and radio telemetry data from 2013 and 2014 confirm that the northern part of the PPA is used throughout the year by GRSG. Currently, fire, invasive weeds, and juniper encroachment in to sage-steppe ecosystems remain the biggest concerns within the Duck Flat planning area.

Vegetation

Vegetation in the PPA generally consists of Wyoming big sagebrush on mostly west facing slopes. The native perennial bunch grass understory has been phased out throughout large portions of the SW and W. Islands of low sagebrush exist but are sparse. Upper elevations in the NE region of the planning area consist of mountain big sagebrush and mixed mountain shrub species. Small patches of saltscrub comprised of greasewood and saltbush exist at lower elevations closer to the lake playas to the W and SW. In 2012 the Lost Fire burned approximately 41,000 acres, consuming several thousands of acres of sagebrush scrub land. Only 634 acres within the Wall Canyon project planning boundaries were burned, occurring mainly on N facing slopes with high resilience and resistance potential. Natural recovery is taking place. 3,164 acres of rangeland located at the north end of the Wall Canyon West allotment were seeded with crested wheatgrass in the 1980's.

Cheatgrass dominates portions of the PPA on south facing slopes. Other noted noxious weeds include Bull thistle, Russian knapweed, and perennial pepperweed which exist as small populations.

Coniferous encroachment is not a major concern within this planning area.

Fire

The planning area has had some impact from fire. Although most fires have been small, there have been twenty one known fires that have occurred in this planning area burning a total of 25,483 acres or roughly 12 percent of the planning area. The largest fire to have occurred within the Wall Canyon planning area occurred during the 2012 fire season. These were all natural caused starts that burned within a very short time period. Prior to 1990s, historical fire information is very limited; however, fires that did occur tended to be small in size. There has been a higher occurrence of fires in the recent past and the potential for future fires is higher due to the conversion of cheatgrass coupled with higher amounts of recreational use. Restoration on sites is generally better on northerly facing slopes and on sites at higher elevations, generally above 6,000 feet. Other than juniper and fuels reduction targeted projects, no fuel breaks have been accomplished within the planning area to help prevent the future spread of catastrophic fire.

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 within the Wall Canyon PPA area are as follows: 56 percent in Fire Regime III, 38 percent in Fire Regime IV, 3 percent in fire Regime V, and the remaining in the other Fire Regimes. Three condition classes are largely present with 42 percent in condition class III, 40 percent in condition class II, 16 percent in condition class one, two percent classified as barren, and the remaining not being classified (see **Table 4-121**).

Table 4-121
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	96,555
High and Very High Burn Probability in PPA (percent)	37.8

Management Strategies

Treatments

Although there have been several wildfires that have occurred within the PPA, no large scale seeding operations have been conducted thus far. However, there is an aerial seeding operation that will be taking place in 2015 to try and establish sagebrush and perennial grasses over portions of the Lost Fire which burned in 2012.

Other Relevant Management Activities

Mineral exploration is almost non-existent however some small operations have occurred in the Hays Range.

One large 750kV power line crosses the PPA, running north to south. Evidence suggests that there has been loss of active leks in the vicinity of the power line.

Two Wild Horse and Burro HMAs fall within the southern portion of the planning area, the Coppersmith and Fox Hog HMAs. These HMAs overlap the planning area by about 39,255 acres or approximately 16 percent of the planning area. Current horse numbers have been attributed to riparian area damage on springs and seeps.

Livestock grazing is the most noticeable management activity that occurs throughout the planning area with 135 miles of fences and approximately 117 water developments related to livestock grazing having been built in the past. However, of the 117 water developments, a small portion of them are springs that have no records of being developed for livestock use. Many no longer function, making the total for water developments being proportionately less than the 117 recorded.

Fuels Management

There have been no fuels reduction projects conducted within in the PPA. However, plans are being made to reduce juniper encroachment on the southern and eastern slopes of the Hay's Mountain Range in the near future. These treatments will take place outside of the WSA. In addition, no prescribed fires have been conducted in the PPA to date (see **Table 4-122**).

Table 4-122
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	61.89	29.37	0	91.26

There are few natural fuel breaks within the PPA; however, there are several roads that run through the PPA that could be used as fuels breaks if improvements were made to them.

First order priority phase 1 and 2 juniper removals include:

- Hay's Mountain Range

First order priority fuel breaks include:

- Wall Canyon Road
- Highway 34
- Pinto Springs road
- Chester Lyons road
- Powerline

Second order priority fuel breaks include:

- Any additional roads that can be improved upon to construct fuel breaks

Habitat Restoration and Recovery

Within the Wall Canyon planning area, there have been no juniper reduction projects that have occurred. However, there is an opportunity for some juniper reduction to take place in the northwestern portion of the planning area. The development of an environmental assessment will have to be completed before any projects occur; however, development of a programmatic EA that would encompass this area and a large portion of the Bull Creek planning area has been discussed with some of the department heads and there is some support for developing this document.

With regards to ESR related seeding, broadcast seeding of sagebrush and hand planting of sagebrush and bitterbrush seedlings have occurred within the planning area. Success of the broadcast seeding was largely confined to areas that received large amounts of sagebrush seed. No grass filler was used during the seeding of the sagebrush seed which impacted sagebrush seed distribution on designated seeding areas. Conversely, success of sagebrush and bitterbrush seedlings were recorded to be above 60 percent in the clover creek drainage; however, planting success of sagebrush and bitterbrush seedlings east of Highway 34 were largely unsuccessful due to insufficient precipitation during the winter and spring months. Just over 30,000 sagebrush and bitterbrush seeding's have been planted on the Lost Fire to date. In addition to planting and broadcast seeding, approximately 2624 acres of aerial seeding will be occurring on the Lost Fire in February of 2015. Seeding rates will be approximately three lbs/ acre over the entire area. Monitoring of this treatment is set to occur in the summer of 2015 (see **Table 4-123**).

Table 4-123
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	58,693	1,539	0	60,232
Percent of PPA	22.93	0.60	0	23.53

South facings slopes within the planning area are largely dominated by invasive annual grasses and will likely not recover naturally. In areas that have been recently disturbed, mainly on the Lost Fire, south facing slopes have converted primarily into annual grassland with minor components of perennial grasses. However, north facings slopes remain largely dominated by perennial grasses and in relatively good ecological health, even on disturbed sites.

The area within and adjacent to Wall Canyon Creek is extremely important lek and brood rearing habitat for Greater GRSG. The Surprise Field Office staff is focused on maintaining and enhancing connectivity within the planning area. Grazing systems that support perennial bunchgrass health could be implemented as part of the recovery of the habitat.

Coordination of projects with government agencies (primarily the NRCS) and private landowners in this area has been frequent and this coordination of efforts will be continued primarily in riparian areas that are not meeting riparian health standards.

Fire Operations
High Priority for Suppression (see **Tables 4-124** and **4-125**)

- Wyoming Big sagebrush below 5500 ft.
- Wyoming Big sagebrush > 5500 ft.
- South Slopes
- Low resilience and resistance potential and not likely not recover.

Moderate Priority for Suppression

- Lost Fire ESR area which is recovering well therefore, suppression is important so it can continue to recover.
- Higher elevations and North slopes with Big sagebrush.

Table 4-124
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	150,858	135,786	13,222	299,866
Percent of PPA	58.9	53.1	5.2	117.2

Table 4-125
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Cool/Moist >5500 ft. (2B)	Medium	14,816.5
North Slope > 5500 ft.	Medium	43,702.6
Wyoming Big Sagebrush < 5500 ft. (3C)	High	72,608.3
Low Sagebrush > 5500 ft.	Low	13,221.6
Wyoming Big Sagebrush > 5500 ft. (3B)	High	6,073.5
Lost Fire ESR	Medium	23,488.1
Mixed Sagebrush > 5500 ft.	Medium	51,049.1
South Slope > 5500 ft.	High	45,495.0

Low Priority for Suppression

- Low sagebrush, high elevation sites which are less likely to burn and have high recovery potential.

Post-Fire Rehabilitation Management
High Priority for ESR

- Big Sagebrush greater than 5,500 ft. excluding southern aspects
- Wyoming Big sagebrush

Most of the habitat in this planning area is Wyoming Big sagebrush at low elevations. There is little chance for recovery here but ESR treatments should be implemented in the first year. Invasive grasses should be monitored and treated after the first year if necessary (see **Tables 4-126** and **4-127**).

Moderate Priority for ESR

- Areas less than 5,500 ft.
- Southern aspects

Low Priority for ESR

- Low Sagebrush greater than 5,500 ft.
- Northern aspects greater than 5,500 ft.

Low priority habitat is concentrated in the Northern region of the area and with a strong chance for natural recovery.

Table 4-126
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	138,474	69,232	48,249	255,955
Percent of PPA	54.1	27.0	18.9	100

Table 4-127
Post-Fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
Cool/Moist > 5500 ft.	High	14,816.5
North Slope > 5500 ft.	Low	43,702.6
Wyoming Big Sagebrush < 5500 ft.	High	72,608.3
Low Sagebrush > 5500 ft.	Low	13,221.6
Wyoming Big Sagebrush > 5500 ft. (3B)	Moderate	6,073.5
Lost Fire ESR > 5,500 ft.	Moderate	23,488.1
Mixed Sagebrush > 5500 ft.	High	51,049.1
South Slope > 5500 ft.	Moderate	45,495.0
North Slope > 5,500 ft.	Low	43,702.6

Proposed Management

See **Table 4-128** for projects that have been identified presently within the NEPA planning process. See **Figures 4-71** through **4-76** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-128
Project Planning Area Treatment Summary Table

Treatment Description: Name/Type	Treatment Description: Acres/Miles	Priority: 1st	Priority: 2nd	Priority: 3rd	Threats Addressed: Conifer (C)	Threats Addressed: Invasive annual grasses (I)	Threats Addressed: Riparian (R)	Threats Addressed: Wildfire (W)	NEPA: Initiated (I)	NEPA: Completed (C)	NEPA: Needed (N)	Treatments: Time Frame: Pending Funding (P)[1]	Treatments: Time Frame: Implementing (I)[1]	Treatments: Certainty of Effectiveness[1]: Likely	Treatments: Certainty of Effectiveness[1]: Unlikely	Treatments: Maintenance Time Frame (Years)[2]	Treatments: Completion Time Frame (0-2, 3-5, 5+ years)[3]
Wall Canyon Green Stripping	1,522	X						W			N	P		L1		5-7	5+
Wall Canyon Green Stripping	3,215		X					W			N	P		L1		5-7	5+
Wall Canyon Conifer Treatments	1,539		X		C						N	P		L1		10 to 20	5+
Wall Canyon Weeds Treatments	54,993	X				I					N	P		L1		5-7 if follow-up is necessary	5+
Wall Canyon Green Stripping	1,522	X						W			N	P		L1		5-7	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.16 Duck Flat

Project Planning Area Description

General Site Description

The Duck Flat PPA is located in northeastern Lassen County, California. The area is comprised of 129,089 acres of which 111,127 acres (86 percent) are administered by the BLM, 17,638 acres (14 percent) undetermined and 323 acres (greater than one percent) are private lands. The Duck Lake PPA encompasses the Cottonwood Mountains, Coppersmith Hills, Tuledad Valley, Duck Lake Valley, and numerous dry lake beds on the southern portion of the focal area. Mountain ranges are typically oriented north to south, with large, flat valley bottoms between ranges. There is only one perennial stream located in the northwestern corner of the PPA; however, most of the PPA contains numerous ephemeral drainages. Springs and seeps commonly occur throughout most of the mountains and hills within the planning area. According to monitoring data gathered in the late 1980's a number of springs in the area were at risk falling below riparian health standards. It is apparent that some of these streams have fallen below the standards however; no monitoring data has been collected in recent years. Elevations throughout the planning area generally range from 4,629 feet in valley bottoms to approximately 8,028 feet near the eastern slopes of the Warner Mountain range (see **Table 4-129**).

Table 4-129
Duck Flat Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	5,437	4,064	2,222	228	23,665	13,877	0	4,745	37,475	37,377
Percent of PPA	4	3	2	0	18	11	0	4	29	29

The majority of the Duck Flat PPA is comprised of 3A, 3B, and 3C habitat classifications, meaning that a large portion of this planning area is of low resistance and resilience to disturbances and invasive species. Portions of the 1A, 1B, 1C, 2A, 2B, and 2C habitat classifications can be found in the Coppersmith Hills and Cottonwood Mountains which are located in the Western and southern portions of the planning area.

Sage-grouse

The Duck Flat PPA is adjacent to the Wall Canyon Planning Area. The Duck Flat PPA lies entirely within the Buffalo-Skedaddle PMU. The Duck Flat PPA contains four known active GRSG leks and several historic lek sites. Leks within the Duck Lake PPA are predominantly found on mountain benches or plateaus adjacent to Duck Flat and Tuledad Valley with typical vegetation within the leks consisting of low sagebrush and perennial grasses. GRSG that are utilizing these leks tend to be observed strutting in sagebrush with an average height of less than six inches. These leks are primarily located south of Duck Flat and North of Tuledad Valley. Duck Flat is a large depression located in the eastern portion of the planning area and Tuledad Valley is a long valley that is oriented in an east-west direction and is located in the center of the planning area. Population trends within the planning area are generally trending downward. The planning area remains largely intact; however, a portion of the planning area was burned during the 2012 Rush Fire. This area has largely been converted to annual grassland with little or no chance of recovery. Connectivity is not thought to be very good and could be non-existent between both the Duck Lake and Wall Canyon planning areas. Although Duck Flat and Wall Canyon nearly "touch", habitat at the adjacent peripheries in the Duck Flat proper area is barely suitable. There is currently no GPS or radio telemetry data to show that GRSG within the Duck Lake PPA are interacting with GRSG populations within the Wall Canyon planning areas. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottoms and mountain bench locations. Brood rearing generally occurs within the riparian areas throughout the PPA. The PPA is known to be used by GRSG year round. Currently, fire, invasive weeds, and juniper encroachment in to sage-steppe ecosystems remain the biggest concerns within the Duck Flat PPA.

Vegetation

Vegetation in the PPA consists of low elevation south facing slopes of Wyoming and Basin big sagebrush with juniper, valley bottoms of primarily greasewood and saltbush and mountain big sagebrush on north facing slopes with juniper. Small patches of curleaf mountain mahogany and aspen exist at higher elevations within the Cottonwood Mountains and Coppersmith Hills. In 2012 the Rush Fire burned approximately 315,500 acres. 10,617 acres composed primarily of low sagebrush and mountain big sagebrush were burned on the southernmost portion of the Duck Lake planning area. A large portion of this planning area is dominated by phase I and phase II juniper woodland sites, threatening the sagebrush-grass understory. No ESR was implemented after the fire and a heavy infestation of cheatgrass has developed. ESR treatments took place after the cottonwood fire in 1979 and antelope bitterbrush was seeded on 1,450 acres. In the 1980's 2,728 acres in the Tuledad allotment were seeded with crested wheatgrass, however, success was low.

Cheatgrass and medusahead rye dominate a large portion of the southern region of the planning area. Other noxious weeds such as Scotch thistle, Canada thistle, perennial pepperweed and Russian knapweed have also been documented.

Fire

The PPA has had some impact from fire. Although most fires have been small there have been thirty five known fires that have occurred in this planning area. The largest is the 2012 Rush Fire which burned about 7,174 acres on the southern edge of the PPA. Several small fires occurred in the 1990's consuming less than 200 acres. In total all recorded fires have burned 7,386 acres within the planning area or about six percent of the PPA. These were all natural caused starts that burned within a very short time period. Prior to 1990s historical fire information is very limited however, the fires that did occur were likely small in size. There has been a higher occurrence of fires in the recent past and the potential for future fires is higher due to the conversion of cheatgrass coupled with higher amounts of recreational use (see **Table 4-130**).

Table 4-130
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	89,475
High and Very High Burn Probability in PPA (percent)	69.7

Restoration on sites is generally better on northerly facing slopes and on sites at higher elevations, generally above 6,000 feet. Other than juniper and fuels reduction targeted projects, no fuel breaks have been accomplished within the planning area. Fire and invasive species such as cheatgrass remain the biggest concerns in this PPA with limited restoration success seen at elevations below about 5,500 feet. Juniper is also a concern in this planning area with numerous projects completed since the late 1990s and many still forthcoming.

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 within the Duck Flat PPA area are as follows: 52 percent in Fire Regime III, 35 percent in Fire Regime IV, 11 percent in Fire Regime V and the remaining in the other Fire Regimes. Three condition classes are largely present with 66 percent in condition class III, 17 percent in condition class II, 15 percent in condition class I, and the remaining not being classified.

Existing Treatments

There have been several ESR seeding treatments within the PPA. These seedings have occurred in the southwestern portion of the planning area and were primarily seeded with antelope bitterbrush using dozers and range drills. The topography in this region of the planning area was suitable for such treatments. In addition, there have been numerous seeding's in the Duck Lake basin to improve livestock grazing. Principle species used for these treatments include crested wheatgrass and Ladak alfalfa. Additionally, treatments have been used in the PPA to reduce sagebrush cover and to increase perennial grass cover. These treatments occurred periodically from the 1960's to the 1980's.

Other ESR treatments in the area have been focused on the control of noxious weeds and the spread of cheatgrass which is prevalent in the southern portion of the PPA.

Management Strategies

Other Relevant Management Activities

The Coppersmith and Buckhorn wild horse and burro HMAs fall within the southern portion of the PPA. These HMAs overlap most of the PPA, about 112,500 acres or approximately 96 percent of the planning area. Current horse numbers, exceeding established AMLs have been attributed to riparian area damage on springs and seeps.

Livestock grazing is the most noticeable management activity that occurs throughout the PPA with 71 miles of fences and 77 total water developments related to livestock grazing having been built in the past.

Fuels Management

Beginning in 1999 and continuing periodically to the present, numerous juniper reduction projects have been completed. The projects are dispersed among the northwestern, western, and south western portions of the PPA. There are several additional habitat restoration projects that are in the process of being implemented, primarily in the Tuledad valley area.

There are few natural fuel breaks that exist within the PPA; however, one fuel break was constructed on the southern portion of the PPA in the Cottonwood Mountains. Construction of the fuel break began in 2008 and was completed in 2009. Opportunities exist in the PPA to create additional fuel breaks using existing roads present within the planning area (see **Table 4-131**).

Table 4-131
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	15.25	42.27	0	57.52

First order priority phase 1 and 2 juniper removals include:

- Upper Tuledad
- Wire Lakes
- Buckhorn

First order priority fuel breaks include:

- Bare Creek road
- Tuledad Canyon road
- Buckhorn road
- Highway 447
- Red Rock Lake road

Second order priority fuel breaks include:

- Additional roads that could be improved upon to construct fuel breaks
- Identify opportunities to utilize a coordinated approach across jurisdictional boundaries

Habitat Restoration and Recovery

In this PPA, the biggest concern is Juniper encroachment therefore the high priority sites are the 3C areas comprised of big sagebrush and low sagebrush and phase I and phase II juniper. These areas are located throughout the Northwest, West, Southwest and Southern region of the planning area. The next biggest concern is the loss of perennial grasses throughout the 3A and 3B territories however, in general, previous attempts to reduce sagebrush cover and seed with both native and nonnative perennial grasses have been largely unsuccessful. For this reason, it is beneficial to protect established plant communities. The best opportunity for treatment in the planning area addresses juniper encroachment, fuel loading and treating invasive annuals throughout the 3A areas (see **Table 4-132**).

Table 4-132
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	21,549	53,827	0	75,376
Percent of PPA	16.69	41.70	0	58.39

There are opportunities to work with permittees and the NRCS to implement juniper reduction projects.

Fire Operations
High Priority for Suppression (see **Tables 4-133** and **4-134**)

3C and 3B habitat except for the area in and around the Rush Fire perimeter.

- Lower elevations and south facing slopes due to low resilience and resistance potential and low probability for recovery.
- Areas in and around the Rush Fire perimeter which contains cheatgrass.

Moderate Priority for Suppression

- Elevations that exceed 5500 ft. and North facing slopes.
- Greater resistance and resilience potential.

Low Priority for Suppression

- Low sagebrush above 5500 ft.
- Most resistant and resilient and high recovery potential. Also, least likely to burn.

Table 4-133
Fire Operations Priority Areas

Suppression Area Description	Fire Operations Priority Rating	Acreage
South slopes < 5500 ft.	High	16,707.71
North slopes > 5500 ft.	Medium	27,559.73
Rush Fire > 5500 ft.	High	7,176.744
South slopes > 5500 ft.	High	25,487.33
Low sagebrush > 5500 ft.	Low	12,467.86
Wyoming sagebrush < 5500 ft.	High	9,350.257
North slope < 5500 ft.	High	4,537.654
Mixed sagebrush < 5500 ft.	High	16,335.79
Mixed sagebrush > 5500 ft.	Medium	9,471.862

Table 4-134
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	24,990	46,983	0	71,973
Percent of PPA	34.7	65.3	0	100

Post-Fire Rehabilitation Management

High Priority for ESR (see **Tables 4-135** and **4-136**)

- Big Sagebrush species greater than 5,500 ft. excluding southern aspects.

Table 4-135
Post-Fire Rehabilitation Priority Areas

Project Area Description	Priority	Acreage
South slopes < 5500 ft.	Moderate	16,707.7
North slopes > 5500 ft.	Low	27,559.7
Rush Fire > 5500 ft.	High	7,176.7
Wyoming Sagebrush >5500 ft.	High	12,467.9
Low sagebrush > 5500 ft.	Low	9,350.3
South Slope > 5500 ft.	Moderate	25,487.3
North slope < 5500 ft.	Moderate	4,537.7
Mixed sagebrush > 5500 ft.	High	9,471.9
Mixed sagebrush < 5500 ft.	Moderate	16,335.8

Table 4-136
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	37,980	58,682	32,429	129,091
Percent of PPA	29.4	45.5	25.1	100

Wyoming Big sagebrush

These are some low lying areas in the northwestern portion of the PPA and at higher elevations in the South. Although recovery potential is low on most Wyoming Big sagebrush sites, immediate and short term ESR actions should be implemented to reduce cheatgrass invasion. If treatment is unsuccessful after the first year then repeat treatments will be a lower priority. Treatments would include seeding mostly native and possibly some nonnative grasses and planting big sagebrush seedling islands.

Moderate Priority for ESR

- Areas less than 5,500 ft.
- Southern aspects

This is the Northwestern region which is less resilient and resistant. The potential for recovery is very low therefore it becomes less of a priority compared to North aspects and higher elevations.

Low Priority for ESR

- Low sagebrush greater than 5,500 ft.
- Northern aspects greater than 5,500 ft.

Low Priority areas occur mainly throughout the Cottonwood mountain range and Coppersmith hills. Natural recovery potential is high therefore ESR will not be necessary in most cases.

Proposed Management

See **Table 4-137** for projects that have been identified presently within the NEPA planning process. See **Figures 4-77** through **4-80** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-137
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 (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]
Duck Flat Green Stripping	799	X						W			N	P		L1		5-7	5+
Duck Flat Green Stripping	2,219		X					W			N	P		L1		5-7	5+
Duck Flat Conifer Treatments	75,376		X		C						N	P		L1		10 to 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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.17 High Rock

Project Planning Area Description

General Site Description

The High Rock PPA is located northwestern Washoe County, Nevada near the Humboldt-Washoe county line. The area is comprised of 237,912 acres of which 233,406 acres (98 percent) are administered by the BLM, 3,606 acres (two percent) are under unknown administration, and 791 acres (greater than one percent) are private lands. This area primarily encompasses the High Rock canyon area and adjacent canyons that merge into High Rock canyon. Additionally, the PPA also encompasses all of the High Rock wilderness area, as well as, the High Rock ACEC. There are two large dry lake beds within the PPA. There are numerous ephemeral drainages within the area. Elevations throughout the PPA generally range from 4,347 feet in valley bottoms to approximately 7,192 feet (see **Table 4-138**).

Table 4-138
High Rock Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	121	0	0	8,260	0	1,878	46,161	0	13,717	167,776
Percent of PPA	0	0	0	3	0	1	19	0	6	71

The majority of the High Rock PPA is comprised of either 3B or 3C habitat which is characterized by a combination of big and low sagebrush plant communities occurring on a wide array of elevations and slopes. This habitat type is characterized by very low resistance and resilience to invasives and to disturbances making the majority of the PPA very fragile. Portions of the 3B habitat community may recover naturally over an extended period of time; however, majority of the area will not recover naturally in the event of a wildfire or other disturbance event.

Sage-grouse

The High Rock PPA is adjacent to the Massacre and Wall Canyon Planning Areas. In addition, the Sheldon National Wildlife Refuge is located directly north of the planning unit. The High Rock planning area lies entirely within the Massacre PMU. The High Rock planning area contains seven known active leks including three leks just outside of the planning area boundary. Leks within the High Rock planning area are predominantly found on mountain benches or plateaus adjacent to High Rock Canyon and the surrounding tributaries. Typical vegetation within the leks consists of low sagebrush and perennial grasses. GRSG that are utilizing these leks tend to be observed strutting in sagebrush with an average height of less than six inches. These leks are primarily located east and west of High Rock Canyon. Population trends within the planning area are generally trending downward. The planning area remains largely intact, with very little of the planning area being impacted by fires or other disturbances. Current radio and GPS data indicate that birds do move between the Sheldon and this planning area and to smaller degrees Wall Canyon and Massacre Planning Areas. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottoms and mountain bench locations. Brood rearing generally occurs within the riparian areas throughout the PPA. The planning area is known to be used by GRSG year round. Currently, fire and invasive weeds remain the biggest concerns within the High Rock planning area. Juniper encroachment into sage-steppe habitat is not an issue in this planning area because juniper densities are low. The planning area is largely comprised of vegetation communities that receive limited precipitation.

Vegetation

The majority of the area has a warm/dry soil temperature/moisture regime and vegetation is comprised of mostly Wyoming big sagebrush and perennial bunch grass plant communities. Low sagebrush dominates sites that are above 6000ft whereas the Wyoming sites occur in lower elevations. In 2012 the Lost Fire burned a total of approximately 41,000 acres, consuming approximately five percent of the High Rock planning area. The area that burned was predominately low sagebrush with perennial grass with a cool/dry soil temperature regime and is currently recovering to its natural state.

Minimal cheatgrass exists currently however, a large portion of this planning area is weakly resistant and should be protected from wildfire which would likely lead to cheatgrass invasion. Juniper woodlands exist but are not a major concern. No substantial noxious weed populations have been documented (see **Table 4-139**).

Table 4-139
High Rock Vegetation Categories

Site Description	Fire Operations Priority Rating	Acreage
Low Sagebrush > 6000 ft.	Low	25,234.0
Wyoming Big Sagebrush < 6000 ft.	High	75,055.3
Mixed Sagebrush < 6000 ft.	Medium	73,957.6
Mixed Sagebrush > 6000 ft.	Medium	47,957.9
Lost Fire > 6000 ft.	High	15,706.9

Fire

About 15,863 acres are known to have been burned since 1980. Besides the Nellie fire, a 100 acre fire that burned in 1998, the only other fire since 1980 was the Lost fire that burned over 15,000 acres of the Wall Canyon planning area. This equates to approximately about 5 percent of the total area encompassed by the High Rock planning area. These were all naturally caused starts that burned within a very short time period. Prior to 1998, this area had very limited fire history and most fires were small in size. There has been a higher occurrence of fires in the recent past and the potential for future fires is high due to the conversion of light, flashy fuels such as cheatgrass coupled with higher amounts of recreational use. There have been no fuel breaks created within the High Rock planning area. In addition, none are currently planned because the High Rock planning area lies completely within the wilderness boundary (see **Table 4-140**).

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 within the High Rock PPA are as follows: 81percent in Fire Regime III, 19 percent in Fire Regime IV, and the remaining in the other Fire Regimes. Two condition classes are largely present with 82 percent in condition class II, 17 percent in condition class I, with very little in condition class III, and the remaining not being classified.

Table 4-140
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	12,340
High and Very High Burn Probability in PPA (percent)	5.2

Existing Treatments
There have been several prescribed fires that have occurred within the High Rock PPA. These prescribed fires began in the early 2000's and ended in 2007. ESR treatments have taken place in 2013 and 2014 after the Lost Fire. Mountain Big sagebrush and slender wheatgrass were seeded aerially and antelope bitterbrush seedlings were hand planted. Due to the resilience of the site natural and ESR recovery has been successful.

Management Strategies

Other Relevant Management Activities
A portion of the PPA is readily accessible for the public and is visited due to the fact that High Rock canyon once was part of the Emigrant Trail. Management of noxious weeds will continue to be a management activity due to the fact that this area is visited readily by tourists. Additional management activities in the area include livestock management, wild horse management, and monitoring of California bighorn sheep populations.

The High Rock Wild Horse HMA is within the western portion of the High Rock PPA. Current herd numbers exceed established AMLs. It is estimated that damage to remote riparian areas, springs and seeps are attributed to these high numbers.

Livestock grazing is the most noticeable management activity that occurs throughout the planning area. Approximately 95 miles of fence and over 75 water developments related to livestock grazing having been built.

Fuels Management

Fuels treatments have occurred within the High Rock PPA. These treatments have primarily been used to reduce sagebrush cover within the High Rock Canyon drainage. Most of the PPA is within a wilderness boundary making the construction of new fuel breaks difficult. However, existing roads could serve this purpose (see **Table 4-141**).

Table 4-141
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	28.95	102.88	0	131.83

Habitat Restoration and Recovery

Seeding and hand planting in the Lost Fire generally has been successful. There are opportunities to continue ESR treatment in this area where Big sagebrush has not recovered. The vast majority of the PPA is comprised of low elevation Wyoming Big sagebrush considered to have low resistance and resilience. For this reason, restoration potential is low and focus should be put on preservation of what exists (see **Table 4-142**).

Table 4-142
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	3,218	381	0	3,599
Percent of PPA	1.35	0.16	0	1.51

Fire Operations

Priority 1 for Suppression (see **Table 4-143**)

- Recovery is unlikely due to low resistance and resilience.

Priority 2 for Suppression

- Moderate resistance and resilience which is strongly dependent on elevation and aspect.
- The NW and E side of the planning area is a moderate fire suppression area

Priority 3 for Suppression

- Low sagebrush sites above 6,000 ft. are highly resistant and resilient with a strong potential to recover naturally.

Table 4-143
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	119,913	91,308	26,691	237,912
Percent of PPA	50.4	38.4	11.2	100

Post-Fire Rehabilitation Management

Priority 1 for ESR

- Big sagebrush species greater than 5,500 ft. excluding southern aspects.
- Wyoming Big sagebrush

The majority of the area is made up of Wyoming Big sagebrush habitat on a warm/dry soil temperature/moisture regime. The resistance and resilience is low. Post-fire treatments would likely be unsuccessful however, due to the importance of this habitat ESR treatments should be implemented within the first year. Invasive grasses are a major concern here and should be monitored, followed by treatment if necessary (see **Table 4-144**).

Moderate Priority for ESR

- Areas less than 5,500 ft.
- Southern aspects

Low Priority for ESR

- Low sagebrush greater than 5,500 ft.
- Northern aspects greater than 5,500 ft.

Table 4-144
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	90,762	121,915	25,234	237,912
Percent of PPA	38.1	51.2	10.6	100

Proposed Management

See **Table 4-145** for projects that have been identified presently within the NEPA planning process. See **Figures 4-81** through **4-85** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-145
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 (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]
High Rock Fuel Break/Green Stripping	29	X						W			N	P		LI		5-7	5+
High Rock Fuel Break/Green Stripping	104		X					W			N	P		LI		5-7	5+
High Rock Lost Fire Active ESR Treatments	381		X			I					N	P		LI		10-20	5+
High Rock Sagebrush Planting Treatment	3,218	X				I					N	P		LI		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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.18 Massacre

Project Planning Area Description

General Site Description

The Massacre PPA is located in northwestern Washoe County, Nevada. The area is comprised of 116,234 acres of which 105,002 acres (90 percent) are administered by the BLM, 663 acres (one percent) are administered by the Sheldon Wildlife Refuge, and 10,569 acres are undetermined. The PPA primarily encompasses a large portion of Massacre Rim, the northern portion of Massacre Lake, and the Bitner Table area which is a large plateau. Mountain ranges are typically oriented north to south, with large valley bottoms between ranges. There are no perennial streams within the PPA; however, there are numerous ephemeral drainages within the PPA. Springs and seeps commonly occur throughout the PPA in the higher elevations; however most of these areas are not meeting riparian health objectives due to livestock grazing and/or overuse by wild horses. Elevations throughout the PPA generally range from 5512 feet in valley bottoms to approximately 7028 feet on top of Massacre Rim (see **Table 4-146**).

Table 4-146
Massacre Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C
Acres	1,649	0	0	2,377	0	438	38,235	0	338	73,197
Percent of PPA	1	0	0	2	0	0	33	0	0	63

The majority of the Massacre PPA is comprised of 3C habitat which is characterized by a combination of big and low sagebrush plant communities occurring on a wide array of elevations and slopes. This habitat type is characterized by very low resistance and resilience to invasives and to disturbances making the majority of the Massacre PPA very fragile.

Sage-grouse

The Massacre PPA is adjacent to the High and Vya Planning Areas. In addition, the Sheldon National Wildlife Refuge is located directly east of the planning unit. The Massacre Planning Area overlaps onto the Vya and Massacre PMUs. The Massacre planning unit contains six known active GRSG leks including one lek just outside of the planning area polygon boundary. Leks within the Massacre planning area are predominantly found on mountain benches or plateaus adjacent to Massacre Lakes with vegetation consisting of low sagebrush and perennial grasses. GRSG that are utilizing these leks tend to be observed strutting in sagebrush with an average height of less than six inches. These leks are primarily located above Massacre Lakes which consists of several large alkali lake beds that are situated in the center of the planning area. Population trends within the planning area are generally trending downward; however, there are a few leks that are trending in an upward direction. The planning area remains largely intact, with very little of the planning area being impacted by fires or other disturbances. Current radio and GPS data indicate that birds do move between the Sheldon and this planning area and to smaller degrees Vya and High Rock Planning Areas. Distribution patterns and movements are typical of the Great Basin with wintering occurring on valley bottoms and mountain bench locations. Brood rearing generally occurs within the riparian areas throughout the PPA. The planning area is known to be used by GRSG year round. Currently, fire, invasive weeds, and juniper encroachment remain the biggest concerns within the Massacre planning area.

Vegetation

Vegetation in the planning area generally consists of low sagebrush and juniper with small portions of big sagebrush communities. Wet meadows are prevalent throughout and host a variety of obligate and facultative riparian species. Several wetland areas have been enclosed to allow for a vigorous composition of forbs providing quality habitat for GRSG. Several small sections of the planning area have received juniper reduction treatments to improve understory vegetation cover which has been lost throughout a significant portion of the area. Several crested wheatgrass seedings took place in the southernmost region of the planning area. In the 1960's approximately 425 acres of sagebrush were sprayed with herbicide and seeded. In addition, 481 acres were seeded in the 1980's. No wildfires or other major disturbances have been documented within the planning area.

Elevation exceeds 5,500 feet throughout the entire planning area thus, there are few areas highly susceptible to cheatgrass invasion. No other significant noxious weed populations exist.

Fire

There have been approximately 15 fire ignitions in this planning area since 1980. All fires were naturally caused starts that burned within a very short time period. No large fires are known to have occurred in this planning area however, about 375 acres have burned since 1980. At elevations below about 5,500 feet heavy cheatgrass infestations are generally observed and will continue to be of a concern in the event of another fire. The Massacre planning area has remained largely intact with little to no habitat fragmentation occurring within the planning area. No fuel breaks have been created within the planning area. Juniper occurs along the northwestern boundary of the planning area. Future reduction projects are currently in the planning stages.

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 within the Massacre PPA area are as follows: 81 percent in Fire Regime III, eight percent in Fire Regime IV, five percent in fire Regime V, and the little that remains in the other Fire Regimes. Two condition classes are largely present with 51 percent in condition class I, 43 percent in condition class II, with very little in within condition class III, six percent classified as barren and the remaining not being classified (see **Table 4-147**).

Table 4-147
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	0.0
High and Very High Burn Probability in PPA (percent)	0.0

Existing Treatments

There have been no major fires within the PPA However, several seeding's of crested wheatgrass and ladak alfalfa have occurred within the confines of the PPA. These seeding have occurred during the late 60's to early 70's. Brush management treatments and chemical treatments have also occurred within the

PPA during this same time period and extended into the early 80's. These vegetative treatments were aimed at reducing sagebrush cover and establishing feed for livestock grazing.

Management Strategies

Other Relevant Management Activities
Currently, the SFO staff is working on a joint wildlife and fuels management plan for the Massacre Rim to improve GRSG and California bighorn sheep habitat.

The Bitner, Massacre, and Nut Mountain Wild Horse HMA's boundaries cover much of the planning area, 90,280 acres or 78 percent of the planning area. Current numbers of wild horses that exceed established AMLs have been attributed to riparian area damage at springs and seeps within the area.

There are no known current or planned mineral exploration projects in the planning area. Some small gravel pits are present.

Livestock grazing is the most noticeable management activity that occurs throughout the planning area with approximately 90 miles of fence and over 40 water developments having been built.

Fuels Management
There are approximately 900 acres of fuel treatments proposed within the PPA. These projects are designed to reduce juniper encroachment into sage steppe habitats, as well as, to reduce juniper encroachment into riparian areas.

Very few natural fuel breaks exist within the PPA. There are two major roads that border the southern and western portions of the PPA and would serve as a fuel break in the event of a wildfire. Development of additional fuel breaks in the PPA would require extensive NEPA analysis as well as work. Because the PPA is located within a Wilderness Study Area (WSA) few roads exist that can serve as fuel breaks (see **Table 4-148**).

Table 4-148
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	23.87	44.18	0	68.05

First order priority phase 1 and 2 juniper removals include:

- Massacre Rim
- Board Corral
- Massacre Springs

Habitat Restoration and Recovery

Within the Massacre planning area, there have been only one or two juniper reduction projects to have occurred. These projects were not aimed at sage-steppe restoration, but to remove juniper trees from encroaching onto Native American historical sites. However, there is an opportunity for some juniper reduction to take place in the northwestern portion of the planning area, primarily below and along Massacre Rim. The development of an environmental assessment will have to be completed before any projects occur. Currently, a plan is being developed to manage juniper encroachment into sage-steppe and riparian areas. These treatments will improve GRSG general habitat and brood rearing habitat, as well as, to improve habitat for California bighorn sheep.

This area has not been impacted by major wildfires; therefore there have not been any ESR projects recorded. As noted in a previous section, there have been several seeding that have occurred in the southwestern portion of the planning area aimed at improving livestock grazing (see **Table 4-149**).

Table 4-149
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	4,622	37,008	2,817	44,447
Percent of PPA	3.98	31.84	2.42	38.24

Fire Operations

High Priority for Suppression (see **Tables 4-150** and **4-151**)

- Mountain and Wyoming Sagebrush sites in the SW have the highest chance of burning in this planning area.
- There is a higher start potential along massacre rim to the W.
- Lower elevations on W and S aspects are the highest priority because they are the least resilient and resistant.

Moderate Priority for Suppression

- Mixed Big sagebrush sites which are more likely to burn than the low sage sites.
- W and S aspects are a higher priority than N and E aspects.

Low Priority for Suppression

- Dry Lake Beds which are highly unlikely to burn
- Low sage sites and the general NE region which have a low burn probability.

Table 4-150
Fire Operation Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Low Sagebrush > 5500 ft.	Low	41,013.7
Big Sagebrush > 5500 ft.	Medium	15,221.1
Dry Lake Bed > 5500 ft.	Low	9,962.9
Mixed Sagebrush > 5500 ft.	Medium	37,939.6
Mountain and Wyoming Sagebrush > 5500 ft.	High	120,70.8

Table 4-151
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	12,071	53,180	50,983	116,234
Percent of PPA	10.4	45.8	43.9	100

Post-Fire Rehabilitation Management

High Priority for ESR

- Big sagebrush species greater than 5,500 ft. excluding southern aspects.
- Wyoming Big sagebrush

All habitat throughout this planning area is above 5,500 ft. therefore it has a strong chance of recovering after fire depending on the aspect and weather conditions. Big sagebrush can be found primarily in the W and SW (see **Tables 4-152** and **4-153**).

Moderate Priority for ESR

- Areas less than 5,500 ft.
- Southern aspects

There are no areas of moderate priority for ESR in the Massacre planning area.

Low Priority for ESR

- Low sagebrush greater than 5,500 ft.
- Northern aspects greater than 5,500 ft.

There are low sagebrush sites above 5,500 ft. throughout the planning area which have a strong chance of recovering naturally after a fire. There are dry lakebeds on the West side of the planning area which are barren and do not make suitable habitat for GRSG.

Table 4-152
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	12,071	53,181	50,977	116,229
Percent of PPA	10.4	45.8	43.9	100

Table 4-153
Post-fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
Low Sagebrush > 5500 ft.	Low	41,013.7
Big Sagebrush > 5500 ft.	High	15,221.1
Dry Lake Bed > 5500 ft.	Low	9,962.9
Mixed Sagebrush > 5500 ft.	High	37,939.6
Mountain and Wyoming Sagebrush > 5500 ft.	High	12,070.8

Proposed Management

See **Table 4-154** for projects that have been identified presently within the NEPA planning process. See **Figures 4-86** through **4-90** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-154
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 (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]
Massacre Green Stripping	1,309	X						W			N	P		L1		5-7	5+
Massacre Green Stripping	2,301		X					W			N	P		L1		5-7	5+
Massacre Conifer Treatments	40,601		X		C						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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.19 Shinn

Project Planning Area Description

General Site Description

The Shinn PPA is located in eastern Lassen County, CA and northwestern Washoe County, NV. This area encompasses Skedaddle Mountain to the south and Shinn, Spanish Springs and Observation Mountains in the north. All individual mountains are eroded, remnant volcanos. Smoke Creek is the primary perennial stream that occurs within the PPA. Springs and seeps commonly occur throughout most of the mountains and plateaus. Elevations throughout the PPA generally range from 4,800 feet in valley bottoms to approximately 8,000 feet on top of Skedaddle Mountain (see **Table 4-155**).

Table 4-155
Shinn Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	9,210	10,955	33	0	19,254	9,715	90	129,431	112,959	121,046	412,692
Percent of PPA	2	3	0	0	5	2	0	31	27	29	100

The majority of the 3C habitat encompasses the valley bottoms, low lying hills and volcanic plateaus. The resistance resilience model may be over estimating the amount of sagebrush returning to the burned areas, as there are recommendations to augment past fires with sagebrush plantings. Mainly (90 percent) warm/dry soil moisture regime with cool/dry in higher elevations. Lower elevations will be slow to recover. GRSG are living in marginal habitat.

In 2012 the Rush Fire burned 315,000 acres within the PPA. Numerous rehabilitation and restoration projects were completed with moderate success during the first growing season after the fire. Extreme drought in 2013 severely impacted all seeding and planting projects in the second year.

The Shinn PPA is almost entirely within the Twin Peaks HMA. The Field Office did not get approval to remove horses after the Rush fire and, at present, the AML within the PPA is at least three times over high end (AML = 450 to 750). Several bands of horses have been sited at remote springs and in riparian areas because these are the first places to recover from fire. Soils at these sites have become extremely compacted and vegetation is limited due to excessive horse use.

Portions of the southern Shinn PPA have converted to cheatgrass but continue to maintain a population of GRSG. The Rush Fire has further expanded cheatgrass and medusahead. After the fire the area had less than 25 percent sagebrush cover but will remain a priority for restoration and recovery as long as the GRSG population is maintained.

At the end of 2014, USGS, USFWS, CDFW, NDOW and BLM received grant funding to initiate additional telemetry studies to help determine GRSG distribution after the Rush Fire.

Sage-grouse

The eastern portion of the ELFO contains the majority of the leks within the Buffalo-Skedaddle Population Management Unit (PMU). Virtually all of the leks showed a significant decline over the past few years regarding number of males counted during annual counts. These leks were affected by the 315,000-acre Rush Fire which ignited in August 2012. The fire burned in various areas from low to high intensity, but resulted in the significant loss of sagebrush and other shrub, grass, and forb species within the fire perimeter. This in turn affected nesting and hiding cover for GRSG, which ultimately increases visibility of adults, and particularly young, to predators. The loss of the majority of beneficial vegetation, including riparian vegetation and associated insects further affected populations and recruitment of young grouse into the adult population. Although natural regrowth of some vegetation has occurred, and rehabilitation efforts included approximately 30,000 acres of reseeding, sagebrush and other brush and browse species are slow to regrow and recover. It is still unknown what long-term effects the fire will have on GRSG and other wildlife species, but results of some post-fire surveys have shown that annual invasive plants are prevalent within the fire perimeter. Multiple fires have occurred in the last 30 years in this area, repeatedly burning the same lands, particularly in the Observation Mountain area. More known noxious or invasive weed sites occur in this area; annual treatments of these infestations occur, and most do not occur in close proximity to known GRSG leks. The 1998-2001 and 2007-2009 GRSG telemetry studies were again very consistent in results; most of the detections occurred in the immediate and surrounding vicinities of known leks. Water sources occur mostly as creeks and springs, and include Smoke Creek, Deep Creek, Rush Creek, Stony Creek, Skedaddle Creek, and numerous springs and ephemeral creeks and drainages.

Vegetation

The Rush Fire of 2012 burned approximately 300,000 acres, consuming large stands of sagebrush and western juniper, much of which was located in the Shinn PPA. In addition, much of this landscape had been designated Preliminary Priority GRSG Habitat (PPH). These areas are now predominately annual grasslands dominated by cheatgrass and tumble mustard. In areas where clay soils are present medusahead is often the dominant species. Noxious weeds are also present and are discussed further in the Existing Treatments section.

Prior to the Rush Fire the Shinn PPA supported large expansive stands of sagebrush. Wyoming big sagebrush plant communities are present in the lower elevations and mountain big sagebrush communities and scattered aspen stands can be found in the higher elevations. Some areas with deeper soils support basin big sagebrush and Great Basin wild rye stands. Some areas have very shallow rocky soils, it is common to find low sagebrush and shallow rooted grasses and forbs growing in these places.

The Wyoming and mountain sagebrush plant communities consist of the respective sagebrush species, bitterbrush and rabbit brush shrubs. Perennial grasses such as bluebunch wheatgrass, bottle brush squirrel tail and Thurber's needlegrass and annual and perennial forbs make up most of the understories. In low sagebrush plant communities the common understory grass species is Sandberg's bluegrass. Several small annual and perennial forbs can also be found in these areas.

The Rush fire burned large swaths of sagebrush stands, but left some stands unburned. The fire burned in a mosaic, consuming more than it spared. Areas where sagebrush is missing are now large expansive stands of annual invasive nonnative species. Many of the unburned stands are decadent with low seed production and recruitment of other species.

Riparian areas in the Shinn PPA consist mostly of perennial and ephemeral streams and small remote springs and seeps. Smoke Creek, Buffalo Creek, Stony Creek, Rush Creek and Deep Creek are the perennial streams and Skedaddle Creek and South Fork Wash are intermittent waterways. Vegetative communities along these waterways consist mainly of perennial bunch grasses, willow, carex, juncus and various wetland obligate and wetland facultative species. Small springs and seeps dot the landscape and support many of the same wetland obligate and facultative species that are found along the perennial waterways.

Fire

The PPA was heavily impacted by fire over the last 15 years with over 400,000 acres of wildfire within the Shinn PPA. These were all natural caused starts that burned within a very short time period. Prior to 1999 this area had limited fire occurrences and what fires did occur were small in size. 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 that has occurred within many of the fire perimeters.

Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. Within the Shinn PPA, fire regimes are highly altered. The predominant Fire Regime Group (FRG) is FRG III with a smaller but significant area of FRG IV and lesser areas of FRGs I and V. There are also significant areas of Fire Regime group IV with less amounts of Fire Regime group I (see **Table 4-156**).

Table 4-156
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	377,950
High and Very High Burn Probability in PPA (percent)	91.7

Management Strategies

Treatments

Large ESR seeding efforts have occurred over a majority of the PPA following the 2012 fire season. The majority of these treatments were aerial and drill seeded using native species. The main objective was to impede cheatgrass expansion and stabilize sites. In areas where terrain allowed drill seeding, treatments occurred within areas that cheatgrass and other invasives were likely to invade. Small areas have been hand planted with bitterbrush seedlings. The main objective is to establish perennial vegetation for wildlife habitat. These reseeding efforts have occurred with varied success. Although livestock grazing was suspended for two growing seasons, free-roaming horses and burros occupy these sites and were not gathered after the Rush Fire. Due to excessive horse and burro populations restoration and rehabilitation efforts have been degraded.

Several remote springs have been fenced off using Liberty Pipe fencing. This style of fencing is wildlife friendly and keeps livestock and free-roaming horses and burros out of the spring sources and wet meadows.

The control of noxious weeds continues throughout most of the PPA by government agencies and local Weed Conservation Districts. BLM treats noxious weeds on federal land using methods discussed in the Eagle Lake Integrated Invasive Plant Management Plan. Known species in the Shinn PPA are perennial pepperweed, yellow starthistle Canada thistle, Scotch thistle, Russian knapweed and Dyers woad. The area is surveyed annually and known populations are currently being monitored and treated.

Previous fires and restoration efforts that began in the 1950s have altered the landscape from its historical vegetative state. Shinn and Observation mountains have both burned several times in recent years. In an effort to stabilize soils and to increase forage production, burned areas were aerial seeded with crested wheat grass and intermediate wheat grass. Most of these treatments occurred on and around Shinn Mountain. There is evidence that big sagebrush species and associated native understory plants are currently present in these sites.

The Rush Creek project began in 2014 and is protecting approximately 200 acres of riparian and upland vegetation along the South Tributary of Rush Creek. This project is also replacing and repairing nine troughs within a 20mile radius and fencing any associated riparian areas. The objective of this project is to protect the South Tributary of Rush Creek and to provide dispersed water sources to encourage wildlife, livestock, horse and burro circulation across the landscape. So far success has been good with this project. Vegetation along the South Tributary of Rush Creek is responding positively and several wildlife species, burros and horses have been sighted at the new troughs.

Other Relevant Management Activities

Other management activities in the PPA are: primitive recreation, seasonal hunting, sheep and cattle grazing, previous wind energy testing applications and discussions about solar energy potential.

The Shinn PPA falls within The Twin Peaks HMA. Twin Peaks was last gathered in 2010 with approximately 1600 animals being removed at that time. AML for the HMA is 450 to 750 animals. At present projected animal numbers are approximately 1800. Under present Wild Horse and Burro guidance there is no mechanism to reduce numbers down to acceptable AML levels.Fuels Management

The priority fuel management areas for the Shinn PPA are to create green strips around the remaining sagebrush islands within the Rush Fire perimeter. These areas are critical to the GRSG population that remains within the area. The secondary priority is to create green strips along east/west oriented linear features within the area to aid in suppression of future wildfires. Primarily, roads would be utilized including the Buckhorn Byway, Smoke Creek, and Ramhorn roads. The next priority is to remove juniper, using both mechanical and manual methods, along and north of Buckhorn Byway followed by creation of green strips.

There is a need for additional analysis to consider flammability of plantings and use for fuel breaks (some plant species retain moisture and are less flammable).

Additional fuels management treatments to consider are targeted use of grazing and chemical treatments for control of invasives. Treatments not considered in the PPA are prescribed fire, biological or mechanical treatments on south slopes below 6,000 feet (see **Table 4-157**).

Table 4-157
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	62.69	65.62	13.93	142.24

Habitat Restoration and Recovery

In general, restoration and rehabilitation has been successful at higher elevations but significantly less successful in lower elevations and south slopes. The area is dominated by sagebrush with some areas experiencing low to medium density juniper encroachment.

Treatments

The area surrounding Smoke Creek Road burned thoroughly and there are very large areas that lack shrubs or perennial vegetation. Some areas did not burn but are decadent. This area would be ideal to establish some greenstripping sites. Medusahead is currently present and will require treatment prior to planting. Treatment in the existing sagebrush stands can include planting fire resistant vegetation around the existing stands and hand planting sagebrush seedlings within the stands (see **Table 4-158**).

Table 4-158
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	54,120	69,930	26,378	150,427
Percent of PPA	13.11	16.94	6.39	36.45

Liberty pipe fencing has been installed at various riparian locations within the Rush Fire perimeter. Liberty pipe fence is heavy gauge pipe that is installed to prevent horses, burros and livestock from accessing riparian areas. The fencing is designed to allow riparian access to wildlife. As funding becomes available Liberty pipe fencing can be purchased and installed at more springs and seep areas. As circumstances arise riparian areas can receive vegetation treatments to expand and improve their condition.

Work is ongoing and would be a continuance of ESR. Treatments using a long-term perspective need to continue.

Free-roaming horses and burro use is a continuing problem and will negate any success gained from treatment. Fencing may not be effective, especially for burros.

Existing restoration of aerial, broadcast, and drill seeding need to be maintained and enhanced. Ongoing planting of bitterbrush and sagebrush seedlings needs to be funded for long term recovery. Large understory areas of invasive annuals need to be chemically treated before seeding.

Restoration and recovery would focus priority on north-slope and high elevation where there is a higher probability for restoration and could provide birds with at least some habitat. The concept is to provide better habitat (cover) surrounding the leks for nesting and brood rearing. Seeding on south slopes and low elevation is a viable mechanism but would be a lower priority. (with the exception of greenstripping).

In brood rearing habitat, there is a need to ensure that riparian areas have good recovery. Fencing will be used to protect sensitive riparian areas. There are only a few springs in the southern portion. There is more water in the north, but there is a need to monitor for grazing in those areas.

The West/northwest areas of the PPA would be targeted for conifer reduction. There are large areas of phase 1 and 2 juniper in the Buckhorn area. Conifer treatments would be prioritized around the leks and work outward from there in stages.

There would continue to be a focus on maintaining and improving success of existing projects, especially those in riparian areas. Repair existing exclosures, repair water troughs, clean out head boxes and/or repair pipes.

In low elevation and warm/dry soils, active restoration would need to be very selective and would need to be followed by chemical treatments. These areas are not a priority for mechanical treatments.

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Shinn PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Fire OperationsThe entire area is high priority for fire suppression; however, protection of the remaining sagebrush islands within the Rush Fire perimeter would take precedence for suppression activities. The Wildland Fire Decision Support System will be updated to reflect these priorities and identify the areas to the decision maker during a wildfire event. Given a scenario with two fire starts, resources would be evenly split among north and south areas. It is all priority. The message to fire crews (incident commander) in this area under this scenario would be to talk to resource advisor(s) for advice. Coordination of Fire Suppression activities would be conducted under the current dispatch system (see **Table 4-159**).

Table 4-159
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	304,351	108,341	0	412,692
Percent of PPA	73.7	26.3	0	100

Opportunities to enhance or improve suppression activities include preloading contracts with private landowners. This is currently a regulatory issue that needs to be addressed as it can only be done once a year. Prepositioning suppression resources at Ravendale during high fire danger periods and considering the possibility of increasing the volume of current water sources in the southern part of the PPA can reduce the turn-around time to refill engines and/or water tenders.

The use of wildfire for resource benefits would not be used within the Shinn PPA due to the urgency of protecting the limited amount of GRSG habitat that remains.

The Rush fire area and intact sagebrush stands adjacent to the fire area are high priorities to prevent from burning again.

Use of resource advisors during any incidents in the PPA is critical. Contracts with private landowners could be preloaded to develop a new water sources in the south. This would be a regulatory change.

Post-Fire Rehabilitation ManagementAreas of high priority for post-fire rehabilitation would be to reestablish and improve habitat connectivity (see **Table 4-160**). These areas would be prioritized by:

- Greater than 6,000ft and north slopes.
- Along the Smoke Creek Road
- Areas of existing drill seedings in burn area (protecting investments). (include existing stands as part of mosaic burn?
- Consider areas with higher success as being higher priority, as data becomes available

Previous seedings on the low elevation south slopes were not effective; focus should be higher elevation in the future.

Opportunities to improve fuel breaks and implement green stripping along linear features will be analyzed during the Post-Fire Rehabilitation Analysis

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Horse Lake PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Table 4-160
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	310,278	102,413	0	412,690
Percent of PPA	75.2	24.8	0	100

Proposed Management

See **Table 4-161** for projects that have been identified presently within the NEPA planning process. See **Figures 4-91** through **4-96** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-161
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 (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]
Shinn Green Stripping	3,253	X						W			N	P		L1		5-7	5+
Shinn Green Stripping	3,414		X					W			N	P		L1		5-7	5+
Shinn Green Stripping	717			X				W			N	P		L1		5-7	5+
Shinn Conifer Treatments	36,777		X		C						N	P		L1		10 to 20	5+
Shinn Invasive Weeds Treatments	87,179	X				I					N	P		L1		5-7 if follow-up is neces-sary	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.20 Horse Lake

Project Planning Area Description

General Site Description

The Horse Lake PPA is located in Lassen County. This area encompasses the Fredonyer Mountain area which is oriented north/south with the GRSG habitat occupying the eastern slope. The PPA encompasses the eastern slope of the mountain, dry lakes beds and volcanic table lands. Springs and seeps commonly occur throughout most of the area. The two main drainages are Pete's and Snowstorm Creeks. Elevations throughout the PPA generally range from 4300 feet on the lower plateaus of Horse Lake to approximately 7,200 feet on Fredonyer Mountain. See **Table 4-168**, Project Planning Area Treatment Summary Table.

The PPA is dominated by warm/dry soils except in high elevation areas, such as Pete's Creek and Snowstorm, which are warm/moist. Cool/moist soils types exist in the northwest and in higher elevation areas (see **Table 4-162**).

Table 4-162
Horse Lake Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	1,845	5,988	9,229	1,474	0	371	0	484	32,265	41,694	93,351
Percent of PPA	2	6	10	2	0	0	0	1	35	45	100

The majority of the habitat is within the warm/dry (3C) soil types except for the higher elevations. The habitat is defined by intact sagebrush stands with a native grass and forb understory in the higher elevations grading to invasive grasses understory in the lower elevations. The area falls within a 10 to 12 inch/year precipitation zone.

Sage-grouse

The Horse Lake vicinity currently supports five active GRSG leks. These include Horse Lake, Little Blacks Mountain North, Little Blacks Mountain Res Satellite, Little Blacks Mountain South, and Pete's Creek. Annual lek counts are conducted on these leks, and only Pete's Creek showed an increase in number of males from 2013 (eight) to 2014 (14). Telemetry data from studies done in 1998-2001 and 2007-2009 resulted in very similar results; frequent detections occurred in the Blacks Mountain area and even more heavily to the southeast near Biscar, the Tablelands and to the area of the Shaffer lek. Vegetation within the area is typical of the sagebrush community, and includes big sage, low sage, bitterbrush and other browse species, and a variety of native annual and perennial grass and forb species. The majority of the area is classified as GRSG value R-1 (areas with potential to produce sagebrush plant communities with a good understory of grasses and forbs, but lacks sufficient sagebrush canopy) and R-4 (areas with potential to produce sagebrush plant communities, but whose understories are currently dominated by annual grass, forbs, or bare ground). Water sources are plentiful, and include Pete's Creek, Snowstorm Creek, Biscar Reservoirs, Craemer Reservoir, Willow Creek, and multiple springs and ephemeral drainages. These provide important riparian habitat for GRSG brood-rearing by supplying beneficial forbs and insects to nesting females and young broods. Several locations of noxious weeds are known within the vicinity and are treated annually; however the density of these sites is sparse compared to other areas within the ELFO, and none occur in the immediate vicinity of GRSG leks. Bird usage on table lands is more for connectivity and less for nesting and brood rearing.

Vegetation

The topography of the Horse Lake PPA area can be considered Basin and Range. The dominate vegetation consists of mountain big, Wyoming and low sagebrush plant communities. Associated shrub species include antelope bitterbrush and rabbit brush. Buckwheat is the common shrub association found in the low sagebrush sites. Perennial and annual grass and forb species make up the understories. Curleaf mountain mahogany is present in the rocky outcrops and ridges and there are a few aspen stands scattered in the higher elevations. In addition, western juniper, cheatgrass and in some areas medusahead are also present. Noxious weeds are present and further discussed in the Existing Treatments section of this document.

Western juniper, is actively encroaching onto the sagebrush rangeland. These sites are predominately dominated by phase 1 and phase 2 encroachments as described by Miller, et al. (2005). Cheatgrass dominates portions of past fires and disturbed areas throughout the PPA. Medusahead has also been documented in small patches where clay soils are present.

Riparian areas in the Horse Lake PPA consist mostly of perennial streams and small remote springs and seeps. Pete's Creek and Snowstorm Creek are both perennial streams that flow through the center of the habitat area. Pine Creek and Shoal's Creek are also perennial streams that are located in the northern end of the PPA and at higher elevations. Vegetative communities along these waterways consist mainly of perennial bunch grasses, willow, carex, juncus and various wetland obligate and wetland facultative species. Small springs and seeps dot the landscape and support many of the same wetland obligate and facultative species that are found along the perennial waterways.

Fire

Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. Within the Horse Lake PPA, fire regimes are moderately altered. The dominant vegetation in the PPA is mountain big sagebrush, which falls within Fire Regime group III based upon a historic fire frequency of 20 years with stand-replacement severity (source: LANDFIRE biophysical settings model). There are also significant areas of Fire Regime group IV with less amounts of Fire Regime group I. Most of the Horse Lake PPA has experienced too little recent fire leading to expansion of western juniper and the establishment of phase I and II juniper woodlands (see **Table 4-163**).

Several small fires have occurred in the general area; one in 1987 for approximately 1,100 acres, and two in 2002 for a total of approximately 1,200 acres. These fires all occurred just south of Horse Lake and Craemer Reservoir.

Table 4-163
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	78,811
High and Very High Burn Probability in PPA (percent)	84.9

Existing Treatments

Horse Mountain was the site of an expansive multi-year juniper reduction that began in 2008. Rehabilitation treatments consisted of small efforts to seed associated landings and skid rows. The objective of these efforts was to get some native vegetation reestablished in the disturbed areas. Treatments consisted of broadcast and drill seeding native perennial grasses, forbs and shrubs. Treatments occurred in 2010, 2011 and 2013. Success rates have varied, for example, north slopes at higher elevations have had better success than south slopes. Treatments that occurred in 2011 were more successful than 2013 because precipitation levels were higher in 2011.

The control of noxious weeds continues throughout most of the PPA by government agencies and local Weed Conservation Districts. BLM treats noxious weeds on federal land using methods discussed in the Eagle Lake Integrated Invasive Plant Management Plan. Known species in the Horse Lake PPA are perennial pepperweed, hoary cress, yellow starthistle and Mediterranean sage. These populations are currently being monitored and treated.

Existing vegetative treatments within the PPA include 564 acres of juniper hand thinning and 600 acres of mechanical juniper thinning. There are 1,642 acres of additional juniper reduction treatments currently planned within the PPA. The original objectives of these treatments were to reduce hazardous fuels and improve sage-steppe habitat.

In 2014 a low impact phase 1 juniper removal project treated 500 acres in the Horse Lake PPA. This project consisted of people hiking to encroachment trees and cutting them with chainsaws, loppers or hand saws. The trees were left where they fell. At this time it is too early to measure the success rate.

Management Strategies

Other Relevant Management Activities

Traditional use activities for the area includes: grazing, hunting and non-invasive recreation. Summer grazing occurs in the Horse Lake PPA. Adjacent to the west side of the PPA is a wind energy plan of development application that has been accepted but is deferred until the ongoing GRSG EIS is signed and implemented.

Fuels Management

The priority fuels management area within the Horse Lake PPA is to the south and east of Blacks Mountain due to the generally lower elevation and its susceptibility to cheatgrass encroachment following disturbance and fall within the 3C category (warm/dry soils, >65 percent sagebrush cover). Fuels treatments within this area would primarily be focused on hand treatment of phase I and phase II juniper encroachment areas along linear features (roads, pipe and power lines) followed by green stripping with suitable species.

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Horse Lake PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Areas of higher elevation receive more moisture, theoretically these areas recover quicker and have a higher rate of success. These areas would be lower priority for fuels management projects.

Mechanical treatments in the southeastern area, at lower elevations and on south facing slopes would be avoided due to high probability of conversion to cheatgrass.

Other treatments to continue and to consider in the future are: prescribed fire, chemical treatments at lower elevations, mechanical at higher elevations and on north slopes and targeted grazing (see **Table 4-164**).

Table 4-164
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	20.97	33.00	0	53.97

Habitat Restoration and Recovery

In general, restoration and rehabilitation has been successful on north slopes at higher elevations but significantly less successful on south slopes in lower elevations. The area is dominated by sagebrush with areas of low to medium density juniper encroachment (see **Table 4-165**).

Table 4-165
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	19,792	52,349	0	72,141
Percent of PPA	21.20	56.08	0	77.28

Noxious weeds will be inventoried, treated, and monitored. There will be a special emphasis on roadsides, landings and skid-rows within the North Horse Stewardship project area. Focus on roadside and known infestations sites within the Horse Lake PPA.

The focus of the Eagle Lake Field Office is to protect intact habitat, improve degraded habitat and to restore connectivity. Juniper encroachment will only be treated when in phase 1 and phase 2. Phase 3 sites are present but will not receive priority treatment because the cost necessary for successful rehabilitation often outweighs the benefits. The benefits of hand treating encroachment trees that are in phase 1 and 2 outweighs the cost, provides low impacts to surrounding vegetation and wildlife species and will be a priority method of treatment over mechanical treatments. If it is decided that mechanical juniper treatments will occur they will be restricted to north slopes and elevations above 6000 feet.

The Horse Lake PPA supports leks and brood rearing habitat. There are several water sources that support desirable vegetation for GRSG. Some areas can be fenced to protect these areas from grazing impacts.

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Horse Lake PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

The Tablelands in the southeast portion of the PPA are important for connectivity to the Shaffer Connectivity PPA and Shinn PPA to the east. A large percent of the area has converted to invasive grasses. As this area continues to be used by GRSG a plan to prevent cheatgrass from spreading into good habitat would be appropriate. Grazing systems that support perennial bunchgrass health could be implemented as part of the recovery of the habitat. NRCS could initiate the process on private lands and assist with infrastructure on public lands as this area is prioritized.

Fire Operations

The priority areas for fire suppression operations coincide with those for fuels treatments (Tablelands to the south and east of Blacks Mountain). The management of wildfire for resource benefit would not be utilized in this PPA due to the high risk of cheatgrass encroachment following disturbance (see **Table 4-166**).

Table 4-166
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	26,428	66,923	0	93,351
Percent of PPA	28.3	71.7	0	100

There have been few historic fires and access to and within the PPA is adequate for fighting fire.

The coordination of Fire Suppression activities within the PPA is already in place.

Post-Fire Rehabilitation Management
The table lands and uplands areas would be targeted first after a fire or other disturbance. The uplands would recover quickest and provide suitable habitat as the other, less resilient, areas would be targeted for treatments (see **Table 4-167**).

Opportunities for fuel breaks and green stripping will be analyzed during the post-fire rehabilitation assessment process.

Table 4-167
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	26,428	66,923	0	93,351
Percent of PPA	28.3	71.7	0	100

Proposed Management
See **Table 4-168** for projects that have been identified presently within the NEPA planning process. See **Figures 4-97** through **4-101** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-168
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 (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 Lake Green Stripping	1,090	X						W			N	P		LI		5-7	5+
Horse Lake Green Stripping	1,703		X					W			N	P		LI		5-7	5+
Horse Lake Conifer Treatments	40,188		X		C						N	P		LI		10-20	5+
Horse Lake Conifer Treatments Existing	4,531				C					C			I	LI		10-20	0

Table 4-168
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 (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 Lake Conifer Currently Proposed Treatments	992		X		C					C			I	L1		10-20	0-2

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.21 Shafer Mountain Connectivity

Project Planning Area Description

General Site Description

The Shaffer Mountain Connectivity PPA is located in Lassen County. This area starts on the north slope of Shaffer Mountain down to the Tablelands to the north. Springs and seeps commonly occur throughout most of the area. Elevations throughout the PPA generally range from 4,200 feet on the lower plateaus to approximately 6,700 feet.

The majority of the habitat is within the warm/dry (3C) soil types except for the higher elevations. The habitat is defined by intact sagebrush stands with a native grasses and forbs understory in the higher elevations grading to invasive grasses understory in the lower elevations. The area falls within a 10 to 12 inch/year precipitation zone (see **Table 4-169**).

Table 4-169
Shafer Connectivity Corridor Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	993	0	23	865	0	0	0	0	1,135	16,200	19,216
Percent of PPA	5	0	0	5	0	0	0	0	6	84	100

Sage Grouse

The Shaffer connectivity PPA currently supports two active GRSG leks. These include Shaffer Mountain and Shaffer 2003 Satellite. Annual lek counts are conducted on these leks and only Shaffer 2003 Satellite showed an increase in number of males from 2013 (eight) to 2014 (11). Telemetry data from studies done in 1998-2001 and 2007-2009 resulted in very similar results; frequent detections occurred on the Tablelands and near the Shaffer lek. The majority of the area is classified as GRSG value R-4 (areas with potential to produce brush plant communities, but whose understories are currently dominated by annual grass, forbs, or bare ground). Water sources include Butte and Shaffer wells, Gilman Springs, Snowstorm Creek, Secret Creek, and Deep Creek. These provide important riparian habitat for GRSG brood-rearing by supplying beneficial forbs and insects to nesting females and young broods. Several small fires have occurred in the general area; one in 1985 and one in 2001 for a total of approximately 1,022 acres.

Vegetation

The dominate vegetation consists of mountain big, Wyoming and low sagebrush plant communities. Associated shrub species include antelope bitterbrush and rabbit brush. Buckwheat is the common shrub association found in the low sagebrush sites. Perennial and annual grass and forb species make up the understories. Curleaf mountain mahogany is present in the rocky outcrops and ridges. In addition, western juniper, cheatgrass and in some areas medusahead are also present. Noxious weeds are present and further discussed in the Existing Treatments section of this document.

Fire

Few historic fires have occurred within the Shaffer Connectivity PPA. Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. The dominant vegetation in the PPA is mountain big sagebrush, which falls within Fire Regime group III based upon a historic fire frequency of 20 years with stand-replacement severity (source: LANDFIRE biophysical settings model). There are also significant areas of Fire Regime group IV with less amounts of Fire Regime group I. The area has experienced too little recent fire leading to expansion of western juniper and the establishment of phase I and II juniper woodlands (see **Table 4-170**).

This planning area is accessible for firefighting. The coordination of Fire Suppression activities within the PPA is already in place.

Table 4-170
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	19,023
High and Very High Burn Probability in PPA (percent)	99.7

Existing Treatments

The control of noxious weeds continues throughout most of the PPA by government agencies and local Weed Conservation Districts. BLM treats noxious weeds on federal land using methods discussed in the Eagle Lake Integrated Invasive Plant Management Plan. Known species in the PPA area are perennial pepperweed, Russian Knapweed, halogeton, yellow starthistle, bull thistle, Canada thistle and Mediterranean sage. These populations are currently being monitored and treated.

Management Strategies

Other Relevant Management Activities

NRCS has proposed juniper removal along a riparian area north of Karlo Road as well as water developments on the tablelands to help potentially facilitate grazing pressure on annual grasses.

Traditional use activities for the area include: grazing, hunting and non-invasive recreation. Summer grazing occurs in the PPA.

Fuels Management

The priority fuels management area within the Shaffer Mountain Connectivity PPA is the lower elevations which are susceptible to cheatgrass encroachment following disturbance and fall within the 3C category (warm/dry soils, > 65 percent sagebrush cover). Areas of higher elevation and moisture would be quicker and more successful to recover and would be lower priority for fuels management projects.

Treatments to continue and to consider in the future are: prescribed fire, chemical treatments at lower elevations, mechanical at higher elevations and on north slopes and targeted grazing (see **Table 4-171**).

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Shaffer Mountain Connectivity PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Table 4-171
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	9.13	7.41	0	16.54

Habitat Restoration and RecoveryIn general, restoration and rehabilitation has been successful on north slopes at higher elevations but significantly less successful on south slopes in lower elevations. The area is dominated by sagebrush and annual invasives (see **Table 4-172**).

Table 4-172
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	15,578	0	0	15,578
Percent of PPA	81.07	0	0	81.07

The focus of the Eagle Lake Field Office is to protect intact habitat, improve degraded habitat and to restore connectivity.

The Tablelands in the north portion of the PPA are an important connectivity corridor between the western Horse Lake PPA and the eastern Shinn PPA. A large percent of the area has converted to invasive grasses. As this area continues to be used by GRSG and a plan to prevent cheatgrass from spreading into good habitat would be appropriate. Grazing systems that support perennial bunchgrass health could be implemented as part of the recovery of the habitat. NRCS could initiate the process on private lands and assist with infrastructure on public lands as this area is prioritized.

The Karlo Road area is an important brood-rearing area for GRSG. There are many stringer meadows and springs with adjacent shrub cover. Anecdotally, reports have been that hundreds of grouse use this area in the summer. Grazing management could be improved to provide more perennial grass cover in this area and to keep the meadow and spring areas healthy.

Coordination of projects with other government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination efforts will be continued. The Shaffer Mountain Connectivity PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Fire Operations

High Priority for Suppression (see **Tables 4-173** and **4-174**)

- Areas with low resistance and resilience which are not likely to recover
- Mud Flat region of the connectivity north of Shaffer Mountain.
- The Tablelands to the south and east of Black Mountain.

Moderate Priority for Suppression

- TBD

Table 4-173
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Shaffer Mountain Connectivity	Moderate	5,682.1
Mud Flat Connectivity	High	13,529.4

Table 4-174
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	11,362	7,853	0	19,215
Percent of PPA	59.1	40.9	0	100

Post-Fire Rehabilitation Management

High Priority for ESR (see **Tables 4-175** and **4-176**)

- Areas with a short burn interval (burned more than twice in the last 12 years)
- Areas unburned in the last 30 years
- Elevations > 6,000 ft.

The North slopes and Balls Canyon in the SW corner of the planning area.

Moderate Priority for ESR

- Recently Burned sites
- Elevations < 6,000 ft.
- North Slopes
- Areas with high levels of invasive annuals in the understory

The Tablelands Restoration Area which makes up the majority of the connectivity area.

Low Priority for ESR

- Areas with high levels of irrigated crop land

There are no areas that meet this description.

Opportunities for fuel breaks and green stripping will be analyzed during the post-fire rehabilitation assessment process.

Table 4-175
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	11,358	7,857	0	19,214
Percent of PPA	59.1	40.9	0	100

Table 4-176
Post-fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
North Slopes and Balls Canyon	High	3,155.0
Tablelands Restoration Area	Moderate	16,764.1

Proposed Management

See **Table 4-177** for projects that have been identified presently within the NEPA planning process. See **Figures 4-102** through **4-105** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-177
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 (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]
Shaffer Mountain Green Stripping	481	X						W			N	P		L1		5-7	5+
Shaffer Mountain Green Stripping	381		X					W			N	P		L1		5-7	5+
Shaffer Mountain Weeds Treatments	15,578		X		C						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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.22 Madeline Plains

Project Planning Area Description

General Site Description

The Madeline Plains PPA is located in Lassen County, California. Elevation is around 5,300 feet on the Madeline Plains to approximately 7,000 feet on Whitinger Mountain. The majority of the land within in the PPA, 58,994 acres (81 percent) is owned and managed by private landowners, while the remaining 13,916 acres (19 percent) interconnecting the private land public lands in the higher elevations to the north west is managed by the BLM.

The majority of the PPA is within the warm/dry (2b, 2C) soil types. The habitat is a mixture of agricultural lands (typically alfalfa) and intact acreages of mountain big sagebrush stands with a native grass and forb understory in the higher elevations grading to Wyoming big sagebrush with invasive grasses understory in the lower elevations (see **Table 4-178**).

Table 4-178
Madeline Plains Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	6	3,007	5,369	356	617	2,265	346	1,909	35,442	23,677	72,992
Percent of PPA	0	4	7	0	1	3	0	3	49	32	100

Sage-Grouse

The Madeline PPA currently supports one active lek, Spanish Springs. Recent lek counts show a 50 percent decline in male attendance following the 2012 Rush Fire. Telemetry data from studies conducted in 1998-2001 and 2007-2009 resulted in very similar results; frequent detections occurred year round throughout the Madeline Plains. The majority of the area is classified as GRSG value X-4 (areas that have crossed the threshold from sagebrush communities into annual grasslands, forbs, or bare ground). Large alfalfa fields on private property provide valuable brood-rearing habitat by supplying insects for foraging GRSG chicks. Several small fires have occurred in the general area and two recent large fires have burned southeast of the PPA, in 2001 approximately 67,790 acres burned and in 2012 over 315,000 acres. However, the PPA itself has not burnt in the 30 years.

Vegetation

The dominate vegetation consists of mountain big sagebrush, Wyoming big sagebrush and low sagebrush plant communities. Associated shrub species include antelope bitterbrush and rabbit brush with snowberry and desert currant at the higher elevations. Rock buckwheat is the common sub-shrub association found in the low sagebrush sites. Perennial and annual grass and forb species make up the understories; native perennial grasses are dominant at elevations above 6,000 feet. Curleaf mountain mahogany is present in the rocky outcrops and ridges and there are a few aspen stands scattered in the higher elevations. In addition, western juniper and cheatgrass are also present. Noxious weeds are present and further discussed in the Existing Treatments section of this document.

Western juniper is actively expanding into the sage-steppe plant communities within the PPA. As described by Miller, et al. (2005), there are three transitional phases of juniper woodland development.

- Phase I - trees are present but shrubs and herbs are the dominant vegetation that influence ecological processes (hydrologic, nutrient, and energy cycles) on the site;
- Phase II - trees are co-dominant with shrubs and herbs, and all three vegetation layers influence ecological processes on the site;
- Phase III - trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site.

The juniper woodland successional phases are predominately in phase I and phase II for the PPA.

Fire

Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. The dominant vegetation in the PPA is mountain big sagebrush, which falls within Fire Regime group III based upon a historic fire frequency of 20 years with stand-replacement severity (source: LANDFIRE biophysical settings model). Agricultural development limits fire spread (see **Table 4-179**).

Table 4-179
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	64,634
High and Very High Burn Probability in PPA (percent)	89.0

Existing Treatments

The control of noxious weeds continues throughout the PPA by government agencies, local Weed Management Areas and Resource Conservation Districts. Known species in the Madeline Plains PPA are Scotch thistle, perennial pepperweed, Russian knapweed, hoary cress, and Canada thistle. These populations are currently being treated and evaluated annually.

Management Strategies

Other Relevant Management Activities

Traditional use activities for the area includes: agriculture, grazing, hunting and recreation.

Fuels Management

New fuel break opportunities are limited. Agriculture use has established a network of dirt roads that could be used during a fire (see **Table 4-180**).

Juniper reduction would be refocused for sagebrush habitat since prior treatments were done for a different purpose.

Coordination of projects with state and government agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Madeline Plains PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation strategy developed by the Buffalo-Skedaddle working group.

Areas of higher elevation and moisture would be quicker and more successful to recover and would be lower priority for fuels management projects.

Table 4-180
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	0	6.66	8.63	15.29

Habitat Restoration and RecoveryGRSG typically stay on private lands. Restoration and recovery would focus on juniper reduction, mainly of phase I and II. Mechanical use would be considered for late phase II treatments (see **Table 4-181**).

Prior juniper treatments have used chemical treatments following mechanical treatments.

Coordination of projects with state and government agencies (NRCS, CDF&W, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Madeline Plains PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation strategy developed by the Buffalo-Skedaddle working group.

Table 4-181
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	2,648	16,557	0	19,205
Percent of PPA	3.63	22.68	0	26.31

Fire Operations

High Priority for Suppression (see **Tables 4-182** and **4-183**)

- Warmer/Drier sites at low elevations

Moderate Priority for ESR

- Cool/Moist soil temperature/moisture regimes at higher elevations which are more resilient and resistant with a higher potential to recover.

Table 4-182
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Madeline Flat (SE)	Moderate	39,959.1
Madeline Flat Uplands (NW)	High	33,033.2

Table 4-183
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	19,094	13,939	39,959	72,992
Percent of PPA	26.2	19.1	54.7	100

Post-Fire Rehabilitation Management

High Priority for ESR (see **Table 4-184**)

- Warm/cool dry soils (3A, 3B, 3C) < 6,000 ft.
- Warm moist soils (2A, 2B, 2C) < 6,000 ft.

Moderate Priority for ESR

- Warm/cool dry soils (3A, 3B, 3C) > 6,000 ft.
- Cool/cold moist soils (1A, 1B, 1C) < 6,000 ft.
- Recently Burned
- Areas with high levels of irrigated crop land

Low Priority for ESR

- Warm moist soils (2A, 2B, 2C) > 6,000 ft.
- Cool/Cold moist soils (1A, 1B, 1C) >6,000 ft.

Table 4-184
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	27,301	0	45,691	72,992
Percent of PPA	37.4	0	62.6	100

Proposed Management

See **Table 4-185** for projects that have been identified presently within the NEPA planning process. See **Figures 4-106** through **4-109** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-185
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 (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]
Madeline Plains Green Stripping	343	X						W			N	P		L1		5-7	5+
Madeline Plains Green Stripping	444		X					W			N	P		L1		5-7	5+
Madeline Plains Conifer Treatments	19,205		X		C						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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.23 Madeline Plains Connectivity

Project Planning Area Description

General Site Description

The Madeline Plains Connectivity PPA is located mostly in Lassen County with some acreage in Modoc County, California. Elevation is around 5200 feet and is a paleo lakebed. The PPA is mostly private lands interconnected with public lands.

The majority of the habitat is within the warm/dry (3C) soil types. The habitat is a mixture of agricultural lands (typically alfalfa) and intact acreages of sagebrush (see **Table 4-186**).

Table 4-186
Madeline Plains Connectivity Corridor Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	9,990	13,349	9,721	8,778	1,610	269	1,291	6,894	25,314	63,372	140,589
Percent of PPA	7	9	7	6	1	0	1	5	18	45	100

Sage-Grouse

The Madeline Plains Connectivity PPA currently supports one active lek, Spanish Springs. Recent lek counts show a 50Percent decline in male attendance following the 2012 Rush Fire. Telemetry data from studies done in 1998-2001 and 2007-2009 resulted in very similar results, frequent detections occurred year round throughout the Madeline Plains. The majority of the area is classified as GRSG value X-4 (areas that have crossed the threshold from sagebrush communities into annual grasslands, forbs, or bare ground). Large alfalfa fields on private property provide valuable brood rearing habitat by supplying insects for foraging GRSG chicks. Several small fires have occurred in the general area and two recent large fires have burned south of the area, one in 2001 for approximately 67,790 acres and one in 2012 for 315,000 acres.

Vegetation

The dominate vegetation consists of mountain big, Wyoming and low sagebrush plant communities. Associated shrub species include antelope bitterbrush and rabbit brush. Buckwheat is the common shrub association found in the low sagebrush sites. Perennial and annual grass and forb species make up the understories. Curleaf mountain mahogany is present in the rocky outcrops and ridges and there are a few aspen stands scattered in the higher elevations. In addition, western juniper, cheatgrass and in some areas medusahead are also present. Noxious weeds are present and further discussed in the Existing Treatments section of this document.

Fire

Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. The dominant vegetation in the PPA is mountain big sagebrush, which falls within Fire Regime group III based upon a historic fire frequency of 20 years with stand-replacement severity (source: LANDFIRE biophysical settings model). In 2001 the Observation fire occurred consuming some of the SE portion of the PPA. Portions of the area was consumed by the Rush fire in 2012. Access to and within the PPA is adequate for fighting fire and he coordination of Fire Suppression activities within the PPA is already in place (see **Table 4-187**).

Table 4-187
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	116,532
High and Very High Burn Probability in PPA (percent)	83.3

Existing Treatments

The control of noxious weeds continues throughout most of the PPA by government agencies and local Weed Conservation Districts. Known species in the PPA area are perennial pepperweed, hoary cress, yellow starthistle and Mediterranean sage. These populations are currently being monitored and treated.

Management Strategies

Other Relevant Management Activities

Traditional use activities for the area include: agriculture, grazing, hunting and non-invasive recreation.

Fuels Management

Coordination of projects with other government agencies (NRCS, CDF&W, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Madeline Plains Connectivity PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Areas of higher elevation and moisture would be quicker and more successful to recover and would be lower priority for fuels management projects (see **Table 4-188**).

Table 4-188
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	7.59	17.45	16.64	41.68

Habitat Restoration and Recovery

In general, restoration and rehabilitation has been successful on north slopes at higher elevations but significantly less successful on south slopes in lower elevations. The area is dominated by sagebrush and annual invasives (see **Table 4-189**).

Table 4-189
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	26,927	15,453	0	42,380
Percent of PPA	19.15	10.99	0	30.14

As this area continues to be used by GRSG a plan to prevent cheatgrass from spreading into good habitat would be appropriate.

Coordination of projects with other government agencies (NRCS, CDF&W, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Madeline Plains Connectivity PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation plan developed by the Buffalo-Skedaddle working group.

Fire Operations
Moderate/High Priority for Suppression (see **Tables 4-190** and **4-191**)

- Areas in the SW and S with cool/moist soil temperature/moisture regimes which have high resistance and resilience however, repeated burning and threat from lower elevation annual grasses decreases overall resistance.

Low/Moderate Priority for Suppression

- Mostly large scale agricultural land below 5,500 ft. which makes up the majority of this PPA. This is important habitat but it is not likely to burn.

Table 4-190
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
< 5,500 ft.	Low-Moderate	105,853.8
Cool/Moist	Moderate-High	34,727.4

Table 4-191
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	104,578	89,522	194,100
Percent of PPA	0	74.4	63.7	138.1

Post-Fire Rehabilitation Management
High Priority for ESR

- Areas with a short burn interval (burned more than twice in the last 12 years)
- Areas that have not been burned in the last 30 years
- Elevations > 6,000 ft.

Areas that have been frequently burned in the SE and SW are high priority, especially the area that was consumed by the Rush fire and Observation fire.

Moderate Priority for ESR

- Recently Burned
- Elevations < 6,000 ft.
- North Slopes
- High levels of invasive annuals in the understory

There are no areas in the PPA that meet this description.

Low Priority for ESR

- Areas with high levels of irrigated crop land

The majority of this PPA is irrigated crop land.

Opportunities for fuel breaks and green stripping will be analyzed during the post-fire rehabilitation assessment process (see **Table 4-192**).

Table 4-192
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	27,301	0	45,691	72,992
Percent of PPA	37.4	0	62.6	100

Proposed Management

See **Table 4-193** for projects that have been identified presently within the NEPA planning process. See **Figures 4-110** through **4-113** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-193
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 (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]
Madeline Plains Connectivity Green Stripping	395	X						W			N	P		L1		5-7	5+

Table 4-193
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 (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]
Madeline Plains Connectivity Green Stripping	907		X					W			N	P		L1		5-7	5+
Madeline Plains Connectivity Green Stripping	856			X				W			N	P		L1		5-7	5+
Madeline Plains Connectivity Conifer Treatments	19,205		X		C						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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.24 Cold Springs

Project Planning Area Description

General Site Description

The Cold Springs PPA is located in Lassen County, California. This area encompasses the McDonald Mountain/Cold Springs Mountain area. The PPA is typically higher elevation and higher moisture zones, with many north slope areas.

Springs and seeps commonly occur throughout most of the area. Elevations throughout the PPA generally range from 5,300 feet on the Madeline Plains to approximately 7,000 feet on McDonald Mountain.

In general, this PPA contains a diverse vegetation composition with a low frequency of invasives and moist soils. Cool/moist soils types exist in the higher elevation PPA.

The majority of the PPA is within the warm/dry (3A, 3B, 3C) and cool/moist (1A, 1B) soil types. The habitat is defined by intact mountain big sagebrush stands with native grasses and forbs understory in the higher elevations grading to Wyoming big sagebrush with invasive grass understory in the lower elevations. The area falls within a 10 to 12 inch/year precipitation zone (see **Table 4-194**).

Table 4-194
Cold Springs Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	2,372	25,097	12,916	0	2,998	15,019	506	6,741	4,116	2,208	71,973
Percent of PPA	3	35	18	0	4	21	1	9	6	3	100

Sage-Grouse

There are 15 leks identified within the Cold Springs PPA. Currently only two leks are documented as being active by CDFW. These include the Dodge Spring and Dill Field leks. Since 2009, no birds have been documented at either lek during annual lek counts. However, GRSG use has been documented year-round within the PPA. Vegetation within the area is typical of the mountain big sagebrush community, and includes mountain big sagebrush, Wyoming big sagebrush, low sagebrush, bitterbrush and other browse species, and a variety of native annual and perennial grass and forb species. Water sources include seeps and springs, stock ponds and stock reservoirs. The seeps and springs provide important riparian habitat for GRSG brood-rearing by supplying beneficial forbs and insects to females and young broods.

Vegetation

The dominate vegetation consists of mountain big sagebrush, Wyoming big sagebrush and low sagebrush plant communities. Associated shrub species include antelope bitterbrush and rabbit brush with snowberry and desert currant at the higher elevations. Rock buckwheat is the common sub-shrub association found in the low sagebrush sites. Perennial and annual grass and forb species make up the understories; native perennial grasses are dominant at elevations above 6,000 feet. Curleaf mountain mahogany is present in the rocky outcrops and ridges and there are a few aspen stands scattered in the higher elevations. In addition, western juniper and cheatgrass are also present. Noxious weeds are present and further discussed in the Existing Treatments section of this document.

Western juniper is actively expanding into the sage-steppe plant communities within the PPA. As described by Miller, et al. (2005), there are three transitional phases of juniper woodland development.

- Phase I - trees are present but shrubs and herbs are the dominant vegetation that influence ecological processes (hydrologic, nutrient, and energy cycles) on the site;
- Phase II - trees are co-dominant with shrubs and herbs, and all three vegetation layers influence ecological processes on the site;
- Phase III - trees are the dominant vegetation and the primary plant layer influencing ecological processes on the site.

The juniper woodland successional phases are predominately in phase I and phase II for the PPA.

Riparian areas in the Cold Springs PPA consist mostly of perennial and intermittent streams and small remote springs and seeps. Vegetative communities along these waterways consist mainly of perennial bunch grasses, willows, sedges, rushes and various wetland obligate and wetland facultative species. Small springs and seeps dot the landscape and support many of the same wetland obligate and facultative species that are found along the perennial waterways.

Fire

Fire regimes characterize the historic fire frequency, severity, and resulting landscape pattern, and correspond to specific vegetation types. Within the Cold Springs PPA, fire regimes are moderately altered. The dominant vegetation in the PPA is mountain big sagebrush, which falls within Fire Regime group III based upon a historic fire frequency of 20 years with stand-replacement severity (source: LANDFIRE biophysical settings model). There are also significant areas of Fire Regime group IV with less amounts of Fire Regime group I (see **Table 4-195**).

Table 4-195
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	61,013
High and Very High Burn Probability in PPA (percent)	85.5

One large fire, the McDonald Fire (2010, 9,500 acres) and several small fires have occurred in the general area. Recovery within the McDonald Fire has been good. Monitoring should continue.

Existing Treatments

The control of noxious weeds continues throughout the PPA by government agencies, local Weed Management Areas and Resource Conservation Districts. Known species in the Cold Springs PPA are Scotch thistle, perennial pepperweed, spotted knapweed, hoary cress, and Canada thistle. These populations are currently being treated and evaluated annually.

Existing vegetative treatments within the assessment area include over 4,500 acres of juniper removal by manual and mechanical methods. There are approximately 2,500 acres of additional juniper reduction treatments currently planned within the PPA. The original objectives of these treatments were to improve GRSG habitat.

Following the McDonald Mountain fire in 2010, three acres were planted with 2,000 Mountain big sagebrush seedlings and 67 acres were drill seeded with bottlebrush squirreltail (Elymus elymoides), a native perennial grass species.). An additional 8,200 seedlings (18 acres) were planted in 2012.

Management Strategies

Other Relevant Management Activities

Traditional use activities for the area includes: grazing, hunting and recreation. Summer/Fall grazing occurs in the Cold Springs PPA.

Fuels Management

Fuels treatments within this area would primarily be focused on hand treatment of phase I and phase II juniper encroachment areas followed by green stripping with suitable species, however opportunities for new fuel breaks are limited.

Coordination of projects with government, state agencies (NRCS, CDF&W, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Cold Springs PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation strategy developed by the Buffalo-Skedaddle working group.

Other treatments to continue and to consider in the future are: prescribed fire, chemical treatments at lower elevations, mechanical at higher elevations and on north slopes and targeted grazing.

