U.S. Department of the Interior
Bureau of Land Management

Targeted Grazing Fuel Breaks

Environmental Assessment

DOI-BLM-NV-E020-2016-0025-EA

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Prepared by
U.S. Department of the Interior
Bureau of Land Management

Elko District, Tuscarora Field Office

Table of Contents

List of Tables

List of Figures

List of Maps

1. Introduction

Background

This Environmental Assessment (EA) specifically considers the proposed use of targeted grazing to create fuel breaks in certain areas within allotments in the Elko District. The Bureau of Land Management (BLM) is preparing this EA to disclose and analyze the environmental consequences of the proposed project in compliance with the National Environmental Policy Act of 1969 (NEPA). BLM's range program manages grazing allotments under the authority of the Taylor Grazing Act of 1934, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976 (PL 94-579), as amended; and the Public Rangelands Improvement Act of 1978 (PL 95-514) as amended.

Past wildland fires have resulted in large-scale impacts to the Great Basin ecology because of the slow recovery process and overwhelming presence of invasive annual grasses which continue to spread and are facilitated by wildland fire. Emergency Stabilization and Rehabilitation (ES&R) treatments have helped to recover some of the habitat areas lost. Fuels treatments have resulted in decreased habitat suitability for some species, and an increase in habitat suitability for others. Fuels treatments likely contributed to protection of existing quality habitat for wildlife, migratory birds, threatened, endangered, candidate, and BLM special status species.

Recent trends in increasing frequency and size of very large wildland fires continue to plague the Great Basin. The spread of cheatgrass (*Bromus tectorum*) and other annual invasive species throughout the Great Basin have exacerbated the problem. The result to vegetative communities has been a sagebrush system that is vulnerable to the spread/increase in invasive annual grasses and a subsequent increase in fire frequency. The increase in fire frequency further inhibits recovery of the sagebrush steppe and associated native plant communities. Preventing large scale fires is vital to maintaining intact sagebrush habitat and continuity throughout the Elko District Office (EDO). Employing fire prevention and reduction techniques, such as fuel breaks, can help in the prevention of large-scale catastrophic fires. This project is a research Pilot Project and data collected during implementation of this project will be used to shape future projects regarding targeted grazing for fine fuel reduction. This project is a collaborative effort between the National SO3336 Targeted Grazing Team, the Elko District office, the Nevada State Office, and the permittees on the allotments involved in treatment. These early projects will be closely watched and a good faith effort will be required by all parties involved to implement plans and adapt to changing conditions to improve the potential for success.

Established priorities for fire suppression consideration are (in order of priority) life, property, and natural resources (Federal Wildland Fire Management Policy Chapter 1, page 3; FA IM 2015-003). During multiple–fire outbreaks, wildland fires located away from the wildland/urban interface (WUI) cannot always receive sufficient suppression resources to extinguish the fire. Proactive actions such as fuel breaks provide fire suppression resources with opportunities to

safely engage wildland fires and to be more effective across a larger area with potentially fewer resources.

The National Wildfire Coordination Group (NWCG) defines fuel breaks as "a natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled" (NWCG, 2014) . Pro-active measures such as fuel breaks help to alleviate the amount of resources necessary to contain a fire in WUI areas and allow more suppression forces to be allocated to protect life, property, and important habitat in outlying areas. Fuel breaks are designed to reduce flame lengths, slow the spread of fast moving wildland fire, and provide opportunities for firefighters to gain control of or contain a fire.

Research and decades of fire suppression experiences indicate fuel breaks have the potential to slow fires enough for suppression crews to control the incident or alter fuel sufficiently to limit fire spread. EDO fire personnel have observed the effectiveness of established fuel breaks and have been provided a greater margin of safety for firefighters, reduced flame lengths, and slowed progression of wildland fires.

Major highway corridors tend to have higher incidents of fire. Across northern Nevada fuel breaks have been constructed in strategic areas along these corridors to prevent fire spread to high value sagebrush habitats. These fuel breaks have shown success by slowing or stopping fires and by providing suppression personnel a safe place to tie in during initial attack activities.

The Secretarial Order 3336 (SO 3336) was issued in recognition that fire has had, and continues to have, large impacts on sagebrush ecosystems (This Order is issued under the authority of Section 2 of Reorganization Plan No. 3 of 1950 (64 Stat.1262), as amended). The SO 3336 was aimed at increasing effectiveness of fire suppression resources, reducing the size of catastrophic wildland fires, and specifies we "(d)evelop a science-based strategy to reduce the threat of large-scale rangeland fire to habitat for the Greater sage-grouse and the sagebrush-steppe ecosystem through effective rangeland management (including the appropriate use of livestock), fire prevention, fire suppression, and post fire restoration efforts at a landscape scale.. Several criteria were developed by the National SO3336 Targeted Grazing Team for 'demonstration plot' selection to further research the use of targeted grazing in this capacity on the landscape. The areas identified for possible treatments have gone through specific screening and selection criteria. Some of the screening and selection criteria are as follows:

- Pilot projects/demonstration areas will be used to inform decisions on implementation of strategic, targeted grazing to reduce fuels in other areas. These early projects will be closely watched by agency and outside entities. Therefore, a good faith effort will be required by all parties involved to implement plans and adapt to changing conditions to improve the potential for success.
- Focus to strategically reduce annual invasive fuels to reduce wildland fire threat in or near priority sage-grouse habitats.

- The intent is not to improve an area dominated by invasive annual grasses into a functioning native plant community, but rather use livestock as the tool to create fuel breaks and conserve intact habitats.
- Targeted grazing to reduce fine fuels must be consistent with sage-grouse land use plan revisions.
- An evaluation to address the potential for large wildland fires served as the basis for identifying the scale of targeted grazing needs. Targeted grazing "bands" or emphasis areas should connect across the landscape in which they are designed to minimize wildland fire threats.
- Grazing plans and/or agreements would be developed cooperatively by livestock managers and agency personnel.
- Targeted grazing is not intended to create fuel breaks in intact stands of sagebrush.
- Fine fuel reduction objectives need to be met and in place at the start of the fire season each year.
- Resource impacts must continuously be monitored to ensure that unintended consequences don't occur.
- Winter grazing can be used to reduce carryover fuels going into the spring growing season.
- In dry spring seasons or during drought periods, livestock use will be curtailed if cheatgrass is not producing enough biomass to pose a fire threat.
- Livestock managers and agency personnel need to monitor regrowth of annual plants which may require moving livestock back to an area previously grazed to meet fuels management objectives.
- Targeted grazing objectives will be measured by a standardized monitoring protocol (Appendix B) that quantifies the effects of targeted grazing on pilot project/demonstration areas.
- Based upon annual monitoring study results (Appendix B), adjustments in the season of use, livestock numbers or distribution, class of livestock, etc. should be implemented the following growing season if resource or livestock issues are significant.
- Monitoring results and reports will be shared widely in order to improve the implementation of future targeted grazing projects. Also, results from case studies, scientific literature, and other projects will be incorporated in future projects.

1.1. Location of Proposed Action

Areas within four grazing allotments on the Tuscarora Field Office have been identified for potential targeted grazing treatments: T Lazy S, Hadley, Carlin Field, and Blue Basin. See Maps 1-1 through 1-4 in Appendix A for specific locations of proposed targeted grazing treatment pilot studies.

Table 1. Legal Description of Treatment Areas (by Allotment)

Allotment	Private Legal Description	BLM Managed Legal Description
T Lazy S	T 32 N R 49 E Section 11 ,13 T 32 N R 50 E Section 7,17 T 33 N R 49 E Section 1,12,13,14,23,24,26,27 T 33 N R 50 E Section 7,18 T 34 N R 49 E Section 1,12,13,24,25,36 T 34 N R 50 E Section 7, 19,29, 31 T 35 N R 49 E Section 24, 25,36 T 35 N R 50 E Section 29	T 35N R 50E Section 32; T 34N R 50E Sections 6, 18, 20, 30, & 32; T 33N R 50E Section 6; T 32N R 50E Sections 8 & 18; T 33N R 49E Section 35; T 32N R 49E Sections 2 & 12
Hadley	T 32 N R 52 E Section 9, 11	T 33N R 52E Sections 10 & 12
Carlin Field	none	T 33 N R 53 E Section 19
Blue Basin	none	T 34 N R 54 E Section 11, 12,13,14,24,25

1.2. Purpose and Need for Action

The purpose of this action is to implement large-scale experimental activities to remove cheatgrass and other invasive annual grasses through targeted grazing that meet defined fuels management objectives.

The need for this project is to research the efficacy of targeted grazing as a tool for establishing and maintaining landscape-scale fuel breaks and to document the short and long-term effects of targeted grazing on vegetation, soils and other natural resources. This is part of the larger need articulated in Secretarial Order 3336 (This Order is issued under the authority of Section 2 of Reorganization Plan No. 3 of 1950 (64 Stat.1262), as amended) to identify and develop effective tools and practices to reduce frequency and extent of wildland fires that threaten property, ecological function and wildlife habitats across much of the west.

1.3. Land Use Plan Conformance

Fuel break methods identified in the Proposed Action are consistent with the following applicable land use plans, as amended:

Elko Resource Management Plan
The Tuscarora Field Office is managed under the Elko Resource Management Plan (1987), and the Elko and Wells Fire Management Plans Amendment (2004). Although the Elko Resource Management Plan (RMP) does not specifically discuss fuel breaks, it does state the maintenance or improvement of resources values as a management goal. Because fuel breaks are exclusively constructed for the purpose of slowing the spread of a fire in a strategic location, thereby providing for maintenance or improvement of rangeland resource values on the windward side. The Proposed Action is in conformance with the following Elko RMP objectives:

- Maintain or improve the condition of the public rangelands to enhance productivity for all rangeland values.
- Conserve and enhance terrestrial, riparian and aquatic wildlife habitat.

Elko and Wells Resource Management Plans Fire Management Amendment
The Proposed Action is in conformance with the following Elko and Wells RMP Fire Management Amendment objectives:

- Vegetative manipulation, fuels reduction, greenstrips, fuel breaks and thinning should be maximized through the use of prescribed burning, mechanical, chemical and biological (including grazing) treatments to reduce wildland fire fuel hazards. Annual target acreage levels to reduce hazardous fuels are 24,000 to 60,000 acres.
- Improve shrub cover and densities in western regions affected by fire in recent years. Maintain big game habitat and woodland integrity at higher elevations. Maintain sagebrush/perennial grass diversity at lower elevations. Prevent annual nonnative plant encroachment.
- Maintain and/or improve age class diversity of sagebrush. Maintain and/or improve the diversity of sagebrush and perennial grasses and forbs. Prevent further encroachment of annual and non-native plant species. Improve and/or maintain riparian areas to achieve proper functioning condition and other site specific multiple use objectives.
- Sage-grouse:
    - Use vegetation treatments to maintain or improve known habitats.
    - Minimize the amount of sage-grouse habitat burned.

Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment
The Proposed Action is in conformance with the following Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (SGPA) goals and objectives:

- **Goal SSS 1:** Conserve, enhance, and restore the sagebrush ecosystem upon which [greater sage-grouse (GRSG)] populations depend in an effort to maintain and/or increase their abundance and distribution, in cooperation with other conservation partners.
- **Objective SSS 1:** Manage land resource uses to meet GRSG habitat objectives, as described in **Table 2-2**. The habitat objectives will be used to evaluate management actions that are proposed in GRSG habitat. Managing for habitat objectives will ensure that habitat conditions are maintained if they are currently meeting objectives or if habitat conditions move toward these objectives in the event that current conditions do not meet these objectives.
- **Objective SSS 2:** Maintain or improve connectivity between, to, and in [Priority Habitat Management Areas (PHMAs)] and [General Habitat Management Areas (GHMAs)] to promote movement and genetic diversity for GRSG population persistence and expansion.
- **Objective SSS 3:** Identify and implement GRSG conservation actions that can augment, enhance, or integrate program conservation measures established in agency and state land use and policy plans, to the extent consistent with applicable law.
- **Objective VEG 2:** On public lands, establish, maintain, and enhance a resistant and resilient sagebrush vegetative community and restore sagebrush vegetation communities to reduce GRSG habitat fragmentation and maintain or reestablish GRSG habitat connectivity over the long term (Chambers et al.2014 as cited in the SGPA).
- **Objective VEG 3:** Manage PHMAs and GHMAs for vegetation composition and structure, consistent with ecological site potential and to achieve GRSG habitat objectives (**Table 2-2**).
- **Objective VEG 5:** Reduce the amount of GRSG habitat loss due to wide-spread wildfires and invasion by nonnative species.
- **Objective VEG 9:** Manage upland habitat associated with riparian areas to promote cover relative to site potential to facilitate brood-rearing habitat (**Table 2-2**).
- **Objective FIRE 3:** Protect post-fire treatments in [Sagebrush Focal Areas (SFA)] first, followed by PHMAs outside of SFA, and then GHMAs from subsequent wildfires.
- **Objective FIRE 4:** Use pre-suppression efforts to reduce the size and impact of wildfires in SFA, PHMAs, and GHMAs.
- **Objective FIRE 5:** Protect and enhance PHMAs and GHMAs and areas of connectivity that support GRSG populations, including large contiguous blocks of sagebrush, through fuels management and incorporation of the [Fire and Invasives Assessment Tool (FIAT)] assessment (**Appendix H**).

1.4. Relationship to Other Laws, Policies and Plans

43 Code of Federal Regulation, Subchapter D—RANGE MANAGEMENT (4000), Group 4100-Grazing Administration, Part 4100-Grazing Administration Exclusive of Alaska

- **§ 4130.1–1 Filing applications**
  Applications for grazing permits or leases (active use and nonuse), free-use grazing permits and other grazing authorizations shall be filed with the authorized officer at the

local Bureau of Land Management office having jurisdiction over the public lands involved.

- **§ 4130.5 Free-use grazing permits.**
  (b) The authorized officer may also authorize free use under the following circumstances:
  (1) The primary objective of authorized grazing use or conservation use is the management of vegetation to meet resource objectives other than the production of livestock forage and such use is in conformance with the requirements of this part;
  (2) The primary purpose of grazing use is for scientific research or administrative studies; or
  (3) The primary purpose of grazing use is the control of noxious weeds.
- **§ 4190.1 Effect of wildfire management decisions**
  (a) Notwithstanding the provisions of 43 CFR 4.21(a)(1), 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, or at immediate risk of erosion or other damage due to wildfire, BLM may make a rangeland wildfire management decision effective immediately or on a date established in the decision. Wildfire management includes but is not limited to:
  (1) Fuel reduction or fuel treatment such as prescribed burns and mechanical, chemical, and biological thinning methods (with or without removal of thinned materials); and
  (2) Projects to stabilize and rehabilitate lands affected by wildfire.
  (b) The Interior Board of Land Appeals will issue a decision on the merits of an appeal of a wildfire management decision under paragraph (a) of this section within the time limits prescribed in 43 CFR 4.416.

Secretarial Order 3336

- Develop a science-based strategy to reduce the threat of large-scale rangeland fire to habitat for the greater sage-grouse and the sagebrush-steppe ecosystem through effective rangeland management (including the appropriate use of livestock), fire prevention, fire suppression, and post-fire restoration efforts at a landscape scale.
- Establish protocols for monitoring the effectiveness of fuels management, post-fire, and long-term restoration treatments and a strategy for adaptive management to modify management practices or improve land treatments when necessary.

An Integrated Rangeland Fire Management Strategy, Secretarial Order 3336 - Rangeland Fire Prevention, Management, and Restoration

Section 7(b)vii

- Implement large-scale experimental activities to remove cheatgrass and other invasive annual grasses through various tools.
  - Action Item #5 – develop scalable and adaptive grazing management plans for reducing invasive annual grass and other fine fuels through targeted livestock grazing methods to diminish fire risk in priority greater sage-grouse areas to meet greater sage-grouse habitat goals. Targeted grazing would be a cooperative engagement on both private and Federal lands.

Section 7(b)viii

- Commit to multi-year investments in science and research.

- Improve targeting of fuels reduction opportunities and implementation.

Elko County Public Land & Natural Resource Management Plan

7. Agriculture and Livestock Production

- Directive 7-3: Grazing should utilize sound adaptive management practices. Elko County encourages the federal land management agencies to include flexibility into their grazing management plans that allow for grazing management that is beneficial to the health of the land, economic viability of the producer, and enhances all other multiple uses of our public lands…

8. Noxious Weeds and Invasive Species

- Directive 8-2: Prevent the introduction, reproduction and spread of designated noxious and invasive exotic plants.
- Directive 8-3: Reduce the extent and density of established noxious weeds to a point that natural resource damage is within acceptable limits.
- Directive 8-4: Implement the most economical and effective control methods for the target of weeds.

20. Fire Management

- Directive 20-3: Mandate that the federal agencies re-establish management methods to fully utilize livestock grazing on federally managed lands to reduce the fire hazard. There may be situations where livestock grazing can be effective in reducing the fire danger and will not result in environmental damage…

Eureka County Master Plan

6.2.1 Soil, Vegetation, and Watersheds

- Develop…wildfire management plans…and include in such plans livestock grazing techniques as a tool for fire fuel management related to both wildfires and prescribed fires.
- Prevent the introduction, invasion or expansion of undesirable plants and noxious weeds into native rangelands and improve the ecological status of sites that are currently invaded by undesirable plants or noxious weeds by integrating, through consultation with Eureka County Weed District and Eureka County Department of Natural Resources, appropriate control methods into all planning efforts. Prescriptions for control of undesirable plants and noxious weeds may include but are not limited to burning, grazing, mechanical, manual, biological and chemical methods.
- Properly managed grazing provides substantial advantage for native plant recovery following fire. Managed grazing is beneficial in prevention excessive damage to plants by wildfire…

6.2.2 Forage and Livestock Grazing

- Where monitoring history [or] actual use…demonstrates that supplemental use…can or should be used to improve or protect rangelands (e.g., reduction of fuel loads to prevent recurring wildfire), initiate a process to allocate such use to permittees…

2. Proposed Action and Alternatives

2.1. No Action

Under the No Action Alternative livestock grazing would continue as permitted on the allotment. No fuel breaks would be grazed and current conditions would remain. Due to the size of the allotments, and the distance to water of each treatment area, these edges of the allotments usually receive light distributed use that results in large amounts of standing residual fuels. Recovering sagebrush habitats representing important sagebrush obligate species, including sage-grouse, would remain at elevated risk of catastrophic wildland fires. See livestock grazing section of Chapter 3 for a description of currently permitted livestock grazing. The feasibility of, and best practices for, implementing targeted grazing would not be studied. No data would be collected on the environmental effects of targeted grazing to accomplish fuels management objectives.

2.2. Proposed Action

Targeted Grazing Fuel Breaks

The Proposed Action is to utilize targeted grazing and minimal mechanical treatment to strategically reduce fuel loads on degraded sagebrush steppe now dominated by annual invasive grasses. Treatment areas have been identified within four allotments in the Tuscarora Field Office: the Hadley, Carlin Field, T Lazy S, and Blue Basin Treatment Areas (see Maps 1-1 through 1-4 in Appendix A). A decision would be issued to allow for targeted grazing of the designated fuel break areas. The decision would allow for the authorization of targeted grazing annually for up to a ten year duration. Current permittees would be asked to implement fuel treatment actions as part of a strategic, landscape effort to protect and conserve sagebrush-steppe habitats (BLM, An Integrated Rangeland Fire Managment Strategy, 2015). Priority Habitat Management Areas (PHMAs) exist on the leeward side of the grazing treatments, and would be at reduced risk of wildland fire spread when objectives are met in the proposed treatment areas. Free Use Permits would be issued to the current permittees on Hadley, Carlin Field, T Lazy S, and Blue Basin for periodic biologic treatment of annual fine fuels. A 'Free Use Permit' is addressed in 43 CFR Sec. 4130.5, which states:

> "(a) A free-use grazing permit shall be issued to any applicant whose residence is adjacent to public lands within grazing districts and who needs these public lands to support those domestic livestock owned by the applicant whose products or work are used directly and exclusively by the applicant and his family. The issuance of free-use grazing permits is subject to Sec. 4130.1-2. These permits shall be issued on an annual basis. These permits cannot be transferred or assigned.
> (b) The authorized officer may also authorize free use under the following circumstances:
>
> > (1) The primary objective of authorized grazing use or conservation use is the management of vegetation to meet resource objectives other than the production

of livestock forage and such use is in conformance with the requirements of this part;
(2) The primary purpose of grazing use is for scientific research or administrative studies; or
(3) The primary purpose of grazing use is the control of noxious weeds."

The treatment would be accomplished with livestock concentrated within the identified treatment areas to accomplish the fuels management objectives.

Grazing treatments would be restricted to specific areas dominated by cheatgrass or other annual or introduced grasses, and conducted across BLM public and private ownerships (see Map 2-1 in Appendix A). With the exception of one section of the Hadley Allotment (legal description T 32 N R 52 E Section 11) which is owned by New Nevada Lands, the private inholding within the treatment areas are owned or controlled by the permittees of the associated allotments, and all are amenable to applying this treatment on the associated private lands. Twenty foot easements will be acquired from the private land owners for the installation of fences. BLM would retain ownership of the portions of fence located on private lands.

Fencing would be used to confine livestock and to achieve grazing objectives in the targeted grazing treatment areas. Approximately 40 miles of new fencing would be constructed and tied to existing fencing, to provide control of livestock and allow specific targeted grazing on cheatgrass and/or introduced grass dominated areas. Mowing would be done in very limited areas that have components of shrubs.

Table 2. Treatment Acres Across All Ownerships

Treatment Area	Private Acres	BLM Acres
T Lazy S	5195	2984
Hadley	201	241
Carlin Field	0	59
Blue Basin	15	133

The Proposed Action would provide a net conservation gain for greater sage-grouse in the form of protecting PHMA from loss by wildland fire and providing an opportunity for previously burned areas to rehabilitate back to sagebrush steppe.

A core component of the proposed project is monitoring the implementation and effects of targeted grazing. A detailed monitoring plan is provided in Appendix B and is part of the Proposed Action.

Treatment objectives:

- Grazing cheatgrass to maintain a stubble height of 2 to 3 inches during the fire season is the objective (Mosley & Roselle, 2006). Stubble heights will be monitored during implementation of targeted grazing, and livestock will be removed when the objective is attained or plants become unpalatable to livestock, whichever comes first (Mosley & Roselle, 2006; Vallentine & Stevens, 1992; Hempy-Mayer & Pyke, 2008). Reentry into already treated areas may be necessary if sufficient precipitation induces regrowth of cheatgrass (Diamond, Call, & Devoe, Effects of Targeted Cattle Grazing on Fire Behavior of Cheatgrass-Dominated Rangeland in the Northern Great Basin, 2009; Mosley & Roselle, 2006).
- Fall grazing may be used, as needed, to assist in residual fuel reduction. Fall grazing would also reduce litter, further reducing germination of cheatgrass. The stubble height objective would not be exceeded (Launchbaugh, et al., 2008; Schmelzer, et al 2014; USDA, 2012).
- Upon attainment of targeted grazing objectives for the treatment area, livestock will be removed within 48 hours of the BLM notifying the permittee. No motorized herding or vehicle travel off designated routes will be authorized.

The following management tools may be used singly or in aggregate to achieve treatment objectives:

Grazing Season of Use

- Strategic targeted spring grazing would take place on specific cheatgrass dominated areas or existing greenstrips (seedings of introduced grasses planted to reduce wildland fire spread) to reduce fine fuel loads for the upcoming fire season (Diamond, Call, & Devoe, Effects of Targeted Cattle Grazing on Fire Behavior of Cheatgrass-Dominated Rangeland in the Northern Great Basin, 2009). Substantial data collection would accompany the grazing treatments which would be administered through free use grazing permits (43 CFR §4130.5(b)(2)). Cheatgrass phenology would determine when livestock grazing could begin. Grazing in the springtime would begin when cheatgrass or introduced species were still palatable to livestock, prior to the dough stage (Vallentine & Stevens, 1992). Since cheatgrass has been shown to germinate readily in residual fall litter (Foster, et al., 2015), fall targeted grazing treatments may be used, as necessary, to further reduce spring fuel loads.

Livestock Numbers

- Annually, when free-use grazing permits are authorized, they will include the kind and number of livestock, the period use, and the amount of use in AUMs. These terms and conditions would be based on annual conditions, and will change with each free-use grazing permit issuance, as appropriate for the annual fuel growth and conditions of that given year. For the purpose of scientific research or administrative studies, free use grazing permits, as defined in 43 CFR 4130.5, would be issued annually to provide fluidity to attain the stubble height objective, at the appropriate time, solely on treatment areas. Regular term permits for each allotment would not be affected. Permittees for the T Lazy S, Hadley, Carlin Field, and Blue Basin allotments would be required to fill out annual, free use, applications for their respective targeted grazing treatment areas. Applications would have to be received by the Tuscarora Field Office no later than 7

days prior to proposed implementation. Authorization to implement grazing treatments would be mutually agreed upon between the authorized officer and grazing permittees for the T Lazy S, Hadley, Carlin Field, and Blue Basin allotments. Both livestock numbers and timing will be adjusted and varied to attain the aforementioned grazing stubble height objective. Removal will be dictated by stubble height objective being met, or cheatgrass becoming unpalatable, whichever comes first. Actual use reports for the targeted grazing treatment areas would be received by the BLM within 15 days of livestock removal for each seasonal treatment.

Livestock Management with Fencing

- Fencing would be used to confine livestock and to achieve grazing objectives in the targeted grazing treatment areas. Approximately 40 miles of new fencing would be constructed and tied to existing fencing, to provide control of livestock and allow specific targeted grazing on cheatgrass and/or introduced grass dominated areas. Wire gates and cattle guards would be put in to maintain access on existing roads where needed. The fences would be three-strand (two barbed with smooth bottom) and built to BLM Handbook 1741-1 wildlife friendly standards. Fences would be marked with flight diverters to prevent bird strikes.

Livestock Water Distribution

- Water hauling to portable troughs would be used to manage livestock distribution and meet fuels management objectives (Maps 2-2 through 2-4 in Appendix A). Watering locations would be next to existing roadways. Roads maintained by BLM may not be improved for this project unless authorized by the BLM. The existing road, combined with targeted grazing treatment areas, would enhance fire suppression activities (direct attack or conducting burnout operations). Water troughs must have wildlife escape ramps and would be removed within 72 hours of livestock removal from the targeted grazing treatment areas. Troughs would be placed more than twenty feet from fences to prevent flying animal strikes. Troughs will be excluded within 50 meters of areas with known archeological sites.

Supplements

- Mineral supplements, salt, and/or protein supplements (blocks or liquid) would be used to distribute livestock and meet fuels objectives. Mineral, salt, and/or protein supplements would be next to existing roadways and may be placed with water troughs. All supplements would be removed within 72 hours of livestock removal from the targeted grazing treatment areas. Supplements will be excluded within 50 meters of areas with known archaeological sites.

Mowing

- Some locations within treatment areas contain scattered shrubs that may compromise the efficacy of grazed fuel breaks. In these areas, mowing would be conducted up to 300 feet from the windward border of the treatment area to enhance the targeted grazing treatment. Mowing these areas would reduce these taller, woody fuels that contribute to increased flame length and fire spread. Mowing height would be four to eight inches, ground conditions permitting. After initial mowing, these areas would be maintained through targeted grazing unless woody shrubs re-establish and interfere with ability to meet the stated fuels objectives.
- Where the condition of the road, terrain and vegetation would allow, a deck mower (or any mechanical equipment designed to mow brush) could be used to reduce vegetation

height on sites having vegetation comprised of shrubs on either side of roads in strategic locations.

- Mowing can serve as an alternative fuels treatment tool in areas where livestock grazing cannot fully meet the fuels management objective or where scattered shrubs create a fire hazard in the targeted grazing fuel break.
- Mowing would be predominately completed using agricultural tractor(s) and rotary cutter(s). Treatment areas would be focused in areas where residual herbaceous vegetation is abundant.
- Shrub mowing would occur during the cooler seasons (outside of the migratory bird nesting period, April 1 to July 31) when wildland fire risk is low and required design features (Appendix C) would be followed.

Monitoring

- This project has a significant monitoring component. The Assessment Inventory Monitoring (AIM) protocol will be used. The BLM has adopted this protocol nationally and will allow the data to be used as part of a national data set. The AIM protocol can provide data such as Bare Ground, Foliar and Basal Cover, Vegetation Composition, and Vegetation Height among others. Soil Surface Resistance to Erosion will also be collected. Additional data that will be collected include Bulk Density, Production (post treatment), and Stubble height. The monitoring protocol can be found in Appendix B.

2.3. Alternatives Considered but Eliminated

- **Other kinds of livestock to create fuel breaks**

  Although any kind of livestock (sheep, goat, cattle, etc.) could be considered for biomass removal, this project is being designed to research large-scale experimental activities to remove cheatgrass and other invasive grasses by using livestock as a tool for biomass removal. Since current permittees on the target allotments are cattle producers, cattle would be used to complete the targeted grazing treatments. As experimentation progresses, other types of livestock can be examined for applicability as appropriate.

- **Use of chemical herbicide to create fuel breaks**

  Although the use of chemical herbicides is a legitimate option for biomass control, the purpose of this project is to research and explore specifically the use of targeted grazing, with a minor component of mowing) for fine fuel removal, therefore using herbicide for fine fuels reduction is outside the scope of this project. Under direction of Secretarial Order 3336 and associated report *An Integrated Rangeland Fire Management Strategy*, Section 7(b) iii-Fuels*:*

  Action Item #6: Explore opportunities to provide support to livestock grazing permittees and private landowners to implement fuel treatments actions as part of strategic, landscape efforts to protect, conserve, and restore sagebrush-steppe habitats.

  Action Item #7: Explore incentives for livestock producers to implement targeted fuels and vegetation treatments.

Section 7(b) vii- Large-scale Activities to Remove Invasive Non-native Grasses
Action Item #5: Develop scalable and adaptive grazing management plans for reducing invasive annual grass and other fine fuels through targeted livestock grazing methods to diminish fire risk in priority greater sage-grouse areas to meet greater sage-grouse habitat goals.

Use of herbicide for required brush removal would not meet the fuels management objective because this treatment would leave standing dead shrubs that would need to be removed to reduce fuel continuity.

2.4. Unacceptable Consequences

Certain consequences will be considered unacceptable. Should monitoring detect that these consequences are occurring, mitigation measures would be employed to prevent further unacceptable consequences. If the unacceptable consequences persist, the project may be modified or cease altogether.

- **Excessive Erosion**
  If data or field observations identify excessive erosion, e.g. rills and/or pedestals unexpected for the ecosite**,** is taking place the following mitigation measures that may be employed include:
  - use of quick dam flood barriers
  - use of straw wattle
  - use of silt fencing
  - use of erosion control blankets
  - increase the stubble height objective slightly

- **Increase in Noxious Weeds**
  - A noxious weed inventory would be carried out by the monitoring group during the inventory and as the treatment progresses. If found, noxious weed locations would be reported to the district weeds coordinator and promptly treated prior to spreading.

If unacceptable consequences are documented as a result of treatment, modifications to the treatment will be made. If modifications to the treatment do not abate the unacceptable consequences, then treatment will not occur past the experimental phase.

3. Affected Environment/ Environmental Effects

3.1. Supplemental Authorities and Resource Concerns

Table 3. Review of Supplemental Authorities

Element/Resource	Not Present	Present, NOT Affected	Present and Affected	Rationale
A C E C	X			
Access		X		The Proposed Action and No Action Alternative would not have disproportionately high or adverse impacts on access. Access is not being limited or denied through any action alternative. No new access routes are being proposed.
Air Quality			X	Brought forward for analysis.
Aquatic Species	X			
Climate Change			X	Brought forward for analysis.
Cultural Resources			X	Brought forward for analysis.
Energy (Oil/Gas)	X			
Engineering	X			
Environmental Justice		X		The Proposed Action and No Action Alternative would not have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations; as such populations would see no decrease in employment opportunities if proposed alternative is selected.
Farm Lands – Prime/Unique	X			
Fire Management			X	Brought forward for analysis.
Floodplains	X			
Forestry and Woodland Products	X			
Grazing/ Rangelands			X	Brought forward for analysis.
Human Health and Safety		X		The Proposed Action and No Action Alternative would not have disproportionately high or adverse impacts on health or human safety and is not being carried forward for analysis.
Lands/Realty		***X***		The Proposed Action and No Action Alternative would not have disproportionately high or adverse impacts to land use or realty actions. The acquisition of non-exclusive easements for installation of fence on private land is to protect the federally funded range improvements constructed on private land and would have no impacts to land use or realty actions, therefore will not be carried forward for analysis.

Element/Resource	Not Present	Present, NOT Affected	Present and Affected	Rationale
Lands with Wilderness Characteristics	X			As there are no Lands with Wilderness Characteristics present in the project area, the resource will not be analyzed further.
Migratory Birds			X	Brought forward for analysis.
Mining/Minerals		X		The Proposed Action and No Action Alternative will not affect mining/minerals actions although the public lands involved in this EA are open to mineral entry. The proposed activities are not located within or adjacent to the mining operations; therefore, the Proposed Action will not be affected by the mining operations. The Proposed Action does not eliminate surface exploration activities from occurring and will not adversely affect exploration activities. Therefore, mining/minerals will not be carried forward for analysis.
Native American Traditional Values			X	Brought forward for analysis.
Non-Native, Invasive and Noxious Species			X	Brought forward for analysis.
Paleontology		X		To date no known fossils have been found in the location of the proposed fuel breaks; however, the potential exists to find vertebrate fossils in the Carlin Formation. Vertebrate fossils have been found in the Carlin Formation an upper fluvial and ash-rich unit of Miocene age. Vertebrate fossils have been found in the Carlin Formation at the Gold Quarry Mine, which is located approximately 10 miles east of the proposed fuel break for the T Lazy S Allotment, approximately 5 miles west of the proposed fuel break in the Hadley Allotment, and approximately 23 miles to the north along Antelope Creek. The vertebrate fossils that have been found in the Carlin Formation include varieties of extinct camel, antelope, and ancestors of the horse. The Carlin Formation would rate 4 or 5 in the Potential Fossil Yield Classification system for high potential for scientifically valuable fossils. Any fossils that they may exist would be buried at depth in the soil and would not be discovered unless they are exposed by erosion of the soil or ground surface disturbing activities.
Rangeland Health (HFRA)			X	Brought forward for analysis.
Recreation			X	Brought forward for analysis.
Special Status			X	Brought forward for analysis.

Element/Resource	Not Present	Present, NOT Affected	Present and Affected	Rationale
Species (Endangered, sensitive, etc.)				
Socio-Economics		X		The Proposed Action and No Action Alternative would not have disproportionately high or adverse impacts on Socio-Economics. Due to the research nature of this project outside funding sources are available, in turn there will be little cost to the cooperators. Jobs created by the Proposed Action construction would be short-term and negligible; maintenance activities would result in negligible impacts.
Soils			X	Brought forward for analysis.
Threatened or Endangered Species			X	Brought forward for analysis.
Vegetation			X	Brought forward for analysis.
Visual Resources			X	Brought forward for analysis.
Waste – Hazardous or Solid	X			
Water Quality (Surface/Ground)			X	Brought forward for analysis.
Wetlands/Riparian		X		Brought forward for analysis.
Wild & Scenic Rivers	X			
Wild Horses	X			
Wilderness	X			
Wildlife and Fisheries			X	Brought forward for analysis.

3.2. Affected Environment and Effects of the Alternatives

3.2.1. Cultural Resources

The term "cultural resource" encompasses any archaeological, historic, or architectural site, building/structure, or location that signifies some cultural, traditional, or religious importance to a specific cultural or social group. Cultural resources are defined as nonrenewable remains of human activity and once the objects in or the integrity of an archaeological or traditional resource are disturbed, nothing can recover the information that might have been gained through analysis of their relationships in past human history. The primary concern of cultural resource management, therefore, is to minimize the loss or degradation of culturally significant material remains, tangible and intangible. Protection of America's cultural resources began with the passage of the 1906 Antiquities Act. Next to pass was the Historic Sites Act of 1935. These two previous Acts were incorporated into the National Historic Preservation Act (NHPA) of 1966 and its amendments (54 U.S.C. § 300101, et seq., previously 16 U.S.C. § 470 et seq.). Protection of historic properties was reiterated in the Archaeological Resources Protection Act (ARPA) of 1979, and protection was broadened by the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990. Although each of these acts has its own focus and orientation, collectively they require a comprehensive, multicultural, and multi-disciplined approach to managing cultural resources on public lands.

Pursuant to Title 54 U.S.C. §300108 federal agencies must consider the effects of undertakings on Historic Properties prior to authorizing the undertaking. By definition, a historic property is a "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP" and includes "artifacts, records, and remains that are related to and located within such properties" (36 CFR 800.16(I)(1)). In evaluating historic properties within undertakings, "effect" means alteration to the characteristics of a historic property qualifying it for inclusion in or eligible for the NRHP. If the property is determined not eligible for the NRHP, or the undertaking will not directly or indirectly affect the property, the action would be considered "no effect". An "adverse effect" is found when an undertaking may alter characteristics of the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A determination of "no adverse effect" is reached when the integrity and existing character of the NRHP-eligible historic property can be maintained through treatment plans, project modification, and other types of undertakings as outlined in Chapter 5 of the State Protocol Agreement (the 'BLM-SHPO Protocol') between Nevada BLM and Nevada State Historic Preservation Office (SHPO 2014). The term "adverse effect" in the Cultural Resources sections of this EA is used in the specific context and definition set in the NHPA, and not in NEPA.

3.2.1.1. Affected Environment

The Targeted Grazing Fuel Breaks project area covers approximately 8,829 acres, of which, 3,418 acres are public land and 5,411 acres are privately owned. The analysis area for cultural resources includes all 8,829 acres on both public and private lands in the 4 allotments of the Targeted Grazing Fuel Breaks project area. This analysis area includes all lands which would be included in the grazing project, as well as 6 proposed range improvement projects (fences), corridors designated for mineral supplements and water haul locations, and potential livestock congregation areas (LCAs). Because of the brevity of construction activities and emplacement of water hauls and mineral supplements, as well as the presumed short duration of LCAs, this analysis area is considered sufficient to address both direct and indirect effects to cultural resources. The scope of the proposed project precludes a separate analysis area for indirect visual, auditory, and atmospheric effects. As the effects of dispersed grazing and mowing on cultural resources are considered to be negligible, the majority of the analysis area was determined not to require survey. The APE requiring Class III cultural resource surveys, totaling approximately 2,156 acres, was determined based on areas that would experience direct ground disturbance from the Proposed Actions, these include:

- a 60 meter buffer around the six proposed range improvement projects (fences)
- four buffered corridors in which water hauls and mineral supplements are to be placed
- 660 feet wide (based on the desire for a choice of locations for larger water hauls on both sides of the road) on the Hadley and TS parcels
- 100 foot wide (based on a fairly precise corridor adjacent to the south side of the road) for the Carlin Field allotment
- a 45 to 130 foot buffer around two potential livestock congregation areas on public lands

To evaluate the potential effects of the Proposed Actions for the Targeted Grazing Fuel Breaks project a Class I records search was conducted for the entire cultural resource analysis area using BLM site records and maps, Geographical Information System (GIS) inventory, GLO survey plats, Master Title Plats, and the Nevada Cultural Resource Inventory System (NVCRIS) to determine previously surveyed acres and sites recorded within the boundaries of the 4 parcels which make up the Targeted Grazing Fuel Breaks project area. Twenty-two cultural resource surveys have been conducted covering approximately 1,164 acres, or around 13.1%, of the total analysis area. These previous surveys documented 10 archaeological sites within the analysis area. Additionally, GLO data revealed 14 resources and 15 land patents within the analysis area.

Because previous survey coverage within the cultural resource analysis area does not cover the entire APE for cultural resources, a new Class III cultural resources inventory was carried out for the APE (BLM Report #1-3194). The project documented 17 archaeological sites (15 new sites and two previously recorded sites) and eight isolated occurrences. Five of these archaeological sites have been determined eligible for listing on the NRHP.

Environmental Effects

Effects of the No Action Alternative

Under the "No Action" alternative, livestock grazing would remain unchanged, and no new range improvements or vegetation treatments would be authorized. Under this alternative, no historic properties would be impacted and this alternative would result in no adverse effect to cultural resources.

Effects of the Proposed Action

Under the Proposed Action, the timing and intensity of livestock grazing within the five parcels would be altered slightly to achieve the uniform grazing of treatment areas through livestock grazing. As the area is already grazed by cattle, little change is expected in the impact of the altered grazing schedule.

Mowing is listed in the Proposed Action as a potential part of the project. Analysis of the potential mowing areas has shown that the only suitable one is in the southern portion of the TS parcel. Because other alternatives exist, it is very likely that the mowing will not be carried out. However, if it is determined, following the completion of this EA, that mowing should be carried out in the southern portion of the TS parcel or any other area, a separate decision document will be created to authorize this mowing. Prior to the creation of the new decision document a cultural resource inventory of the proposed mowing area will be carried out. The BLM will make a determination of eligibility and an effects determination for any cultural resources documented within the proposed mowing area. The eligibility and determination of effects for cultural resources will then be used to inform the new decision document, which will be completed prior to a Notice to Proceed being issued.

The installation of new fencing and the placement of new water hauls and mineral supplements will create ground-disturbing activities through their installation. The creation of new fences and installation of water hauls and mineral supplements may also result in cattle trailing (along the fences) and potentially new LCAs (at the water hauls and mineral supplements). The 100-foot buffer survey area along the fences, for the water hauls in the Carlin Fields allotments, and the 660-foot buffer survey area for water hauls and mineral supplements in the Hadley and T Lazy S allotments will more than encompass the LCAs created by these activities. For the proposed range improvement projects, the Section 106 process will be completed prior to project implementation in compliance with the BLM-Nevada SHPO Protocol. Under this alternative, historic properties would not be adversely affected because all proposed projects would be modified to avoid any historic properties so as to avoid causing adverse effects.

Mitigation

For all historic properties in areas with proposed ground disturbing activities, avoidance is the agreed mitigation strategy. Through avoidance of historic properties, historic properties within the project area will not be impacted; consequently the Proposed Action would result in no adverse effect to cultural resources and a Finding of No Significant Impact.

To ensure that historic properties are being avoided and that no unintended adverse effects are realized by cultural resources, a BLM archaeologist would monitor historic properties within the project area during the implementation of the Proposed Actions. If any adverse effect to historic properties is observed during a monitoring visit, the BLM will discontinue all activities associated with the Proposed Actions.