Habitat Restoration and Recovery

Restoration and recovery would focus on juniper reduction, mainly of phase I and II. Mechanical use would be considered for late phase II treatments (see **Table 4-196**).

Table 4-196
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	65.97	16.18	0	82.15

Noxious weeds will continue to be inventoried, treated, and evaluated. There will be a special emphasis on roadsides, landings and skid-rows within the

McDonald Mountain/Cold Springs Mountain Complex project area. Focus on roadside and known infestations sites within the Cold Springs PPA.

The Cold Springs PPA supports leks and early and late brood-rearing, fall, and winter habitats. There are several water sources that support desirable vegetation for GRSG. Some areas can be fenced to protect these areas from grazing impacts.

Coordination of projects with government, state agencies (NRCS, CDFW, USFWS) and private landowners in this area has been frequent and coordination of efforts will be continued. The Cold Springs PPA falls within the Buffalo-Skedaddle PMU and is governed by the conservation strategy developed by the Buffalo-Skedaddle working group.

Fire Operations

High Priority for Suppression (see **Tables 4-197** and **4-198**)

- The whole PPA is high priority GRSG habitat and should be high priority for suppression.
- Burned areas are high priority especially islands, and where the McDonald and Mendinboure Fires took place.

Table 4-197
Fire Operations Priority Areas

Site Description	Fire Operations Priority Rating	Acreage
Cold Springs Unburned	High	61,223.1
Cold Springs Burned Area	High	10,750.2

Table 4-198
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	24,990	46,983	0	71,973
Percent of PPA	34.7	65.3	0	100

Habitat Restoration

See **Table 4-199**.

Table 4-199
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	5,485	49,754	0	55,239
Percent of PPA	7.62	69.13	0	76.75

Post-Fire Rehabilitation Management

High Priority for ESR (see **Tables 4-200** and **4-201**)

- Warm/cool dry soils (3A, 3B, 3C) < 6,000 ft.
- Warm moist soils (2A, 2B, 2C) < 6,000 ft.

Moderate Priority for ESR

- Warm/cool dry soils (3A, 3B, 3C) > 6,000 ft.
- Cool/cold moist soils (1A, 1B, 1C) < 6,000 ft.
- Recently Burned
- Areas with high levels of irrigated crop land

Low Priority for ESR

- Warm moist soils (2A, 2B, 2C) > 6,000 ft.
- Cool/Cold moist soils (1A, 1B, 1C) >6,000 ft.

Table 4-200
Post-fire Rehabilitation Priority Areas

Site Description	Priority	Acreage
McDonald and Mendinboure Fire	Moderate	10,546.4
Cold Springs Fire, Cold Springs Prescribed Burn	Moderate	1,557.1
North and East Slopes > 6,000 ft.	Low	12,154.3
South and West Slopes > 6,000 ft.	Low	12,870.7
North and East Slopes < 6,0000 ft.	High	9,047.8
South and West Slopes < 6,000 ft.	Moderate	8,283.7
South and West Slopes < 6,000 ft.	High	7,760.1

Table 4-201
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	24,990	0	46,983	71,973
Percent of PPA	34.7	0	65.3	100

Proposed Management

See **Table 4-202** for projects that have been identified presently within the NEPA planning process. See **Figures 4-114** through **4-118** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-202
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 (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]
Cold Springs Green Stripping	778	X						W			N	P		L1		5-7	5+
Cold Springs Invasive Weeds Treatments	31,531	X				I					N	P		L1		5-7 if follow-up is neces-sary	5+
Cold Springs Conifer Treatments	17,941		X		C						N	P		L1		10-20	5+
Cold Springs Green Stripping	378	X						W			N	P		L1		5-7	5+
Cold Springs Green Stripping	830		X					W			N	P		L1		5-7	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.25 Hart Mountain NWR

Project Planning Area Description

General Site Description

Hart Mountain National Antelope Refuge PPA is located in the northwestern corner of the Great Basin, located in Lake County, Oregon. The lands adjacent to the Refuge are primarily managed by the BLM Lakeview and Burns Districts. The total area within the Refuge's borders is 277,893 acres and >75 percent of the Refuge is sagebrush-steppe habitat. Elevations range from 4455 feet in the valleys to 8012 feet at the highest mountain peak.

The majority of the PPA ranges from cool/moist at higher elevations to cool/dry at lower elevations. Cool/moist ecological types on the Refuge consist of mountain big sagebrush, mountain shrub, and low sagebrush habitats, and generally exhibit moderately high resilience and moderate resistance. Cool/dry ecological types are more common at lower elevations along the northeastern edge of the Refuge, are dominated by Wyoming big sagebrush, and exhibit low resilience and moderate resistance. In these habitats, effective precipitation limits site productivity and the climate is more suitable to invasive annual grasses (Chambers et al. 2014).

Within Hart Mountain Refuge, the soils generally range from cool/moist at higher elevations to cool/dry at lower elevation with sagebrush cover >75 percent. Within the Refuge, roughly 221,760 acres (80 percent) is Greater GRSG habitat (Table 1, highlighted; Figure 1). Current invasive or exotic plant cover is low, estimated at 1.2 percent. Western juniper encroachment into GRSG habitat currently occurs at relatively low to moderate levels within scattered mountain big sagebrush habitats mainly along the western and southern portions of the Refuge (see **Table 4-203**).

Table 4-203
Hart NWR Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	10,721	0	15,481	28,289	0	14,717	165,620	0	2,319	4,531	241,678
Percent of PPA	4	0	6	12	0	6	69	0	1	2	100

Sage-Grouse

Hart Mountain Refuge lies within the Western Great Basin PAC and the entire Refuge has been designated a GRSG "core area" by the Oregon Department of Fish and Game. The entire Refuge has also been designated as Preliminary, Priority (GRSG) Habitat (PPH); PPH represents the habitat designated to maintain distribution and sustainable GRSG populations (Manier et al. 2013). The Refuge provides breeding, brood rearing, and winter habitat for GRSG. As of 2013, there were 31 known lek complexes comprised of 72 individual leks distributed across the Refuge; roughly 61 percent of the known lek complexes are currently active. The GRSG population is stable to increasing and is a stronghold population.

Vegetation

Large, interconnected, and intact stands of native upland shrub and steppe habitats comprise >75 percent of Hart Mountain Refuge. The major vegetation types are Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*), low sagebrush (*A. arbuscula*), mountain big sagebrush (A.t. ssp. vaseyana), and Basin big sagebrush (*A.t. ssp. tridentata*) communities, all are species most commonly associated with GRSG (Manier et al. 2013). Elevational differences are evident, with Wyoming big sagebrush and Basin big sagebrush being more dominant along the lower elevation, northeastern edge of the Refuge. As the elevation increases to the south and west, the habitat becomes primarily dominated by mountain big sagebrush / mountain shrub and low sagebrush. Western juniper is most common along the western portion of the Refuge and the Hart Mountain escarpment, although there are scattered stands throughout the Refuge.

The native perennial grass understory is intact, and common species include Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achnatherusm thurberianum*), squirreltail (*Elymus spp*.), Sandberg's bluegrass (*Poa secunda*), and needle-and-thread (*Hesperostipa comata*). A wide variety of native forbs also occurs, and includes Phlox spp., Lomatium spp., Crepis spp., and Lupinus spp.

Invasive Plants

Approximately 30 species of introduced, nonnative, and often noxious plants have been documented on Hart Mountain Refuge. However, the combined invasive species cover is currently estimated to be roughly one percent of the total Refuge area (less than 2,770 acres), and substantial infestations remain generally confined to road corridors and other sites of disturbance (e.g., campgrounds, burned areas). Cheatgrass (*Bromus tectorum*) is the most common species, and other species include knapweed (*Centaurea spp*.), kochia (*Bassia scoparia*), hoary cress (*Cardaria draba*), yellow sweetclover (*Melilotus officianalis*), bull thistle (*Cirsuim vulgare*), scotch thistle (*Onopordum acanthium*), and Russian thistle (*Salsola* spp.) (see **Table 4-204**).

Table 4-204
Classified Vegetation Cover Types and Estimated Percentage of Total Area
(Greater GRSG habitat is highlighted in gray)

Vegetation Type	Estimated Percent of Total Area
Invasive annual grasses and forbs	1.2
Open water/emergent marsh	1.6
Barren and sparse vegetation	4.0
Woodlands (juniper, aspen, mountain mahogany)	2.3
Semi-desert grassland	2.5
Salt desert scrub/Greasewood flat	6.7
Mesic wet meadow	2.8
Basin big sagebrush steppe	8.9
Mountain big sagebrush steppe/Mountain shrub	19.7
Low sagebrush shrubland and steppe	20.3
Wyoming big sagebrush shrubland	31.9

Source: Hart Mountain National Antelope Refuge 2010

Fire

The historic role of fire in sagebrush ecosystems has been difficult to accurately estimate. Recently revised estimates of fire return intervals describe 200-350 year fire-return intervals in Wyoming sagebrush, 150-300 years in mountain sagebrush, and more than 200 years for low sagebrush (Manier et al. 2013).

There is little evidence that fire will enhance GRSG habitat in Wyoming big sagebrush communities, especially where there is already a balance of native shrubs, perennial grasses, and forbs. There is also a growing body of evidence that suggests that on the current landscape, even prescribed fire designed to enhance brood-rearing habitat values does not have a positive effect on herbaceous habitat conditions and can cause demonstrable decline in valuable sagebrush cover (Manier et al. 2013).

Although relatively infrequent, the majority of lightning fires occur in the assessment area from June through September, with some fires occasionally starting as early as mid-May or as late as mid-October. Historically all fires have been aggressively suppressed throughout Hart Mountain Refuge. Prescribed fire activities have been typically conducted September through April, with limited use beginning in the 1960s and continuing through the early 1980s. The use of prescribed fire then increased substantially in the late 1980s through the 2000s. In the mid-1990s, the Refuge set a target to significantly reduce shrub cover on over 75 percent of the Refuge's upland habitats via prescribed burning. As a result, roughly 22,000 acres were treated between 1990 and 2011, predominantly upland shrub habitats dominated by Wyoming and mountain big sagebrush. In addition, the majority of riparian meadow habitats available on Hart Mountain Refuge were also treated with prescribed fire, some multiple times over the 20-year period, with the objective of improving brood-rearing habitat for GRSG. Wildfires also burned approximately 8,645 acres between 1990 and 2011, and then an additional 4,200 acres were burned by wildfire between 2011 and 2014. The approximate total of Hart Mountain Refuge affected by either wild or prescribed fire since 1990 is over 35,000 acres or roughly 13 percent of the total acreage (see **Table 4-205**).

Preliminary information suggests that shrub cover in Wyoming big sagebrush and mountain shrub communities burned on Hart Mountain Refuge in the 1980s have recovered to pre-burn conditions in the roughly 20+ years following treatment (Ellsworth et al. unpublished data). This is substantiated by others that found recovery may take 10-15 years or longer for shrubs, and up to 20-30 years for biological soil crusts to recover at most sites following treatment (McIver et al. 2014).

Table 4-205
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	73,821
High and Very High Burn Probability in PPA (percent)	30.6

Management Strategies

Treatments

On Hart Mountain Refuge, mountain big sagebrush communities have been found to be significantly more productive than Wyoming big sagebrush communities and have a higher site potential which could respond more favorably to management actions (Davies and Bates 2010). Additional findings suggested that not all plant functional groups can be increased with management actions (e.g., mowing), and that the abundance of sagebrush may either not be the limiting factor for some herbaceous plants or that they respond very slowly to sagebrush-removing disturbances (Davies et al. 2012). Plant diversity was found to be increased with prescribed fire in the first post-burn year, but decreased by the third post-burn year. However, burning can create spatial and temporal heterogeneity in sagebrush communities, and long-term maintenance of mountain big sagebrush communities may need to consider infrequent burning (Davies et al. 2014).

Other Relevant Management Activity

Livestock grazing (including feral horses) began on Hart Mountain Refuge in the 1870s and continued after the Refuge was established in 1936. Between 1994 and 1999, both feral horses and livestock were removed after it was determined that grazing was not compatible with the purposes of the Refuge. In the absence of feral horse and livestock grazing, substantial habitat recovery, particularly within severely deteriorated riparian habitats, has been documented on the Refuge. In the roughly two decades following livestock exclusion from Hart Mountain Refuge, riparian and snowpocket aspen, native forb cover, and mesic shrub cover have all significantly increased, whereas sagebrush encroachment into riparian areas has decreased (Earnst et al. 2012). Additionally, measurements of riparian health, including bank stability, stream morphology, greenline, and ecological stability all increased following the removal of livestock (Ballard 2010). Increases in native forb and riparian shrub cover, with a concomitant decrease in sagebrush cover, also indicated an improved depth to groundwater functioning and riparian condition (Dobkin et al. 1998). In uplands, removal of livestock has resulted in decreases in bare ground, and increases in shrub, native bunchgrass, and biological soil crust cover (Ellsworth et al., unpublished data).

Fuels Management

The primary fuels management activities would be focused on fire breaks and control of invasive annual grasses to prevent large-scale, catastrophic fires. Specific activities include creating fire breaks to minimize fire risk. This can be done by implementing strategic fuel break networks to provide anchor points for suppression that will reduce losses when wildfires escape initial attack. Continue to maintain existing fire breaks along established roads via mowing. Identify additional established roads for consideration as potential fuel break treatment areas while minimizing GRSG habitat fragmentation. Finally, coordinate with adjacent land-management agencies (i.e., BLM) to identify established roads and treatments outside of Refuge-lands which may be appropriate to incorporate as fire breaks (see **Table 4-206**).

Table 4-206
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	26.32	82.18	0	108.5

In addition, Refuge management will continue to implement appropriate public restrictions including seasonal road closures during high-fire risk time periods to reduce fire risk from vehicles. Continue to minimize fire risk from public campgrounds by reducing fuel at campsites (e.g., mowing, herbicide application) and restricting campfires during high-risk time periods. Consider installing additional fire breaks and conducting fuels treatments around high-use campgrounds (e.g., Camp Hart Mountain, Hot Springs).

Invasive annual grass control methods will include implementing a proactive approach by emphasizing herbicide treatment along road corridors and early detection and eradication of small infestations. Aggressively control newly detected small infestations of noxious weeds and other highly invasive nonnative plants using a variety of tools and methods, primarily mowing, reseeding native species (aerial and drill), and the use of herbicides. Slow the spread of established populations of invasive plants (i.e., cheatgrass) by limiting prescribed burning and other disturbances in highly susceptible areas and through pre and post project monitoring, reseeding native species (aerial and drill), and herbicide treatments following disturbances.

Habitat Restoration and Recovery

In the Northern Great Basin, habitat loss and fragmentation due to wildfire and conifer encroachment have been identified as the primary threats to GRSG (Manier et al. 2013). Conifer expansion results in declines in sagebrush cover and reductions in perennial native grasses and forbs as conifer canopy cover increases (see summary by Chambers et al. 2014). The ability to maintain active leks is severely compromised when conifer canopy cover exceeds four percent, and habitats containing most active leks average greater than one percent conifer canopy cover. Nonnative annual grasses and forbs also reduce both habitat quality and quantity for GRSG. Further, due to repeated fires, some low- to mid-elevation native sagebrush communities can permanently shift to annual grassland states resulting in habitat loss that may be irreversible with current technologies (see summary by Chambers et al. 2014). Most GRSG lek sites have very little annual grassland cover, and lek use becomes progressively less as the cover of invasive annual species increases contributes to reductions in recruitment and annual survival (see summary by Chambers et al. 2014).

Treatments

On Hart Mountain Refuge, western juniper (*Juniperus occidentalis*) is encroaching into some stands of mountain big sagebrush, mountain shrub, aspen, and riparian habitats. Juniper treatment of phases I and II has been shown to be highly effective at maintaining native shrubs and understories, while functionally restoring sagebrush landscapes on many ecological sites. Efforts are ongoing to quantify the extent of juniper encroachment on Hart Mountain NAR and prioritize areas for treatment in relation to GRSG habitats. Ongoing treatments will continue to be conducted primarily via mechanical methods supported by limited prescribed fire. Recommended activities include (in part from Chambers et al. 2014):

Other activities include using prescribed fire and mechanical treatments to remove trees, decrease woody fuels, and release native understories in cool and moist big sagebrush ecosystems with relatively high resistance to annual invasive grasses that are in early to mid-phases of juniper expansion. Actively monitor and manage post-treatment areas to minimize secondary weed infestation.

Recovery after wildfire includes implementing recommended activities, in part from Chambers et al. 2014:

- Within areas of the Refuge with high resilience to disturbance and resistance to invasive annual grasses (e.g., mountain big sagebrush, mountain shrub, low sagebrush habitats; Figure 1), natural sagebrush recovery is likely and perennial herbaceous species are sufficient for recovery.
    - Restoration is typically passive and designed to increase or maintain perennial herbaceous species, biological soil crusts, and landscape cover of sagebrush.
    - Post-fire rehabilitation is generally a low priority with the exception of areas where native understory is inadequate for recovery, where seeding or transplanting sagebrush is needed to maintain habitat connectivity, or where there are steep slopes and soils with erosion potential.
    - Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.
- For areas of the Refuge with moderate to low resilience to disturbance and resistance to invasive annuals (e.g., Wyoming big sagebrush habitats; Figure 1), natural sagebrush recovery is less likely and perennial herbaceous species are typically inadequate for recovery.
    - Restoration is typically active. Areas with >65 percent landscape cover of sagebrush are the first order priority for post-fire rehabilitation and restoration, especially if they are part of a larger, contiguous area of sagebrush. Seeding and/or transplanting sagebrush may be necessary and success will likely depend on more than one intervention due to low and variable precipitation. Repeat restoration

treatments if they fail initially to ensure success especially in warm and dry soil temperature regimes where weather is often problematic for establishment.

- Other priority areas for restoration activities include relatively warm and dry areas where annual invasives are expanding.
- Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.

- Actively monitor and manage post-fire areas to minimize secondary weed infestation.
- Explore options to partner with other agencies to develop and maintain supplies of locally adapted seed banks.

Restoration of wet meadow habitats

- Early management activities on Hart Mountain Refuge focused on the development of water resources to increase water availability for livestock. Ponds were dug in seeps and wet meadows, spring flow diverted to watering troughs, and stock ponds built. Wet meadow habitats in particular are important brood-rearing habitats for GRSG. However, many wet meadow habitats on Hart Mountain Refuge have been altered by these activities. The goal of the Refuge is to restore these habitats to naturally functioning hydrological processes for the benefit of a diverse assemblage of native species including GRSG. Activities to include:
  - Removal of water control structures, dugouts, or other developments that alter natural hydrology.
  - Where necessary, investigate and employ wetland restoration techniques (e.g., plantings, bank stabilization).
  - Where appropriate, use mechanical or prescribed fire treatments to mimic natural disturbances, reduce litter, and increase herbaceous vigor.
- Landscape connectivity
  - Explore options to work with partners to restore and maintain GRSG habitats across the larger landscape, including connectivity with Sheldon National Wildlife Refuge.

Habitat Maintenance

Sagebrush-steppe habitats within Hart Mountain NAR are currently in Good to High condition (as defined by Manier et al. 2013) with intact, native understories as a result of largely passive restoration following the elimination of feral horse and livestock grazing. The goal of the Refuge is to protect and/or maintain the natural condition and processes throughout these habitats for the benefit of a diverse assemblage of native species, including GRSG. For habitats in good to high condition, minimal action is recommended: maintain status and protect intact shrub stands, monitor and treat invasive species, monitor productivity, and adjust management if condition decline is documented (Manier et al. 2013). Recommended activities are (in part from Chambers et al. 2014) (see **Table 4-207**):

- Continue to exclude feral horses and livestock from Hart Mountain Refuge.
- Suppress fire in moderate to low resilience and resistance sagebrush (e.g., Wyoming big sagebrush habitats, Figure 1) and wooded shrublands to prevent an invasive annual grass-fire cycle. Large sagebrush patches are high priority for protection from wildfires.
- Use prescribed fire and mechanical treatments to remove trees, decrease woody fuels, and release native understories in cool and moist big sagebrush ecosystems with relatively high resistance to annual invasive grasses that are in early to mid-phases of juniper expansion.
- Where appropriate, use mechanical or prescribed fire treatments to mimic natural disturbances, reduce litter, and increase herbaceous vigor in wet meadow habitats.
- Implement strategic fuel break networks to provide anchor points for suppression and reduce losses when wildfires escape initial attack (Figure 2).
- Limit anthropogenic activities that can cause surface disturbance, invasion, and fragmentation, e.g., road and utility corridors, OHV use.
- Detect and control new exotic weed infestations.

Table 4-207
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	33,826	0	33,826
Percent of PPA	0	14.00	0	14.00

Fire Operations

Fire operations are primarily focused on adequate early detection and initial attack efforts, as well as prevention of additional introductions of invasive plants to Refuge lands. Fire Operations at the Refuge will continue to work with partners to explore the potential for a strategically located interagency “weed wash" station as well as the establishment of a station at the Hart Mountain NAR Field Headquarters. Vehicles used in or around sites with prevalent invasive plants would be washed before entering and leaving the Refuge (see **Table 4-208**).

Table 4-208
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	24,990	46,983	0	71,973
Percent of PPA	34.7	65.3	0	100

Efforts to explore the potential to improve initial attack efforts include re-evaluation of water use agreement for Jacob's Reservoir located in the southeast portion of Hart Mountain Refuge in order to conserve sufficient water availability during a fire event. Work with adjacent landowners on water use agreements. Explore opportunities for water storage tanks (non-potable) at the Refuge Field Headquarters. Increase availability of suppression resources (i.e., SEATs and water tenders) for initial attack. Increase capability to pre-position resources across agencies. Explore opportunities to improve early fire detection. Investigate potential to install remote cameras at existing radio repeater sites (e.g., Hart Mountain/Warner repeater) to serve as lookout sites. Increase interagency availability of aircraft for detection flights.

Efforts to improve the function of Fire Operations include the possibility of expanding the number of available interagency Resource Advisors. Increase the availability of interagency fire prevention programs and staff, to include educational, patrolling, and sign posting capabilities. Maintain current fire dispatch capabilities. Add resources and preposition resources specifically identified to protect GRSG habitat through use of "Step-Up" plans that are tied to the unit Fire Danger Operating Plan, local/regional preparedness levels, potential for ignitions, and or key weather events. Type III to V IC delegations: provide clear leaders intent to IC's and first responders that supports the Land Management Plan direction and that in the Fire Management Plan as it pertains to protection of GRSG habitat. Ex. "To the extent it can safely be performed, retain unburned fingers and islands that do not pose a significant threat of escape." Duty Officers should become familiar with priority areas within GRSG habitat that are more or less resistant/resilient, any pre-attack plan generated for a specific area, treatment locations, and or advantages on the landscape engineered to aid in containment (Initial Attack prioritization and efficiency).

Establish a "Pre-Attack Plan" specific to each juniper control treatment. While added fuel hazard is present, utilize a pre-attack plan as the means to mitigate wildfire spread potential until treatment is complete/hazard removed. Examples include: improved access, creating/planning control lines, creating temporary water sources, improved detection cycles/methods, preestablished authorizations to utilize heavy equipment (if applicable), contact lists and notifications specifically needed, etc. Load PAC areas into a CAD system at Dispatch. Front load this resource value and set it as a priority area for action and notifications. Look at existing dispatch run cards "Block Cards" to modify and or create new cards for GRSG PAC areas in an effort to best provide for habitat protection. Resource Advisors kits should be updated with treatment areas, site data of GRSG landscape and ability to advise fire mangers and IC's of areas more and less resilient/resistant. This provides knowledge to better prioritize localized incident suppression action (extended attack).

Post-Fire Rehabilitation Management

Within areas of the Refuge with high resilience to disturbance and resistance to invasive annual grasses (e.g., mountain big sagebrush, mountain shrub, low sagebrush habitats; Figure 1), natural sagebrush recovery is likely and perennial herbaceous species are sufficient for recovery. Restoration is typically passive and designed to increase or maintain perennial herbaceous species, biological soil crusts, and landscape cover of sagebrush. Post-fire rehabilitation is generally a low priority with the exception of areas where native understory is inadequate for recovery, where seeding or transplanting sagebrush is needed to maintain habitat connectivity, or where there are steep slopes and soils with erosion potential. Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques (see **Table 4-209**).

For areas of the Refuge with moderate to low resilience to disturbance and resistance to invasive annuals (e.g., Wyoming big sagebrush habitats; Figure 1), natural sagebrush recovery is less likely and perennial herbaceous species are typically inadequate for recovery. Restoration is typically active. Areas with >65% landscape cover of sagebrush are the first order priority for post-fire rehabilitation and restoration, especially if they are part of a larger, contiguous area of sagebrush. Seeding and/or transplanting sagebrush may be necessary and success will likely depend on more than one intervention due to low and variable precipitation. Repeat restoration treatments if they fail initially to ensure success especially in warm and dry soil temperature regimes where weather is often problematic for establishment.

- Other priority areas for restoration activities include relatively warm and dry areas where annual invasives are expanding.
- Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.
- Actively monitor and manage post-fire areas to minimize secondary weed infestation.
- Explore options to partner with other agencies to develop and maintain supplies of locally adapted seed banks.

Table 4-209
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	176,397	65,266	0	241,663
Percent of PPA	73.0	27.0	0	100

Proposed Management

See **Table 4-210** for projects that have been identified presently within the NEPA planning process. See **Figures 4-119** through **4-123** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-210
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 (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]
Hart Mountain NAR - Poker Jim Conifer Removal	6153 ac	X			C	I		W		C			I	I		5+	0-2
Hart Mountain NAR - Rock Creek Conifer Removal	2485 ac	X			C	I		W		C		P		I		5+	3-5
Hart Mountain NAR – Guano Creek Conifer Removal	8452 ac		X		C	I		W		C		P		I		5+	3-5
Hart Mountain NAR – East Desert South Conifer Removal	3521 ac			X	C	I		W		C		P		I		5+	5+

Table 4-210
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 (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]
Hart Mountain NAR - Poker Jim Conifer Removal	6153 ac	X			C	I		W		C			I	1		5+	0-2

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.26 Sheldon NWR

Project Planning Area Description

General Site Description
Sheldon National Wildlife Refuge PPA is located in the northwestern corner of the Great Basin, located in Humboldt and Washoe Counties, Nevada. The lands adjacent to the Refuge are primarily managed by the BLM Lakeview, Burns, Northern California, and Winnemucca Districts. The total area within the Refuge's borders is 575,000 acres and >80 percent of the Refuge is sagebrush-steppe habitat. Elevations range from 4544 feet in the valleys to 7290 feet at the highest mountain peak.

The Sheldon NWR did not have the detailed soil data available to update the resistance/resilience layer from the original assessment work in the fall of 2014. This lack of data is apparent in the regional and PPA scale maps.

The majority of the PPA area ranges from cool/moist at higher elevations to cool/dry at lower elevations. Cool/moist ecological types on the Refuge consist of mountain big sagebrush and low sagebrush habitats, and generally exhibit moderately high resilience and moderate resistance. Cool/dry ecological types are more common at lower elevations and in higher densities along the northeastern edge of the Refuge, are dominated by Wyoming big sagebrush, and exhibit low resilience and moderate resistance. In these habitats, effective precipitation limits site productivity and the climate is more suitable to invasive annual grasses (Chambers et al. 2014) (see **Table 4-211**).

Table 4-211
Sheldon NWR Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	535	0	0	34	0	39	355,366	0	225	66,453	422,650
Percent of PPA	0	0	0	0	0	0	84	0	0	16	100

Sheldon NWR not update to the new soil moisture – temperature map due to the lack of data.

Within Sheldon Refuge, the soils generally range from cool/moist at higher elevations to cool/dry at lower elevation with sagebrush cover >80 percent. Within the Refuge, roughly 471,500 acres (82 percent) are GRSG habitat. Current invasive or exotic plant cover is low, estimated at greater than one percent. Western juniper encroachment into GRSG habitat currently occurs at relatively low levels within scattered mountain big sagebrush habitats confined along the northwestern third of the Refuge.

Sage-Grouse

Sheldon Refuge lies within the Western Great Basin PAC and has been designated as a GRSG "core" (80 percent) or "priority" (12 percent) management areas by the State of Nevada's GRSG conservation plan. Roughly 90 percent of the Refuge, therefore, is preliminary, priority (GRSG) habitat PPH; PPH represents the habitat designated to maintain distribution and sustainable GRSG populations (Manier et al. 2013). The Refuge provides breeding, brood rearing, and winter habitat for GRSG. As of 2014, there were 26 known lek sub-complexes comprised of 60 individual leks distributed across the Refuge; roughly 76 percent of the known lek sub-complexes are currently active. The GRSG population is sustaining and is a stronghold population.

Vegetation

Large, interconnected, and relatively intact stands of native upland shrub and steppe habitats comprise >80 percent of Sheldon Refuge. The major vegetation types are low sagebrush (*A. arbuscula*), mountain big sagebrush (*A.t.* ssp. *vaseyana*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), and Basin big sagebrush (*A.t.* ssp. *tridentata*) communities (Table 1; Figure 1); all are species most commonly associated with GRSG (Manier et al. 2013). Elevational differences are evident, with Wyoming big sagebrush and Basin big sagebrush being more dominant at lower elevations and are at higher densities along the eastern portion of the Refuge. As the elevation increases to the south and west, the habitat becomes primarily dominated by mountain big sagebrush and low sagebrush on the tablelands. Western juniper is mainly constricted to within the northwestern portion of the Refuge (Figure 1).

The native perennial grass understory is relatively intact, and common species include Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Thurber's needlegrass (*Achnatherusm thurberianum*), squirreltail (*Elymus* spp.), Sandberg's bluegrass (*Poa secunda*), and needle-and-thread (*Hesperostipa comata*). A wide variety of native forbs also occurs, and includes *Phlox* spp., *Lomatium* spp., *Crepis* spp., and *Lupinus* spp. (see **Table 4-212**).

Table 4-212
Classified Vegetation Cover Types and Estimated Percentage of Total Area (Greater GRSG habitat is highlighted in gray)

Vegetation Type	Estimated Percent of Total Area
Invasive annual grasses and forbs	<1
Open water/emergent marsh	0.2
Barren and sparse vegetation	1.7
Woodlands (juniper, aspen, mountain mahogany)	2.3
Semi-desert grassland	7.8
Salt desert scrub/Greasewood flat	5.9
Mesic wet meadow	0.5
Basin big sagebrush steppe	5.1
Wyoming big sagebrush shrubland	20.7
Mountain big sagebrush steppe/Mountain shrub	26.5
Low sagebrush shrubland and steppe	29.2

Source: Sheldon National Wildlife Refuge 2010

Invasive Plants

Approximately 30 species of introduced, nonnative, and often noxious plants have been documented on Sheldon National Wildlife Refuge. However, the combined invasive species cover is currently estimated to be less than one percent of the total Refuge area (less than 5,750 acres), and substantial infestations remain generally confined to road corridors and other sites of disturbance (e.g., campgrounds, burned areas). Cheatgrass (*Bromus tectorum*) is the most common species, and other species include knapweed (*Centaurea* spp.), kochia (*Bassia scoparia*), hoary cress (*Cardaria draba*), yellow sweetclover (*Melilotus officianalis*), bull thistle (*Cirsuim vulgare*), scotch thistle (*Onopordum acanthium*), and Russian thistle (*Salsola* spp.).

Fire

The historic role of fire in sagebrush ecosystems has been difficult to accurately estimate. Recently revised estimates of fire return intervals describe 200-350 year fire-return intervals in Wyoming sagebrush, 150-300 years in mountain sagebrush, and more than 200 years for low sagebrush (Manier et al. 2013). There is little evidence that fire will enhance GRSG habitat in Wyoming big sagebrush communities, especially where there is already a balance of native shrubs, perennial grasses, and forbs. There is also a growing body of evidence that suggests that on the current landscape, even prescribed fire designed to enhance brood-rearing habitat values does not have a positive effect on herbaceous habitat conditions and can cause demonstrable decline in valuable sagebrush cover (Manier et al. 2013).

Although relatively infrequent, the majority of lightening fires occur in the PPA from June through September, with some fires occasionally starting as early as mid-May or as late as mid-October. Between the 1930s and early 1980s, all fires were aggressively suppressed throughout Sheldon Refuge. Between 1985 and 2007, roughly 57,500 acres were burned during wildfire events. The largest wildfires in recent history were the Badger Fires which burned over 45,000 acres in 1994 and 1999 (see **Table 4-213**).

Table 4-213
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	215,050
High and Very High Burn Probability in PPA (percent)	51.1

Management Strategies

Treatments
Prescribed fire activities have been typically conducted September through April, with limited use beginning in the 1960s and continuing through the early 1980s. The use of prescribed fire then increased in the late 1980s. Between 1991 and 2012 roughly 22,950 acres were treated by prescribed fire, predominantly in habitats dominated by Wyoming, mountain, and Basin big sagebrush and as well as meadow habitats.

The approximate total of Sheldon Refuge affected by either wild or prescribed fire since 1985 is over 80,450 acres or roughly 14 percent of the total acreage.

Other Relevant Management Activity
Livestock grazing (including feral horses and burros) began on Sheldon Refuge in the 1870s and continued after the Refuge was established in the 1930s. Between 1990 and 1994, domestic livestock were removed after all grazing permits on Sheldon Refuge were purchased and retired. However, feral horses and burros continued to graze uncontrolled on the Refuge and their population numbers substantially increased. Between 2007 and 2012, feral horses and burros were determined to be significantly impeding any potential for ecological recovery following the removal of livestock. Research indicated that, in the absence of cattle, feral horses were decreasing sagebrush density and plant species diversity, impacting the recovery of important soil surface characteristics, and were affecting the ecological function of the semi-arid rangelands (Davies et al. 2014). In addition, grazing by horses was found to be a strong determinant of how vegetative productivity was sustained during the growing season and even small numbers of horses had a proportionally greater effect on productivity compared to native ungulates, particularly during drought years (Zeigenfuss et al. 2014). As a result, the remaining feral horses and burros were removed from Sheldon Refuge between 2013 and 2014 in accordance with existing policy, the mission of the Refuge System and the Service, and the purposes for Sheldon Refuge.

Fuels Management

The primary fuels management activities would be focused on fire breaks and control of invasive annual grasses to prevent large-scale, catastrophic fires. Specific activities include creating fire breaks to minimize fire risk. This can be done by implementing strategic fuel break networks to provide anchor points for suppression that will reduce losses when wildfires escape initial attack. Continue to maintain existing fire breaks along established roads via mowing. Identify additional established roads for consideration as potential fuel break treatment areas while minimizing GRSG habitat fragmentation. Finally, coordinate with adjacent land-management agencies (i.e., BLM) to identify established roads and treatments outside of Refuge-lands which may be appropriate to incorporate as fire breaks (see **Table 4-214**).

Table 4-214
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	104.38	81.06	0	185.44

In addition, Refuge management will continue to implement appropriate public restrictions including seasonal road closures during high-fire risk time periods to reduce fire risk from vehicles. Continue to minimize fire risk from public campgrounds by reducing fuel at campsites (e.g., mowing, herbicide application) and restricting campfires during high-risk time periods. Consider installing additional fire breaks and conducting fuels treatments around high-use campgrounds (e.g., Virgin Valley Campground, Badger Campground).

Invasive annual grass control methods will include implementing a proactive approach by emphasizing herbicide treatment along road corridors and early detection and eradication of small infestations. Aggressively control newly detected small infestations of noxious weeds and other highly invasive nonnative plants using a variety of tools and methods, primarily mowing, reseeding native species (aerial and drill), and the use of herbicides. Slow the spread of established populations of invasive plants (i.e., cheatgrass) by limiting prescribed burning and other disturbances in highly susceptible areas and through pre and post project monitoring, reseeding native species (aerial and drill), and herbicide treatments following disturbances.

Habitat Restoration and Recovery

In the Northern Great Basin, habitat loss and fragmentation due to wildfire and conifer encroachment have been identified as the primary threats to GRSG (Manier et al. 2013). Conifer expansion results in declines in sagebrush cover and reductions in perennial native grasses and forbs as conifer canopy cover increases (see summary by Chambers et al. 2014). The ability to maintain active leks is severely compromised when conifer canopy cover exceeds four percent, and habitats containing most active leks average greater than one percent conifer canopy cover. Nonnative annual grasses and forbs also reduce both habitat quality and quantity for GRSG. Further, due to repeated fires, some low- to mid-elevation native sagebrush communities can permanently shift to annual grassland states resulting in habitat loss that may be irreversible with current technologies (see summary by Chambers et al. 2014). Most GRSG lek sites have very little annual grassland cover, and lek use becomes progressively less as the cover of invasive annual species increases contributes to reductions in recruitment and annual survival (see summary by Chambers et al. 2014).

Treatments

On Sheldon Refuge, western juniper (*Juniperus occidentalis*) is encroaching into some stands of mountain big sagebrush, aspen, and riparian habitats but is currently confined to the very northwestern edge of the Refuge. Juniper treatment of phases I and II has been shown to be highly effective at maintaining native shrubs and understories, while functionally restoring sagebrush landscapes on many ecological sites. Efforts are ongoing to quantify the extent of juniper encroachment on Sheldon Refuge and prioritize areas for treatment in relation to GRSG habitats. Ongoing treatments will continue to be conducted primarily via mechanical methods supported by limited prescribed fire. Recommended activities include (Chambers et al. 2014):

Other activities include using prescribed fire and mechanical treatments to remove trees, decrease woody fuels, and release native understories in cool and moist big sagebrush ecosystems with relatively high resistance to annual invasive grasses that are in early to mid-phases of juniper expansion. Actively monitor and manage post-treatment areas to minimize secondary weed infestation.

Recovery after wildfire includes implementing recommended activities, in part from Chambers et al. 2014:

- Within areas of the Refuge with high resilience to disturbance and resistance to invasive annual grasses (e.g., mountain big sagebrush, low sagebrush habitats; Figure 1), natural sagebrush recovery is likely and perennial herbaceous species are sufficient for recovery.
    - Restoration is typically passive and designed to increase or maintain perennial herbaceous species, biological soil crusts, and landscape cover of sagebrush.
    - Post-fire rehabilitation is generally a low priority with the exception of areas where native understory is inadequate for recovery, where seeding or transplanting sagebrush is needed to maintain habitat connectivity, or where there are steep slopes and soils with erosion potential.
    - Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.

- For areas of the Refuge with moderate to low resilience to disturbance and resistance to invasive annuals (e.g., Wyoming big sagebrush habitats; Figure 1), natural sagebrush recovery is less likely and perennial herbaceous species are typically inadequate for recovery.
  - Restoration is typically active. Areas with >65 percent landscape cover of sagebrush are the first order priority for post-fire rehabilitation and restoration, especially if they are part of a larger, contiguous area of sagebrush. Seeding and/or transplanting sagebrush may be necessary and success will likely depend on more than one intervention due to low and variable precipitation. Repeat restoration treatments if they fail initially to ensure success especially in warm and dry soil temperature regimes where weather is often problematic for establishment.
  - Other priority areas for restoration activities include relatively warm and dry areas where annual invasives are expanding.
  - Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.
- Actively monitor and manage post-fire areas to minimize secondary weed infestation.
- Explore options to partner with other agencies to develop and maintain supplies of locally adapted seed banks.

Restoration of wet meadow habitats

- Early management activities on Sheldon Refuge focused on the development of water resources to increase water availability for livestock. Ponds were dug in seeps, spring flow diverted to watering troughs, and stock ponds built. Currently there are over 180 such water developments on Sheldon Refuge, including: reservoirs, stock ponds, pit reservoirs, gabions, diversion canals, and water control structures. Wet meadow habitats in particular are important brood-rearing habitats for GRSG. However, the majority of the wet meadow habitats on Sheldon Refuge have been altered both by water diversion and by extensive grazing by feral horses and burros. This has resulted in soil compaction, altering of plant diversity and abundance, and headcutting all leading to a lowered water table and meadow drying. The goal of the Refuge is to restore these habitats to naturally functioning hydrological processes for the benefit of a diverse assemblage of native species including Greater GRSG. Activities to include:

  - Continued exclusion of feral horses and burros from Sheldon Refuge.
  - Removal of water control structures, diversions, or other developments that alter natural hydrology.
  - Investigate and employ wetland restoration techniques (e.g., plantings, bank stabilization).
  - Where appropriate, use mechanical or prescribed fire treatments to mimic natural disturbances, reduce litter, and increase herbaceous vigor.
- Landscape connectivity
  - Explore options to work with partners to restore and maintain GRSG habitats across the larger landscape, including connectivity with Hart Mountain National Antelope Refuge.

Habitat Maintenance

Sagebrush-steppe habitats within Sheldon Refuge are currently in Moderate to Good condition (as defined by Manier et al. 2013) with potentially under-represented native understories and invasive plants which are common but not dominant as such that natives have been entirely displaced as a result of past grazing pressure by feral horses and burros. The goal of the Refuge is to enhance, protect and/or maintain the natural condition and processes throughout these habitats for the benefit of a diverse assemblage of native species, including GRSG. For habitats in Moderate to Good condition, passive restoration with small, localized treatments or restoration actions are recommended: rest from grazing to avoid a sudden change in disturbance regime and/or exotic species invasion, and consideration of increasing active restoration if habitat conditions are not improved (Manier et al. 2013). Recommended activities are (in part from Chambers et al. 2014) (see **Table 4-215**):

- Continue to exclude domestic livestock, feral horses, and feral burros from Sheldon Refuge.
- Suppress fire in moderate to low resilience and resistance sagebrush (e.g., Wyoming big sagebrush habitats, Figure 1) and wooded shrublands to prevent an invasive annual grass-fire cycle. Large sagebrush patches are high priority for protection from wildfires.
- Use prescribed fire and mechanical treatments to remove trees, decrease woody fuels, and release native understories in cool and moist big sagebrush ecosystems with relatively high resistance to annual invasive grasses that are in early to mid-phases of juniper expansion.

Table 4-215
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	0	3,647	0	3,647
Percent of PPA	0	0.86	0	0.86

- Where appropriate, use mechanical or prescribed fire treatments to mimic natural disturbances, reduce litter, and increase herbaceous vigor in wet meadow habitats.
- Implement strategic fuel break networks to provide anchor points for suppression and reduce losses when wildfires escape initial attack (Figure 2).
- Limit anthropogenic activities that can cause surface disturbance, invasion, and fragmentation, e.g., road and utility corridors, OHV use.
- Detect and control new exotic weed infestations.

Fire Operations

Fire operations are primarily focused on adequate early detection and initial attack efforts, as well as prevention of additional introductions of invasive plants to Refuge lands. Fire Operations at the Refuge will continue to work with partners to explore the potential for a strategically located interagency "weed wash" station as well as the establishment of a station at the Sheldon NWR Field Headquarters. Vehicles used in or around sites with prevalent invasive plants would be washed before entering and leaving the Refuge (see **Table 4-216**).

Table 4-216
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	422,651	0	0	422,651
Percent of PPA	100	0	0	100

Efforts to explore the potential to improve initial attack efforts include re-evaluation of water use agreement for Jacob's Reservoir located in the southeast portion of Sheldon Refuge in order to conserve sufficient water availability during a fire event. Work with adjacent landowners on water use agreements. Explore opportunities for water storage tanks (non-potable) at the Refuge Field Headquarters. Increase availability of suppression resources (i.e., SEATs and water tenders) for initial attack. Increase capability to pre-position resources across agencies. Explore opportunities to improve early fire detection. Investigate potential to install remote cameras at existing radio repeater sites (e.g., Hart Mountain/Warner repeater) to serve as lookout sites. Increase interagency availability of aircraft for detection flights.

Efforts to improve the function of Fire Operations include the possibility of expanding the number of available interagency Resource Advisors. Increase the availability of interagency fire prevention programs and staff, to include educational, patrolling, and sign posting capabilities. Maintain current fire dispatch capabilities. Add resources and preposition resources specifically identified to protect GRSG habitat through use of "Step-Up" plans that are tied to the unit Fire Danger Operating Plan, local/regional preparedness levels, potential for ignitions, and or key weather events. Type III to V IC delegations: provide clear leaders intent to IC's and first responders that supports the Land Management Plan direction and that in the Fire Management Plan as it pertains to protection of GRSG habitat. Ex. "To the extent it can safely be performed, retain unburned fingers and islands that do not pose a significant threat of escape." Duty Officers should become familiar with priority areas within GRSG habitat that are more or less resistant/resilient, any pre-attack plan generated for a specific area, treatment locations, and or advantages on the landscape engineered to aid in containment (Initial Attack prioritization and efficiency).

Establish a "Pre-Attack Plan" specific to each juniper control treatment. While added fuel hazard is present, utilize a pre-attack plan as the means to mitigate wildfire spread potential until treatment is complete/hazard removed. Examples include: improved access, creating/planning control lines, creating temporary water sources, improved detection cycles/methods, preestablished authorizations to utilize heavy equipment (if applicable), contact lists and notifications specifically needed, etc. Load PAC areas into a CAD system at Dispatch. Front load this resource value and set it as a priority area for action and notifications. Look at existing dispatch run cards "Block Cards" to modify and or create new cards for GRSG PAC areas in an effort to best provide for habitat protection. Resource Advisors kits should be updated with treatment areas, site data of GRSG landscape and ability to advise fire mangers and IC's of areas more and less resilient/resistant. This provides knowledge to better prioritize localized incident suppression action (extended attack).

Post-Fire Rehabilitation Management

Within areas of the Refuge with high resilience to disturbance and resistance to invasive annual grasses (e.g., mountain big sagebrush, mountain shrub, low sagebrush habitats; Figure 1), natural sagebrush recovery is likely and perennial herbaceous species are sufficient for recovery. Restoration is typically passive and designed to increase or maintain perennial herbaceous species, biological soil crusts, and landscape cover of sagebrush. Post-fire rehabilitation is generally a low priority with the exception of areas where native understory is inadequate for recovery, where seeding or transplanting sagebrush is needed to maintain habitat connectivity, or where there are steep slopes and soils with erosion potential. Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques (see **Table 4-217**).

Table 4-217
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	422,651	0	0	422,651
Percent of PPA	100	0	0	100

For areas of the Refuge with moderate to low resilience to disturbance and resistance to invasive annuals (e.g., Wyoming big sagebrush habitats; Figure 1), natural sagebrush recovery is less likely and perennial herbaceous species are typically inadequate for recovery. Restoration is typically active. Areas with >65% landscape cover of sagebrush are the first order priority for post-fire rehabilitation and restoration, especially if they are part of a larger, contiguous area of sagebrush. Seeding and/or transplanting sagebrush may be necessary and success will likely depend on more than one intervention due to low and variable precipitation. Repeat restoration treatments if they fail initially to ensure success especially in warm and dry soil temperature regimes where weather is often problematic for establishment.

- Other priority areas for restoration activities include relatively warm and dry areas where annual invasives are expanding.
- Treatment options include aerial and ground herbicide application, and reseeding of native species via either aerial or ground techniques.
- Actively monitor and manage post-fire areas to minimize secondary weed infestation.
- Explore options to partner with other agencies to develop and maintain supplies of locally adapted seed banks.

Proposed Management

See **Table 4-218** for projects that have been identified presently within the NEPA planning process. See **Figures 4-124** through **4-127** for a graphic depiction of the proposed treatments and strategies in the PPA.

4.2.27 Virginia Ranges

Project Planning Area Description

General Site Description

The Virginia Ranges (VR) PPA is located in Washoe County in northern Nevada. Pyramid Lake is adjacent to the East of the PPA. The area is comprised of 98,675 acres of which 71,614 acres (73 percent) are administered by the BLM, 1849 acres (two percent) are administered by the BIA, and 25,152 acres (25 percent) are private lands. A high proportion (59,498 acres, 60 percent) of the PPA is presently categorized as 3A habitat, with 19,096 acres of designated 1A

Table 4-218
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 (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]
Sheldon NWR – Bitner Butte Confer Removal	7,000 ac	X			C	I		W		C			I	1		5+	0-2
Sheldon NWR – Little Sheldon Phase I Conifer Removal	7,000 ac		X		C	I		W		C		P		1		5+	3-5
Sheldon NWR – Little Sheldon Phase II Conifer Removal	7,000 ac			X	C	I		W		C		P		1		5+	5+
Sheldon NWR Spring Run/Wet Meadow Restoration	To be deter-mined (180+ sites on Refuge)	X			I		R			C		P		4		5+	5+
Sheldon NWR Feral Horse and Burro Removal	575,000 acres	X			I		R			C			I	1		3-5	0-2

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

and 1B habitats existing in higher elevations of the Fort Sage Mountains and the Virginia Range. understory conversion to annual grasslands in the event of fire is a major reason for the prevalence of 3A and 1A habitats, as 55,352 Acres (56 percent) of the PPA has burned within the last 15 years.

This PPA encompasses the Fort Sage Mountains and portions of the Virginia Range and nearby valley bottoms. The Flanigan Playa borders the northern edge of the area, with HWY 395 and Pyramid Lake bracketing the PPA on the West and East, respectively. Springs and seeps commonly occur throughout most of the mountains; however most of these areas are not meeting riparian health objectives. Elevations throughout the PPA range from 4,500 feet in valley bottoms to approximately 7,990 feet on top of Stateline Mountain (see **Table 4-219**).

*Total acreage variance due to aggregation methods required by remote sensing data

Table 4-219
Virginia Range Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	6,232	5,743	1,086	0	12,074	7,059	0	55,958	10,522	0	98,675
Percent of PPA	6	6	1	0	12	7	0	57	11	0	100

Sage-Grouse

The Virginia Ranges PPA is approximately 98,702 acres and has one lek complex consisting of three active leks. Leks are located in resilient habitat that was rehabilitated post-fire in 1999 and 2001. These leks are displaying strong signs of recovery.

The PPA has become degraded due to pinyon pine and juniper expansion, fire, and invasive weeds. Reestablishing connectivity with other lek complexes and GRSG populations north of the Virginia Ranges is the main priority in this PPA. Large areas near the PPA are fragmented due to the limited amount of post-fire reestablishment of sagebrush and pinyon-juniper expansion into connectivity corridors. Distribution patterns and movements of GRSG are typical in the Great Basin with wintering occurring on valley bottom and mountain bench locations and brood rearing occurring within riparian areas throughout the PPA.

Vegetation

The Western edge of the PPA is dominated by large monocultures of annual grasses surrounded by agriculture fields along the valley bottom. These areas are highly altered by the presence of cheatgrass and are likely to re-burn again (see **Table 4-220**).

Table 4-220
Virginia Range Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Black/low Sagebrush	Grassland	Invasives	Riparian	Salt Desert Scrub	Woodland	Other
Acres	22,129	3,475	646	18,641	186	14,175	32,889	6,598
Percent of Area	22	4	1	19	0	14	33	7

Vegetation in the PPA consists mainly of Wyoming and basin big sagebrush plant communities in the lower elevations. Many of these sites also have a rabbitbrush component. Upper elevations consist largely of mountain big sagebrush and mixed mountain shrub species. In 1999 and 2001 the Fish and Fish two Fires burned approximately 55,000 acres. These areas are now predominately annual grasslands with some sagebrush recovery taking place in the more resilient areas. The vast majority of the burned areas were seeded in 2001.

Across the VR PPA, cheatgrass dominates where past fires have occurred. Noxious weeds such as Scotch thistle, musk thistle and hoary cress have also expanded from past fire occurrences. Other noted species include Russian knapweed, spotted knapweed, scotch thistle, Canadian thistle, musk thistle, and leafy spurge.

Fire

Past fire rehabilitation efforts have exhibited mixed success from obvious cheatgrass conversion to good success and observed use by GRSG. Higher elevations of the VR PPA frequently receive lightning strikes in the summer. Highway 395 is in a lower elevation and runs along the western boundary of the PPA, this area seems to experience a high volume of human caused fires.

The PPA was heavily impacted by fire in 1999 and 2001, particularly in areas now rated 3A and 3B. More resilient habitats identified as 1A and 1B comprise the bulk of the used habitat and also show better establishment of seeded species from rehabilitation efforts undertaken in 2001.

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 within the Virginia Ranges PPA are as follows: 81 percent in Fire Regime II, four percent in Fire Regime IV, four percent in Fire Regime V, and the remaining in the other Fire Regimes. This speaks to potential state conversion issues within the PPA. In healthy, resilient sagebrush ecosystems, typical fire regimes are III and IV (35-100 year frequency mixed/stand replacing fire) whereas 81 percent of the PPA is now fire regime II (0-35 year frequency, stand replacing fire). Two condition classes are largely present with 77 percent in condition class III, 14 percent in condition class II, with very little within condition class 1, and the remaining area not being classified (see **Table 4-221**).

Table 4-221
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	89,169
High and Very High Burn Probability in PPA (percent)	90.9

The Carson City District (BLM office), Plumas National Forest, Humboldt Toyabie National Forest, Northern California District (BLM office), Truckee Meadows Fire Protection District, and Reno Fire Departments all have agreements, equipment, and jurisdictions within or near the PPA. Federal Interagency Station located within and near the PPA includes the Doyle interagency Station, Stead interagency station, and Palomino Valley BLM station. Response time within the PPA is generally fast, with good coverage from multiple resources. In addition the Stead Air Tanker Base hosts single engine air tankers, heavy air tankers, and heavy helicopters throughout the summer and could easily respond to any fires within the PPA.

Existing Treatments

Landscape level NEPA planning has been initiated by the Sierra Front Field Office that encompasses the PPA area. The Carson City District ESR program has treated 45,502 total acres within the PPA. Areas with the most GRSG use are located within these treatments, and appear to have a high correlation to areas with higher resistance/resilience values. These areas are also recovering from fire impacts observably better than the surrounding areas.

Pinyon-juniper treatments are planned in the Piute Canyon Grazing Allotment ES (DOI-BLM-NV-C020-2013-033EA) and will treat 427 acres. This project is intended to enhance GRSG habitat. An additional 1,746 acres of pinyon-juniper removal adjacent to the PPA is also planned within the same document. These projects will be implemented once funding becomes available.

Management Strategies

Other Relevant Management Activities

The Sierra Front Field Office of the BLM administers two grazing permits within the VR PPA, with an aggregate total of approximately 1,000 head utilizing portions of the PPA throughout the year.

Fuels Management

A significant amount of annual grassland 3A habitats exist just outside the western edge of the emphasis area creating high potential for future catastrophic wildfires. Primary focus should be placed in this area which also includes a large proportion of past fire rehabilitation activities. Multiple roads and clearings exist within the PPA that present opportunities for use as fuel breaks to slow fire progression across the 3A and 3B habitats. Active fuels and restoration treatments have been initiated along the western and southern portions of the PPA (see **Table 4-222**). Additional fuels management activities include:

- Establish fuel breaks system along the Western edge of the PPA habitats along HWY 395.
- Establish a fuel break off of the Dry Valley Road along the southern edge of the VR PPA. This will aid in protection of previous restoration projects.
- Pinyon-juniper removal projects south of the PPA will reduce fire intensity and enhance fire suppression success. Effects of pinyon-juniper removal in these areas are currently being analyzed in the Virginia Ranges EA.

Table 4-222
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	25.19	0	0	25.19

Habitat Recovery and Restoration

A high percentage of the area (19 percent) has been converted to annual grassland due to low resiliency and repeated fire occurrence. More resilient habitats and riparian areas exist within the focal habitat, but are currently degraded. Priority 1 treatments for restoration are focused on reestablishing functioning riparian systems. Priority 2 treatments include removal of coniferous expansion in travel corridors on the south end of the focal area. The focus of Priority 3 restoration areas is to reestablish native perennial species in an effort to reverse or slow annual grassland conversion (see **Table 4-223**).

Treatment considerations include:

- Riparian treatments around the dry valley drainages and associated ephemeral streams
- Inventory and ground preparation in invasive annual grasslands
- Herbicide application in invasive annual grasslands
- Seeding of desirable species in prepared annual grasslands.

Table 4-223
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	8,343	0	0	8,343
Percent of PPA	8.46	0	0	8.46

Fire Operations

Fire operations are primarily focused on adequate early detection and initial attack efforts. Suppression is generally applied to fire however, the 'let it burn' policy can be applied successfully in some areas like riparian corridors, decadent sagebrush stands, aspen stands and grasslands.

Other issues include:

First order suppression focusses on unburned areas adjacent to previous ESR treatments on the South and West sides.

Secondary Suppression priorities are centered on areas that have been previously treated by the ESR program.

Tertiary suppression priorities are directed at higher elevation areas of the Virginia Range and Fort Sage Mountains and 3B habitats on the northeast portion of the PPA. The majority of these areas has been rated 1A and 1B and should be highly resilient if fire burns in these areas (see **Table 4-224**).

Table 4-224
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	49,706	87,595	8,312	145,613
Percent of PPA	50.4	88.8	8.4	147.6

Post-Fire Rehabilitation

The prevalence of highly desirable habitat (3B and 3C) within low resiliency regimes elevates the need for prompt fire rehabilitation activities with an emphasis on establishing sagebrush cover and limiting cheatgrass establishment post-fire within this emphasis area. Current telemetry data suggests that the most used habitat in the PPA is in previous ESR treatments with higher resiliency values. Cheatgrass expansion and state conversion is a high concern in this PPA and has occurred over a large portion of the PPA.

First order treatment priority would be centered on the valley bottoms and any impacted fuels or restoration treatments (see **Table 4-225**). Second order treatment priorities would include 3B designated habitat on the toe slopes (lower one third of the slope) and around active leks and known areas that GRSG use. High elevation fires within the PPA may become a priority for treatment if it is determined that erosion potential may negatively and significantly impact habitat values. Treatment considerations include:

In areas where sagebrush systems have burned and natural recovery is not likely targeted seeding on North and East facing microclimates within the areas designated 3A and 3B would enhance probability of successful establishment.

Table 4-225
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	23,532	61,842	7,335	92,709
Percent of PPA	23.8	62.7	7.4	94

Use of some form of ground preparation (drill seeding, aerial seeding and chaining, harrowing, etc.) is warranted and feasible on valley bottom areas.

Areas appropriate for drill seeding and equipment use will be surveyed, inventoried and cleared by Cultural Resource staff prior to treatment.

Where appropriate, herbicide treatments will be applied to suppress invasive and noxious species establishment and spread.

Proposed Management

See **Table 4-226** for projects that have been identified presently within the NEPA planning process. See **Figures 4-128** through **4-131** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-226
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 (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]
Black Rock Priority	59.6 miles	X						X			X	X		X		5-7	5+
Black Rock Secondary	166 miles		X					X			X	X		X		5-7	5+
Invasive Weeds Treatments	2,000 acres	X				X					X	X		X		5-7 or 0	5+
Sage-grouse Conifer Treatments	1,000		X		X						X	X		X		50+	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.28 Black Rock

Project Planning Area Description

General Site Description

The Back Rock PPA is located in the central portion of the Winnemucca District and lies entirely within Humboldt County, Nevada. Approximately, 28,489 acres lies within the Black Rock-High Rock Canyon National Conservation Area. Additionally, 22,920 acres are in designated wilderness and 8,414 acres are in a WSA or an Instant Study Area (managed as wilderness). The PA is 191,758 acres in size of which 8,911 acres are part of the Summit Lake Indian Reservation (five percent), 175,292 acres are public (91 percent), 6,710 acres are private (three percent), six acres are US Fish and Wildlife Service (greater than one percent) and 840 acres are water (greater than one percent). Major mountain ranges include the Pine Forest, Black Rock and Calico Mountain ranges which are typically oriented north to south. Elevation ranges from 3,996 to 9,416 feet.

Major streams include Soldier Creek, Battle Creek, Bartlett Creek, Leonard Creek and Craine Creek. Craine Creek flows north; Mahogany, Summer Camp and Snow Creeks flow west into Summit Lake, all others flow to the south. Summit Lake is located between the Black Rock and Calico Mountains and has no outflow. Over 600 springs and seeps have been identified; small wet meadows are scattered in conjunction with springs and riparian areas. Just over half of stream reaches assessed in the PPA are meeting Proper Functioning Condition (PFC) (see **Table 4-227**).

Table 4-227
Black Rock Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	2,272	0	196	775	0	8,321	75,384	0	7,659	97,153	191,758
Percent of PPA	1	0	0	0	0	4	39	0	4	51	100

With little respect for elevation or vegetation type, 89 percent of the PPA is classified as 3C or 3B habitat. This classification is based on the soil temperature/moisture layer and not actual perennial cover. The 1B and 1C habitat occurs in the headwater regions of Coleman Creek and the North Fork of Battle Creek and in the northwestern corner of the PPA around Bear Butte and Trough Mountain.

Sage-grouse

There are 14 active GRSG (*Centrocercus urophasianus*) leks; four are located in the Pine Forest Range, eight are located in the Black Rock Range and two are located in the Calico Mountains. For habitat types, all leks are located in class 3C habitat, the least resistant and resilient type. Lek surveys have been conducted annually over the past five years by Nevada Department Of Wildlife (NDOW). Annual variability in count numbers has been high with no apparent trend in population. Summer and winter habitat overlap considerably because of inconsistent snowfall and persistence. The greatest threat to GRSG is the loss of habitat from wildfire and habitat degradation due to heavy livestock grazing and free-roaming horses.

Vegetation

Lower elevations consist of salt desert shrub and Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*). When fires occur, these areas generally convert to nonnative invasive annual grasses. For fires above 5,500 ft. elevation, Wyoming sagebrush often recovers back to native perennials. Other native plant communities appear resilient over time to wildfire. There are small areas of low sagebrush (*Artemisia arbuscula)* throughout the PPA that are defined and restricted by soils. Higher elevations have both Mountain big sagebrush (*Artemisia tridentata ssp. vaseyana)* and mixed mountain shrub. Aspen (*Populus tremuloides*) stands are restricted to riparian areas, drainages, seeps and other mesic sites. Curl-leaf mountain mahogany (*Cercocarpus ledifolius*) occurs in small stands generally on rocky outcrops (see **Table 4-228**).

Major invasive noxious weeds include scotch thistle (*Onopordum acanthium*) , Canada thistle (*Cirsium arvense)*, hoary cress (*Cardaria draba*) , perennial pepperweed (*Lepidium latifolium*) and spotted knapweed (*Centaurea maculosa*). Livestock congregate within riparian areas due to poor water distribution. These areas are heavily impacted and generally in poor condition.

Table 4-228
Black Rock Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Aspen Forest	Mahogany Woodland	Invasives	Riparian	Salt Desert Scrub	Other	Grand Total
Acres	146,431	8,771	8,100	3,790	744	7,08814,900	16,835	191,759
Percent of Area	76	5	4	2	<1	4	9	100

Fire

A total of 12 wildfires have burned 19,391 acres in the Black Rock PPA since 1982. The Mahogany fire was the largest fire that impacted the PPA and burned 12,029 acres within the PPA boundary. Most burned areas demonstrated good recovery in part, due to ESR efforts, natural recovery and exclusion from domestic grazing. Approximately 42 percent and 57 percent of the PPA have a ‘high’ and ‘moderate’ burn probability, respectively. Historic fire regimes were generally Fire Regime IV, but some areas of Mountain big sagebrush may have burned at rates <100 years; the current rate for the entire PPA irrespective of vegetation type is >300 years. Most areas are considered condition class II with small areas of condition class I. condition class III areas occur within the boundaries of past wildfires (see **Table 4-229**).

Table 4-229
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	80,162
High and Very High Burn Probability in PPA (percent)	42.0

Management Strategies

Treatments

Past and present treatments in the area have primarily focused on ESR treatments and weed treatments, with the addition of several small fuel breaks near roadways. Major rehabilitation efforts followed the 1999 Denio and Pass Fires, 2001 Mahogany Fire, and 2006 New York Fires. The Mahogany and New York Fire received some seeding but recovered naturally due to elevation, though the Denio and pass fire were heavily reseeded.

Other Relevant Management Activities

Primary uses occurring in the area include grazing and some moderate scale mining. The mining activities are restricted to a small portion planning area at present, though grazing occurs across the entire planning area. Grazing may hinder some of the rehabilitation activities such as seeding or meadow restorations activities. Also included in the planning are the North Black Rock and Pahute Peak Wilderness areas, and the Lahontan Cutthroat Trout Instant Study area in the Black Rock Mountains, and the newly designated Pine Forest Wilderness Area in the Pine Forest Range, which preclude or limit some forms of active management

In addition, the Black Rock East and Black Rock West HMAs make up a majority of the southern portion of the assessment area. Rehabilitation activities, specifically seedings or riparian restoration will likely be hindered in areas overlapped by HMAs.

Fuels Management

The District identified several fuel breaks within the PPA that cover roughly 500 miles and have been selected as possible areas for full green stripping and seeding using all of the tools available, including chemical and mechanical treatments, and leaving the potential for native and nonnative seeding use open. Treatments will be identified on a case-by-case basis. Generally, roads are mowed first, then greenstripped, and maintained. Areas that have been greenstripped that now have cheatgrass (*Bromus tectorum)* growing will be chemically treated and maintained. The District will be careful to avoid killing low-sage areas when managing and creating these fuel breaks, and will spot treat for noxious weeds. Despite the lack of burning in the higher elevation areas, fuel breaks will be installed as a result of climate change and the expectancy of higher intensity storms, which may result in an increased fire regime (see **Table 4-230**).

Table 4-230
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	58.91	161.77	0	220.68

Black Rock does not have conifer expansion issues.

There is one nonnative annual grass treatments proposed within the Black Rocks PPA, situated in the Pearl Camp Canyon and Leonard Creek Area, though the remainder of this area has limited nonnative invasive grass exposure. Some additional areas on the perimeter may also be targeted. The area does have some problems with noxious weeds, such as scotch thistle, perennial pepperweed and short whitetop. The District will continue to inventory and spot treat the PPA for noxious weeds, especially where meadow conversion is occurring.

Habitat Restoration and Recovery

The District would treat the Black Rock PPA with protection greenstrips by applying herbicide and then reseeding with appropriate species in areas adjacent to important GRSG habitat. Treatment applications will occur at appropriate times of the year and will not interfere with lifecycles of local GRSG populations (see **Table 4-231**).

The District would also treat the Pine Forest which has some high elevation meadows that have been damaged partially due to Livestock management. The District will look into altering livestock management to better manage the meadows which serve as brood rearing habitat for greater GRSG.

The high elevation areas tend to be wet, have cool-dry and warm-dry soils, some aspen stands, mountain sagebrush and varying levels of understory. In an effort to enhance existing habitat hand planting, aerial and or drill seeding may be applied.

Table 4-231
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	143,614	0	0	143,614
Percent of PPA	74.89	0	0	74.89

Fire Operations

First priority areas for fire operations are low elevation areas (below 6,000ft) because these areas are less likely to recover naturally, as well as white bark pine (*Pinus albicaulis*) stands and occupied LCT streams. Second priority areas are high elevation areas (above 6,000ft). In extreme fire years, the Black Rock PPA may take precedence over other planning areas because large blocks of contiguous habitat occur in these places (see **Table 4-232**).

Table 4-232
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	117,952	107,913	34,886	260,751
Percent of PPA	61.5	56.3	18.2	136

The Denio Junction was identified as a prepositioning stage for areas below 6000 feet. High elevation areas would not be priority for prepositioning due to general lack of burning. The Black Rock area has some tactic and response constraints due to difficult terrain and lack of access to higher elevation areas. The probability of a burn in these areas is lower than in other areas of the District. The southern portion has very limited experience with wildfire.

Post-Fire Rehabilitation Management

First priority areas for ESR operations are low elevation areas (below 6,000ft) because these areas are less likely to recover naturally, and have some areas that have converted to cheatgrass Second priority areas are high elevation areas (above 6,000ft), focusing on areas where T&E species habitat is and the treatment of invasive annuals (see **Table 4-233**).

Table 4-233
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	109,008	82,752	0	191,760
Percent of PPA	56.8	43.2	0	100

Emergency Stabilization and Rehabilitation operations for this area will include an intense program for the first three years after fire. The program will include a full suite of treatments, such as pretreating with herbicide, aerial seeding, drill seeding where possible, and monitoring for appropriate vegetation communities. If the area is still on a downward trend after three years, then the District will reassess the priority of the area before moving towards restoration efforts. All PPAs with high lek concentrations and T&E species habitat will be the priority for ESR treatments, as well as protecting remaining islands from cheatgrass establishment and spread.

Grazing within a burned area will be assessed on a case-by-case basis for one to five years after the fire. Monitoring results will determine management decisions.

Proposed Management

See **Table 4-234** for projects that have been identified presently within the NEPA planning process. See **Figures 4-132** through **4-136** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-234
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 (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]
Black Rock Priority	59.6 miles	X						X			X	X		X		5-7	5+
Black Rock Secondary	166 miles		X					X			X	X		X		5-7	5+
Invasive Weeds Treatments	2,000 acres	X				X					X	X		X		5-7 or 0	5+
Sage-grouse Conifer Treatments	1,000		X		X						X	X		X		50+	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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

4.2.29 Lone Willow

Project Planning Area Description

General Site Description

The Lone Willow PPA is located in the northeastern portion of the Winnemucca District along the Idaho-Nevada state line and lies entirely within Humboldt County. The PA is 277,485 acres in size of which 262,661 acres (95 percent) are public and 14,824 acres (five percent) are private. Major mountain ranges include the Bilk Creek, Trout Creek and Montana Mountain ranges which are typically oriented north to south. Kings River Valley separates the major mountain ranges. Elevation ranges from 4,167 ft. in the valley bottoms to 8,494 ft. on the highest ridges of the Bilk Creek Mountains.

Most perennial streams feed either Quinn River or Kings River; a few streams flow north or east of the PPA. Hundreds of springs and seeps occur; some form larger meadow complexes. Approximately half of the stream reaches assessed in the PPA are meeting PFC.

All 3C habitat (33 percent of total) is located in the Montana Mountains; this is likely an erroneous categorization as much of the top of the mountain has very little to absent nonnative invasive grass cover, and has been highly resilient to past disturbances. Approximately half of the 3C habitat has good sagebrush cover; the other half was impacted by the 2012 Holloway and Long Canyon Fires (should be in A category). The 3B habitat (18 percent) occurs at the base of the Montana and Bilk Creek Mountains as well as one large patch at the upper end of Kings River Valley. All 3A and 1A habitats (40 percent and eight percent, respectively) are located in the Trout Creek and Bilk Creek Mountains at higher elevations. The 3A classification comes from sagebrush cover loss due to recent wildfires (see **Table 4-235**).

Table 4-235
Lone Willow Sage-Grouse Habitat Matrix Categories

Matrix Category	No Data	1A	1B	1C	2A	2B	2C	3A	3B	3C	Grand Total
Acres	1,910	17,115	0	0	46,100	15,486	39,749	71,274	35,068	50,783	277,485
Percent of PPA	1	6	0	0	17	6	14	26	13	18	100

Sage-grouse

There are 50 active GRSG (*Centrocercus urophasianus*) leks; 31 of those leks are on the Montana Mountains, seven leks in the Trout Creek Mountains and 12 leks in the Bilk Creek Mountains. By habitat types, 27 leks are located within 3C habitat; 16 leks are located within 3B habitat, and seven leks on 3A habitat. Lek surveys have been conducted annually over the past five years by NDOW. Annual variability in count numbers has been high with no apparent trend in population. Lek counts in 2014 were below the five-year average. Summer and winter habitat overlap considerably because of inconsistent snowfall and persistence. Habitat has been greatly impacted by wildfire over the past 25 years. The greatest threat to GRSG habitat is loss of habitat due to wildfire and habitat degradation due to heavy livestock grazing.

Vegetation

Lower elevations consist of salt desert shrub and Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*). When fires occur, these areas generally convert to dominance by invasive annuals. For fires above 5,500 ft. elevation, Wyoming sagebrush recovers back to native perennials. Other native plant communities appear resilient over time to wildfire. There are large areas of low sagebrush (*Artemisia arbuscula*) throughout the PPA that are defined and restricted by soils. Higher elevations have both mountain big sagebrush (*Artemisia tridentata ssp. vaseyana*) and mixed mountain shrub. Aspen (*Populus tremuloides*) stands are restricted to riparian areas, drainages, seeps and other mesic sites. Curl-leaf mountain mahogany (*Cercocarpus ledifolius*) occurs in small stands generally on rocky outcrops. Major invasive weeds include scotch thistle (*Onopordum acanthium*), Canada thistle (*Cirsium arvense*) , hoary cress (*Cardaria* *draba*), perennial pepperweed (*Lepidium latifolium*) and spotted knapweed (*Centaurea maculosa*). Livestock congregate within riparian areas due to poor water distribution. These areas are heavily impacted and generally in poor condition (see **Table 4-236**).

Table 4-236
Lone Willow Vegetation Categories

Vegetation Category	Big Sagebrush Shrubland	Aspen Forest	Mahogany Woodland	Invasives	Riparian	Salt Desert Scrub	Other	Grand Total
Acres	194,426	16,098	12,896	5,295	1,812	14,900	39,819	285,248
Percent of Area	68	5	5	2	1	5	14	100

Fire

A total of 45 wildfires have burned in the Lone Willow PPA since 1985 for 194,210 total acres. The Holloway fire was a particularly large fire which impacted 154,972 acres in the Lone Willow PPA. Several areas have burned two or even three times over the past 25 years; these areas have poor shrub recovery. Approximately eight percent and 90 percent of the PA have a 'very high' and 'high' burn probability, respectively. Historic fire regimes were generally Fire Regime IV, but some areas of Mountain big sagebrush may have burned at rates <100 years; the current rate for the entire PA irrespective of vegetation type is less <37 years. Most areas are considered condition class II with small areas of condition class I. Condition class III areas are not captured in Landfire data (see **Table 4-237**).

Table 4-237
Summary of Burn Probability

High and Very High Burn Probability in PPA (acres)	271,308
High and Very High Burn Probability in PPA (percent)	97.9

Management Strategies

Treatments

Past and present treatments occurring in the PPA include hazardous fuels, weed treatments, ESR and burned area rehabilitation treatments. A significant portion, approximately 250,000 acres of the planning area was affected by wildfire in the 2012 Holloway and Long Canyon Fires. Past and present treatment related to fire rehabilitation include approximately 80,000 acres of broadcast seeding, hand-planting of 45,000 sagebrush and bitterbrush seedlings, with an additional 50,000 planned for installation in spring of 2015, and numerous riparian and meadow restoration projects.

Cheatgrass treatment projects are also currently underway along the margin of intact habitat, or in areas of persistent cheatgrass die-off areas. Approximately 2500 acres of cheatgrass has been chemically treated and recently reseeded to buffer intact habitat from the invasive annual grassland and in cheatgrass die-offs. This is in addition to other spot treatments of noxious and invasive weeds within the planning area.

Numerous green strips and fuel breaks have been installed over the last several years throughout the planning area. Approximately 70 miles of fuel breaks have been installed with a combination of mechanical, chemical and seeding treatments.

Other Relevant Management Activities
Primary uses occurring in the area include grazing and some moderate scale mining. The mining activities are restricted to a small portion of the planning area at present, though grazing occurs across the entire planning area. Grazing may hinder some of the rehabilitation activities such as seeding or meadow restorations activities. Also included in the planning area is the Disaster Peak Wilderness Study Area which precludes or limits some forms of active management.

Fuels Management
Currently, there are four road fuel breaks within the Lone Willow PPA totaling 70 miles in length. These fuel breaks were treated mechanically by mowing; portions were sprayed with herbicide where necessary. Several other fuel breaks have been implemented outside of the PA to limit fire spread within (see **Table 4-238**).

Table 4-238
Fuels Management Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Miles	88.69	137.49	0	226.18

The District identified six additional fuel breaks within the PPA that extend roughly 100 miles and have been selected for full green stripping and seeding using all of the tools available- chemical and mechanical treatments, and leaving the potential for native and nonnative seeding use open. Treatments would be identified on a case-by-case basis, but generally, the roads would need to be mowed first, then greenstripped, and maintained. Areas that have been greenstripped that now have cheatgrass (*Bromus tectorum*) growing will be chemically treated and maintained. The District will be careful to avoid killing low-sage areas when managing and creating these fuel breaks.

Lone Willow has no conifer expansion issues.

Annual grass treatments are proposed along the southern edge of the PPA and extending out of the PPA Perimeter. Roadsides, drainages, and livestock improvements need to be inventoried for nonnative invasive species as ground disturbance areas are the primary locations for these species to gain entry into the Lone Willow PMU. Inventoried areas will be treated as applicable.

Currently the district is spot treating for nonnative invasive species, primarily cheatgrass and limited patches of medusahead rye (*Taeniatherum caput-medusae*).

Habitat Restoration and Recovery

The District has been hand planting in the Holloway fire area in large blocks where sagebrush is absent (see **Table 4-239**).

Table 4-239
Habitat Restoration Potential Treatments

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	3,341	44,078	0	47,419
Percent of PPA	1.20	15.88	0	17.09

In 2014, 45,000 seedlings were planted with an additional 50,000 planned for 2015. There are also several ongoing restoration projects off of Highway 293, and some hand-plantings south of the Priority Area.

The District has plans to work on roughly five miles of riparian areas located in the Bilk Creek and Trout Creek mountains in 2015, including House Creek, Cold Springs Creek, and parts of King's River.

The District has two ongoing and one planned meadow restoration projects located in the Montana's which are crucial brood rearing habitat for GRSG.

Fire Operations

First priority areas for fire operations are the intact sagebrush habitat with good understory located in the Montana Mountains which are in the south-central and eastern portion of the PPA (see **Table 4-240**).

First priority areas are located at or above 6,500ft to 7,500ft in elevation and have cool-dry soils.

Remaining intact sagebrush islands are the second highest priority to protect after intact habitat as the District wants to work to extend the burn interval in these areas to 5-10 years, and reduce the rapid fire interval which will lead to invasive annual establishment.

Table 4-240
Fire Operations Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	122,405	155,833	128,084	406,321
Percent of PPA	44.1	56.2	46.2	146.4

Post-Fire Rehabilitation Management

There are several current ESR treatments (VTRT geospatial layer), mostly aerial seeding and a 500 acre area targeted for herbicide application. The district is seeing a positive response to the ESR treatments. The aerial treatments occurred in the Holloway Fire of 2012, and treatments began in 2013. These treatments did not need herbicide applications due to lack of the presence of nonnative invasive grasses in those areas. These treatments will continue for one to five years with the goal of reestablishing healthy, functioning native vegetation communities that will support GRSG populations (see **Table 4-241**).

Table 4-241
Post-Fire Rehabilitation Management Strategies

Priority	Priority 1	Priority 2	Priority 3	Total
Acres	80,115	48,348	149,022	277,485
Percent of PPA	28.9	17.4	53.7	100

Additionally, there are some remaining sagebrush islands that the District wants to protect. The islands are intact habitat but have invasive annuals butting up against them, which are being treated with herbicide application and seeding.

If the Montana Mountains were to burn again the District would continue ESR treatments appropriate to pre-burn conditions and the history of this landscape to recover. The Rapid Ecological Assessment data for this area projects the Montana Mountains as being GRSG habit through 2025, making this area a stronghold for Winnemucca. Treatments will include:

Where crucial sagebrush species have been impacted, seed or seedlings are planted to reestablish GRSG habitat. If there is cheatgrass present the area will be pre-treated with herbicides, and then seeded in areas that are unlikely to recover naturally. Sagebrush will be hand-planted (bare root plant) in blocks, or seeded, aerially or drilled if applicable.

ESR treatments on the Montana Mountains are part of an overall strategy of recovery and restoration, due to their importance as GRSG habitat.

Other areas would get the ESR treatments appropriate to their priority as GRSG habitat and ability to recover according to FIAT parameters.

Proposed Management

See **Table 4-242** for projects that have been identified presently within the NEPA planning process. See **Figures 4-137** through **4-141** for a graphic depiction of the proposed treatments and strategies in the PPA.

Table 4-242
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 (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]
Kings River Fuelbreaks	790	1								C			I	L1		5-7	0-2
South End Fuelbreak	360	1								C			I	L1		5-7	0-2
Montana Fuelbreak	264	1								C			I	L1		5-7	0-2
Montana Road Fuelbreak	80 miles		2							C			I	L1		5-7	0-2
Habitat Protection Strips	203	1						W		C			I	L1		5-7	0-2
Bilk Creek Fuelbreaks	96 miles		2						I			P		L1		5-7	3-5
Meadow Restoration	230			3		I	R			C			I	L1		0 or 10	0-2
Sagebrush Restoration Projects HL	2500	1				I		W		C		P	I	L1		0	3-5
BRTE Die-off Restoration Blocks	4020		2			I		W		C		P	I	L2*		0 or 10	3-5
Lone Willow Riparian Restoration Projects	25 miles			3		I	R		I	C		P	I	L1		0 or 10	3-5

[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 time frame, considering NEPA adequacy, relative priority, and local ranking factors

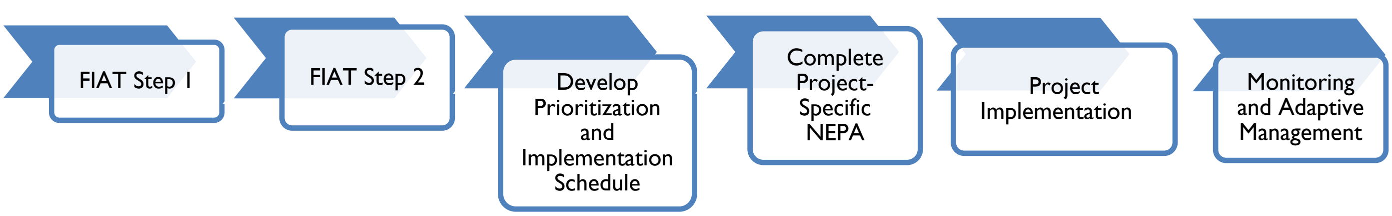
SECTION 5
LOOKING AHEAD: IMPLEMENTATION, NEPA, AND MONITORING

5.1 IMPLEMENTATION STRATEGY

Management strategies identified in this assessment are consistent with and fall within broader land use plan direction. FIAT assessments are referenced in the appendices of each sub-regional environmental impact statement. As such, the potential implementation of all FIAT management strategies and treatments are fully subject to all direction and constraints pronounced in the overarching land use plan.

The planning, implementation, and monitoring cycle for FIAT strategies is a multiyear and multistep process. **Figure 5-1** illustrates the sequence of FIAT steps, project implementation, and monitoring. In 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; in these cases, planning has not begun.

Figure 5-1: FIAT Process



Prioritizing the sequence of project/treatment implementation is an important process; NEPA compliance, budgeting, unit capacity, and other factors may be considered. Furthermore, this prioritization is a necessary step in order to produce an out-year program of work. The FIAT Technical Team concluded that this program of work would be developed immediately following the completion of FIAT Step 2 assessments. The time necessary for implementation, the scale of treatment, and the type of treatment by management strategy will be considered. The program of work will portray the years for implementation, scale of treatment, and type of treatment by program area (see **Table 5-1**).

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	998,190	1,048,979	29,195	**2,076,361**	NA	NA	NA	NA
Fuels Treatments	NA	NA	NA	NA	1295.91	1879.13	123.67	**3,298.71**
Fire Operations	3,369,742	1,758,164	477,100	**5,605,006**	NA	NA	NA	NA
Post-Fire Treatments (ESR)	3,225,663	1,283,307	604,883	**5,113,853**	NA	NA	NA	NA

5.1.1 Fuels Management

Fuels management is a proactive strategy designed to reduce wildfire behavior by changing the size, structure, arrangement, and amount of live and dead vegetation.

The focus of the FIAT process was very specific to the identified habitats and the associated buffers of these areas (see **Table 5-2**). In the vegetation types being addressed, fire growth can cross large tracts of ground in very short time frames. Due to the focus on the habitats and buffers, many types of treatments, existing or planned, were not addressed in this process. The areas outside of the planning areas will need to be addressed in the future because they are often the only option available to minimize fires entering the planning areas and the identified leks.

Future efforts should also include fuels and restoration types of treatments outside of the areas identified. This is because these areas will be critical for increasing habitat and connecting the identified areas.

The emphasis for fuels management to reduce wildfire behavior and size is to use existing linear structures to compartmentalize areas burned and to not fragment additional habitat by establishing new lines.

Table 5-2
Fuels Management in Project Planning Areas in the Western Great Basin/Warm Springs Valley Landscape

PPA	Total Miles of High (1st Priority) Fuels Management	Total Miles of Moderate (2nd Priority) Fuels Management	Total Miles of Low (3rd Priority) Fuels Management
Beaty Butte	48.70	92.27	0
Black Rock	58.91	161.77	0
Bull Creek	3.52	19.76	0
Clover Flat	29.37	0	0
Cold Springs	65.97	16.18	0
Duck Flat	15.25	42.27	0
Frenchglen	127.19	40.03	0
Gravelly	14.60	9.65	0
Hart Mountain	26.32	82.18	0
High Rock	28.95	102.88	0
Horse Lake	20.97	33.00	0
Lone Willow	88.69	137.49	0
Madeline Plains	0	6.66	8.63
Madeline Plains Connectivity	7.59	17.45	16.64
Massacre	23.87	44.18	0
North Warner	0	167.22	0
Orejana East	139.81	52.77	84.47
Orejana West	0	258.76	0
Pueblo	109.14	44.81	0
Roaring Springs	45.93	0	0
Shaffer Mountain Connectivity	9.13	7.41	0
Sheldon	104.38	81.06	0
Shinn	62.69	65.62	13.93
South Warner	0	149.59	0
Trout Creek East	46.67	115.87	0
Trout Creek West	78.20	42.25	0
Virginia Ranges	25.19	0	0
Vya	52.98	58.63	0
Wall Canyon	61.89	29.37	0
Total for all WGB PPAs	**1295.91**	**1879.13**	**123.67**

5.1.2 Habitat Restoration/Recovery

All natural systems vary in space and time; in many cases, restoring a range of target vegetative conditions may be desirable. Where historic processes are not likely to become reestablished, full restoration may not be possible; however, site resilience can be leveraged to increase ecological function over time. This assumes that proper post-disturbance management does not continue to bring a site back to a ruderal successional state.

By further defining the restoration continuum, treatments can in turn be further defined and prioritized at finer local scales.

The following are considerations for habitat restoration and recovery project planning, project implementation, and NEPA (also see **Table 5-3**).

Table 5-3
Habitat Restoration and Recovery Potential Treatment Areas in the Western Great Basin/ Warm Springs Valley Landscape

PPA	Total Acres of Potential Conifer Encroachment Potential Treatments	Percent-age of PPA	Total Acres of Invasive Annual Grasses Potential Treatments	Percent-age of PPA	Total Acres of Other Potential Habitat Restoration and Recovery Potential Treatments	Percent-age of PPA
Beaty Butte	72,652	18	401,507	100	14,932	4
Black Rock	0	0	71,807	37	71,807	37
Bull Creek	21,265	32	32,235	49	0	0
Clover Flat	17,941	57	31,531	100	0	0
Cold Springs	49,754	69	0	0	5,485	8
Duck Flat	75,376	58	0	0	0	0
Frenchglen	212,624	115	0	0	0	0
Gravelly	27,260	84	33,205	103	0	0
Hart Mountain	22,599	9	0	0	11,228	5
High Rock	0	0	0	0	3,599	2
Horse Lake	45,711	49	26,430	28	0	0
Lone Willow	0	0	44,078	16	3,341	1
Madeline Plains	19,205	26	0	0	0	0
Madeline Plains Connectivity	42,380	30	0	0	0	0
Massacre	40,600	35	0	0	3,847	3
North Warner	195,437	67	293,398	100	0	0
Orejana East	0	0	150,221	50	158,715	53
Orejana West	0	0	124,800	100	124,800	100
Pueblo	0	0	0	0	22,412	17
Roaring Springs	0	0	13,892	18	8,527	11
Shaffer Mountain Connectivity	0	0	15,578	81	0	0
Sheldon	3,647	1	0	0	0	0
Shinn	36,777	9	54,120	13	59,531	14
South Warner	37,523	100	37,520	100	0	0
Trout Creek East	0	0	0	0	71,060	21
Trout Creek West	0	0	0	0	35,900	43
Virginia Ranges	8,343	8	0	0	0	0
Vya	24,287	10	0	0	3,536	2
Wall Canyon	0	0	54,993	21	5,239	2
Total for all WGB PPAs	**953,381**	**19**	**1,385,315**	**27**	**603,959**	**12**

Habitat Restoration is a proactive strategy that includes the following types of treatments:

- Reducing phase 1 and phase 2 conifer vegetation, generally through hand mechanical treatment
- Managing invasive annual grasses, generally through the use of herbicides

- Seeding and planting of sagebrush
- Other types of treatments (such as fire use) with the primary goal of restoring or enhancing native plant species and vegetative structure in the native sagebrush steppe ecosystem; this may include removing undesirable plant species.

5.1.3 Fire Operations

Fire operations are preparedness, prevention, and suppression and are both proactive and reactive responses to wildfires. Proactive management under the resistance/resilience model includes activities that increase the probability of fire containment and severity in critical areas before fires start. Reactive management prioritizes and identifies fire suppression that has a high probability of keeping disturbed acres to a minimum by using the proactive planning and infrastructure after fires start (see **Table 5-4**).

Table 5-4
Fire Operations Potential Treatment Areas in Project Planning Areas in the Western Great Basin/ Warm Springs Valley Landscape
(Fire Operations percentages exceed 100 due to operations planned outside of PPAs for optimal protection)

PPA	Total Acres of High (1st Priority) Fire Suppression Areas	Percent of 1st Priority in Each PPA	Total Acres of Moderate (2nd Priority) Fire Suppression Areas	Percent of 2nd Priority in Each PPA	Total Acres of 3rd Priority Fire Suppression Areas	Percent of 3rd Priority in Each PPA	Total Acres of Fire Suppression Areas	Total Percent of Fire Suppression Areas in Each PPA
Beaty Butte	346,878	86.3	55,236	13.7	0	0	402,115	100
Black Rock	117,952	61.5	107,913	56.3	34,886	18.2	260,751	136
Bull Creek	75,937	114.6	6,099	9.2	12,486	18.8	94,521	142.7
Clover Flat	31,524	100	0	0	0	0	31,524	100
Cold Springs	24,990	34.7	46,983	65.3	0	0	71,973	100
Duck Flat	37,982	29.4	58,682	45.5	32,429	25.1	129,093	100
Frenchglen	189,155	101.9	0	0	0	0	189,155	101.9
Gravelly	39,730	123.0	2,795	8.7	0	0	42,525	131.7
Hart Mountain	176,397	73.0	65,281	27.0	0	0	241,678	100
High Rock	119,913	50.4	91,308	38.4	26,691	11.2	237,912	100
Horse Lake	26,428	28.3	66,923	71.7	0	0	93,351	100
Lone Willow	122,405	44.1	155,833	56.2	128,084	46.2	406,321	146.4
Madeline Plains	19,094	26.2	13,939	19.1	39,959	54.7	72,992	100
Madeline Plains Connectivity	0	0	104,578	74.4	89,522	63.7	194,100	138.1
Massacre	12,071	10.4	53,180	45.8	50,983	43.9	116,234	100
North Warner	44,057	15.0	249,344	85.0	0	0	293,401	100
Orejana East	314,350	104.9	44,266	14.8	0	0	358,616	119.7
Orejana West	124,781	100	0	0	0	0	124,781	100
Pueblo	100,631	75.0	55,576	41.4	0	0	156,207	116.4

Table 5-4
Fire Operations Potential Treatment Areas in Project Planning Areas in the Western Great Basin/ Warm Springs Valley Landscape
(Fire Operations percentages exceed 100 due to operations planned outside of PPAs for optimal protection)

PPA	Total Acres of High (1st Priority) Fire Suppression Areas	Percent of 1st Priority in Each PPA	Total Acres of Moderate (2nd Priority) Fire Suppression Areas	Percent of 2nd Priority in Each PPA	Total Acres of 3rd Priority Fire Suppression Areas	Percent of 3rd Priority in Each PPA	Total Acres of Fire Suppression Areas	Total Percent of Fire Suppression Areas in Each PPA
Roaring Springs	40,240	53.1	35,570	46.9	0	0	75,809	100
Shaffer Mountain Connectivity	11,362	59.1	7,853	40.9	0	0	19,215	100
Sheldon	422,651	100	0	0	0	0	422,651	100
Shinn	304,351	73.7	108,341	26.3	0	0	412,692	100
South Warner	37,522	100	0	0	0	0	37,522	100
Trout Creek East	216,062	64.5	119,419	35.5	0	0	335,481	100
Trout Creek West	48,319	57.9	55,682	66.7	0	0	104,001	124.7
Virginia Ranges	49,706	50.4	87,595	88.8	8,312	8.4	145,613	147.6
Vya	164,396	70.0	29,982	12.8	40,526	17.3	234,904	100
Wall Canyon	150,858	58.9	135,786	53.1	13,222	5.2	299,866	117.2
Total for all WGB PPAs	**3,369,742**	**65.8**	**1,758,164**	**34.3**	**477,100**	**9.3**	**5,605,006**	**109.5**

5.1.4 Post-Fire Rehabilitation

Post-fire rehabilitation (see **Table 5-5**) is based on the BLM's ESR program and the Forest Service's Burned Area Emergency Response Program. Resistance/resilience modeling underlies post-fire activities by prioritizing treatments, based on probability of success at present and through time. Specific geographic GRSG population trends after fire also indicate where rehabilitation projects should be developed and whether projects continue into recovery and restoration. Program policies limit available funding from one to three years.