3.2.2. Soils

3.2.2.1. Affected Environment

T Lazy S Treatment Area

The T Lazy S Treatment Area has fifteen soil associations present which are listed in Table 4 and shown in Map 3-1 in Appendix A. However, only five dominant soil associations account for almost 80% of the treatment area. The dominant soil associations are described below in order of most to least abundant. Soil biocrusts have not been found in the treatment area. This area has undergone wildland fire damage previously and biocrusts probably do not exist. However, should biocrusts be discovered at a future date then mitigation plans will be made.

Tomera-Cherry Spring association comprises 20.1% of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a loam surface texture and a Unified Soil Classification of silt and lean clay of low plasticity (CL-ML). It has a low resistance to soil compaction and a low resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has low potential for damage by fire.

Cherry Spring-Cortez-Chiara association comprises 18.1 % of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a silt loam surface texture and a Unified Soil Classification of lean clay of low plasticity (ML). It has a moderate resistance to soil compaction and a low resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a low potential for damage by fire.

Cherry Spring-Orovada association comprises 16.8 % of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a silt loam surface texture and a Unified Soil Classification of lean clay of low plasticity (ML). It has a moderate resistance to soil compaction and a low resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a low potential for damage by fire.

Boulflat-Havingdon association comprises 12.1 % of the treatment area. The soil is classified R024XY005NV (ecological site number) and is not prime farmland. This association has a gravelly loam surface texture and a Unified Soil Classification of silty gravel (GM). It has a low resistance to compaction and a moderate resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a moderate potential for damage by fire.

Geysen silt loam comprises 11.2 % of the treatment area. The soil is classified R024XY006NV (ecological site number) and is not prime farmland. This association has a silt loam surface texture and a Unified Soil Classification of silt (ML). It has a moderate resistance to soil compaction and a low resistance to dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a moderate potential for damage by fire.

Table 4. Soil Parameters for T Lazy S Treatment Area

Soil Association	[1]Hydro Group	Percent of Treatment Area	[2]K_{WS}	[3]K_{RF}	[4]WEI	[5]T Factor
Boulflat-Havingdon association	C	12.1	0.32	0.49	48	2
Orovada fine sandy loam, 4 to 15 percent slopes	B	4.7	0.43	0.43	86	5
Orovada gravelly fine sandy loam, 2 to 4 percent slopes	B	4.7	0.28	0.32	86	5
Rad silt loam, 2 to 4 percent slopes	B	0.6	0.55	0.55	56	2
Geysen silt loam	C	11.2	0.43	0.43	56	2
Iron Blossom silt loam	C	4.1	0.55	0.55	86	3
Pocker silt loam	C	0.3	0.55	0.55	86	2
Rose Creek loam, drained	B	0.0	0.32	0.37	56	5
Welch-Bosco association	C	1.5	0.32	0.43	56	5
Susie Creek-Short Creek association	C	0.6	0.32	0.37	56	3
Bucan-Humdun association	C	4.5	0.24	0.43	38	3
Cherry Spring-Cortez-Chiara association	C	18.1	0.55	0.55	56	2
Cherry Spring-Orovada association	C	16.8	0.55	0.55	56	2
Chiara-Cherry Spring association	D	0.6	0.55	0.55	56	1
Tomera-Cherry Spring association	C	20.1	0.55	0.55	56	2

[1]Hydrologic Groups are an indication of infiltration in soils. Group A has very high infiltration rates and Group D has the lowest infiltration rate (near zero).

[2]Erosion K Factor (Whole Rock) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Whole soil indicates the erodibility of the whole soil.

[3]Erosion K Factor (Rock Free) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Rock free indicates the erodibility of the fine size fraction (<2mm).

[4]Wind Erodibility Index indicates the susceptibility of soil to wind erosion or tons per acre per year that can be expected to be lost to wind erosion.

[5]T Factor is an estimate of soil loss by wind/water that can occur without affecting crop productivity over a sustained period. The rate is tons per acre per year.

Source: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Blue Basin Treatment Area

The Blue Basin Treatment Area has two soil associations present which are listed in Table 5 and shown in Map 3-5 in Appendix A. The dominant soil associations for the treatment area are described below in order of most to least abundant. Soil biocrusts have not been found in the treatment area. This area has undergone wildland fire damage previously and biocrusts probably do not exist. However, should biocrusts be discovered at a future date then mitigation plans will be made.

Hunnton-Wieland-Gance association comprises 64.0 % of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a loam surface texture composed of alluvium derived from mixed rocks, loess and volcanic ash. The association has a Unified Soil Classification of silt and lean clay of low plasticity (CL-ML). It has a low resistance to soil compaction and a moderate resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a moderate potential for damage by fire.

Donna-Stampede-Gance association comprises 36.0 % of the treatment area. The soil is classified R025XY018NV (ecological site number) and is not prime farmland. This association has a gravelly loam surface texture composed of alluvium derived from mixed rocks, loess and volcanic ash. The association has a Unified Soil Classification of lean clay of low plasticity (CL). It has a low resistance to soil compaction and a moderate resistance to fugitive dust propagation. It has a very slow infiltration rate and very high runoff potential (Hydrologic Group D) with slow to very slow water movement and an impervious restrictive layer which impedes downward water movement may be present. The soil association has a low potential for damage by fire.

Table 5. Soil Parameters for Blue Basin Treatment Area

Soil Association	[1]Hydro Group	Percent of Treatment Area	[2]K_{WS}	[3]K_{RF}	[4]WEI	[5]T Factor
Donna-Stampede-Gance association	D	36	0.37	0.43	38	2
Hunnton-Wieland-Gance association	C	64	0.49	0.55	56	5

[1]Hydrologic Groups are an indication of infiltration in soils. Group A has very high infiltration rates and Group D has the lowest infiltration rate (near zero).
[2]Erosion K Factor (Whole Rock) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Whole soil indicates the erodibility of the whole soil.
[3]Erosion K Factor (Rock Free) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Rock free indicates the erodibility of the fine size fraction (<2mm).

(4)Wind Erodibility Index indicates the susceptibility of soil to wind erosion or tons per acre per year that can be expected to be lost to wind erosion.
(5)T Factor is an estimate of soil loss by wind/water that can occur without affecting crop productivity over a sustained period. The rate is tons per acre per year.
Source: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Carlin Field Treatment Area

The Carlin Field Treatment Area has four soil associations present which are listed in Table 6 and shown in Map 3-3 in Appendix A. However, only two dominant soil associations account for almost 97 % of the treatment area. The dominant soil associations are described below in order of most to least abundant. Soil biocrusts have not been found in the treatment area. This area has undergone wildland fire damage previously and biocrusts probably do not exist. However, should biocrusts be discovered at a future date then mitigation plans will be made.

Orovada-Humdun-Puett association comprises 56.0 % of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a fine sandy surface texture composed of loess over alluvium derived from mixed rocks. The association has a Unified Soil Classification of silty sand (SM). It has a low resistance to soil compaction and a low resistance to fugitive dust propagation. It has a moderate infiltration rate (Hydrologic Group B) with moderately rapid water movement. The soil association has a moderate potential for damage by fire.

Moranch-Ocala-Orovada association comprises 41.0 % of the treatment area. The soil is classified R024XY008NV (ecological site number) and is not prime farmland. This association has a silt loam surface texture composed of alluvium derived from mixed rock. The association has a Unified Soil Classification of silt (ML). It has a low resistance to soil compaction and a low resistance to fugitive dust propagation. It has a moderate infiltration rate (Hydrologic Group B) with moderately rapid water movement. The soil association has a moderate potential for damage by fire.

Table 6. Soil Parameters for Carlin Field Treatment Area

Soil Association	(1)Hydro Group	Percent of Treatment Area	(2)K_{WS}	(3)K_{RF}	(4)WEI	(5)T Factor
Geysen silt loam	C	2	0.55	0.55	56	2
Beowawe silty clay loam, heavy subsoil variant	D	0.3	0.43	0.43	48	5
Moranch-Ocala-Orovada association	B	41	0.43	0.43	86	5
Orovada-Humdun-Puett association	B	56	0.37	0.37	86	5

(1)Hydrologic Groups are an indication of infiltration in soils. Group A has very high infiltration rates and Group D has the lowest infiltration rate (near zero).

(2)Erosion K Factor (Whole Rock) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Whole soil indicates the erodibility of the whole soil.
(3)Erosion K Factor (Rock Free) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Rock free indicates the erodibility of the fine size fraction (<2mm).
(4)Wind Erodibility Index indicates the susceptibility of soil to wind erosion or tons per acre per year that can be expected to be lost to wind erosion.
(5)T Factor is an estimate of soil loss by wind/water that can occur without affecting crop productivity over a sustained period. The rate is tons per acre per year.
Source: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

Hadley Treatment Area

The Hadley Treatment Area has four soil associations present which are listed in Table 7 and shown in Map 3-3 in Appendix A. However, only two dominant soil associations account for 90 % of the treatment area. The dominant soil associations are described below in order of most to least abundant. Soil biocrusts have not been found in the treatment area. This area has undergone wildland fire damage previously and biocrusts probably do not exist. However, should biocrusts be discovered at a future date then mitigation plans will be made.

Cherry Spring-Orovada association comprises 48.0 % of the treatment area. The soil is classified R025XY019NV (ecological site number) and is not prime farmland. This association has a silt loam surface texture and a Unified Soil Classification of lean clay of low plasticity (ML). It has a low resistance to soil compaction and a low resistance to fugitive dust propagation. It has a slow infiltration rate (Hydrologic Group C) with moderate slow water movement and generally a restrictive layer which impedes downward water movement. The soil association has a low potential for potential damage by fire.

Orovada-Humdun-Puett association comprises 42.0 % of the treatment area. The soil is classified R024XY005NV (ecological site number) and is not prime farmland. This association has a fine sandy surface texture composed of loess over alluvium derived from mixed rocks. The association has a Unified Soil Classification of silty sand (SM). It has a low resistance to soil compaction and a low resistance to fugitive dust propagation. It has a moderate infiltration rate (Hydrologic Group B) with moderately rapid water movement. The soil association has a moderate potential for damage by fire.

Table 7. Soil Parameters for Hadley Treatment Area

Soil Association	(1)Hydro Group	Percent of Treatment Area	(2)K_{WS}	(3)K_{RF}	(4)WEI	(5)T Factor
Cherry Spring-Orovada association	C	48	0.55	0.55	56	2

Soil Association	[1]Hydro Group	Percent of Treatment Area	[2]K_{WS}	[3]K_{RF}	[4]WEI	[5]T Factor
Orovada gravelly fine sandy loam, 2 to 4 percent slopes	B	1	0.28	0.32	56	5
Orovada silt loam, 0 to 2 percent slopes	B	9	0.49	0.49	56	5
Orovada-Humdun association	B	42	0.43	0.43	86	5

[1]Hydrologic Groups are an indication of infiltration in soils. Group A has very high infiltration rates and Group D has the lowest infiltration rate (near zero).
[2]Erosion K Factor (Whole Rock) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Whole soil indicates the erodibility of the whole soil.
[3]Erosion K Factor (Rock Free) The susceptibility of a soil to sheet and rill erosion by water. Values of K ranges from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water. Rock free indicates the erodibility of the fine size fraction (<2mm).
[4]Wind Erodibility Index indicates the susceptibility of soil to wind erosion or tons per acre per year that can be expected to be lost to wind erosion.
[5]T Factor is an estimate of soil loss by wind/water that can occur without affecting crop productivity over a sustained period. The rate is tons per acre per year.
Source: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

3.2.2.2. Environmental Effects

Effects of the No Action Alternative

Direct effects of the No Action Alternative include continuation of current grazing management practices, susceptibility to wildfire, and potential erosion. Grazing practices involve low density grazing with no little to no fencing to control livestock. Low density would result in little control of vegetation and impact on ground surface. Large scale, severe wildfires could lead to potential damage to the ground surface particularly in the Carlin Field treatment area which has a moderate potential damage from fire rating (Table 8). The other treatment areas have low potential of damage from fire and would not be impacted. With the loss of vegetation with wildland fire, water erosion could be an issue because of the higher Erosion K factors ($K_{(WR)}$ and $K_{(RF)}$) seen for the various soil associations (Tables 4, 5, 6 and 7). However, watershed modelling (GEOWEPP) within the treatment areas indicates that runoff and sediment loss is negligible with or without fire impacts (Table 9).

The soils within the treatment areas may be susceptible to wind erosion as seen by the low and moderate resistance to fugitive dust propagation (Table 8). After a fire, the soils would be susceptible to wind erosion.

There are no indirect effects from the No Action Alternative.

Effects of the Proposed Action

Implementing the Proposed Action would result in the creation of a fuel break within the targeted grazing treatment areas. The fuel break would have vegetation reduced to a stubble height of 2 to 3 inches for effective fire suppression. Once objectives were obtained, livestock grazing would cease on the treatment areas. Direct effects from the Proposed Action include erosion (water and wind) and soil compaction. The potential impacts from wind erosion are evaluated by the fugitive dust propagation parameter. The vulnerability of soil particles to be lifted and carried by wind is evaluated as low to high where low is less susceptible to wind erosion and high is likely to be eroded by wind. A low to moderate vulnerability to fugitive dust propagation (8X) shows that without vegetation there will be soil loss (Table 9; WEI). If the vegetation is absent through burning the wind erosion will be even greater. The soil associations have a low to moderate resistance to soil compaction (Table 8). Soil compaction may be greater where a large number of animals congregate which increases animal density, such as near water supplies and along fence lines and gates. Proper and careful grazing management practices are needed to manage impacts from soil compaction. Areas of soil compaction may result in reduced infiltration. Impacts in increased surface runoff, sediment movement and erosion potential are not seen in watershed modelling within the treatment areas.

There are no indirect effects from the Proposed Action.

Table 8. Soil Parameters for Targeted Grazing Treatment Areas

Treatment Area	Soil Compaction[(1)]		Fugitive Dust Propagation[(2)]		Potential Damage by Fire[(3)]	
	Level	Area Percent	Level	Area Percent	Level	Area Percent
T Lazy S	Low	32.2	Low	66.2	Low	54.9
	Moderate	46.1	Moderate	12.1	Moderate	23.3
	High	--	High	--	High	--
Hadley	Low	90	Low	90	Low	48
	Moderate	--	Moderate	--	Moderate	42
	High	--	High	--	High	--
Blue Basin	Low	100	Low	--	Low	36
	Moderate	--	Moderate	100	Moderate	64
	High	--	High	--	High	--
Carlin Field	Low	97	Low	97	Low	--
Carlin Field, Cont.	Moderate	--	Moderate	--	Moderate	97
	High	--	High	--	High	--

[(1)]Each soil is interpreted for its resistance to compaction
[(2)]The vulnerability of the eroded soil particles to go into suspension during a windstorm.
[(3)]Ratings indicate the potential for damage to nutrient, physical, and biotic soil characteristics by fire.
Source: https://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

Table 9. Runoff and Sediment Loss Values Estimated by GEOWEPP

Treatment	Normal Climate and Vegetation		Normal Climate and Severe Burn		Climate Change and Normal Vegetation		Climate Change and Severe Burn	
	Runoff	Sediment Loss	Runoff	Sediment Loss	Runoff	Sediment Loss	Runoff	Sediment Loss
T Lazy S	0.0	0	0.53	0	0.0	0	0.33	0
Hadley	0.0	0	0.29	0	0.0	0	0.15	0
Blue Basin	0.0	0	0.78	0	0.0	0	0.48	0
Carlin Field	0.0	0	0.46	0	0.0	0	0.26	0

Runoff – cubic feet/year
Sediment Loss – ton/year
GEOWEPP model used closest weather station modified by PRISM. Climate Change weather estimates used nearest weather station modified by PRISM and adjustments caused by precipitation amounts. Precipitation adjustments source: Meehl and Washington, 2006 and Timmermann et.al, 2009.

Mitigation

The proposed vegetation treatments would reduce available plant material for consumption in a wildland fire and allow for manageable fire suppression tactics. The fuel break would have vegetation reduced to a stubble height of 2 to 3 inches for effective fire suppression. The stubble height would be maintained for erosion prevention

3.2.3. Water Resources (Surface/Ground)

3.2.3.1. Affected Environment

There are four treatments that comprise the proposed project: the T Lazy S, Blue Basin, Hadley, and Carlin Field Treatment Areas. Water is not readily available in the treatment areas and when grazing is utilized water would be supplied to livestock. Each pasture has varying numbers of water sources and different levels of availability for water resources that are used by livestock and wildlife.

T Lazy S has no seeps or springs in the proposed project boundary. There are 17 miles of intermittent streams on BLM land, 41 miles of intermittent stream on private land, and 5.6 mile of perennial streams on private land. Blue Basin Treatment Area has no seeps or springs present and has 6.2 miles of intermittent streams on BLM land. No perennial streams are present. Carlin Field and Hadley Treatment Areas have no seeps or springs. Carlin Field does not have stream drainages and Hadley has 1.8 miles of intermittent drainage located on private land. Map 3-7 in Appendix A shows the locations of springs and perennial streams within the proposed project areas.

3.2.3.2. Environmental Effects

Effects of the No Action Alternative

The No Action Alternative would not change current conditions on the treatment areas and would have little impact beyond that occurring from ongoing permitted grazing.

Effects of the Proposed Action

The Proposed Action includes an adaptive management strategy, which includes a number of components, which could result in direct and indirect impacts in the treatment areas. Direct effects of the Proposed Action include the potential increase in trampling and increase in soil compaction near water troughs. This is expected to be minimal if present, since each trough will be on site for a short duration and the troughs will move throughout the treatment to facilitate livestock movement. The placement and utilization of watering troughs to control livestock movements and provide adequate water supplies and may reduce trampling, compaction and degradation of water sources. Water quality monitoring within the pasture would continue.

There are no indirect effects from the Proposed Action.

3.2.4. Air Quality

3.2.4.1. Affected Environment

Regional air quality is influenced by a combination of factors including climate, meteorology, the magnitude and spatial distribution of local and regional air pollution sources, and the chemical properties of emitted pollutants. Within the lower atmosphere, regional and local scale air masses interact with regional topography to influence atmospheric dispersion and transport of pollutants. The majority of PM_{10} and $PM_{2.5}$ emissions in the Project Area are attributed to fugitive dust sources, defined as those not able to be captured and routed to a control device. These fugitive sources include primarily wildland fires, and to lesser degrees, vehicle travel on unpaved roads, and windblown disturbance. Table 8 in the Soils Section shows that many soils have a low to moderate vulnerability to fugitive dust propagation. However, if vegetation cover is lost an increase in dust generation is expected. The following sections summarize the climatic conditions and existing air quality within the Project Area and surrounding region.

Regional Climate

The Project Area is located in Elko County, west of the Ruby Mountains and the Humboldt-Toiyabe National Forest. The climate is arid and characterized by warm, dry summers and cold, wet winters.

The EPA and states set limits on permissible levels of air pollutants. These permissible levels are health-based criteria outlined by the National Ambient Air Quality Standards (NAAQS) and

Nevada Ambient Air Quality Standards (Nevada AAQS). A geographic area that meets or has pollutant levels below the NAAQS is called an attainment area. An area with persistent air quality issues is designated a nonattainment area. This means that the area has violated federal health-based standards for outdoor air pollution.

Monitoring of air pollutant concentrations has been conducted in the region. These monitoring sites are part of several monitoring networks overseen by state and federal agencies, including: NDEP-Bureau of Air Quality Planning (BAQP) Clean Air Status and Trends Network (CASTNET), Interagency Monitoring of Protected Visual Environments (IMPROVE), and National Acid Deposition Program (NADP) National Trends Network (NTN). The Elko District is in an area of attainment.

3.2.4.2. Environmental Effects

Effects of the No Action Alternative

The No Action Alternative would not increase protection from wildland fire spread, and potentially lead to further contributions of air pollutants as smoke (mainly PM10 and PM2.5) if wildland fires burn in the area and leave denuded, wind-erodible soils. The majority of PM_{10} and $PM_{2.5}$ emissions in the treatment areas are attributed to fugitive dust sources, defined as those not able to be captured and routed to a control device. These fugitive sources include primarily wildland fires, and to lesser degrees, vehicle travel on unpaved roads, and windblown disturbance.

Small quantities of HAP emissions would not be a concern in this situation.

Effects of the Proposed Action

The direct effects of the Proposed Action Alternative could impact the current conditions. Wildland fires could potentially be controlled quicker, burn less land and vegetation and reduce the release of PM10 and PM2.5 constituents into the atmosphere. Emissions of the criteria pollutants NO_x, CO, and volatile organic compounds (VOCs) occur primarily from fuel combustion sources including engines, heaters, heavy equipment, and mobile sources (heavy and light-duty vehicles) operating during the construction and operations phases of the Proposed Action. This construction is short term and these constituents would not be a concern.

There are no indirect effects.

3.2.5. Climate Change

3.2.5.1. Affected Environment

According to the BLM's Instruction Memorandum (IM) No. 2008-171, "Guidance on Incorporating Climate Change into Planning and NEPA Documents," dated August 19, 2008, climate change considerations should be acknowledged in EA documents. The IM states that

ongoing scientific research has identified the potential impacts on global climate of anthropogenic (man-made) GHG emissions and changes in biological carbon sequestration due to land management activities. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused CO_2 concentrations to increase dramatically, and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change recently concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially CO_2 and methane) from fossil fuel development, large wildland fires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs could have a sustained climatic impact over different temporal scales. For example, recent emissions of CO_2 may influence climate for 100 years.

Current emissions within the vicinity of the Treatment Areas include occasional smoke from wildland fires, vehicle combustion emissions, fugitive dust from travel on unimproved roads, ranching and mining activities, and wildland fires. Emissions of all pollutants are generally expected to be low due to the extremely limited number of sources in the vicinity of the Treatment Areas. Existing climate prediction models are global in nature; therefore they are not at the appropriate scale to estimate potential impacts of climate change within the Treatment Area.

3.2.5.2. Environmental Effects

Effects of the No Action Alternative

For the No Action Alternative, there would be potentially a sudden and uncontrolled increase in carbon contributions to the atmosphere due to wildland fires.

Effects of the Proposed Action

For the Proposed Action, removal of vegetation to create a fuel break would result in a loss of stored carbon in the vegetation. However, the amount of carbon lost with treatment is much less than without the Proposed Action and the unchecked vegetation loss by wildland fire. The removal of carbon due to wildland fire is much greater than the carbon loss by the Proposed Action. Livestock grazing would result in methane emissions, which are a contributor to greenhouse gases. However, existing livestock grazing within the area would be concentrated in the treatment areas to meet fuels objectives, and then dispersed to other locations when treatment

objectives are met. Therefore, no appreciable net increase in livestock grazing and associated methane emissions would be expected. Some temporary emissions of fossil fuels would result from use of machinery for constructing fences, and on an annual basis in association with water hauling.

3.2.6. Vegetation

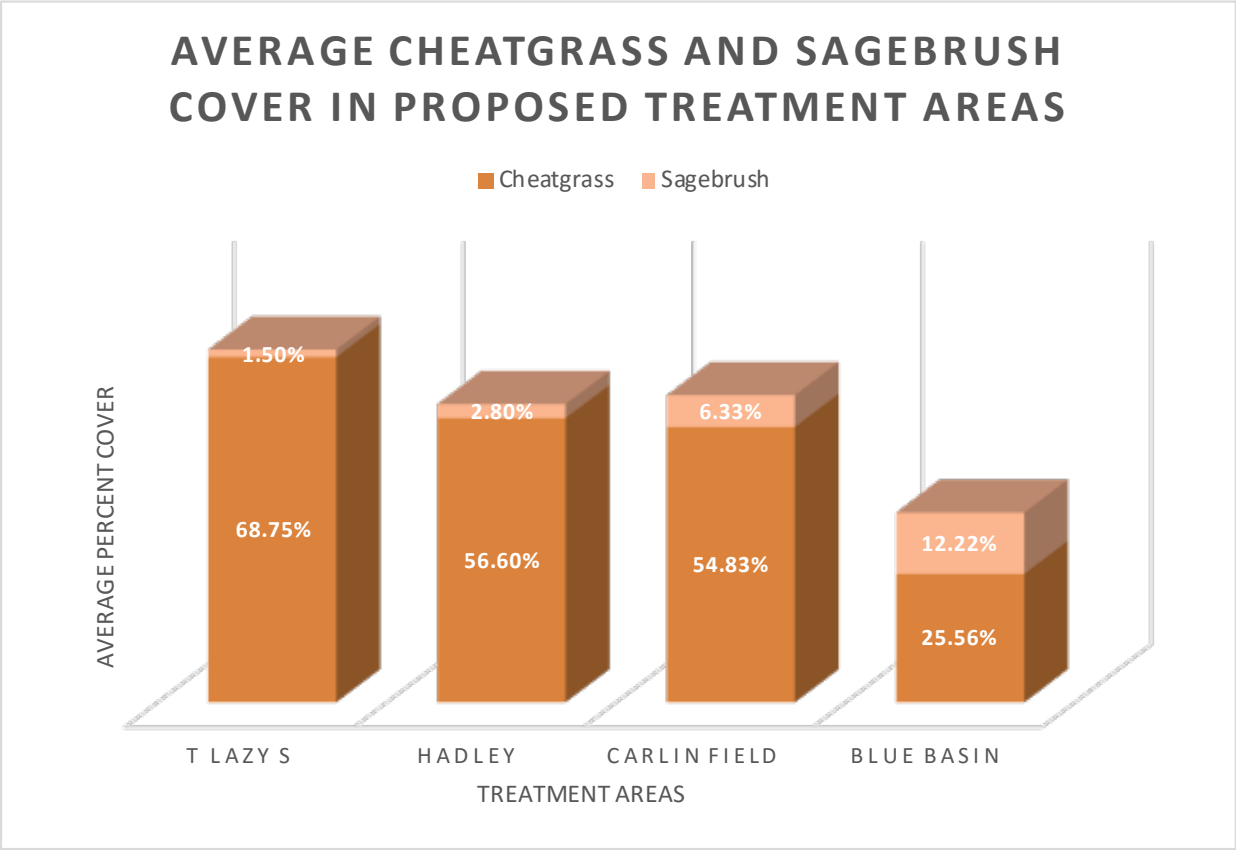
3.2.6.1. Affected Environment

The analysis area for vegetation would be those fenced Treatment Areas identified for creation and maintenance of fuel breaks by livestock. The two most dominant ecological sites within the treatment areas are the Loamy 8-10" (Thurber's needlegrass, Wyoming big sagebrush) and the Dry Floodplain (Basin big sagebrush and Basin wildrye). The majority of these sites should be a dynamic balance of native perennial bunchgrasses with big sagebrush dominance by percent cover. However, this natural stand dynamic has been altered in favor of annual grasses due to fire. Fire has altered vegetation composition of the treatment areas to consist primarily of cheatgrass or introduced perennial species (Figure 1). Landscape level fires such as the 2012 Willow Creek Fire, 2011 Indian Creek and Chukar Canyon Fires, 2007 Red House and Bobs Flat Fires, 2006 Suzie and Basco Fires, and 2005 Esmeralda Fire have burned over 750,000 acres on the Tuscarora and Independence Mountains dating back to the 2005 fire season, and the proposed treatment areas are on the windward side of these mountains.

The lower elevation vegetation types within the planning area generally are described as black greasewood, Wyoming big sagebrush, shadscale, and bunchgrass communities. Ecological sites include Saline Bottom (basin wildrye, greasewood), Loamy 8-10" (big sagebrush, Indian ricegrass, and needle and thread), Sodic Flat 8-10" (greasewood, big sagebrush, basin wildrye), Saline Floodplain (basin big sagebrush, and basin wildrye), and the Sodic Bottom (greasewood, and basin wildrye). The majority of these sites are typically dominated by shrub species with a sub-dominant native perennial bunchgrass understory. The current state of vegetation communities, at lower elevations within the planning area, has been greatly altered due to impacts from wildland fires (Figure 1). Cheatgrass, tumble mustard, and Russian thistle have moved into, and in many cases dominate, much of these lower elevations. Refer to Table 5, 6 and 7 for ecological site acres associated with each treatment area.

In the fall of 2016 there were line point transects conducted at 72 sites throughout the treatment areas. When the fences are constructed, 36 of those points will be inside the treatment areas, and 36 sites will be 'control' plots outside the treatment areas. These points are distributed throughout the treatment areas so that ecological sites and topographic differences are represented in data collection. The points used for data collection can be seen in Maps 3-2, 3-4, 3-6 in Appendix A. The data collected in 2016 quantitatively depicts the amount of cheatgrass dominance throughout the treatment sites.

Figure 1. Average Percent Cover of Sagebrush and Cheatgrass in the Treatment Areas



Graph made using data collected on proposed treatment sites in fall of 2016.

There have also been vegetation treatments in the area, largely associated with Emergency Stabilization and Rehabilitation (ES&R) activities post-fire. The treatments have had varying levels of success.

Vegetation Treatments previously completed within the targeted grazing areas are listed below:

Blue Basin Treatment Area

The Blue Basin Treatment area is Elko North Greenstrip project. The greenstrip consisted of brush beating a 300 foot strip in existing sagebrush followed by drill seeding the non-native grass mix and constructing protection fence adjacent to an existing pasture fence to allow for grazing rest of the drill seeding. The following seed mix was used for the Elko North Greenstrip: Siberian Wheatgrass 2.5 lbs. /acre), Nordan Crested Wheatgrass (2.0 lbs. /acre), Hycrest crested wheatgrass (2.0 lbs. /acre), and Russian wildrye (2.5 lbs. /acre). This project area has not experience fire for over 30 years.

Carlin Field Treatment Area

The majority of the proposed treatment area was burned in the 2006 Susie Fire but did not receive any ES&R treatments within the treatment area.

Hadley Treatment Area

The Hadley Treatment area burned during the 2006 Susie Fire and received both aerial and drill seeding ES&R treatments on the public land portions of the project. About 50 acres within the proposed treatment area were drill seeded with the following seed mix: Nordan crested wheatgrass, Siberian Crested wheatgrass, Russian Wildrye, Indian rice grass and fourwing saltbrush. The public portions of the treatment area were also aerial seeded with the following mix: Wyoming big sagebrush, Basin big sagebrush and Western yarrow.

T Lazy S Treatment Area

The T Lazy S Treatment area involves two fires since 1996 that ES&R treatments were implemented. The Bob's Flat Fire which is located on the southern portion of the treatment area and the 2011 Chukar Fire on the northern portion of the treatment area.

The ES&R treatments completed on the Bob's Flat Fire included disking of cheatgrass the spring of 1997, drill seeding the fall 1997 and aerial seeding of forage kochia the winter of 1997/1998. The drill seed mix consisted of crested wheatgrass, Siberian wheatgrass, and four-wing saltbrush. The drill seeding area was then aerial seeded with forage kochia.

The Chukar Canyon Fire ES&R treatments included drill seeding and aerial seeding. The drill seeding mix is as follows: Siberian wheatgrass, Russian wildrye, Sandberg's bluegrass, and small burnet. The low elevation aerial seeding consisted of Wyoming big sagebrush and western yarrow.

Emergency Stabilization and Rehabilitation (ES&R) treatments.

2006 Susie Fire

The 2006 Susie Fire burned a total of 78,457 acres (39,734 acres public and 38,723 private). Approximately 8,900 acres of drill seeding were completed on the Susie Fire of which 2,900 acres were seeded with a native grass mix and 6,000 acres were seeded with a mostly non-native mix. Both seed mixes were successfully established but the non-native mix establishment was more successful. A total of 13,700 acres were aerial on the Susie fire of which 2,200 acres were watershed seedings that included native grasses and sagebrush and was confined to drainage bottoms. A total of 11,500 acres were aerial seeded primarily with Wyoming big sagebrush and Basin big sagebrush within crucial mule deer and antelope winter range. This also included over seeding the 8,900 acres of drill seeding with sagebrush. The big sagebrush aerial seedings were very successful and are providing much needed cover and winter forage for wildlife.

1996 Bob's Flat Fire

The Bob's Flat Fire burned a total of 27,973 acres (12,291 acres public and 15,682 acres private). A total of 5,015 acres of public land were seeded using a combination of drill and aerial seeding methods in an effort to stabilize the site and provide winter forage for mule deer and antelope and livestock. The private land owner in cooperation with NDOW also seeded 4,965 acres of private land using similar methods and seed mixes. The fire area was drill seeded using both native and non-native grasses and was overseeded with forage kochia and in some areas Wyoming big sagebrush. The Bob's Flat seedings have a good component of forage kochia that in below normal precipitation years is able to compete with cheatgrass. However, on above normal precipitation years cheatgrass is able to persist throughout the kochia seeding.

2011 Chukar Canyon Fire

The Chukar Canyon Fire burned a total of 48,671 acres (22,830 acres public and 25,851 acres private). Aerial seed mixes consisted of a Low elevation mix which consisted of Wyoming big sagebrush and western yarrow with an every other swath pattern covering 17,500 acres. A high elevation mix of mountain big sagebrush, western yarrow, antelope bitterbrush and Idaho Fescue was also seeded on an every other swath pattern covering a 9,000 acre block. Aerial seeding of forage kochia and Wyoming big sagebrush was completed on lower elevation areas south of Mack Creek over 5,000 acres. In addition approximately 3,700 acres of public and private lands were drill seeded. A total of 1,050 acres were seeded with a low elevation mix on the west side of the fire which included Siberian wheatgrass, Russian wildrye, Sandberg's bluegrass, and small burnet. This a total of 845 acres were drill seeded with a native mix on the east side of the fire consisting of Snake River wheatgrass, thickspike wheatgrass, blue bunch wheatgrass Indian rice grass and Wyoming big sagebrush. Both aerial and drill seedings at the mid and high elevation areas of the fire are established. The seedings at the low elevations are partially established but have a lot of competition from cheatgrass that is spread throughout the west side of the fire.

3.2.6.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action alternative current conditions would be expected to continue. The direct impacts from distributed livestock grazing would continue to occur, removing small amounts of the fine fuel production. Grazing of both domestic livestock and wild ungulates will be largely in transit, as there is no surface water available throughout each of the targeted grazing treatment areas currently to attract animals. Indirectly, fine annual invasive fuel continuity would remain intact. These fuels would continue to promote fast moving fires. The risk of longer fire seasons due to early drying of these annual invasive fuels would remain high (Foster, et al., 2015). Recovering and intact sagebrush uplands on the leeward side of these proposed treatments would remain at elevated risk of wildland fire.

Several native and crested wheatgrass seedings lie on the leeward side of the treatment areas in the mid and upper elevations. Big sagebrush and native forbs are slowly reestablishing back into these areas. Recurring wildland fire would remove reestablishing sagebrush, which is killed by fire. Bunchgrass recovery would also be hindered because invasion of cheatgrass would be promoted by wildland fires, while bunchgrasses can be injured or killed when fire conditions result in high soil surface temperatures (Foster, et al., 2015; Diamond, Call, & Devoe, 2012; Davies, Svejcar, & Bates, 2009; Wambolt, Walhof, & Frisina, 2001). Many of these recovering vegetation communities interface with lower elevation areas that have already been negatively impacted by past wildland fire activity and have a substantial cheatgrass component. These lower elevation, fire affected areas, are identified for treatment.

Effects of the Proposed Action

Under the Proposed Action alternative fine annual invasive fuel continuity would be broken. Annual invasive grasses would be grazed to a 2 to 3 inch stubble height to slow or stop fire spread (Diamond, Call, & Devoe, 2012; Mosley & Roselle, 2006; Vallentine & Stevens, 1992) within strategicaly located treatment areas. There would be concentrated livestock on very small portions of ES&R treatments. Since these ES&R areas are larger than the fuel break treatment areas, and the low elevation of the fuel break treatment areas were often the least successful portions of the treatments, there are not expected to be any negative impacts to past ES&R treatment success. In addition, the placement of the fuel breaks will have a direct impact of promoting ES&R treatment success by lengthening the fire return interval in these locations. The southern end of the T Lazy S TA has a component of successful forage kochia for an ES&R seeding. The kochia is not expected to be selected for in spring, however there is a large component of kochia outside of the TA, so direct comparisons of plant health can be made.

Preventing wildland fire in leeward uplands would help maintain intact sagebrush systems and ensure recovery of those previously burned areas with successful rehabilitation efforts (Foster, et al., 2015). Of the ES&R treatments that have been done in the area,

If sufficient removal of biomass was achieved, reduction in cheatgrass density over time may be possible (Foster, et al., 2015; Hempy-Mayer & Pyke, 2008). Since cheatgrass has been shown to germinate readily in residual fall litter (Foster, et al., 2015), fall targeted grazing treatments may be used to further reduce spring fuel loads, as appropriate. This treatment would only be necessary if there were large amounts of litter present in the fall that would require removal, and there would still be a stubble height objective associated with rooted vegetation.

Spring defoliation of introduced perennial plants may result in reduced biomass, reproduction, and plant vigor. To prevent introduced perennial plant loss and restore vigor, a deferment or rest rotation may be needed for the Blue Basin green strip treatment area (Brewer, Mosley, Lucas, & Schmidt, 2007; Clark, Krueger, Bryant, & Thomas, 1998).

Mowing sagebrush would reduce the height of vertical woody fuels further enhancing the efficacy of the fuel break. Mowing sagebrush communities has shown to increase herbaceous vegetation (Pyke, et al., 2014). In this case, mowing degraded sagebrush systems may cause an increase in annual invasive species (Davies, Bates, & Nafus, 2012; Pyke, et al., 2014). Due to the current degraded condition of the treatment areas, fine annual fuels may increase following the mowing treatment component, but could be controlled by implementation of targeted grazing. Mowing woody fuels may allow for sagebrush growth and reproduction from surviving branches (Pyke, et al., 2014). Please see Map 3-8 in Appendix A for a map showing mowing locations within the T Lazy S treatment area.

Water haul locations would receive a direct impact of livestock concentration, and therefore would expect a reduced vegetative cover at those locations. However, water haul sites will only experience the concentration of livestock for a short duration, since troughs are going to be moved frequently to new locations. Construction of new fencing may also cause a brief increase in localized disturbance. A possible indirect impact of new fencing and water haul areas is that they may serve as potential vectors for the introduction and/or spread of vegetation. Due to this potential, water haul sites will not be placed within or near any existing noxious weed infestations. In addition, equipment used for fence construction will be clean and free of seeds prior to fence construction. Monitoring for new noxious weed infestations would be ongoing. If new infestations are found by bureau staff or cooperators, they would be reported to the Bureau within 24 hours of observation. New infestations would be treated by Bureau staff with appropriate methods.

3.2.7. Livestock Grazing

3.2.7.1. Affected Environment

The analysis area for livestock grazing would be those fenced areas identified as proposed targeted grazing treatment areas. Areas within four livestock grazing allotments (Map 3-9 in Appendix A) administered by the Tuscarora Field Office have been identified as proposed

treatment areas. The four allotments are comprised of over 345,000 acres in total, and include the T Lazy S, Hadley, Carlin Field, and Blue Basin Allotments. Current livestock grazing authorized on these allotments is consistent with the terms and conditions of the respective, allotment specific, 10-year grazing permits. Use within the identified treatment areas has historically been low and dispersed, as water is insufficient to distribute livestock to the proposed treatment areas. Livestock are typically turned out in lower elevations, early in the year, and herded or moved to higher elevations as summer ensues. As available waters dry and vegetation dries out, livestock are moved to those areas with remaining available water, typically livestock wells. By late fall, livestock are herded to private ground where they spend the winter. The Table 10 identifies current permitted use on the allotments.

Table 10. Allotment, Kind of Livestock, Season of Use, AUMs

Allotment	Livestock Kind	Season of Use	AUMs
T Lazy S	Cattle Cattle	02/15-11/30 03/1-02/28	11,363 202
Hadley	Cattle	04/01-12/20 07/01-12/20 05/01-05/31	2,760 1,310 206
Carlin Field	Cattle	04/1-12/20	3,891
Blue Basin	Horse Cattle	04/01-09/01 04/01-11/15	62 4,208
Blue Basin	Cattle	04/01-11/15	3,141

3.2.7.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action alternative livestock grazing would continue as permitted on the allotments. No new water sources would be made available, and no fencing would be constructed, so livestock use in these areas would continue to be very distributed. Direct impacts would include minimal removal of fine annual fuels. This would cause the indirect impact of intact and recovering habitats remaining in jeopardy from large-scale, frequent wildland fires. Large scale burns within the allotments could result in significant impacts to livestock operations, forcing operators to relocate livestock or find other means of providing livestock forage while burn areas recover.

Repeated fire would maintain vegetation in an herbaceous state, which would provide greater forage production and availability when compared to shrub-dominated plant communities. However, repeated fire can also degrade plant communities, removing perennial vegetation favoring invasive annual plants which respond rapidly following wildland fire (Foster, et al.,

2015). These plant species provide adequate early season forage but become unpalatable quickly and do not produce the same quantity of forage produced by perennial plant communities (Mosley & Roselle, 2006). In addition, annual grass production is highly variable from year to year, reducing the ability of the livestock operator to have long term business strategy.

Effects of the Proposed Action

Implementing the Proposed Action would result in 9,576 acres of fuel breaks being created and maintained through targeted grazing. These treatment areas would be physically separated from the larger allotments through fencing, and water will be placed throughout the treatment areas. Due to the physical separation and the small size of the treatment areas in context of each allotment, there will be no changes to the permit or any livestock management on the larger allotments. Grazing treatments would range from less than 1 percent of the allotment on the Hadley Allotment, to no more than 5 percent of the T Lazy S Allotment. Table 11 lists the public and private acres, total treatment acres per allotment, and percent treated of the allotment.

Table 11. Allotment Acres

Allotment	Public Acres	Private Acres	Total Acres	Total Treatment Area Acres	Treatment area % of Allotment
T Lazy S	68,797	108,078	176,875	8,180	4.6
Hadley	27,323	69,314	96,637	442	0.5
Carlin Field	18,797	4,485	23,282	59	0.3
Blue Basin	37,700	13,250	50,950	148	0.3
Totals	152,617	195,127	347,744	8,829	2.5

Once treatment objectives are met, livestock grazing would cease on the treatment areas until regrowth of cheatgrass or other annuals necessitates re-treatment (maintenance). Livestock operators may need to move livestock back into the treatment areas as cheatgrass may have multiple growing periods in any given year, depending upon annual precipitation and temperature and temperature patterns (Mosley & Roselle, 2006). Livestock producers will have to find alternative forage solutions if stubble height objectives in treatment areas are attained before the turn on dates of their permits. Direct impacts may include initial stress to livestock, due to concentration and the large amounts of human interaction they will receive through movements and management. There are not expected to be negative impacts to the livestock health, as supplements will be used if needed, and cheatgrass holds nutrition during the early spring when treatments will occur. Fall treatments would require livestock supplementation in order to mitigate potential negative impacts to livestock condition due to decreased nutritional values of cheatgrass at that time.