Table 5-5
Post-Fire Rehabilitation Potential Treatment Areas In Project Planning Areas in the Western Great Basin/ Warm Springs Valley Landscape

PPA	Total Acres of High (1st Priority) Post-Fire Rehab Areas	Percent of 1st Priority in Each PPA	Total Acres of Moderate (2nd Priority) Post-Fire Rehab Areas	Percent of 2nd Priority in Each PPA	Total acres of 3rd Priority Post-Fire Rehab Areas	Total Percent of 3rd Priority Post-Fire Rehab Areas
Beaty Butte	376,769	93.7	15,003	2.6	10,358	3.7
Black Rock	109,008	56.8	82,752	43.2	0	0
Bull Creek	20,998	31.7	6,717	10.1	38,540	58.2

Table 5-5
Post-Fire Rehabilitation Potential Treatment Areas In Project Planning Areas in the Western Great Basin/ Warm Springs Valley Landscape

PPA	Total Acres of High (1st Priority) Post-Fire Rehab Areas	Percent of 1st Priority in Each PPA	Total Acres of Moderate (2nd Priority) Post-Fire Rehab Areas	Percent of 2nd Priority in Each PPA	Total acres of 3rd Priority Post-Fire Rehab Areas	Total Percent of 3rd Priority Post-Fire Rehab Areas
Clover Flat	31,529	100	0	0	0	0
Cold Springs	24,990	34.7	0	0	46,983	65.3
Duck Flat	37,980	29.4	58,682	45.5	32,429	25.1
Frenchglen	146,051	78.7	39,515	21.3	0	0
Gravelly	16,123	49.9	13,408	41.5	2,766	8.6
Hart Mountain	176,397	73.0	65,266	27.0	0	0
High Rock	90,762	38.1	121,915	51.2	25,234	10.6
Horse Lake	26,428	28.3	66,923	71.7	0	0
Lone Willow	80,115	28.9	48,348	17.4	149,022	53.7
Madeline Plains	27,301	37.4	0	0	45,691	62.6
Madeline Plains Connectivity	46,437	33.0	0	0	94,155	67.0
Massacre	12,071	10.4	53,181	45.8	50,977	43.9
North Warner	232,690	79.3	60,715	20.7	0	0
Orejana East	149,459	49.9	150,211	50.1	0	0
Orejana West	124,781	100	0	0	0	0
Pueblo	84,610	63	49,650	37	0	0
Roaring Springs	75,810	100	0	0	0	0
Shaffer Mountain Connectivity	11,358	59.1	7,857	40.9	0	0
Sheldon	422,651	100	0	0	0	0
Shinn	310,278	75.2	102,413	24.8	0	0
South Warner	29,143	77.7	8,377	22.3	0	0
Trout Creek East	216,650	64.5	119,416	35.5	0	0
Trout Creek West	31,717	38.0	51,696	62.0	0	0
*Virginia Ranges (Total is -6,000 acres for dry lake)	23,532	23.8	61,842	62.7	7,335	7.4
Vya	151,551	64.5	30,188	12.9	53,144	22.6
Wall Canyon	138,474	54.1	69,232	27.0	48,249	18.9
Total for all WGB PPAs	**3,225,663**	**63.1**	**1,283,307**	**25.1**	**604,883**	**11.8**

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, as with all projects designed to enhance or restore GRSG habitats, monitoring and evaluating the individual FIAT actions will use the approved fine- and site-scale monitoring methods of the BLM Core Terrestrial Indicators and Methods (from 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).

During the annual broad-scale 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 inform future actions if necessary to enhance and restore GRSG habitats.

SECTION 6
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SECTION 7
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Appendix A

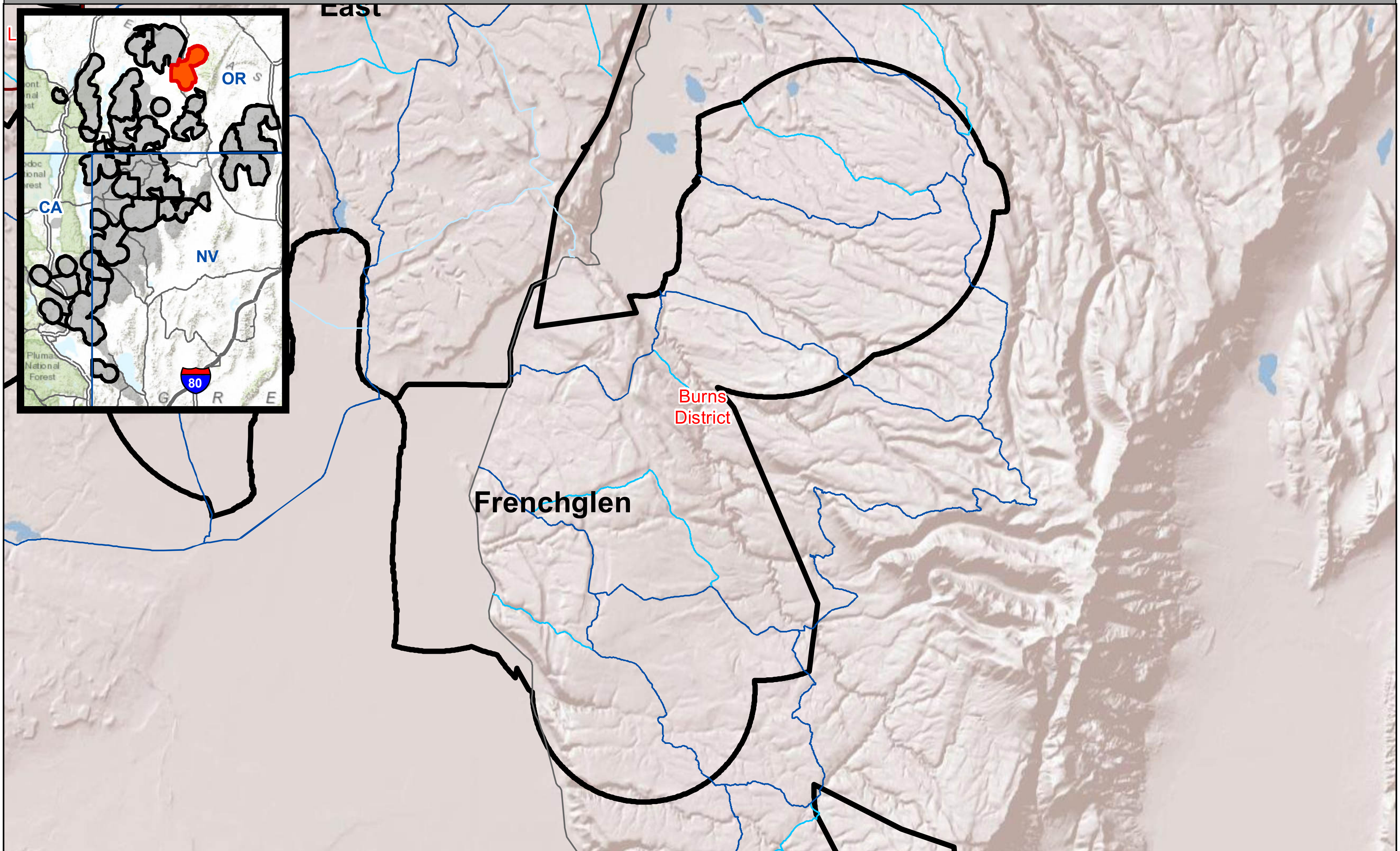
Maps

When viewed electronically, hyperlinks embedded throughout this document allow readers to navigate directly to the maps below.

Frenchglen Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

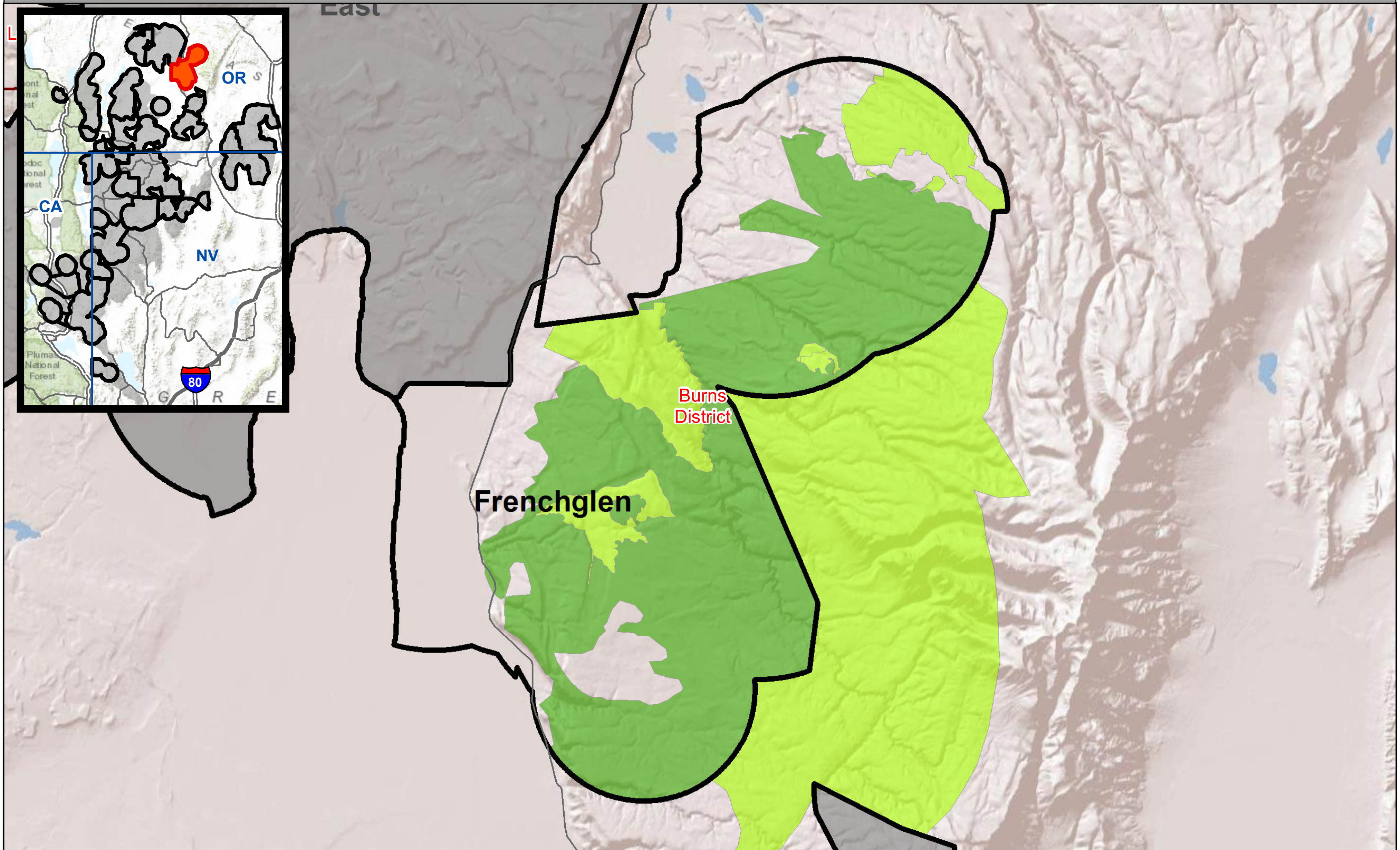
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:407,000

Frenchglen Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Potential Conifer Treatment Areas

- First
- Second
- Third

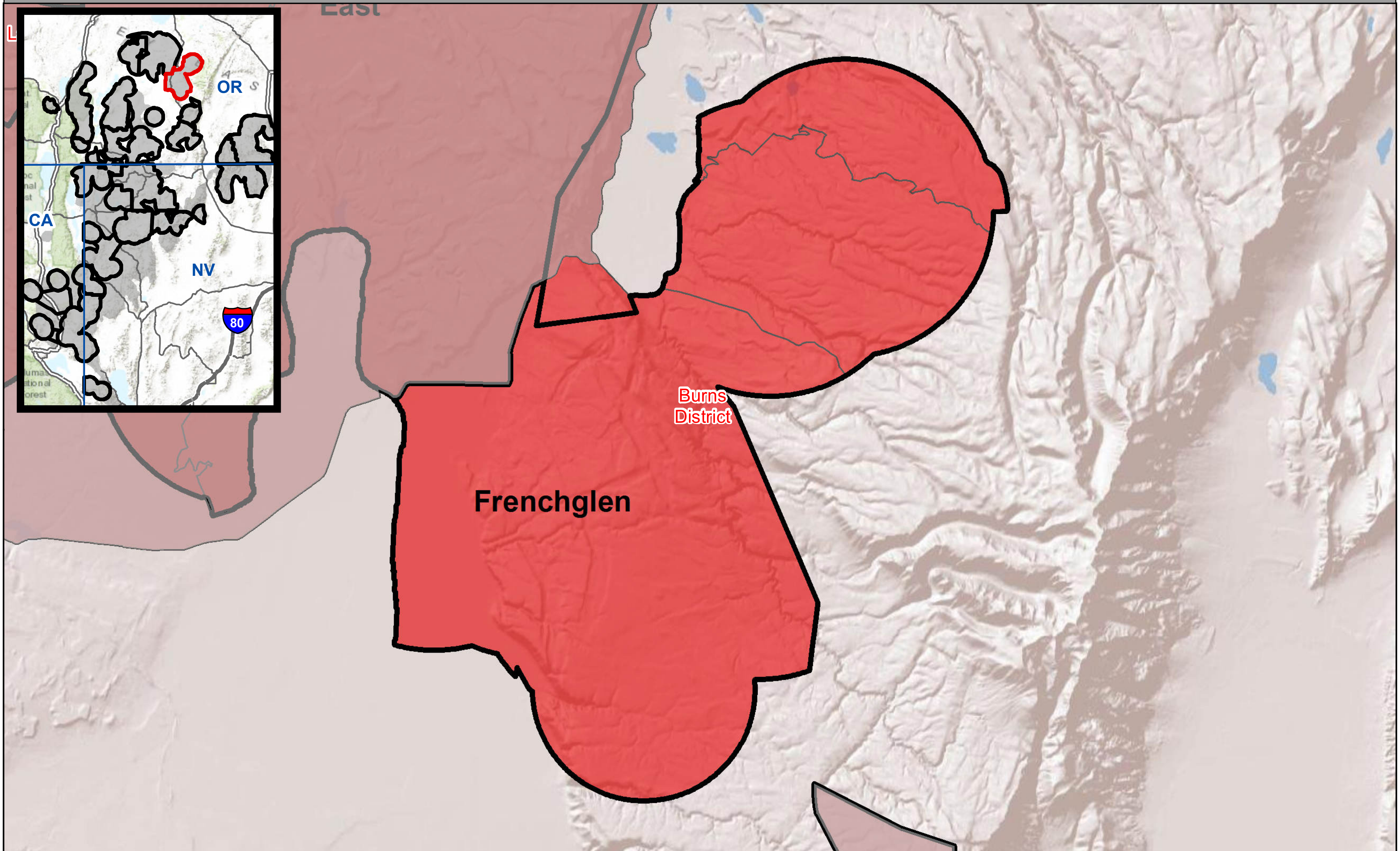
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:407,000

Frenchglen Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority

- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

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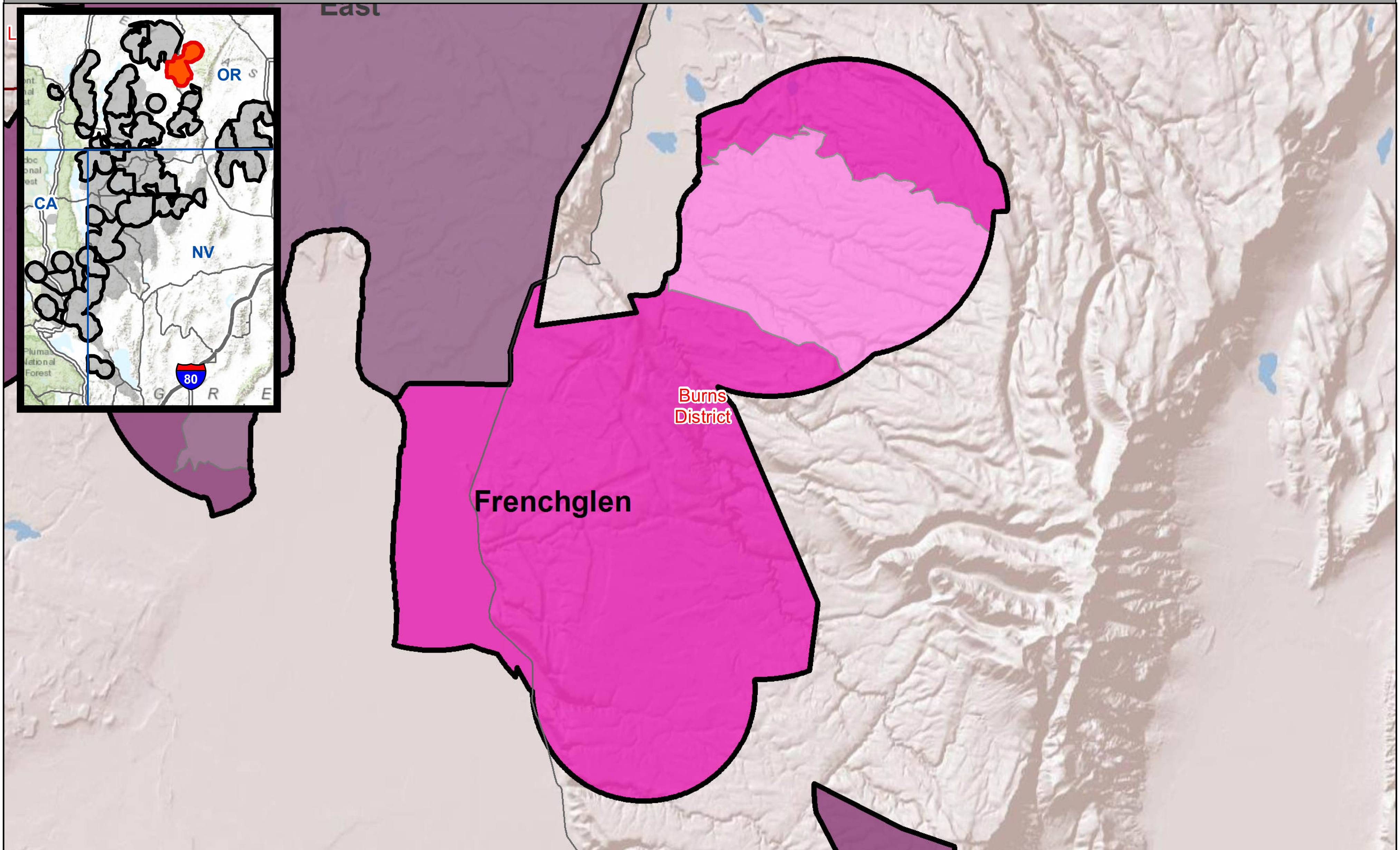
Frenchglen Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority

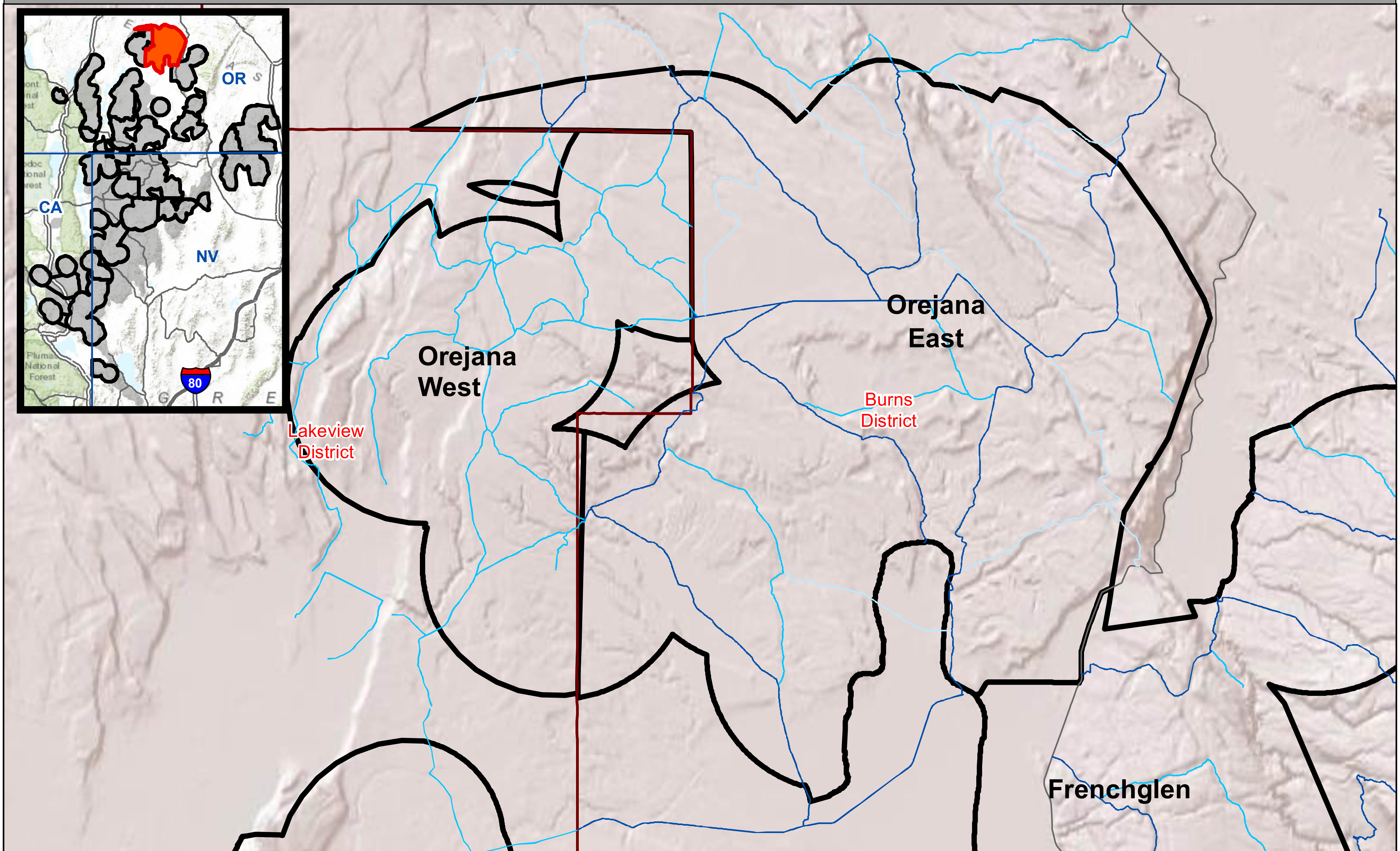
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:407,000

Orejana East Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority for Implementation
- First
- Second
- Third

- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
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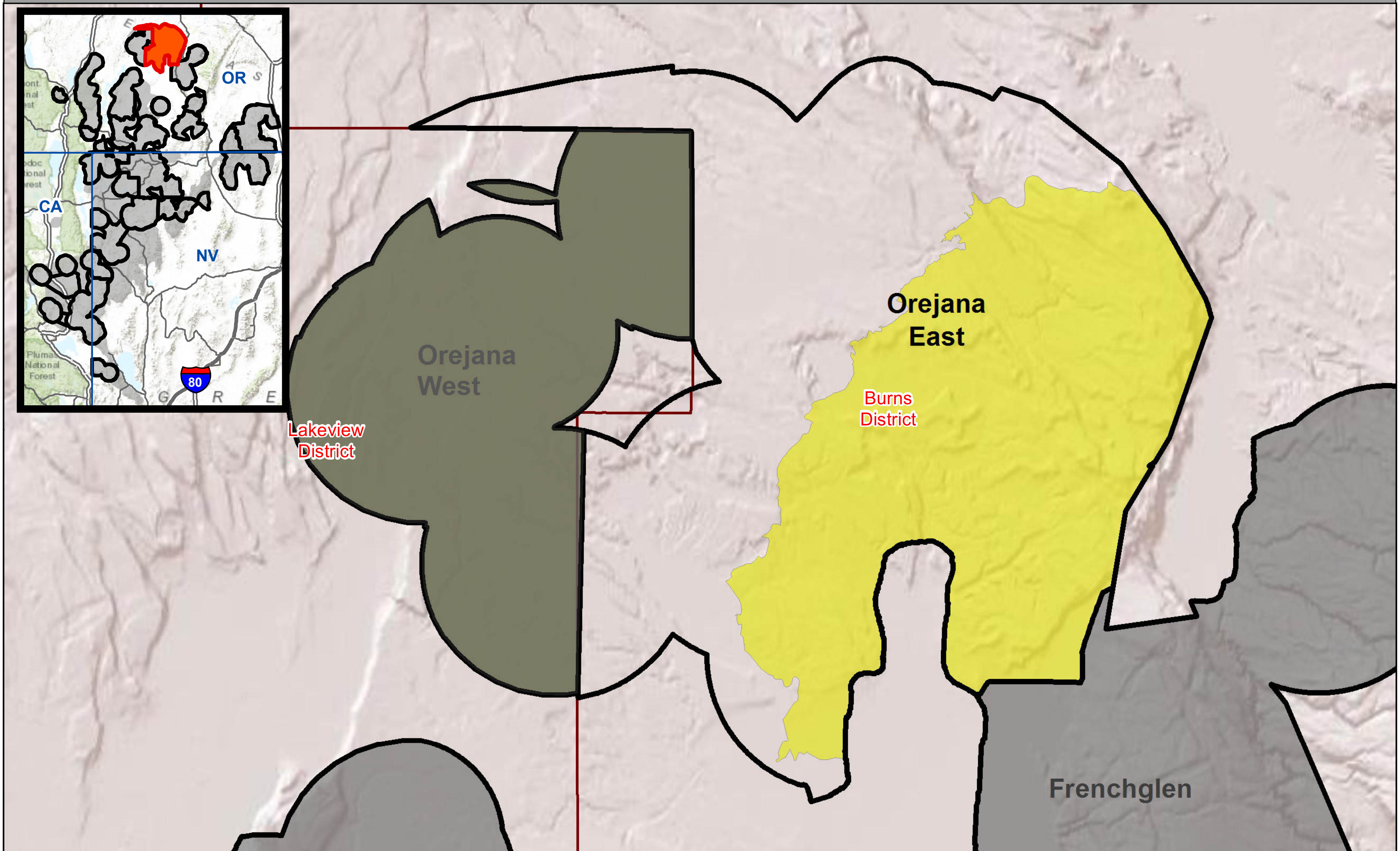
Orejana East Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

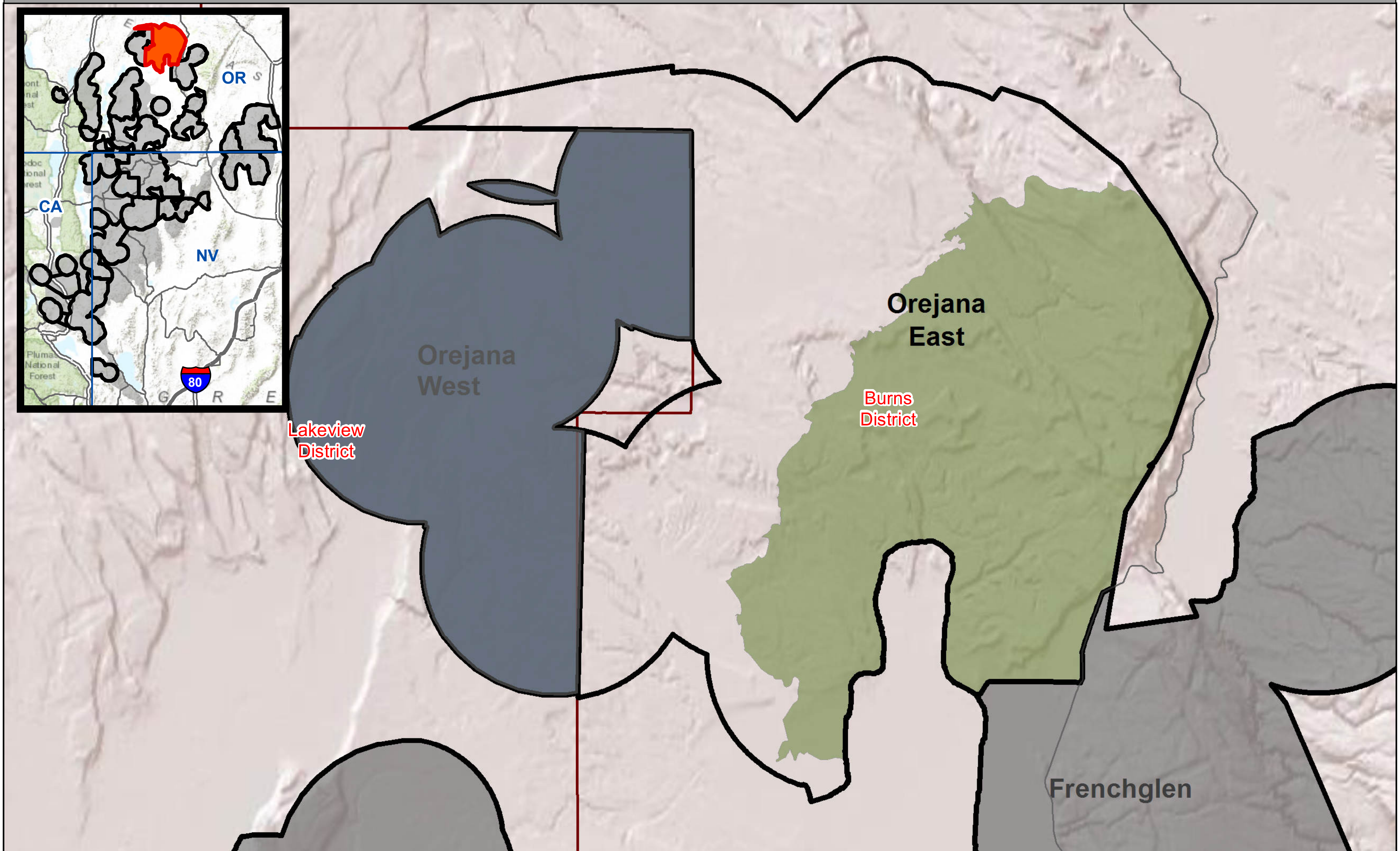
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:447,000

Orejana East Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

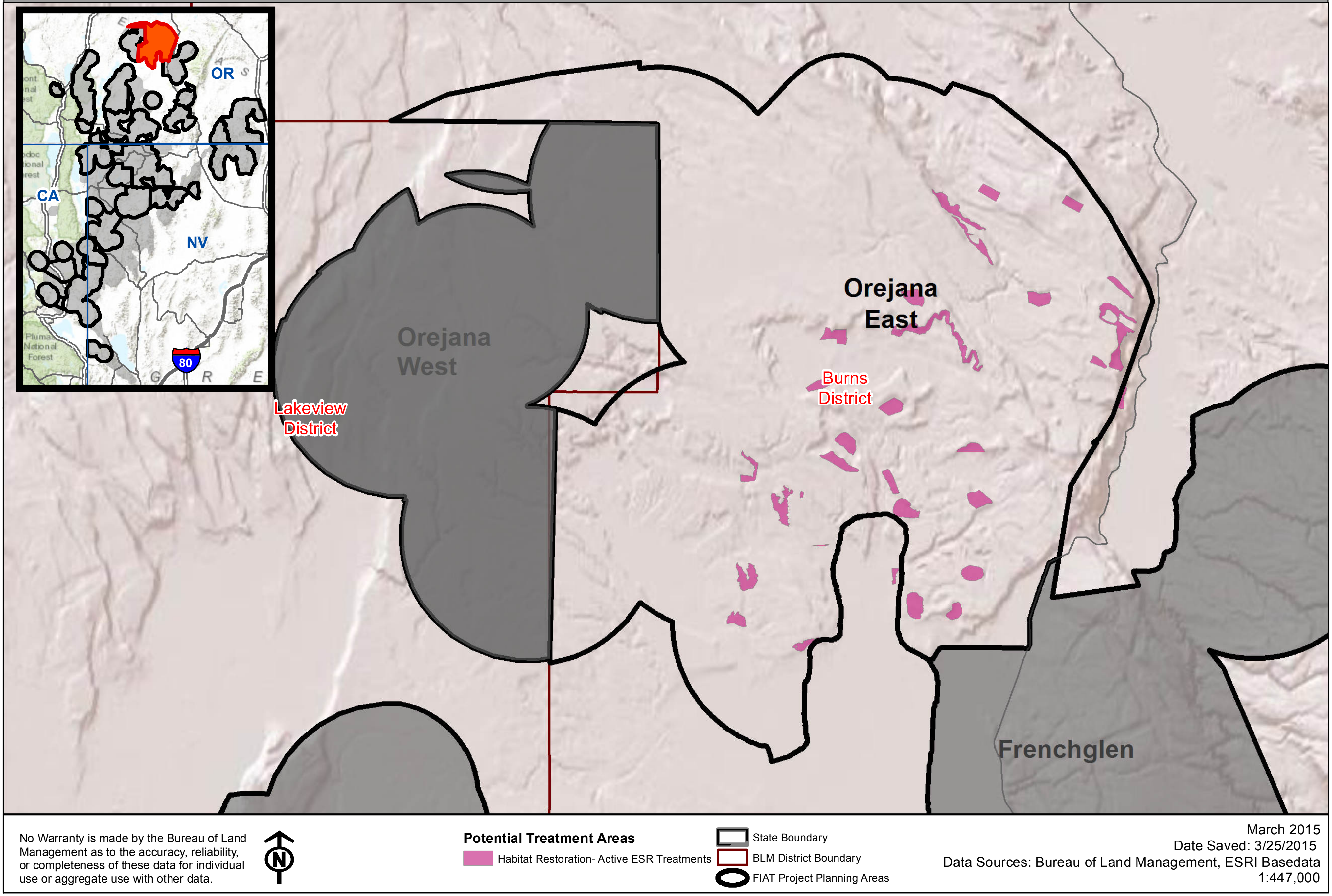
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:447,000

Orejana East Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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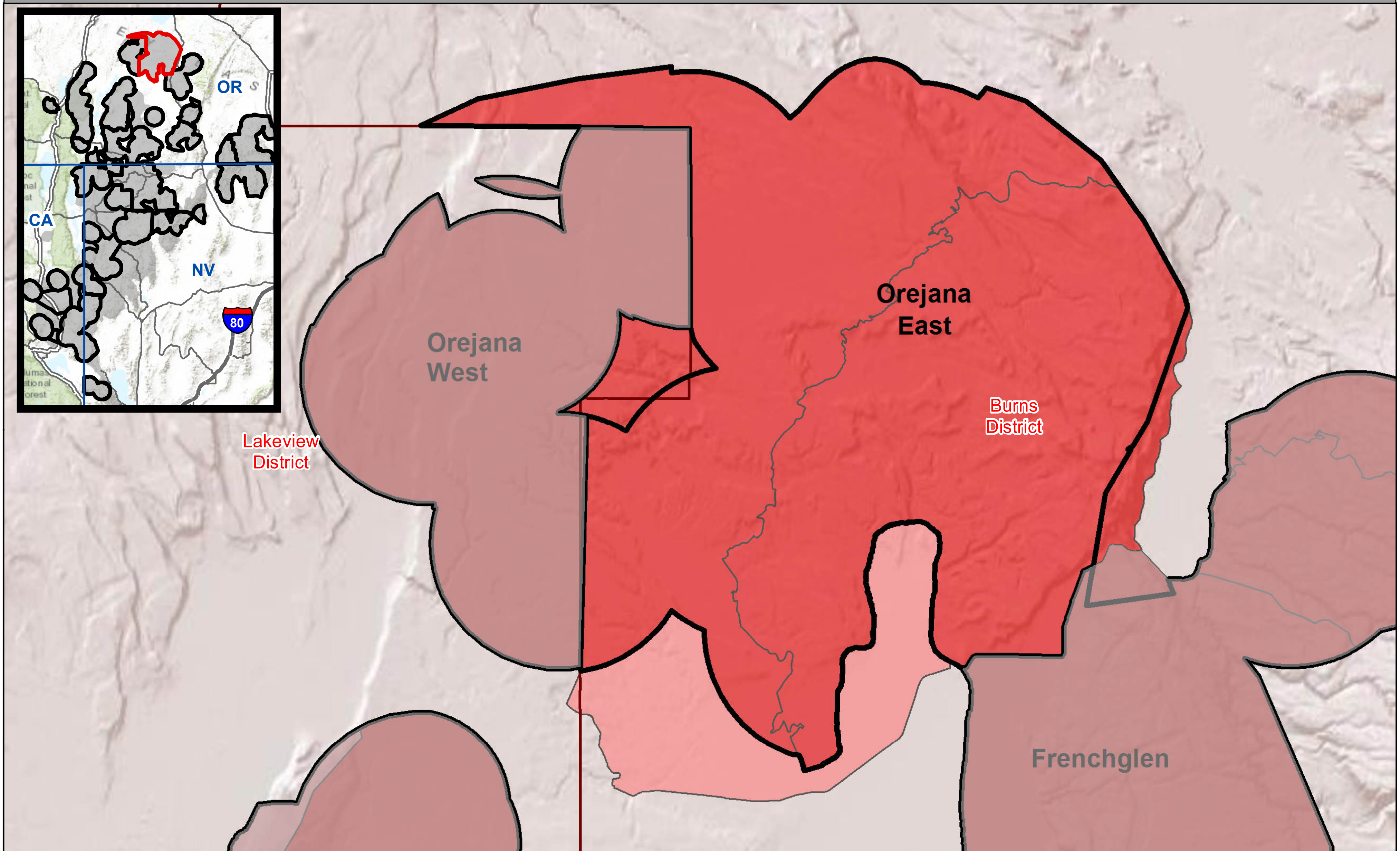
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:447,000

Orejana East Fire Operations

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

Western Great Basin and Warm Springs Valley
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.

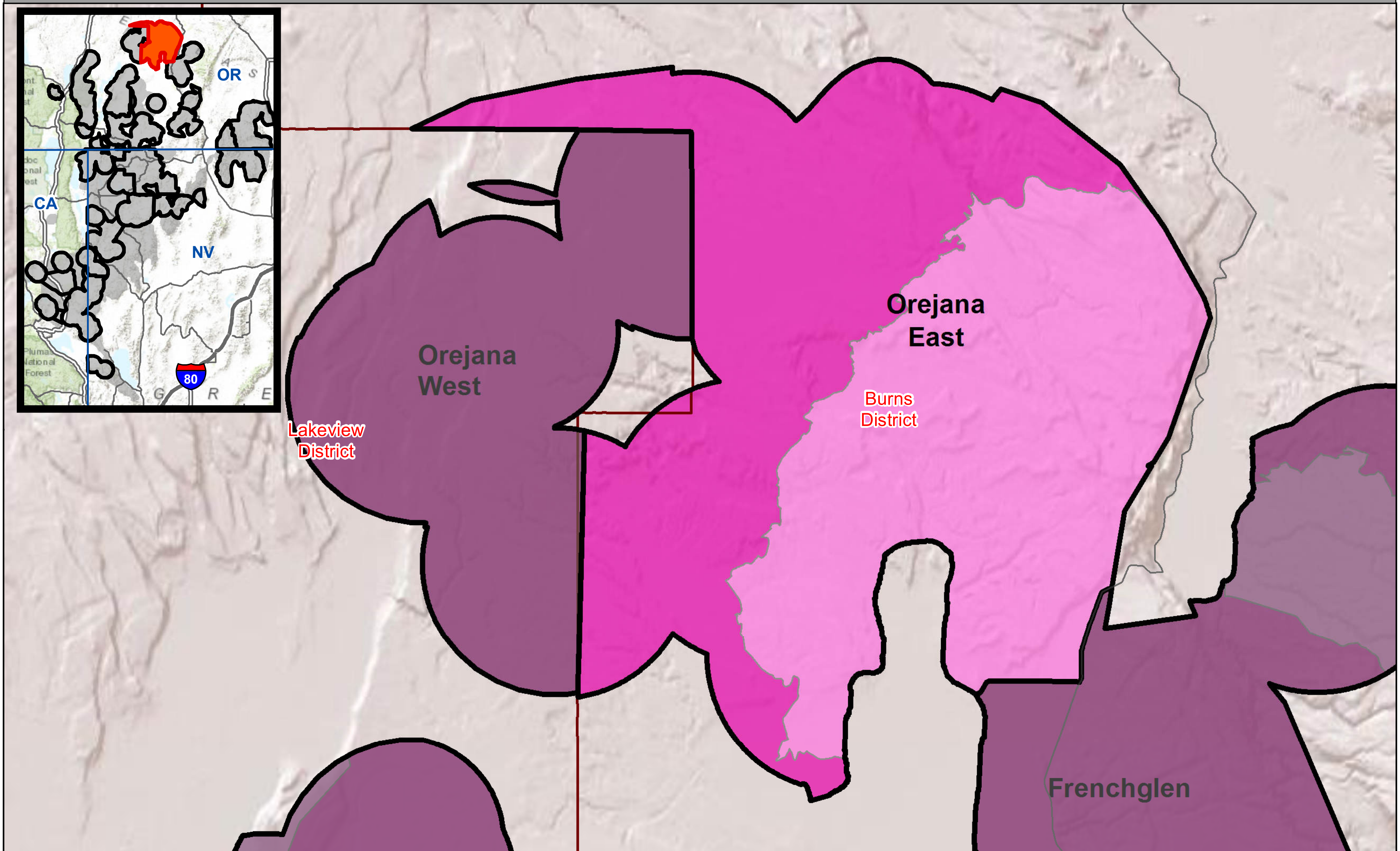
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Orejana East Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior

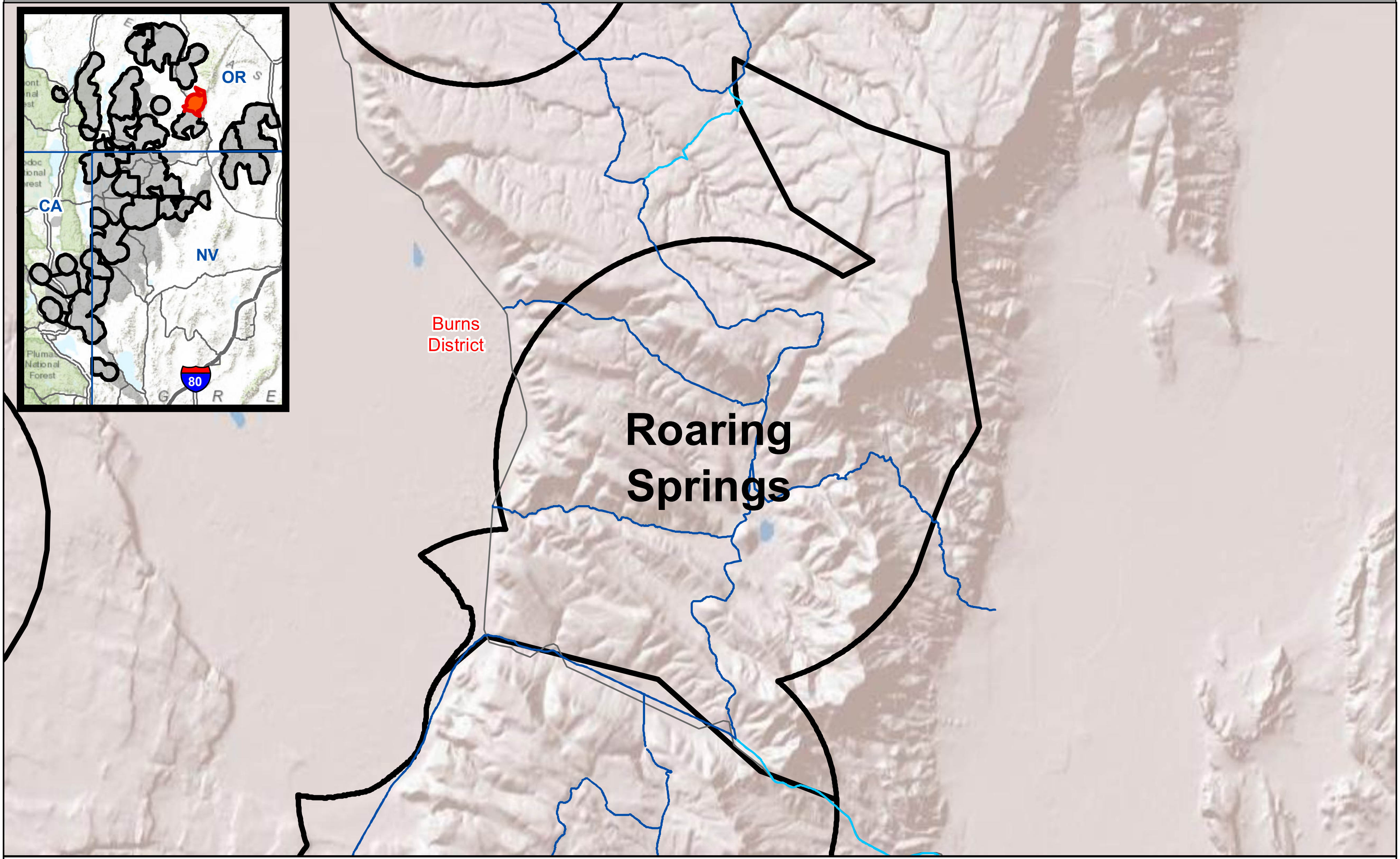


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:448,000

Roaring Springs Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

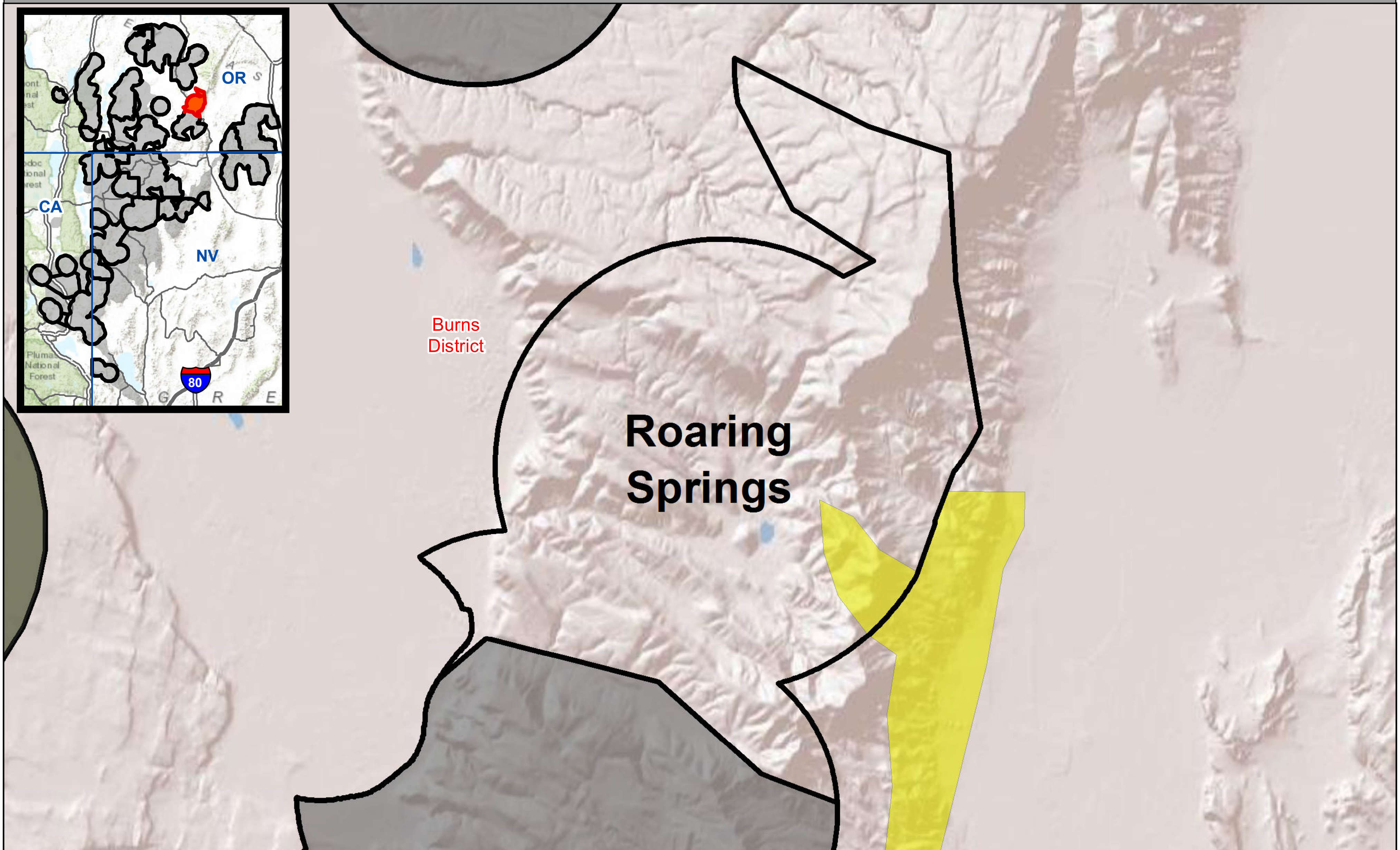
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:268,000

Roaring Springs Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

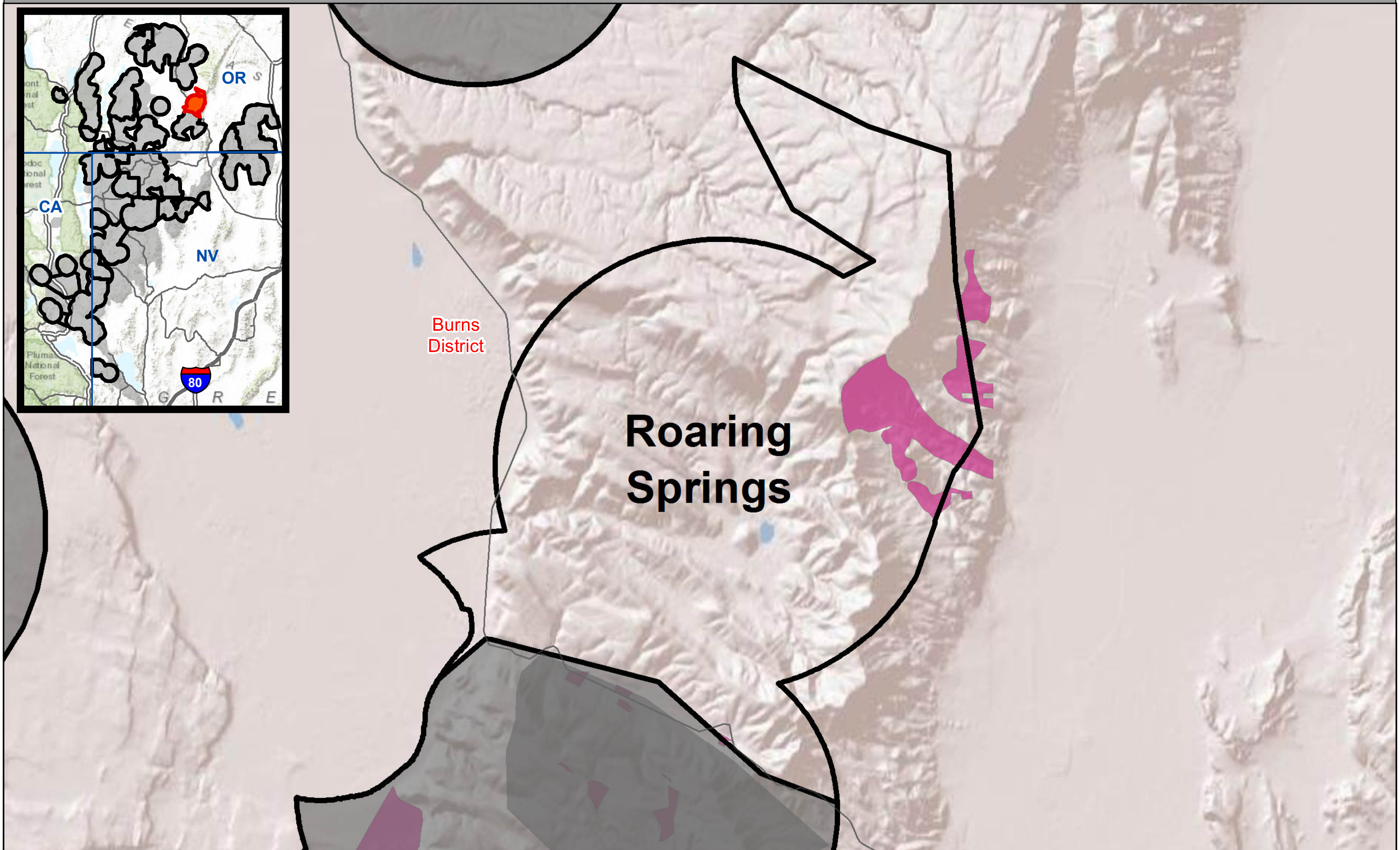
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:267,000

Roaring Springs Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

State Boundary

BLM District Boundary

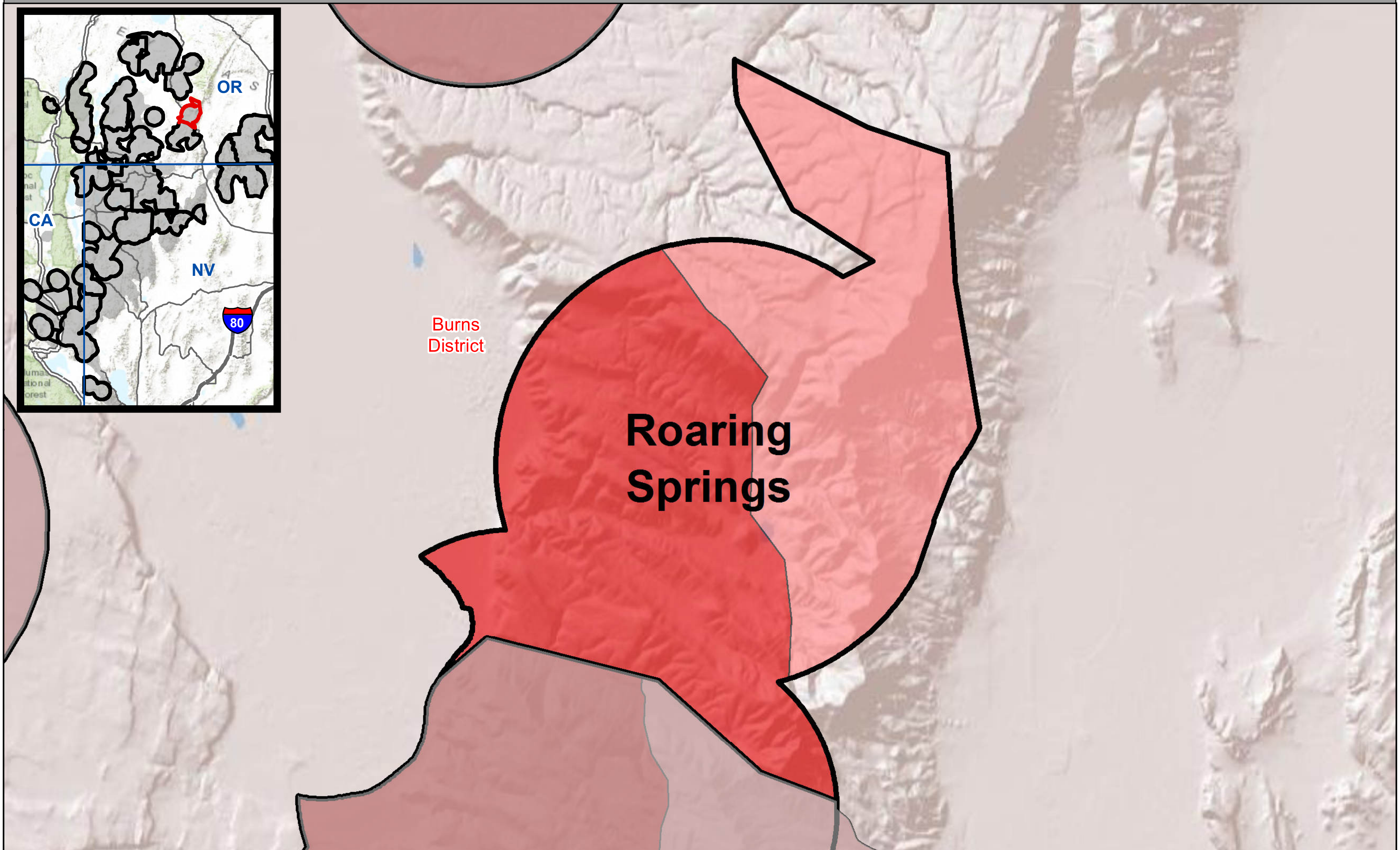
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:267,000

Roaring Springs Fire Operations

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

Western Great Basin and Warm Springs Valley
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

First
Second
Third

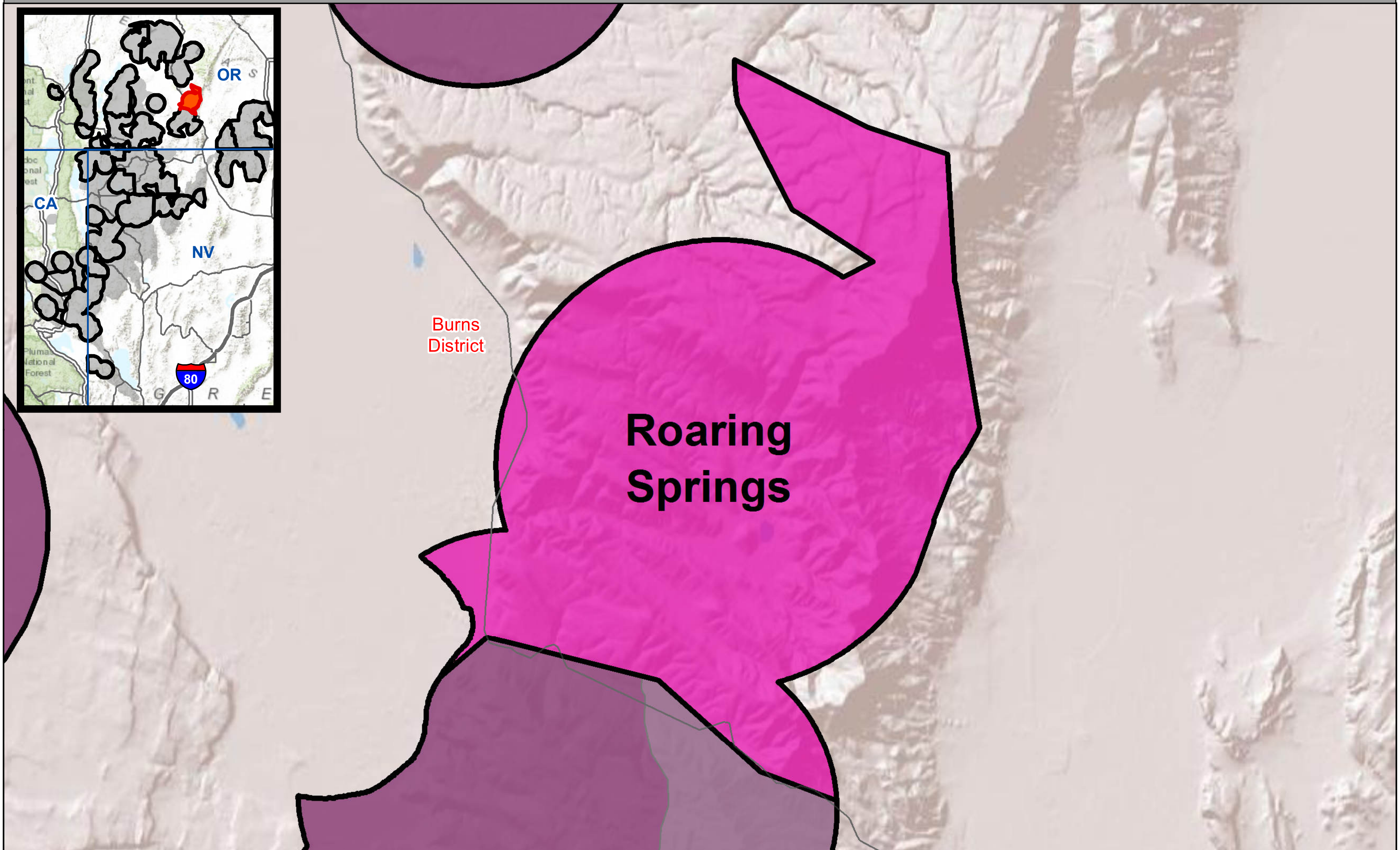
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Roaring Springs Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

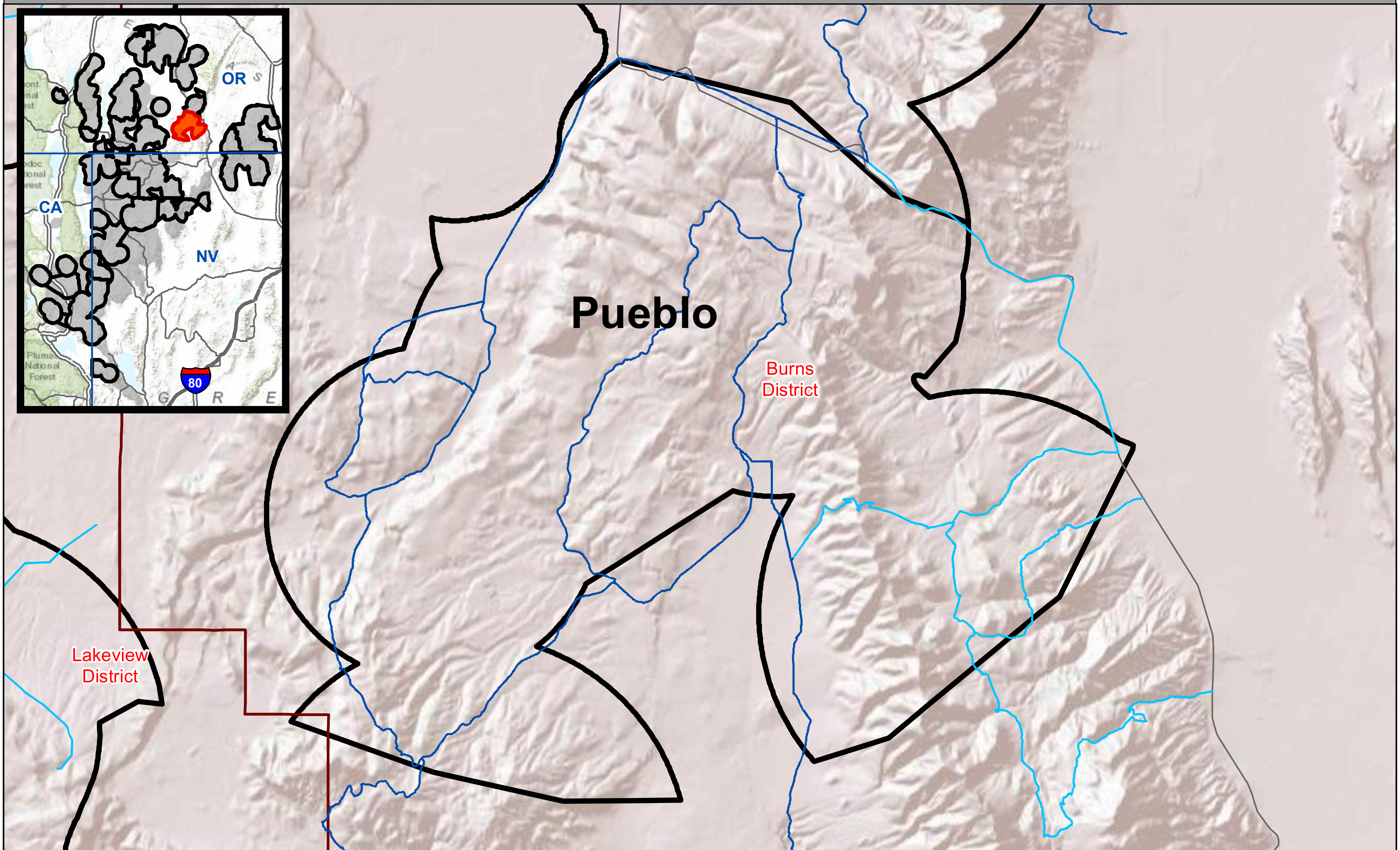
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:268,000

Pueblo Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

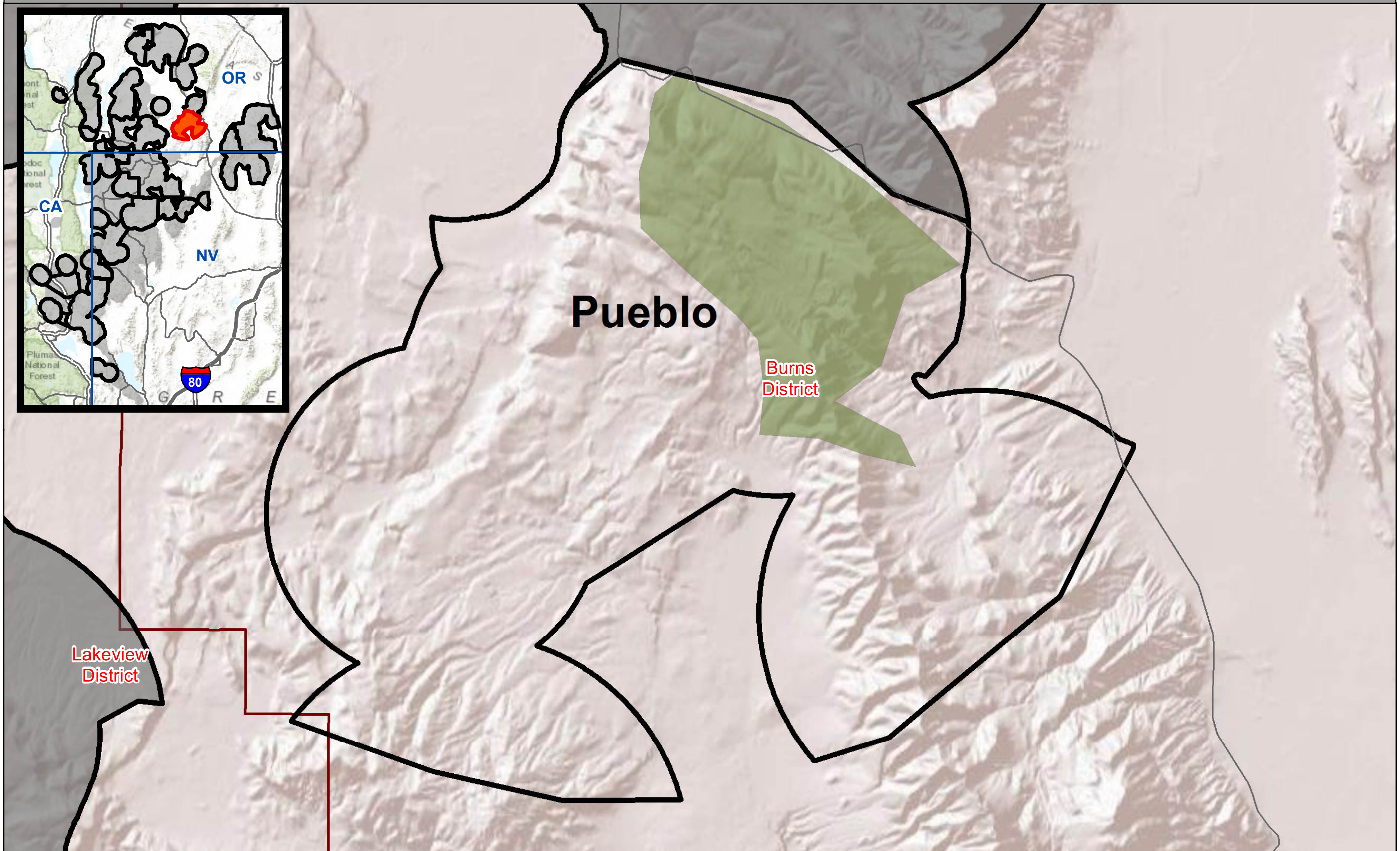
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:269,000

Pueblo Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

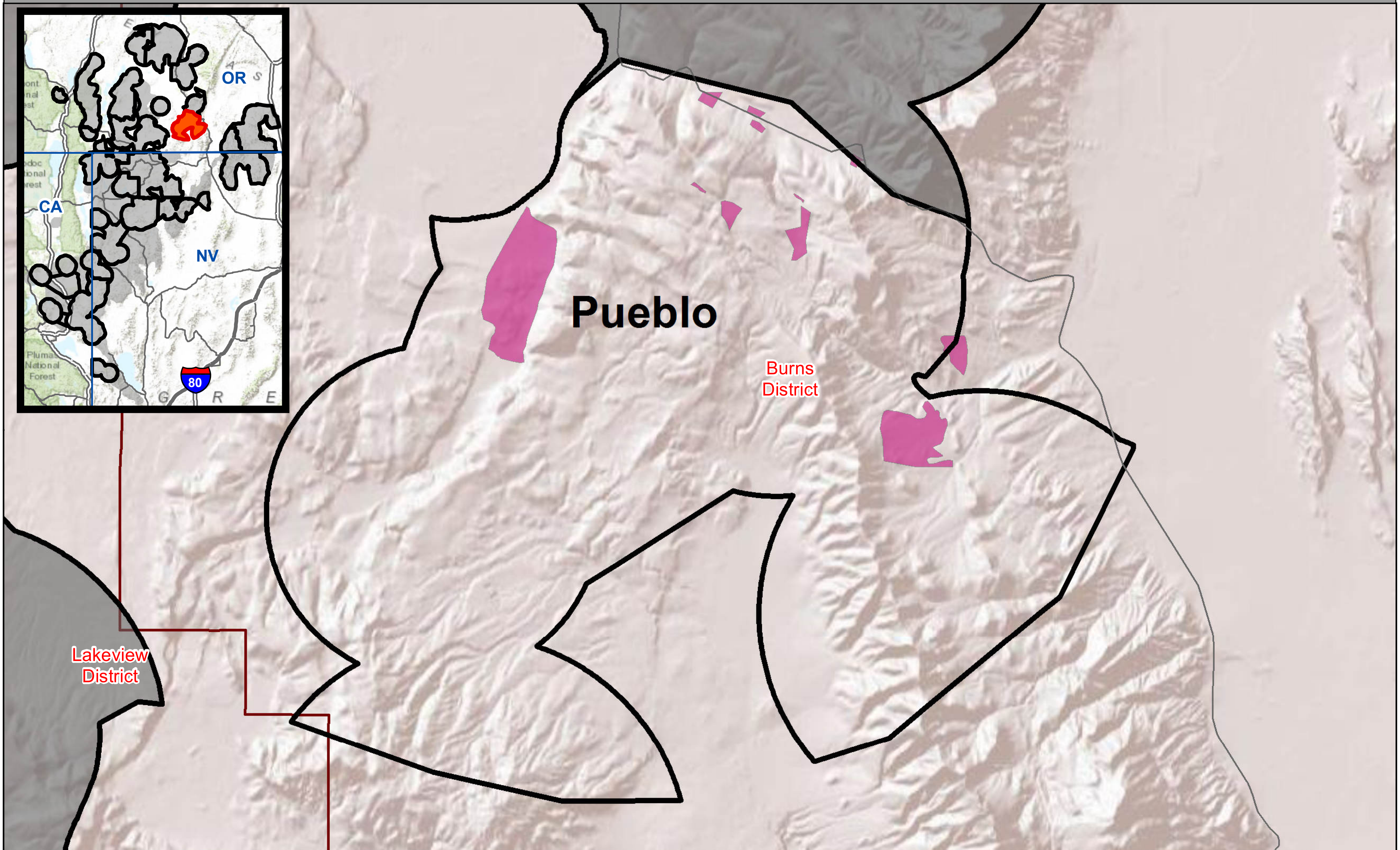
Habitat Restoration- Sagebrush Plantings
Habitat Restoration- Sagebrush Mowings
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:269,000

Pueblo Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

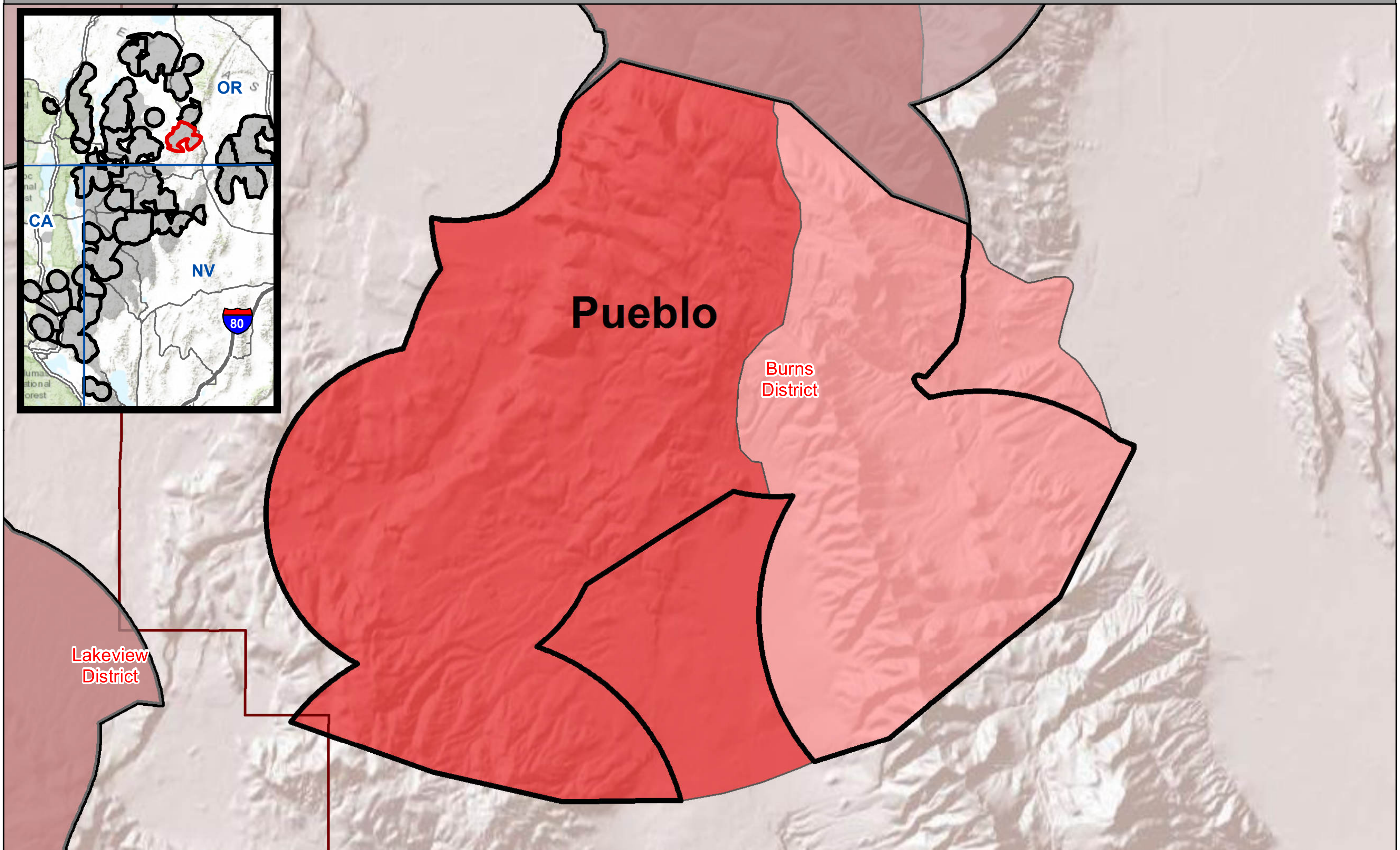
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:269,000

Pueblo Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

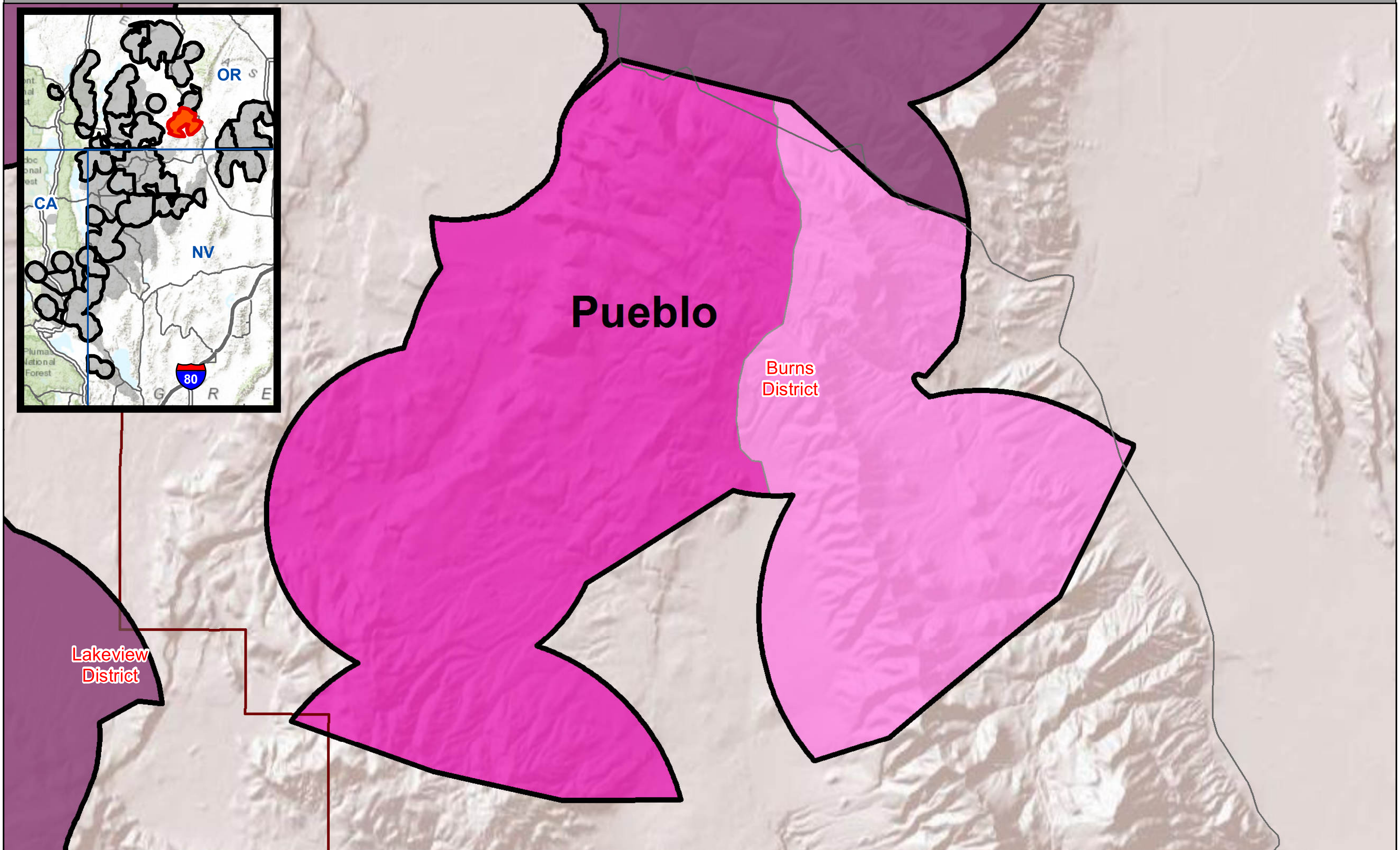
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Pueblo Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority
- First
- Second
- Third

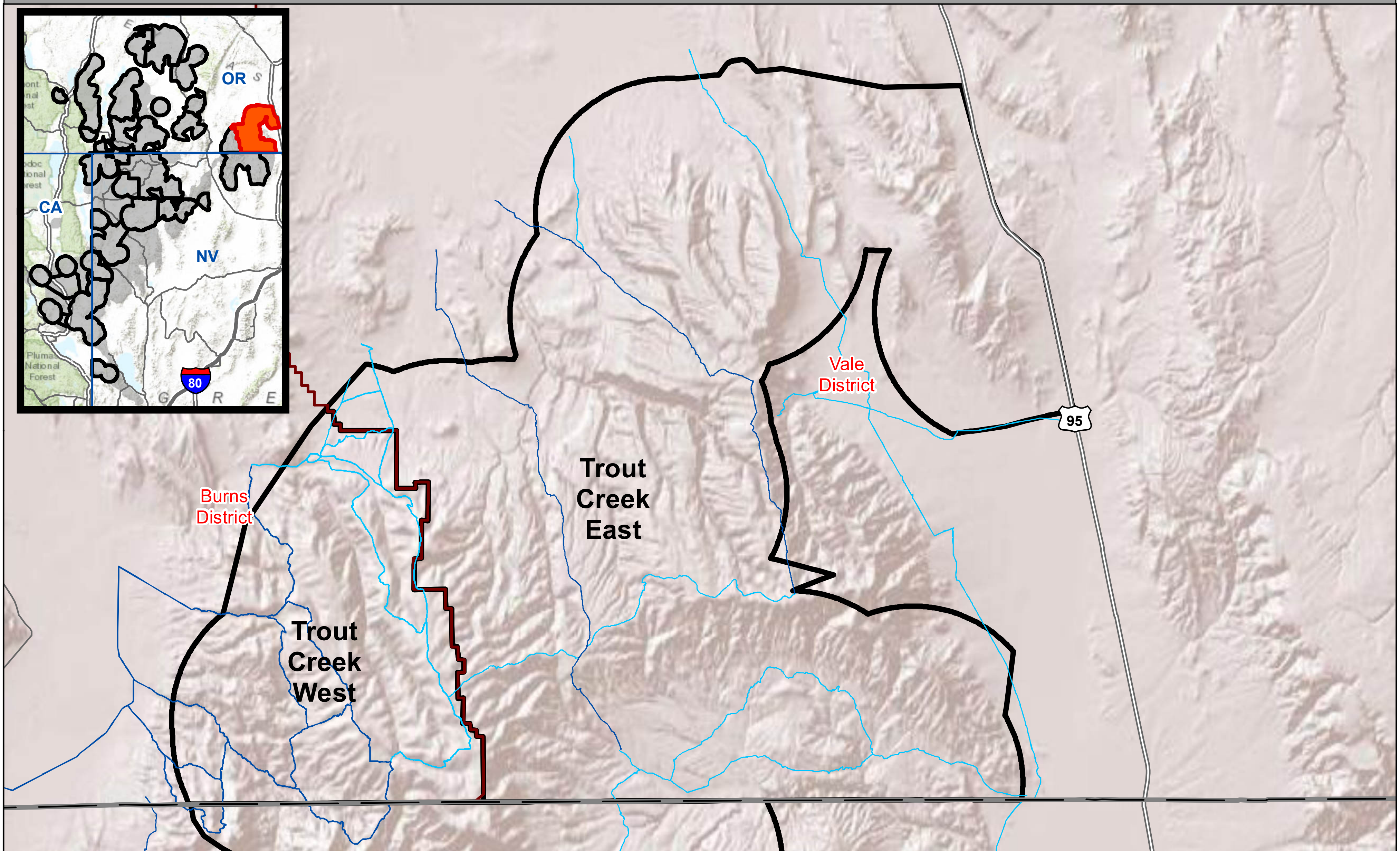
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:269,000

Trout Creek East Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

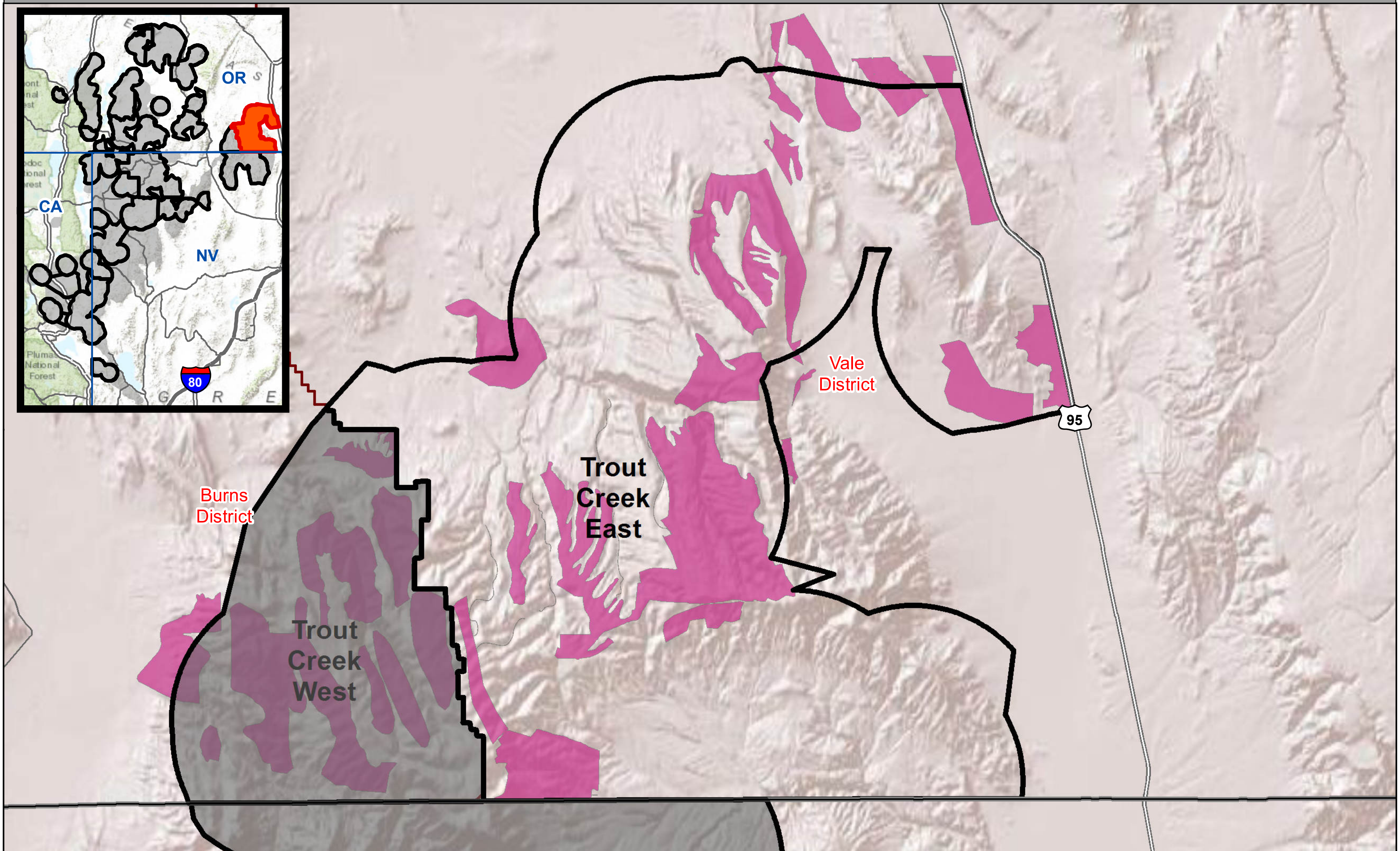
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:446,000

Trout Creek East Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

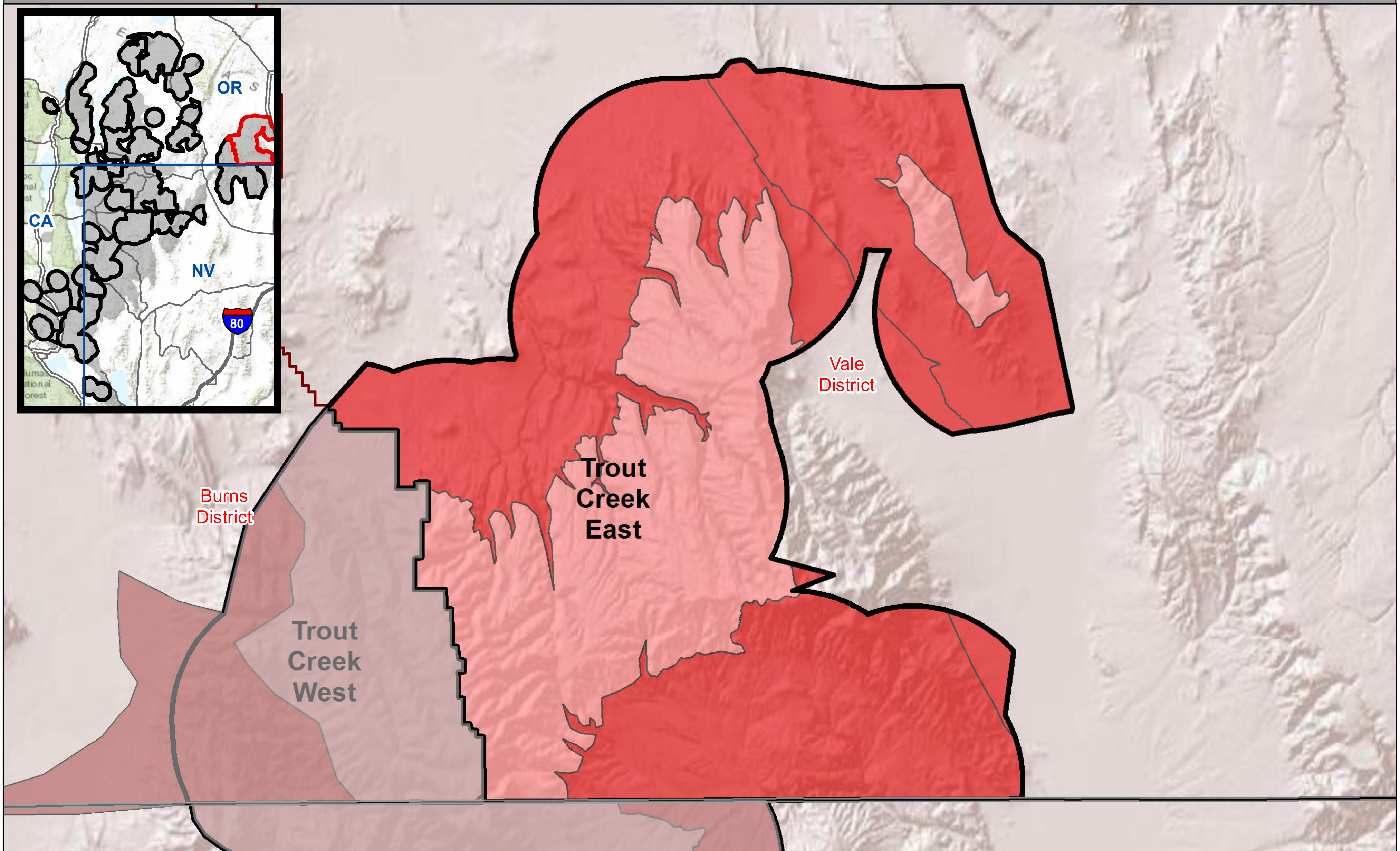
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:446,000

Trout Creek East Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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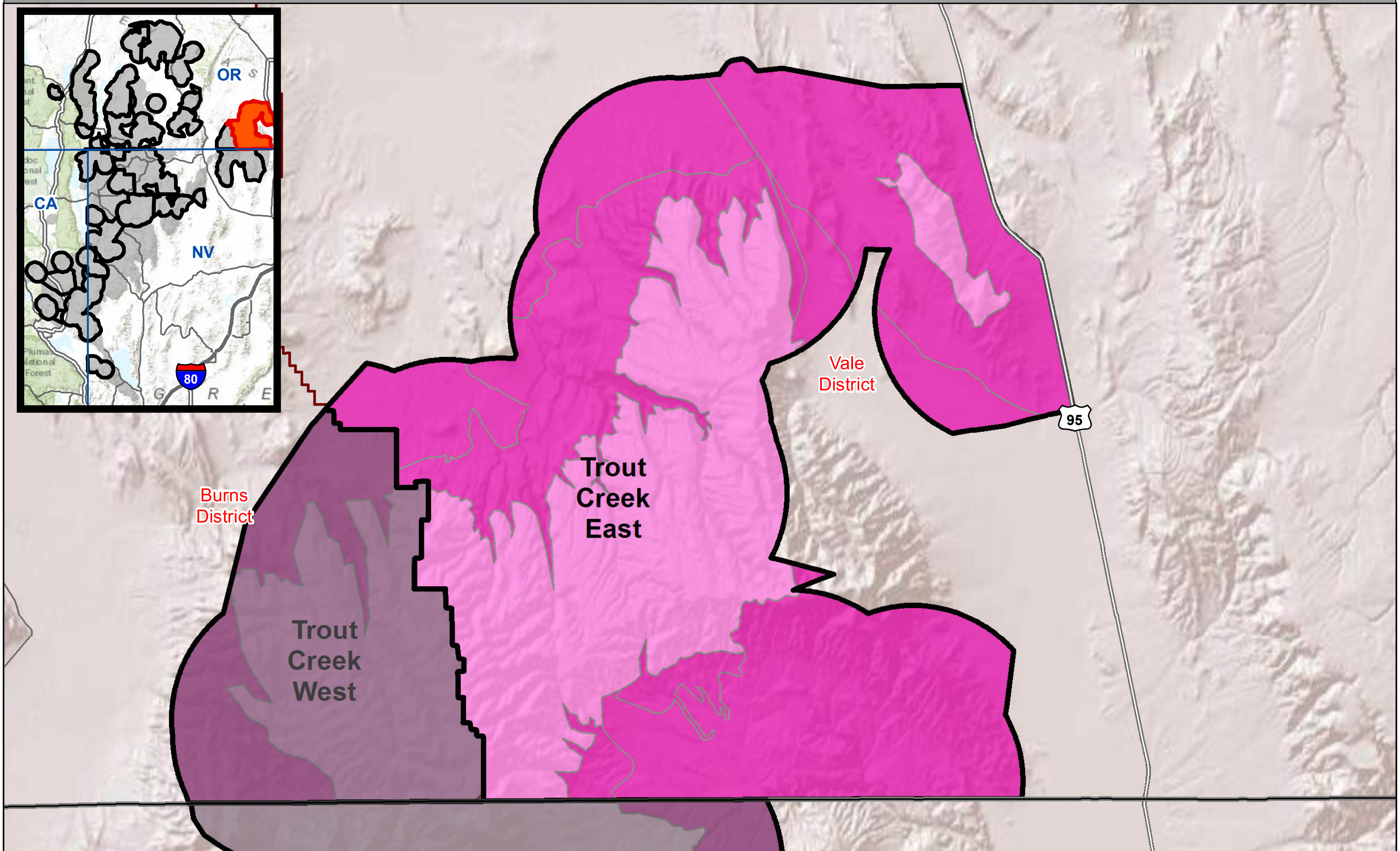
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Trout Creek East Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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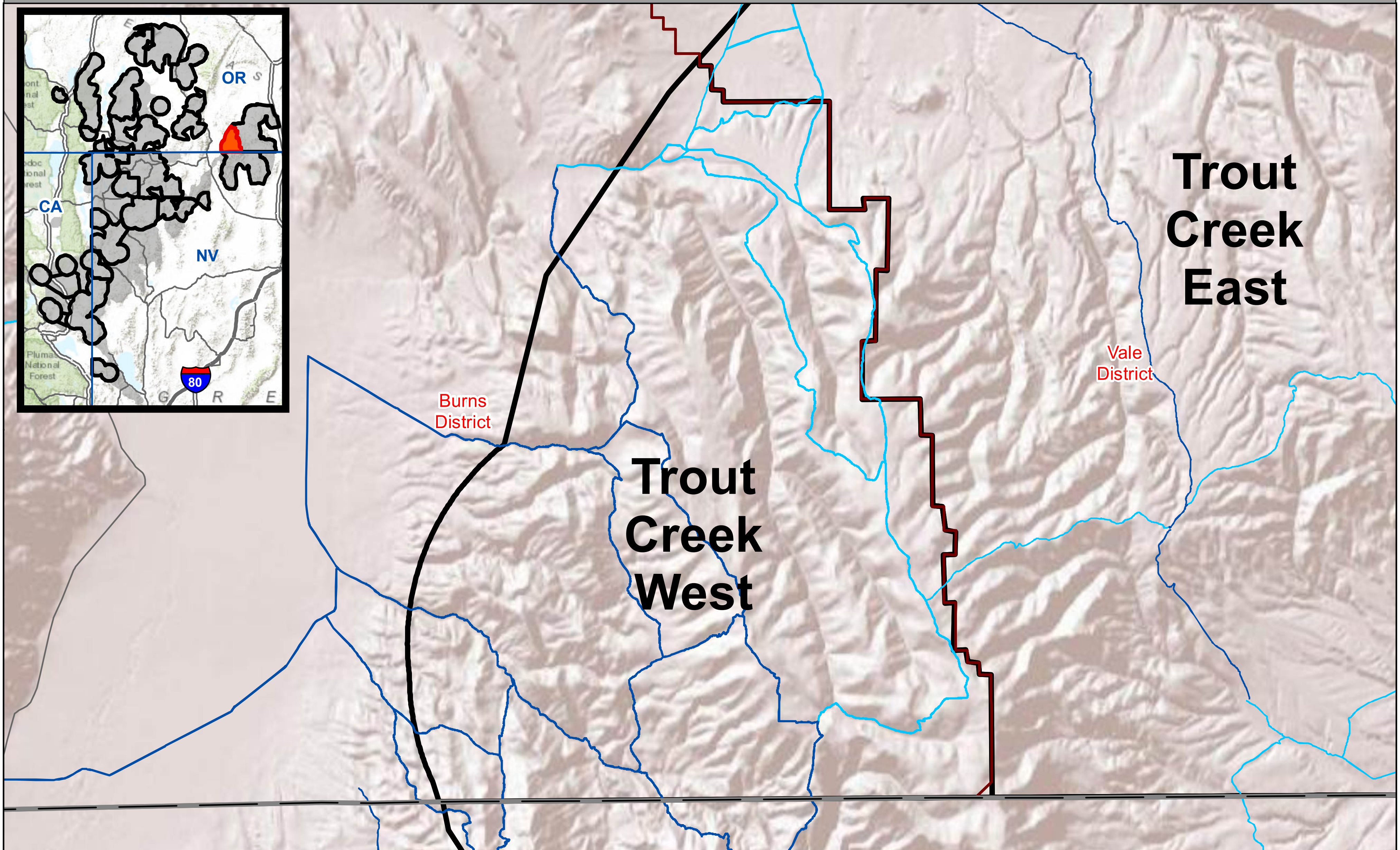
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:446,000

Trout Creek West Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority for Implementation
- First
- Second
- Third

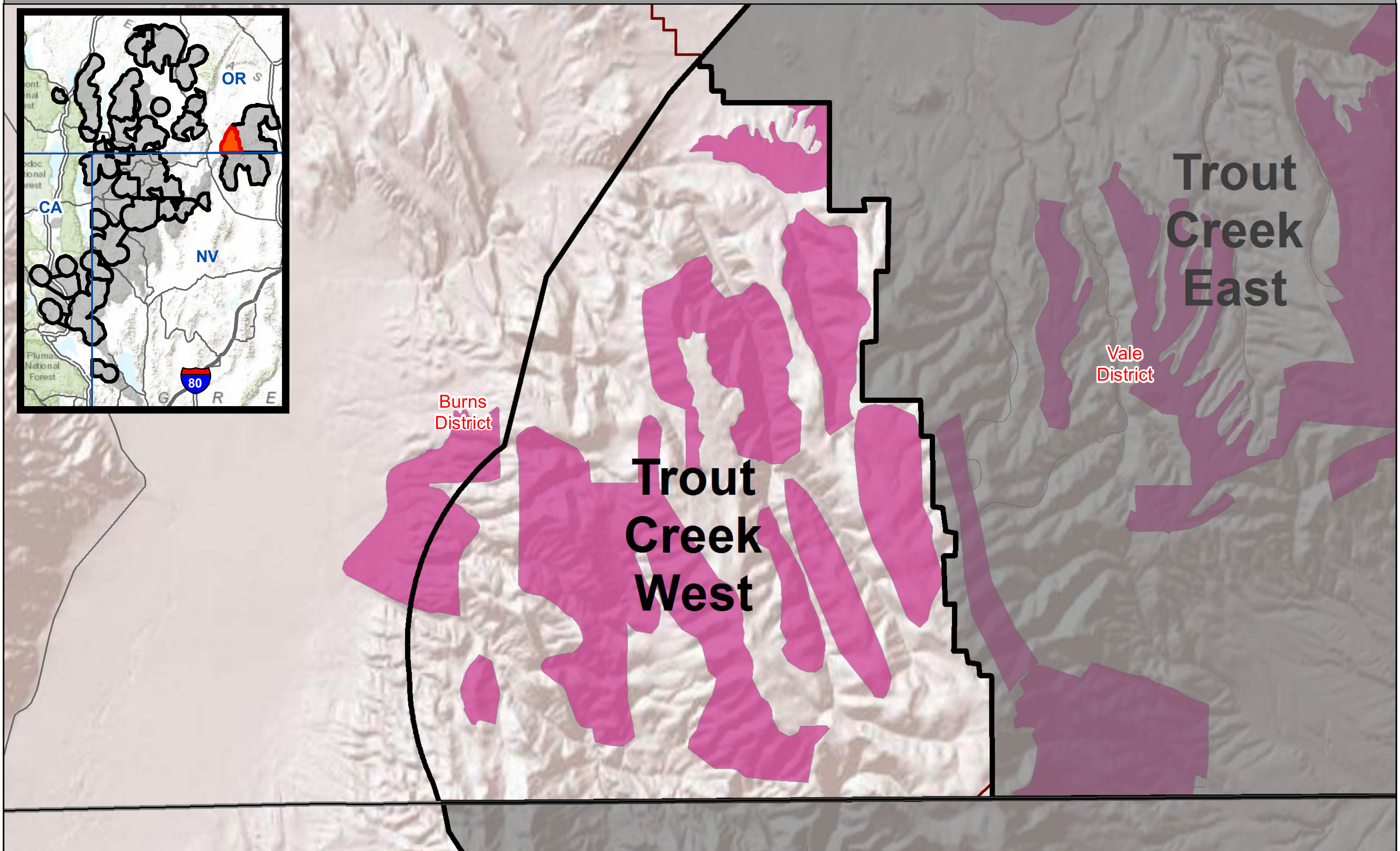
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:238,000

Trout Creek West Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



N

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

State Boundary

BLM District Boundary

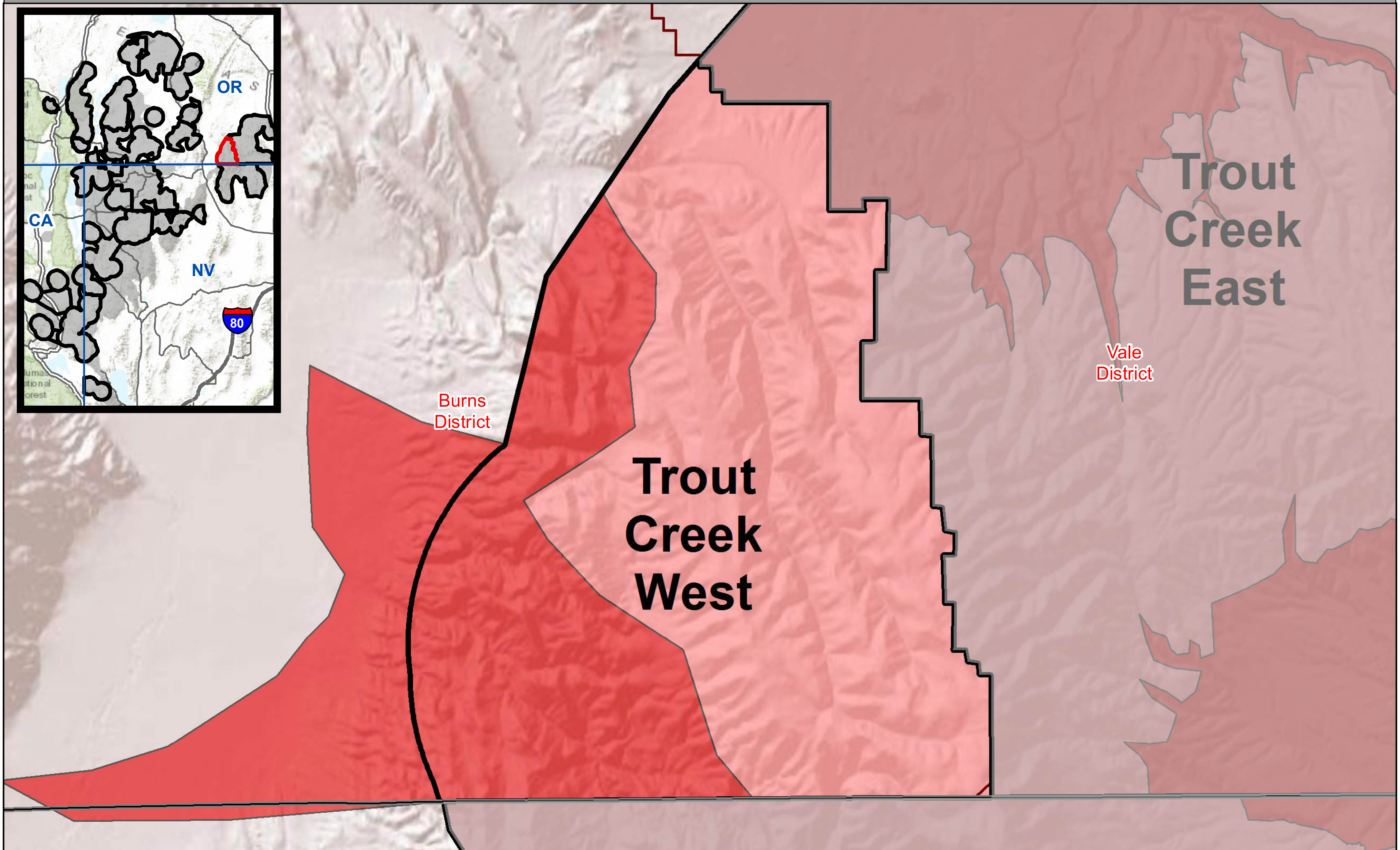
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:238,000

Trout Creek West Fire Operations

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

Western Great Basin and Warm Springs Valley
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

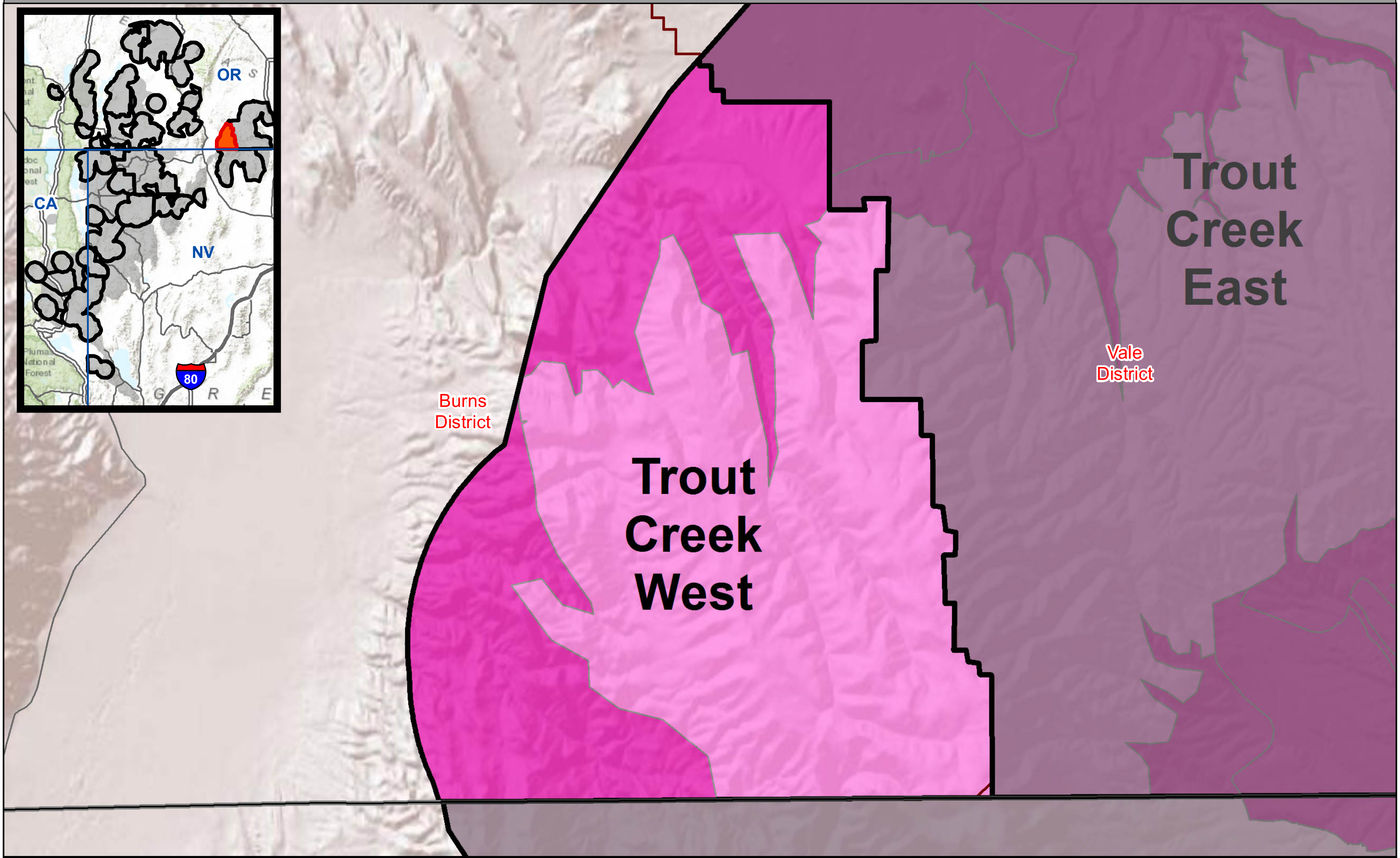
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

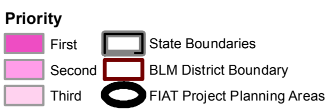
Trout Creek West Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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.

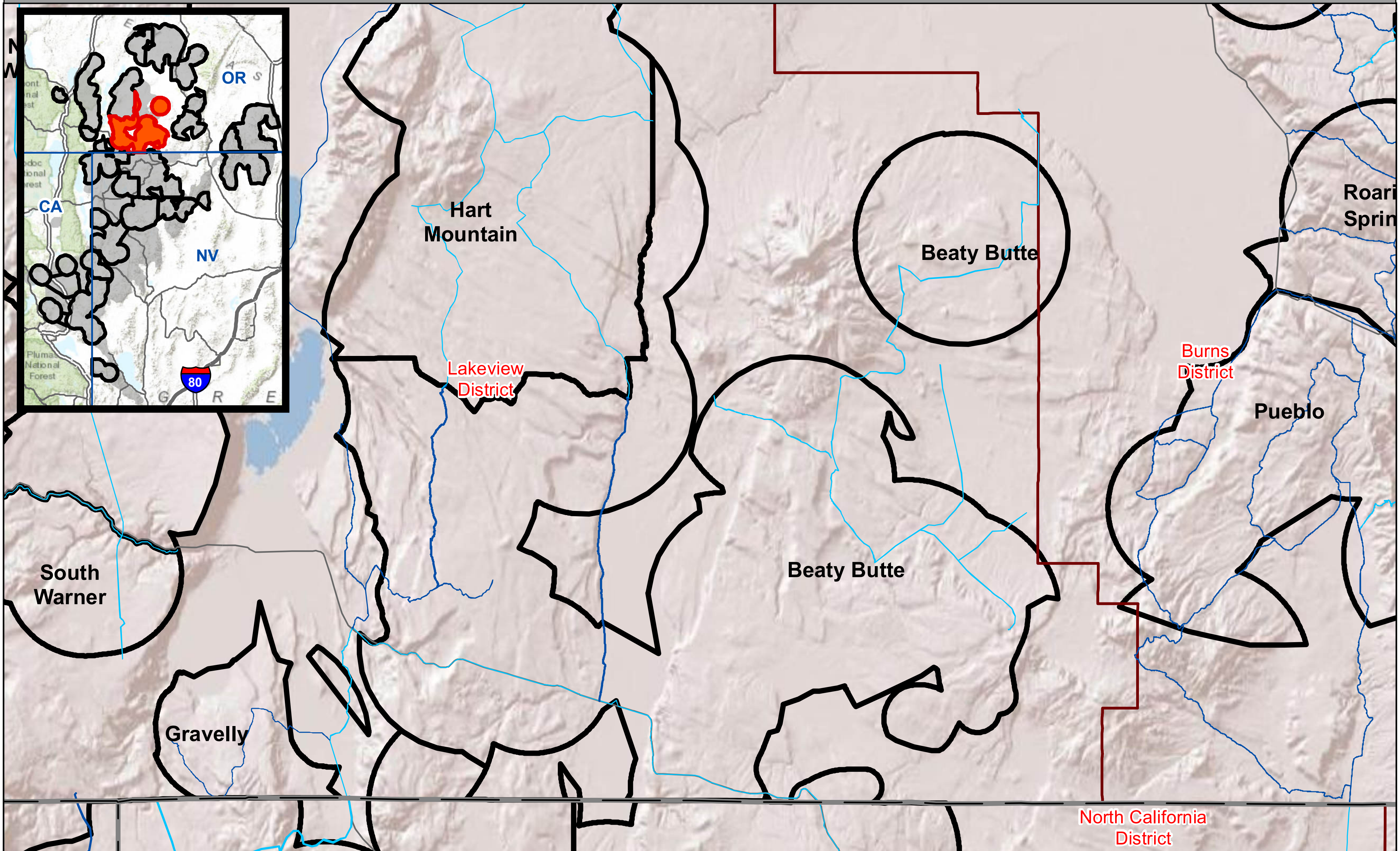


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:238,000

Beaty Butte Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority for Implementation
- First
- Second
- Third

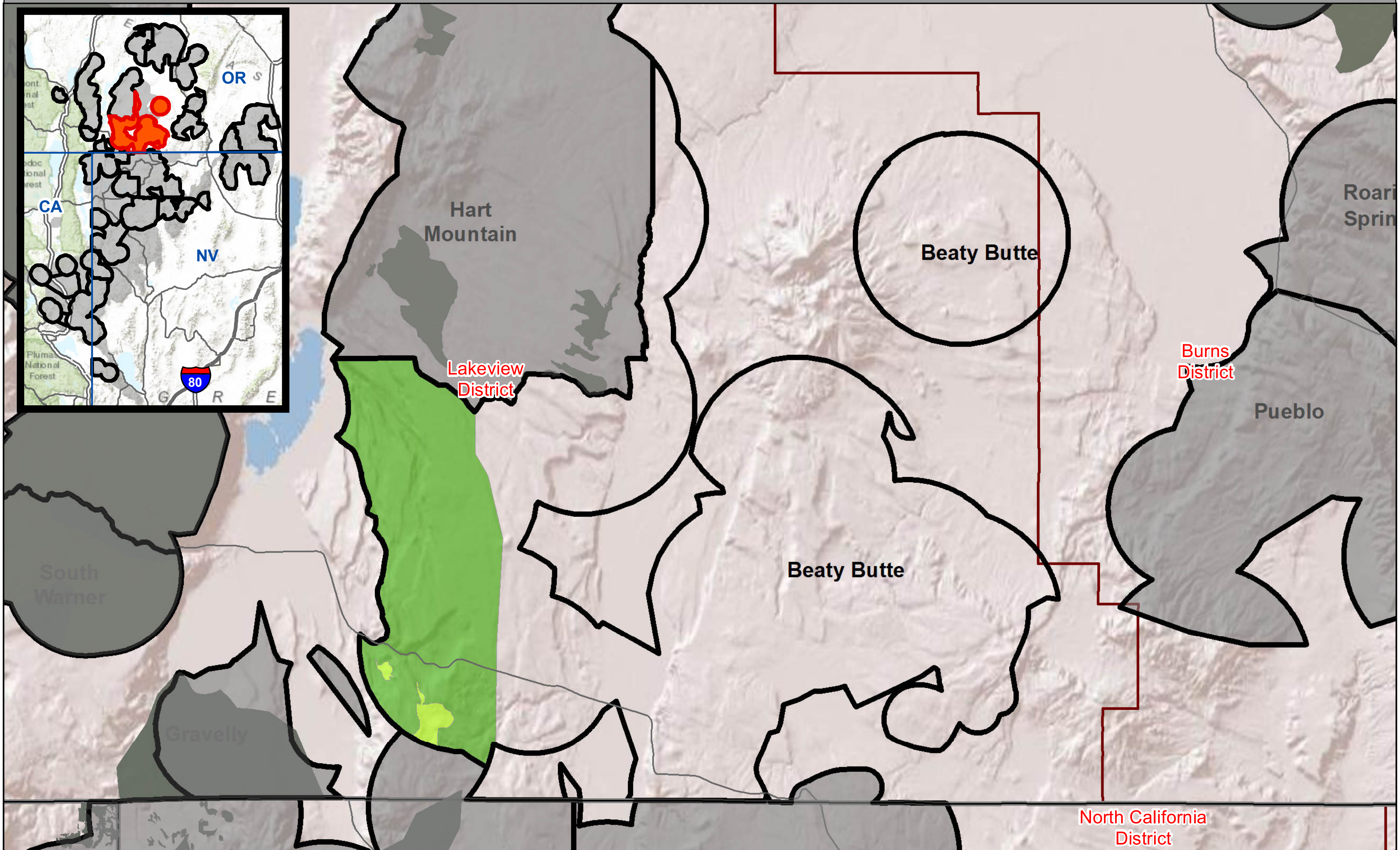
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:562,000

Beaty Butte Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

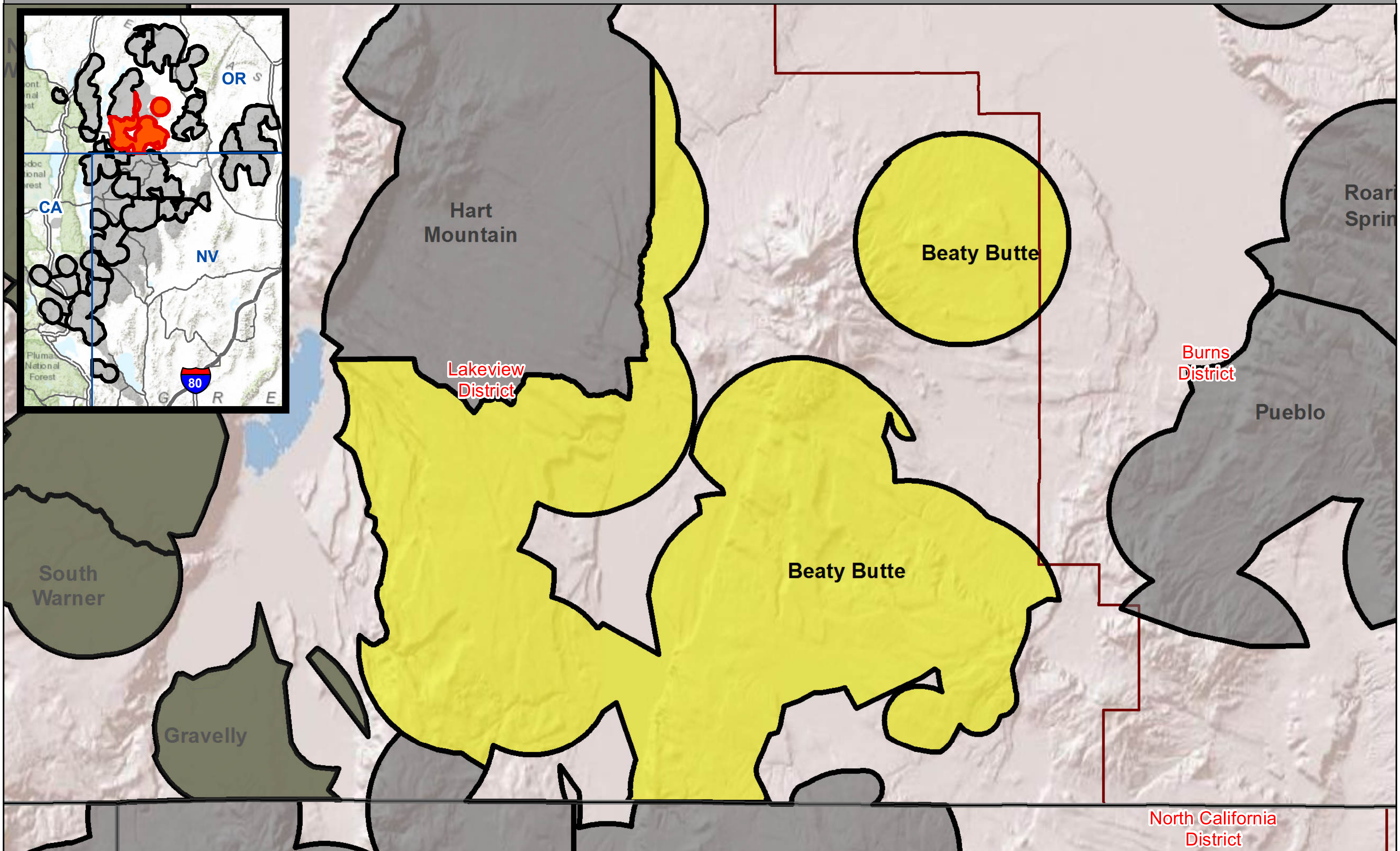
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:562,000

Beaty Butte Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

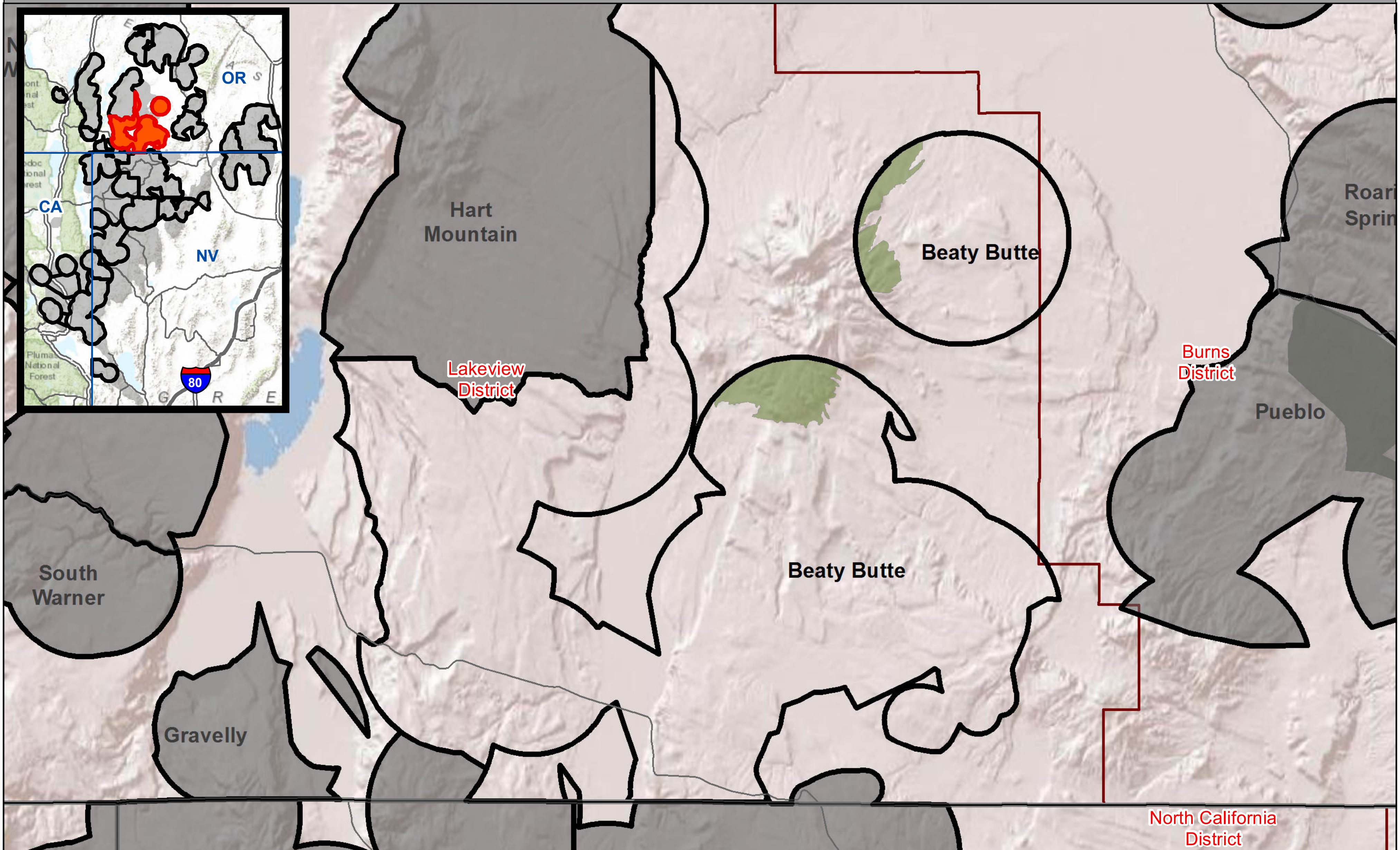
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:561,000

Beaty Butte Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

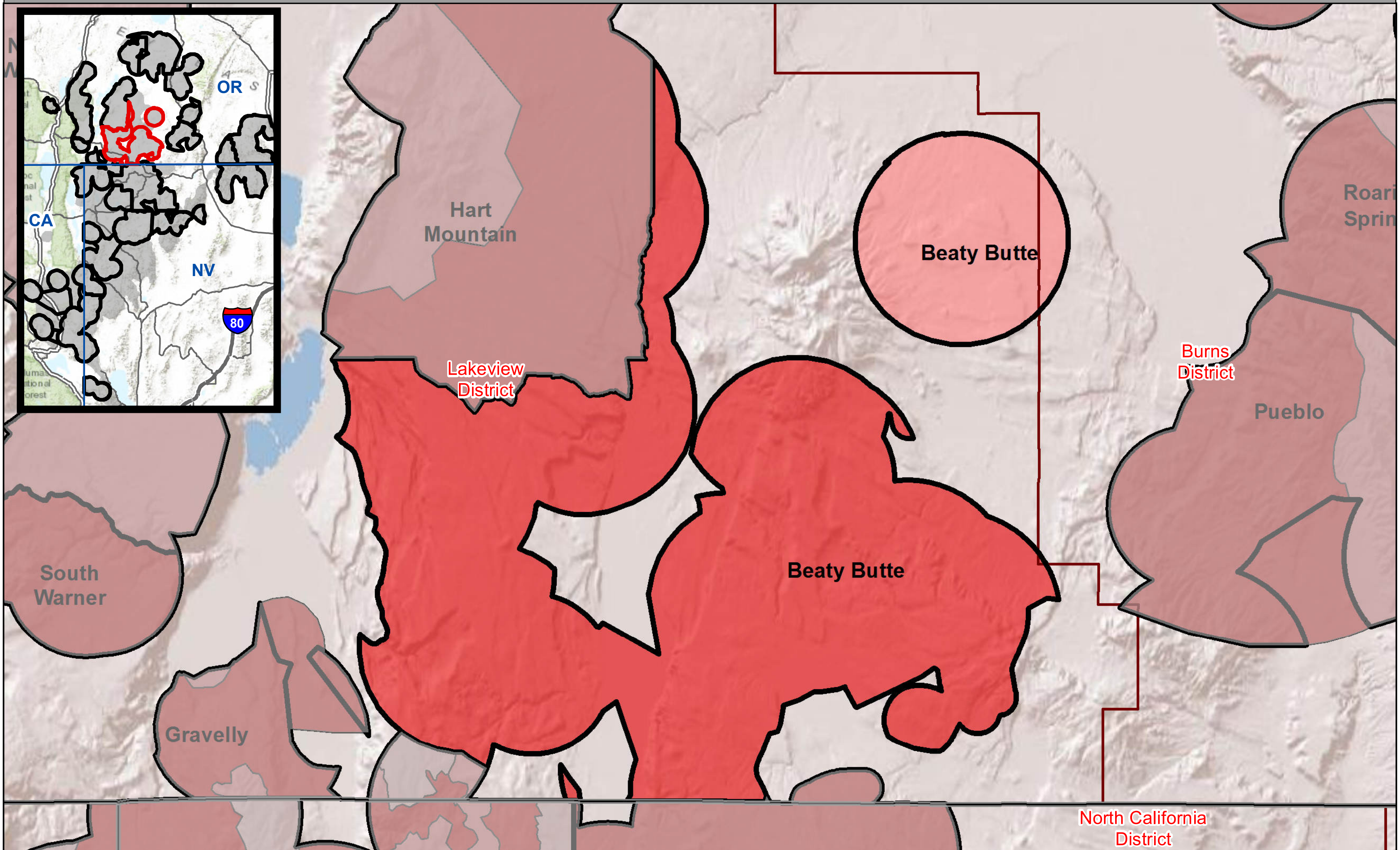
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:561,000

Beaty Butte Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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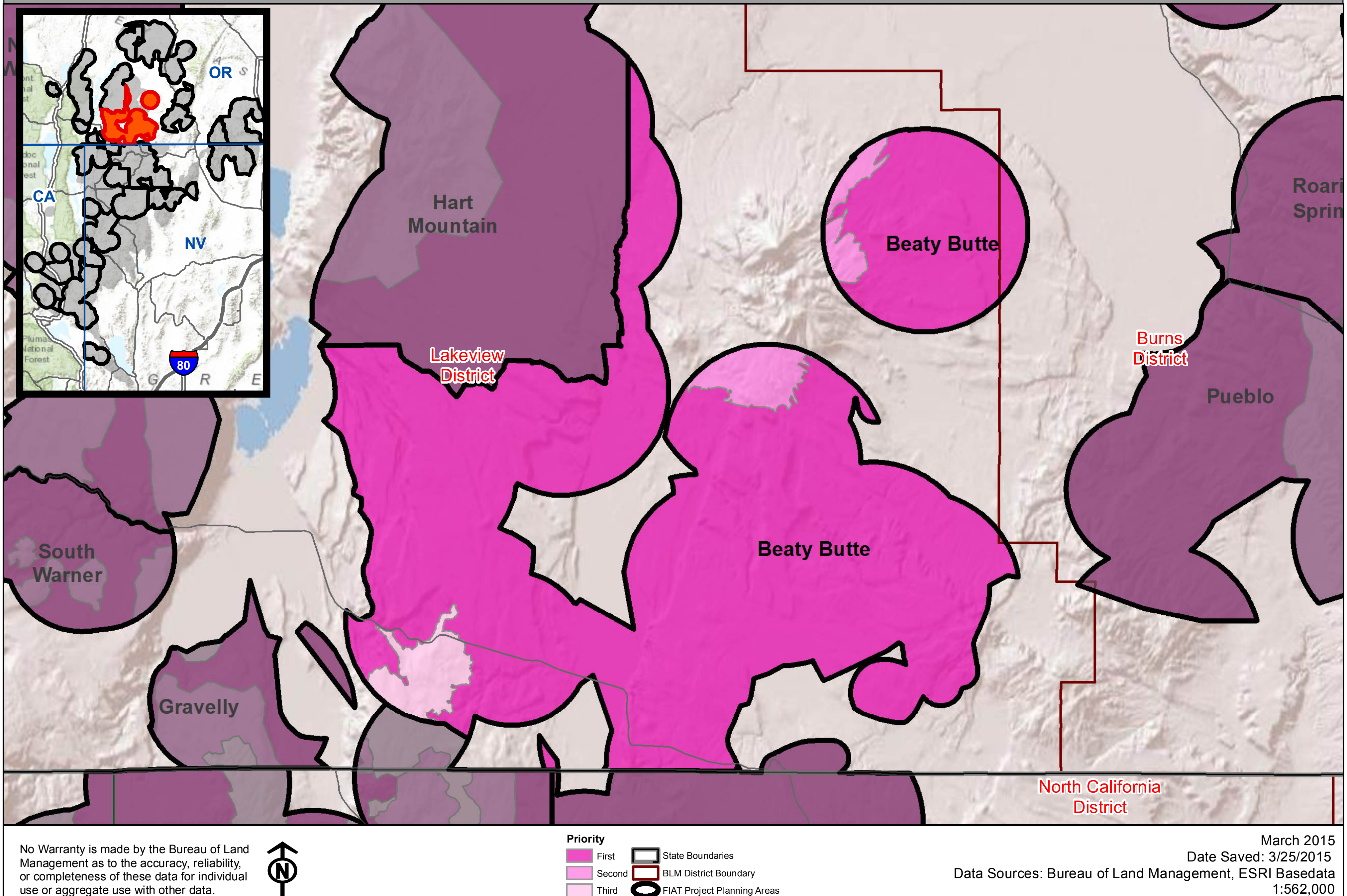
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Beaty Butte Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior

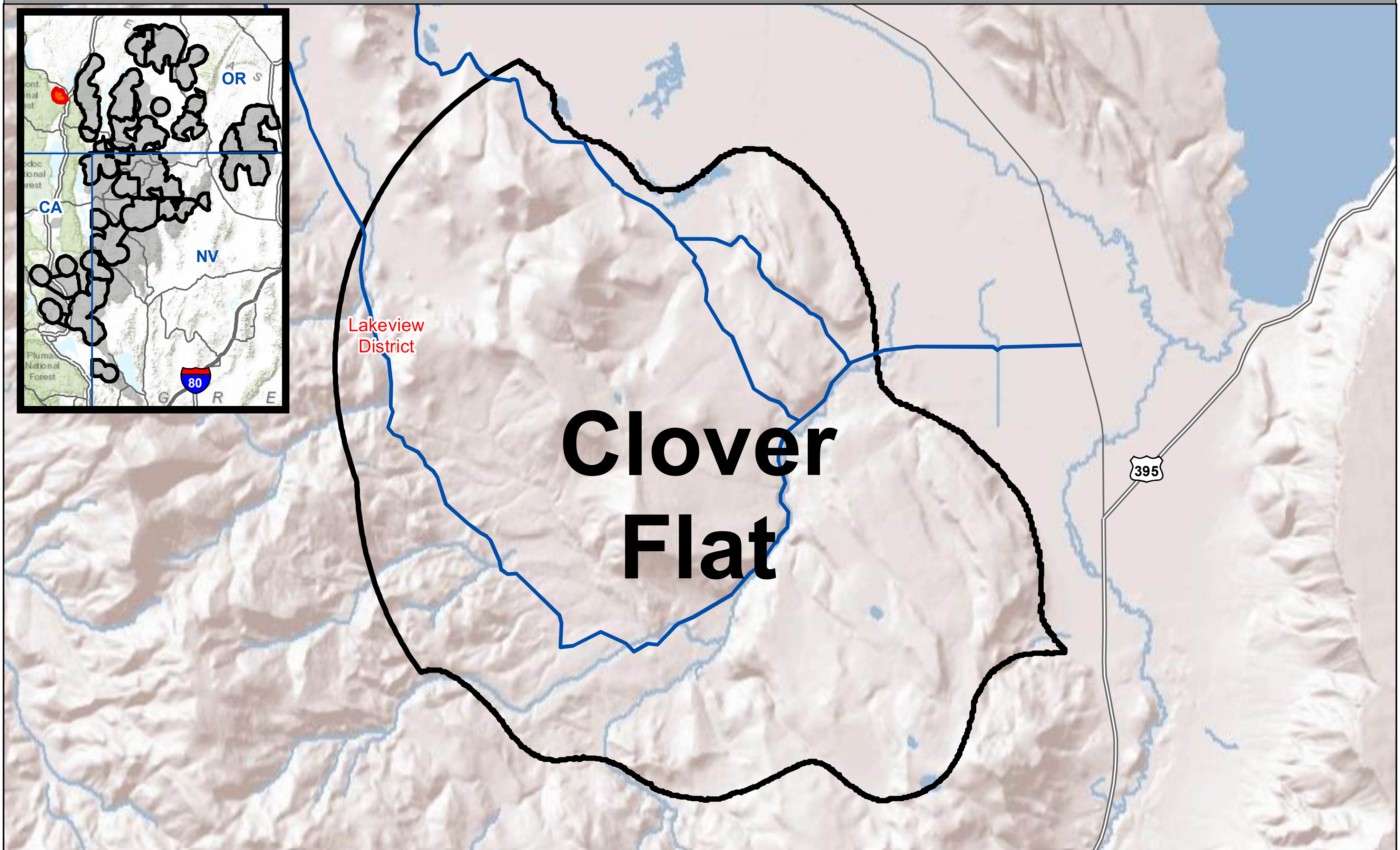


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:562,000

Clover Flat Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority for Implementation
First
Second
Third

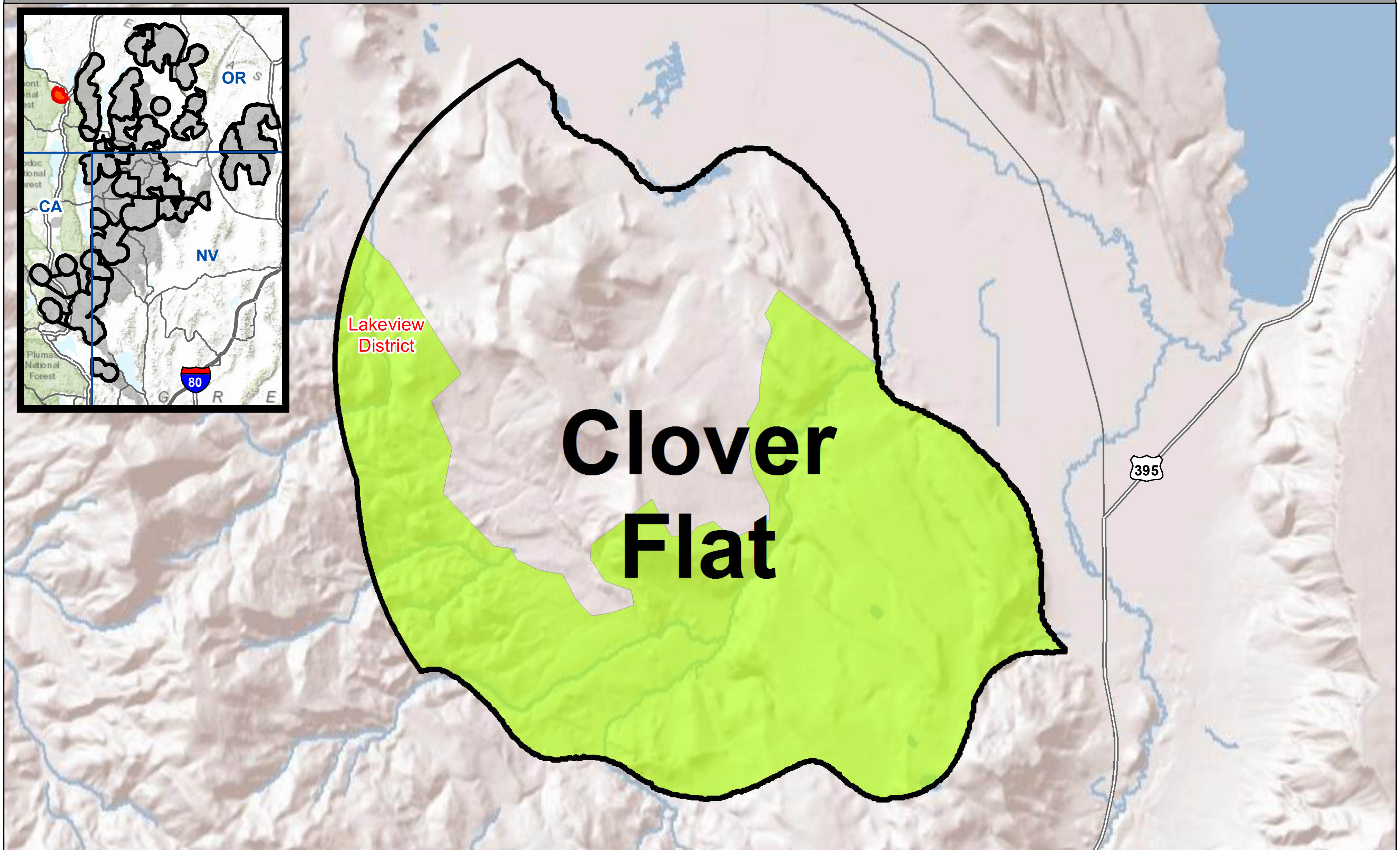
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:134,000

Clover Flat Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Conifer Treatment Areas

- First
- Second
- Third

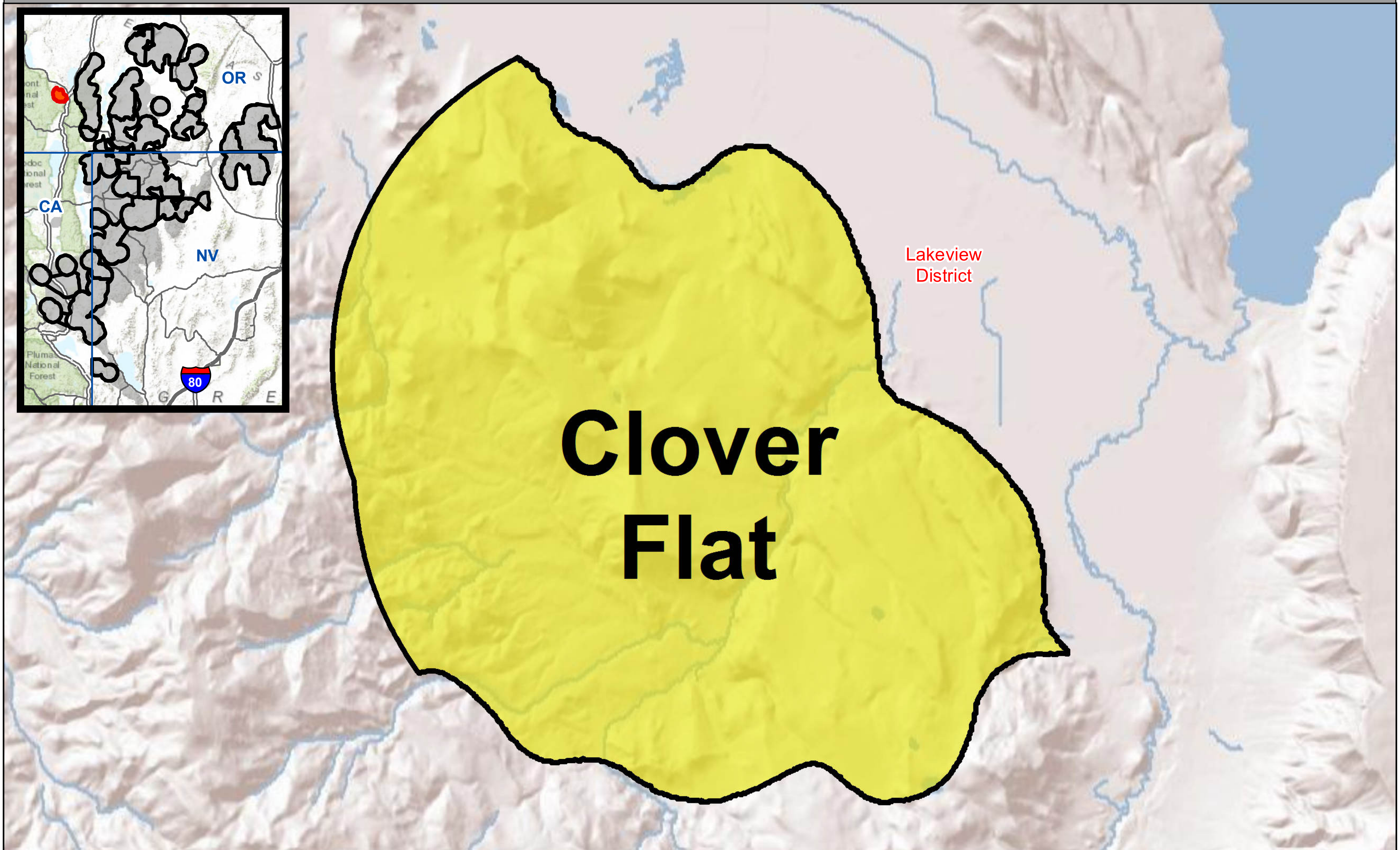
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:134,000

Clover Flat Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

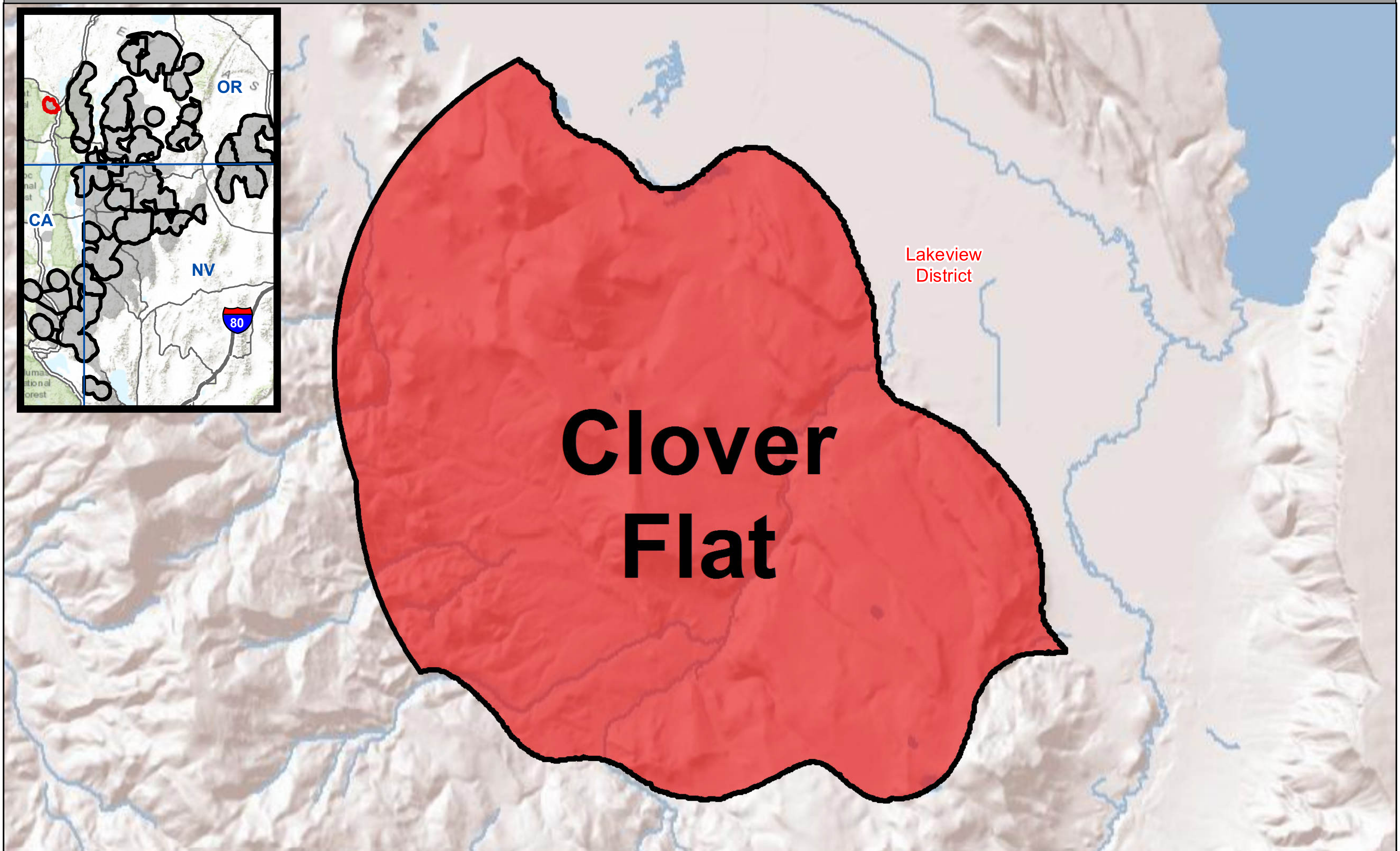
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:133,000

Clover Flat Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority

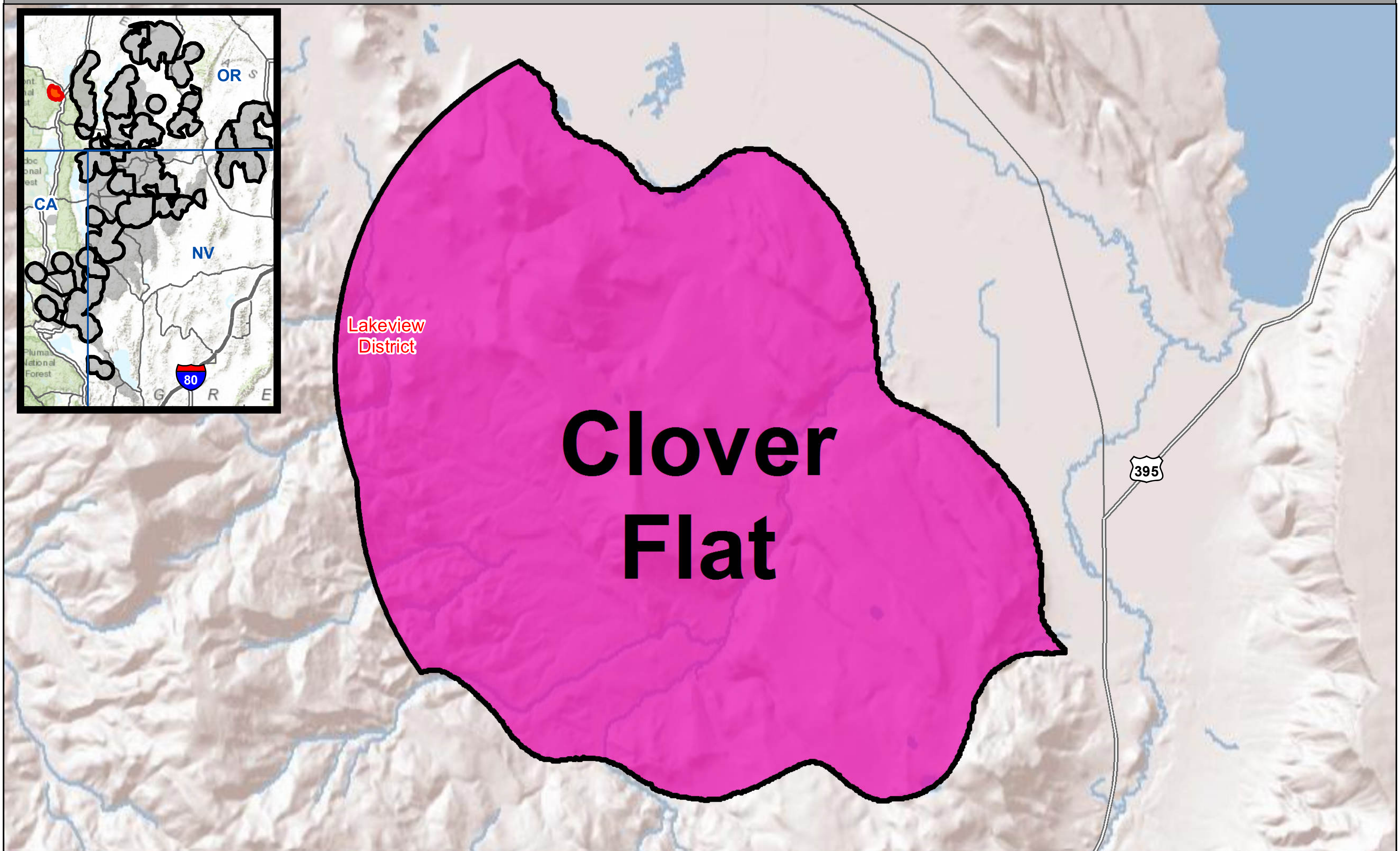
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Clover Flat Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

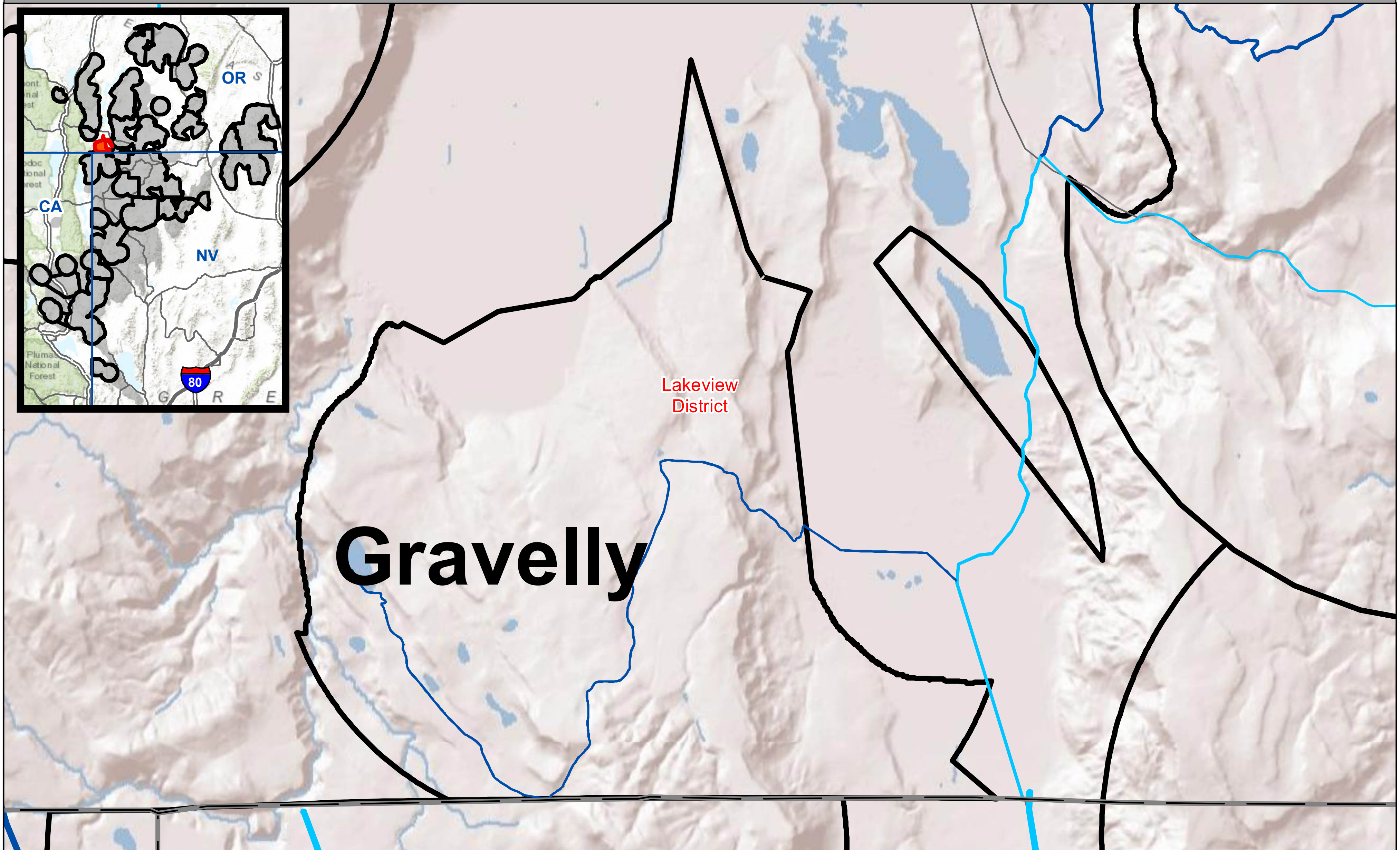
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:134,000

Gravelly Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



N

Priority for Implementation
- First
- Second
- Third

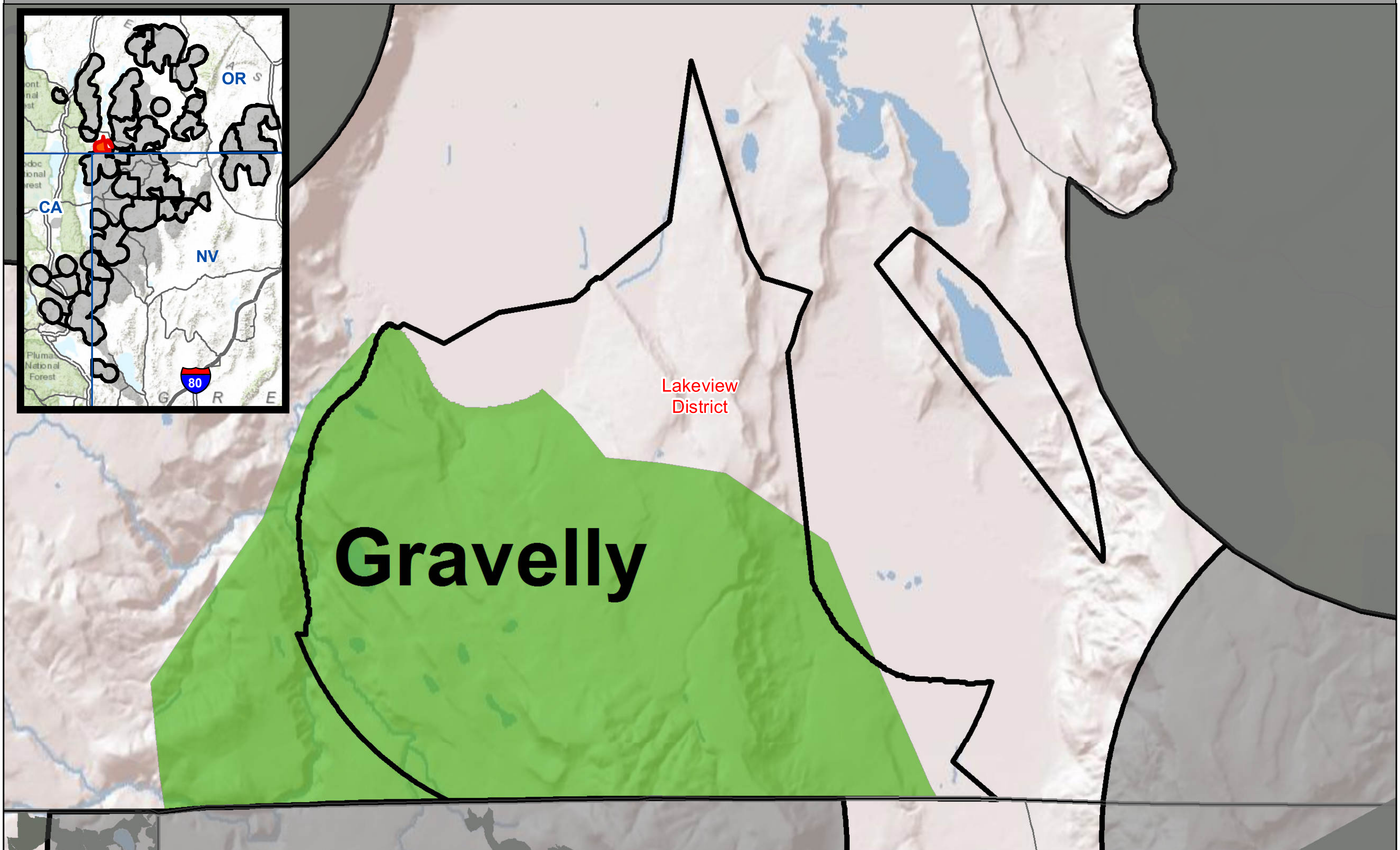
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:149,000

Gravelly Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Conifer Treatment Areas
- First
- Second
- Third

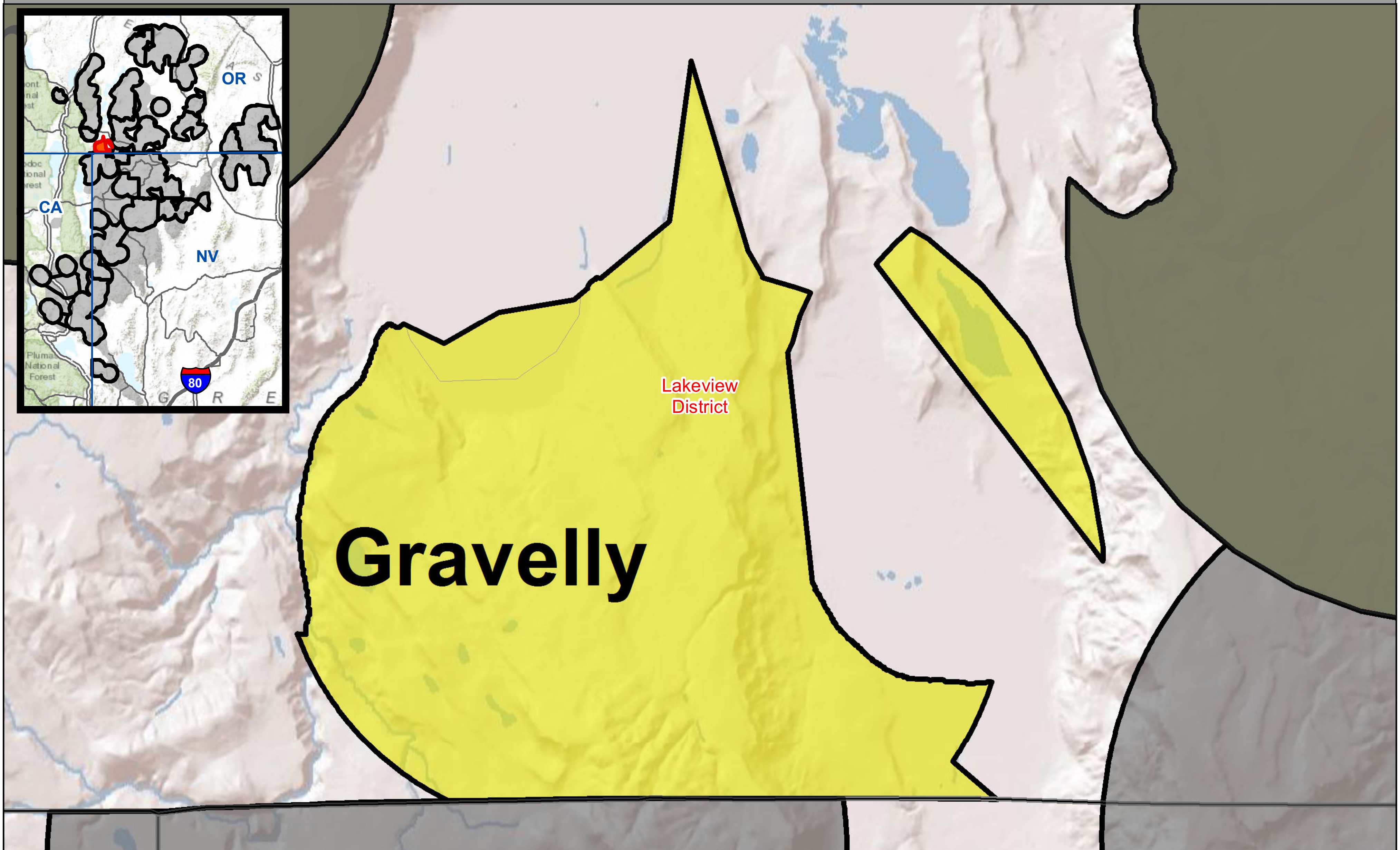
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:149,000

Gravelly Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

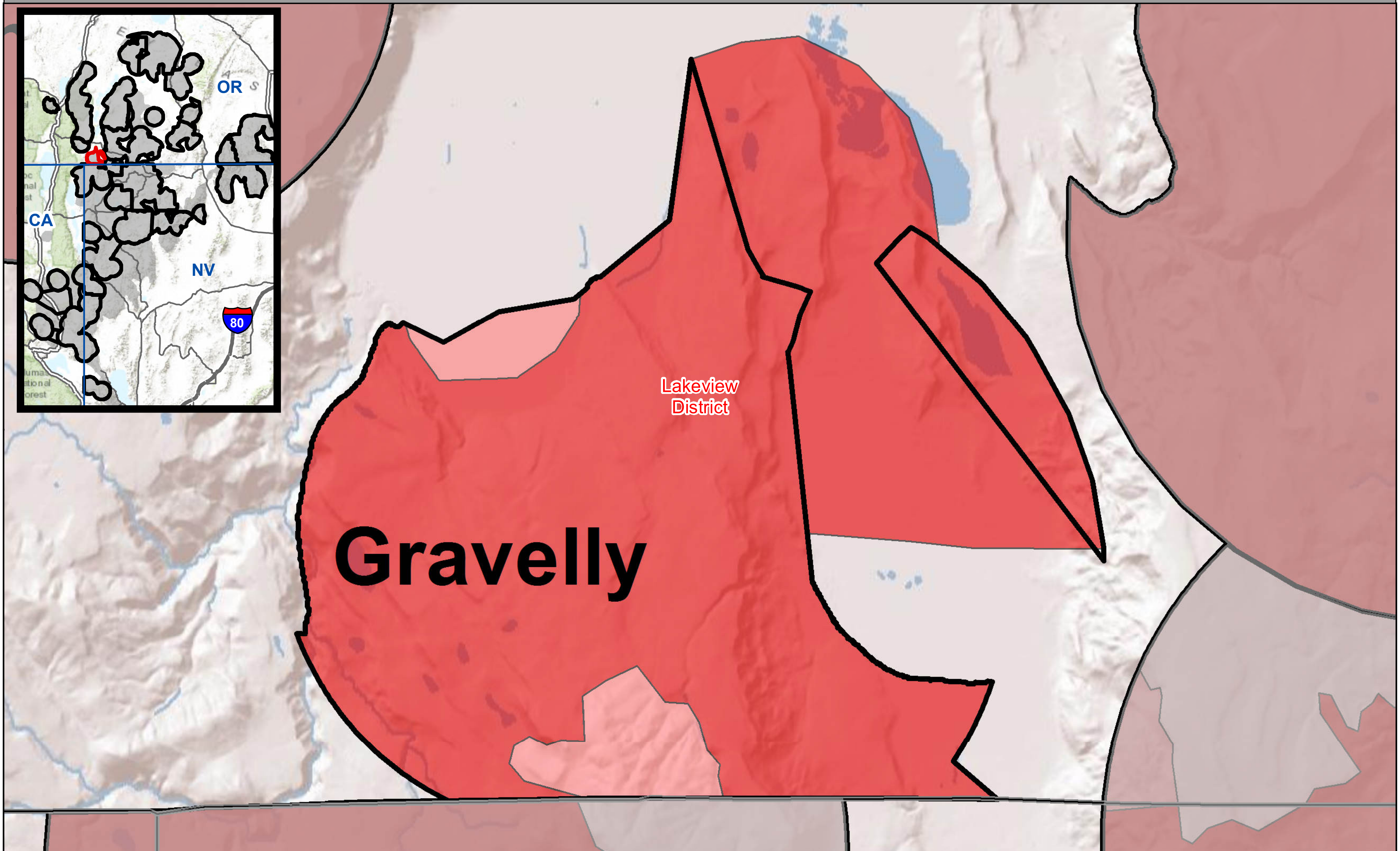
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:149,000

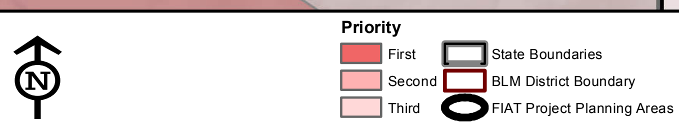
Gravelly Fire Operations

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

Western Great Basin and Warm Springs Valley
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.

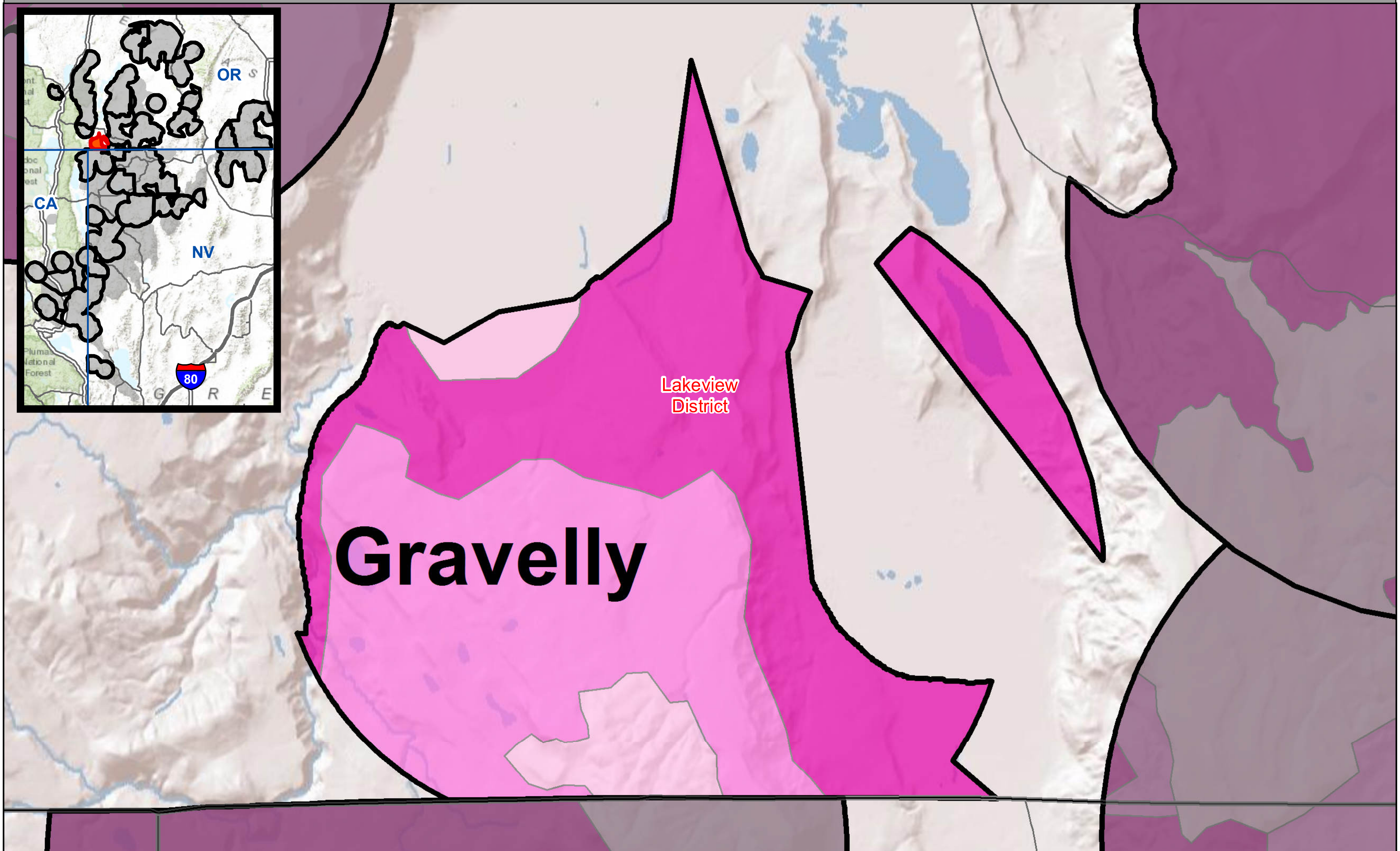


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Gravelly Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

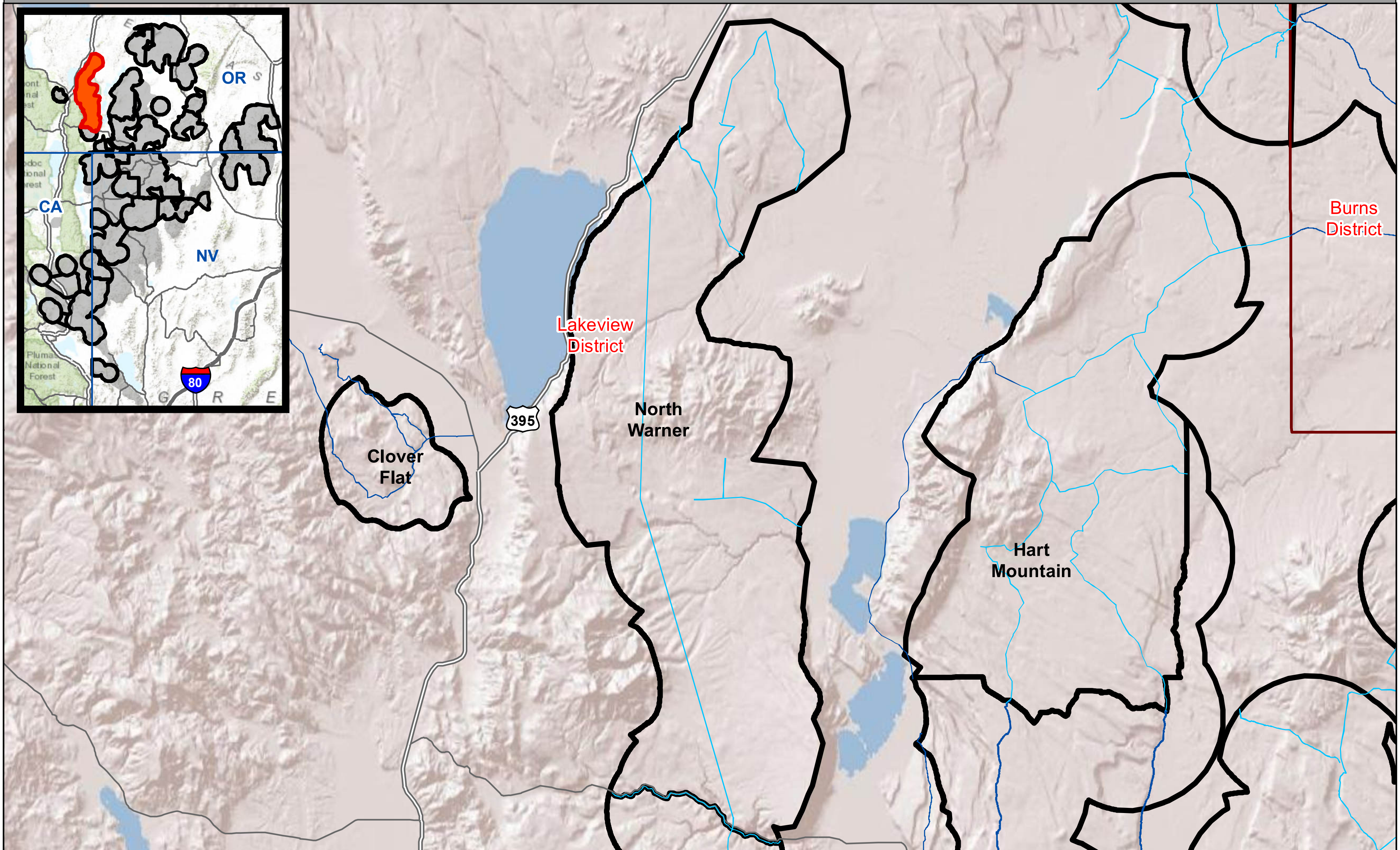
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:149,000

North Warner Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

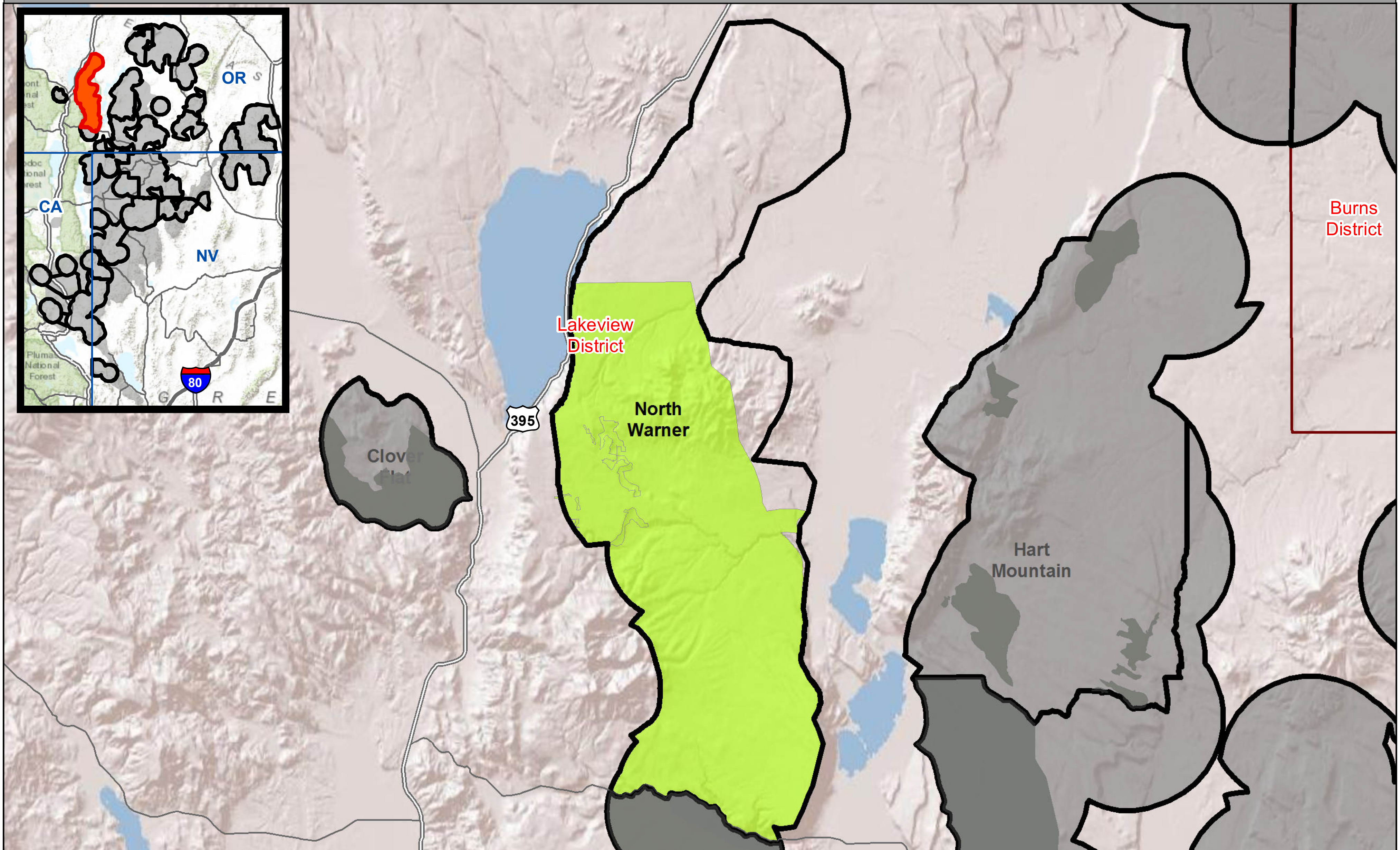
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:656,000

North Warner Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Conifer Treatment Areas

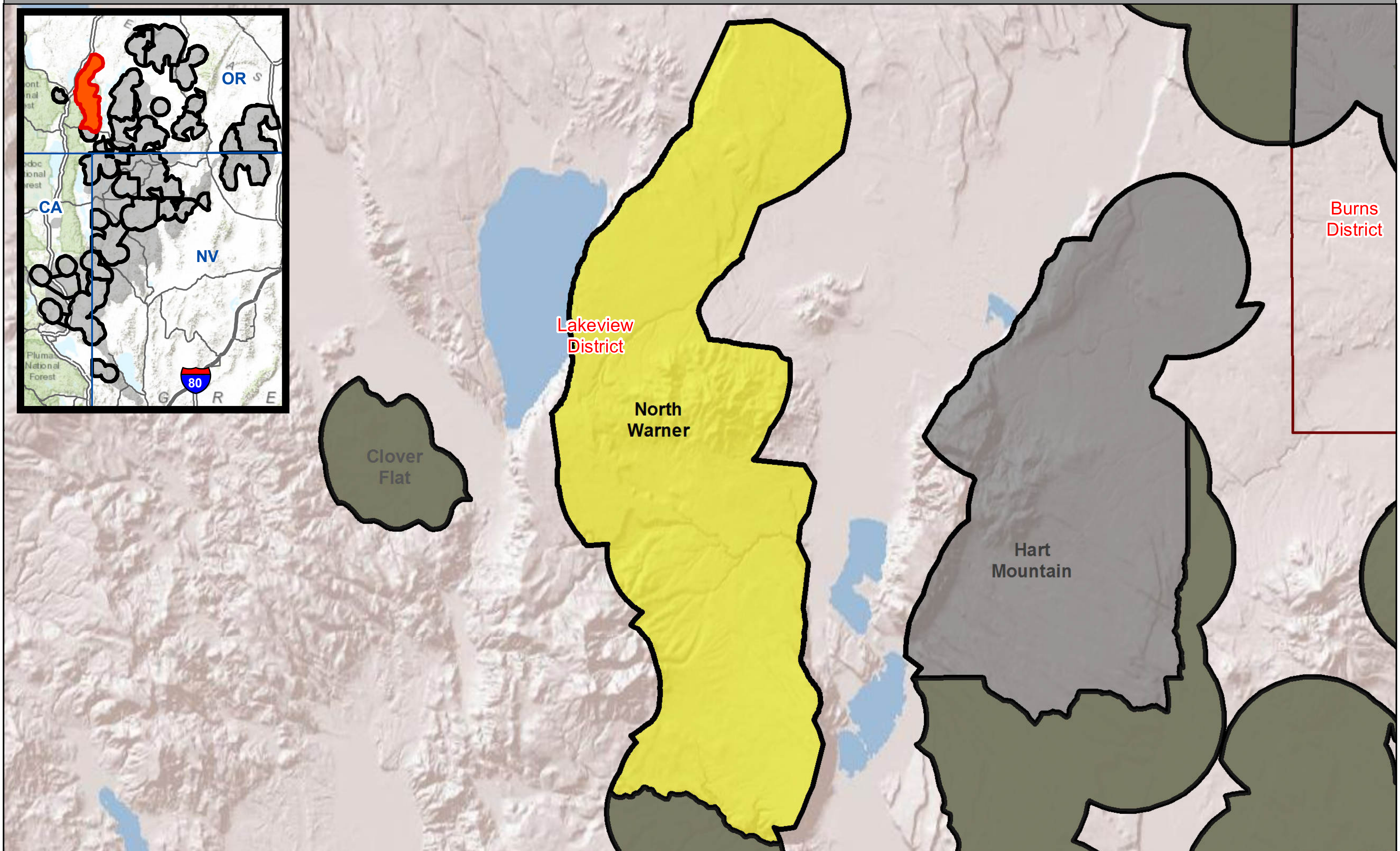
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:656,000

North Warner Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

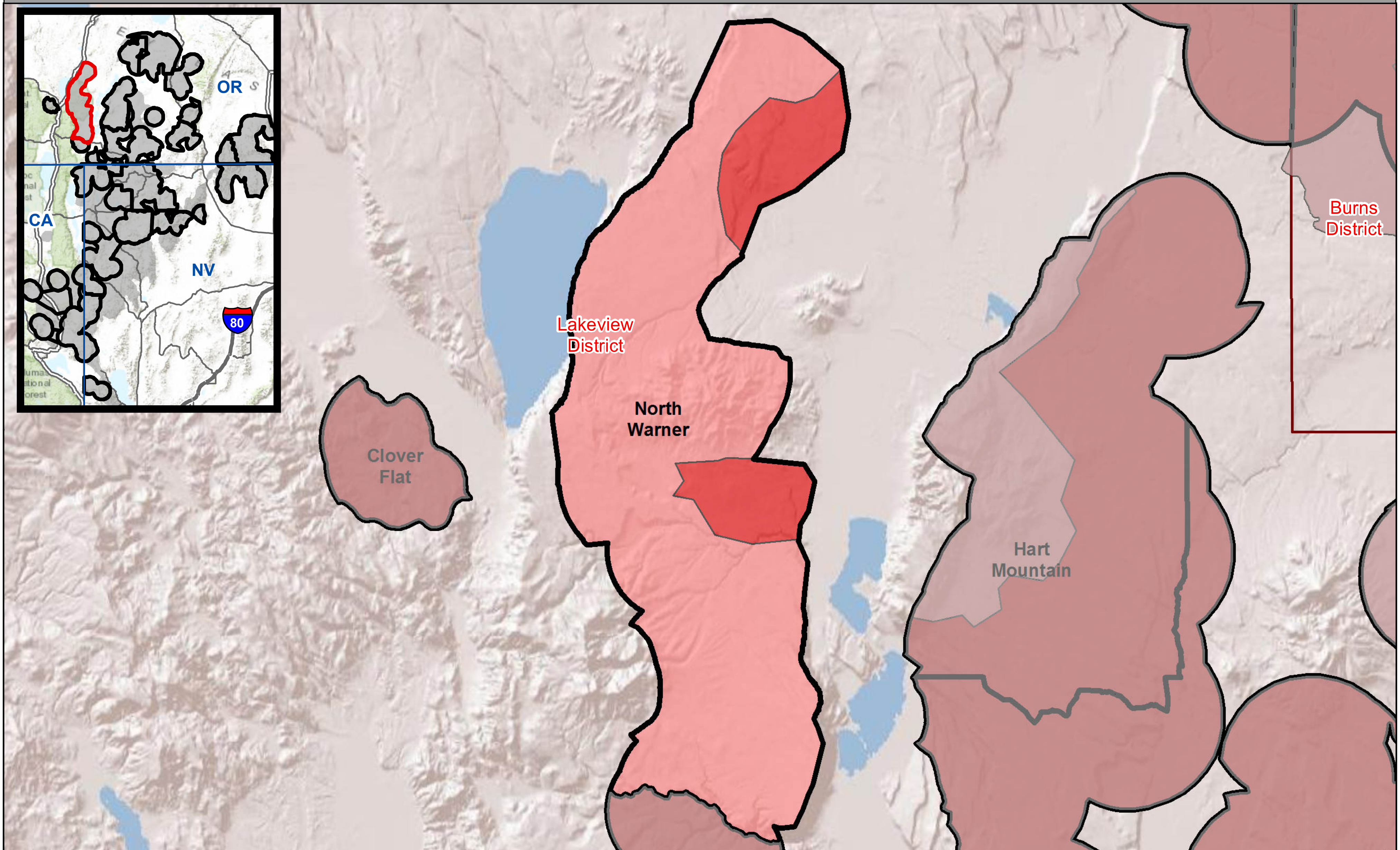
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:655,000