Targeted grazing is the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals (Launchbaugh &

Walker, 2006) Due to the goals of targeted grazing being vegetative, with any livestock production goals coming secondarily, the methods of managing livestock to accomplish targeted grazing are expected to differ greatly from livestock management outside of the treatment areas. Livestock management, and costs associated with livestock management, are expected to increase during targeted grazing treatments. Producers would incur direct additional costs associated with hauling water for distribution of livestock. Water haul contracts may cost $125/hour or more. Yearling cattle water intake may range from 6 to 12 percent of their body weight. An 1100 lb. yearling may drink roughly 16.5 gallons per day. Additional costs for water troughs and supplements would also be incurred. Generally, 250 lb. mineral supplements can be $110.00 or more while 250 lb. protein supplements start around $120.00. As livestock would need to be moved more frequently, more time would be spent herding and additional riders may be necessary to complete the targeted grazing treatments or retreatments.

In addition to the increased management required, there is also a higher level of uncertainty from year to year, leaving only a small amount of time to plan the operations on an annual basis. In years where cheatgrass production is substantial, the producer may need to acquire additional livestock quickly in order to be able to adequately treat the treatment areas. Also, a substantial amount of time would be spent assessing targeted grazing treatment areas to ensure livestock are removed when the fuels treatment objective is attained but not exceeded. Fencing repair and maintenance costs would be incurred including tools and supplies, i.e. pliers and T-posts.

In the long term, the livestock operator would be expected to benefit from having larger areas of the permitted allotment(s) largely protected from repeated fires and in a perennial vegetation community.

3.2.8. Recreation

3.2.8.1. Affected Environment

The analysis area for recreation is the proposed project area as proposed project disturbance would only occur in this area. The area receives moderate seasonal use, primarily dispersed recreation by hunters in the fall. Other recreational activities include camping, biking, hiking, off-highway vehicle (OHV) use, horseback riding, rock hounding, and bird and wildlife watching.

The Target Grazing project area sits within Nevada Department of Wildlife (NDOW) Hunt Unit 064 and 068. Hunt Unit 064 is an area of approximately 312,000 acres of which 1,084 acres comprises the targeted grazing area that includes both public and privately held lands, and which is less than 1% of the unit group acreage. Hunt Unit 068 is an area approximately 1,060,000 acres of which 8,600 acres comprises the targeted grazing area that includes both public and privately held lands and is less than 1% of the unit group acreage. Range improvements

concurrent with livestock management have served to aid wildlife management objectives and then by association hunting experiences as well.

3.2.8.2. Environmental Effects

Effects of the No Action Alternative

The No Action Alternative would result in no fuel breaks being constructed in the project area, no targeted grazing, no mowing, no fence construction, and no mineral or water hauls sites. There would be no immediate direct impact to recreational activities. Livestock would continue to graze throughout the allotments under existing grazing permits, but would not be concentrated periodically in the areas identified under the Proposed Action.

In the future, increased risk of large wildland fires may affect the experiences of visitors. Fires may result in damage to roads, vegetation, and trails. Large fires may lead to recreational activity closures during the fire, and often during recovery. Fires may create dusty environments that are undesirable to visitors, and the scenic quality may be degraded. Dozer lines and hand lines created during suppression may become unofficial trails that can encourage cross-country use and detract from the recreationalist's experience. Widespread wildland fires would have a continued deleterious effect on habitat quality for many game species, which could impact hunting opportunities.

Effects of the Proposed Action

Under the Proposed Action there may be direct impacts to recreational activities, but they are likely to be minimal and largely short-term. These may include degradation of the scenic quality due to the construction of fuel breaks. Construction of fencing may create a hindrance by having to open and close gates, though access through will remain open. Scenic quality may also be temporarily hindered by trough and supplement locations. The supplement bins and water troughs would be removed upon seasonal completion of the treatments.

Over the long term, the Proposed Action may serve to limit the negative effects of large wildland fires on recreational activities in the area.

Mitigation

Recreational use within grazing allotments may result in causing some conflicts with grazing operations primarily regarding the securing of fence gates. For example, when visitors to public lands leave fence gates open that were previously closed this results in livestock wandering away which can cause concern for the grazing permit holder. Public roads intersecting with pasture fences that have had a history of gates being left open should be identified and if applicable a cattle guard considered as an alternative. These guards would restrict the livestock from leaving an individual pasture within the allotment and prevent the public from leaving the gates open.

3.2.9. Visual Resource Management

3.2.9.1. Affected Environment

The Visual Resource Management (VRM) system designates classes for BLM-administered lands in order to identify and evaluate scenic values to determine the appropriate levels of management during land use planning (Table 12, "BLM Visual Resource Management Classes"). Each management class portrays the relative value of the visual resources and serves as a tool that describes the visual management objectives (BLM, 1986).

Table 12. BLM Visual Resource Management Classes

Class	Description
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any change must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the character should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.
	Source: BLM, 1986

Approximately 1,325 acres of the project area are currently designated as VRM Class II, and the remainder acreage is designated as VRM Class IV (Map 3-10 in Appendix A). The objective of Class IV is to provide for management activities that allow for major modification of the existing character of the landscape, while making every attempt to minimize the visual impact of the

activities through careful location, minimal disturbance and repeating the basic elements of form, line, color, and texture (BLM, 1986). The objective of Class II is to retain the existing character of the landscape. The level of change to the character landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer.

A portion of the proposed project area is within the I-80 low visibility corridor. The I-80 corridor was designated as a low visibility corridor in the Elko and Wells Resource Management Plans in order to minimize visual impacts along 1.5 miles on either side of the interstate (BLM, 1986). Within this three-mile wide low visibility corridor, the objective for visual resources is for management actions not to be evident in the characteristic landscape. The proposed targeted grazing action should not attract attention to the casual observer because grazing has historically taken place in these areas and motorists on I-80 are accustomed to these practices.

Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape (BLM, 1986). The proposed targeted grazing action should not attract attention to the casual observer because grazing has historically taken place in these areas and motorists on I-80 are accustomed to these practices.

3.2.9.2. Environmental Effects

Effects of the No Action Alternative

The No Action Alternative would not result in any changes to the landscape or alter the visual resource characteristics within the analysis area.

Effects of the Proposed Action

Under the Proposed Action there would be minimal direct impacts, such as the installation of fences and the movement of stock. These impacts however would be short term and would also be consistent with the current VRM Class II and IV designations at these locations.

Range facilities such as fences tend to be a translucent grey in color and blend favorably with grey and grey-green settings.

Mitigation

The basic landscape elements of form, line color and texture would not change within the allotment under any management alternative. Potential impacts to visual resources would be analyzed and mitigated as allotment management activities are proposed in the future.

3.2.10. Native American Concerns

3.2.10.1. Affected Environment

Federal law, Executive Order (EO) 13175 (Consultation and Coordination with Indian Tribal Governments) of 2000, and agency guidance require the BLM to consult with Native American tribal governments concerning the identification of cultural values, religious beliefs, and traditional practices of the Native American peoples that may be affected by actions on BLM-administered lands. This consultation includes the identification of places (i.e., physical locations) of traditional cultural importance to the affected Native American tribes. Places that may be of Native American traditional cultural importance include, but are not limited to:

- Locations associated with the traditional beliefs concerning tribal origins, cultural history, or the nature of the world.
- Locations where religious practitioners go, either in the past or the present, to perform ceremonial activities based on traditional cultural rules or practice; Ancestral habitation sites; Trails; Burial sites; and Places from which plants, animals, minerals, and waters believed to possess healing powers or used for other subsistence purposes, may be taken.
- Some of these locations may be considered sacred to particular Native American individuals or tribes.
- In 1992, the National Historic Preservation Act (NHPA) was amended to explicitly allow that "properties of traditional religious and cultural importance to an Indian tribe may be determined to be eligible for inclusion on the National Register of Historic Places." If a resource has been identified as having importance in traditional cultural practices and the continuing cultural identity of a community, it may be considered a "traditional cultural property" (TCP). To qualify for nomination to the NRHP, a TCP must:
    - Be more than 50 years old;
    - Be a place with definable boundaries;
    - Retain integrity; and
    - Meet certain eligibility criteria as outlined for cultural resources in the NHPA (Section 3.2.3 Cultural Resources).

In addition to NRHP eligibility, some places of cultural and religious importance also must be evaluated to determine if they should be considered under other federal laws, regulations, directives, or policies. These include, but are not limited to, the Native American Graves Protection and Repatriation Act of 1990, American Indian Religious Freedom Act of 1978, Archaeological Resources Protection Act (ARPA) of 1979, and Executive Order (EO) 13007 (Sacred Sites) of 1996.

The effects of federal undertakings on properties of religious or cultural significance to contemporary Native Americans are given consideration under the provisions of EO 13007, American Indian Religious Freedom Act, and recent amendments to the NHPA. As amended, the NHPA now integrates Indian tribes into the Section 106 compliance process and also strives to make the NHPA and National Environmental Policy Act procedurally compatible. Furthermore, under Native American Graves Protection and Repatriation Act, culturally affiliated Indian tribes and the BLM jointly may develop procedures to be taken when Native American human remains are discovered on federal land.

Tribal Consultation/Information Sharing: The EDO has an ongoing invitation for consultation and information sharing with the groups listed in the Table 13 below. Consultation and communication with these tribal/band governments would include letters, phone calls, e-mails, and visits with individual Tribal/Band Environmental Coordinators. To date, letters to potentially effected Tribal Councils have been sent, face-to-face consultation has occurred with one Tribal Council and information sharing with one Environmental coordinator. Future meetings would be scheduled as needed to discuss targeted grazing. Formal Consultation has yet to be requested by the tribes thus far contacted, but, information sharing will continue throughout the life of the project. BLM initiated formal government to government (G2G) consultation is also a possibility in the future, should need arise.

Tribal ethnographic resources are associated with the cultural practices, beliefs, and traditional history of a community. In general, ethnographic resources include places in oral histories or traditional places, such as particular rock formations, the geothermal water sources, or a rock cairn; large areas, such as landscapes and view sheds; sacred sites and places used for religious practices; social or traditional gathering areas, such as dancing grounds; natural resources, such as plant materials or clay deposits used for arts, crafts, or ceremonies; and places and natural resources traditionally used for non-ceremonial uses, such as trails, herb gathering locations, or camping locations.

Table 13. Summary of Native American Consultation/Information Sharing (Consultation is On-Going)

Name of Tribe or Band	Date of Contact	Type of Contact	Comments/Notes
Te-Moak Tribe of the Western Shoshone Indians of Nevada	10-25-2016	Letter	Informational letter and invitation to open G2G Consultation
	12-9-2016	Information Sharing	Meeting with Environmental Coordinator at the Elko Band Environmental Office.
Battle Mountain Band Council of the Te-	10-25-2016	Letter	Informational letter and invitation to open G2G Consultation.

Name of Tribe or Band	Date of Contact	Type of Contact	Comments/Notes
Moak Tribe			
	11-10-2016	Consultation Meeting	Meeting with Council in Battle Mountain, NV. Requested use of tribal monitors archeological survey and fence installation.
Shoshone-Paiute Tribes of the Duck Valley Reservation.	10-25-2016	Letter	Informational letter and invitation to open G2G.
Elko Band Council of the Te-Moak Tribe	10-25-2016	Letter	Informational letter and invitation to open G2G Consultation
	11-1-2016	Information Sharing	Meeting with Environmental Coordinator.
	12-9-2016	Information Sharing	Meeting with Environmental Coordinator at Elko Band Environmental Office.
South Fork Band Council of the Te-Moak Tribe	10-25-2016	Letter	Informational letter and invitation to open G2G Consultation
Wells Band Council of the Te-Moak Tribe	10-25-2016	Letter	Informational letter and invitation to open G2G Consultation
	12-9-2016	Information Sharing	Meeting with Environmental Coordinator at Elko Band Environmental Office.

The NEPA process does not require a separate analysis of impacts to religion, spirituality, or sacredness. As a result, references to such beliefs or practices convey only the terminology used by participants involved in the ethnographic studies and tribal consultation and information sharing. This terminology does not reflect any BLM evaluation, conclusion, or determination that something is or is not religious, sacred, or spiritual in nature, but conveys only the information that has been gathered through tribal consultation and coordination and current and historic ethnographic study.

3.2.10.2. Environmental Effects

Effects of the No Action Alternative

No new concerns are anticipated under the No Action Alternative.

Effects of the Proposed Action

BLM acknowledges that there are resources in the area that may be of concern to the tribal communities contacted. The act of cattle grazing, while potentially indirectly adversely impacting Native American sites of spiritual/cultural/traditional nature, is unlikely to impact areas of traditional or contemporary importance or use. The types of resource uses during traditional activities and current religious practices that may be located in the area, or that might be impacted are unknown. BLM understands that consultation and information sharing is ongoing for the life of the project. If a tribal community informs BLM during the comment period that any action chosen will disrupt traditional and religious practices and have an adverse impact upon other resources of tribal concern, BLM will consider that information.

3.2.11. Noxious Weeds and Invasive, Non-native Plant Species

3.2.11.1. Affected Environment

The BLM manages both noxious and non-native, invasive plant species in accordance with federal and state regulations. A noxious weed is defined as "any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment" (Plant Protection Act of 2000). Invasive species are managed under the Invasive Species Executive Order 13112, which directs federal agencies to take actions to prevent the introduction of invasive, non-native species and control their impact if introduced.

The State of Nevada also regulates noxious weeds. Under the Nevada Revised Statute (NRS), a noxious weed is defined as "any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate" (NRS 555.005 – Control of insects, pests, and noxious weeds). Noxious weeds are classified into three categories based on the statewide importance, distribution, and the ability of eradication or control measures to be successful.

Based on existing data and field observations, populations of two noxious weeds and four non-native invasive plant species are known to occur within the project areas (Table 14 and shown in Map 3-11 in Appendix A). Infestations are primarily located along roadways and at lower elevation sites. Existing integrated pest management (IPM) tools, compatible with targeted grazing, would be utilized to control broadleaf pressure.

Table 14. Noxious Weeds According to Status and Project Area Location

Species Common Name	Species Scientific Name	Status (Noxious[1] or Non-native Invasive)	Targeted Grazing Project Area
Cheatgrass	*Bromus tectorum*	Invasive	All
Halogeton	*Halogeton glomerus*	Invasive	TS
Hoary cress	*Cardaria draba*	Category C, noxious	TS, North Elko Greenstrip

Species Common Name	Species Scientific Name	Status (Noxious[1] or Non-native Invasive)	Targeted Grazing Project Area
Russian thistle	*Salsola tragus*	Invasive	TS
Scotch thistle	*Onopordum acanthium*	Category B, noxious	North Elko Greenstrip, Hadley
Tumblemustard	*Sisymbrium altissimum*	Invasive	TS

1 **Category A** includes weeds that are generally not found or that are limited in distribution throughout the State subject to a) active exclusion from the State and active eradication wherever found and b) active eradication from the premises of a dealer of nursery stock.

Category B includes weeds that are generally established in scattered populations in some counties of the State subject to a) active exclusion where possible and b) active eradication from the premises of a dealer of nursery stock.

Category C includes weeds that are generally established and generally widespread in many counties of the State subject to active eradication from the premises of a dealer of nursery stock.

3.2.11.2. Environmental Effects

Effects of the No Action Alternative

Direct and indirect effects of the current conditions of fine fuel accumulation attributed to cheatgrass are expected to remain. Noxious weed and invasive plant management would continue using existing integrated pest management techniques.

Effects of the Proposed Action

Direct and indirect effects of the Proposed Action of livestock management flexibility (intensity, timing, and duration) for fine fuel reduction, in combination with compatible IPM techniques to control broadleaf weed pressure, would reduce weed densities and increase the likelihood of creating successful fuel breaks. Additionally, maintaining desirable plant species vigor and minimizing the creation of bare ground through proper grazing will allow for vegetative communities to be better able to withstand future weed invasion.

Ground disturbing activities associated with fence construction, vehicular traffic, and mowing may serve as potential vectors for the introduction and/or spread of invasive species. Following Required Design Features (Appendix C) such as washing equipment (including vehicles and transport trailers) prior to on-site arrival will minimize adverse impacts.

3.2.12. Wetlands and Riparian Zones

3.2.12.1. Affected Environment

The affected environment for wetlands and riparian zones consists of the proposed treatment areas (see Map 3-12 in Appendix A) and a 4-mile effects analysis buffer[1] surrounding each area (project areas). As stated in Section 3.2.6 (Vegetation), the affected environment has been converted from the desired vegetation communities to annual grass dominated vegetation communities (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures).

The project areas contain mostly marginal stream systems (i.e., ephemeral type streams, intermittent type streams) and lack any springs or wetlands. Intermittent streams have flowing water only during the wet season (spring snow melt) and are normally dry during hot summer months. Ephemeral streams flow briefly during, and for a short time after, periods of rainfall within the immediate vicinity. The numerous ephemeral streams within the project areas are typically shallow with a small amount of scour, are normally dry for most of the year, lack green riparian vegetation/zones, and are mostly covered with upland plants (i.e., sagebrush, perennial grasses). These ephemeral and intermittent stream systems do not support wetland or riparian zones and the Proposed Action treatment areas will not impact them; therefore, they will not be discussed further in this document.

The project areas contain five perennial stream systems; however, none of the treatment areas cross over or into their riparian vegetation/zones and will not impact these streams. Therefore, they will not be discussed further in this document.

3.2.13. Wildlife and Fisheries

3.2.13.1. Affected Environment

The affected environment for wildlife and fisheries consists of the proposed treatment areas (see Map 3-12 in Appendix A) and a 4-mile effects analysis buffer[2] surrounding each area (project areas). See Map 3-15 in Appendix A for reference. As stated in Section 3.2.6 (Vegetation), the affected environment has been converted from the desired vegetation communities to annual grass dominated vegetation communities (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures). The species discussed below are those expected to occur in association with the desired vegetation

[1] Based off the buffer for greater sage-grouse disturbance cap calculations (BLM 2015) and in accordance with the scope of the Proposed Action for analysis of potential effects.
[2] Based off the buffer for greater sage-grouse disturbance cap calculations (BLM 2015) and in accordance with the scope of the Proposed Action for analysis of potential effects.

communities. Some of these species may not be currently utilizing the treatment and project areas due to the annual grass conversion.

Figure 2. Proposed Action Site Visit Pictures A, B, C and D

a) Site visit photos from the T Lazy S proposed treatment area.

b) Site visit photos from the Hadley proposed treatment area.

c) Site visit photos from the Carlin Field proposed treatment area.

d) Site visit photos from the Blue Basin proposed treatment area.

Big Game

Big game species, such as pronghorn (*Antilocapra americana*), elk (*Cervus canadensis*), and mule deer (*Odocoileus hemionus*), occur throughout Elko County and the project areas. These species use the project areas during migration periods and for summer and crucial winter range. Pronghorn are common in open, expansive terrain with gentle rolling to flat topography and eat grasses, forbs, shrubs, and occasionally cacti. In Nevada, low sagebrush and northern desert shrubs are their preferred vegetation types. Elk inhabit mostly high elevation terrain, migrating to lower elevations where forage is more readily available during the winter months. Elk are more grazers and their diets are comprised mostly of grasses and forbs during the summer months, but shift to dried grasses, shrubs, and tree bark during the winter months. Mule deer also occur in high elevations during the summer and move to lower elevations for the winter. In

Nevada, mule deer prefer arid, open areas and rocky hillsides with common habitat containing bitterbrush and sagebrush. Mule deer mostly eat forbs and shrubs.

Mountain lions (*Felis concolor*) occur throughout Elko County and are generally found in dense cover or rocky, rugged terrain and where deer are plentiful. In Nevada, habitat is commonly associated with pinyon pine, juniper, and mountain mahogany. Mountain lions may occur within the project areas in association with the mule deer herd.

Upland Game and Furbearers

Furbearer species which may occur in the project areas include desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*). Desert cottontails occur in a wide variety of habitats across Nevada: open upland habitat, sagebrush, and other desert-like grasslands and shrublands, riparian areas, and pinyon-juniper forests. Their diets consist mainly of grasses and forbs. Black-tailed jackrabbits are common in Nevada's desert and foothill landscapes. Jackrabbits live in the extreme environments of the desert and chaparral, where temperatures are hot during the day and cold at night, with low annual precipitation. They are common in brushlands, prairies, pasturelands, and meadows throughout much of the western United States. Their diets consist of grasses, forbs, and shrubs. The red fox is a highly adaptable species found in many habitats, including agricultural and shrub dominant vegetation typical of the project areas. They have a highly varied diet and will feed on small rodents (i.e., voles, mice), small birds and waterfowl, rabbits and hares, reptiles, insects, and some vegetation (i.e., grasses, tubers, berries). Coyotes are found in any type of habitat where they can find food and a place to hide. In Nevada, their diet consists mostly of rabbits and hares, rodents, carrion, and occasionally mule deer and pronghorn. However, coyotes are known to be opportunistic feeders and may also eat insects, forbs, grasses, fruits, and seeds.