North Warner Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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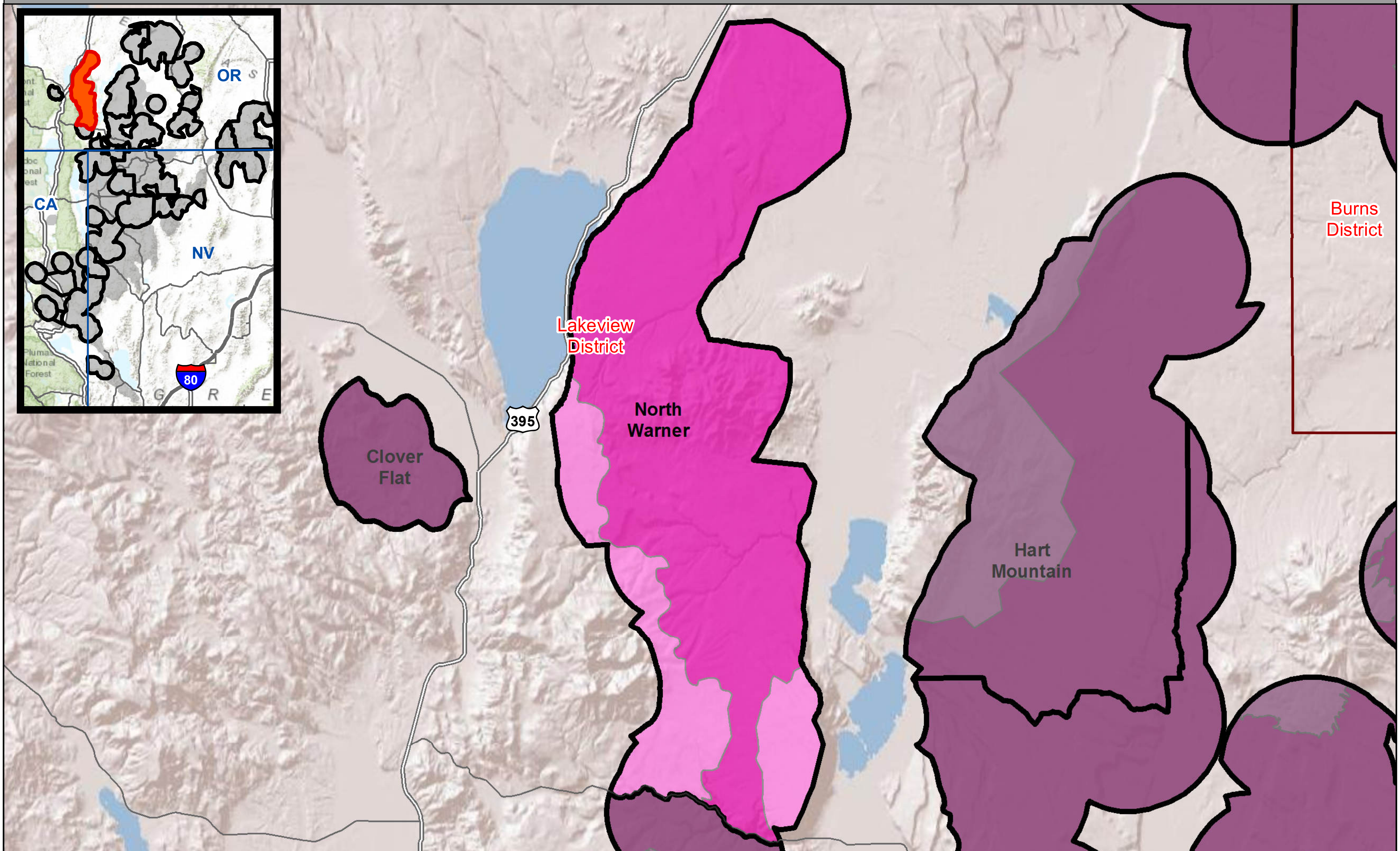
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

North Warner Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

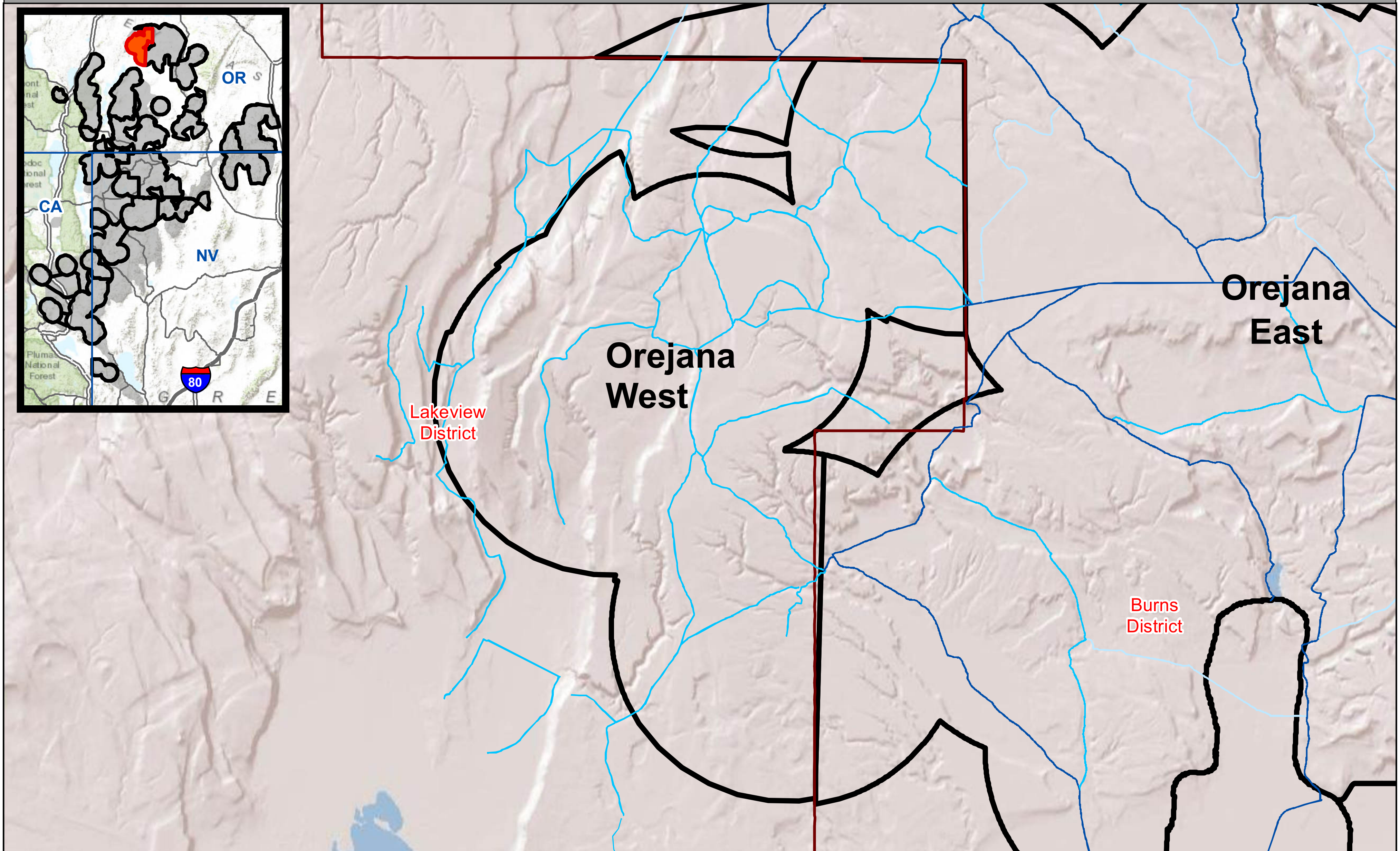
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:655,000

Orejana West Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

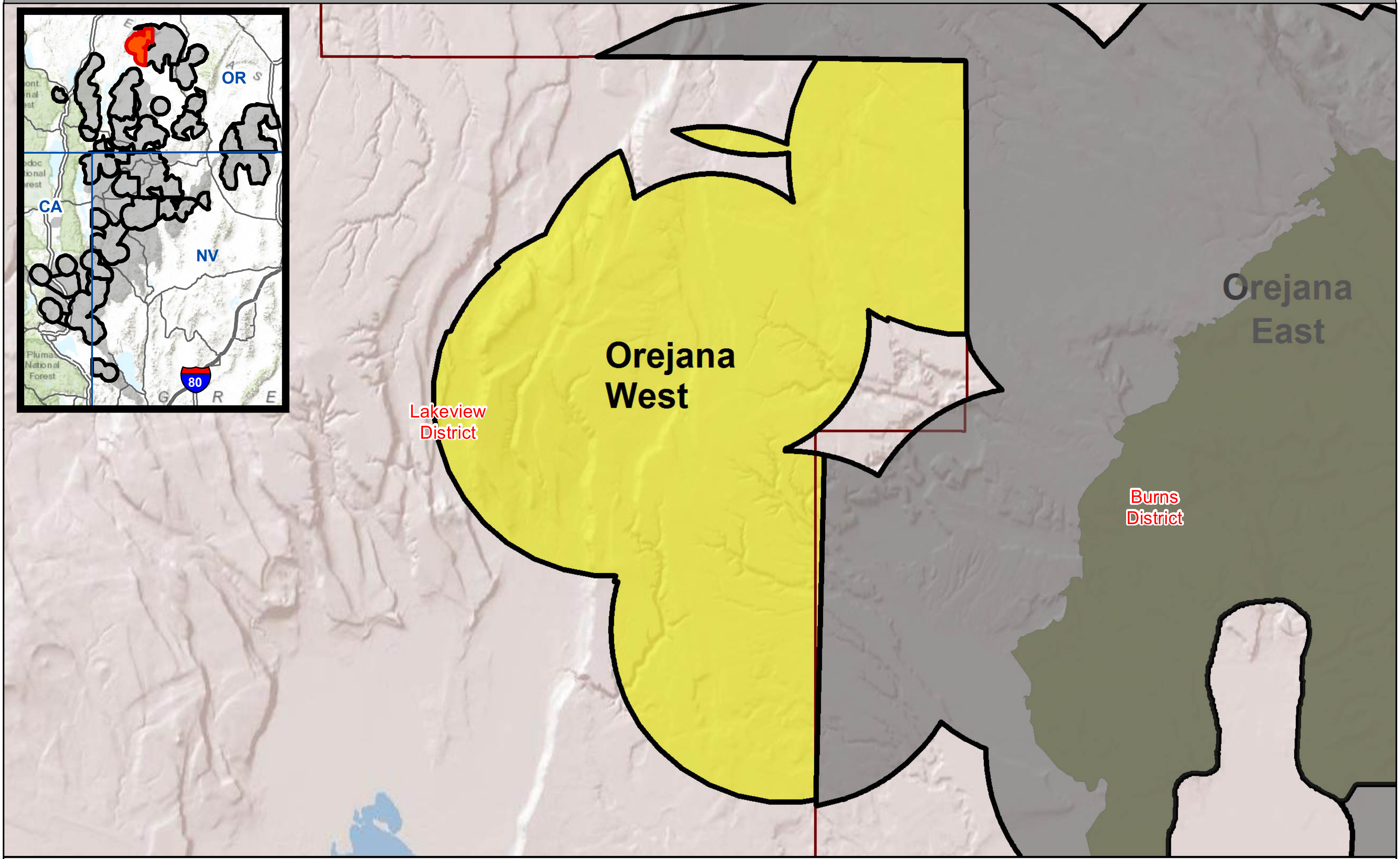
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:341,000

Orejana West Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

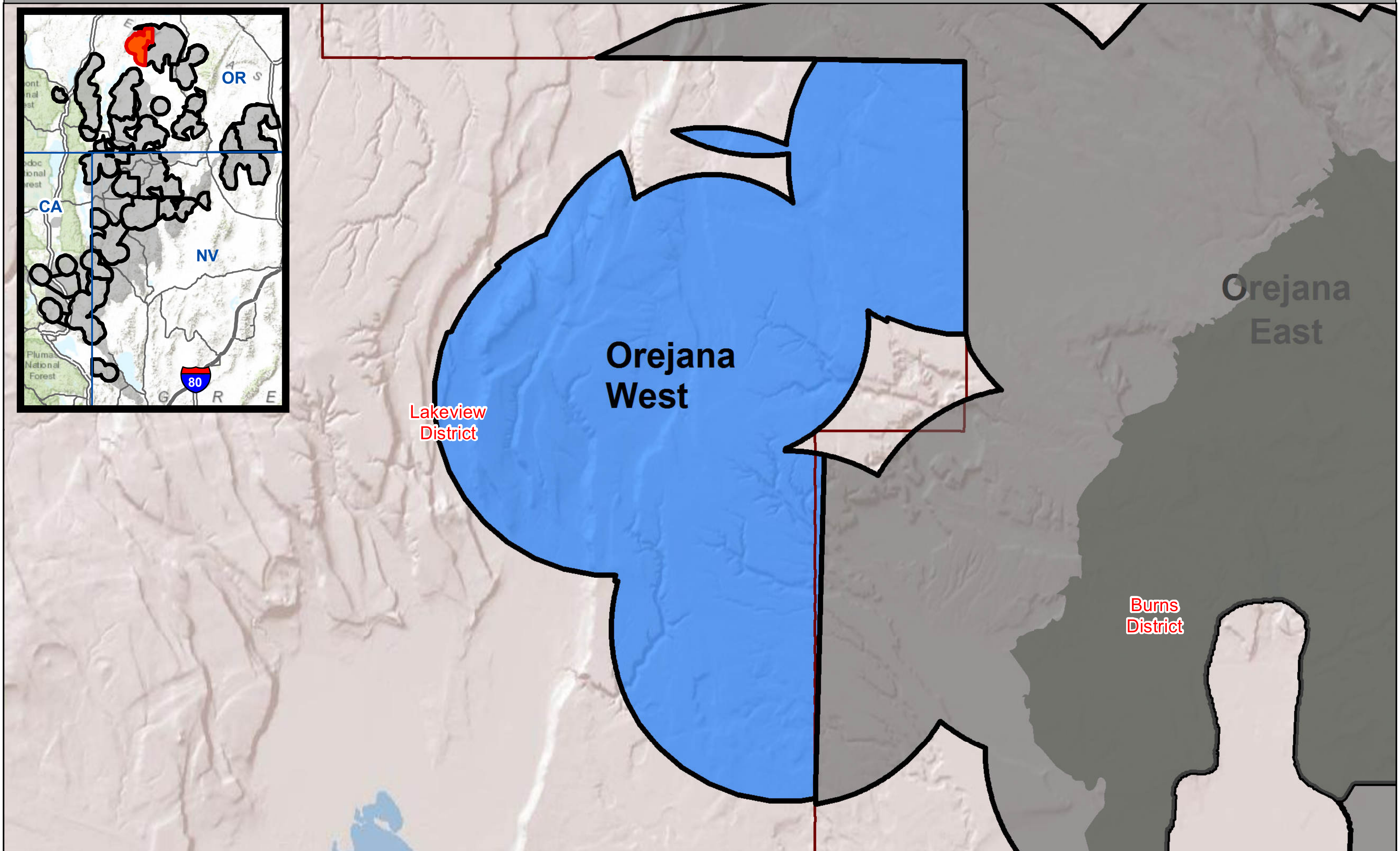
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:340,000

Orejana West Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Sagebrush Plantings
Habitat Restoration- Sagebrush Mowings

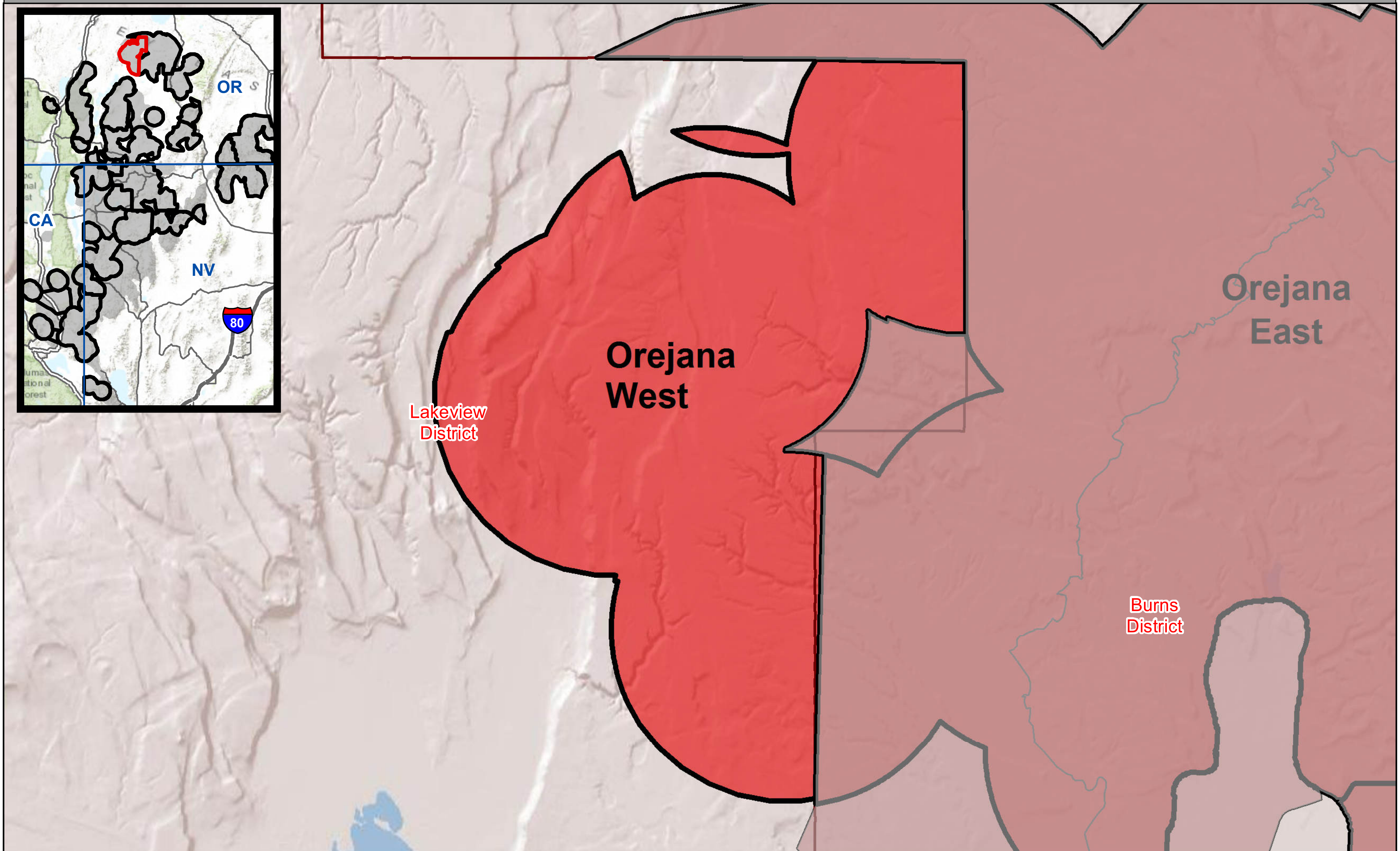
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:341,000

Orejana West Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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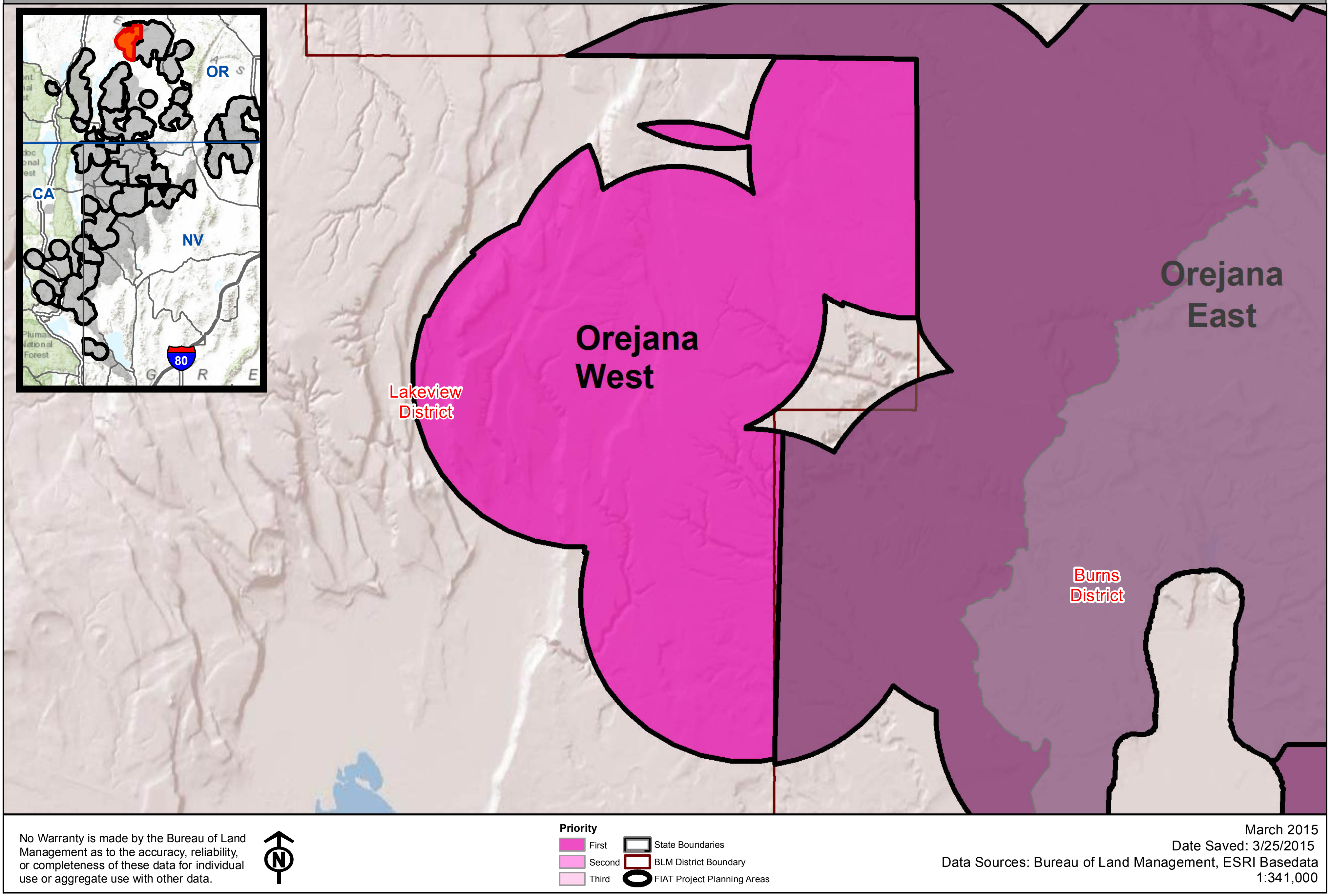
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Orejana West Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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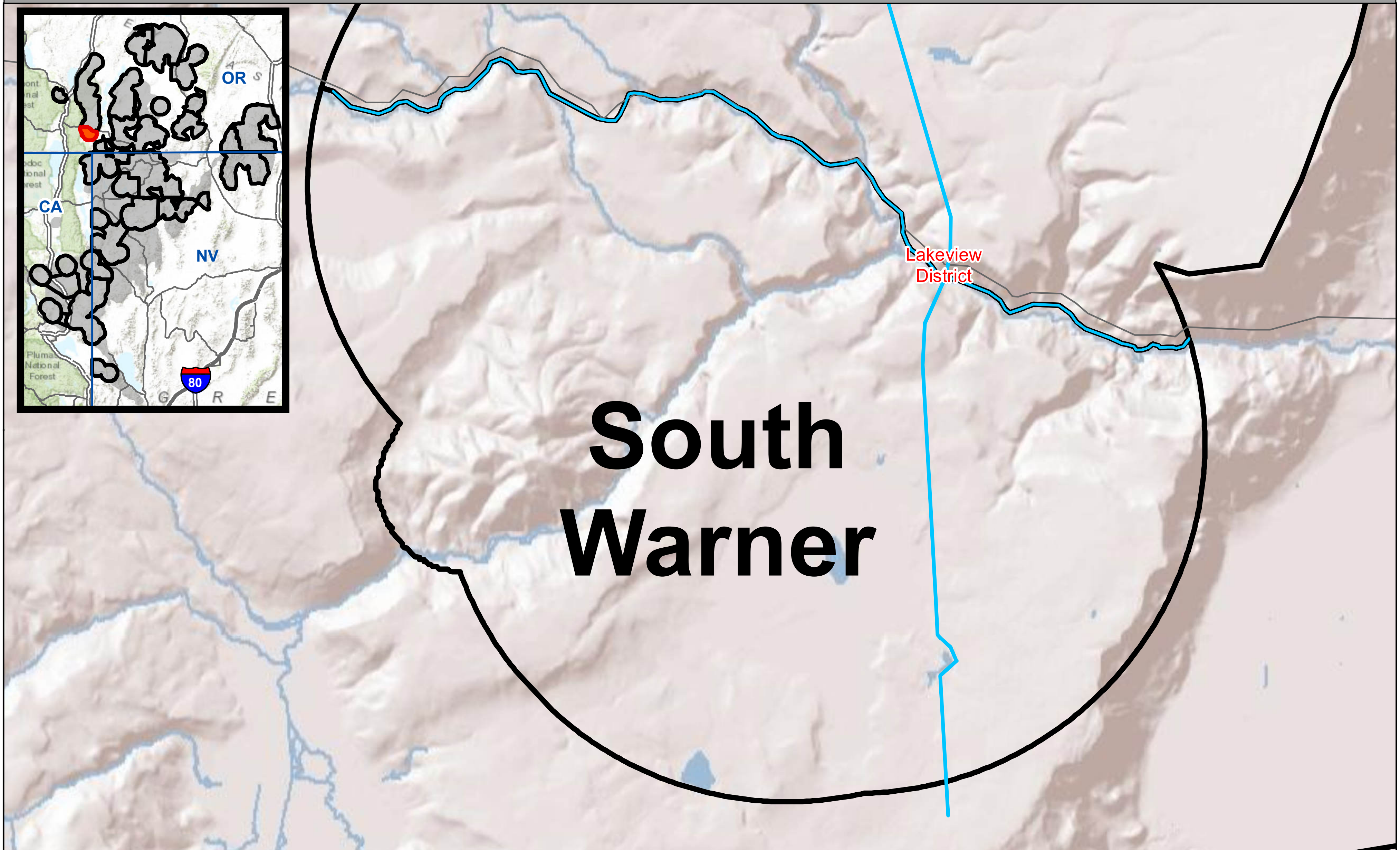
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:341,000

South Warner Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation

- First
- Second
- Third

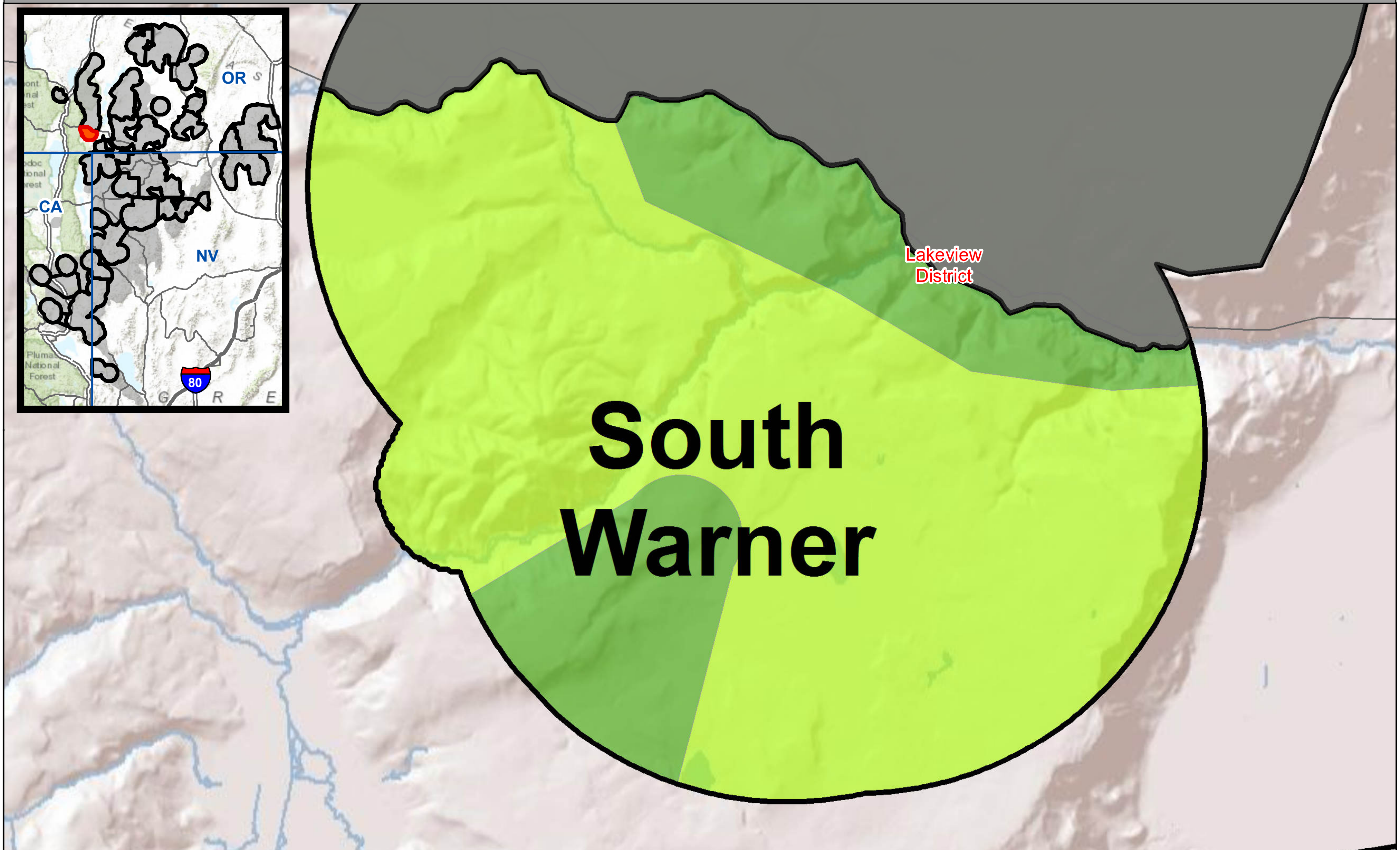
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:129,000

South Warner Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

First
Second
Third

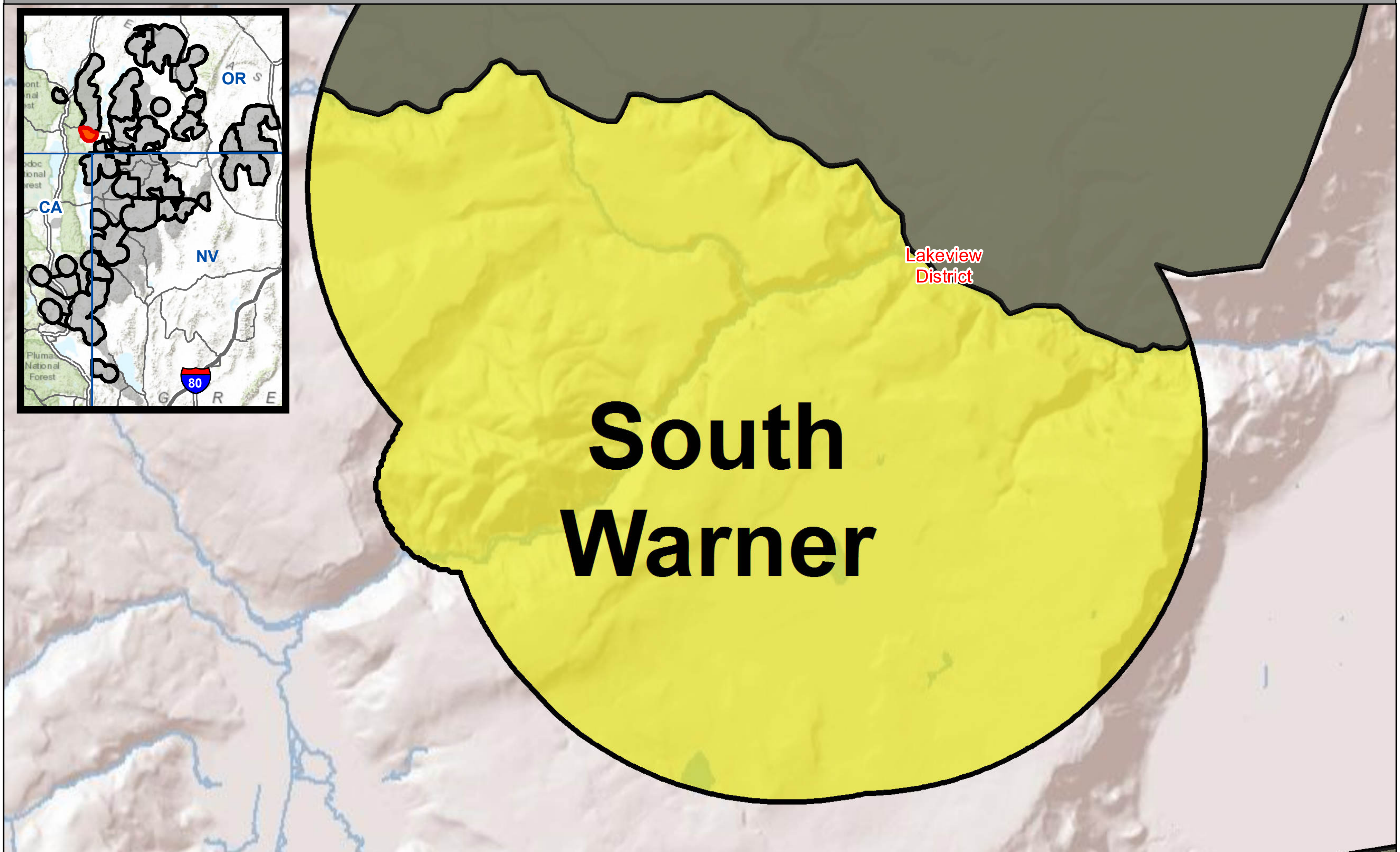
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:129,000

South Warner Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

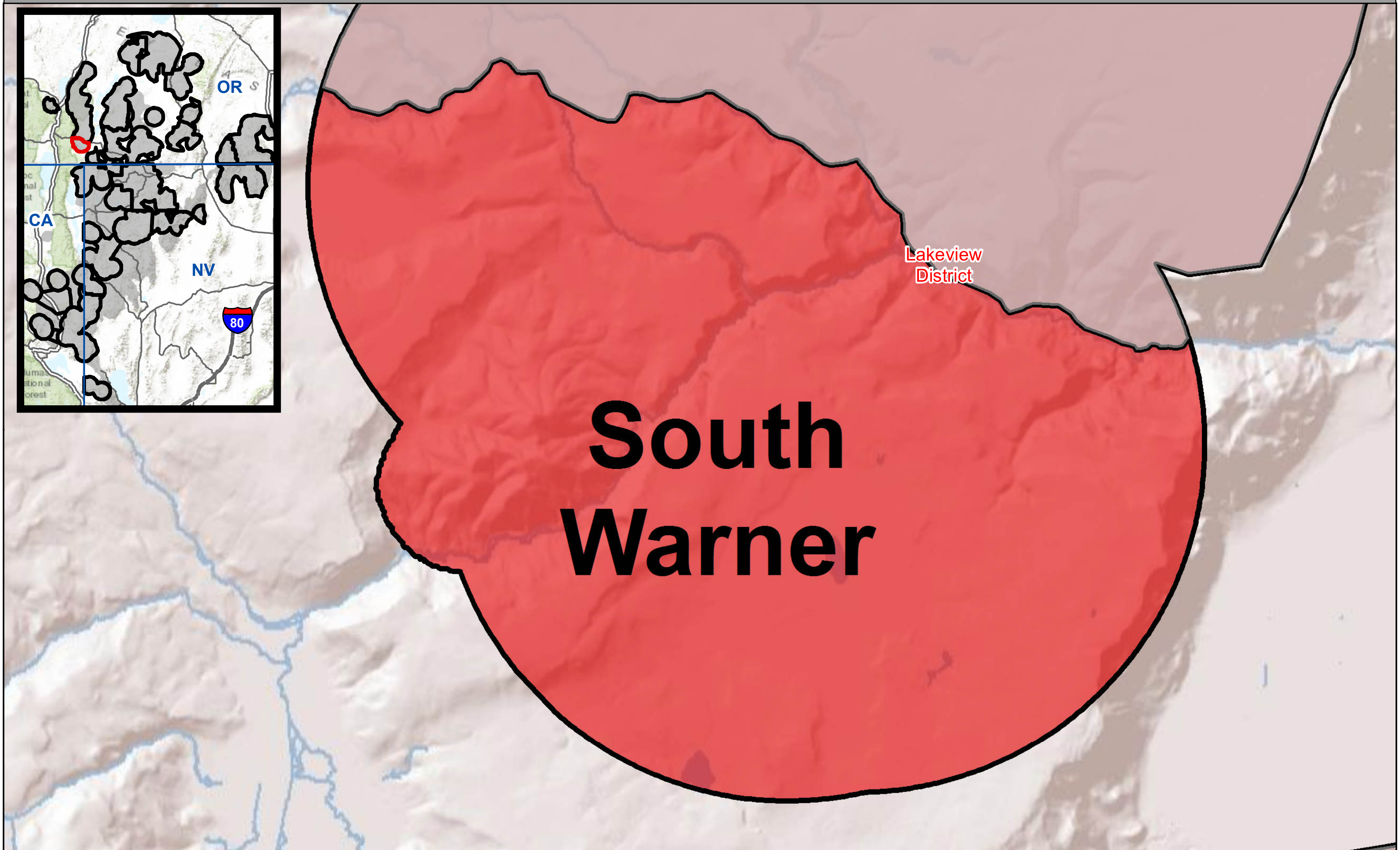
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:129,000

South Warner Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority

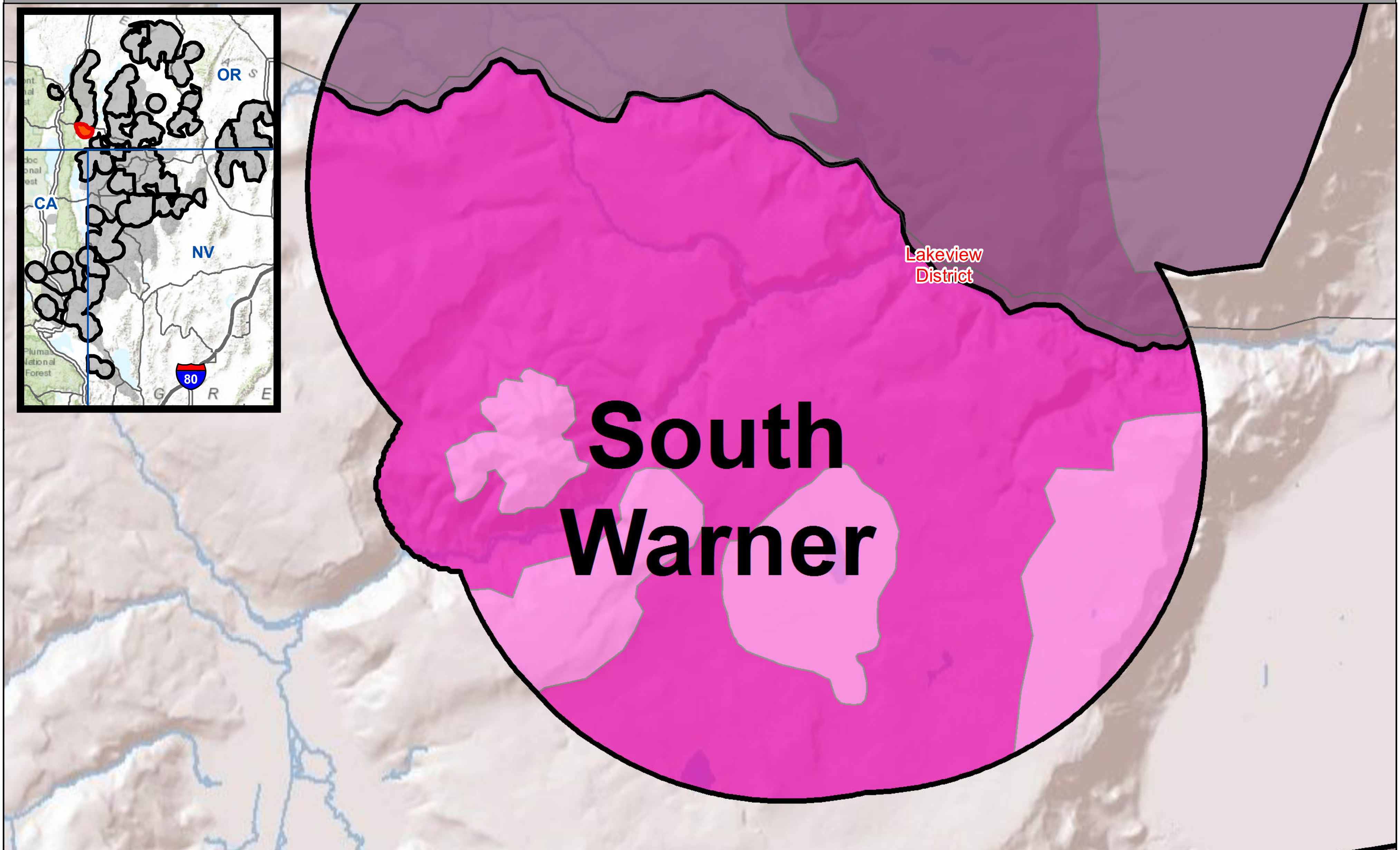
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

South Warner Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

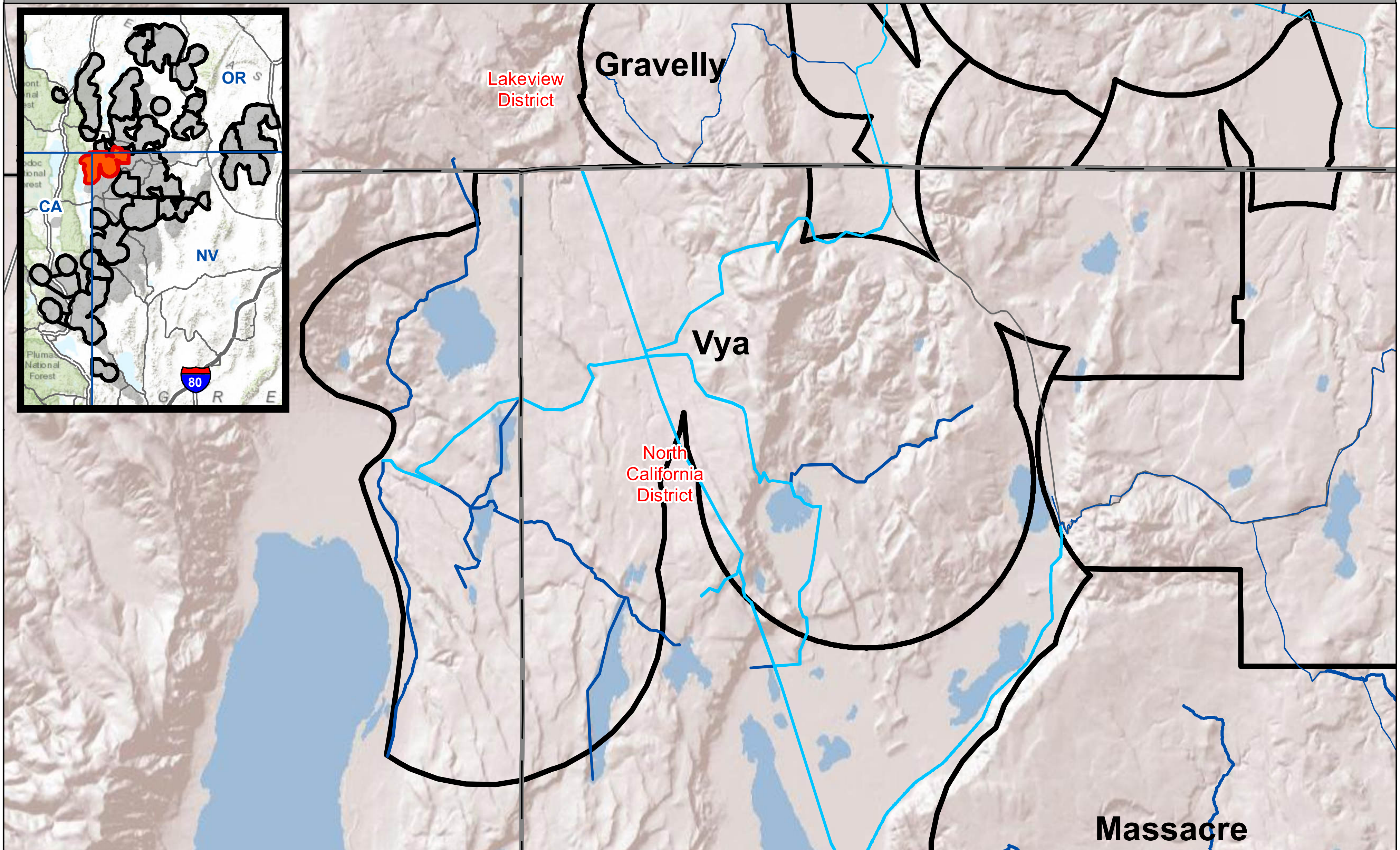
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:129,000

Vya Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority for Implementation
- First
- Second
- Third

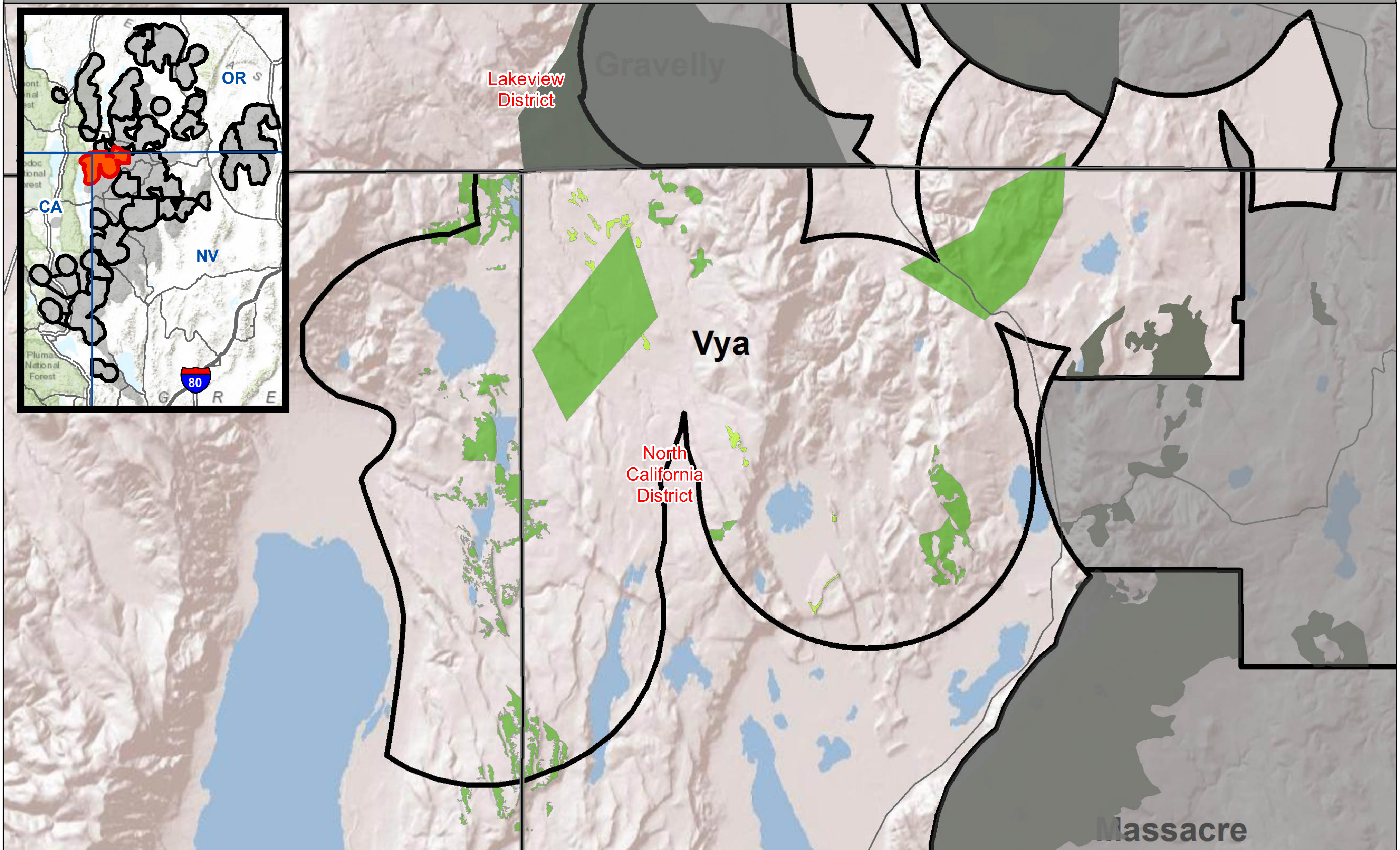
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:355,000

Vya Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

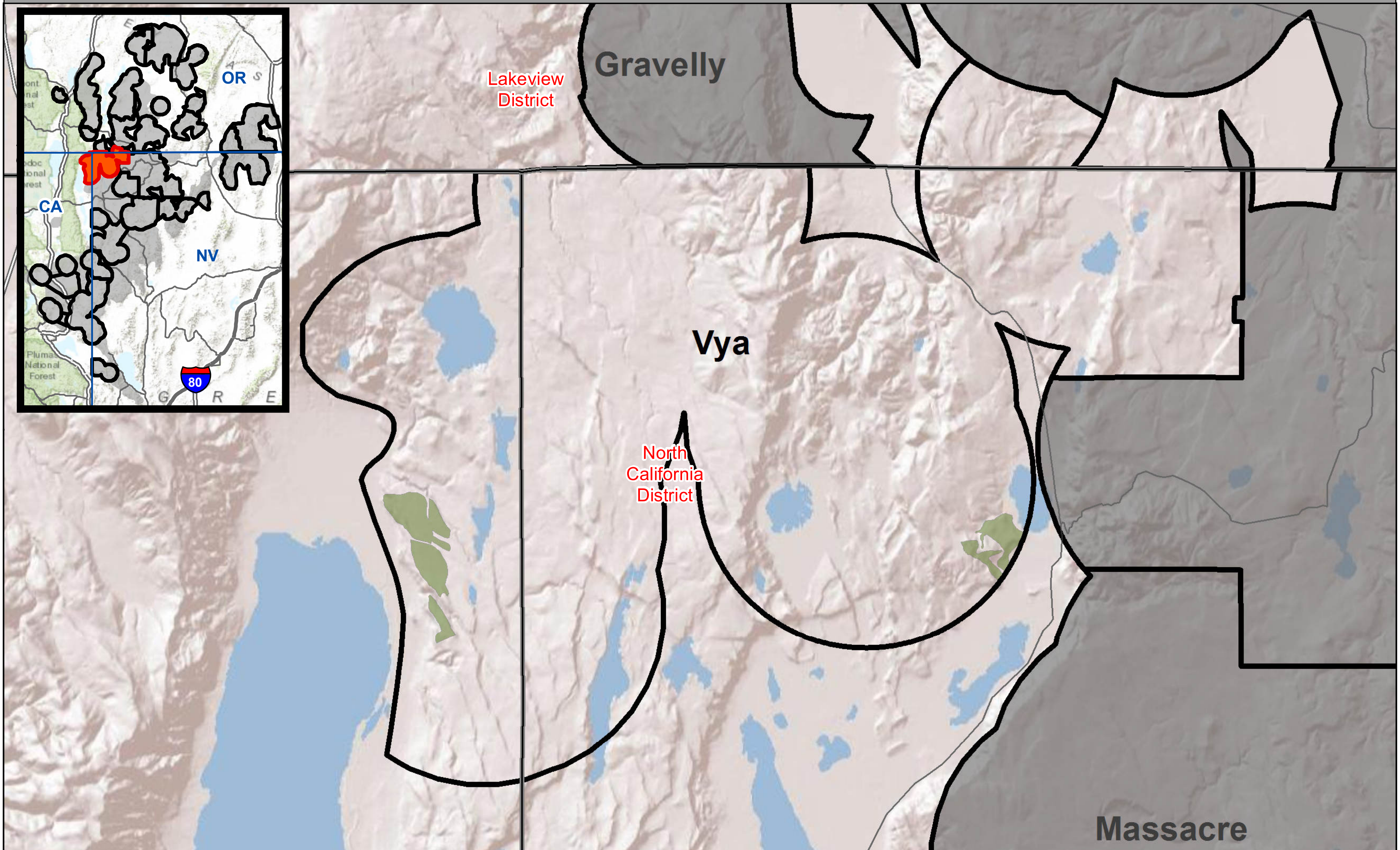
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:355,000

Vya Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Sagebrush Plantings
Habitat Restoration- Sagebrush Mowings

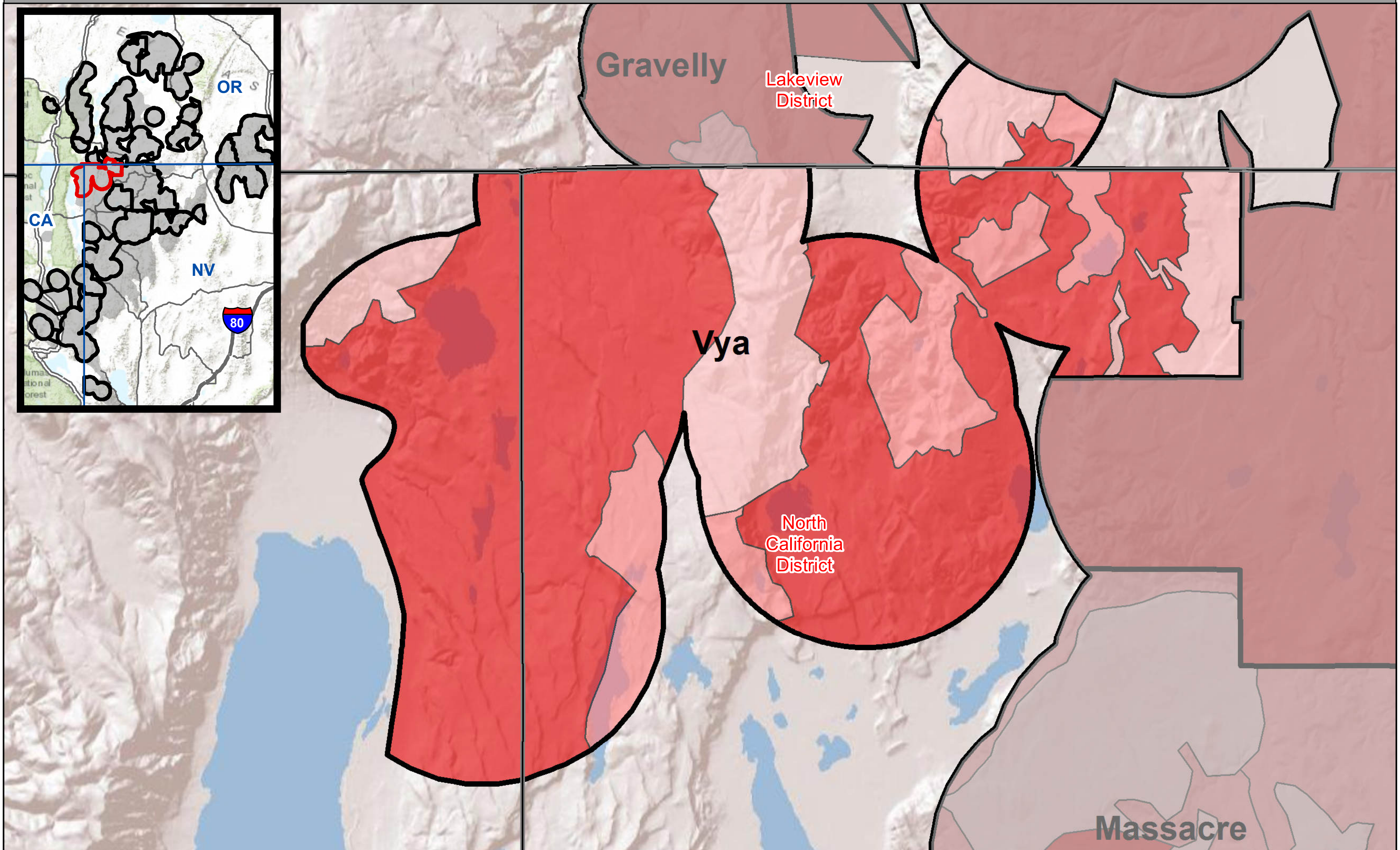
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:355,000

Vya Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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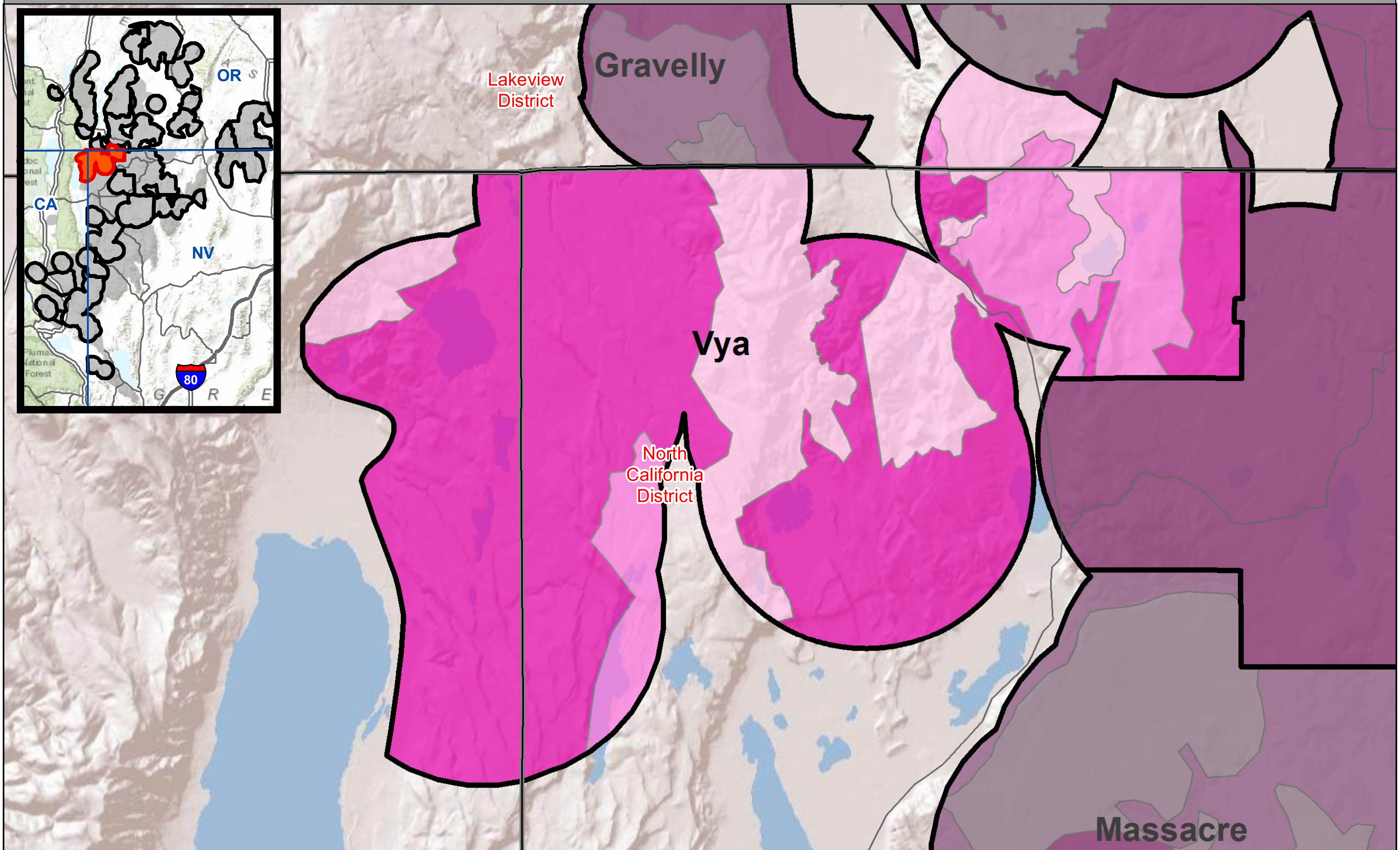
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Vya Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

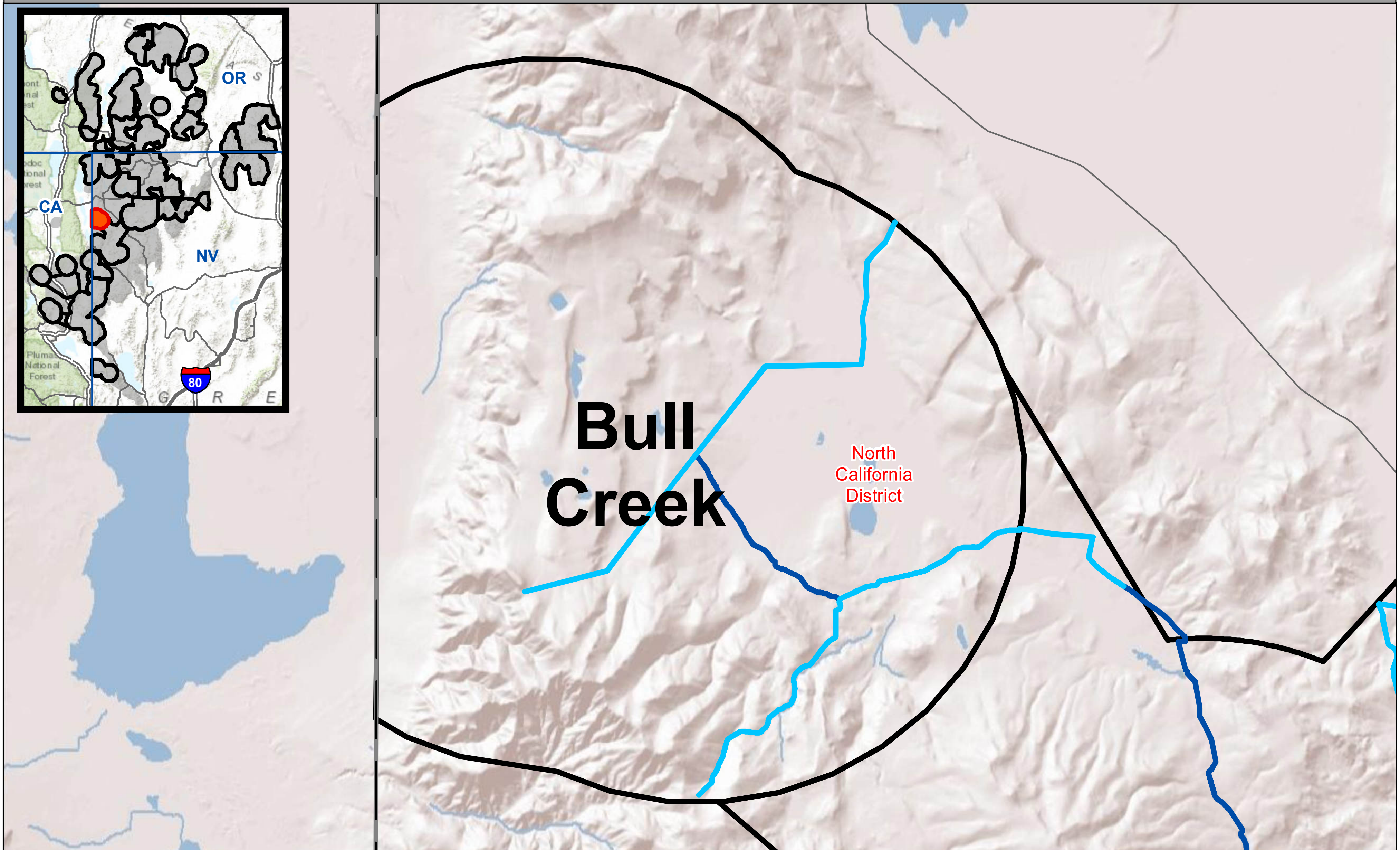
Priority
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:355,000

Bull Creek Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority for Implementation
First
Second
Third

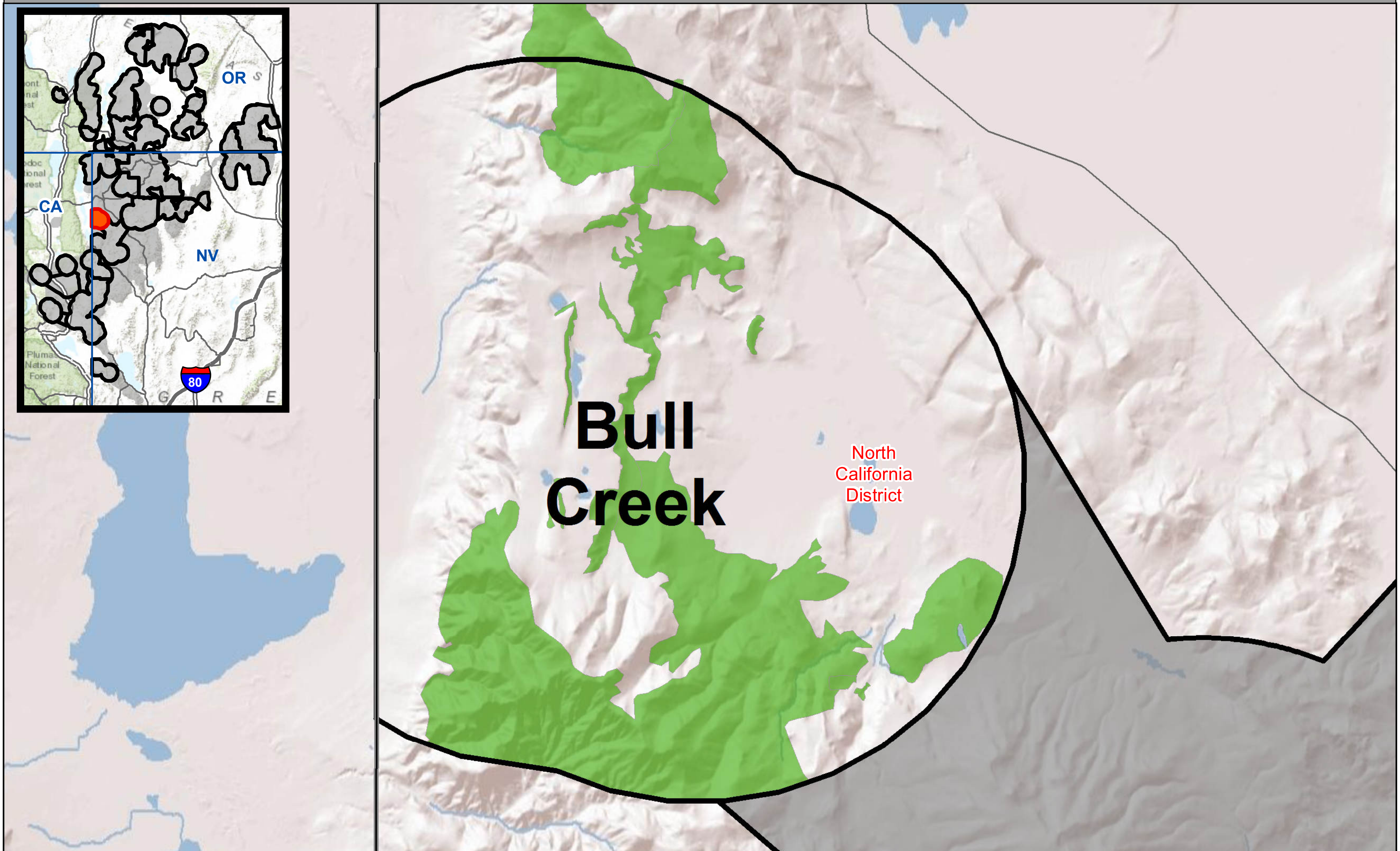
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:182,000

Bull Creek Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

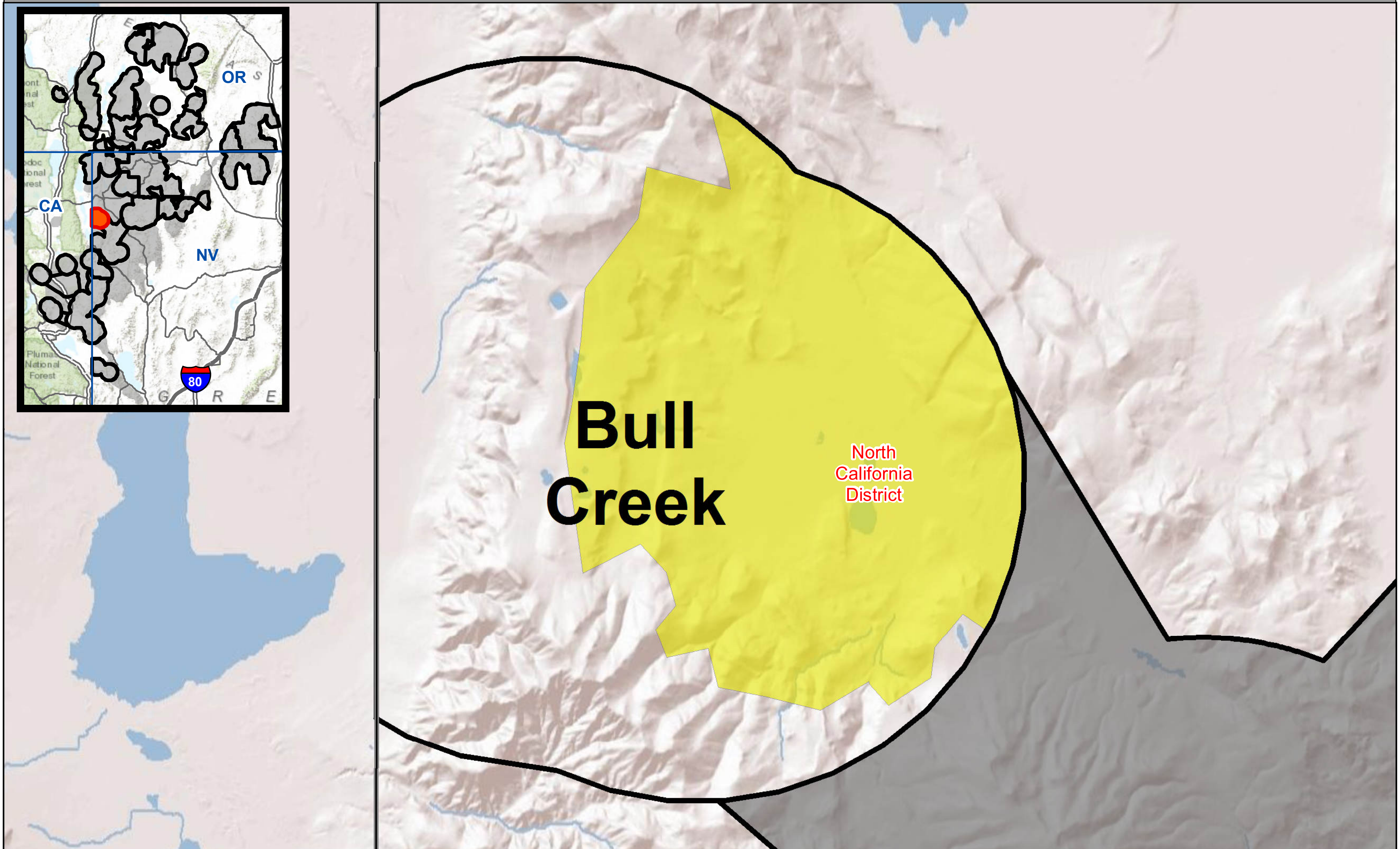
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:182,000

Bull Creek Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

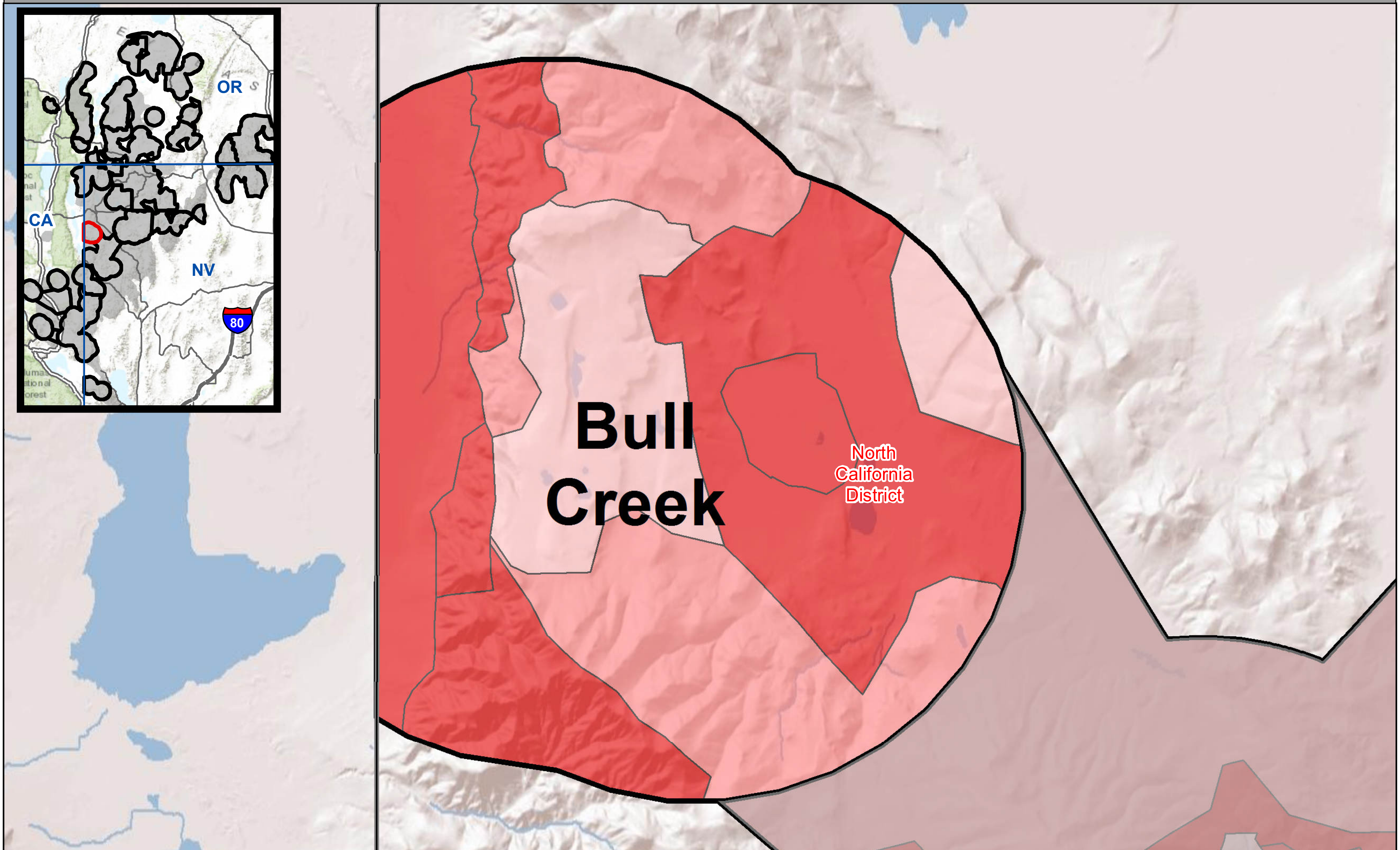
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:182,000

Bull Creek Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority

First
Second
Third

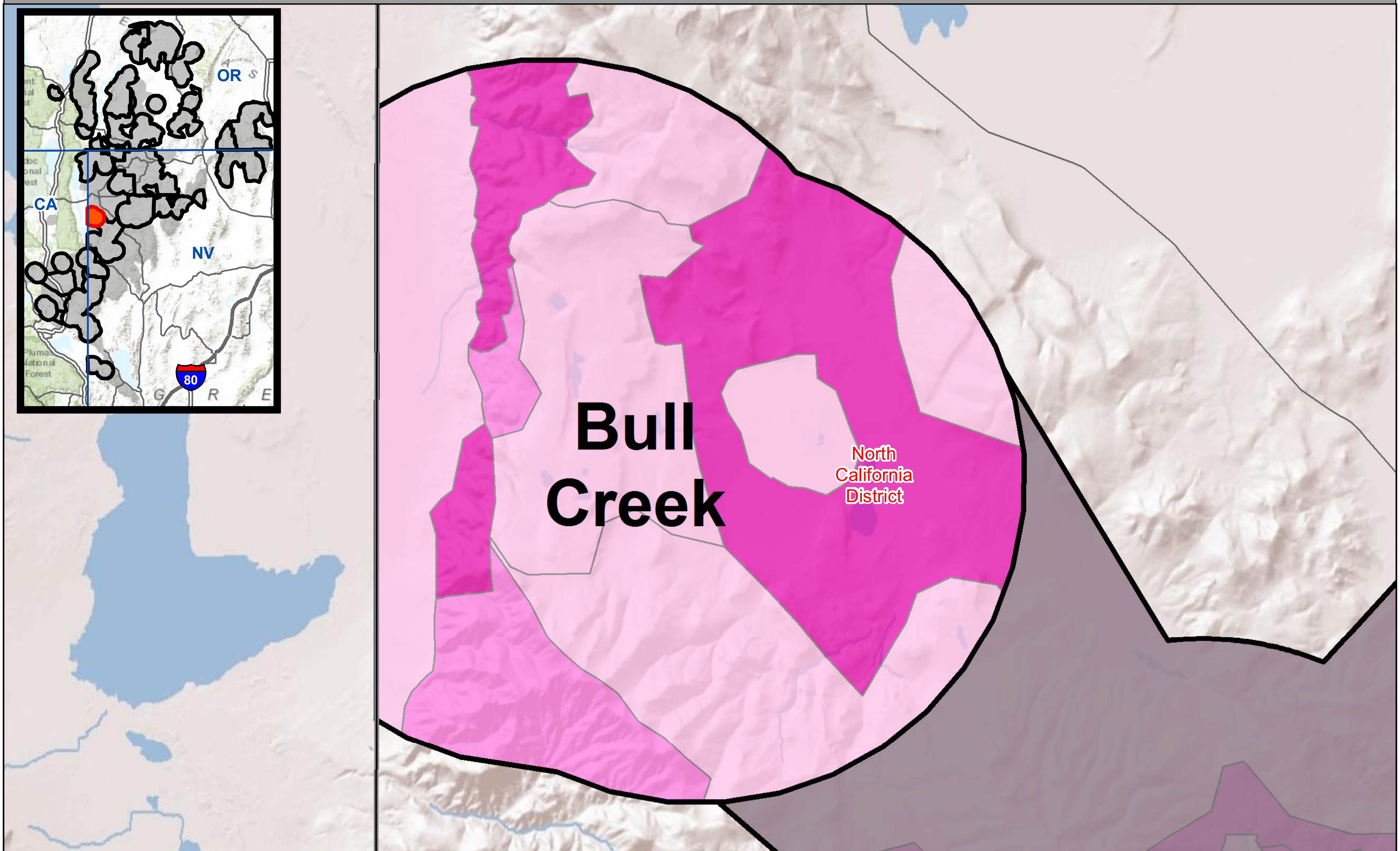
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Bull Creek Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

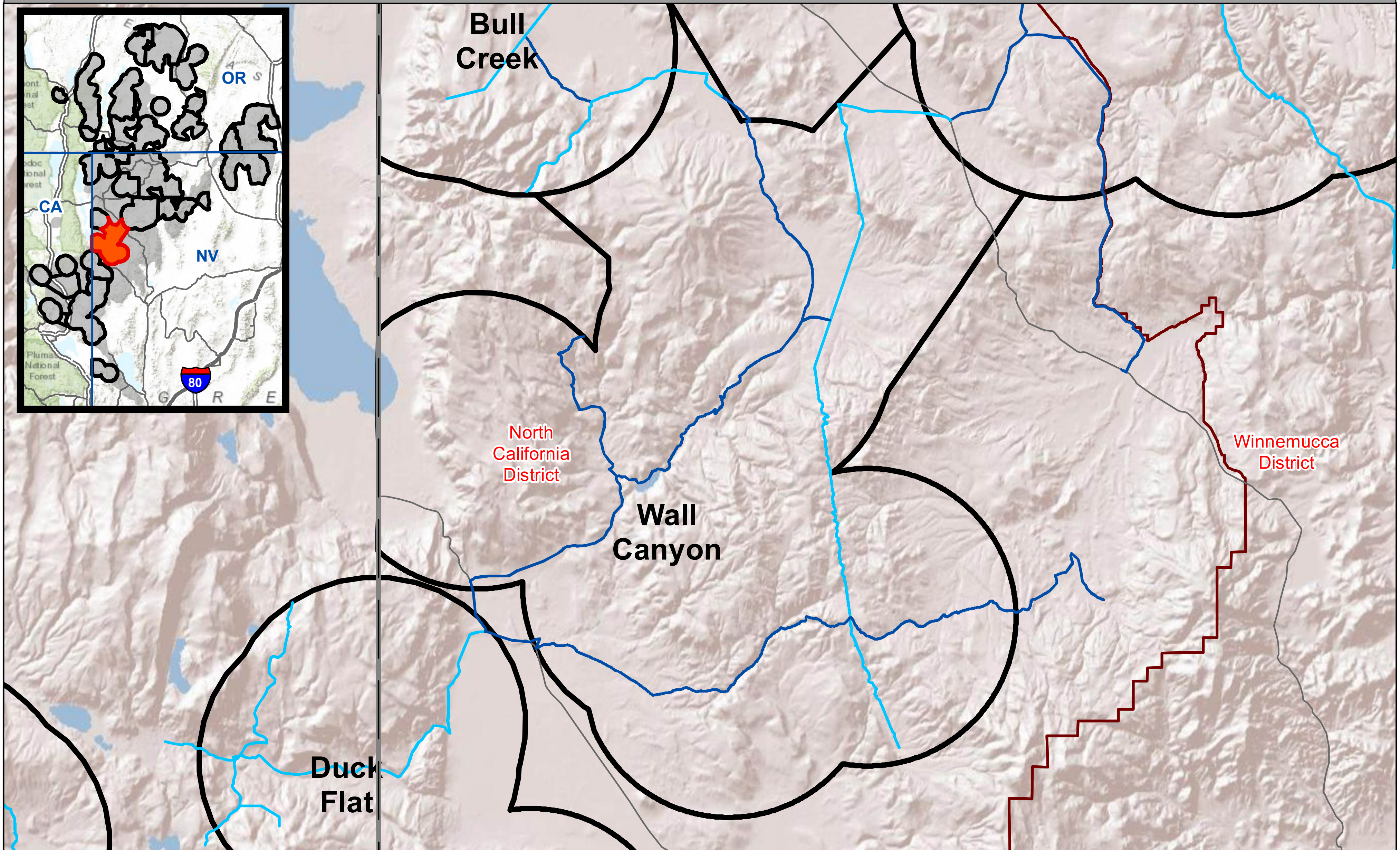
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:182,000

Wall Canyon Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

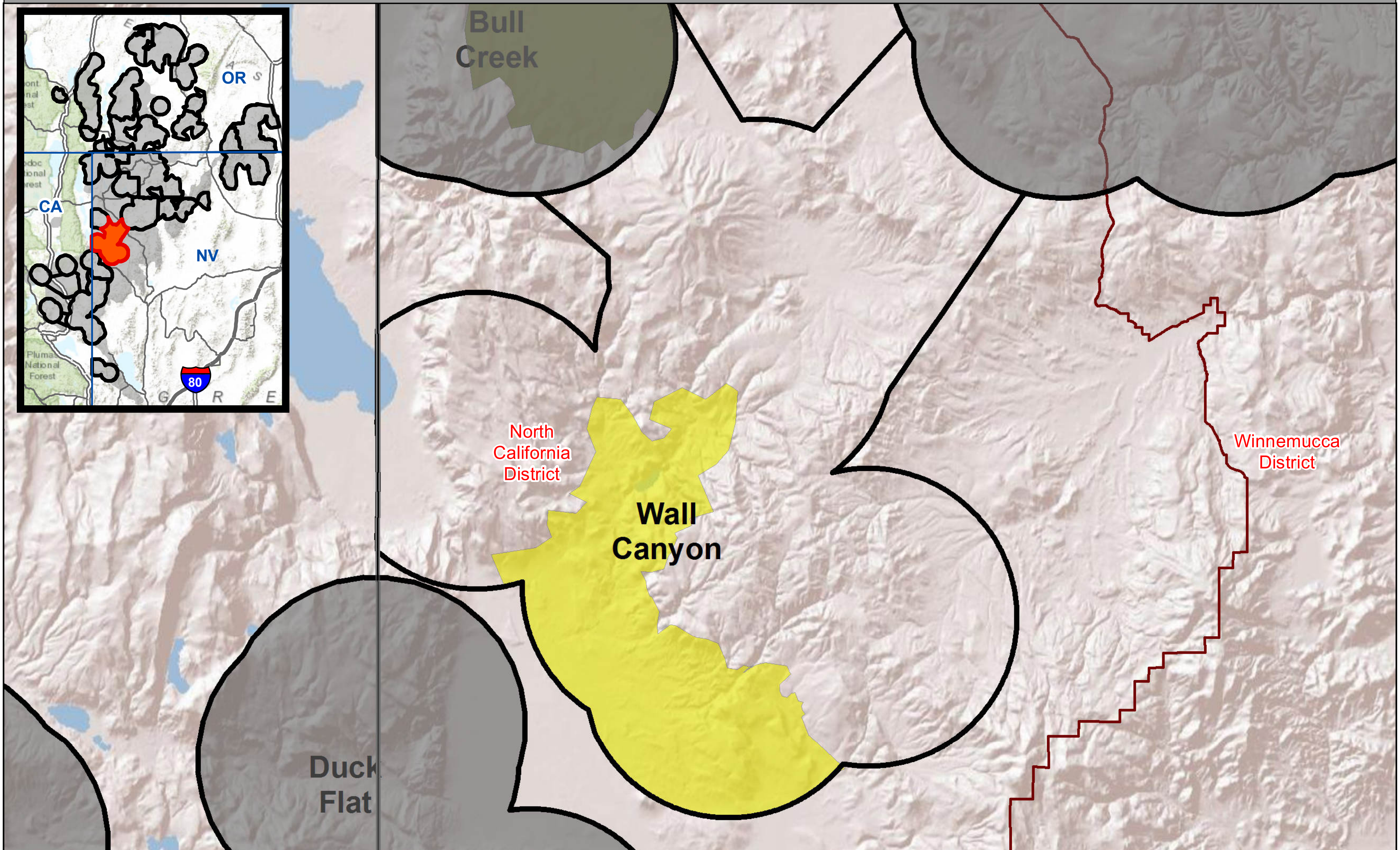
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:397,000

Wall Canyon Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

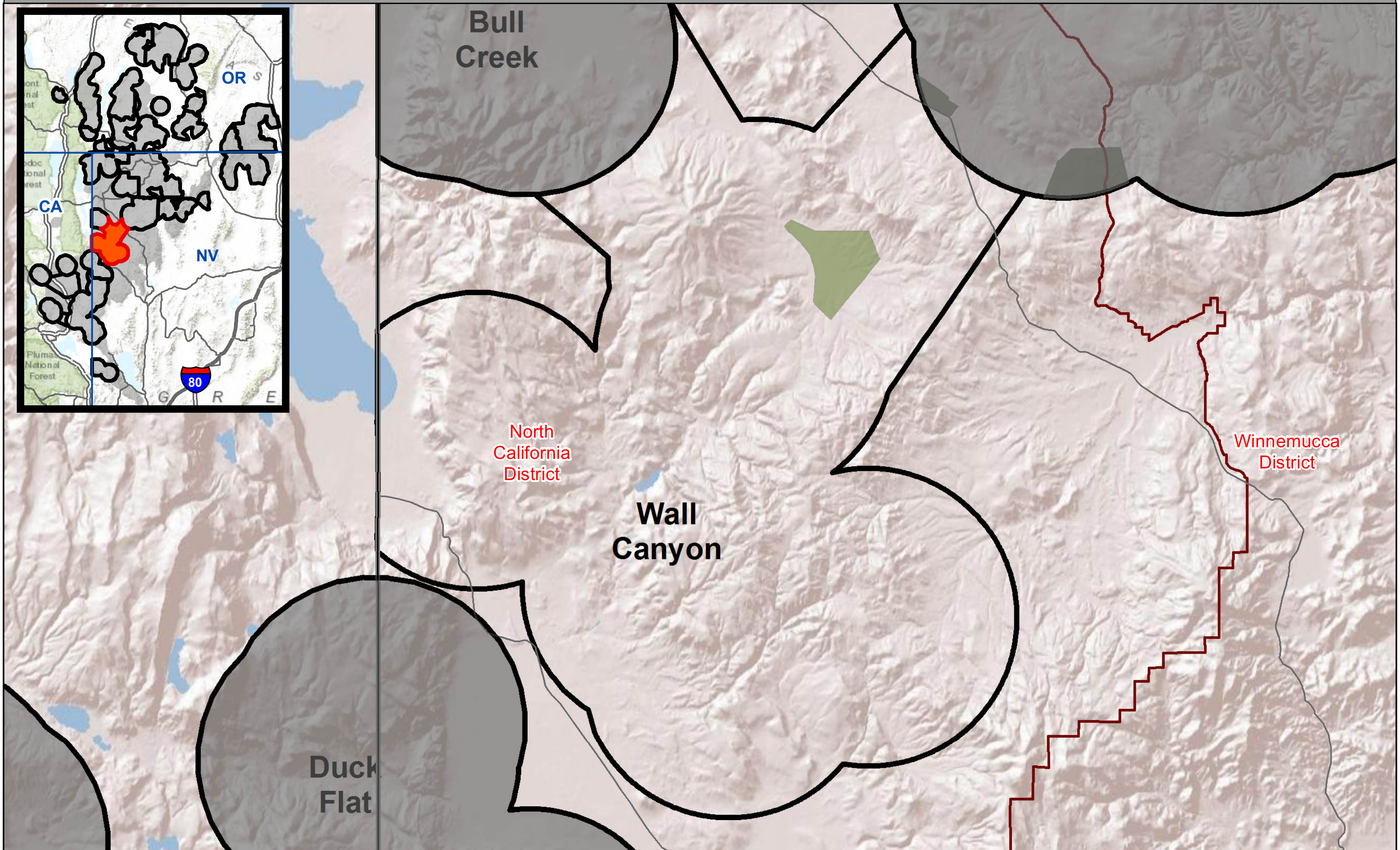
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:396,000