Game bird species include partridge, quail, grouse, and doves, all of which are common in the sagebrush dominant vegetation type found in and near the project areas. Their diets consist of insects, forbs, grasses, and some shrubs.

Other Species

Rodent species, such as the Ord's kangaroo rat (*Dipodomys ordii*) and Townsend's ground squirrel (*Urocitellus townsendii*), are common to arid sagebrush and saltbush-greasewood communities. Reptile species likely to occur include the common sagebrush lizard (*Sceloporus graciosus*), Great Basin collared lizard (*Crotaphytus bicinctores*), Great Basin whiptail (*Cnemidophorus tigris*), western fence lizard (*Sceloporus occidentalis*), western rattlesnake (*Crotalus oreganus*), horned lizard (*Phrynosoma*), bullsnake (*Pituophis catenifer sayi*), Pacific gopher snake (*Pituophis catenifer catenifer*), and western terrestrial garter snake (*Thamnophis elegans*).

Fisheries

The project areas contain mainly ephemeral (flows briefly during and for a short time after periods of rainfall within the immediate locality) or intermittent (normally flows during the wet seasons but are dry during the summer months) streams. The project areas also contain five perennial streams; however, they would not be impacted by the proposed treatment areas because they do not intersect. These streams do not contain habitat required to sustain fish populations or wouldn't be impacted by the Proposed Action; therefore, fisheries will not be discussed further in this document.

3.2.13.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action Alternative, some Wildlife (i.e., Upland Game and Furbearers and Other Species) would stay and continue to use or inhabit portions of the project areas that are still suitable for use. These portions would be under increased pressure to sustain these wildlife species populations and their needs, and would continue to be threatened by the potential for large wildland fire development. Big Game would move to more favorable habitat in order to survive. However, this would cause an increased strain on the more favorable habitat, population declines through lack of highly nutritional food or decreased breeding success, and it would still have an increased risk of being removed due to large wildland fires burning through the converted annual grass habitat. Over time, as the area remains in a converted state, or as favorable habitat is converted to annual grasses, Big Game would no longer use the project areas for important life-stages (i.e., crucial winter habitat) and would move even further away towards more favorable habitat. However, the strain on the next more favorable habitat would increase the risk of higher mortality rates by limited breeding success or starvation, decreasing the population numbers further.

Effects of the Proposed Action

Under the Proposed Action, noise and human activity would increase during fence construction and/or removal at the end of the life of the project, grazing activities (i.e., moving livestock, water tanks, and supplements), and mowing. However, these activities would be of short duration during spring and/or fall depending on the activity and would only occur within the treatment area polygons (see Maps 1-1 through 1-4 in Appendix A). Fence construction/removal would only occur in year one/final year of implementation of the Proposed Action, respectively. Mowing activities to decrease shrub height and fuel loads would occur during the cooler season as necessary for the life of the Proposed Action.

Big Game and Upland Game and Furbearers would avoid the treatment areas until noise and human activities are completed daily and seasonally. However, this would place increased short-term stress on other portions of their habitat within the 4-mile project areas until all activities

cease and they can move into the treatment areas again. Other Species might avoid the treatment areas as well, moving into habitat within the 4-mile project area boundaries. However, these species are not as mobile and would have a higher probability of mortality from fence construction and mowing activities due to shelter collapses from equipment or posts being driven into the ground. As grazing activities and mowing continue over time, all Wildlife would adapt to the activities and continue to avoid the treatment areas until activities cease each year/season.

Mowing the shrub dominated portions of the treatment areas would change the vegetation structure for the life of the project, but in a very small portion of the treatment areas. Mowing will not be conducted outside of the treatment area polygons (see Map 3-8 in Appendix A). Removing the dense shrubs would remove competition and cover from the treatment areas and provide an opportunity for increased native grass, annual grass, and forb vegetative production. Once the noise and human activities are concluded and the targeted grazing period is complete, all Wildlife would utilize the mowed area for forage/food throughout the rest of the year. Some Upland Game and Furbearers and all Other Species would continue to utilize the mowed areas for shelter, if suitable. If the treatment areas are no longer suitable for food or shelter opportunities, Wildlife will move into suitable habitat within the project areas. However, this will place additional stress on the habitat and may displace other Wildlife from their already established homes/territories.

Under the Proposed Action, approximately 40 miles of new fence would be constructed to contain livestock during the targeted grazing time periods. The project areas currently have fences that Big Game already navigate, but they would have to adapt to the increased fence lines and new locations. Upland Game bird species have a higher risk of strikes with the increased amount of new fences; however, the marking of fences within the Proposed Action will decrease this risk. The new miles of fences would have little impact on the predator Furbearers (i.e., red fox, coyote) because they can crawl/move under the bottom wire effortlessly. Prey Furbearers (i.e., desert cottontail) and Other Species would be more susceptible to predation by raptor and other carnivorous bird species (i.e., loggerhead shrike [*Lanius ludovicianus*]), which would use the increased perching opportunities presented by the fence posts and wires.

Under the Proposed Action, livestock would be dispersed within the treatment areas using portable water troughs and supplements (i.e., mineral blocks, salt blocks, etc.); however, these items will be removed once the stubble height requirement has been met. The portable water troughs will increase the amount of water available in the project areas for Wildlife use. Upland Game bird species have an increased risk of mortality when using water troughs due to the inability to exit the tank if they fall in, however all troughs will be outfitted with wildlife escape ramps in order to decrease this risk. The supplements provided to help disperse livestock increase the mineral/salt/protein intake of Wildlife, as they will take advantage of the supplements provided once they are discovered. All of the above impacts from the portable troughs and supplements will occur over a very short time period.

3.2.14. Migratory Birds

3.2.14.1. Affected Environment

The affected environment for Migratory Birds consists of the proposed treatment areas (see Maps 1-1 through 1-4 in Appendix A) and a 4-mile effects analysis buffer[3] surrounding each area (project areas). See Map 3-15 in Appendix A for reference. As stated in Section 3.2.6 (Vegetation), the affected environment has been converted from the desired vegetation communities to annual grass dominated vegetation communities (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures). The species discussed below are those expected to occur in association with the desired vegetation communities. Some of these species may not be currently utilizing the treatment and project areas due to the annual grass conversion.

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, implements treaties for the protection of migratory birds (see list at 50 CFR 10.13). Executive Order (EO) 13186, issued in 2001, directed actions that would further implement the MBTA. As required by MBTA and EO 13186, BLM signed a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (USFWS) in April 2010, which is intended to strengthen migratory bird conservation efforts by identifying and implementing strategies to promote conservation and reduce or eliminate adverse effects to migratory birds.

Per the MOU with USFWS, BLM should:

- Evaluate the effects of their actions on migratory birds and identify where take reasonably attributable to those actions may have a measureable negative effect on migratory bird populations;
- Develop conservation measures and ensure monitoring or the effectiveness of the measures to minimize, reduce or avoid unintentional take; and,
- Consider approaches to the extent practicable for identifying and minimizing take that is incidental to otherwise lawful activities including:
    - Altering the season of activities to minimize disturbances during the breeding season;
    - Retaining the integrity of breeding sites, especially those with long histories of use; and,
    - Coordinating with the USFWS when planning projects that are likely to have a negative effect on migratory bird populations and cooperating in developing approaches that minimize negative impacts and maximize benefits to migratory birds.

[3] Based off the buffer for greater sage-grouse disturbance cap calculations (BLM 2015) and in accordance with the scope of the Proposed Action for analysis of potential effects.

The BLM's conservation efforts focus on migratory bird species and some non-migratory bird species that are listed as Birds of Conservation Concern (BCC). BCC have been identified by the USFWS (2008) for different Bird Conservation Regions (BCR) in the United States. The project areas are entirely located in BCR 9 of the Great Basin region. Table 15 lists those species that may utilize the project areas during the year. For the purpose of this document, the term "migratory bird species" will include species listed under the MBTA (including raptor species) and the BCC species listed below.

Table 15. Birds of Conservation Concern Potentially Present in the Project Areas

Common Name	Scientific Name
Bald eagle*	*Haliaeetus leucocephalus*
Ferruginous hawk*	*Buteo regalis*
Golden eagle*	*Aquila chrysaetos*
Calliope hummingbird	*Stellula calliope*
Lewis' woodpecker*	*Melanerpes lewis*
Willow flycatcher	*Empidonax trailli*
Loggerhead shrike*	*Lanius ludovicianus*
Pinyon jay*	*Gymnorhinus cyanocephalus*
Sage thrasher*	*Oreoscoptes montanus*
Green-tailed towhee	*Pipilo chlorurus*
Brewer's sparrow*	*Spizella breweri*
Sage sparrow	*Amphispiza belli*
Greater sage-grouse*	*Centrocercus urophasianus*
Black rosy-finch*	*Leucosticte atrata*
Williamson's sapsucker	*Sphyrapicus thyroideus*

* Species listed on the BLM Special Status Species List for the Elko District. These will be discussed in the Special Status Species section below.

3.2.14.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action Alternative, some Migratory Birds (i.e., raptors) would stay and continue to use or inhabit portions of the project areas that are still suitable for use. These portions would be under increased pressure to sustain Migratory Bird populations and their needs, and would

continue to be threatened by the potential for large wildland fire development. Other Migratory Birds (i.e., sagebrush obligates) would move to more favorable habitat in order to survive. However, this would cause an increased strain on the more favorable habitat; local population numbers would decline through nesting/breeding failures, and would still have an increased risk of being removed due to large wildland fires burning through the converted annual grass habitat. Over time, as the area remains in a converted state or favorable habitat is converted to annual grasses, Migratory Birds would no longer use the project areas for important life-stages (i.e., breeding) and would move further away towards more favorable habitat. However, the strain on the more favorable habitat would increase the risk of higher mortality rates by limited food sources, limited nest success, and decreased hatchlings, decreasing the population numbers further.

Effects of the Proposed Action

Under the Proposed Action, noise and human activity would increase during fence construction and/or removal at the end of the life of the project, grazing activities (i.e., moving livestock, water tanks, and supplements), and mowing. However, these activities would be of short duration during spring and/or fall depending on the activity and would only occur within the treatment area polygons (see Maps 1-1 through 1-4 in Appendix A). Fence construction/removal would only occur in year one/final year of implementation of the Proposed Action, respectively. Mowing activities to decrease shrub height and fuel loads would occur during the cooler season as necessary for the life of the Proposed Action.

Similar to Wildlife, Migratory Birds would also avoid the treatment areas until activities are completed daily and seasonally. Migratory Birds would choose nest sites away from the treatment areas, but within the project areas, if activities occur before they select nest sites during the migratory bird breeding season (April 1 to July 31). This would place added stress on other portions of their habitat until all activities cease or the next breeding season. There would be a higher probability of mortality from activities if they occur after Migratory Birds have chosen nest sites due to equipment, people, or livestock crushing nests with eggs or abandonment of nests due to disruption. As grazing activities continue over time, Migratory Birds would adapt; they would avoid the treatment areas during nesting seasons and periods of increased grazing activities until activities cease, but would continue to use the treatment areas for foraging and wintering for the life of the Proposed Action.

Mowing the shrub dominated portions of the treatment areas would change the vegetation structure for the life of the project, but in a very small portion of the treatment areas. Mowing will not be conducted outside of the treatment area polygons. Removing the dense shrubs would remove competition and cover from the treatment areas and provide an opportunity for increased native grass, annual grass, and forb vegetative production. Once the noise and human activities are concluded and the targeted grazing period is complete, Migratory Birds would utilize the mowed area for forage/food throughout the rest of the year and potential nesting substrate

collection during the nesting season. However, removing the dense shrubs will remove potential nesting habitat for some Migratory Birds within the treatment areas. These Migratory Birds will move to more suitable nesting habitat within the project areas, but this will place added stress on nesting habitat and may displace special status bird species and other migratory and non-migratory bird species. Raptor and predator Migratory Birds will continue to use the treatment areas for foraging, as long as the prey base continues to use the treatment areas. As discussed in the Wildlife section above, the prey base (i.e., Other Wildlife) may move to more suitable habitat within the project areas and the raptor and predator Migratory Birds will move with them.

Under the Proposed Action, approximately 40 miles of new fence would be constructed to contain livestock during the targeted grazing time periods. Migratory Birds would normally have a higher risk of strikes with the increased amount of new fences, but the Proposed Action decreases this risk by marking the fences with flight diverters. However, the increased perching opportunities presented by the fence posts and wires would provide a benefit during foraging, mating, and territory protection.

Under the Proposed Action, livestock would be dispersed within the treatment areas using portable water troughs; however, the troughs would be removed once the stubble height requirement has been met. The portable water troughs would attract insect species and be another source of water within the project areas. Migratory Birds usually have an increased risk of mortality when using water troughs due to the inability to exit the trough if they fall in and striking fence wires while foraging on the wing for insects. The Proposed Action decreases these risks by requiring wildlife escape ramps for the troughs and moving them more than 20 feet from the fence lines.

3.2.14.3. Mitigation

The following stipulation will be applied to associated activities in the Proposed Action in order to ensure compliance with the Migratory Bird Treaty Act:

> Any disturbance operations conducted during the migratory bird breeding season (for this project April 1 to July 31) will require a breeding bird survey. Surveys must be completed for all birds listed at 50 CFR 10.13. Avian surveys will be conducted during the breeding season for the majority of migratory bird species (April 1 to July 31) before any new disturbance activities commence. If surveys occur between April 1 and May 15, due to the heavy frequency of nesting behavior a 14-day window for disturbance is imposed. Disturbance must commence within 14 days of the completion of the survey to be within compliance. If disturbance does not occur within 14 days, a new survey is required. If initial surveys take place after May 15, a single survey can suffice and the 14-day restriction need not be imposed. Disturbance can commence at any time after the survey completion if no breeding birds or their activity is discovered.

Surveys will be conducted by a qualified wildlife biologist. If surveys are not conducted by a BLM wildlife biologist, a qualified and BLM-approved wildlife biologist may be used to complete the surveys. Survey results and the discovery of any nesting sites will be reported to the BLM and Nevada Department of Wildlife (NDOW) where suitable protection measures will be determined depending on the species (i.e., avoidance buffer, postponement of operations, etc.). Site reporting may be done at initial encounter by the surveying wildlife biologist to the BLM wildlife biologist via phone call and resolved before the submission of the written report. If it is determined from the survey that breeding activity is present, all operations shall be postponed in the immediate vicinity, as determined by the BLM wildlife biologist based on the species identified until after breeding activity ceases.

3.2.15. Special Status Species

3.2.15.1. Affected Environment

The affected environment for special status species consists of the proposed treatment areas (see Maps 1-1 through 1-4 in Appendix A) and a 4-mile effects analysis buffer[4] surrounding each area (project areas). See Map 3-15 in Appendix A for reference. As stated in Section 3.2.6 (Vegetation), the affected environment has been converted from the desired vegetation communities to annual grass dominated vegetation communities (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures). The species discussed below are those expected to occur in association with the desired vegetation communities. Some of these species may not be currently utilizing the treatment and project areas due to the annual grass conversion.

[4] Based off the buffer for greater sage-grouse disturbance cap calculations (BLM 2015) and in accordance with the scope of the Proposed Action for analysis of potential effects.

Endangered Species Act Listed Species

The U.S. Fish and Wildlife Service (USFWS) identified six species listed as threatened or endangered, one candidate species, and one species under review under the Endangered Species Act (ESA) as occurring, or having the potential to occur, within Elko County, Nevada (2016). They include the yellow-billed cuckoo (*Coccyzus americanus*) western United States Distinct Population Segment (DPS), Independence Valley speckled dace (*Rhinichthys oscululus lethoporus*), Clover Valley speckled dace (*Rhinichthys oscululus oligoporus*), bull trout (*Salvelinus confluentus*) in the Jarbidge River DPS, Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), White River spinedace (*Lepidomeda albivallis*), whitebark pine (*Pinus albicaulis*), and Northern Steptoe pyrg (*Pyrgulopsis serrata*).

Yellow-billed cuckoos are considered a riparian obligate species and are usually found in large tracts of cottonwood/willow habitats with dense sub-canopies, but may also be found in urban areas with tall trees (USFWS, 2014). The presence of yellow-billed cuckoo in Elko County has been predicted (NNHP, 2014), but not in the Upper Humboldt Watershed (NatureServe, 2015).

The project areas contain only ephemeral (flows briefly during and for a short time after periods of rainfall within the immediate locality) or intermittent (normally flows during the wet seasons but are dry during the summer months) streams. These streams do not sustain fish or mollusk populations; therefore, the Independence Valley speckled dace, Clover Valley speckled dace, Jarbidge River DPS bull trout, Lahontan cutthroat trout, White River spinedace, and Northern Steptoe pyrg do not occur in the project areas and will not be discussed further. These same streams do not contain cottonwood/willow habitats (i.e., riparian vegetation/zones); therefore, suitable habitat for the yellow-billed cuckoo is not present in or adjacent to the project areas and will not be discussed further.

The project areas do not contain any forested or mountainous areas; therefore, whitebark pine will not be discussed further.

Other Special Status Species

The list of BLM-Sensitive Species for Nevada is updated every 5 years and was last updated in 2011. Species are listed as sensitive within individual BLM district offices and for the entire state. The Elko District sensitive species list is shown below in Table 16, BLM Elko District Sensitive Species List. For the purpose of this document, special status species discussions will not include sensitive species dependent on perennial water bodies, such as amphibians, fish, and mollusks.

Table 16. BLM Elko District Sensitive Species List

Common Name	Scientific Name
Amphibians	

Common Name	Scientific Name
Northern leopard frog	*Rana pipiens*
Columbia spotted frog (including Toiyabe spotted frog subpopulation)	*Rana luteiventris*
Birds	
Northern goshawk	*Accipiter gentilis*
Golden eagle	*Aquila chrysaetos*
Western burrowing owl	*Athene cunicularia hypugaea*
Ferruginous hawk	*Buteo regalis*
Swainson's hawk	*Buteo swainsoni*
Greater sage-grouse	*Centrocercus urophasianus*
Western snowy plover	*Charadrius alexandrinus nivosus*
Peregrine falcon	*Falco peregrinus*
Pinyon jay	*Gymnorhinus cyanocephalus*
Bald eagle	*Haliaeetus leucocephalus*
Loggerhead shrike	*Lanius ludovicianus*
Black rosy-finch	*Leucosticte atrata*
Lewis' woodpecker	*Melanerpes lewis*
Sage thrasher	*Oreoscoptes montanus*
Brewer's sparrow	*Spizella breweri*
Fish	
Independence Valley tui chub	*Gila bicolor isolata*
Newark Valley tui chub	*Gila bicolor newarkensis*
Northern leatherside chub	*Lepidomeda copei*
Fish	
Lahontan cutthroat trout	*Oncorhynchus clarki henshawi*
Inland Columbia Basin redband trout	*Oncorhynchus mykiss gairdneri*
Relict dace	*Relictus solitarius*
Independence Valley speckled dace	*Rhinichthys osculus lethoporus*
Clover Valley speckled dace	*Rhinichthys osculus oligoporus*
Bull trout	*Salvelinus confluentus*
Mammals	
Townsend's big-eared bat	*Corynorhinus townsendii*
Big brown bat	*Eptesicus fuscus*
Spotted bat	*Euderma maculatum*
Silver-haired bat	*Lasionycteris noctivagans*
Hoary bat	*Lasiurus cinereus*
California myotis	*Myotis californicus*
Western small-footed myotis	*Myotis ciliolabrum*
Long-eared myotis	*Myotis evotis*
Mammals	

Common Name	Scientific Name
Little brown myotis	*Myotis lucifugus*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Western pipistrelle	*Pipistrellus hesperus*
Brazilian free-tailed bat	*Tadarida brasiliensis*
Pallid bat	*Antrozous pallidus*
Pygmy rabbit	*Brachylagus idahoensis*
Dark kangaroo mouse	*Microdipodops megacephalus*
Preble's shrew	*Sorex preblei*
Pika	*Ochotona princeps*
Bighorn sheep	*Ovis canadensis*
Insects	
Mattoni's blue	*Euphilotes pallescens mattonii*
Mollusks	
California floater	*Anodonta californiensis*
Humboldt pyrg	*Pygulopsis humboldtensis*
Duckwater Warm Springs pryg	*Pyrgulopsis villacampae*
Vinyards pyrg	*Pyrgulopsis vinyardi*
Grated tryonia	*Tryonia clathrata*
Plants	
Meadow pussytoes	*Antennaria arcuata*
Goose Creek milkvetch	*Astragalus anserinus*
Elko rockcress	*Boechera falcifructa*
Plants	
Barren Valley collomia	*Collomia renacta*
Broad fleabane	*Erigeron latus*
Beatley buckwheat	*Eriogonum beatleyae*
Lewis buckwheat	*Eriogonum lewisii*
Deeth buckwheat	*Eriogonum nutans* var. *glabratum*
Grimy mousetails	*Ivesia rhypara* var. *rhypara*
Grimes vetchling	*Lathyrus grimesii*
Davis peppergrass	*Lepidium davisii*
Owyhee prickly phlox	*Leptodactylon glabrum*
Tiehm blazingstar	*Mentzelia tiehmii*
Idaho beardtongue	*Penstemon idahoensis*
Least phacelia	*Phacelia minutissima*
Cottam cinquefoil	*Potentilla cottamii*
Obscure buttercup	*Ranunculus triternatus*
Nachlinger catchfly	*Silene nachlingerae*

Note: Special Status Species not mentioned in the following narrative do not occur within the project areas because of lack of habitat or other important life-stage requirements.

Birds. Several Special Status raptor species nest and breed within the project areas, such as the western burrowing owl and golden eagle. The greatest use of the project areas by special status raptor species is for foraging purposes. The diet for large raptors, such as the golden eagle, consists of rabbits (mostly black-tailed jackrabbits), ground squirrels, other medium-sized mammals, and carrion. The diet for other special status raptors, such as ferruginous hawks and northern goshawks, consists of rabbits, ground squirrels, birds, bats, insects, reptiles, amphibians, food they steal from other raptors, and sometimes carrion.

Other Special Status bird species that may occur in the project areas are the loggerhead shrike, sage thrasher, Brewer's sparrow, and black rosy-finch. Loggerhead shrikes are songbirds who inhabit open country with scattered low, exposed perches (i.e., shrubs, fence posts) and who possess raptor-like habits. Their diet consists of insects, amphibians, reptiles, small mammals, birds, and sometimes carrion. They are most famous for impaling prey on thorns or barbed wire to eat later. Loggerhead shrikes are year-round residents and may utilize the project areas for foraging. Sage thrashers are considered a "sagebrush obligate" species which prefers running secretively along the ground rather than taking flight when disturbed. They use the tallest sagebrush to conceal their nests, built on or near the ground, and mostly feed on insects, ants, grasshoppers, and ground beetles captured while running on the ground. They prefer sagebrush dominated habitats and may utilize the project areas for foraging during their migration to preferred nesting habitat. Brewer's sparrows are another "sagebrush obligate" species dependent upon the sagebrush steppe for breeding. They build their nests no less than 8 inches from the ground in tall, dense sagebrush. During the breeding season, they spend up to three-quarters of their foraging time in shrubs, as opposed to bare ground, and glean insects such as caterpillars, leaf beetles, weevils, grasshoppers, ants, and spiders. Brewer's sparrows may utilize the project areas for foraging during their migration to preferred nesting habitat. Black rosy-finches breed and nest above tree line, but winter in open country, such as the high desert, sagebrush steppe. They eat seeds and insects that they pick up during ground foraging. Black rosy-finches may utilize the project areas for foraging during their winter stays.

Greater Sage-Grouse

After a 12-month review, USFWS (2010) found that listing the greater sage-grouse (sage-grouse) as threatened or endangered under the ESA throughout its range was warranted but precluded by higher priority listing actions. Consistent with the *National Greater Sage-Grouse Conservation Measures* report (Sage-Grouse National Technical Team, 2011), BLM served as the lead federal agency in preparing several Environmental Impact Statements (EISs) with associated Resource Management Plan (RMP) amendments for 11 western states to establish sage-grouse conservation measures. These documents address a range of alternatives focused on specific conservation measures across the range of the sage-grouse (BLM, 2015b). The *Nevada and*

Northeastern California Greater Sage-Grouse Approved RMP Amendment (SGPA) was approved in September, 2015, and encompasses the project areas. In October, 2015, the USFWS (2015) found that listing the sage-grouse was not warranted due to the updated regulatory mechanisms within the RMP Amendments approved for the 11 western states. The sage-grouse was removed from the candidate species list, but is still considered a BLM Sensitive Species.

The decision area within the SGPA is classified into Habitat Management Areas, defined as follows (BLM, 2015b):

- Priority Habitat Management Areas (PHMAs) — BLM-administered lands identified as having the highest value to maintaining sustainable sage-grouse populations. Areas of PHMA largely coincide with areas identified as priority areas for conservation in the USFWS's Conservation Objectives Team (COT) report. These areas include breeding, late brood-rearing and winter concentration areas and migration or connectivity corridors.
  - Sagebrush Focal Areas (SFAs) — A subset of PHMA, SFAs were derived from sage-grouse stronghold areas described by the USFWS in a memorandum to the BLM titled *Greater Sage-Grouse: Additional Recommendations to Refine Land Use Allocations in Highly Important Landscapes* (USFWS 2014 as cited in BLM, 2015). The memorandum and associated maps provided by the USFWS identify areas that represent recognized strongholds for sage-grouse that have been noted and referenced as having the highest densities and other criteria important for the persistence of the species.
- General Habitat Management Areas (GHMAs) — BLM-administered lands where some special management will apply to sustain sage-grouse populations; these are areas of occupied seasonal or year-round habitat outside of PHMA.
- Other Habitat Management Areas (OHMAs) — BLM-administered lands identified as unmapped habitat in the Draft Land Use Plan Amendment (LUPA)/EIS that are within the planning area and contain seasonal or connectivity habitat areas. With the generation of updated modeling data (*Spatially Explicit Modeling of Greater Sage-Grouse Habitat in Nevada and Northeastern California*; Coates et al. 2014 as cited in BLM, 2015) the areas containing characteristics of unmapped habitat were identified and are now referred to as OHMAs.

Elko County contains 995,800 acres of PHMA (including SFA); 995,800 acres of GHMA; and 1,000,600 acres of OHMA on BLM-administered lands (BLM, 2015b). The Proposed Action treatment areas would occur entirely within GHMA and/or OHMA according to the map in the SGPA (BLM, 2015b, pp. 1-3) as shown in Map 3-12 in Appendix A.

The NTT recommends a 4-mile protective buffer for sage-grouse and the SGPA requires a 4-mile buffer for Disturbance Cap Calculations (BLM, 2015b). However, the treatment areas are not in PHMA for the Disturbance Cap Calculation, there are no active or pending sage-grouse

leks located within four miles of the treatment areas, and the Proposed Action doesn't have any SGPA-classified anthropogenic disturbance proposed (BLM, 2015; see Appendix E).

In accordance with the SGPA, more specific habitat delineations within the project areas were modeled (see Map 3-14 in Appendix A) (Coates, et al., 2016). Seasonal use characteristics for the Proposed Action project areas include the following:

- Nesting habitats are occupied from April 1 through June 30 (BLM, 2015b).
- Early brood-rearing habitat is used by female sage-grouse with chicks for up to three weeks following hatching. Early brood-rearing habitat descriptions can be found in (Connelly, Knick, Schroeder, & Stiver, 2004), the Sage-Grouse National Technical Team (NTT) Report (Sage-Grouse National Technical Team, 2011), and the SGPA (BLM, 2015b). Early brood-rearing habitat is used from May 15 through June 15 (BLM, 2015b).
- Definition and use of late brood-rearing habitat is dependent on many factors including precipitation during spring and early summer and availability of forbs throughout the summer. Late brood-rearing habitats are generally used from June 15 through September 15 (BLM, 2015b).
- Use of winter habitats depends on winter severity, but winter habitats are generally occupied from November 1 through February 28 (BLM, 2015b).

Due to the lack of pending or active leks, the conversion of the project areas to a cheatgrass/invasive species habitat, and the above-mentioned habitat delineations lacking specific characteristics required for sage-grouse use (BLM 2015; Table 2-2), the BLM determined that the Proposed Action will not disrupt sage-grouse use and seasonal restrictions will not be applied.

Declines in sage-grouse populations in the Great Basin region have been greatly influenced by habitat loss caused by wildland fire and invasive weeds (Connelly, Knick, Schroeder, & Stiver, 2004; USFWS, 2013). Cheatgrass is an invasive annual grass that has led to increased wildland fire frequency and subsequent loss of the sagebrush communities important to sage-grouse (Connelly, Knick, Schroeder, & Stiver, 2004; USFWS, 2013). Fire frequency is increased with cheatgrass invasion as the establishment of cheatgrass causes substantial competition for resources used by native shrub steppe species (Connelly, Knick, Schroeder, & Stiver, 2004; USFWS, 2013). The likelihood of future fires can lead to the loss of perennial grasses and shrubs that are needed for multiple life stages for sage-grouse (Crawford, et al., 2004). Additionally, corvids (i.e. crows, ravens) are effective nest predators of sage-grouse, taking eggs and possibly recently hatched chicks, and their abundance has been related to higher nest predation rates of sage-grouse (Connelly, Knick, Schroeder, & Stiver, 2004; Prather & Messmer, 2010).

The project areas reside in the Tuscarora, Cortez, North Fork, and South Fork Population Management Units (PMUs). Six other PMUs occur in Elko County, which supports the highest density of leks in Nevada and the largest contiguous sage-grouse population in the State. Since 1996, wildland fires have reduced sage-grouse habitat in Elko County and specifically within the project areas (see Map 3-17 in Appendix A). NDOW data also indicate that sage-grouse populations within Elko County have been declining since 1998.

Mammals. Fifteen species of BLM sensitive bats have the potential of occurring within the project areas. They roost in anything from caves, mine shafts, loose tree bark, buildings, cracks and crevices, and rock piles. Bat species that migrate do so in the spring and fall; however, some species go into torpor or hibernation. It is expected that these bat species may occur in the project areas as a foraging or migrating visitor. The dark kangaroo mouse is found in sparsely vegetated sites, such as sagebrush, black greasewood, shadscale, horsebrush, and rabbitbrush. Their diet consists mostly of seeds and sometimes of insects. The dark kangaroo mouse may occur within the project areas. Preble's shrews are associated with arid and semiarid shrub-grass habitats such as the sagebrush-grass habitats in Nevada. Their diets consist of insects, worms, centipedes, and mollusks. Preble's shrews may occur within the project areas.

Plants. Several special status plant species may occur in the project areas; however, there are no known or recorded individuals or populations.

3.2.15.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action Alternative, some Special Status Species (i.e., rodents, raptors) would stay and continue to use or inhabit portions of the project areas that are still suitable for use. These portions would be under increased pressure to sustain Special Status Species populations and their needs, and would continue to be threatened by the potential for large wildland fire development. Other Special Status Species (i.e., sagebrush obligate birds) would move to more favorable habitat in order to survive. However, this would cause an increased strain on the more favorable habitat, local population numbers would decline through nesting/breeding failures, and it would still have an increased risk of being removed due to large wildland fires burning through the converted annual grass habitat. Over time, as the area remains in a converted state or favorable habitat is converted to annual grasses, Special Status Species would no longer use the project areas for important life-stages (i.e., breeding) and would move further away towards more favorable habitat. However, the strain on the more favorable habitat would increase the risk of higher mortality rates by limited nest success and decreased hatchlings, decreasing the population numbers.

Effects of the Proposed Action

Under the Proposed Action, noise and human activity would increase during fence construction and/or removal at the end of the life of the project, grazing activities (i.e., moving livestock, water tanks, and supplements), and mowing. However, these activities would be of short duration during spring and/or fall depending on the activity and would only occur within the treatment area polygons (see Maps 1-1 through 1-4 in Appendix A). Fence construction/removal would only occur in year one/final year of implementation of the Proposed Action, respectively. Mowing activities to decrease shrub height and fuel loads would occur during the cooler season as necessary for the life of the Proposed Action.

Similar to Wildlife and Migratory Birds, Special Status Species would also avoid the treatment areas until activities are completed daily and seasonally. Special status bird species would choose nest sites away from the treatment areas, but within the project areas, if activities occur before they select nest sites during their breeding season (generally April 1 to July 31 for songbirds and March 1 to August 31 for raptors). However, this would displace other special status, migratory and non-migratory bird species and place added stress on other portions of their habitat until all activities cease or the next breeding season. There would be a higher probability of mortality from activities if they occur after special status bird species have chosen nest sites due to equipment, people, or livestock crushing nests with eggs or abandonment of nests due to disruption. As grazing activities continue over time, special status bird species would adapt; they would avoid the treatment areas during nesting seasons and periods of increased grazing activities until activities cease, but would continue to use the treatment areas for foraging and

wintering for the life of the Proposed Action. Some special status mammal species (i.e., bats) would continue to use the treatment and project areas for foraging and during migration periods because surface disturbing and most disruptive activities would occur during daylight hours. Other special status mammal species (i.e., rodents) would avoid the treatment areas for nest/den selection during times of high activity. These species would move into the project areas looking for nests/dens, but would continue to forage within the treatment areas. Moving into the project areas would place added stress on the habitat and may displace other burrowing species. Other special status mammal species would also have an increased risk of mortality due to nest/den destruction from fence posts, equipment caving them in, etc. However, they would continue to utilize the area for foraging purposes once activities cease for the day or seasonally. Special status plant species have an increased risk of mortality from fence posts being driven into the ground and livestock trampling.

Mowing the shrub dominated portions of the treatment areas would change the vegetation structure for the life of the project, but in a very small portion of the treatment areas. Mowing will not be conducted outside of the treatment area polygons. Removing the dense shrubs would remove competition and cover from the treatment areas and provide an opportunity for increased native grass, annual grass, and forb vegetative production. Once the noise and human activities are concluded and the targeted grazing period is complete, special status bird species would utilize the mowed area for forage/food throughout the rest of the year and potential nesting substrate collection during the nesting season. However, removing the dense shrubs will remove potential nesting habitat for some special status bird species within the treatment areas. These species will move to more suitable nesting habitat within the project areas, but this will place added stress on nesting habitat and may displace other special status, migratory and non-migratory bird species. Raptor and predator-like special status bird species will continue to use the treatment areas for foraging, as long as the prey base continues to use the treatment areas. As discussed in the Wildlife and Fisheries section above, the prey base (i.e., Other Species) may move to more suitable habitat within the project areas and the raptor and predator-like special status bird species will move with them. The change in vegetation structure through mowing would not impact special status bat species; however, the potential increase in forbs would attract more insects and provide more foraging habitat for these species. The change in vegetation structure could impact specials status rodent species by removing nest/den habitat within the treatment areas. These species would move to more suitable habitat within the project areas, but would place added stress on the habitat and may displace other rodent/burrowing species. The change in vegetation structure and decrease in vegetative competition would provide an opportunity for special status plant species to establish if there is a seed bank available and viable in the treatment areas.

Under the Proposed Action, approximately 40 miles of new fence would be constructed to contain livestock during the targeted grazing periods. Special status bird species normally have a higher risk of strikes with the increased amount of new fences. However, the Proposed Action

decreases these risks by marking the fence lines with flight diverters. The increased perching opportunities presented by the fence posts and wires would provide a benefit during foraging, mating, and territory protection. Special status mammal species (i.e., bats) would also have an increased risk for fence strikes during foraging and migration, especially near the portable water troughs. However, the Proposed Action decreases this risk by placing water troughs greater than 20 feet from the fence lines and providing clear flight paths when drinking. Other special status mammal species (i.e., rodents) would have an increased risk of predation due to the increased opportunities for bird predators to perch on the fence posts and wires. Special status plant species that survive the fence construction would be protected from livestock grazing after the initial targeted grazing periods; however, Wildlife could still forage on them.

Under the Proposed Action, livestock would be dispersed within the treatment areas using portable water troughs; however, the troughs would be removed once the stubble height requirement has been met. The portable water troughs would attract insect species and be another source of water within the project areas. Special status bird, bat, and rodent species have an increased risk of mortality when using water troughs due to the inability to exit the trough if they fall/crash into the water. The Proposed Action decreases this risk by requiring wildlife escape ramps be installed in the water troughs.

3.2.15.3. Mitigation

Appendix C provides additional Required Design Features (RDFs) for sage-grouse impact mitigation.

3.2.16. Wildland Fire Management

3.2.16.1. Affected Environment

The analysis area for wildland fire management is the proposed project area because proposed management actions would only occur within this area. A wide range of wildland fire behavior may be exhibited in the project area depending on fuels, weather and topography. Sagebrush and annual grassland fires may result in high intensity fires with rapid rates of spread, while fires in perennial grasslands are often less intense (NWCG, 2014). The concentration and values of resources at risk vary throughout the project area. Fire behavior and resources at risk dictate in large part the priorities, objectives and strategies for fire management. Fuel breaks are one tool fire managers may use to interrupt fire behavior. These are natural or manmade changes in fuel that serve to modify fire behavior and make the fire easier to control. Fuel breaks may lower flame lengths, slow rate of spread, and provide fire fighters safe places to anchor control lines.

The project area is identified within the Full Suppression Zone in the Elko District Bureau of Land Management Fire Management Plan (FMP) dated June 15, 2016. Impacts of wildland fire are not desired in these areas and suppression priority is based on resource values with the

protection of human life being the single overriding priority. The BLM's highest resource priority is to reduce the amount of Greater Sage-grouse (GRSG) habitat loss due to wide-spread wildland fires and invasion by nonnative species (BLM, 2015). Fires that ignite can spread quickly in these types of fuels and escaped fires can easily reach the limits of initial attack response. Many areas have been modified significantly from their historical fire regime through the introduction of invasive annual grasses which create a continuous and hazardous fuel bed (see Maps 3-11 and 3-16 in Appendix A). As more fires occur in these areas, annual grasses may increase and the departure from the historical fire regime will continue the cycle of large fire occurrence (see Map 3-17 in Appendix A).

The following identifies the fire management category (FMCs) types for the Elko and Wells Resource Management Plans Fire Management Amendment (FMA), as approved on September 29, 2004 that are located within the project area but are not considered GRSG Habitat. Map 3-18, in Appendix A shows these categories.

- A-1 Urban Interface / Mining Areas / Areas of Development
  Current Condition: The primary vegetation type around these areas is sagebrush and perennial grasses with intrusions of cheatgrass and other annual vegetation. The management objective for these areas is to preserve and protect the developed features, life and property. This area also includes the rapidly growing urban interface around Elko and Spring Creek. Recreation sites may be developed or undeveloped, but are moderately to heavily used during the summer and fall months. This polygon is generally represented as Fire Regime 3 and in Fire Condition Class 3.
- B-8 Early Seral Sagebrush Grasslands
  Current Condition: The primary vegetation type in this area is sagebrush and perennial grasses in lower elevations and Utah juniper and pinyon pine at the higher elevations. However, because of frequent fire history and other vegetative disturbances in these areas, intrusions of annual invasive species and noxious weeds exist but do not dominate the area. Because of the current early seral conditions and low response potentials within these areas, future fire occurrences could potentially increase the amount of undesirable and invasive species in these areas to the extent that they could dominate the site. The management objectives for this area are to maintain and improve native vegetation conditions, limit the spread of annual invasive species and noxious weeds, protect critical watersheds, provide wildlife and livestock forage and provide woodland products from higher elevations. This polygon is generally represented as Fire Regime 3 and in Fire Condition Class 3.

All fuel breaks must have a road free of vegetation. The road free of vegetation acts as the break in fuel continuity which is the true fuel break. All fire lines regardless of size or fire behavior have to break the continuity or availability of fuel to an advancing fire. The three components of the fire triangle are heat, oxygen and fuel. The one component that can be manipulated by man is the fuel component in the form of fuel breaks.

All fires must be engaged at some level from ground resources. Aerial resources may or may not be effective for slowing the advancement of fire. To completely extinguish a wildland fire, ground resources will be required. The fuel break also improves safety to fire resources by providing quick ingress and egress in case of emergencies associated with changing fire conditions.

Fuel breaks provide a reduction of vegetation (change in fuel model). For effective fuel breaks, vegetation adjacent to the road must be reduced, which results in a change in fire behavior as the fire burns into the area of reduced fuels. Reduction in flame length and potential reduction in rates of spread are the two fire behavior characteristics modified by fuels reduction.

Flame lengths of 8 feet or less are desired as fire comes to the fuel break. Empirical evidence coupled with decades of experience in fire suppression has established general rules of thumb used in determining suppression tactics based on flame length. In general, a flame length of 8 feet or less is what the proposed fuel break design is based on (Burgan et al 1984).

During extreme fire behavior, fuel breaks can be breached by spotting when fires contact fuel breaks. Spotting is when burning embers from the flaming front are picked up by winds and carried across the fuel break or control line into a receptive fuel bed. Spotting is less likely in fuel model GR1 (primary short grass fuel model) that is the desired fuel model end stage within the project area. The GR1 fuel model is defined as: the primary carrier of fire is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by heavy grazing, and may be sparse or discontinuous. The moisture of extinction of GR1 is indicative of a dry climate fuel bed, but GR1 may also be applied in high-extinction moisture fuel beds, because in both cases predicted spread rate and flame length are low compared to other GR models. (NWCG, 2014)

3.2.16.2. Environmental Effects

Effects of the No Action Alternative

Under the No Action Alternative, fuel breaks would not be created, which means that there would not be any areas of low and discontinuous fuel in the project area to inhibit extreme fire behavior. Fire behavior would be based on existing fuels, weather, topography, and be unimpeded by changes in the fuel bed that would alter fire behavior and decrease resistance to control. Firefighters would not have pre-established fuel breaks on the landscape to create safe and effective anchor points from which to initiate suppression tactics. In those areas with intact shrub vegetation, high flame lengths would not be manageable using direct attack methods. Landscapes more distant from improved roads with intact sagebrush steppe would remain more vulnerable to large fires. Increases in cover of annual grasses from recent large fires may increase the occurrence of fires with extreme fire behavior, including high flames lengths, rapid rates of spread and a high probability of escaping initial attack. The risk to resources within the

project area, including investments made in the recovery of the area burned by past fires would not be reduced.