Wall Canyon Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

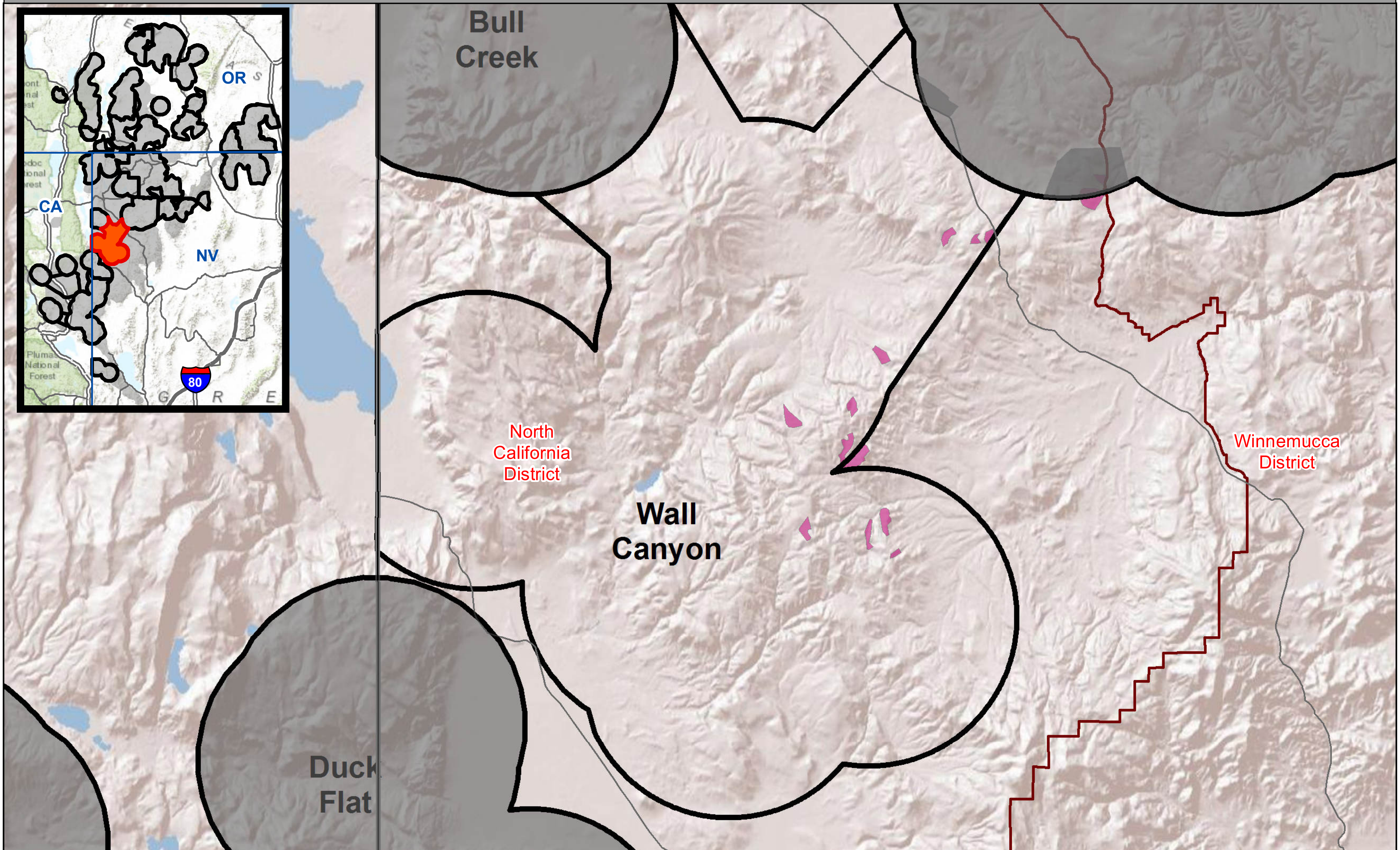
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:396,000

Wall Canyon Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

State Boundary

BLM District Boundary

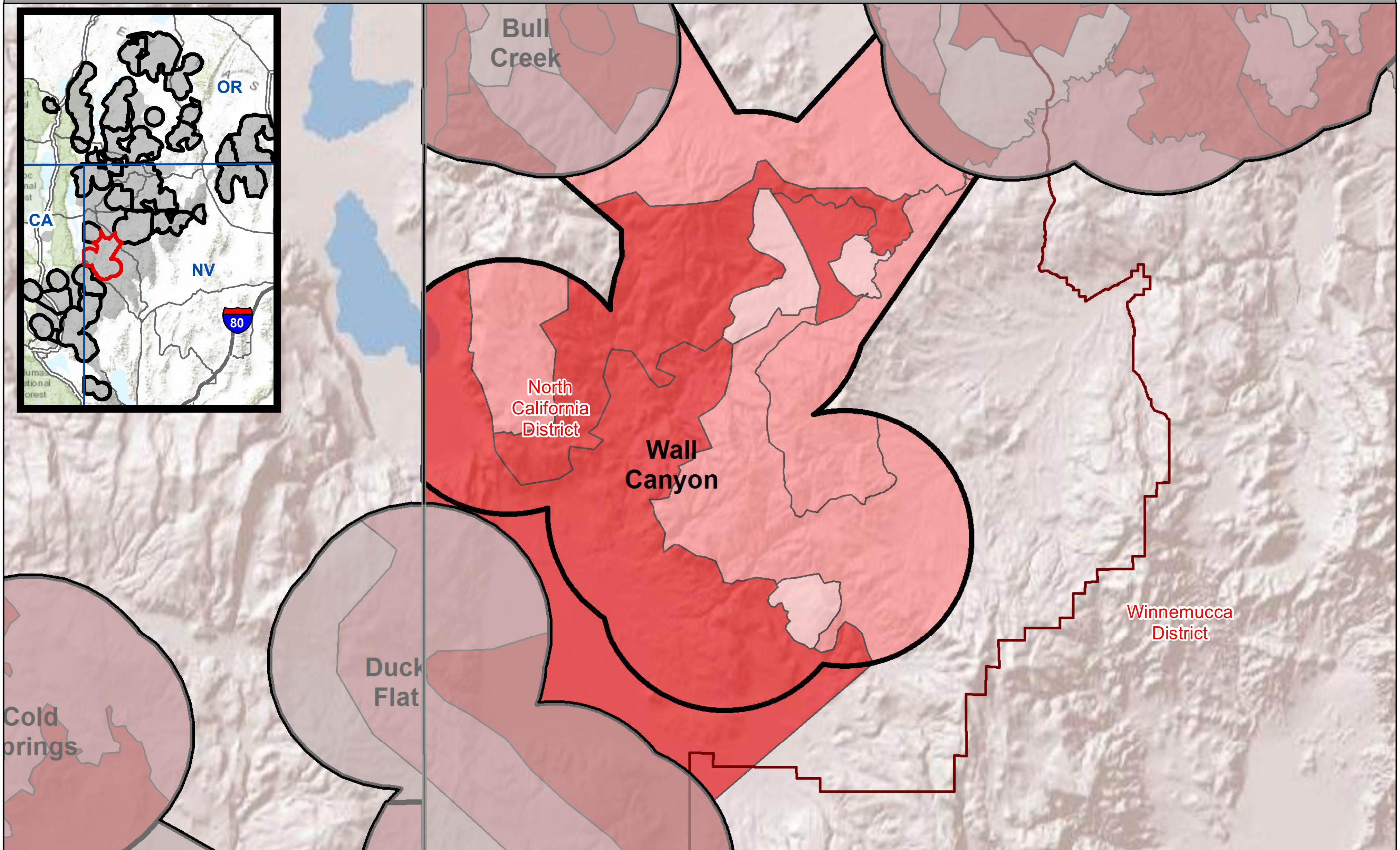
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:396,000

Wall Canyon Fire Operations

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

Western Great Basin and Warm Springs Valley
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

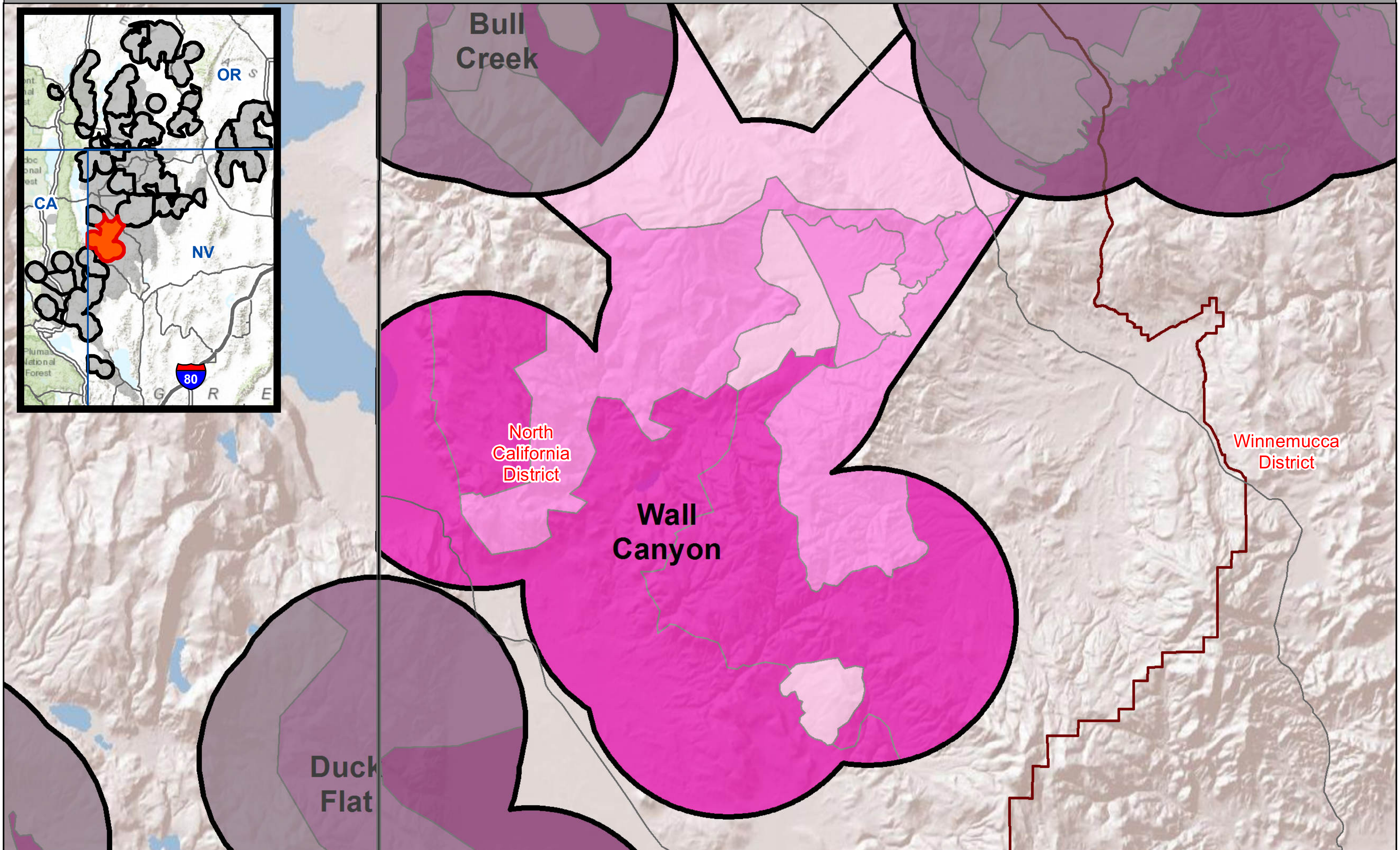
Priority
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Wall Canyon Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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
- First
- Second
- Third

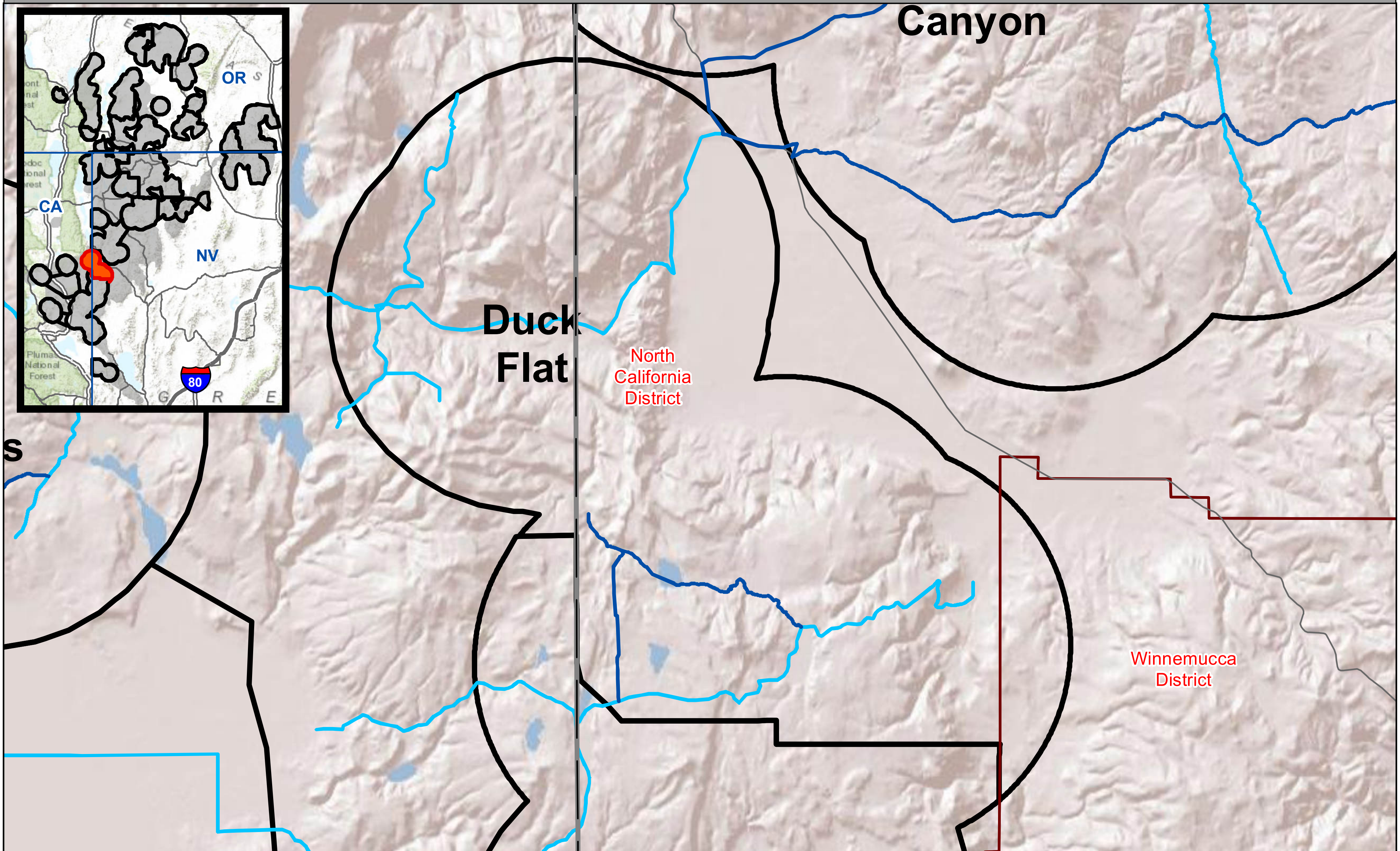
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:397,000

Duck Flat Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

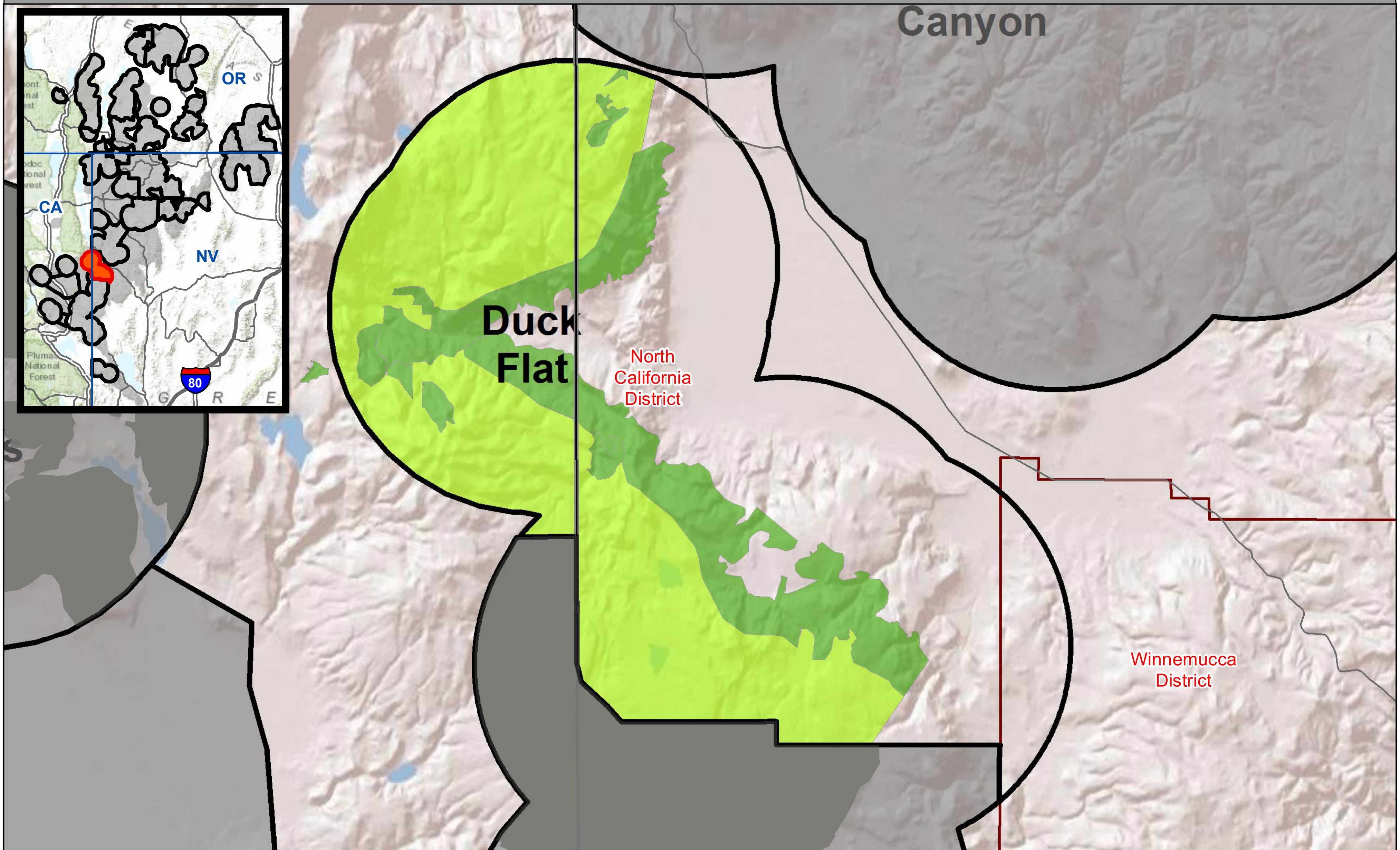
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:289,000

Duck Flat Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



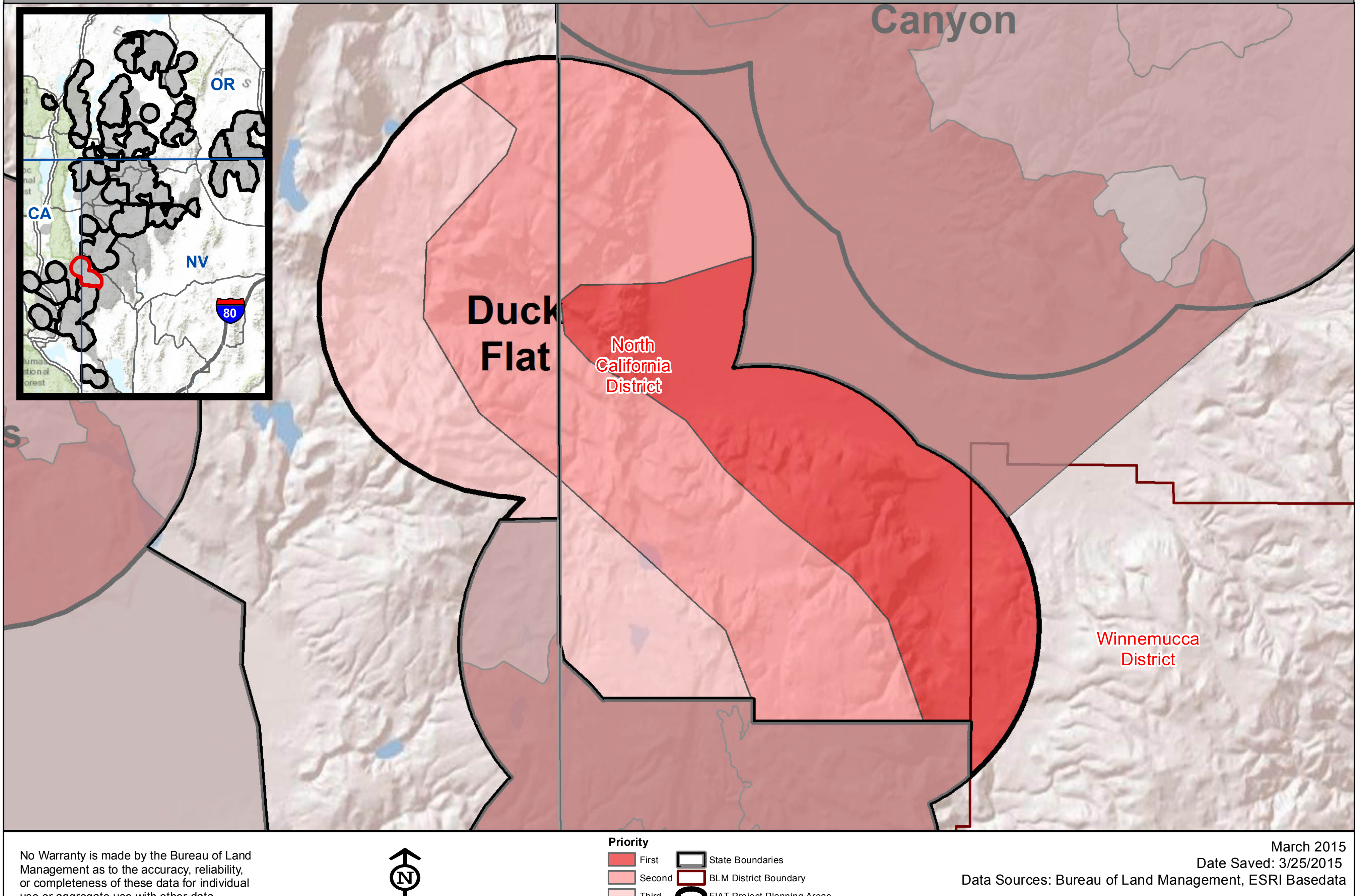
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:289,000

Duck Flat Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior

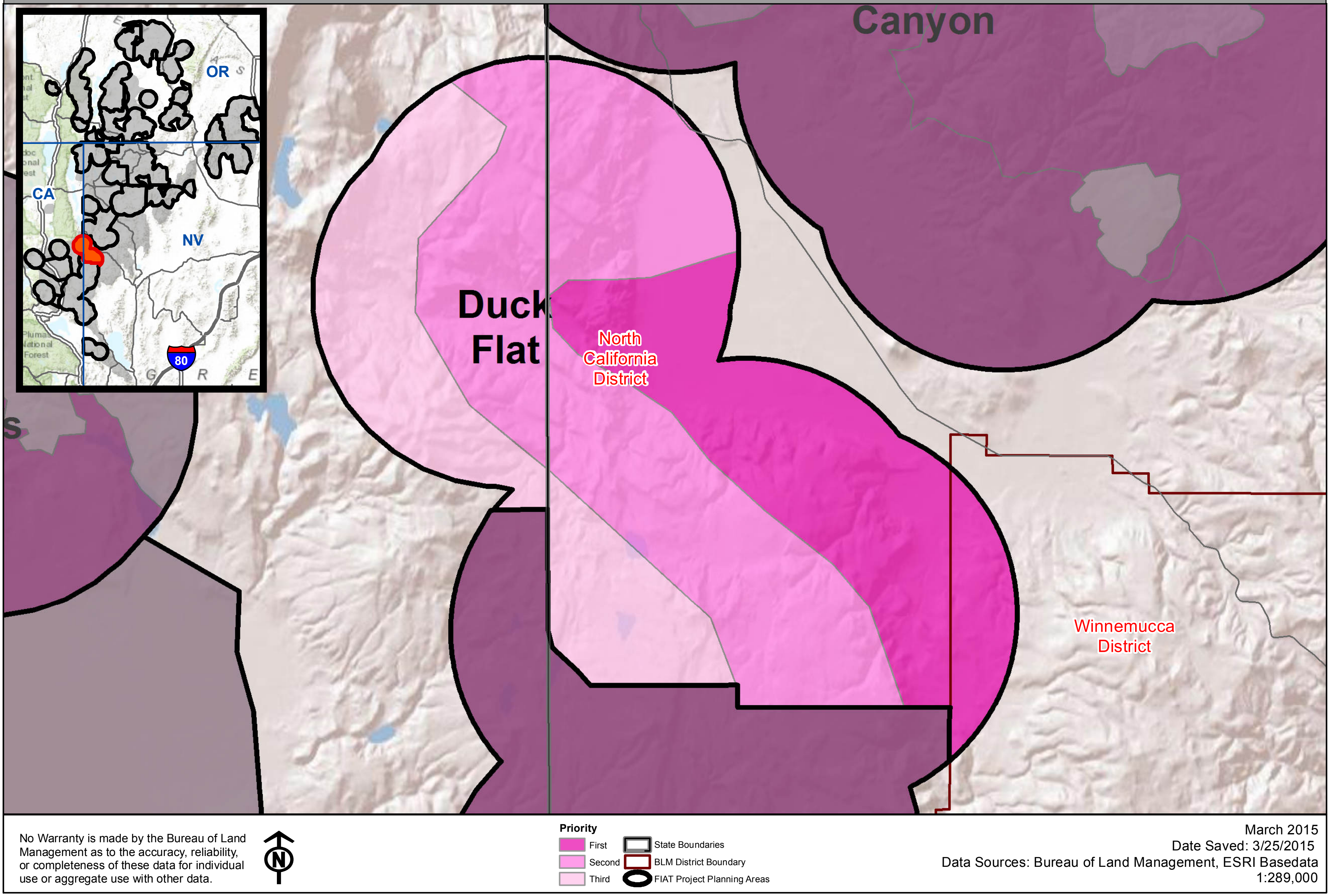


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Duck Flat Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



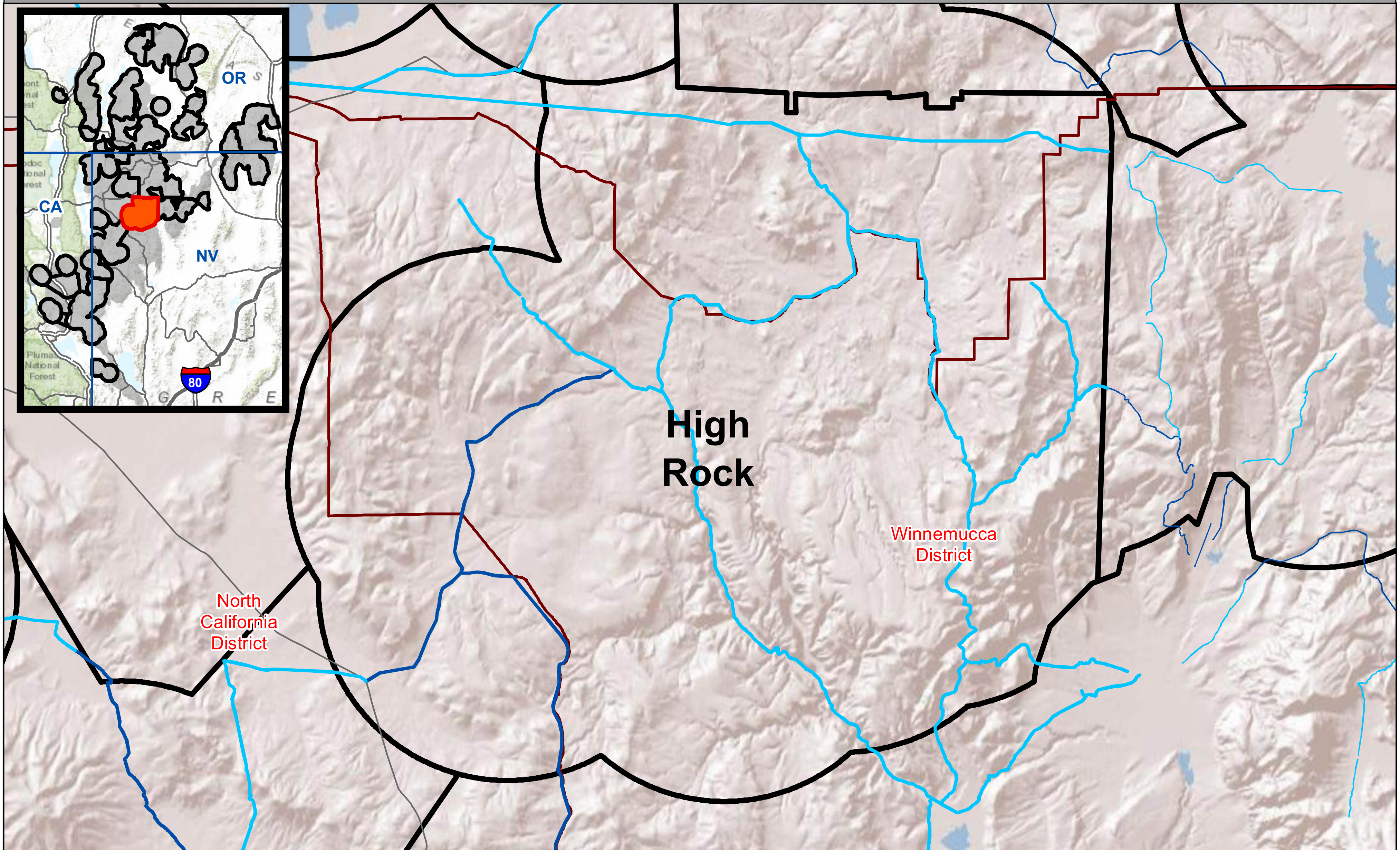
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:289,000

High Rock Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

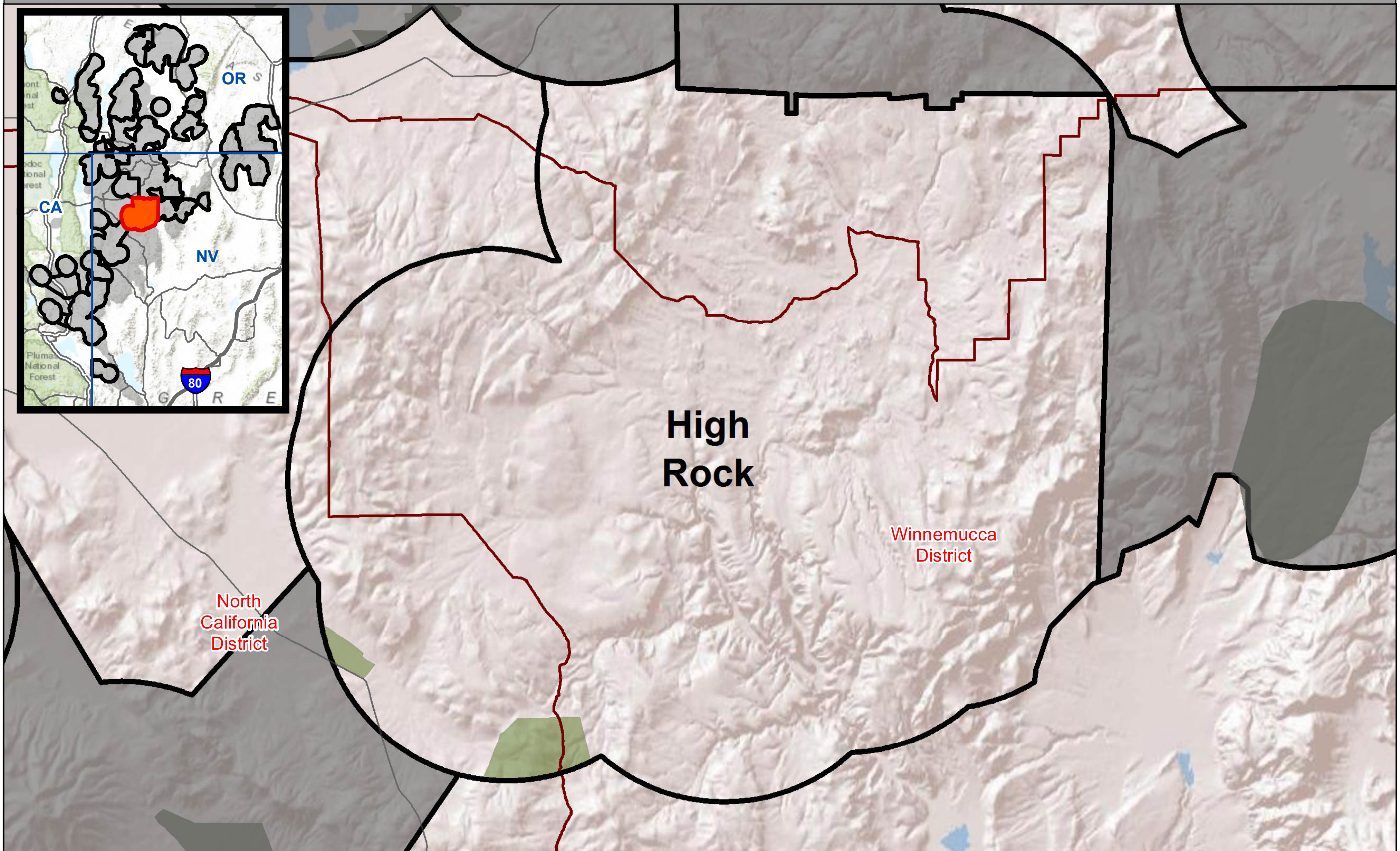
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:313,000

High Rock Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

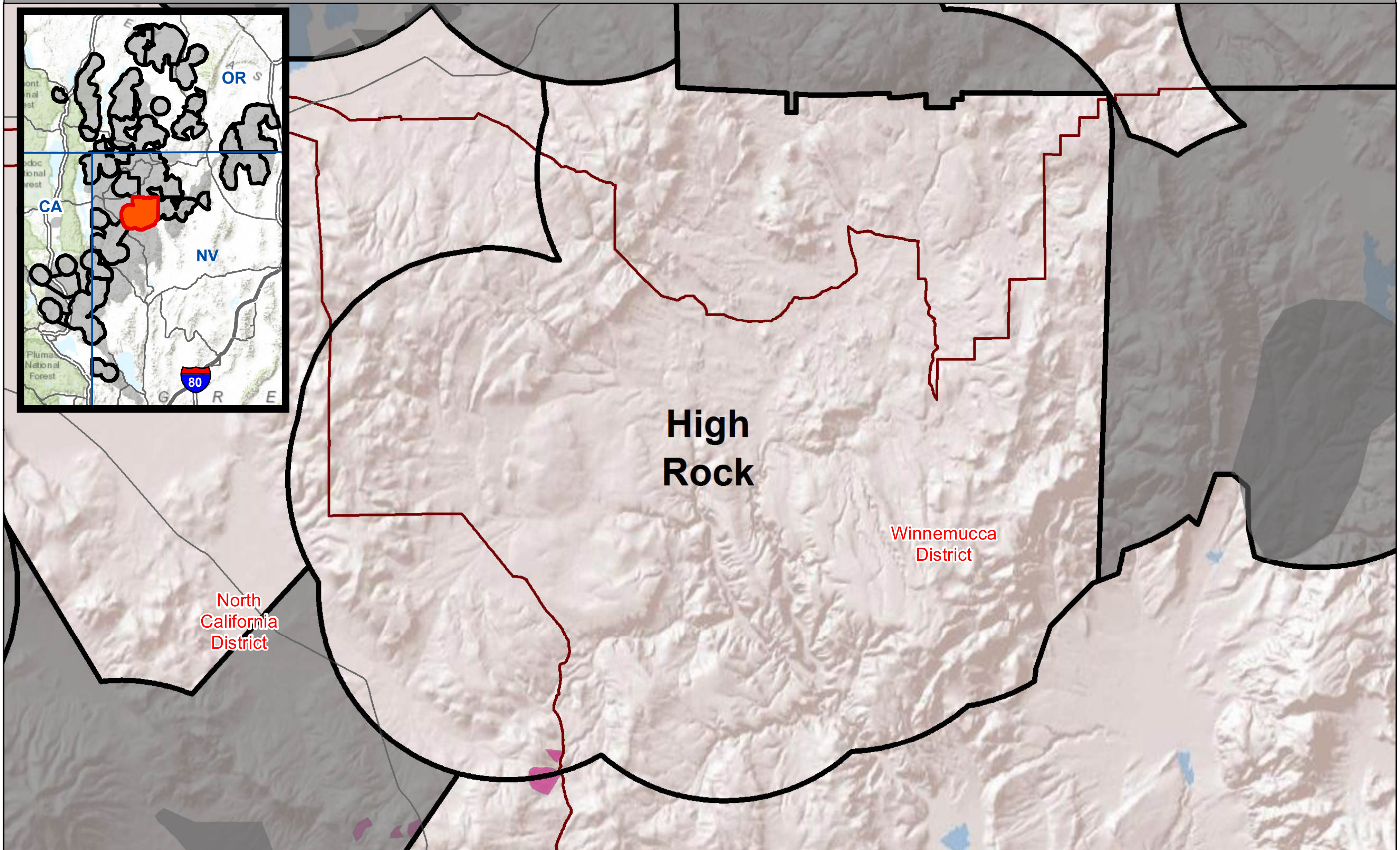
Habitat Restoration- Sagebrush Plantings
Habitat Restoration- Sagebrush Mowings
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:313,000

High Rock Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

State Boundary

BLM District Boundary

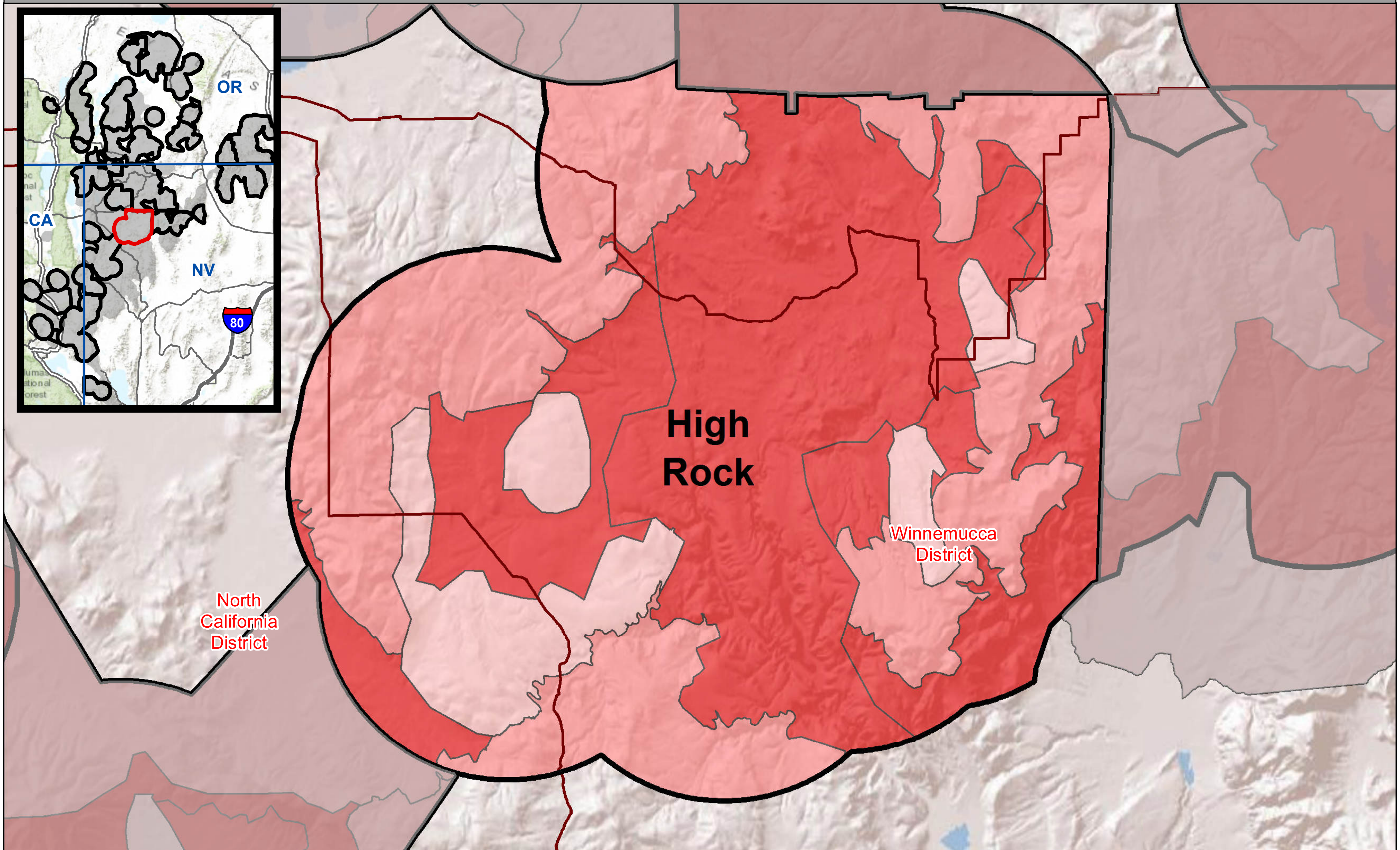
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:313,000

High Rock Fire Operations

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

Western Great Basin and Warm Springs Valley
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.

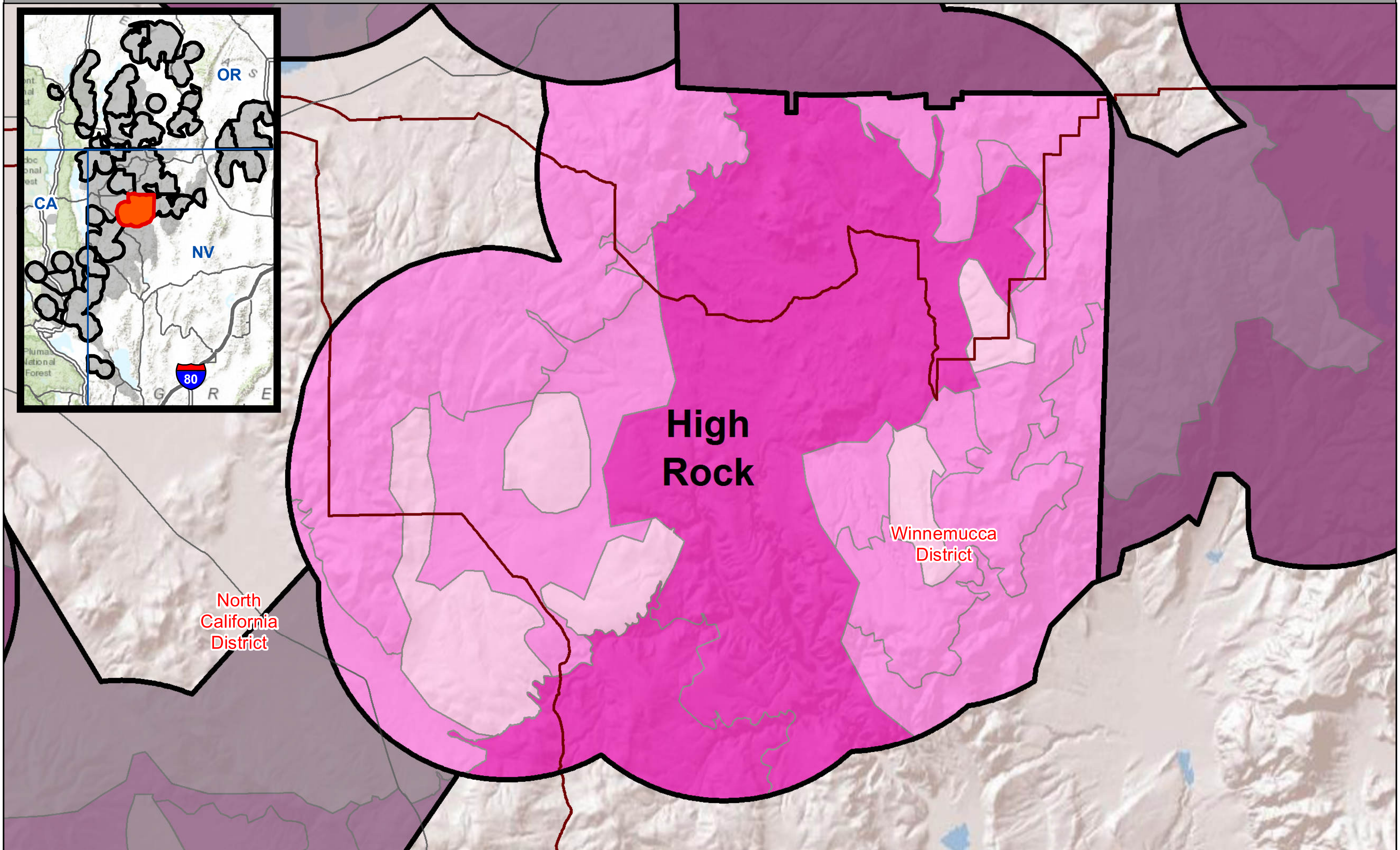
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

High Rock Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

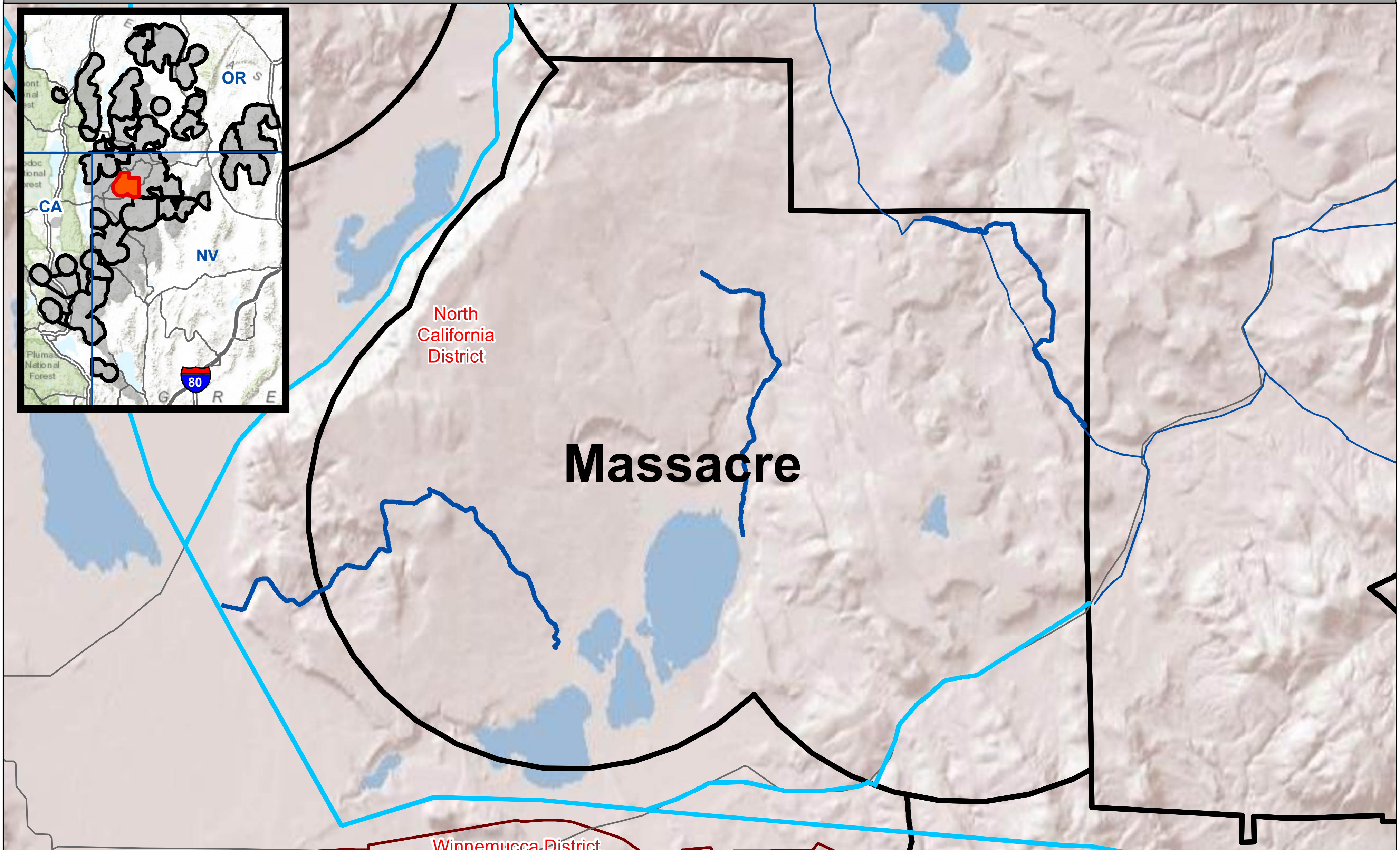
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:313,000

Massacre Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



Priority for Implementation
First
Second
Third

State Boundaries
BLM District Boundary
FIAT Project Planning Areas

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.

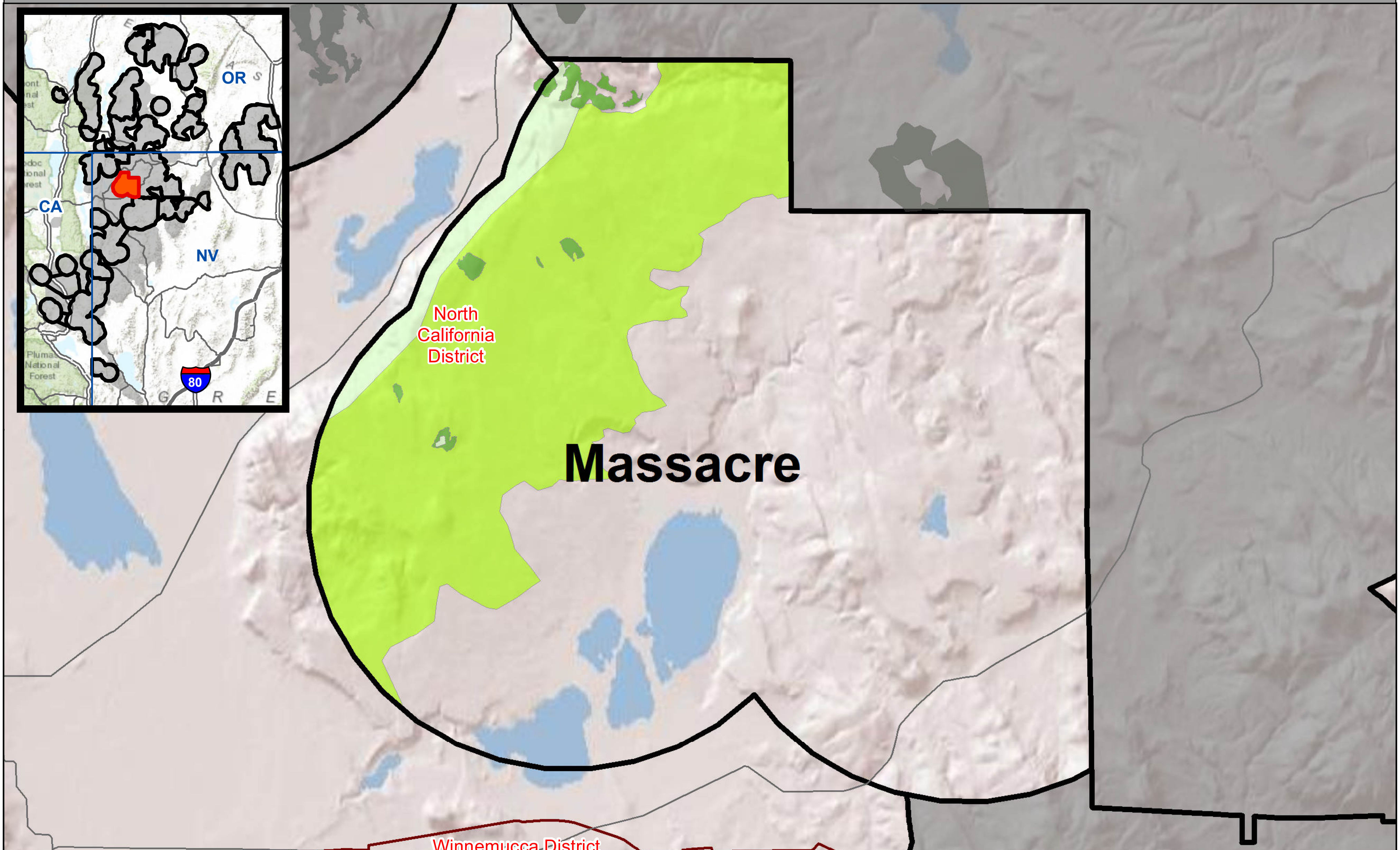
N

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:228,000

Massacre Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas
- First
- Second
- Third

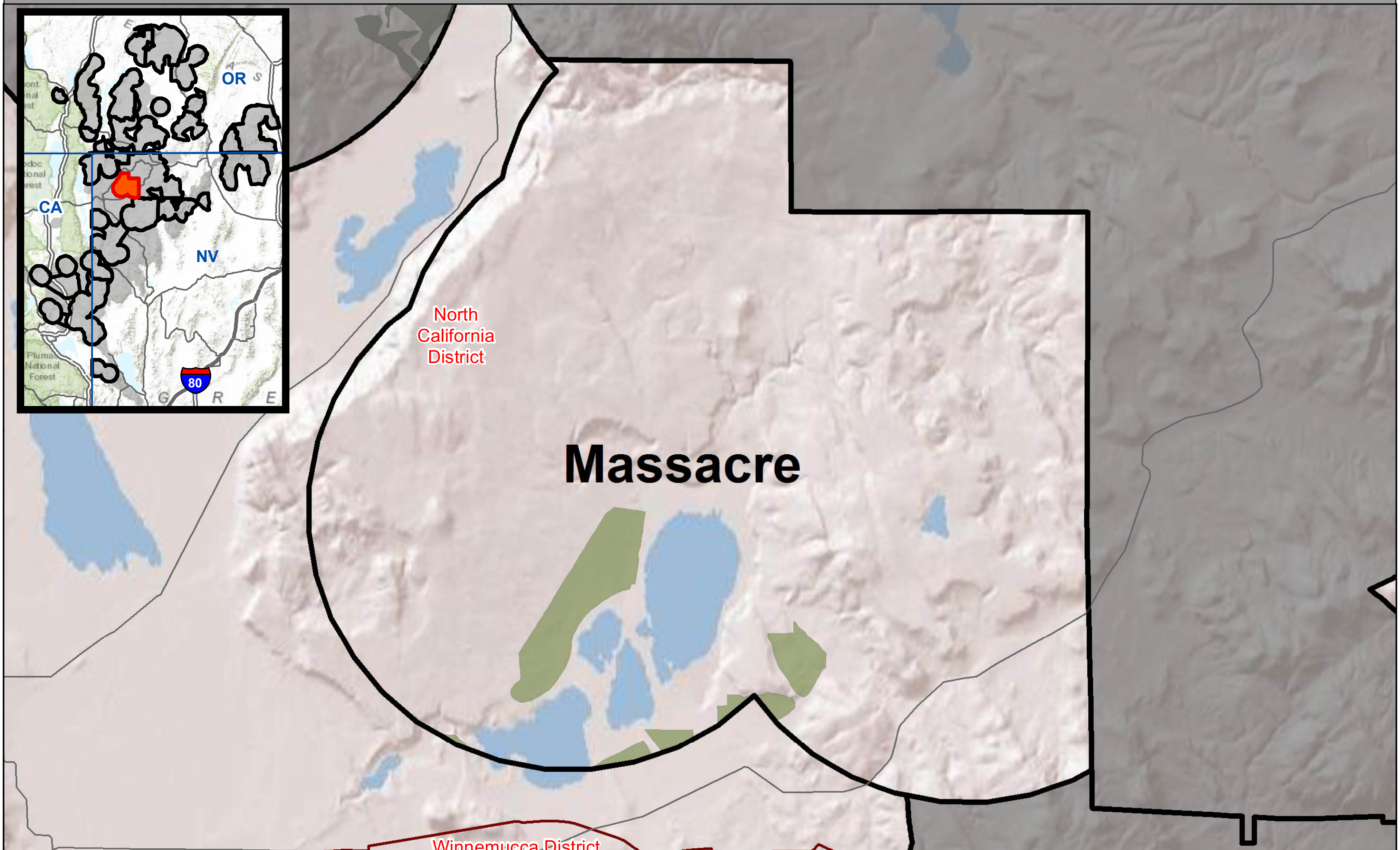
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:228,000

Massacre Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

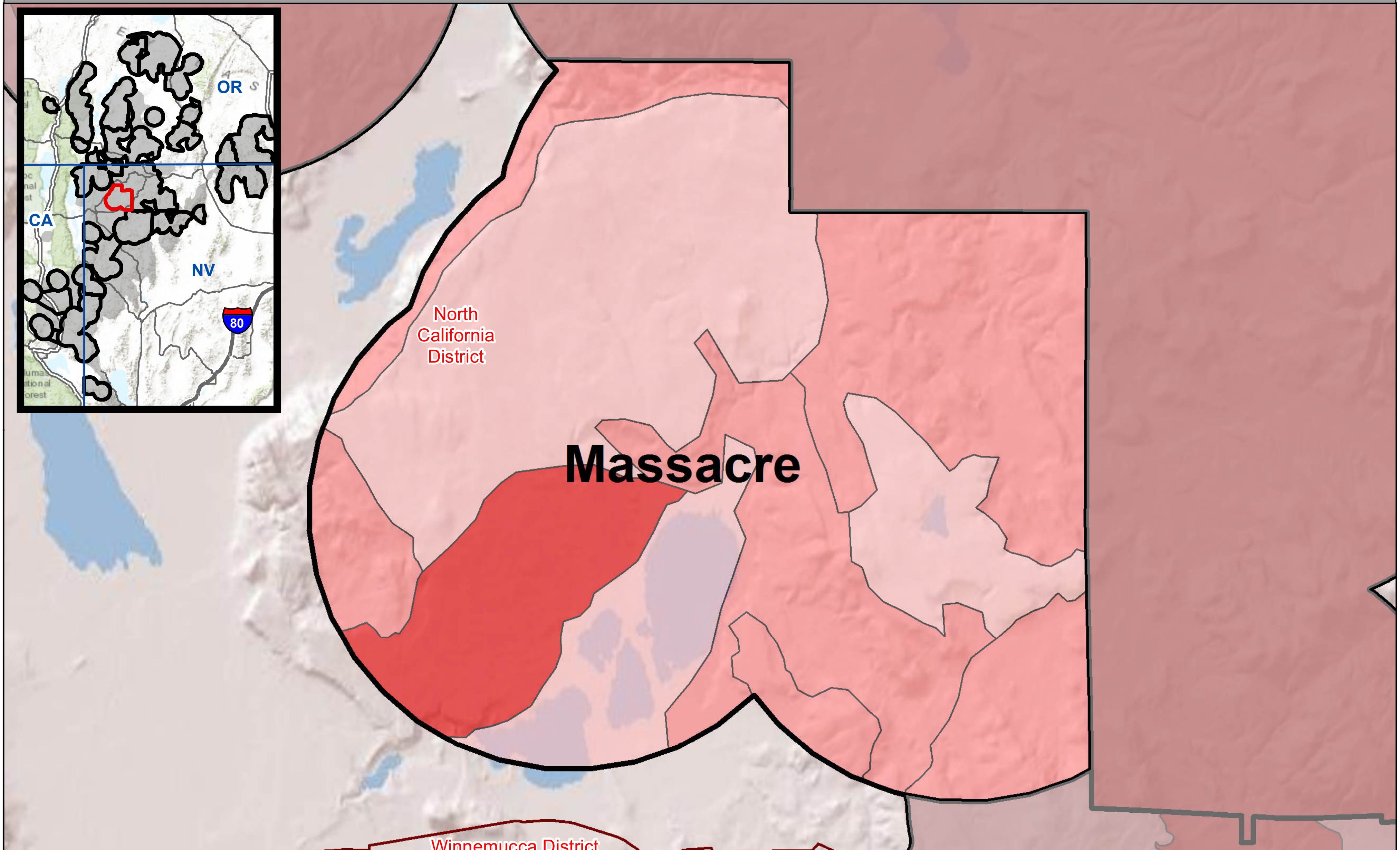
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:228,000

Massacre Fire Operations

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

Western Great Basin and Warm Springs Valley
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

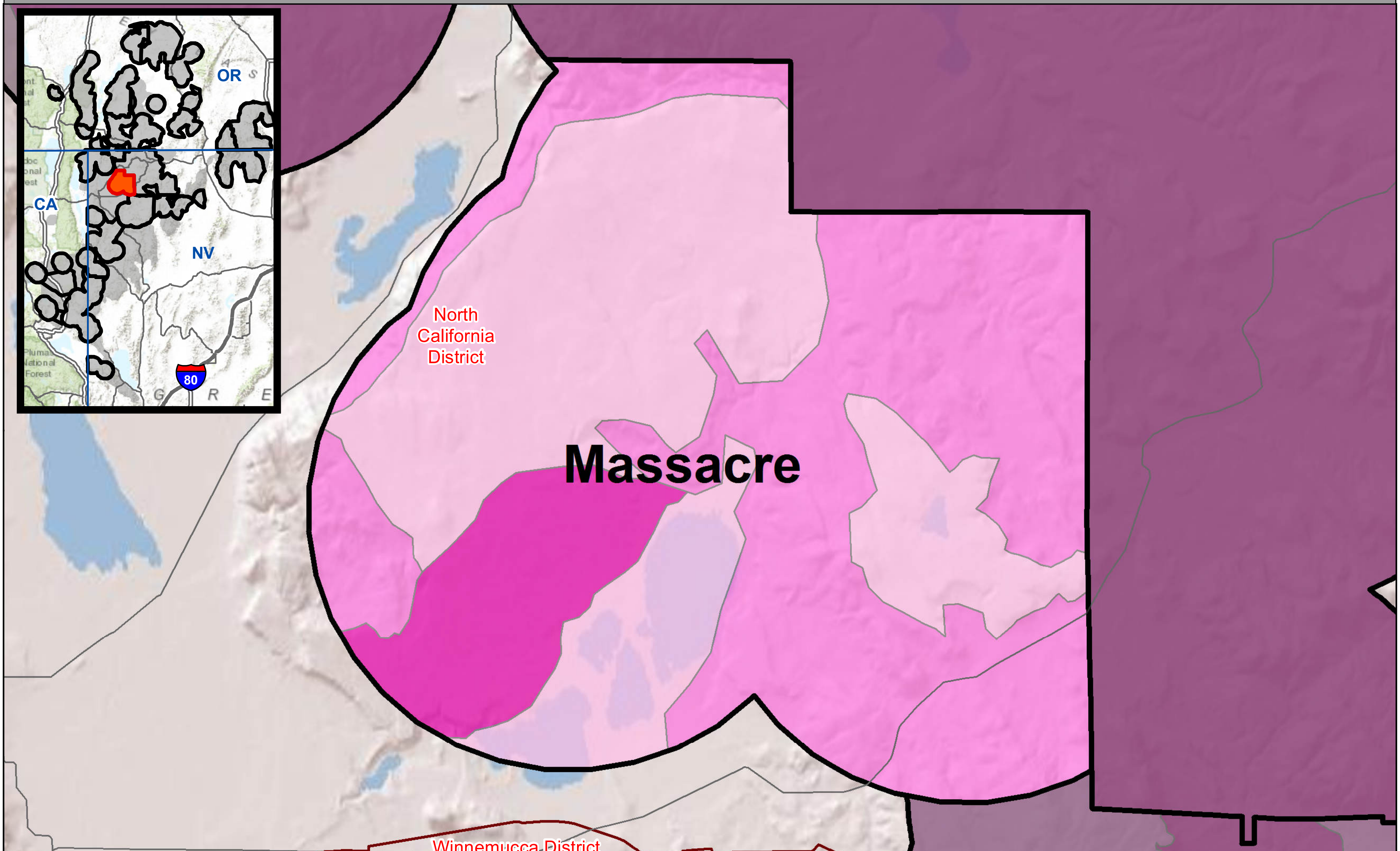
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Massacre Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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
First
Second
Third

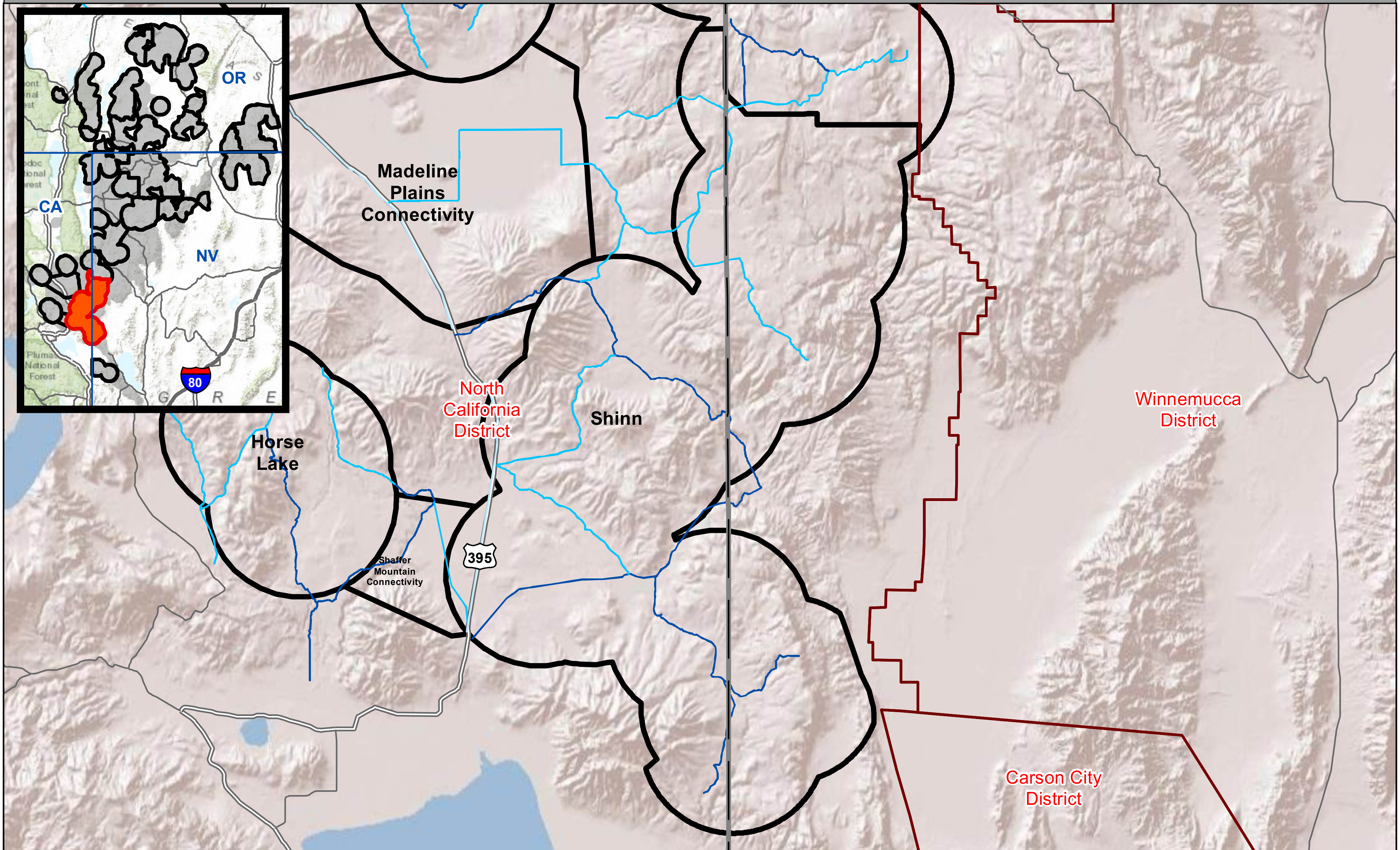
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:228,000

Shinn Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

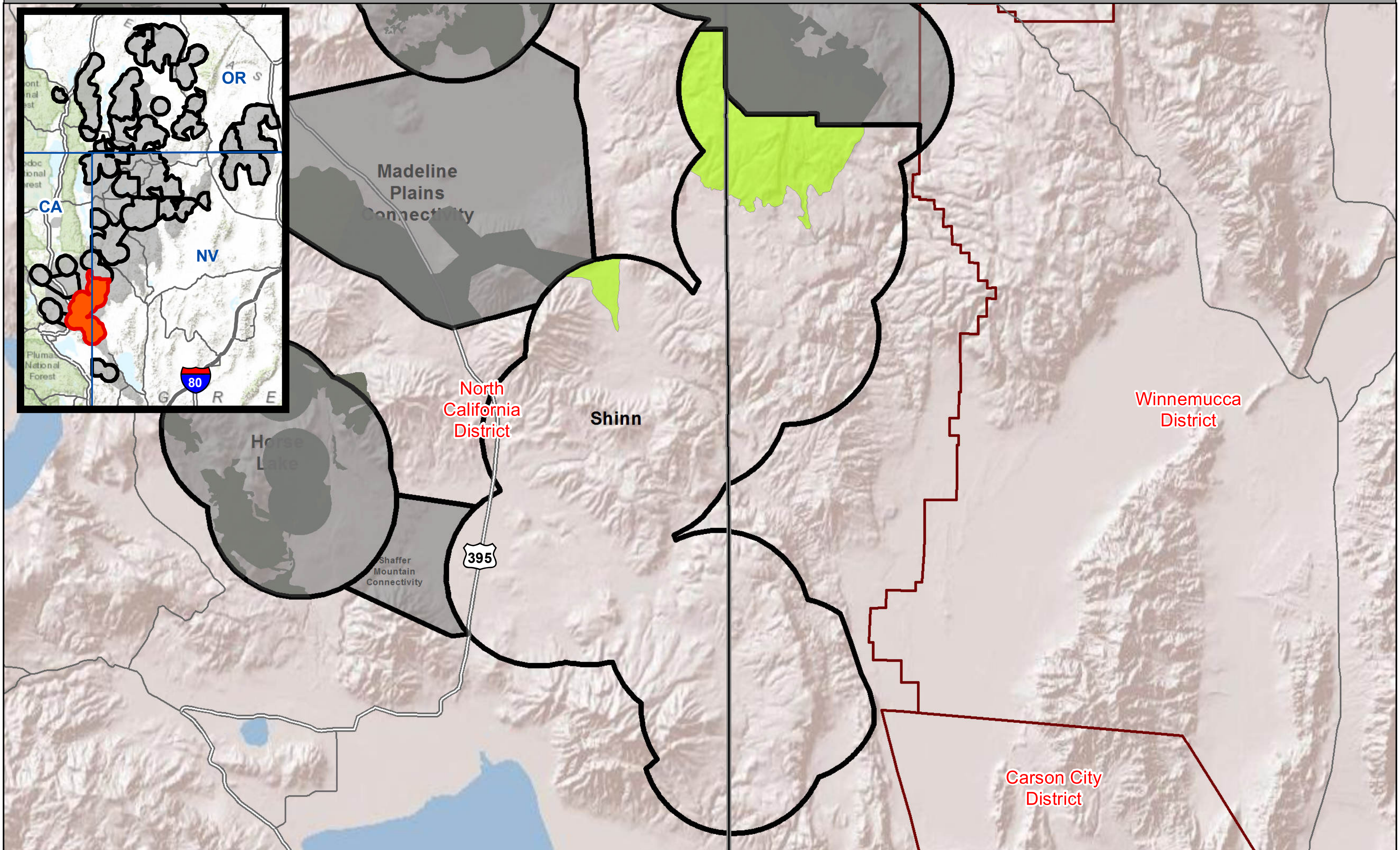
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:631,000

Shinn Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Conifer Treatment Areas

- First
- Second
- Third

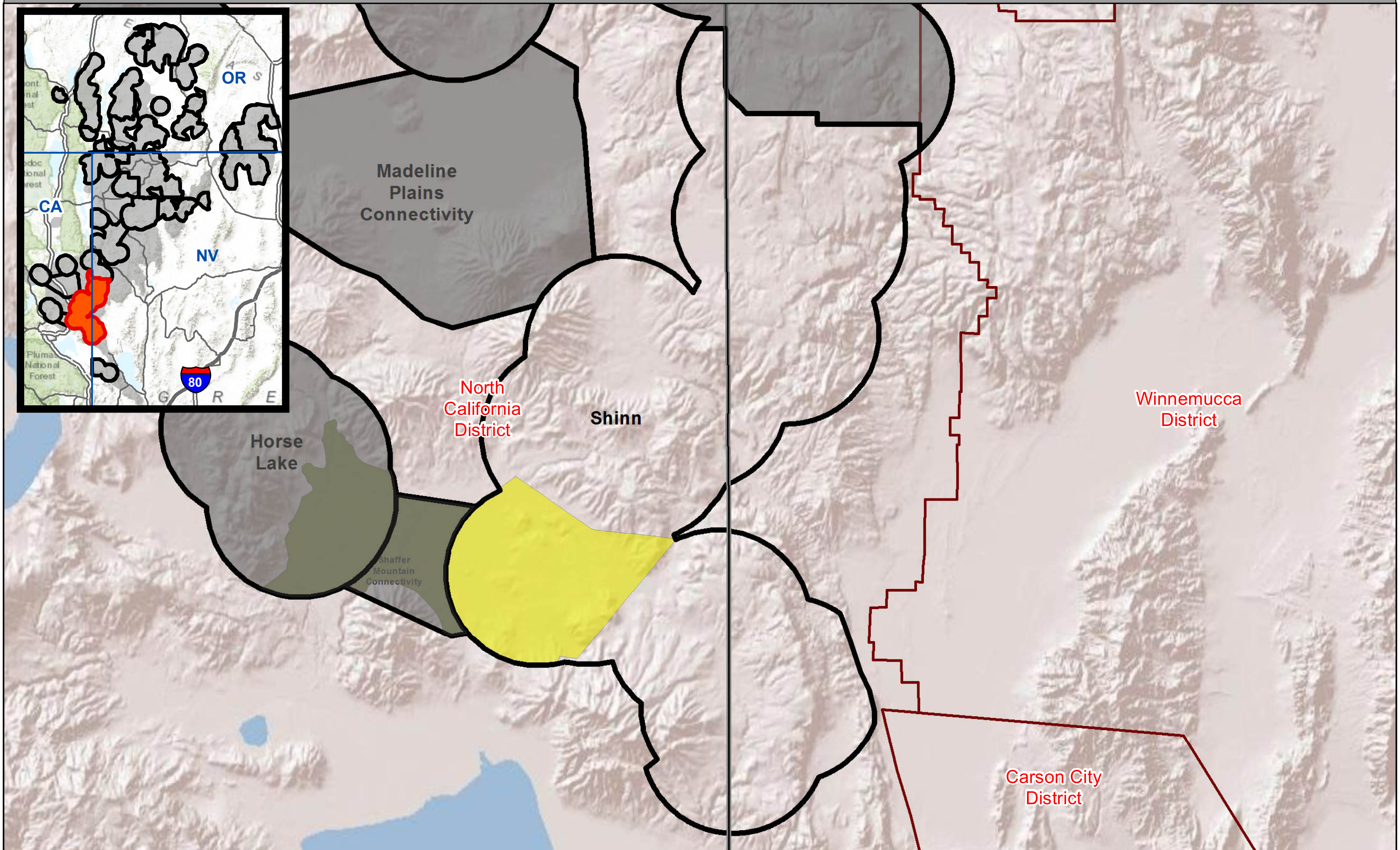
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:631,000

Shinn Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

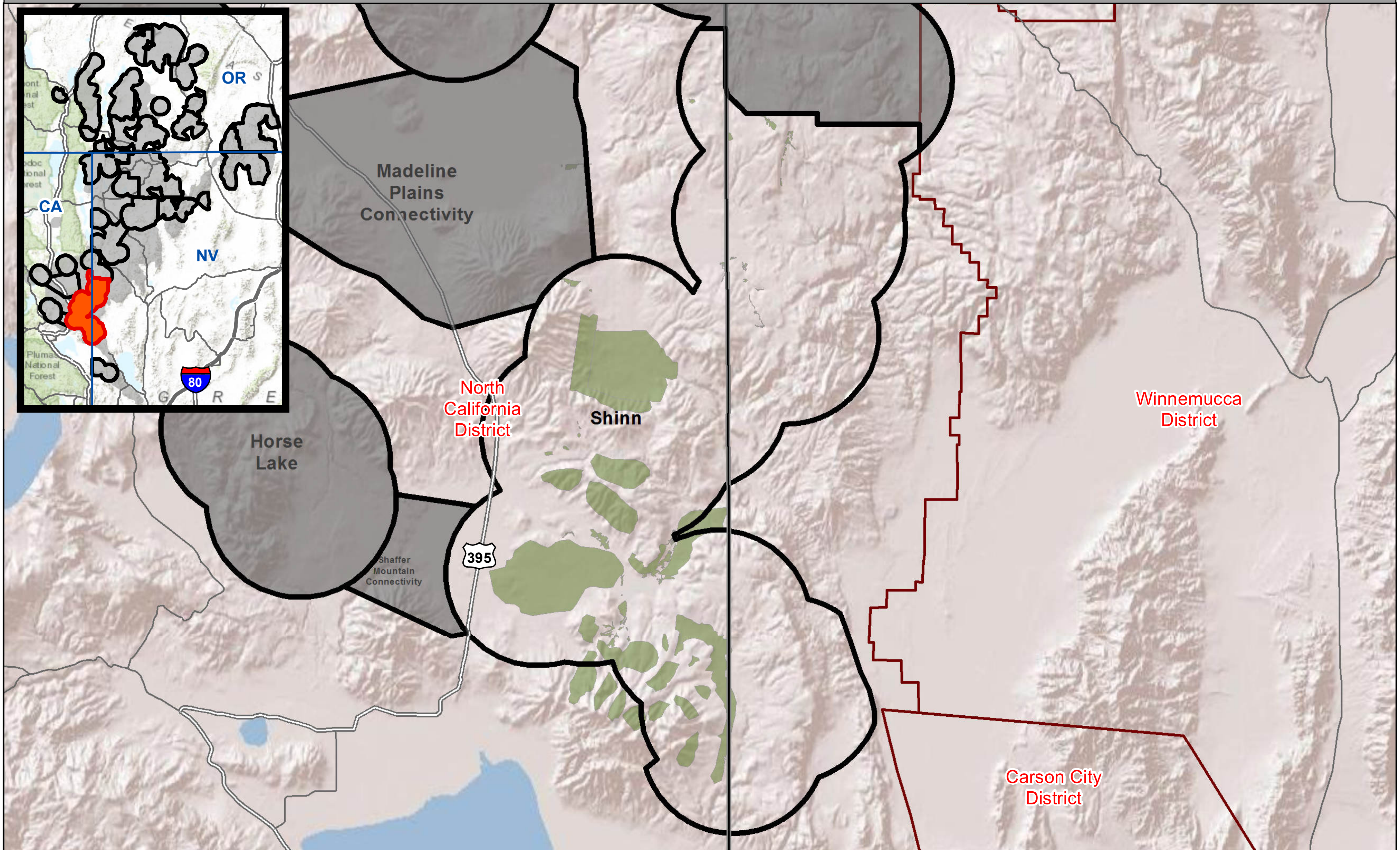
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:630,000

Shinn Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Sagebrush Plantings
Habitat Restoration- Sagebrush Mowings

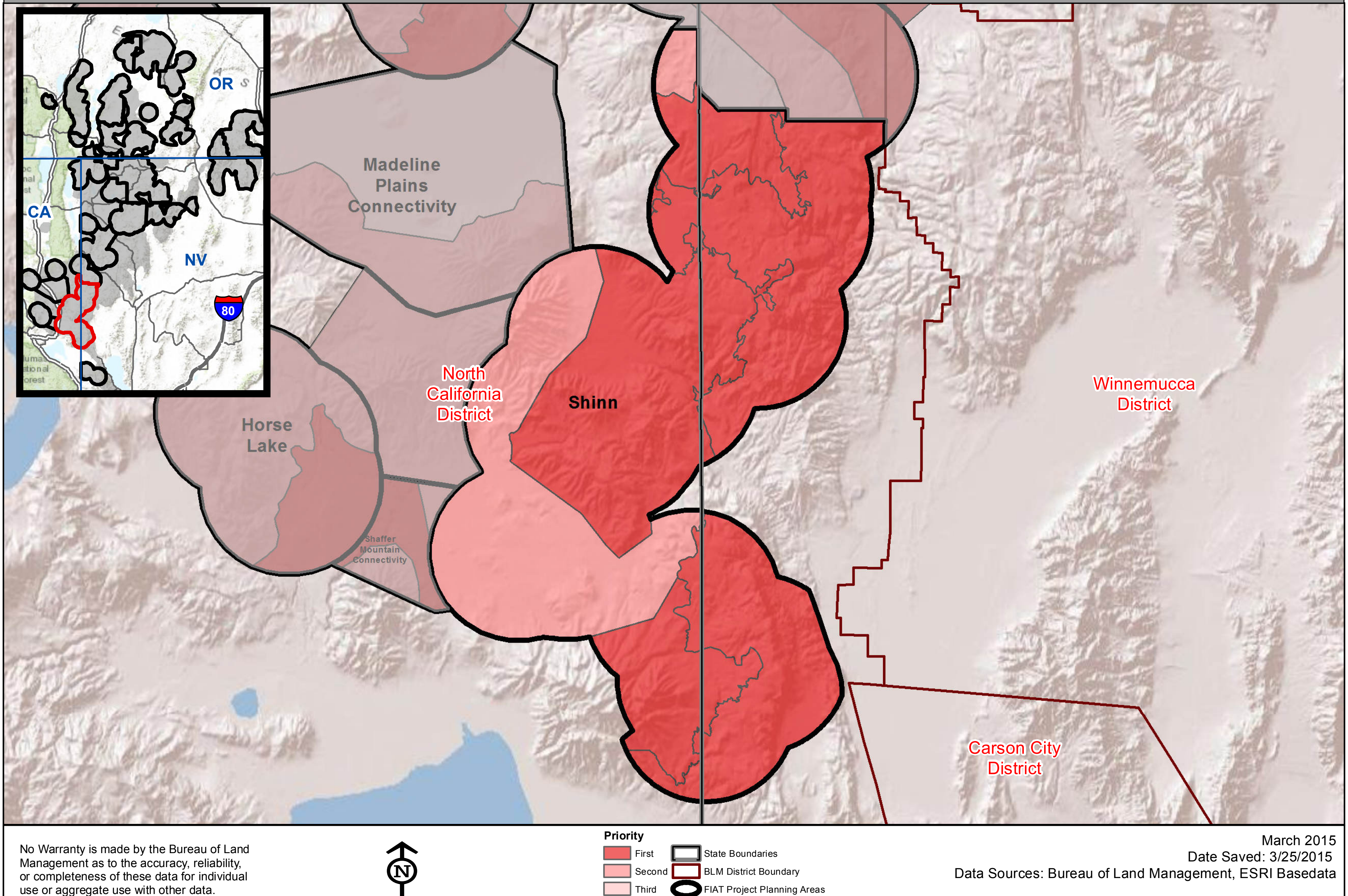
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:630,000

Shinn Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



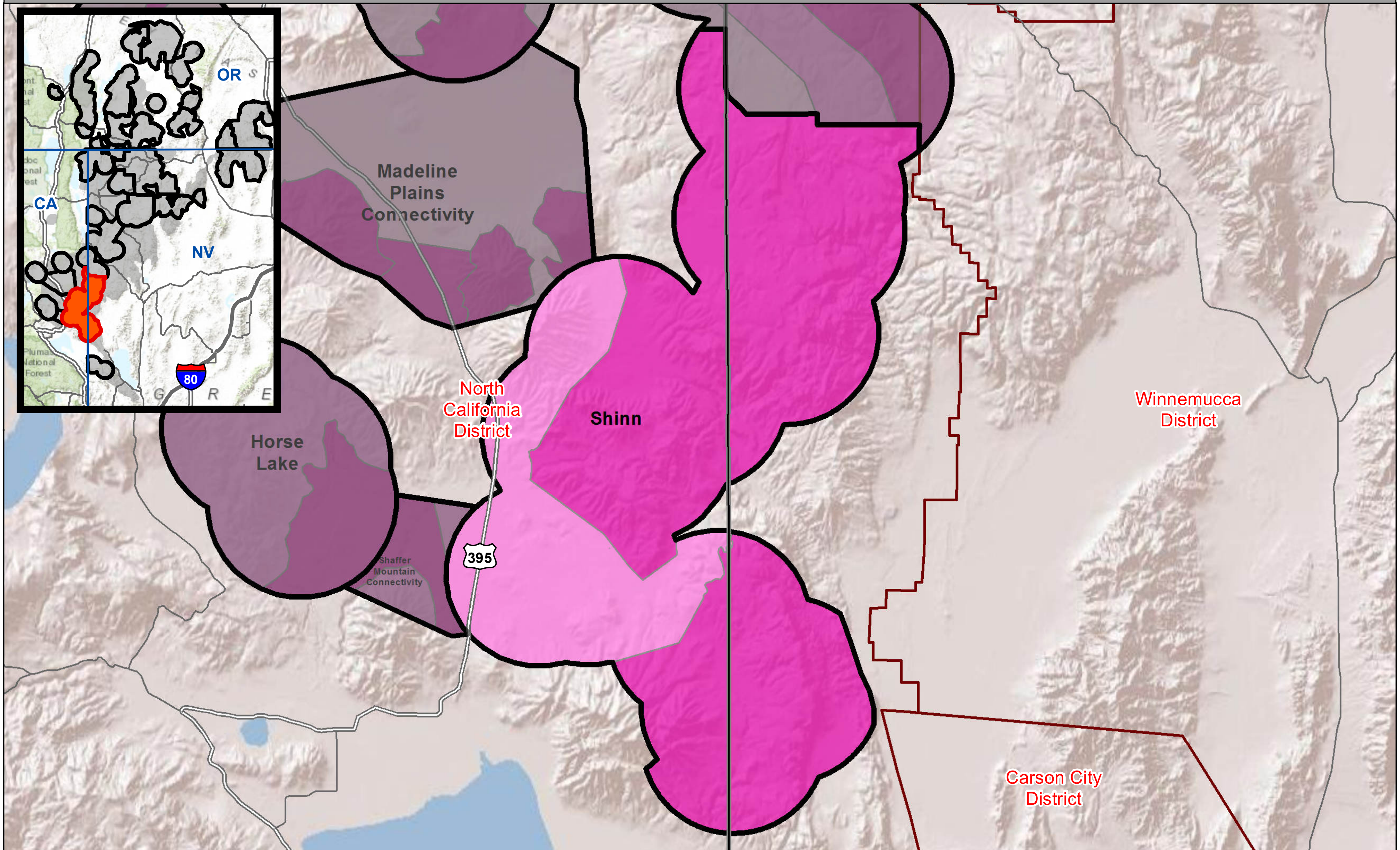
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Shinn Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

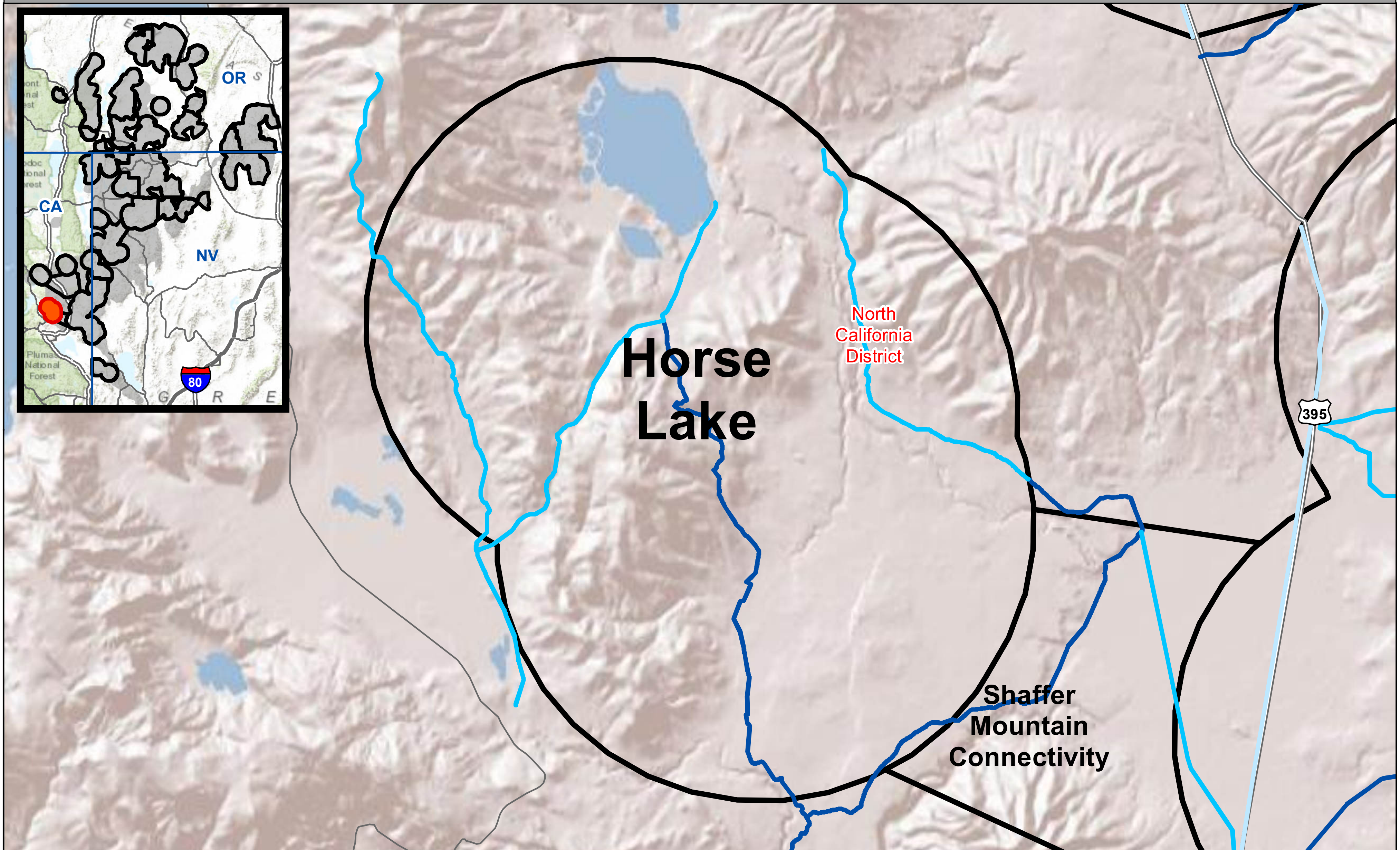
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:631,000

Horse Lake Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

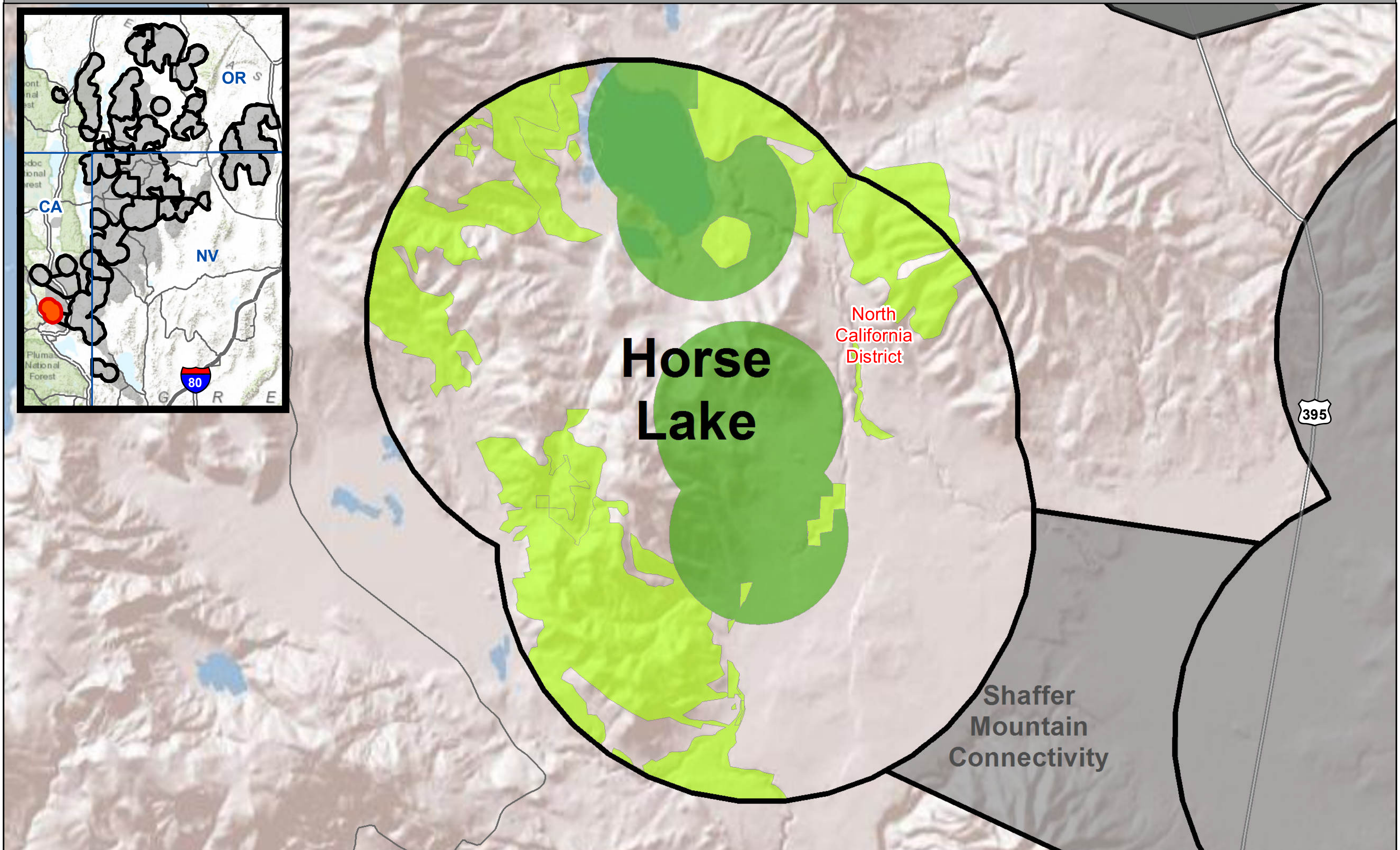
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:222,000

Horse Lake Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Conifer Treatment Areas

- First
- Second
- Third

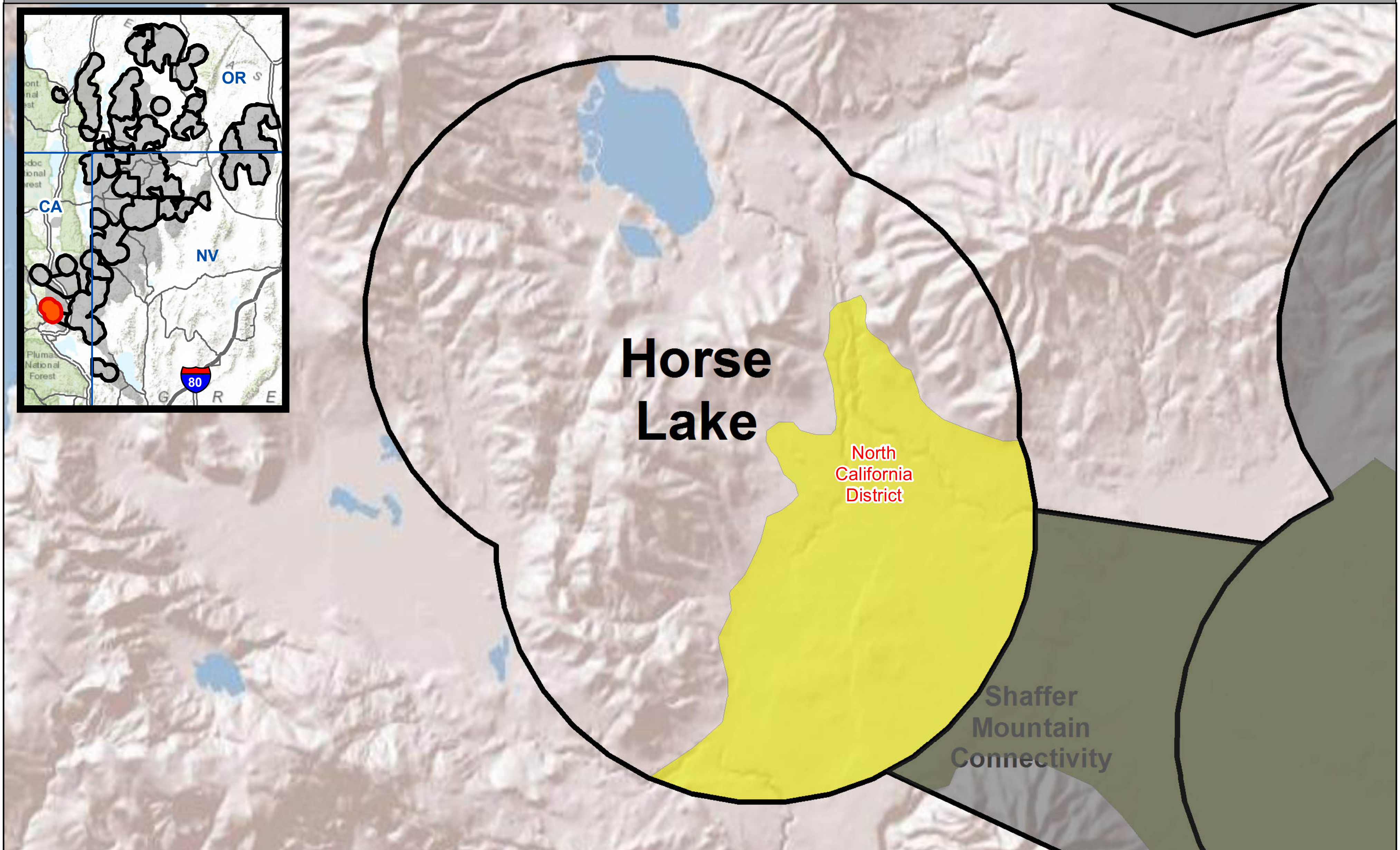
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:222,000

Horse Lake Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

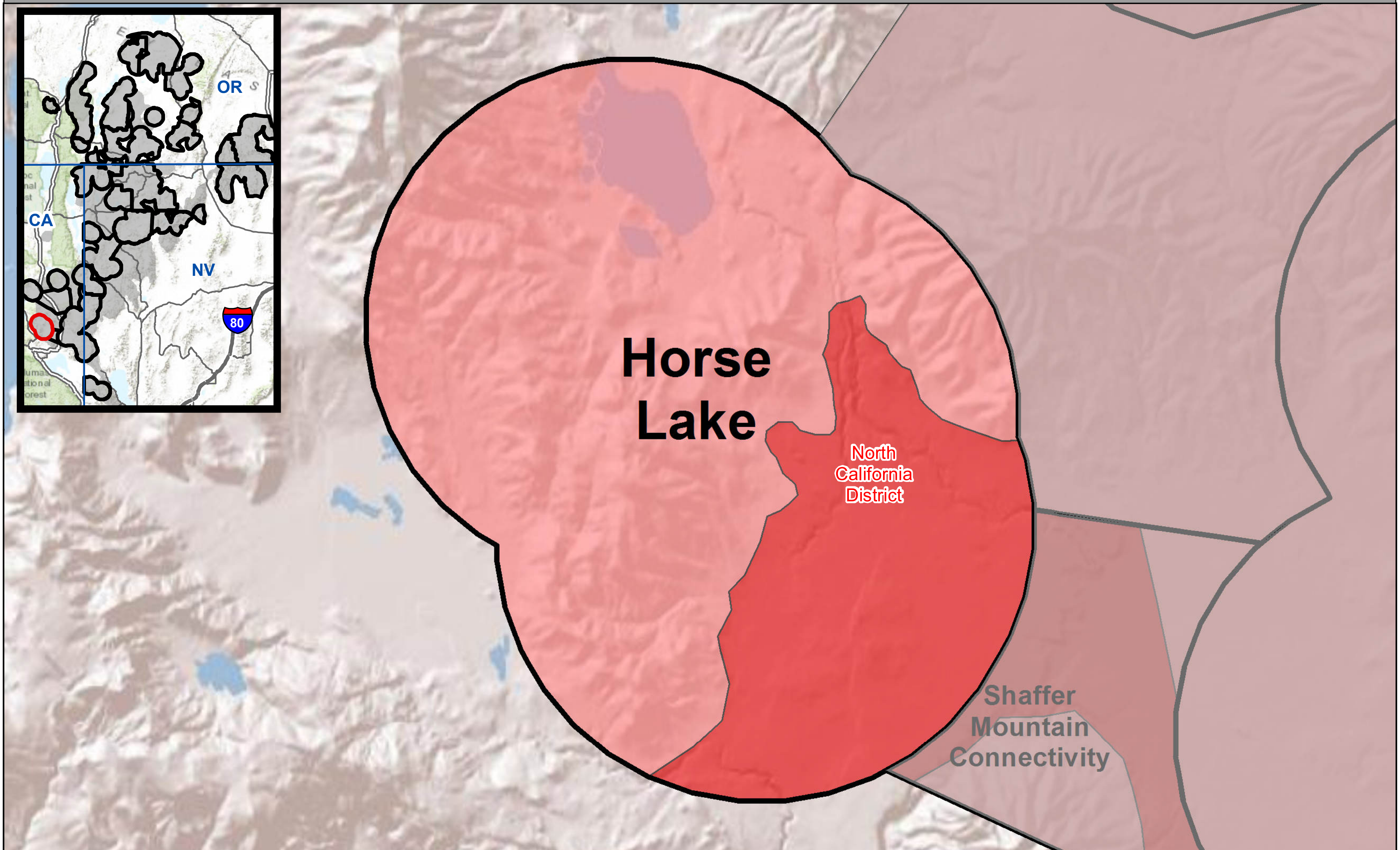
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:221,000

Horse Lake Fire Operations

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

Western Great Basin and Warm Springs Valley
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

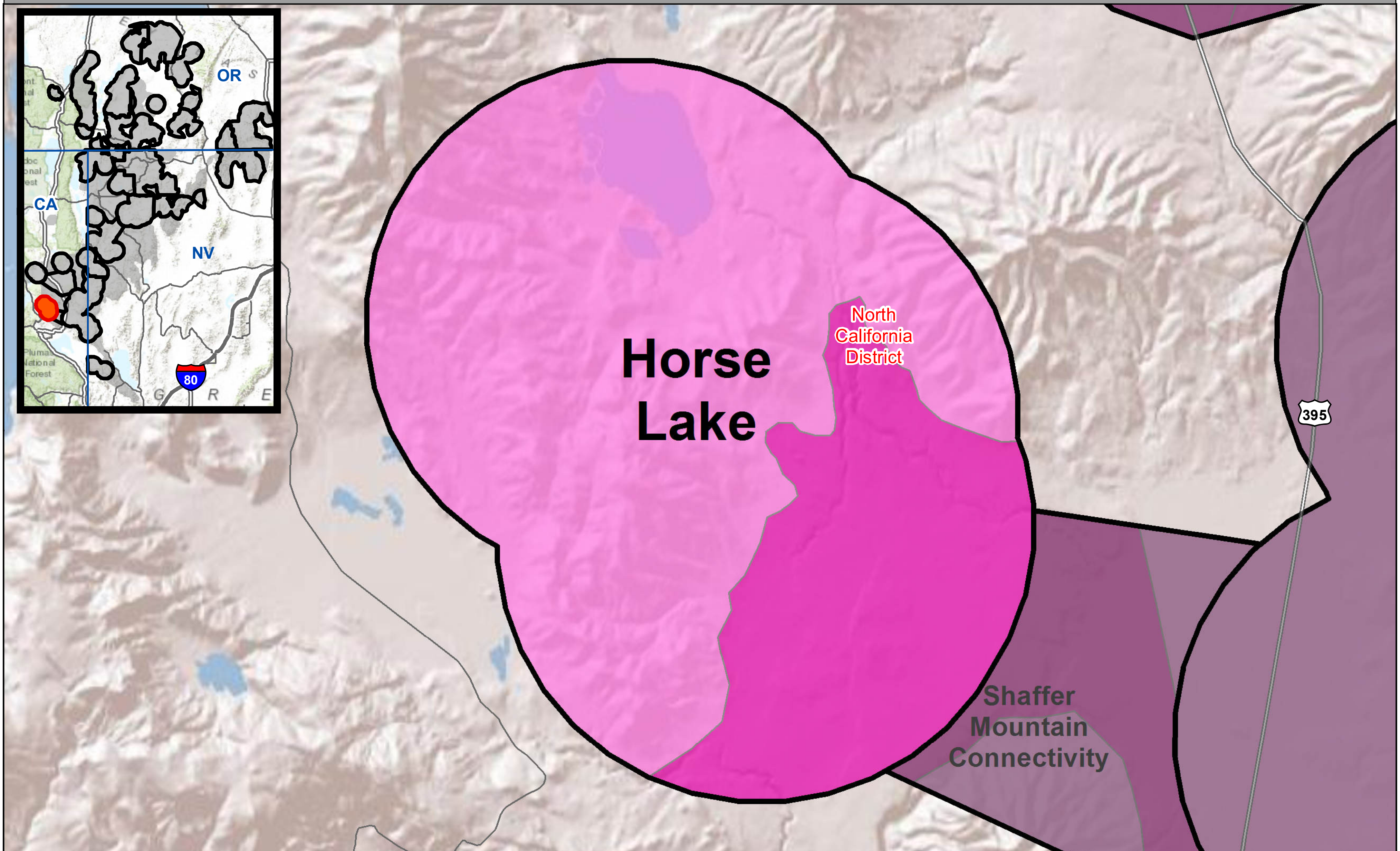
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Horse Lake Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

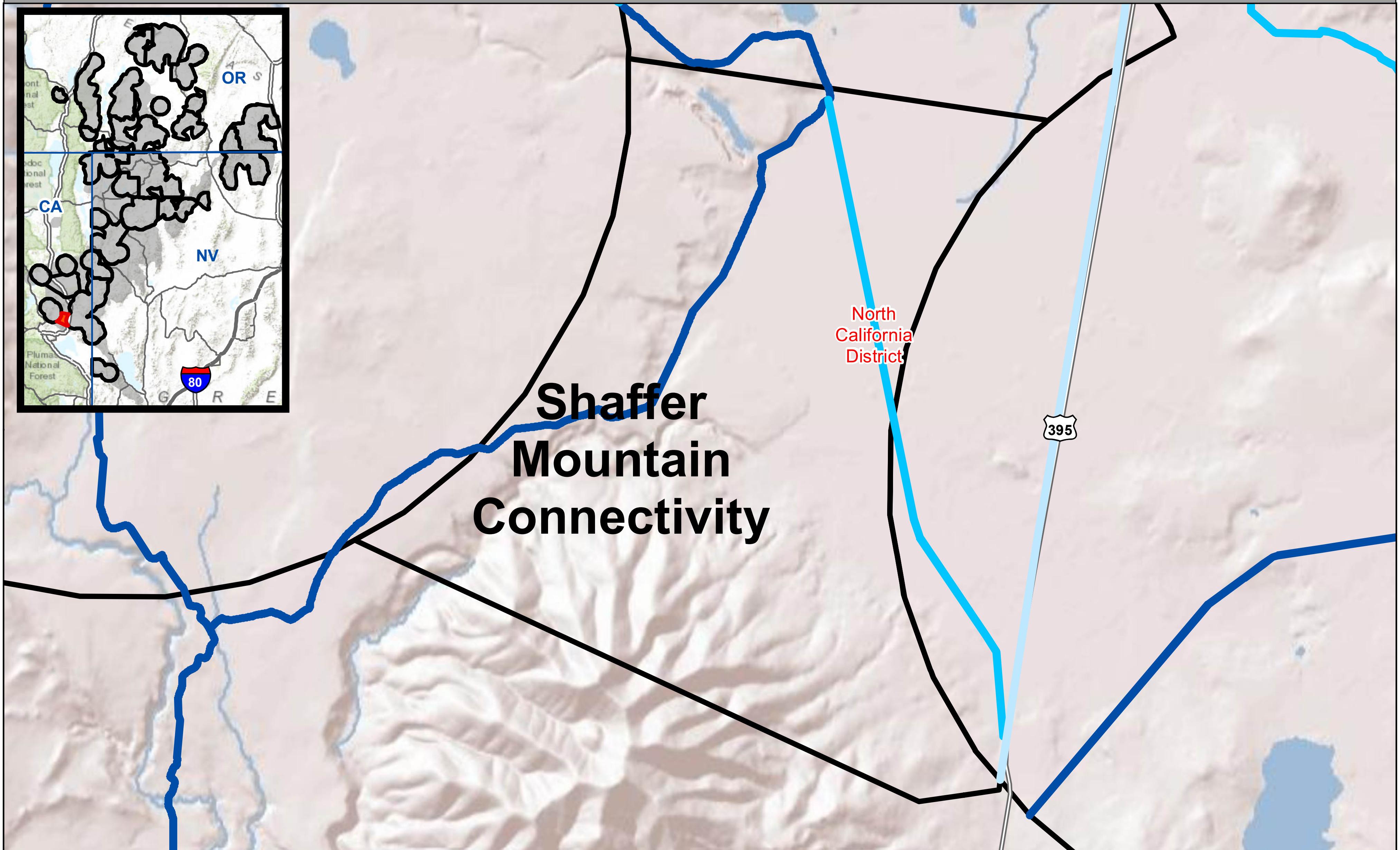
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:222,000

Shaffer Mountain Connectivity Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

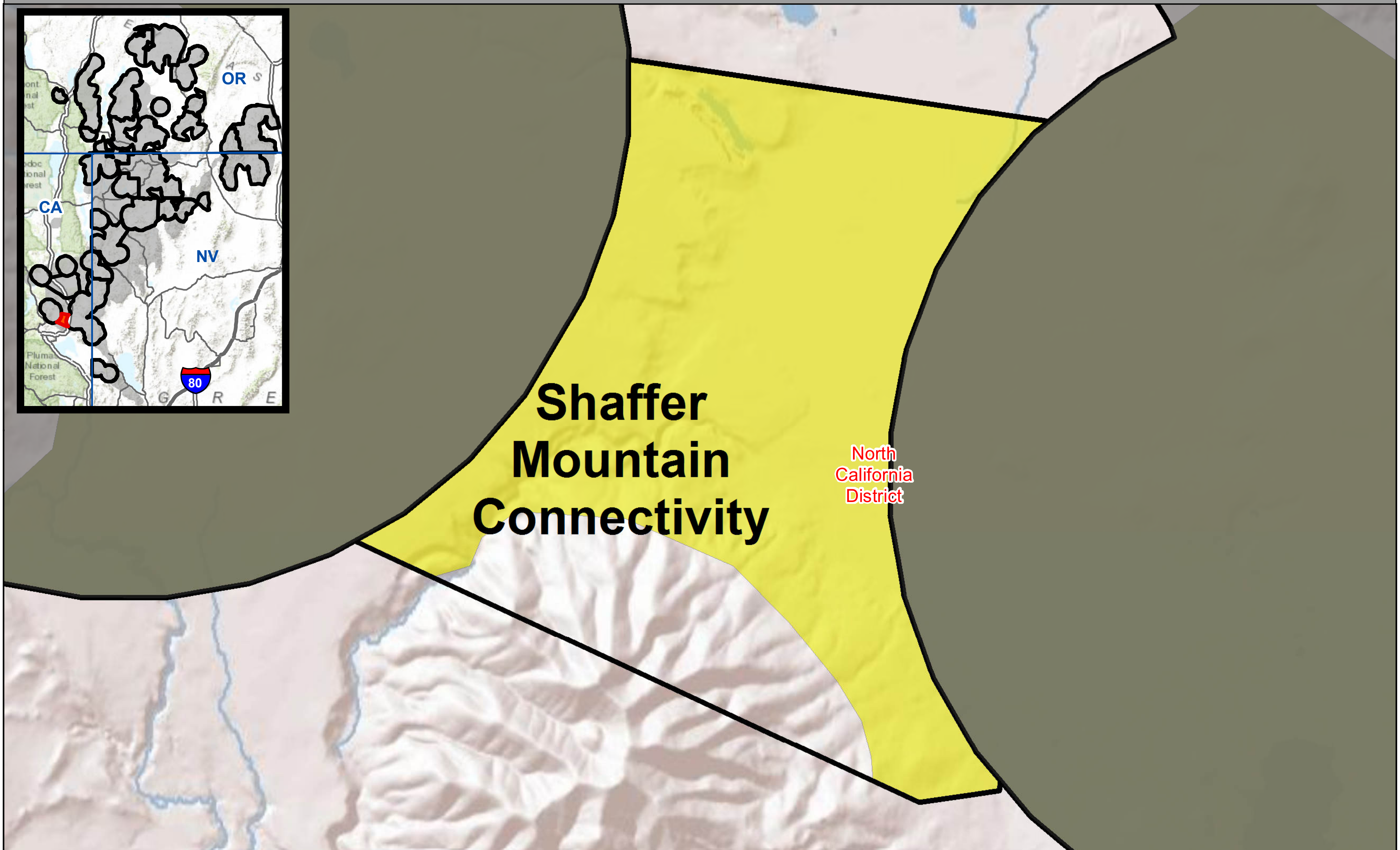
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:120,000

Shaffer Mountain Connectivity Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

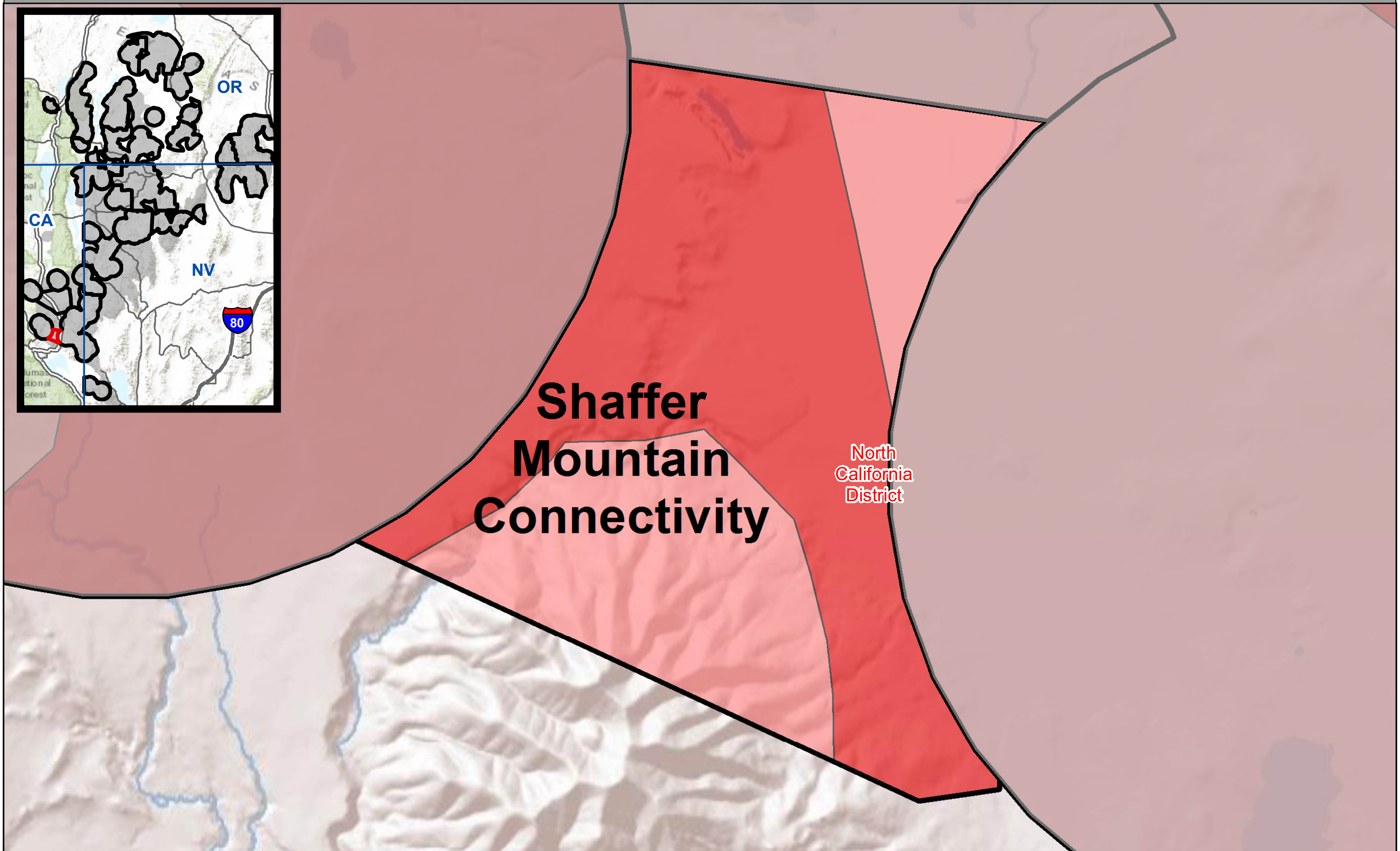
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:120,000

Shaffer Mountain Connectivity Fire Operations

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

Western Great Basin and Warm Springs Valley
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

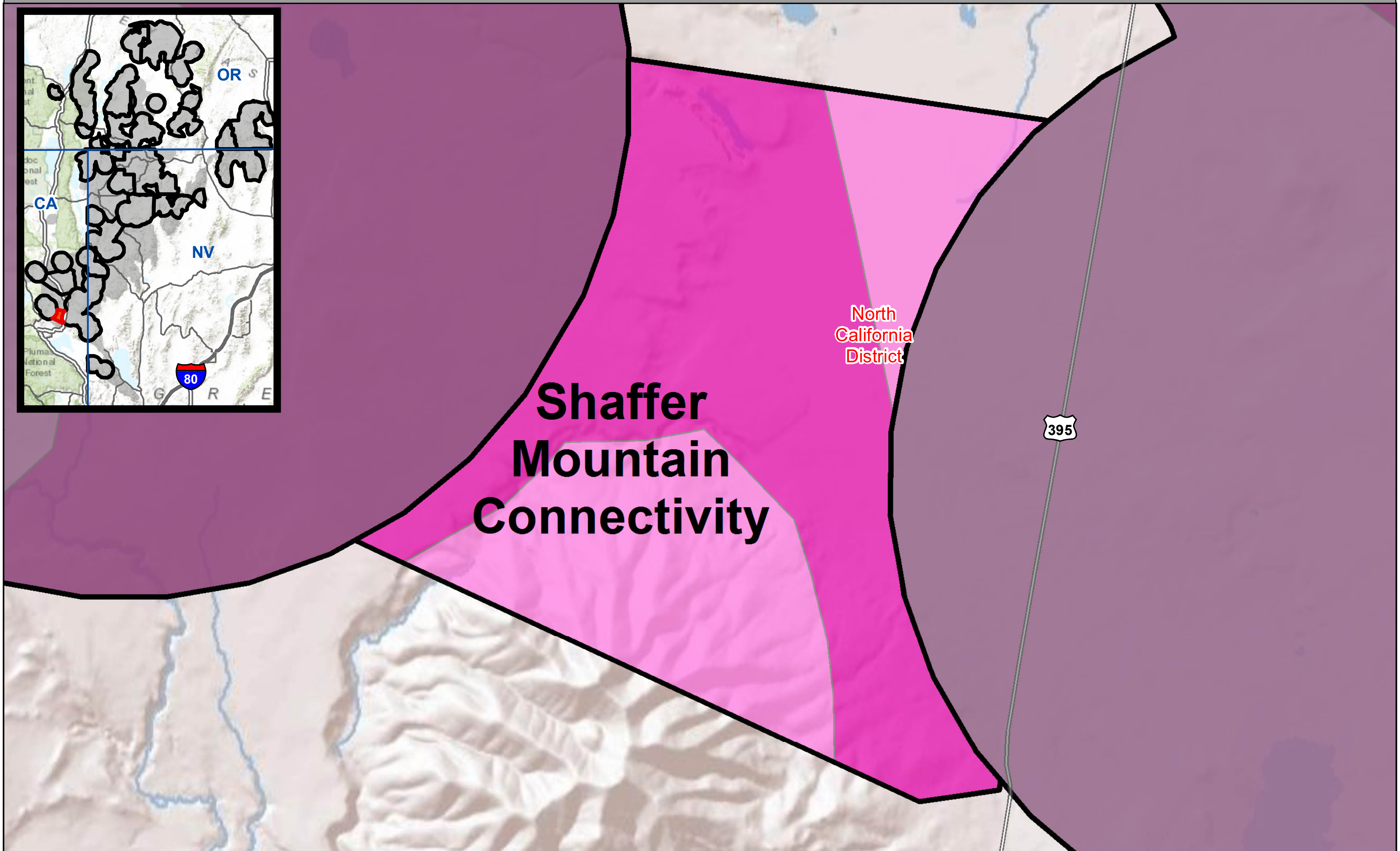
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Shaffer Mountain Connectivity Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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

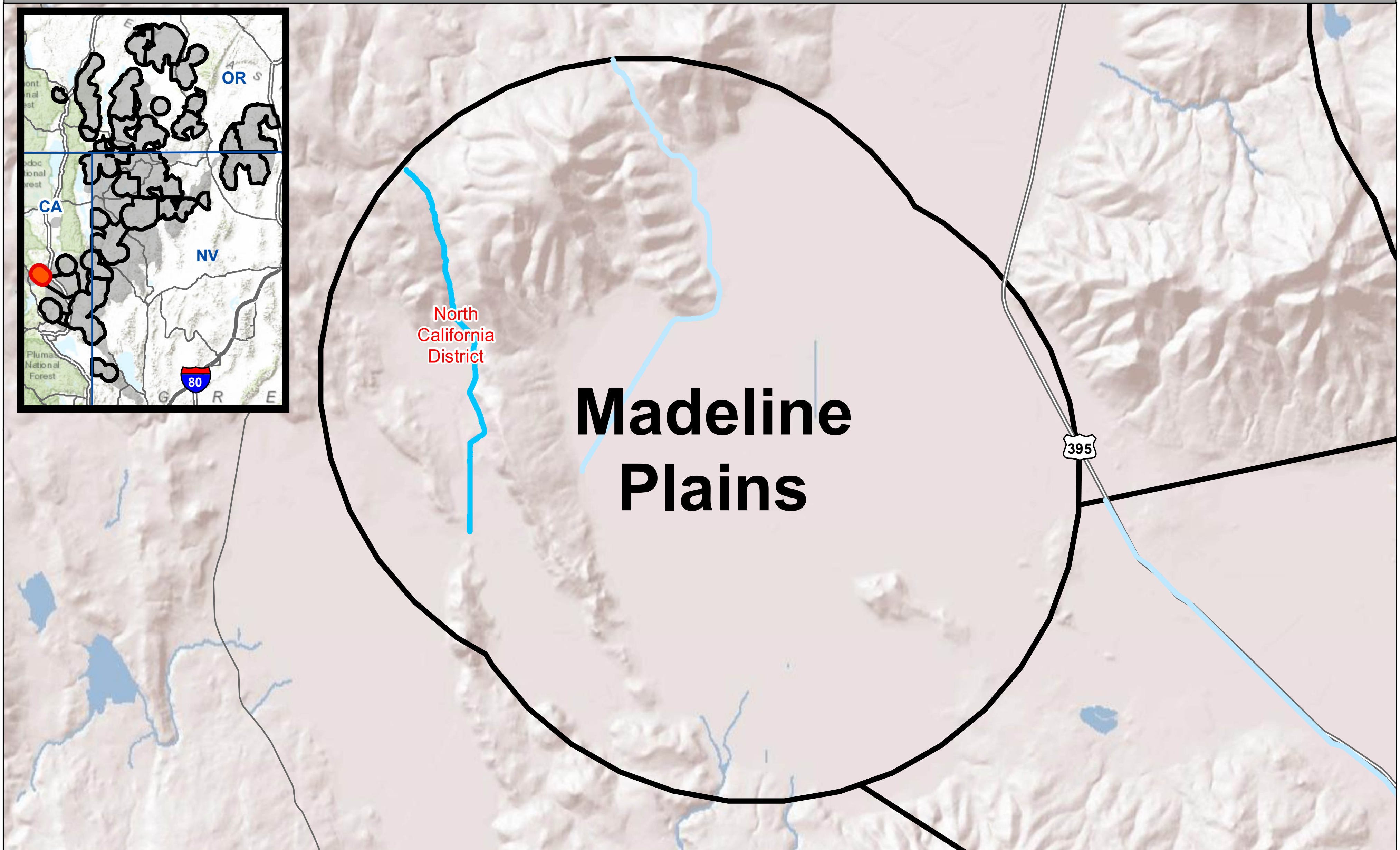
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:120,000

Madeline Plains Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
- First
- Second
- Third

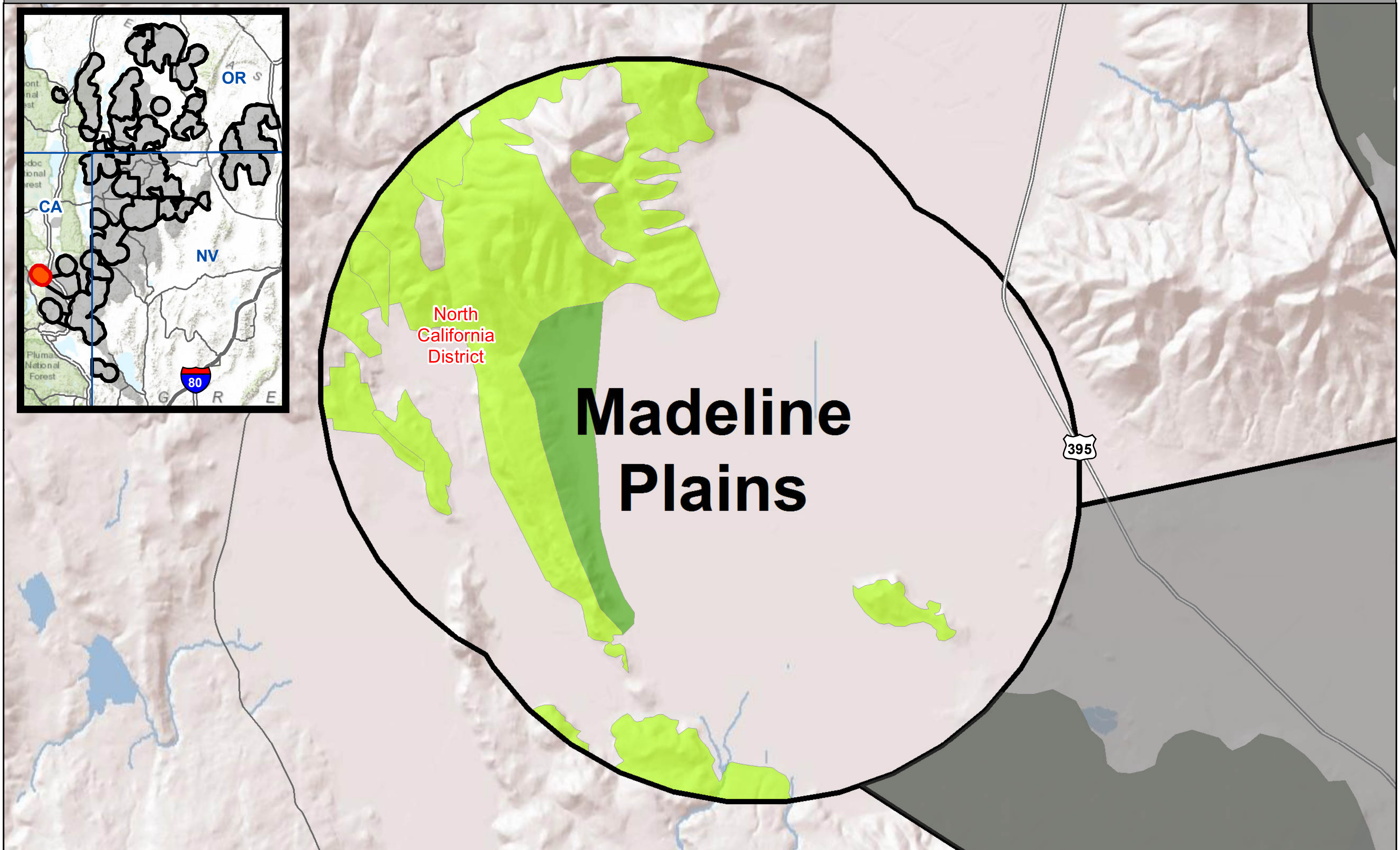
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:183,000

Madeline Plains Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

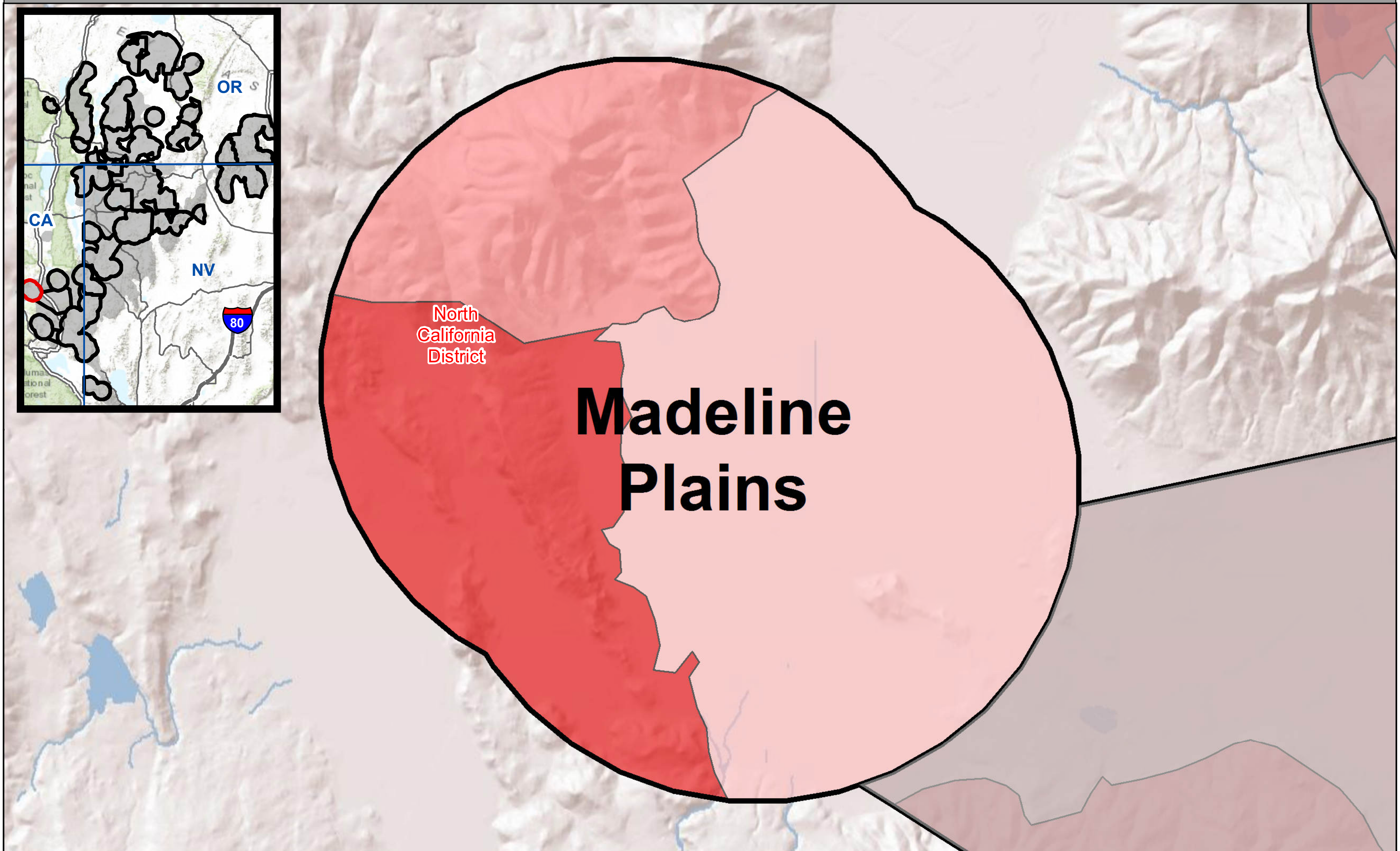
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:183,000

Madeline Plains Fire Operations

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

Western Great Basin and Warm Springs Valley
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

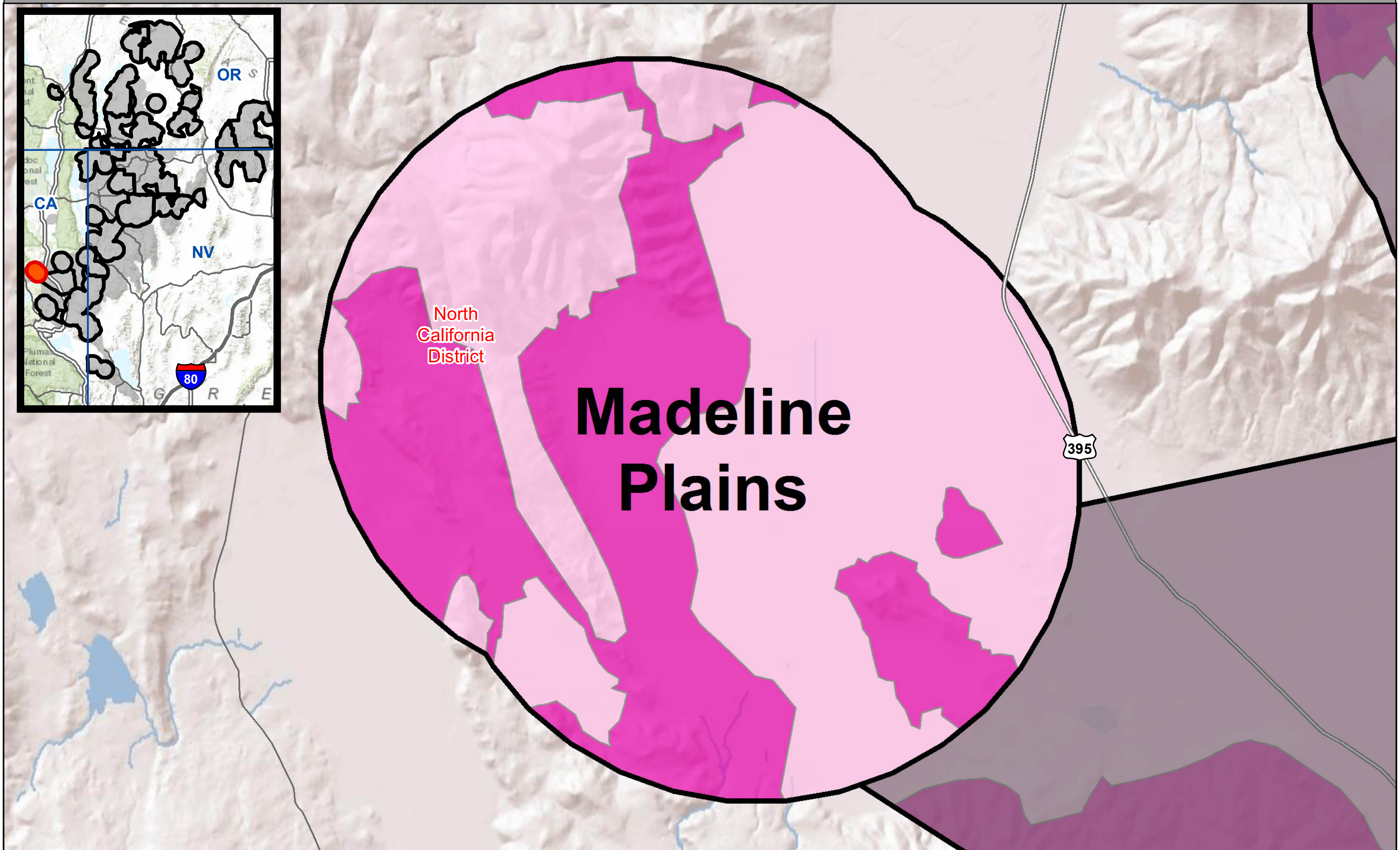
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Madeline Plains Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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.

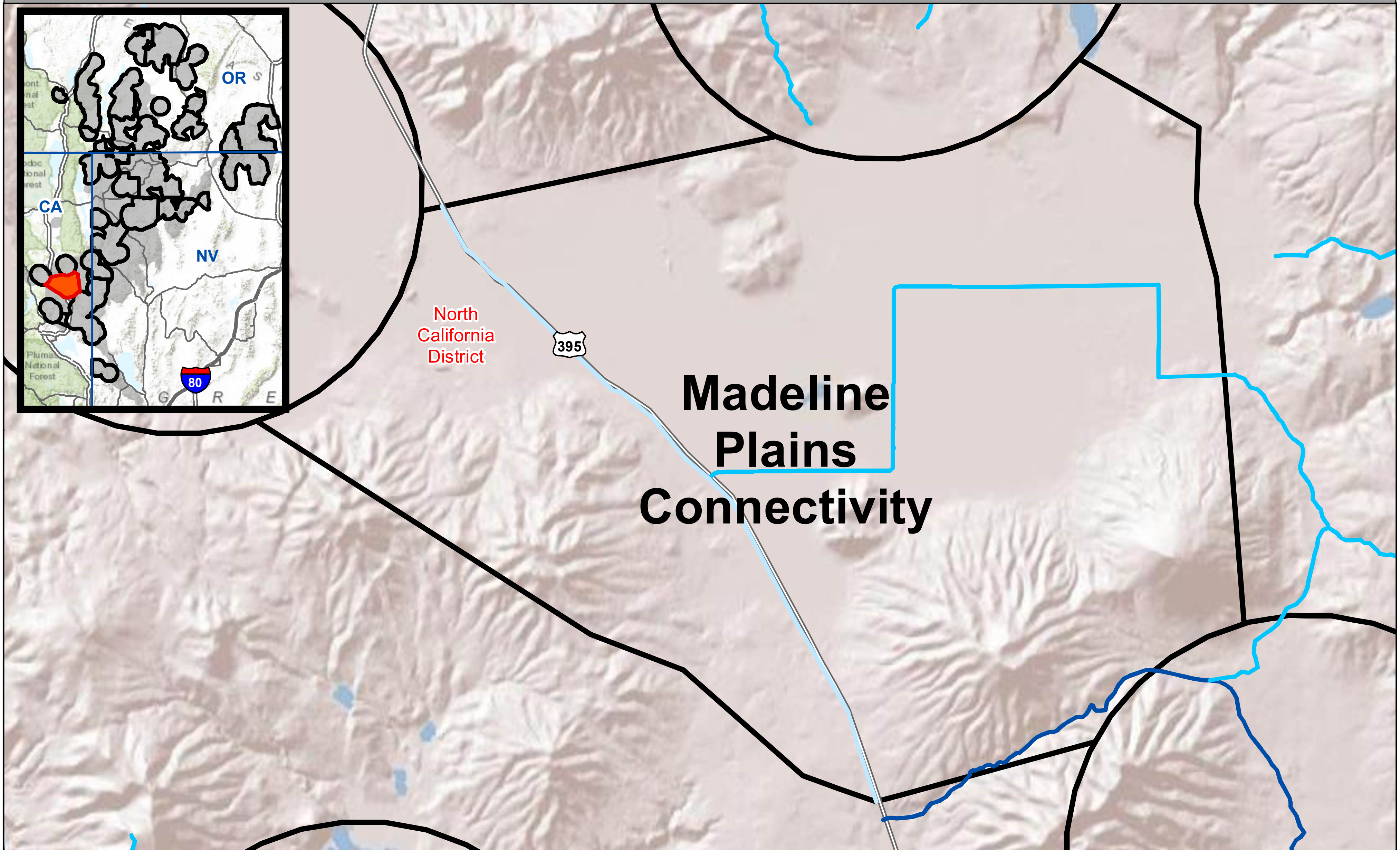
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:183,000

Madeline Plains Connectivity Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

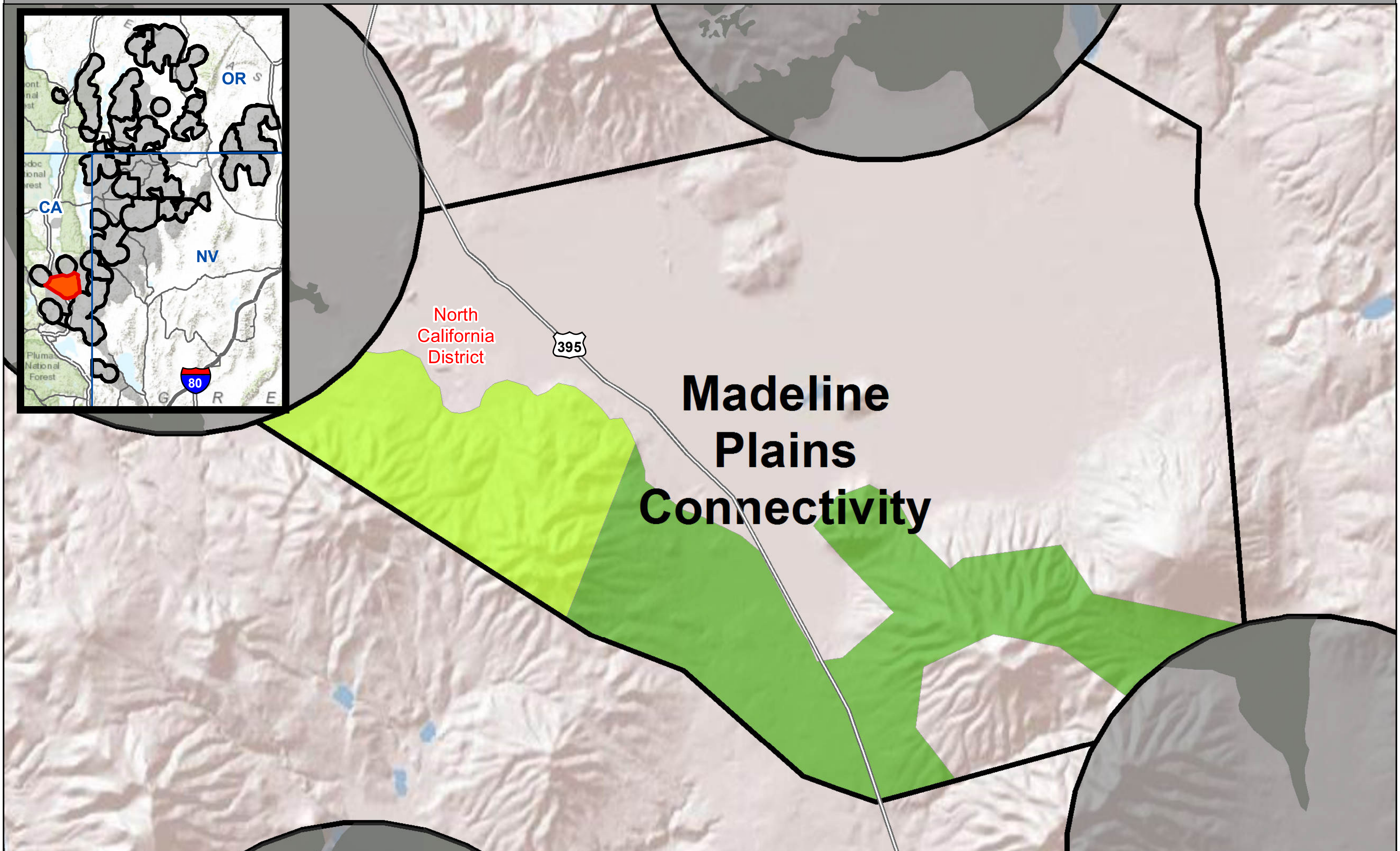
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:243,000

Madeline Plains Connectivity Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

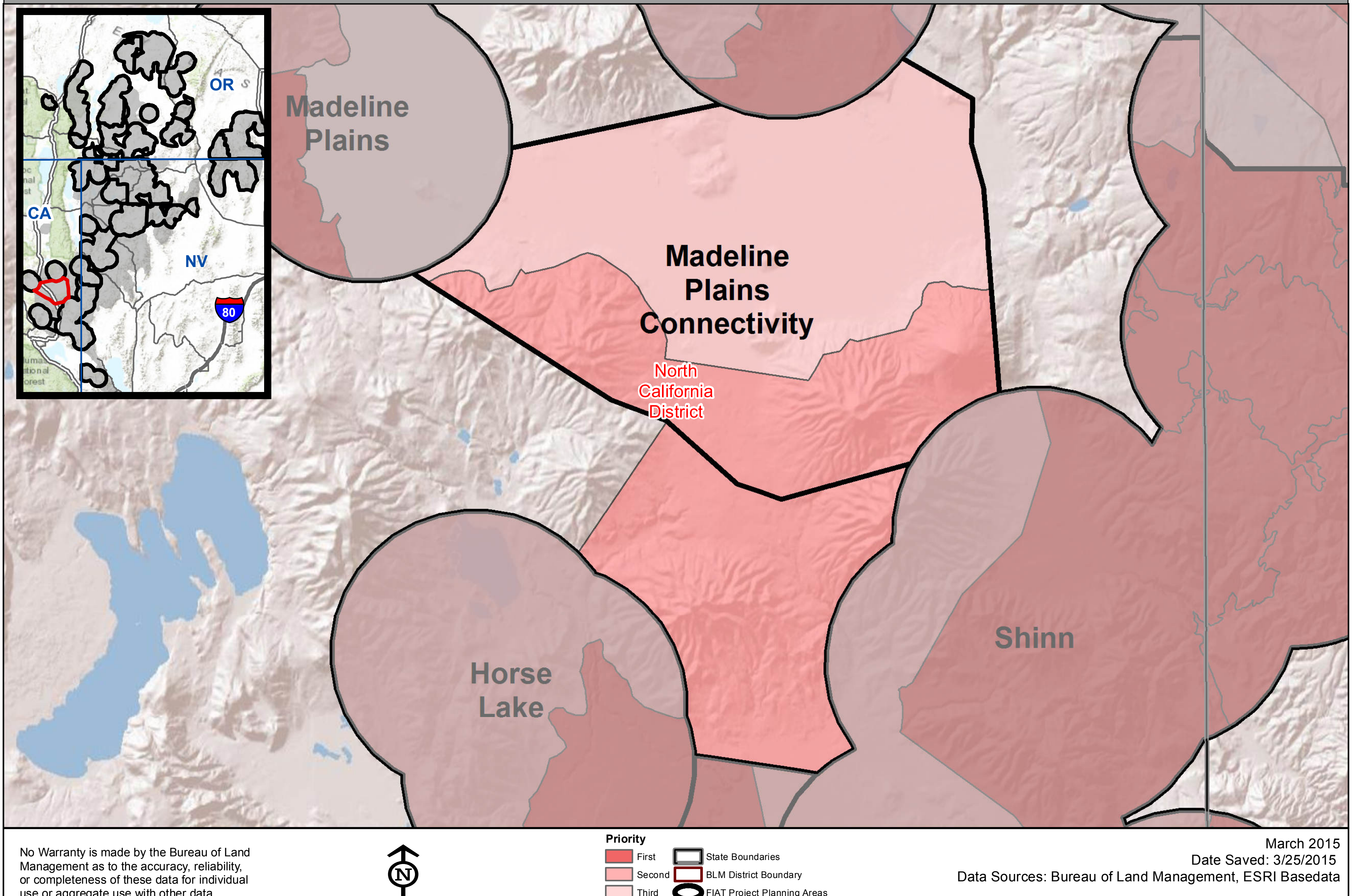
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:243,000

Madeline Plains Connectivity Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



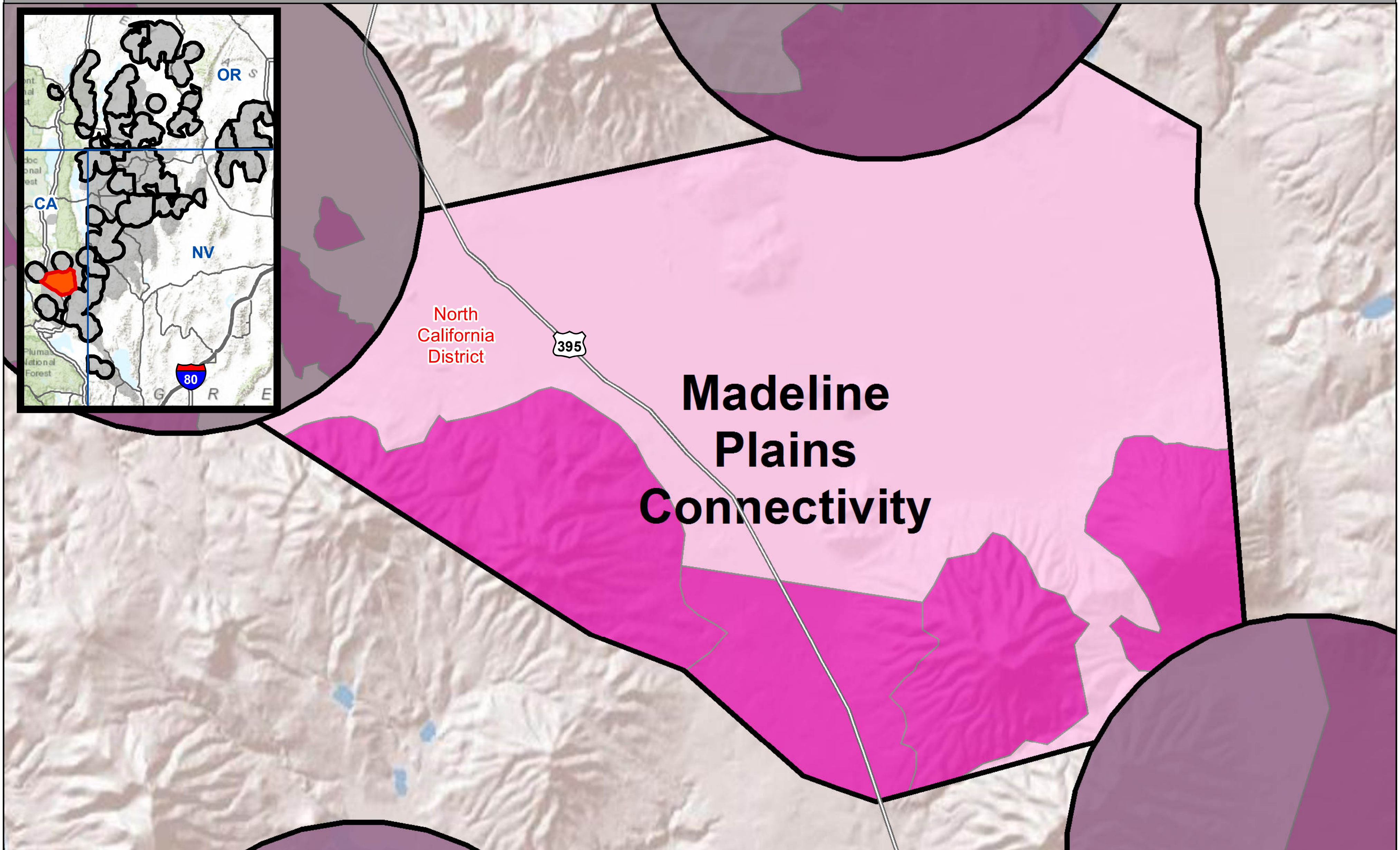
No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data.

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Madeline Plains Connectivity Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

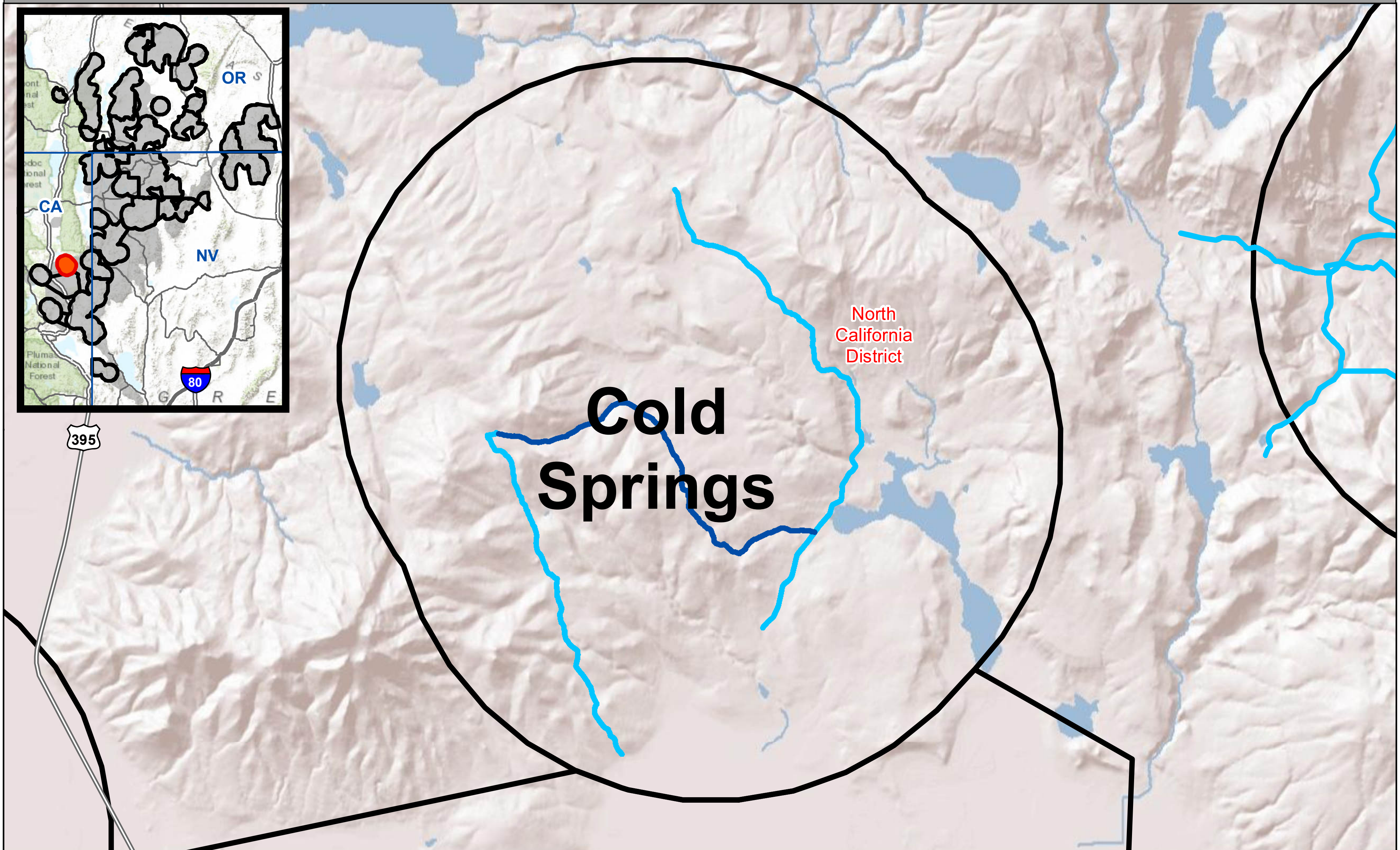
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:243,000

Cold Springs Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

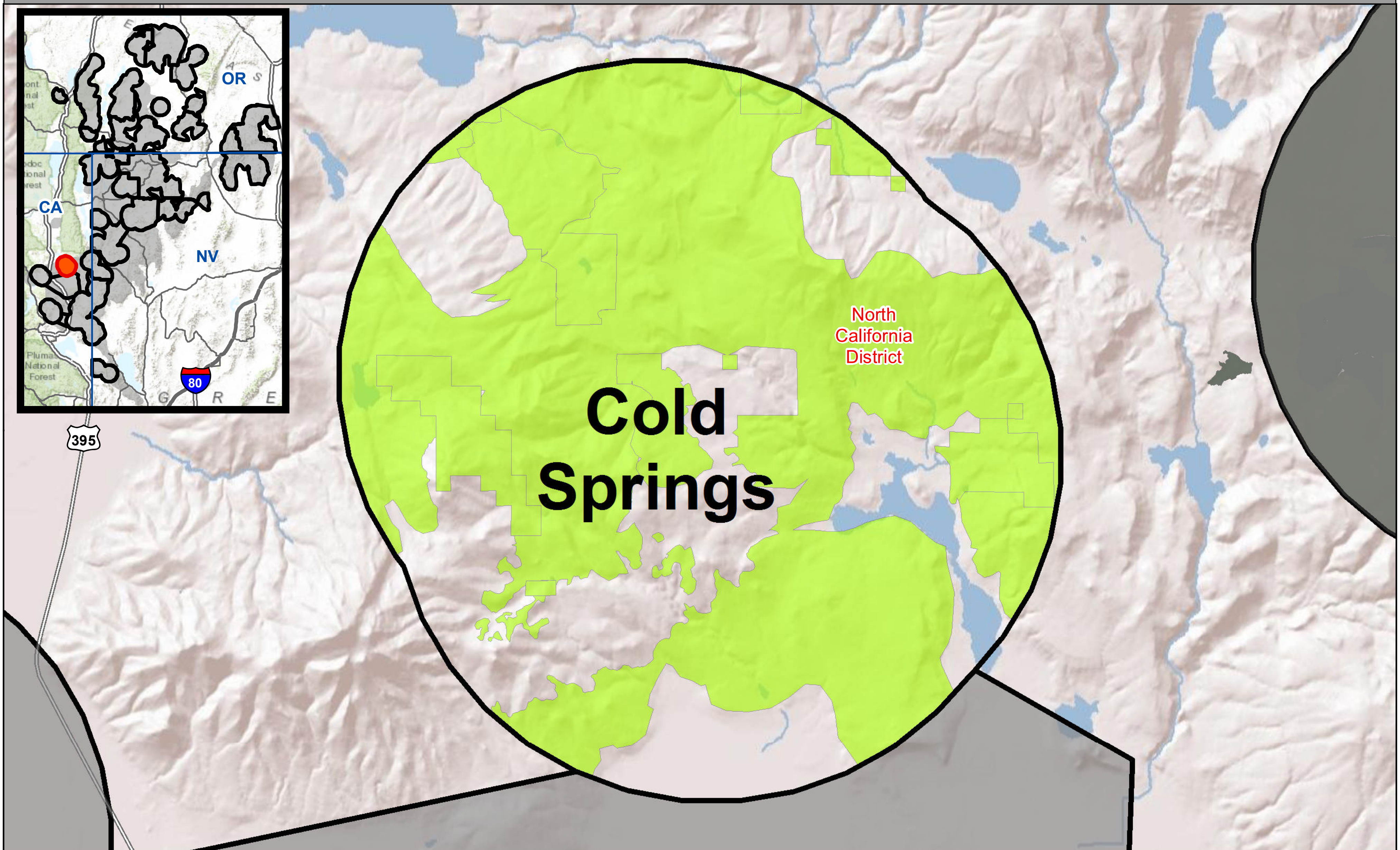
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:185,000

Cold Springs Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas

- First
- Second
- Third

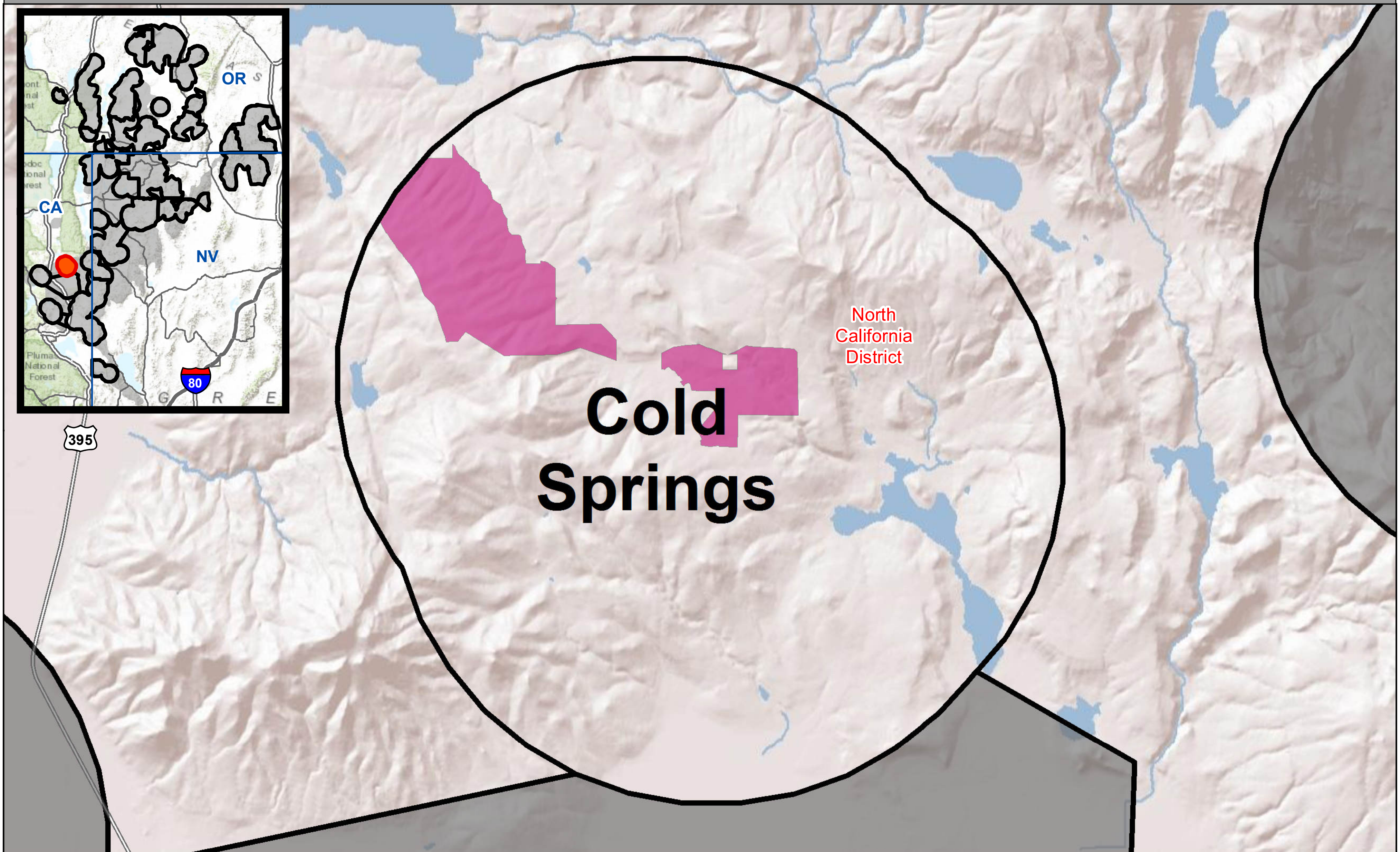
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:185,000

Cold Springs Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

State Boundary

BLM District Boundary

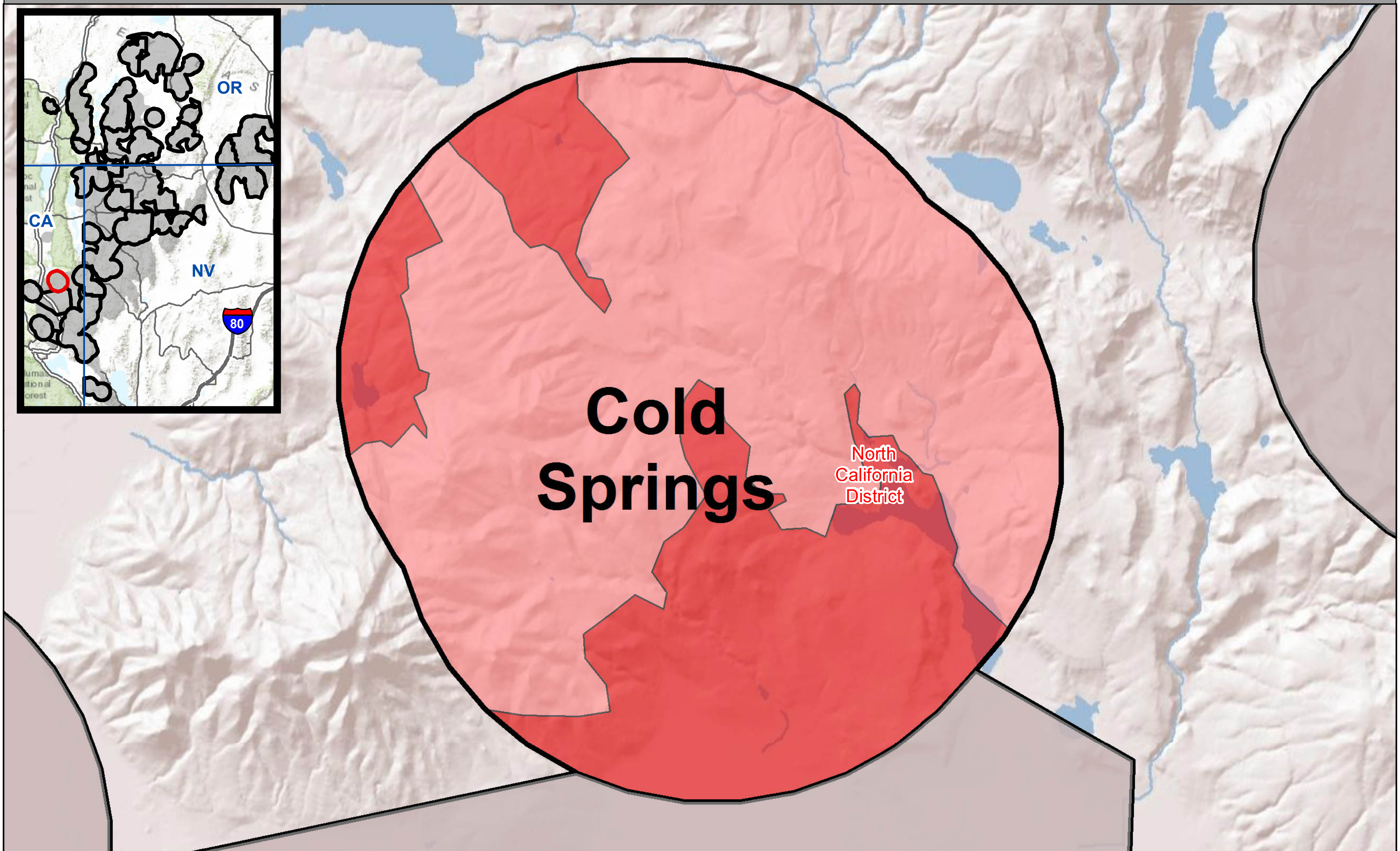
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:184,000

Cold Springs Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

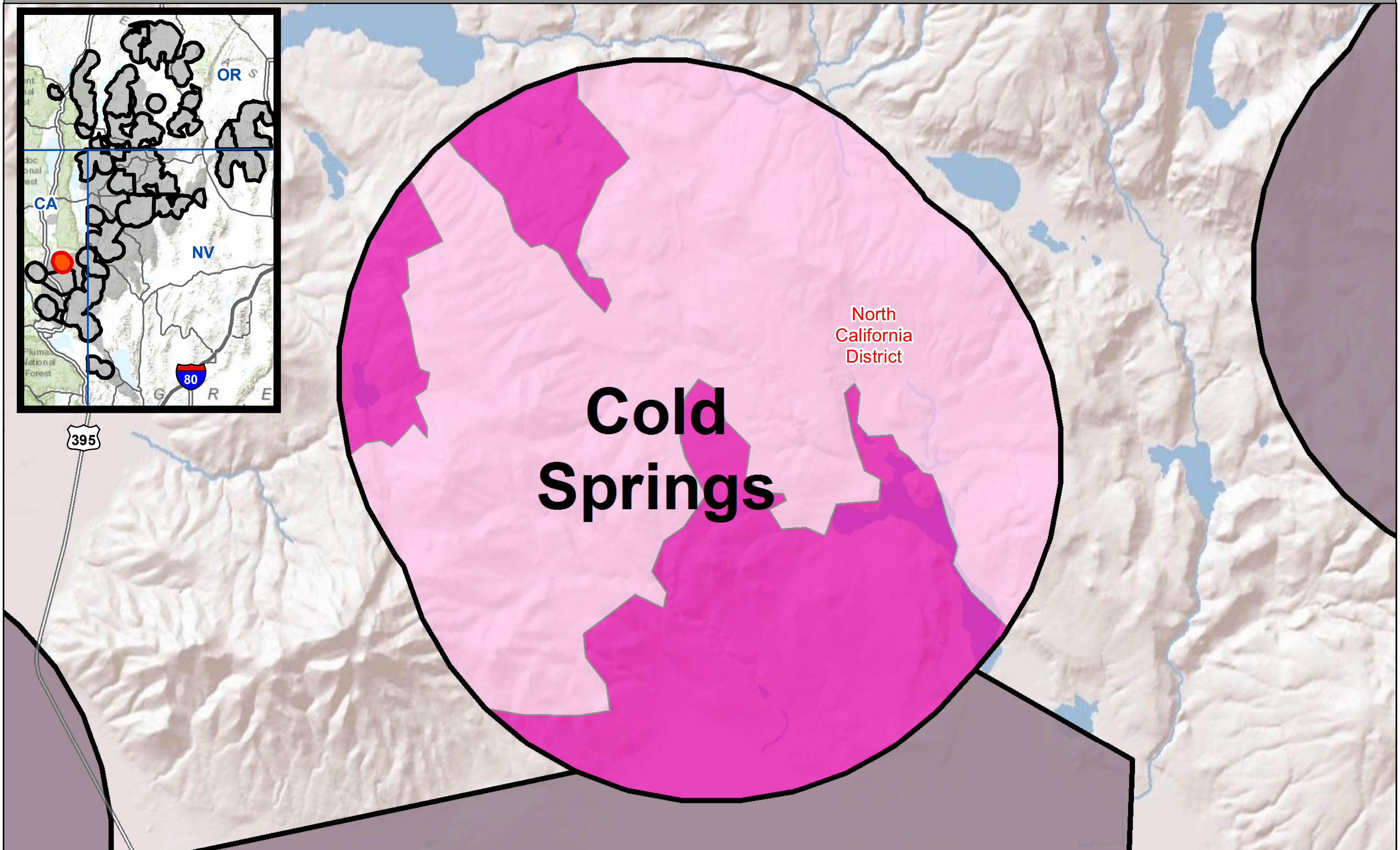
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Cold Springs Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority

First
Second
Third

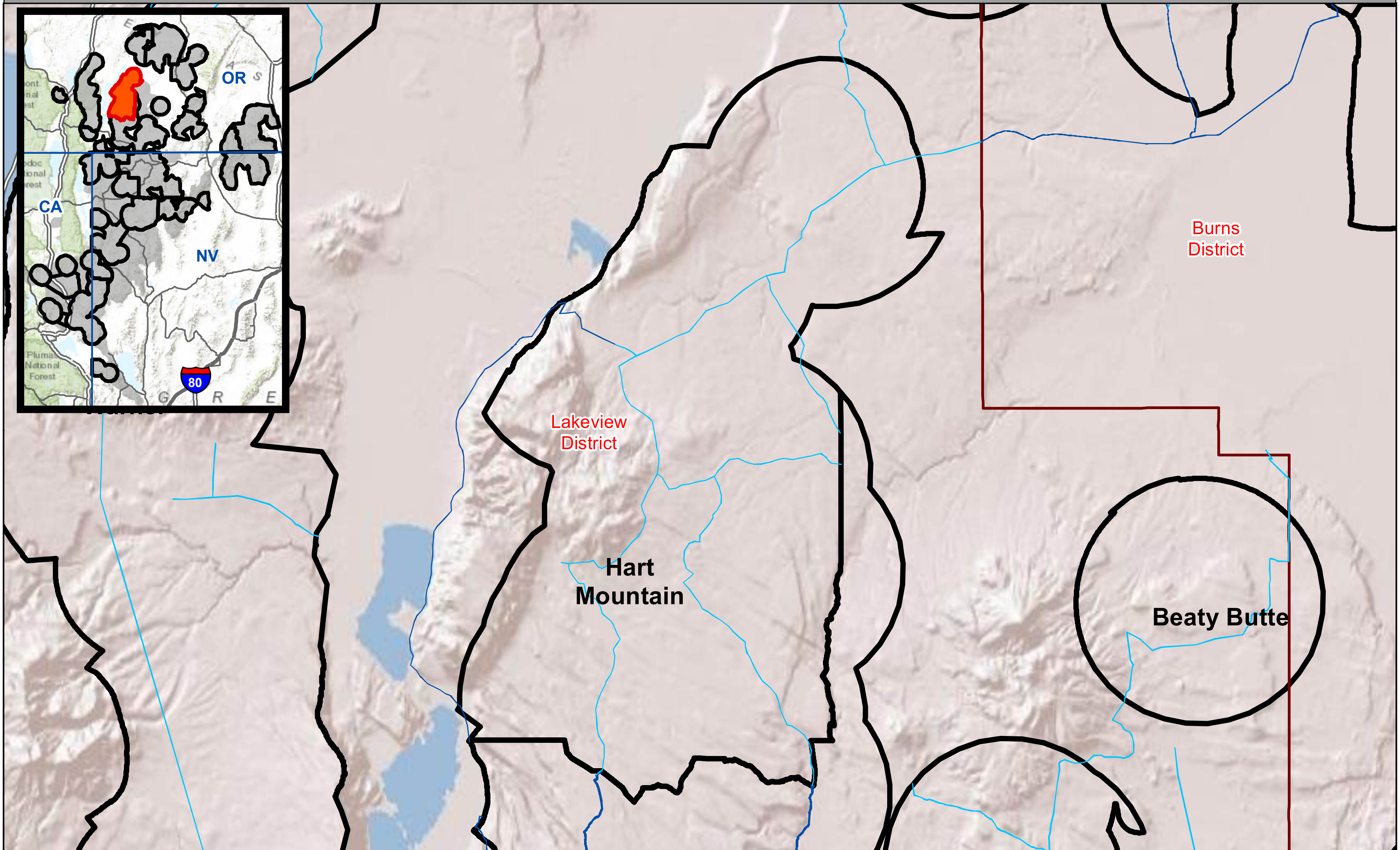
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:185,000

Hart Mountain Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



Priority for Implementation

- First
- Second
- Third

- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

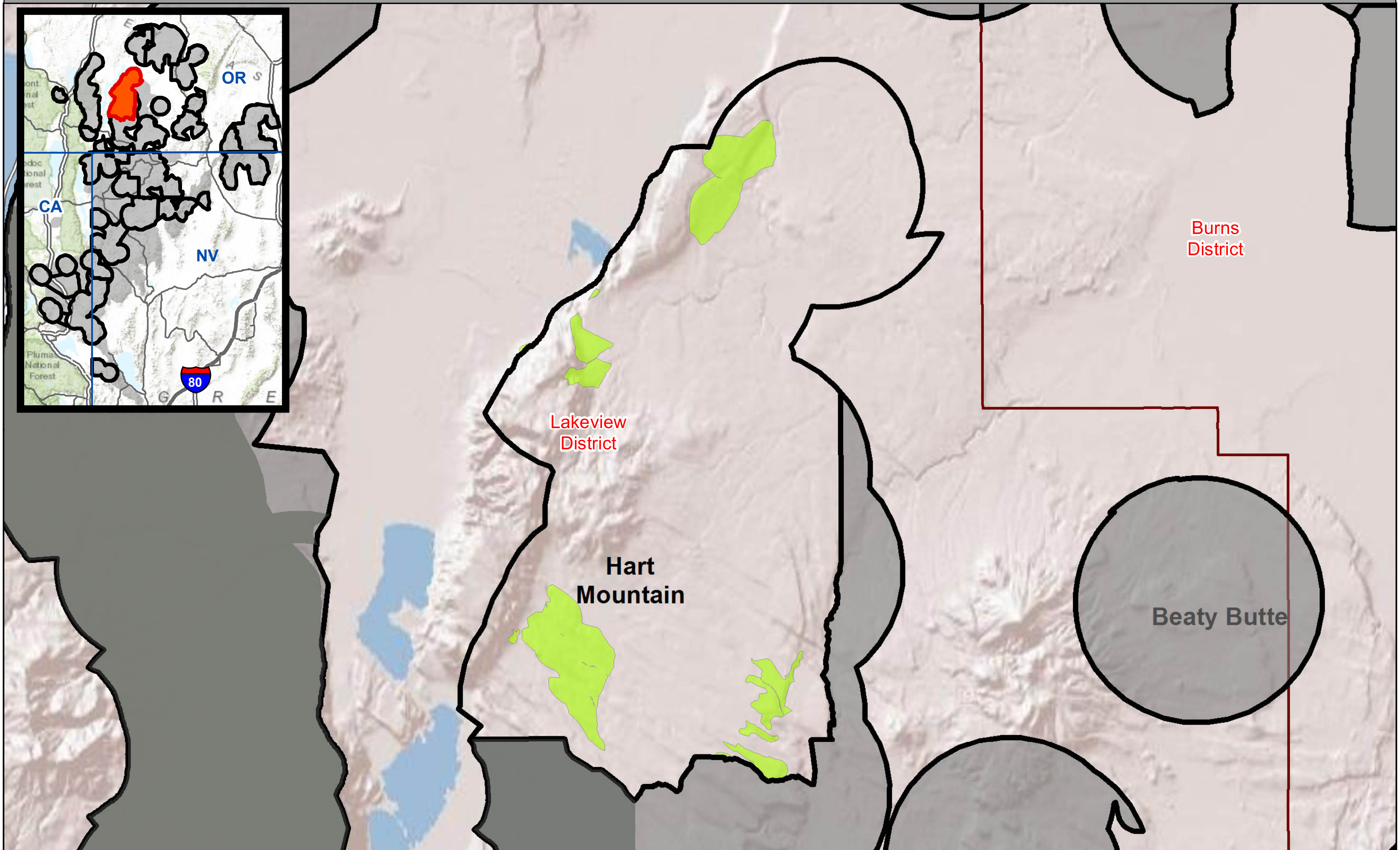
N

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:484,000

Hart Mountain Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Conifer Treatment Areas
- First
- Second
- Third

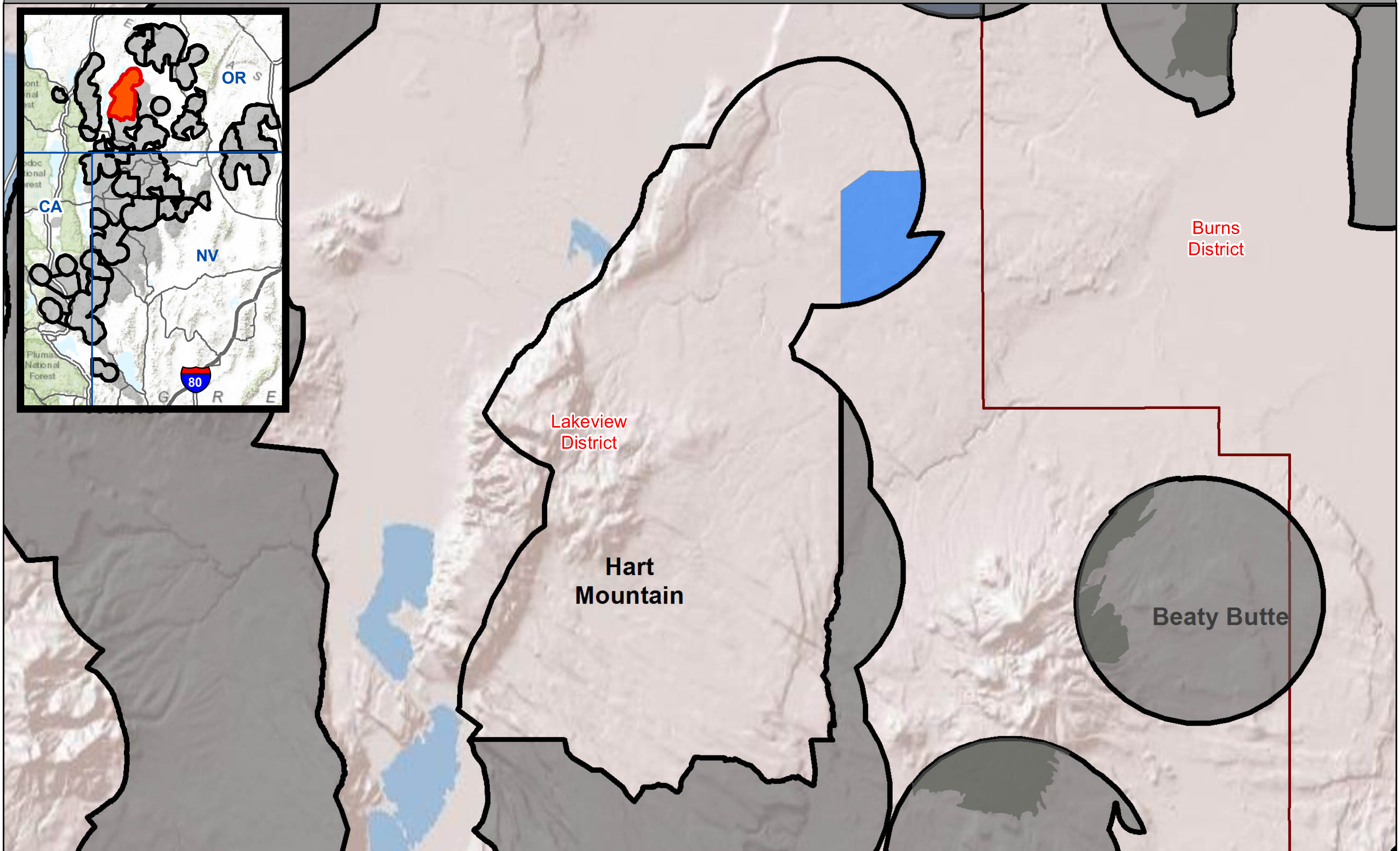
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:485,000

Hart Mountain Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

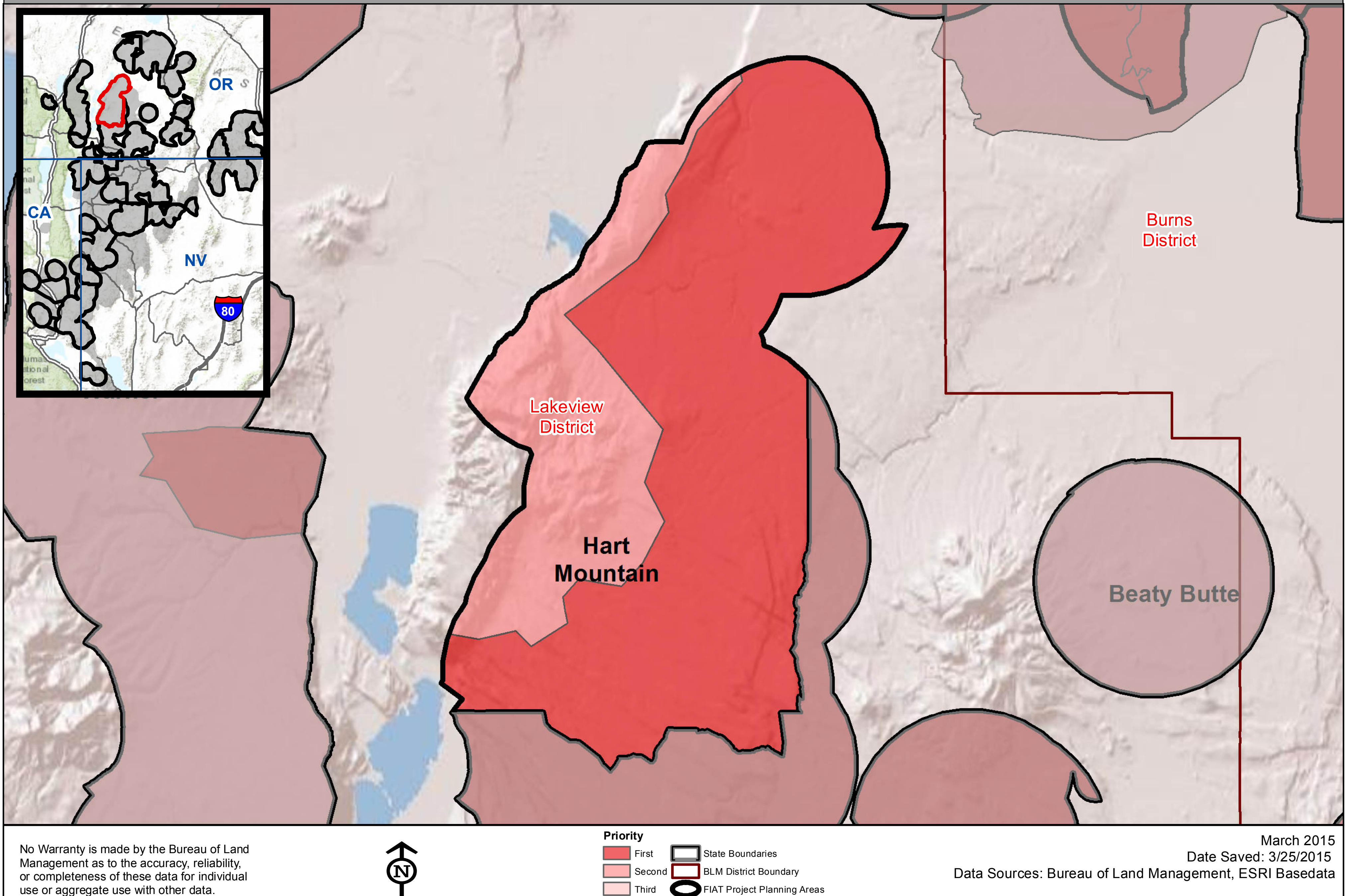
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:484,000

Hart Mountain Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior

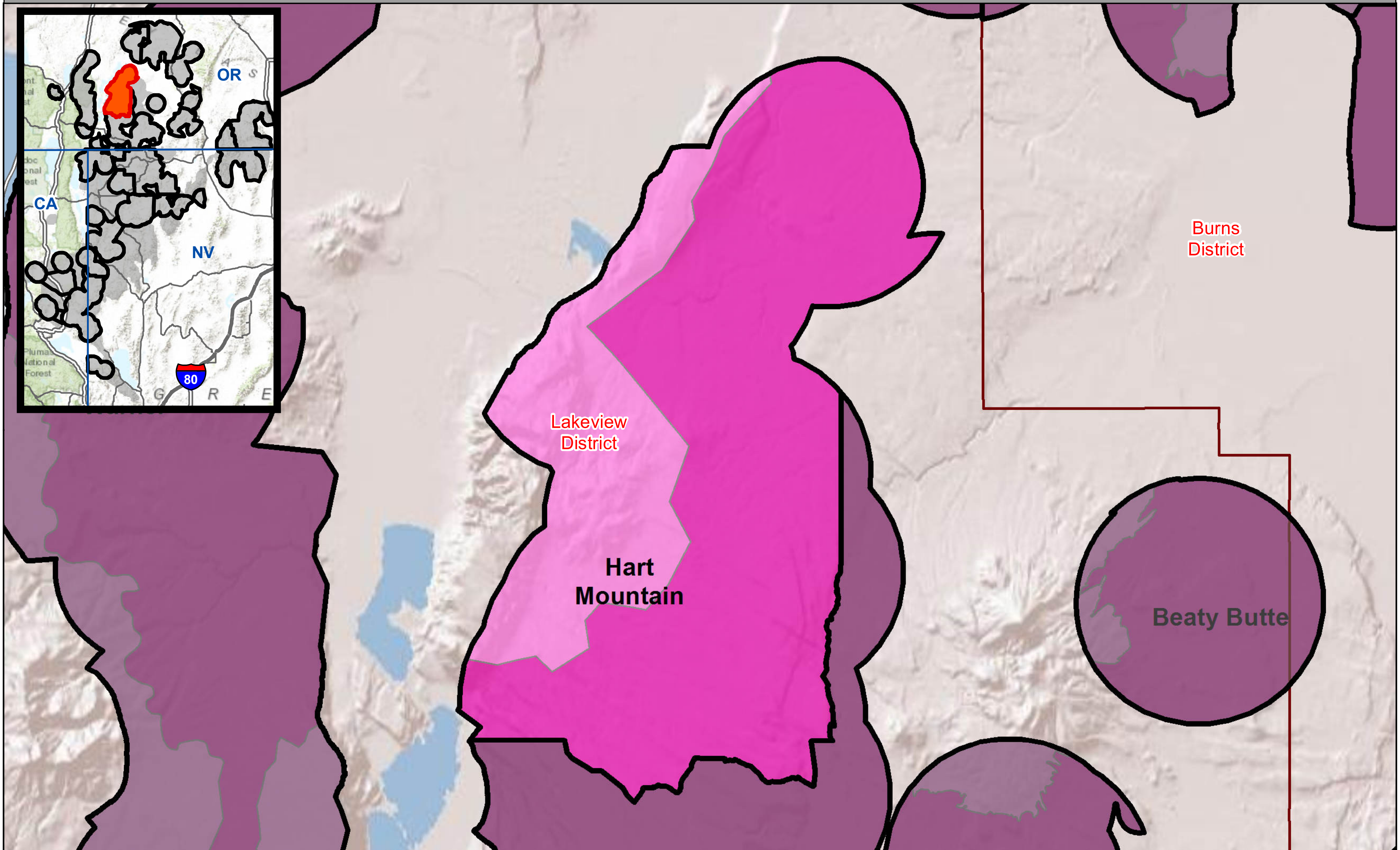


March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Hart Mountain Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority

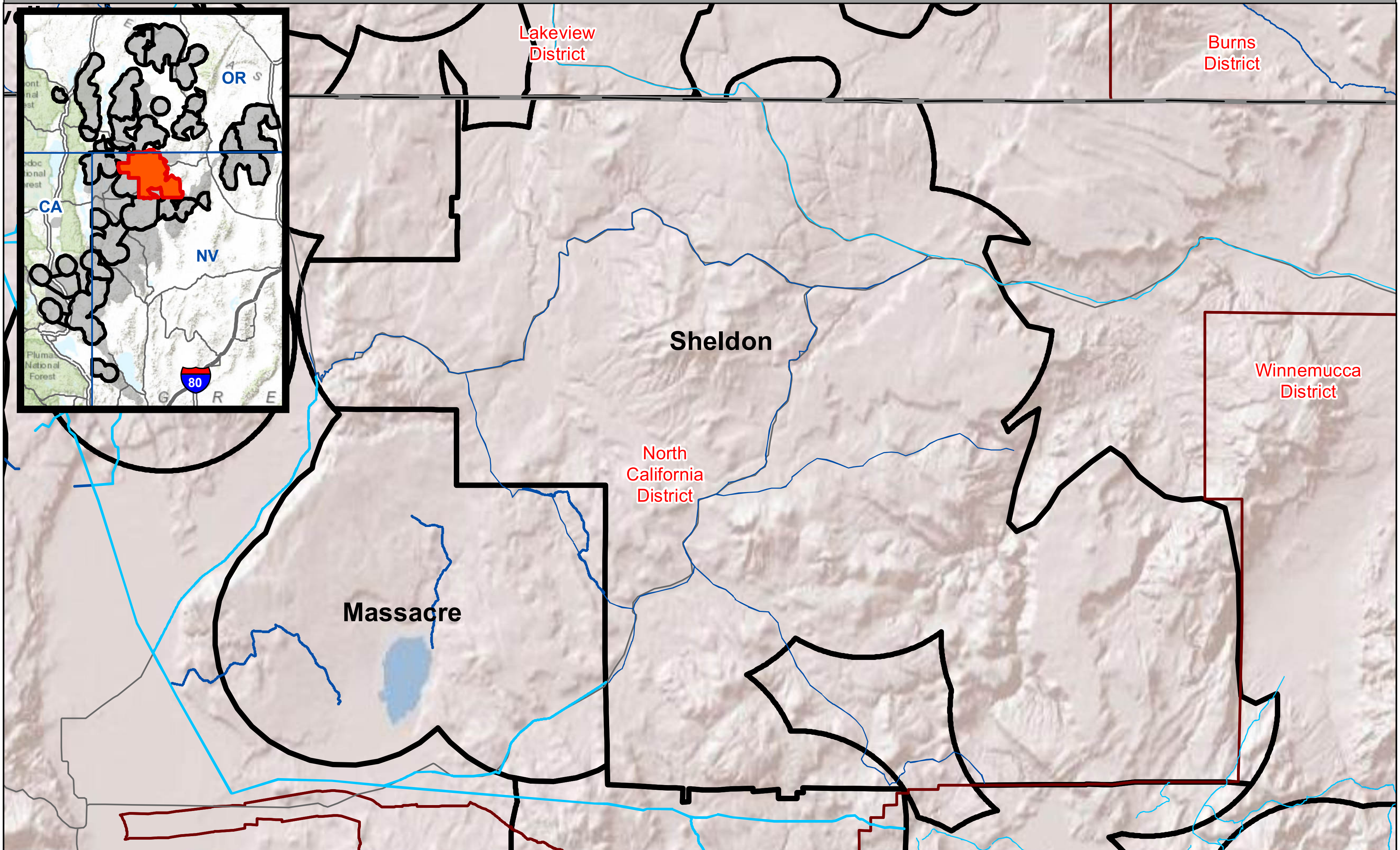
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:484,000

Sheldon Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority for Implementation
First
Second
Third

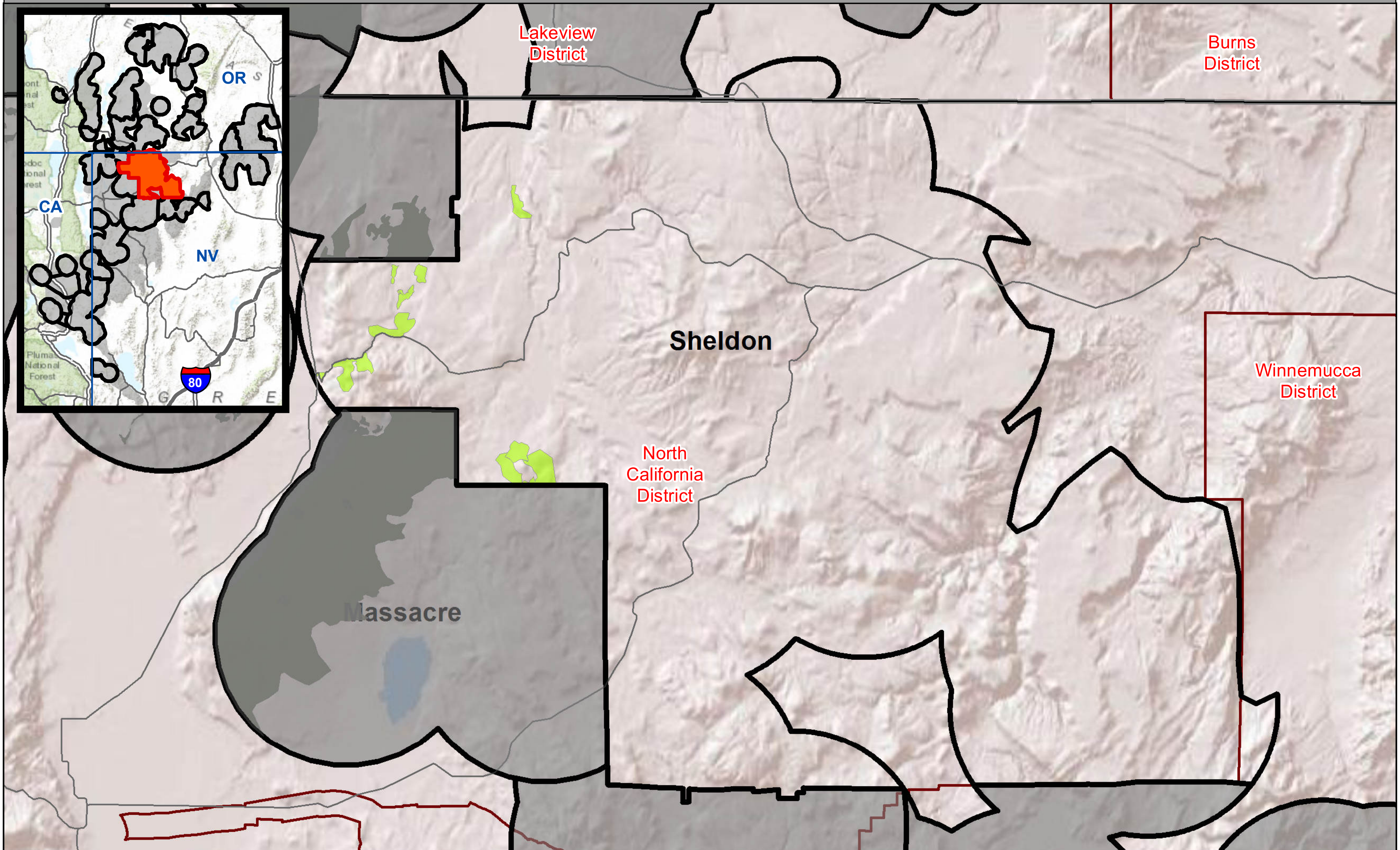
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:455,000

Sheldon Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Potential Conifer Treatment Areas

- First
- Second
- Third

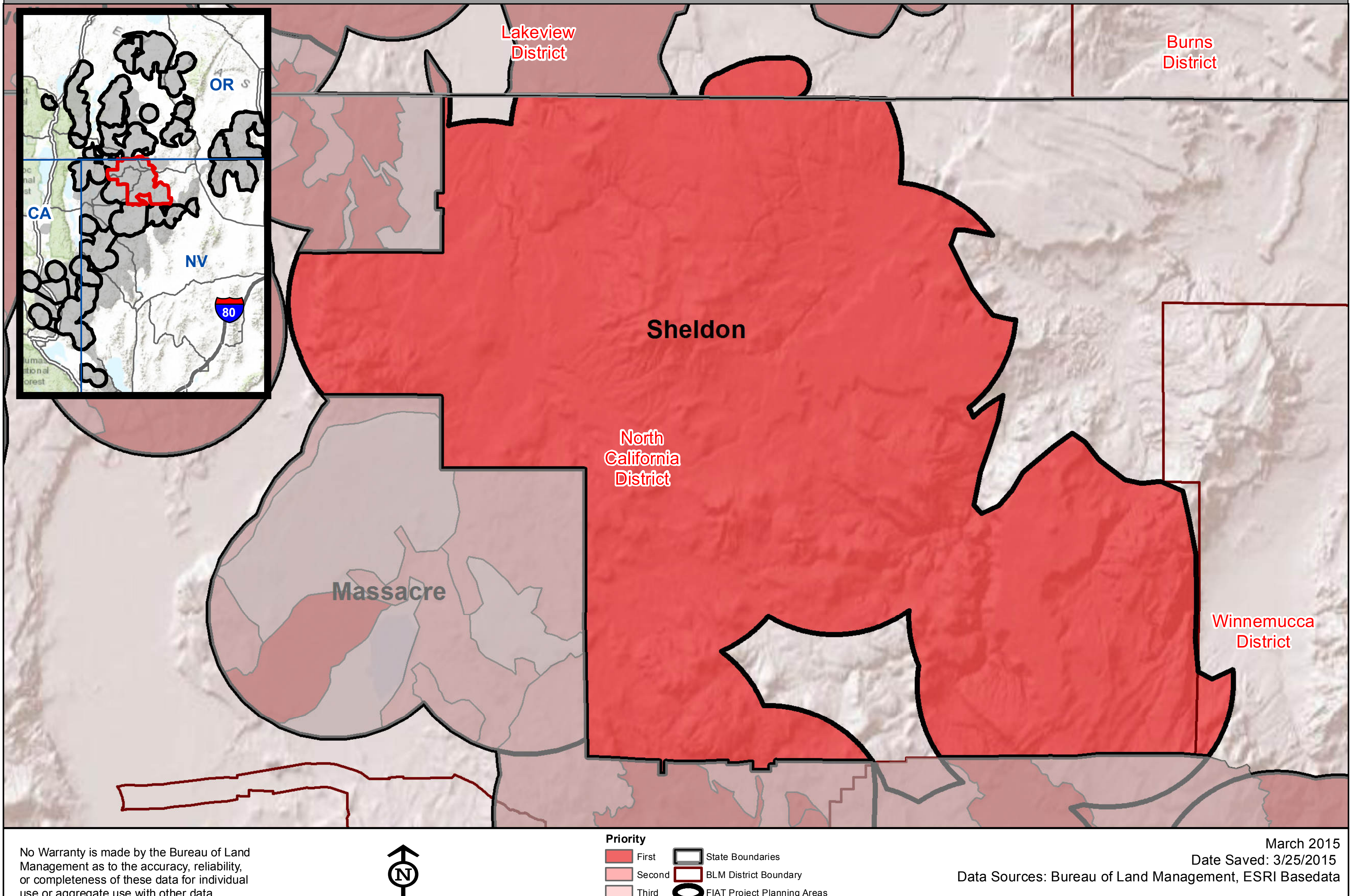
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:455,000

Sheldon Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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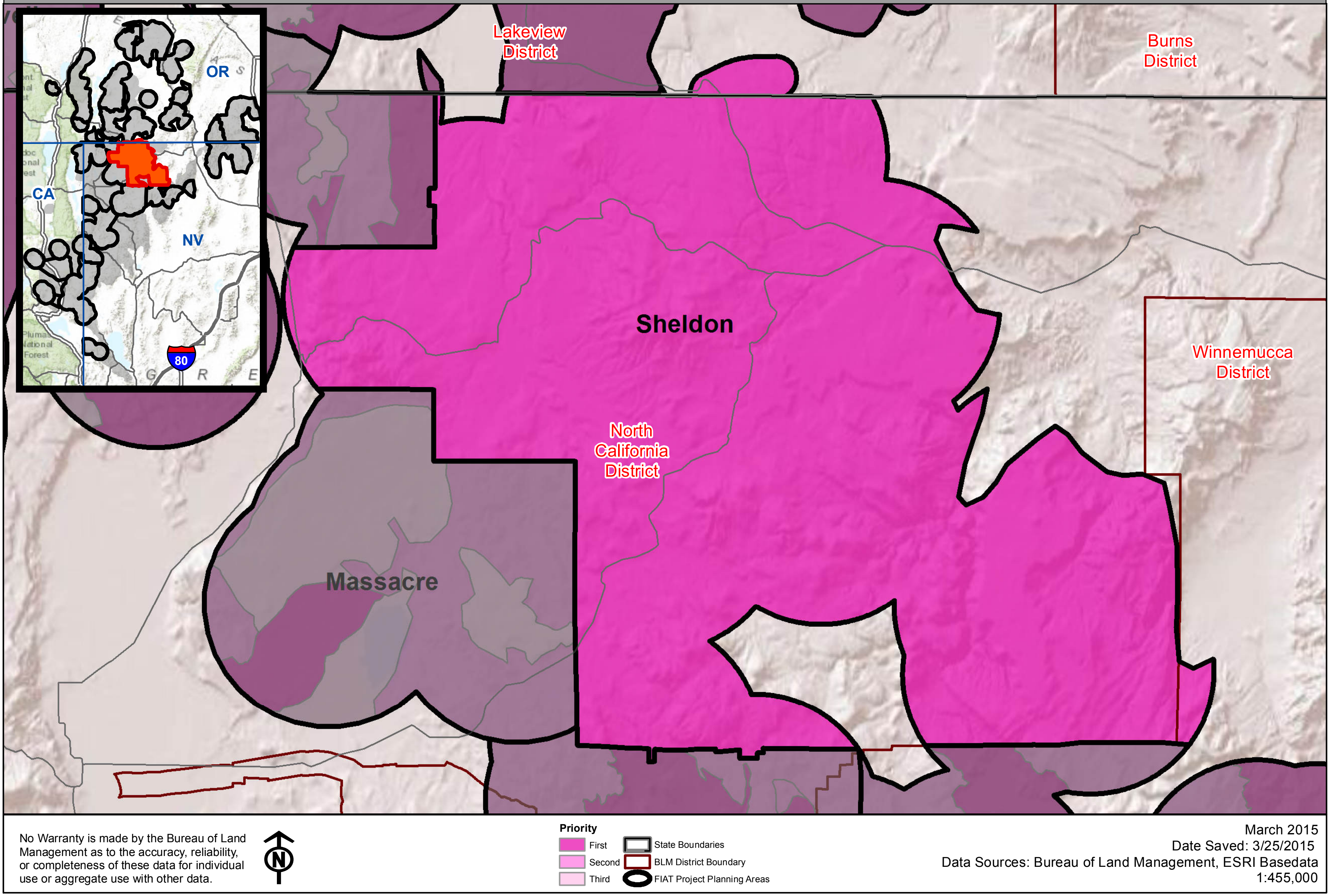
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Sheldon Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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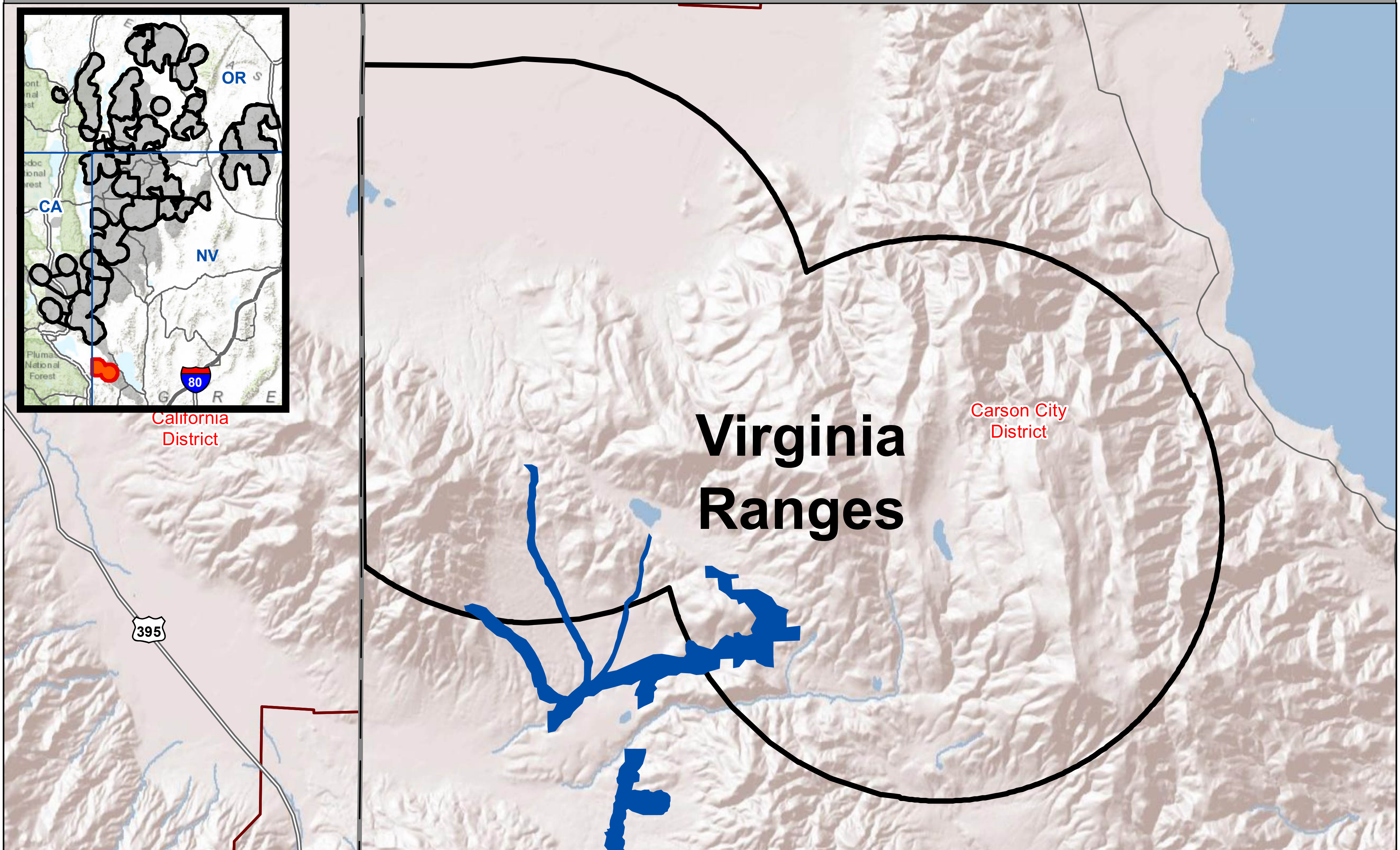
March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:455,000

Virginia Ranges Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Priority for Implementation
- First
- Second
- Third

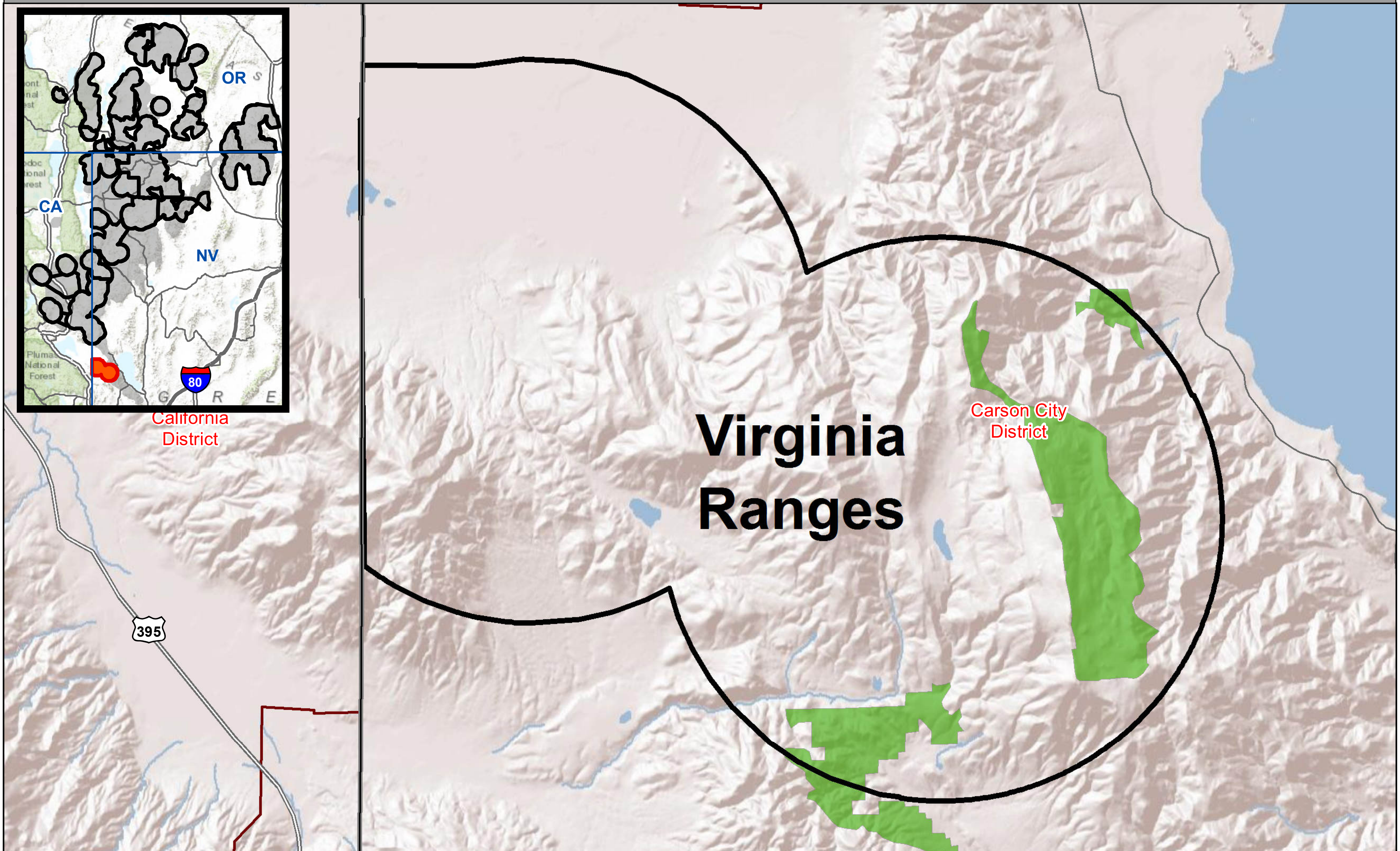
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:206,000

Virginia Ranges Habitat Restoration - Conifer Treatments

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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Potential Conifer Treatment Areas

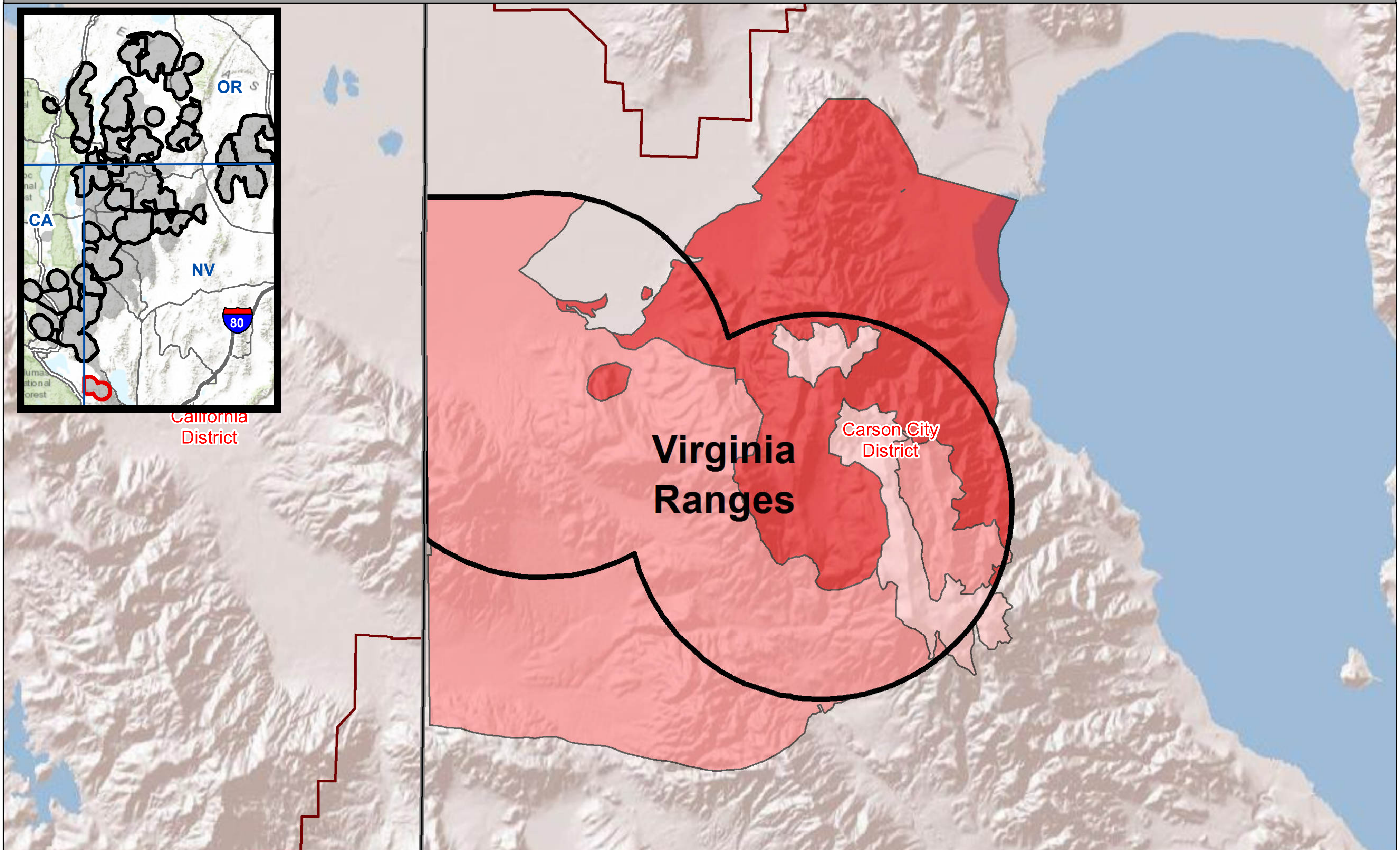
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:206,000

Virginia Ranges Fire Operations

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

Western Great Basin and Warm Springs Valley
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

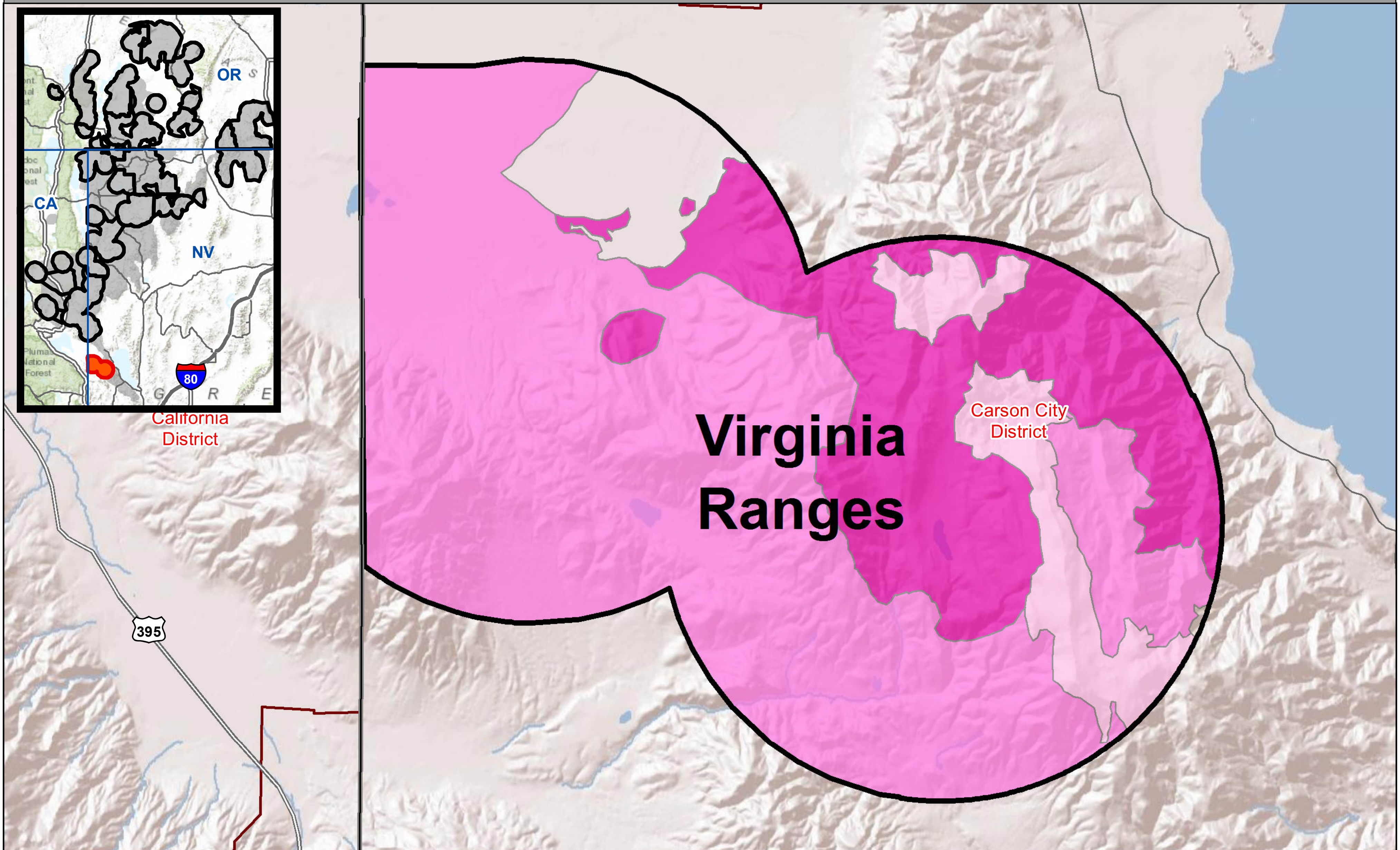
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Virginia Ranges Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
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.

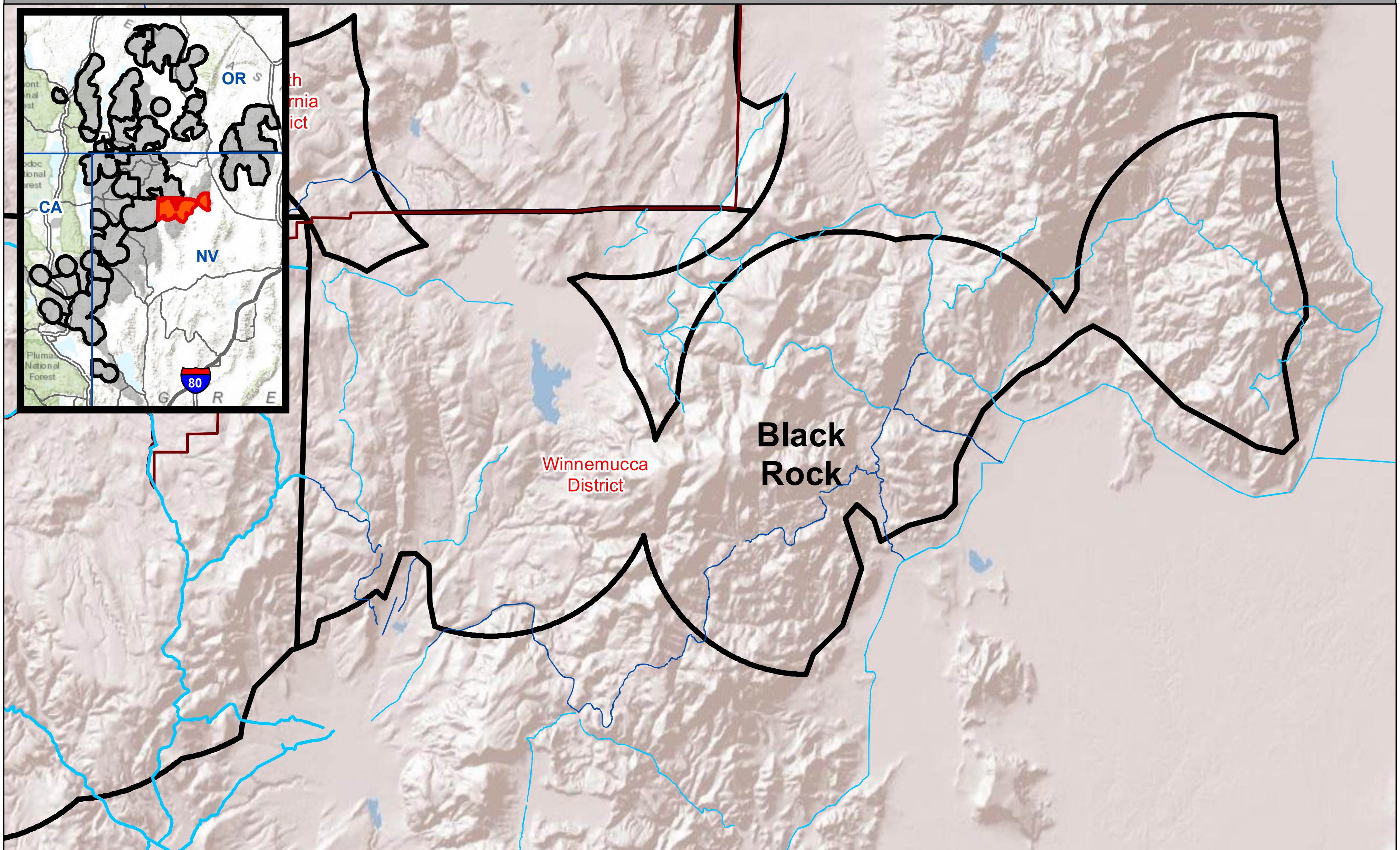
Priority
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:206,000

Black Rock Fuels Management

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

Priority for Implementation
- First
- Second
- Third

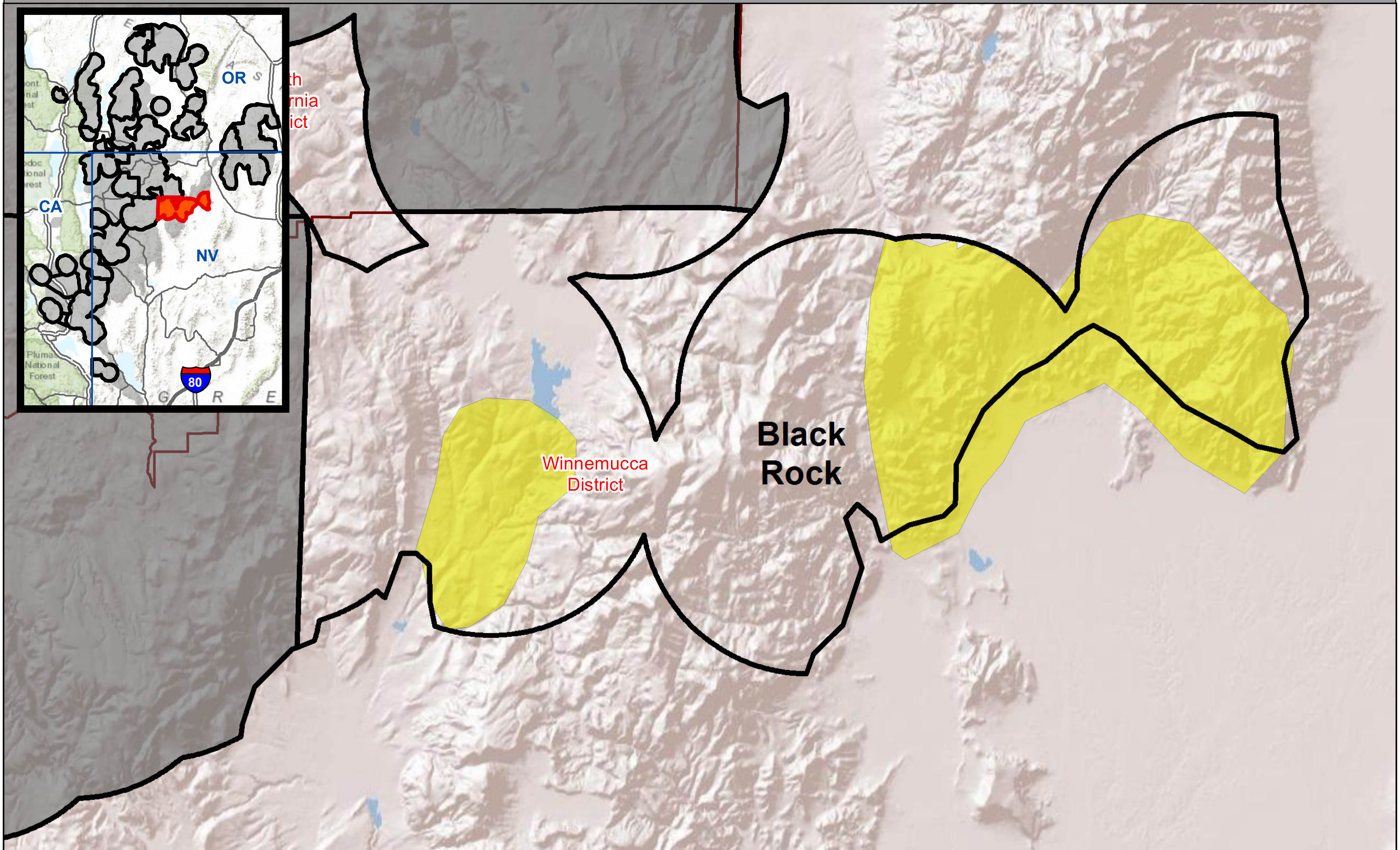
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:354,000

Black Rock Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

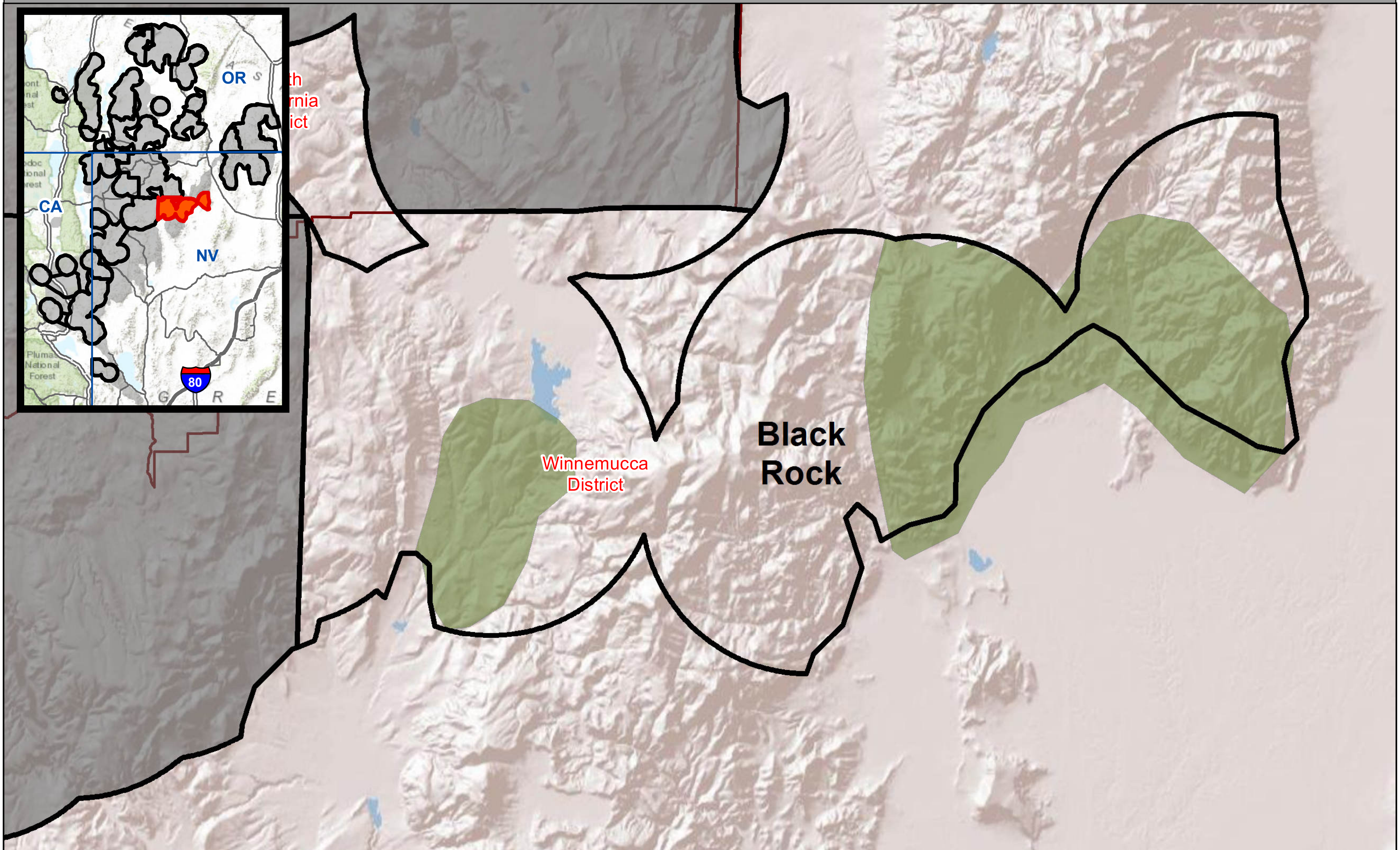
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:354,000

Black Rock Habitat Restoration - Sagebrush Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Area

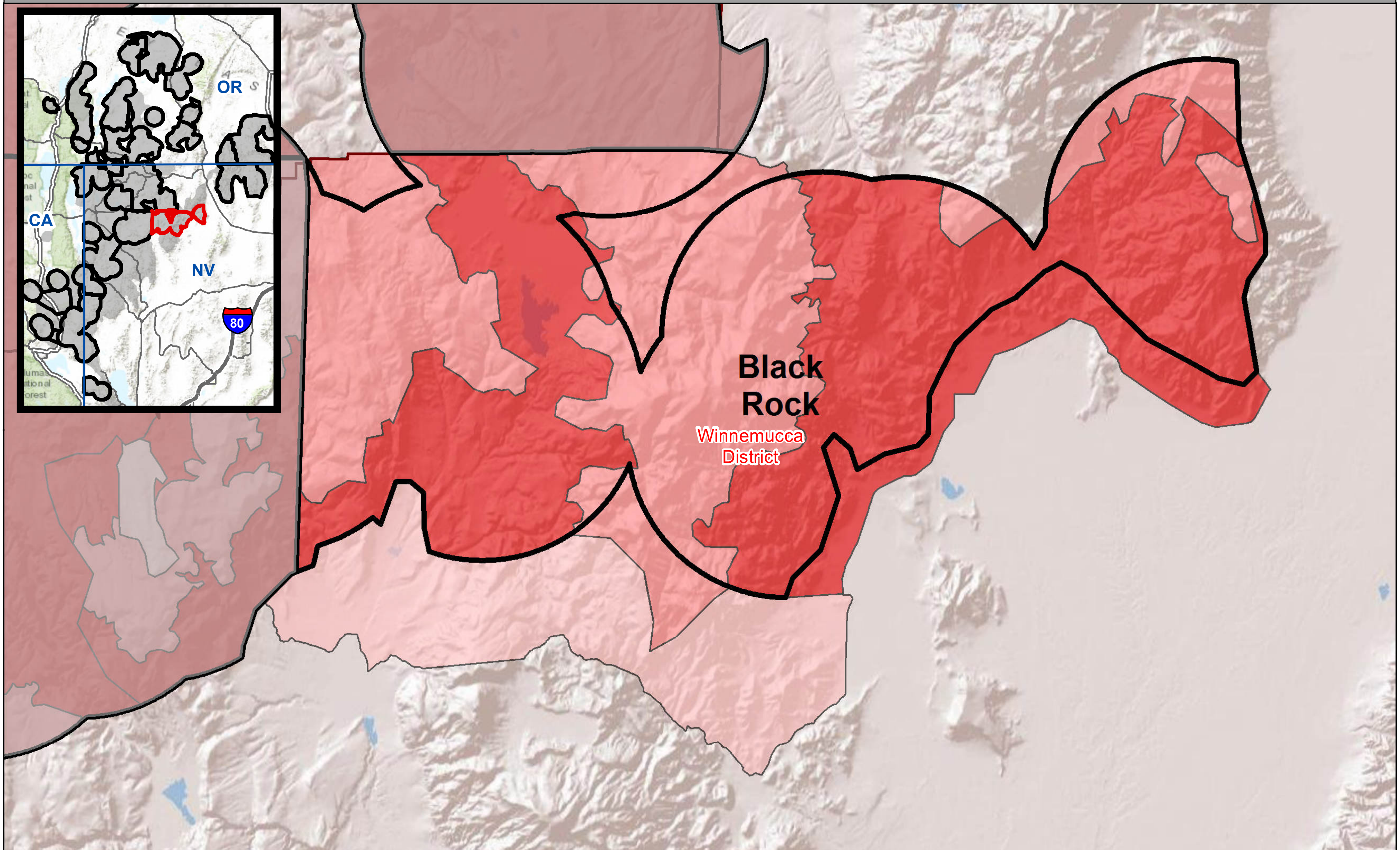
- Habitat Restoration- Sagebrush Plantings
- Habitat Restoration- Sagebrush Mowings
- State Boundary
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:354,000

Black Rock Fire Operations

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

Western Great Basin and Warm Springs Valley
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

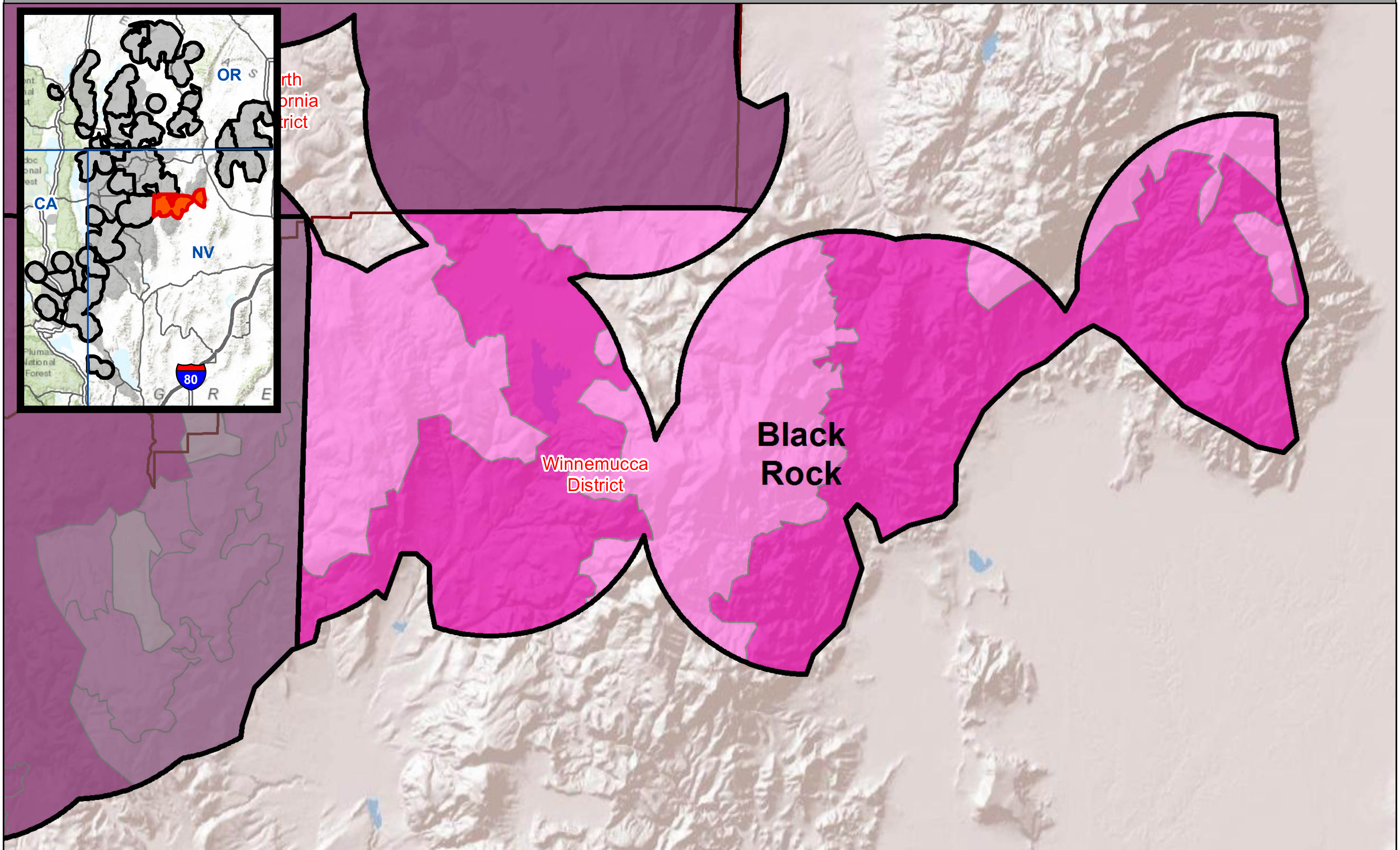
- First
- Second
- Third
- State Boundaries
- BLM District Boundary
- FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Black Rock Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

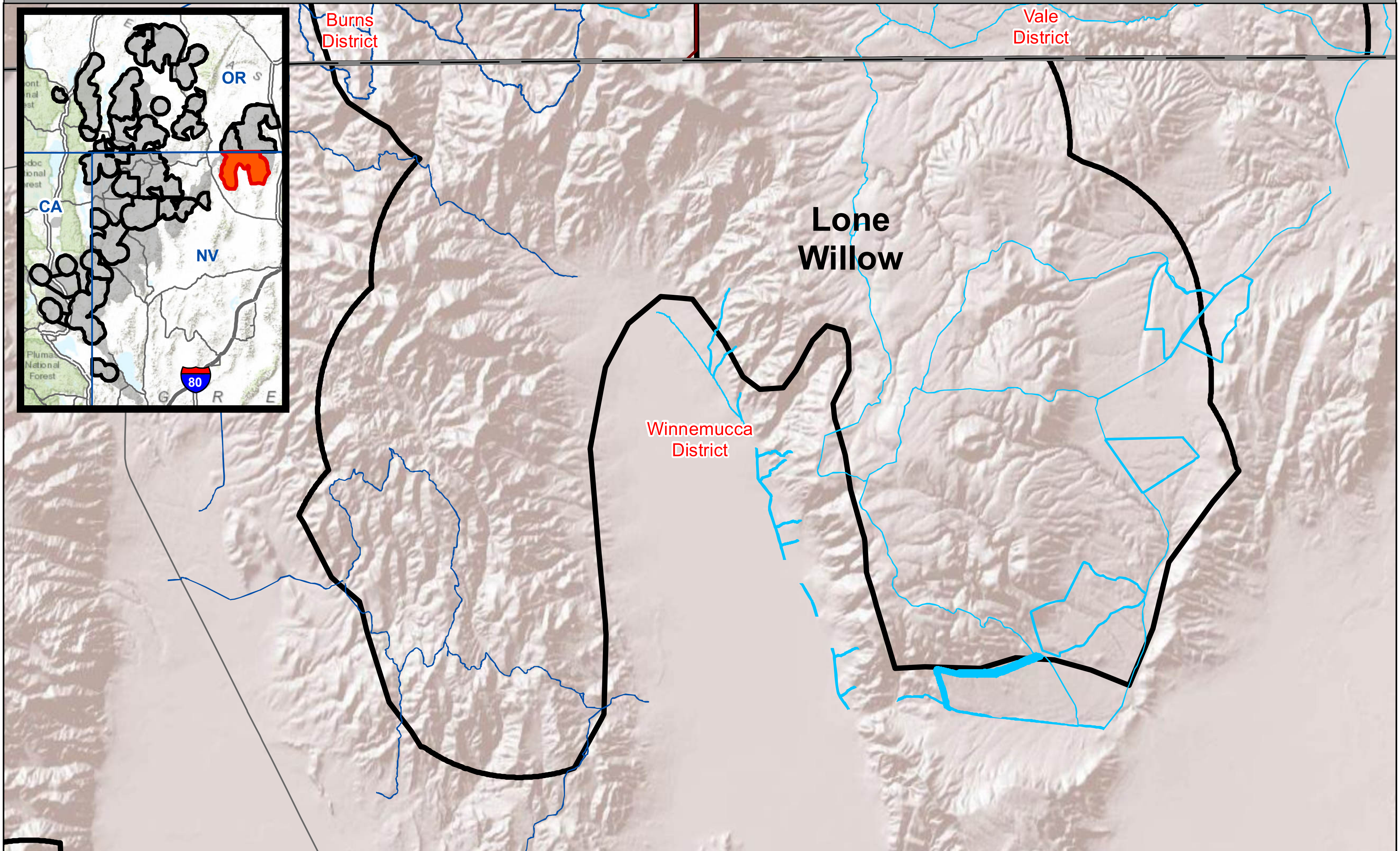
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:354,000

Lone Willow Fuels Management

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

Western Great Basin and Warm Springs Valley
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 for Implementation
First
Second
Third

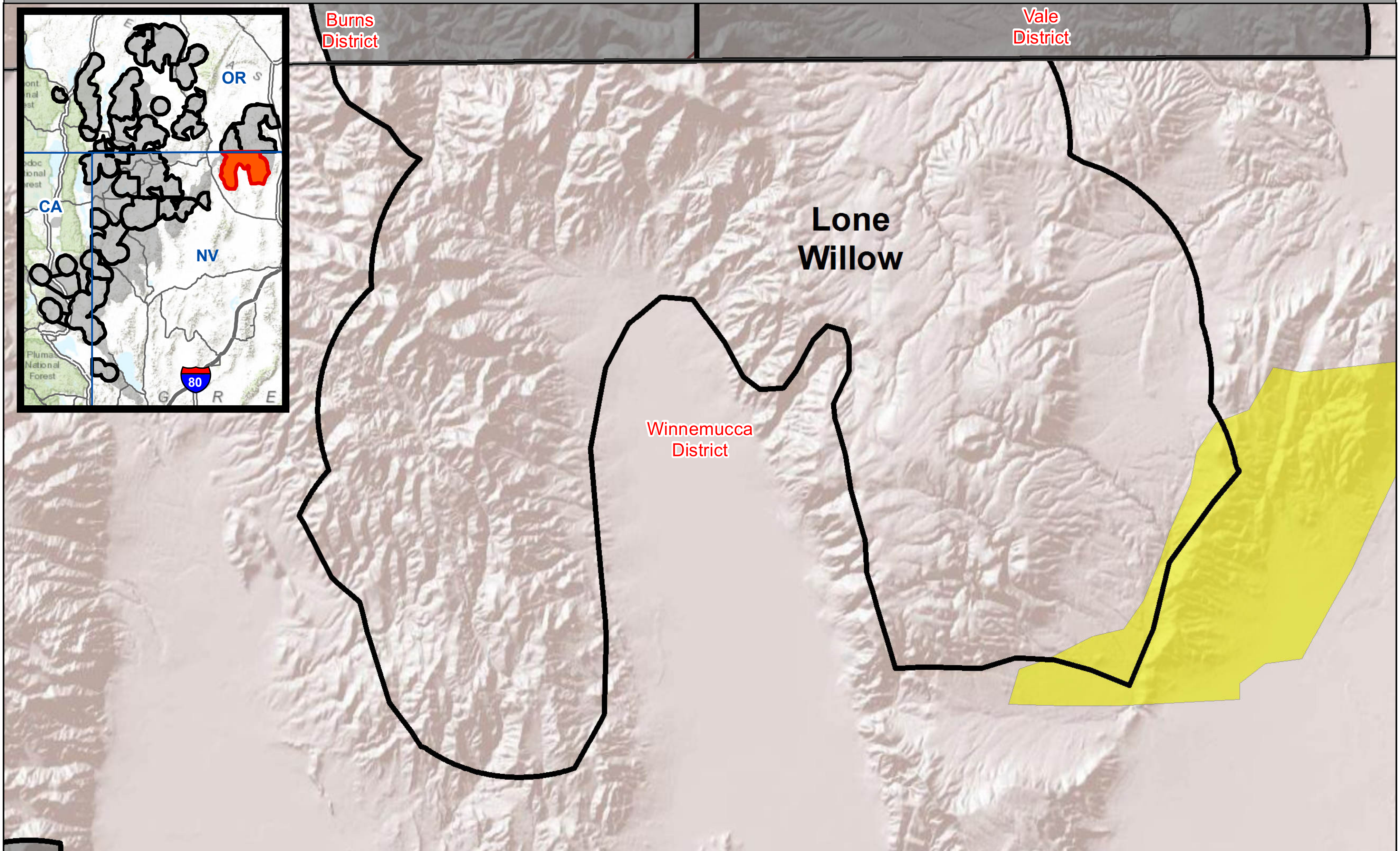
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:358,000

Lone Willow Habitat Restoration - Inv. A. Grass Trtmnts

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

Western Great Basin and Warm Springs Valley
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.

Potential Treatment Area

Habitat Restoration- Invasive Annual Grasses

State Boundaries

BLM District Boundary

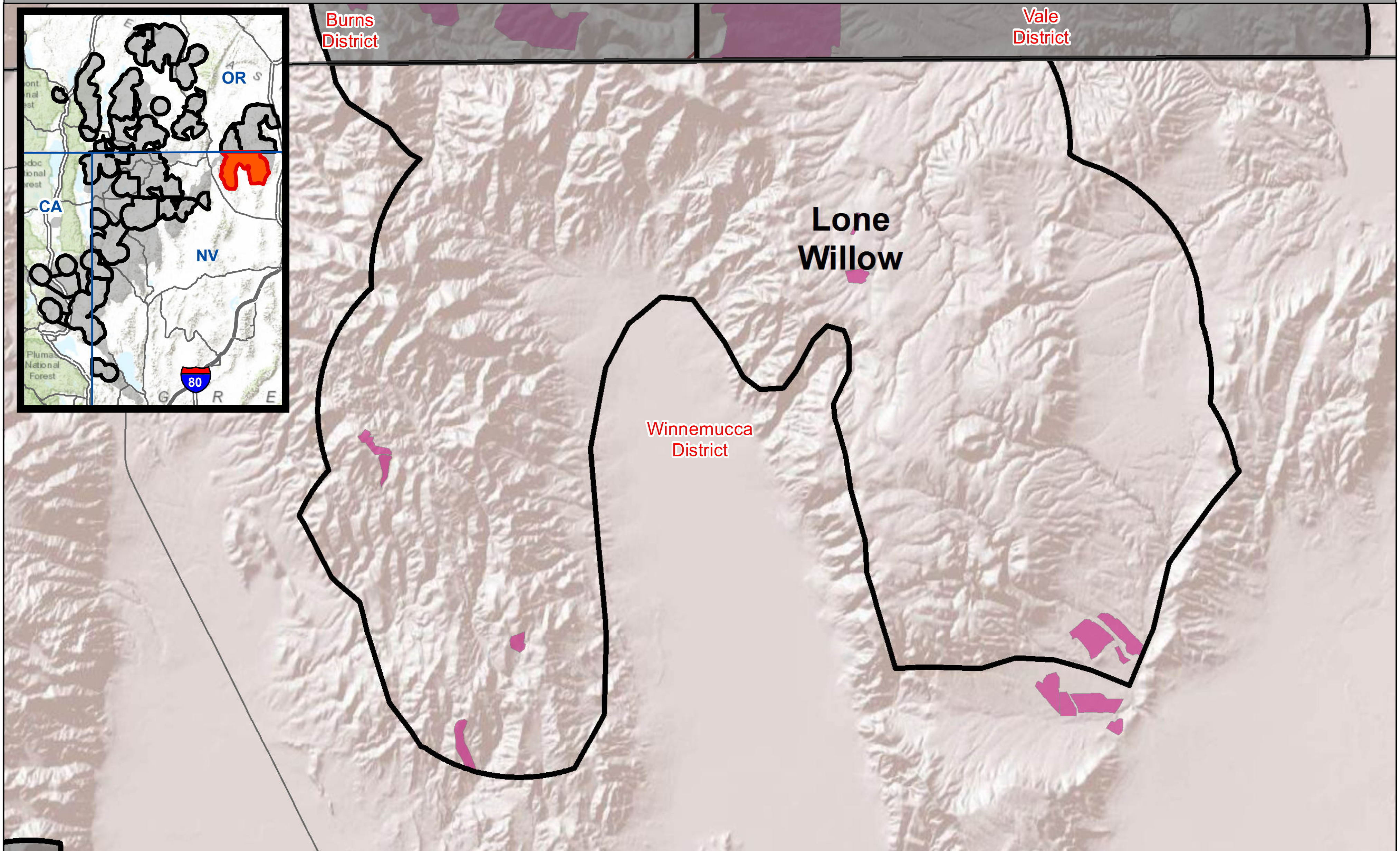
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:358,000

Lone Willow Habitat Restoration - Active ESR Treatments

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

Western Great Basin and Warm Springs Valley
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

Potential Treatment Areas

Habitat Restoration- Active ESR Treatments

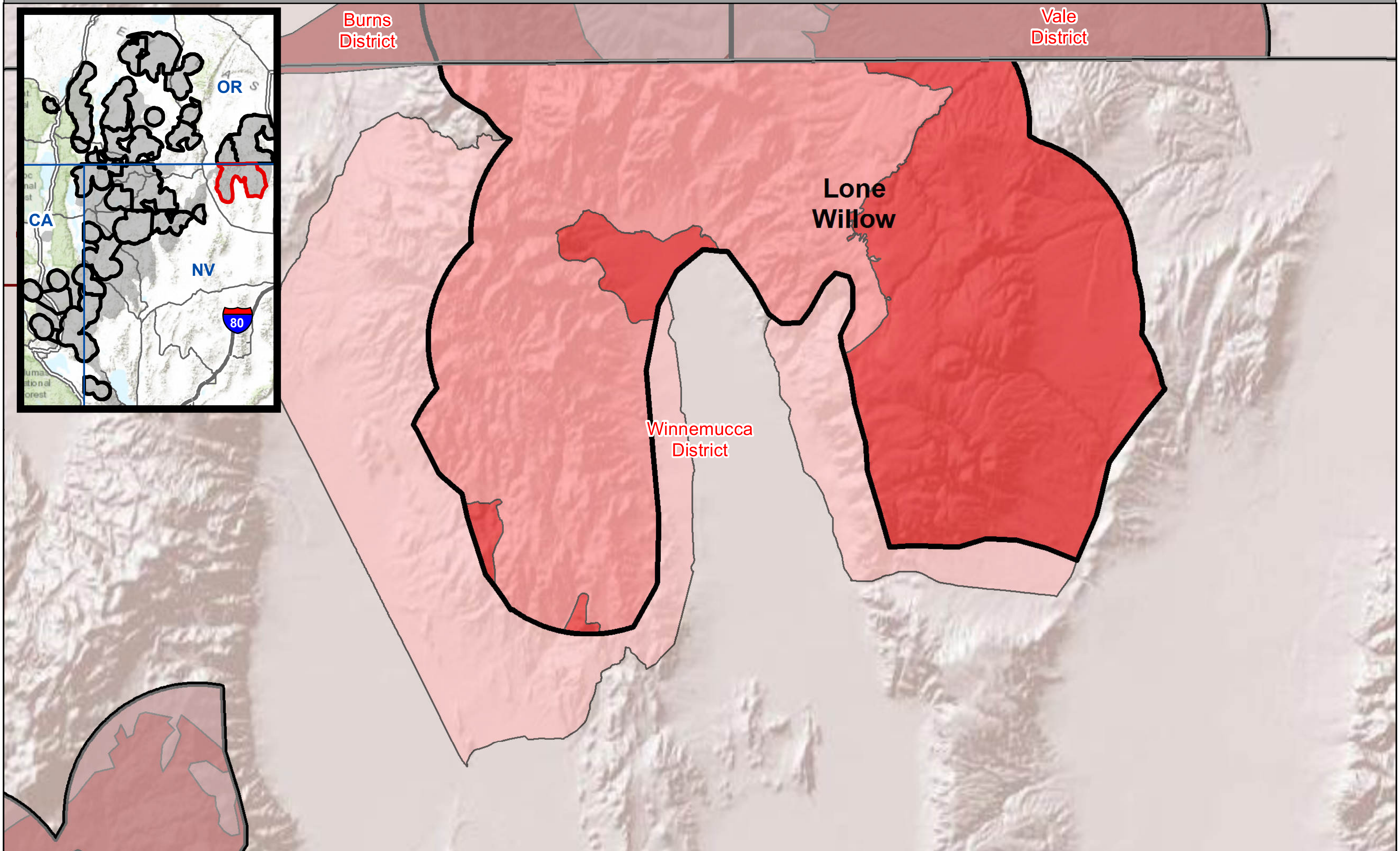
State Boundary
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:358,000

Lone Willow Fire Operations

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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N

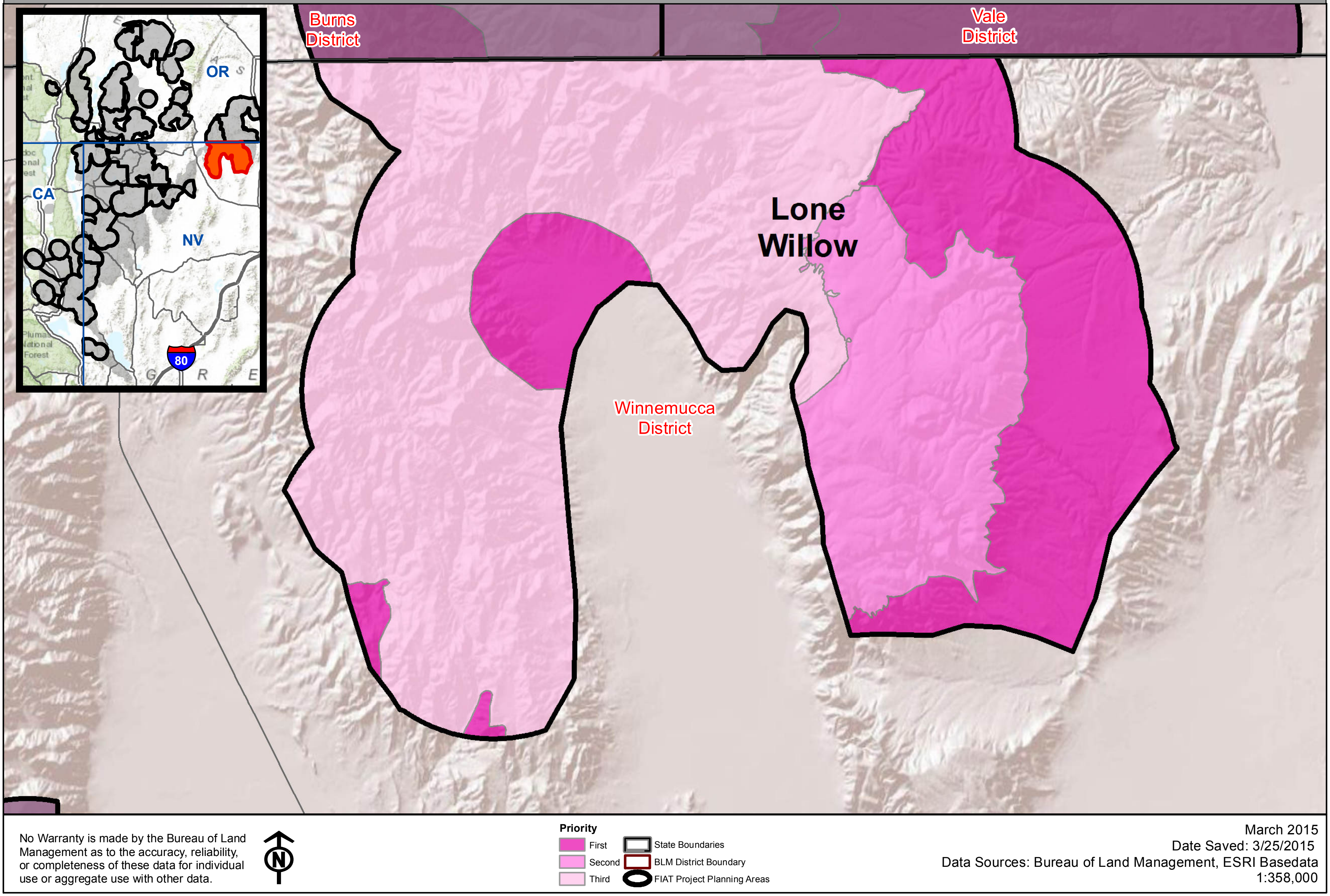
Priority
First
Second
Third
State Boundaries
BLM District Boundary
FIAT Project Planning Areas

March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata

Lone Willow Post-Fire Rehabilitation (ESR) Priority

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

Western Great Basin and Warm Springs Valley
Bureau of Land Management
U.S. Department of the Interior



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March 2015
Date Saved: 3/25/2015
Data Sources: Bureau of Land Management, ESRI Basedata
1:358,000

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Appendix B

GIS Data

State	Regions	Layer Name	Type	Address
California	All California	Roads - CA GTLF	Polyline	ilmcasde.blm.doi.net\ilmcasodb1\ilmcaPub.CASO.GTLF\ilmcaPub.CASO.GTLF_arc
California	Alturas	1998 - 2001 Sagegrouse Telemetry	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Telemtry_1998_2001\Telemetry_Data_Gail_Popham.shp
California	Alturas	2007 - 2009 Sagegrouse Telemetry	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Telemetry_2007_09\2007-09_All_Locations.shp
California	Alturas	Active Leks CA 2014	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\2014\cdfwgisdata_From_Brian_Ehler_20140915\2014_5yr_Active_Leks.shp
California	Alturas	Leks 2012 NDOW	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Lek_NDOW_2012.shp
California	Alturas	Potential Summer Habitat CA	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\California\State\SUMMERHABITAT_DST_CAv1.1
California	Alturas	Potential Summer Habitat NV	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\California\State\SUMMERHABITAT_DST_CAv1.1
California	Alturas	SSURGO Soils Components and Ecosites	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Soil_Data_Ecological_Sites\Merged\SSURGO_Map_Units_NorEastCal_Merged_Joined_Components_Ecosites_clip.shp
California	Alturas	Aspect	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Aspect_DEM10m_NorEast.tif
California	Alturas	Elevation	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Step_2\DEM10m_NorEast_Clip.tif
California	Eagle Lake	1998 - 2001 Sagegrouse Telemetry	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Telemtry_1998_2001\Telemetry_Data_Gail_Popham.shp
California	Eagle Lake	2007 - 2009 Sagegrouse Telemetry	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Telemetry_2007_09\2007-09_All_Locations.shp
California	Eagle Lake	Active Leks CA 2014	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\2014\cdfwgisdata_From_Brian_Ehler_20140915\2014_5yr_Active_Leks.shp
California	Eagle Lake	Leks 2012 NDOW	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\Lek_NDOW_2012.shp
California	Eagle Lake	Weeds Sites	Point	\\blm\dfs\ca\pub\gisimage\el\gis\master\basic\flora\noxious_weeds\weed_sites_all.shp

California	Eagle Lake	Fuels Projects	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\Fuels\All_fuels\Fuels1_12012014.shp
California	Eagle Lake	Potential Summer Habitat CA	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\California\State\SUMMERHABITAT_DST_CAv1.1
California	Eagle Lake	Potential Summer Habitat NV	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\California\State\SUMMERHABITAT_DST_CAv1.1
California	Eagle Lake	Rush Fire ESR Projects	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\flora\2012_Rush_Fire\Seeding
California	Eagle Lake	Roads	Polyline	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\transportation\roads\el_all_roads_wprivate.shp
California	Eagle Lake	Aspect	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Aspect_DEM10m_NorEast.tif
California	Eagle Lake	Elevation	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Step_2\DEM10m_NorEast_Clip.tif
California	Surprise	Active Leks CA 2014	Point	\\blm\dfs\ca\el\pub\gisimage\gis\master\basic\fauna\sagegrouse\2014\cdfwgisdata_From_Brian_Ehler_20140915\2014_5yr_Active_Leks.shp
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California	Surprise	Conifer Projects	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Surprise\SageGrouse_FIAT\Juniper_Projects.shp
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California	Surprise	SR_N_facing_GT_5500_focal_1C.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Surprise\SageGrouse_FIAT\SRFO_Focal_Classes\SR_N_facing_GT_5500_focal_1C.shp
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California	Surprise	SR_WyBigSage_focal_3A.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Surprise\SageGrouse_FIAT\SRFO_Focal_Classes\SR_WyBigSage_focal_3A.shp
California	Surprise	Vegetation Communities	Polygon	\\blm\dfs\ca\pub\gisimage\sr\gis\master\basic\flora\vegetation_communities.shp
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California	Surprise	Elevation	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Step_2\DEM10m_NorEast_Clip.tif
California	Surprise	Leks 2013 NDOW	Point	\\blm\dfs\ca\pub\gisimage\sr\gis\master\basic\fauna\NDOW_SG_2013\NDOW_SG_LekSites_2013_SRFO.shp
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Nevada	Carson City	VirginiaRangesFocalAreaRehabTreatments	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Carson CIty\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesFocalAreaRehabTreatments
Nevada	Carson City	VirginiaRangesFocalAreaVegREGAP	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Carson CIty\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesFocalAreaVegREGAP
Nevada	Carson City	VirginiaRangesFocalFireRegime	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Carson CIty\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesFocalFireRegime
Nevada	Carson City	VirginiaRangesResistance Resilience	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\GIS\Andrew_Johnson_Projects\Sage_Grouse_FIAT_Data\Carson CIty\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesProjectPlanningArea.gdb\VirginiaRangesResistanceResillience
Oregon	All Oregon	ODFW Core Habitat	Polygon	G:\corp\External_Source\State\Fauna_OR\ODFWSageGrouseCoreAreas_Final 20110724
Oregon	All Oregon	Treatment_pub_web.gdb	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\treatment_pub_web\treatment_pub_web.gdb
Oregon	All Oregon	Big_Sage_20141029	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\Big_Sage_20141029
Oregon	All Oregon	Institute of Natural Resources Tree Canopy Cover	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\TREE_CC_SEOR

Oregon	All Oregon	R6_CurrentVeg_Arid_20110202.gdb	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\R6_CurrentVeg_Arid_20110202.gdb
Oregon	All Oregon	SEOR_CurrentVeg_BLM_SageCC.gdb	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\SEOR_CurrentVeg_BLM_SageCC.gdb
Oregon	Burns	Oregon Greater Sage Grouse Leks Points	Point	G:\corp\BLMReplication\ORWA_rep_gdb\sage_grouse.gdb\grsg_leks_or_point
Oregon	Burns	Burn	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\burn_poly
Oregon	Burns	Cut	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\mech_poly
Oregon	Burns	Fire History	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step1\Fire\Merged Fire History.lyr
Oregon	Burns	Hand or Machine Pile	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\mech_poly
Oregon	Burns	ODFW Core Habitat	Polygon	G:\corp\External_Source\State\Fauna_OR\ODFWSageGrouseCoreAreas_Final20110724
Oregon	Burns	Proposed Burn	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\burn_p_poly
Oregon	Burns	Proposed Cut	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\mech_p_poly
Oregon	Burns	Proposed Hand or Machine Pile	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\mech_p_poly
Oregon	Burns	Weed Treatment Chemical	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\chem_poly
Oregon	Burns	Weed Treatment Mechanical	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\treatment_pub.gdb\mech_poly
Oregon	Burns	Weeds	Polygon	G:\bns\layerfiles\LayerData\Burns.gdb\weeds
Oregon	Burns	GTRN Roads	Polyline	G:\corp\BLMReplication\ORWA_rep_gdb\ground_transportation_pub.gdb
Oregon	Burns	Aspect	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb
Oregon	Burns	Elevation	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb

Oregon	Burns	ilap_Invasive_Grasses	Raster	\\blm\dfs\or\egis\projects\bns\FIAT\ilap_Invasive_Grasses\v101\raster_data.gdb
Oregon	Burns	Institute of Natural Resources Tree Canopy Cover	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\TREE_CC_SEOR
Oregon	Hart and Sheldon	SHMNWRC_SageGrouse_Telemetry_2000_2001.shp	Point	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\SHMNWRC_SageGrouse_Telemetry_2000_2001.shp
Oregon	Hart and Sheldon	Hart Mountain Completed Juniper Cuts	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\HartMountainJuniper\HartMountainCompletedJuniper
Oregon	Hart and Sheldon	Hart Mountain Proposed Juniper Cuts	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\HartMountainJuniper\HartMountainProposedJuniper
Oregon	Hart and Sheldon	HartMtnRefuge_Wilderness.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\HartMtnRefuge_Wilderness.shp
Oregon	Hart and Sheldon	HartNAR_SageGrouseLeks_Buff1_5km_Dec2014.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\HartNAR_SageGrouseLeks_Buff1_5km_Dec2014.shp
Oregon	Hart and Sheldon	SheldonCompletedJuniper	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Nevada\Sheldon\SheldonJuniper\SheldonCompletedJuniper
Oregon	Hart and Sheldon	SheldonNWR_SageGrouseLeks_Buff1_5km_Dec2014.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Nevada\Sheldon\SheldonNWR_SageGrouseLeks_Buff1_5km_Dec2014.shp
Oregon	Hart and Sheldon	SheldonProposedJuniper	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Nevada\Sheldon\SheldonJuniper\SheldonProposedJuniper
Oregon	Hart and Sheldon	SheldonRefuge_Wilderness.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Nevada\Sheldon\SheldonRefuge_Wilderness.shp
Oregon	Hart and Sheldon	SHMNWRC_administrative_boundaries.shp	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\SHMNWRC_administrative_boundaries.shp
Oregon	Hart and Sheldon	Hart_RoadsToShareWithCooperators_Feb2013	Polyline	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\HartMountain\Hart_RoadsToShareWithCooperators_Feb2013.shp

Oregon	Hart and Sheldon	Sheldon_RoadsToShareWithCooperators_Feb2013.shp	Polyline	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Nevada\Sheldon\Sheldon_RoadsToShareWithCooperators_Feb2013.shp
Oregon	Hart and Sheldon	Hart Mountain Vegetation Map	Raster	\\blm\dfs\or\egis\gisdata\lak\non_blm\usfws\Hart_Mtn_Data\RefugeVulerabilityAssessment_2012\projects\ORBIC\VISTA\VegCover\Hart\Vegetation\HartMtn_Veg09.tif
Oregon	Hart and Sheldon	Sheldon Vegetation Map	Raster	\\blm\dfs\or\egis\gisdata\lak\non_blm\usfws\Hart_Mtn_Data\RefugeVulerabilityAssessment_2012\projects\ORBIC\VISTA\VegCover\Sheldon_updated\Vegetation\sheldon_veg02_updt.tif
Oregon	Lakeview	Oregon Greater Sage Grouse Leks Points	Point	G:\corp\BLMReplication\ORWA_rep_gdb\sage_grouse.gdb\grsg_leks_or_point
Oregon	Lakeview	Cheat Grass Occurences 1	Polygon	\\blm\dfs\or\egis\projects\oso\SageGrouse_FIAT\Sage_Grouse_FIAT_Data\Lakeview\SLK_BRTE_DOM_VEG_1
Oregon	Lakeview	Cheat Grass Occurences 2	Polygon	\\blm\dfs\or\egis\projects\oso\SageGrouse_FIAT\Sage_Grouse_FIAT_Data\Lakeview\SLK_BRTE_DOM_VEG_2
Oregon	Lakeview	Fire History	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step1\Fire\Merged Fire History.lyr
Oregon	Lakeview	ODFW Core Habitat	Polygon	G:\corp\External_Source\State\Fauna_OR\ODFWSageGrouseCoreAreas_Final20110724
Oregon	Lakeview	WeedInfestationLocation	Polygon	G:\corp\BLMReplication\ORWA_rep_gdb\NISIMS.gdb\WeedInfestationLocation
Oregon	Lakeview	GTRN Roads	Polyline	G:\corp\BLMReplication\ORWA_rep_gdb\ground_transportation_pub.gdb
Oregon	Lakeview	Aspect	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb
Oregon	Lakeview	Elevation	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb
Oregon	Lakeview	Institute of Natural Resources Tree Canopy Cover	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\TREE_CC_SEOR
Oregon	Vale	Oregon Greater Sage Grouse Leks Points	Point	G:\corp\BLMReplication\ORWA_rep_gdb\sage_grouse.gdb\grsg_leks_or_point
Oregon	Vale	Fire History	Polygon	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step1\Fire\Merged Fire History.lyr

Oregon	Vale	ODFW Core Habitat	Polygon	G:\corp\External_Source\State\Fauna_OR\ODFWSageGrouseCoreAreas_Final 20110724
Oregon	Vale	GTRN Roads	Polyline	G:\corp\BLMReplication\ORWA_rep_gdb\ground_transportation_pub.gdb
Oregon	Vale	Aspect	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb
Oregon	Vale	Elevation	Raster	\\blm\dfs\or\pub\gis\gisdata\or\Region\Elevation\NED10M\NED_Elevation_NW.gdb
Oregon	Vale	Institute of Natural Resources Tree Canopy Cover	Raster	\\blm\dfs\ca\el\pub\gisimage\gis\project\FIAT\GIS\Step2\LocalData\Oregon\State\TREE_CC_SEOR

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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.

Sage Grouse Initiative

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.

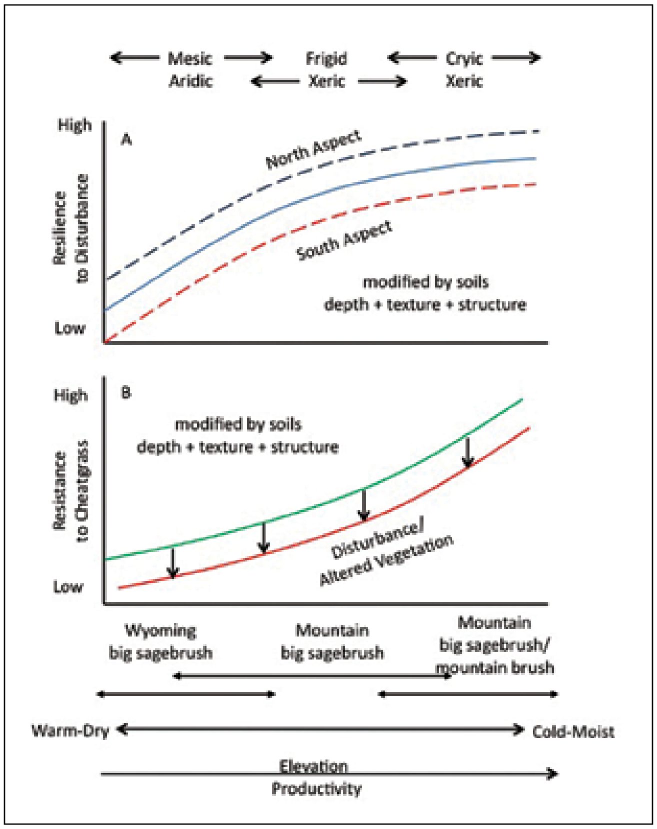

Figure 1. Example of resilience to disturbance (A) and resistance to cheatgrass (B) over a soil temperature and moisture regime gradient in the western portion of the sagebrush ecosystem. Dominant ecological types occur along a continuum from Wyoming big sagebrush communities on warm and dry sites to 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.

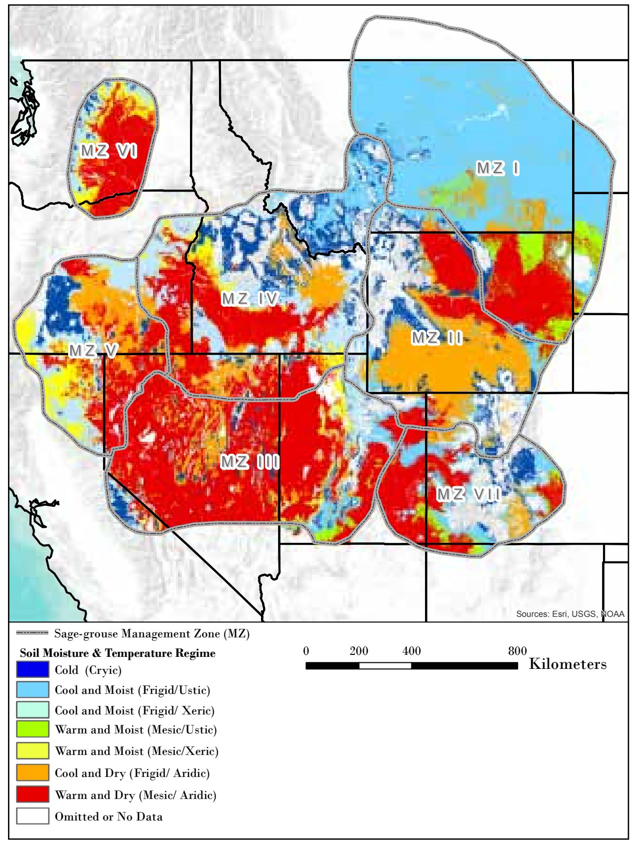

Figure 2. New soils product provides ability to depict potential ecosystem resilience and resistance across the range of sage-grouse using soil temperature and moisture regimes. For more information on interpretation, see Chambers et al. 2014b.

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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Suggested Citation

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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**
Lakeview, OR	10/23/2014		
		Sean Cottle	EMPSi
		Ken Collum	BLM
		David Probasco	BLM
		Bob Crumine	BLM
		Grace Haskins	BLM
		Andrew Johnson	BLM
		Brandi St. Clair	ODFW
		Craig Foster	ODFW
		James Price	ODFW
		Mary Jo Hendrick	ODFW
Burns, OR	11/3/2014		
		Jordan Adams	EMPSi
		Ken Collum	BLM
		Casey O'Connor	BLM
		Douglas Kile	BLM
		Joan Suther	BLM
		Rachel Beaubien	BLM
		Jarod Lemos	BLM
		Chad Rott	BLM
		Bill Dragt	BLM
		Andy Daniels	BLM
		Jeremy Maestas	NRCS
		Lars Santana	NRCS
		Rod Klus	ODFW
Vale, OR	11/4/2014		
		Jordan Adams	EMPSi
		Ken Collum	BLM
		Erin McConnell	BLM
		Bill Lutjens	BLM
		Pat Ryan	BLM
		Bob Narus	BLM

		Brian Watts	BLM
		Megan McGuire	BLM
		Ralph Falsetto	BLM
Winnemucca, NV	12/4/2014		
		Jordan Adams	EMPSi
		Doug Havlina	BLM
		Ken Collum	BLM
		Derek Messura	BLM
		Sam Gersie	BLM
		Andrew Johnson	BLM
		Mark Williams	BLM
		Robert Bunkall	BLM
		Ed Partee	NDOW
		Jane Van Gunst	NDOW
Susanville, CA	12/8/2014		
		Peter Gower	EMPSi
		Ken Collum	BLM
		Andrew Johnson	BLM
		Shawn Thornton	BLM
		Eli Flores	BLM
		Melissa Nelson	BLM
Lakeview, OR	12/9/2014		
		Peter Gower	EMPSi
		Ken Collum	BLM
		Andrew Johnson	BLM
		Sam Gersie	BLM
		James Price	BLM
		Grace Haskins	BLM
		Todd Forbes	BLM
		John Owens	BLM
		David Probasco	BLM
		Bob Crumrine	BLM
		Angela Sitz	BLM
		Shannon Theall	BLM

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