Effects of the Proposed Action

The Proposed Action includes the construction of fuel breaks designed to modify fire behavior and make fires easier to control and contain. Reducing fuels within fuel breaks through targeted grazing has additional benefits for fire suppression resources during burnout and holding operations as follows:

- Reduced fire line intensity – as fire moves from shrub fuel models into short grass fuel models, fire intensity is reduced (Burgan et al 1984). The fuel break would increase area and time fire behavior is being reduced and fire intensity is lowered. This increases the margin of success for suppression crews.

- Increase the safety margin for suppression crews through lower fire line intensity. Including, the ability to move up and down the fire line to address surges and changes in fire behavior or move away from intense fire behavior then re-engage quickly when fire behavior dies down or moderates. (Burgan et al 1984)

- Increase ability to patrol for spots across the line – it is easier to detect spot fires in areas where fuels have been mowed/reduced and not hidden in tall sagebrush until well established.

- Increase ability to catch spot fires across the line because the fire is spotting into an area of reduced fuel loading. Spot fires take longer to establish and build up intensity in reduced fuels.

- Spot fires are easier to control with fewer resources. In other words, less equipment, water, fire retardant would be needed because fire spotting into an area of reduced fuels.

- Fire retardant is much more effective in fuel breaks than untreated fuels. Fire retardant is able to completely coat fuels rather than getting hung-up in the sagebrush canopy and / or continuous annual grasses, which allows fire to creep through fine fuels from beneath the sagebrush.

- Changing the fuel model within the fuel break would reduce spotting distances. Grasses, owing to their fineness and short consumptive time, produce fewer embers that survive to return to the ground. Wider fuel breaks provide larger areas of reduced fuels for fire brands to be generated from and larger areas of reduced fuels for spots to land in if carried over an improved road as fire contacts fuel breaks.

- The residence time (the time the plant is flaming and firefighters need to stay to

manage it) of flaming fuels is greatly reduced in the fuel breaks due to reduced fuels. The burnout time in grass fuel models is less than the burnout time in shrub fuel models. This allows suppression resources to have much more mobility in regards to moving up and down a fire line (fuel break) holding and burning out line in fine fuels versus heavier fuels. This allows the firefighters to hold and secure larger expanses of line with fewer resources. (Burgan et al 1984)

The effectiveness of fuel breaks would be based on their width. Targeted grazing and mowing would create a zone of fuels that would not support high flame lengths or high rates of spread. Implementation is expected to aid firefighters, provide for their safety, and protect resources in the area.

Fire behavior modeling, using the BehavePlus software, shows the changes in fire behavior variables such as flame length and rate of spread for both the Proposed Action (Fuel Model 1 Short Grass) and no action (Fuel Model 3 Tall Grass). Calculations are based on the assumption that conditions are uniform and constant for the projection period.

Definitions per the National Wildland Fire Coordinating Group Glossary of Wildland Fire Terms:

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity.

Fuel Moisture Content: The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees F.

One-hour Timelag Fuel Moisture (1-h TL FM): Moisture content of one-hour timelag fuels.

One-hour Timelag Fuels: Fuels consisting of dead herbaceous plants and roundwood less than about one-fourth inch (6.4 mm) in diameter. Also included is the uppermost layer of needles or leaves on the forest floor.

Mid-Flame Windspeed: The speed of the wind measured at the midpoint of the flames, considered to be most representative of the speed of the wind that is affecting fire behavior.

Fire Behavior Fuel Model 1: Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one third of the area. Grasslands and savanna are represented along with stubble, grass-

tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model.

Fire Behavior Fuel Model 3: Fires in this fuel are the most intense of the grass group and display high rates of spread under the influence of wind. Wind may drive fire into the upper heights of the grass and across standing water. Stands are tall, averaging about 3 feet (1 m), but considerable variation may occur. Approximately one-third or more of the stand is considered dead or cured and maintains the fire. Wild or cultivated grains that have not been harvested can be considered similar to tall prairie and marshland grasses.

Table 17. Fuel Model 3 (No Action) – Surface Rate of Spread (Max) (chains/hr*)

1-h	Midflame Wind Speed (upslope)										
Moisture	mi/h										
%	0	2	4	6	8	10	12	14	16	18	20
2	12.5	64.8	142.4	233.5	334.7	444.2	560.7	683.5	811.8	945.3	1083.4
4	9.8	51.1	112.1	183.9	263.6	349.9	441.7	538.4	639.5	744.6	853.4
6	8.1	42.2	92.7	152.0	217.9	289.1	365.0	444.9	528.5	615.3	705.2
8	7.0	36.6	80.3	131.8	188.9	250.7	316.4	385.7	458.1	533.4	611.4
10	6.3	33.0	72.4	118.8	170.2	225.9	285.2	347.6	412.9	480.8	551.1
12	5.8	30.4	66.8	109.5	157.0	208.4	263.1	320.7	380.9	443.5	508.3
14	5.4	28.2	61.9	101.4	145.4	193.0	243.6	297.0	352.8	410.7	470.8
16	4.9	25.6	56.3	92.3	132.4	175.7	221.8	270.3	321.1	373.9	428.5

* 1 chain = 66 feet

Table 18. Fuel Model 3 (No Action) - Flame Length (feet)

1-h	Midflame Wind Speed (upslope)										
Moisture	mi/h										
%	0	2	4	6	8	10	12	14	16	18	20
2	5.4	11.6	16.6	20.9	24.6	28.1	31.2	34.2	37.0	39.7	42.3
4	4.5	9.6	13.8	17.4	20.5	23.4	26.0	28.5	30.8	33.1	35.2
6	3.9	8.4	12.0	15.1	17.8	20.3	22.6	24.7	26.8	28.7	30.6
8	3.5	7.6	10.9	13.6	16.1	18.3	20.4	22.4	24.2	26.0	27.6
10	3.3	7.1	10.2	12.8	15.1	17.2	19.1	20.9	22.7	24.3	25.9
12	3.2	6.8	9.7	12.2	14.4	16.4	18.2	20.0	21.6	23.2	24.7
14	3.0	6.5	9.3	11.7	13.8	15.7	17.4	19.1	20.7	22.2	23.6
16	2.8	6.1	8.7	11.0	12.9	14.7	16.4	18.0	19.4	20.8	22.2

Table 19. Fuel Model 1 (Proposed Action) - Surface Rate of Spread (Max) (chains/hr*)

1-h	Midflame Wind Speed (upslope)										
Moisture	mi/h										
%	0	2	4	6	8	10	12	14	16	18	20
2	12.0	32.0	96.1	206.8	365.6	573.3	665.6	665.6	665.6	665.6	665.6
4	9.2	24.5	73.5	158.1	279.5	345.1	345.1	345.1	345.1	345.1	345.1
6	8.1	21.5	64.6	138.9	245.5	270.1	270.1	270.1	270.1	270.1	270.1
8	7.0	18.6	55.8	120.0	198.7	198.7	198.7	198.7	198.7	198.7	198.7
10	4.6	12.3	36.9	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* 1 chain = 66 feet

Table 20. Fuel Model 1 (Proposed Action) - Flame Length (feet)

1-h	Midflame Wind Speed (upslope)										
Moisture	mi/h										
%	0	2	4	6	8	10	12	14	16	18	20
2	2.0	3.1	5.2	7.4	9.6	11.8	12.7	12.7	12.7	12.7	12.7
4	1.6	2.5	4.2	6.0	7.8	8.6	8.6	8.6	8.6	8.6	8.6
6	1.5	2.3	3.9	5.5	7.1	7.5	7.5	7.5	7.5	7.5	7.5
8	1.3	2.1	3.5	5.0	6.3	6.3	6.3	6.3	6.3	6.3	6.3
10	0.9	1.5	2.5	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4. Cumulative Impact Analysis

The Council of Environmental Quality (CEQ) regulations implementing NEPA defines cumulative impacts as "…[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person undertakes such actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Past, Present, and Reasonably Foreseeable Future Actions

On the basis of aerial photographic data, agency records and GIS analysis and interdisciplinary team discussion the following past and present actions, which have impacted the affected resources within the assessment area to varying degrees, have been identified:

Recreation

There are many opportunities in the cumulative assessment area that offer a variety of past, present, and future recreation uses. Predominant uses include; hunting, fishing, hiking, camping, and recreational OHV use. All of these recreational uses have been substantial in the past, and recreational use on the Elko District is expected to increase in the future.

Livestock grazing

Livestock grazing has a long history in the region dating back to the 1800's. Today, it remains the dominant use of the entire cumulative impact assessment area. Throughout its history, ranching has remained a dispersed activity characterized by localized areas of more intensive use. The intensity and character of livestock grazing is anticipated to remain consistent into the foreseeable future.

Wildland Fire and Fuels Management

Wildland fire is a natural disturbance process in most vegetation communities in the Elko District. It is anticipated that wildland fire will continue to increase in frequency and spread in areas characterized as having cheatgrass mono-cultures; continued drought and climate change may increase vulnerability of all vegetation communities to increased rates of wildland fire. ES&R and fuels management treatments are common management actions on public land across the west, although the increase in fire frequency has made these actions more common over the past 30 years. Future fires would be subject to Emergency Stabilization and Rehabilitation treatments on a case by case basis. Fuels treatments, designed to control the spread of fire around communities-at-risk and important wildlife habitat, will continue to be implemented. Due to the importance in protecting critical Greater sage-grouse and sagebrush obligate species habitat, it is anticipated that fuels management actions would increase.

Utility corridors

Lands and Realty - According to BLM records, LR 2000, GIS data, past and present lands actions that have impacted the cumulative assessment area to varying degrees are: transportation and access (use and maintenance of roads and trails), development of utilities (power lines, natural gas line, fiber optic lines, communication sites), water pipelines, and easements across private lands. Utilities -Power lines, and other various land authorizations identified above, traverse the assessment area and have been in place for many years. Periodic maintenance to the existing facilities has resulted in some temporary vegetation removal and short term disturbance to wildlife due to human presence.

Development and Infrastructure - The Elko District has a historic network of roads and ROWs, including energy and water developments as well as disturbance from historic settlements. Private landholdings occur within the larger boundary of the Elko District as well. Development, including the construction of roads and ROWs, and sale of BLM administered lands, as allowed by law, can be expected to continue in the reasonably foreseeable future.

Mining and Minerals Management

Mining for gold and other mineral resources has occurred irregularly across the Elko District since European settlement began in the 19th century. Historic mining resulted in surface disturbance as a result of placer and lode mining, and extensive off-road travel and road building associated with mines. Minerals extraction is expected to continue on the WD where mineral resources are located, according to regulation and practices determined by state and federal laws.

Travel/transportation

Transportation and access – Past and present actions within the assessment area are supported by an extensive transportation system. Most of these roads originated from mining exploration or ranching access and few are regularly maintained.

Invasive Species Management

Invasive species management has historically occurred on the Elko District, with a control emphasis placed on Nevada state-listed noxious weeds. Invasive species control is currently on-going, and is expected to continue in the future.

Cumulative Assessment Areas for each respective resource is described in the sections that follow.

4.1. Cumulative Effects of the Alternatives

4.1.1. Cultural Resources

Past, present and reasonably foreseeable actions and conditions within the cumulative effects area that have affected or could (in the future) affect cultural resources include dispersed recreation, travel/transportation, livestock grazing, and range improvement projects.

The cumulative effects study area (CESA) for cultural resources is the analysis area for the project and a half mile buffer around that area. This area was chosen to examine cumulative effect to cultural resources based on the extent of cultural resource sites within the project area and the fact that none extend outside of half a mile of the project area boundary. Because of the brevity of the Proposed Actions, the timeframe for cumulative effects analysis is identical to the duration of grazing in the Proposed Action.

Existing conditions within the Targeted Grazing Fuels Breaks project area are the result of past dispersed recreation, travel/transportation, and grazing activities on areas in which cultural resources were likely undisturbed since their deposition. Though the area of the CESA for cultural resources has been exposed to dispersed recreation and travel/transportation, the area is not known as a hot spot for recreation and travel/transportation through the area has largely been restricted to existing roads. No change in these activities is expected through the implementation of the Proposed Action.

Grazing activities have shown an effect on surficial and shallow subsurface cultural deposits through cattle trampling. The effect of cattle trampling is largely limited to the modification and displacement of artifacts. Because most of the sites in the CESA are prehistoric in nature and are nominated to the NRHP for their information potential, these sites rely upon the presence of significant intact buried deposits. The modification and trampling of surficial artifacts on archaeological sites is unlikely to alter the information potential of these sites. Subsequently, the implementation of the Proposed Action would result in no effect on cultural resources.

The cumulative effect of new range improvement projects will be changes in cattle grazing patterns; new cattle trailing along the fences, and concentrated trampling and churning has the potential to create new created LCAs (at the water hauls and mineral supplements). Because cultural resource inventories have been carried out prior to the implementation of the Proposed Action, and all historic properties will be avoided by new range improvement projects, there will be no significant cumulative effect on cultural resources through these improvements.

4.1.2. Soils

The cumulative effects study area (CESA) includes the following Public Lands Survey System (PLSS) designations for each treatment area: T Lazy S Treatment Area (T32, 33, 34, 35N R49E, T32, 33, 34, 35 N R50E); Blue Basin Treatment Area (T34N R54E); Hadley Treatment Area

(T33N R52E); Carlin Field Treatment Area (T33N R53E). Past, present and reasonably foreseeable actions and conditions within the cumulative effects area that have affected or could (in the future) affect soil resources include improper livestock grazing and overgrazing, wildland fires, roads, recreation, invasive plants, vegetation management and climate change. In the case of climate change, the effects of temporal shifts in precipitation and snowfall patterns, and storm intensities would affect the soil layer recharge by infiltration and percolation.

4.1.3. Water Resources (Surface/Ground)

Past, present and reasonably foreseeable actions and conditions within the targeted grazing area that have affected or would (in the future) affect water resources include livestock and wildlife grazing, mining activities, wildland fires, roads, recreation, invasive plants, vegetation management and climate change. The major impacts from the No Action Alternative are from the impact of wildland fires which could potentially remove the vegetative cover on the ground surface. The burnt surface may display a hydrophobic characteristic which allows less infiltration. Less infiltration would encourage surface runoff and a potential of increased sediment movement.

The Proposed Action where prescriptive management actions are applied to the treatment areas (such as a livestock grazing system) is designed to create a fire break with the reduction of vegetation. The management treatment would restrict and prevent overgrazing of vegetation by livestock but also reduce the fire danger from too much litter on the ground surface. The damage from the management treatment would have minimal impact on surface runoff and erosion potential.

In the case of climate change, the effects of temporal shifts in precipitation and snowfall patterns, and storm intensities would affect the soil layer recharge from infiltration and groundwater recharge.

4.1.4. Air Quality

The past, present and future effects for air quality includes contributions from the Carlin Trend mining area (See Map 3-19 in Appendix A). Air quality in the area is impacted by natural conditions such as fire and blowing dust, along with a variety of anthropogenic effects such as blowing dust from soil disturbance, vehicle exhaust emissions, and emissions from industrial and domestic sources such as mining activities, agricultural activities, etc.

Impacts from natural and anthropogenic emissions have not been high enough in the CESA to classify affected basins and as a result, air quality is generally considered to be good. The cumulative effects study area (CESA) include The Public Land Survey System (PLSS) designations: T Lazy S (T32, 33, 34, 35 N R49E, T32, 33, 34, 35 N R 50E); Blue Basin Treatment Area (T34 N R54 E); Hadley Treatment Area (T33 N R 52 E); and Carlin Treatment

Area (T 33 N R53 E). The Proposed Action would potentially enhance air quality through a decrease in particulate matter generation and distribution.

4.1.5. Climate Change

The past, present, and future effects for climate change include contributions from the Carlin Trend mining area. Changes in the carbon footprint, in the area, are impacted by natural conditions such as fire. Man-made contributions such as vehicle exhaust emissions, mining, and agricultural activities would continue.

The Proposed Action would potentially enhance air quality through a decrease in particulate matter generation and distribution.

The No Action Alternative would potentially contribute to a cumulative loss in stored carbon. Wildland fires would result in uncontrolled burns putting carbon stored in the vegetation into the atmosphere.

Monitoring of air pollutant concentrations has been conducted in the region. These monitoring sites are part of several monitoring networks overseen by state and federal agencies, including: NDEP-Bureau of Air Quality Planning (BAQP) Clean Air Status and Trends Network (CASTNET), Interagency Monitoring of Protected Visual Environments (IMPROVE), and National Acid Deposition Program (NADP) National Trends Network (NTN).

4.1.6. Vegetation

The cumulative effects analysis area for vegetation is the same as the affected environment analysis area described above.

The No Action Alternative may provide avenues for wildland fire. Intact and recovering sagebrush communities could be lost leading to an increase in abundance of cheatgrass in these areas. Increasing cheatgrass could lead to more frequent wildland fires, inhibit future rehabilitation activities, and cause permanent loss of these sagebrush systems. There are mining surface exploration activities planned in the future, which will create localized impacts to vegetation. Dispersed recreation is not expected to contribute to any further spread of annual species or impact the vegetative community. The adjacent highway will continue to be a cause of human caused fire ignitions, and will continue to jeopardize the sage-grouse habitat, ES&R treatments and native vegetation persistence.

The Proposed Action could reduce frequency of wildland fires. Reducing wildland fire frequency may prevent invasion of cheatgrass, further aiding recovering sagebrush communities. Sagebrush may develop varying age classes with native perennial grasses that contribute to infiltration and soil stability. Preventing wildland fires may aide sagebrush recovery in big game crucial winter habitats and provide broader ranges for use. There are mining surface exploration activities

planned in the future, which will create localized impacts to vegetation. Dispersed recreation is not expected to contribute to any further spread of annual species or impact the vegetative community. The adjacent highway will continue to be a cause of human caused fire ignitions, and will continue to jeopardize the sage-grouse habitat, ES&R treatments and native vegetation persistence. Noxious weed management may need to increase in the treatment areas if treatment is found to create spread of noxious weed species.

4.1.7. Livestock Grazing

The cumulative effects analysis area for livestock grazing is the same as the affected environment analysis area described above. Actions that could cumulatively affect livestock grazing are wildland fire, vegetation treatments including noxious weed management, post-fire stabilization and rehabilitation treatments, construction and maintenance of transmission line projects, and recreation.

The No Action Alternative would not have fuel breaks constructed throughout the project area. Response time required to catch fires before they grow beyond the capabilities of initial attack would remain unchanged. Landscapes more distant from improved roads with intact sagebrush would remain most vulnerable to large fires. The result could be the continued trend of wildland fires, post-fire burned lands rested from grazing for 1 to 5 years combined with activities such as transmission line construction could result in negative short-term cumulative impacts for some operators. Conversion from perennial plant communities to annual plant communities would reduce rangeland diversity and forage availability, putting further pressure on livestock operators. Recreation and vegetation treatments would continue to occur in the analysis area. Recreation disturbance is dispersed and would likely increase over time as would the occurrence of noxious weeds; however, these impacts would not result in cumulative effects to livestock grazing management. There are mining surface exploration activities planned in the future, which will create localized and temporary impacts to livestock grazing. Dispersed recreation may have negative impacts to livestock grazing and management if gates are left open. The adjacent highway will continue to be a cause of human caused fire ignitions that will have a fine annual fuel bed to move quickly through. Noxious weed management may need to increase in the treatment areas if treatment is found to create spread of noxious weed species.

Cumulative impacts from the Proposed Action would include increased costs, as the costs associated with livestock management to reach treatment objectives are expected to be considerably higher than usual operating costs under the existing grazing permits. The costs are expected to be somewhat offset when compared to consequences of largescale wildland fires. In addition, the use of free-use grazing permits to authorize the treatments is expected to offset the cost of treatment implementation to some degree. Under the action alternative wildland fire size is anticipated to decrease (Diamond, Call, & Devoe, Effects of Targeted Cattle Grazing on Fire Behavior of Cheatgrass-Dominated Rangeland in the Northern Great Basin, 2009; Diamond, Call, & Devoe, Effects of Targeted Grazing and Prescribed Burning on Community and Seed

Dynamics of a Downy Brome (Bromus tectorum) Domiated Landscape, 2012) preventing livestock producers from having to find alternatives for livestock forage. Native habitat and seeded vegetation treatments may remain over the long-term, providing quality forage for livestock grazing (Foster, et al., 2015). Additionally, knowledge from these treatments may be applied to other grazing operations in the future. There are mining surface exploration activities planned in the future, which will create localized and temporary impacts to livestock grazing. Dispersed recreation may have negative impacts to livestock grazing and management if gates are left open. Added signage, perhaps even describing the treatment, may be helpful in promoting gate closure, and the most frequently accessed routes will be equipped with cattle guards. The adjacent highway will continue to be a cause of human caused fire ignitions however there will be a discontinuity in the fuel bed that is expected to decrease rate of fire spread. Noxious weed management may need to increase in the treatment areas if treatment is found to create spread of noxious weed species.

4.1.8. Recreation

The area of analysis for cumulative impacts for recreation is the proposed project area. Actions that could cumulatively impact the resource are transmission lines and wildland fire.

Under the No Action Alternative the effects of past, present and future foreseeable actions would likely result in a continuation of current trends in recreational activity. Fire would remain an important influence on the landscape and on recreational opportunities. Impacts by fire on recreation may be felt during and after the fires. Past fires have contributed to the spread of non-native annual grasses that lead to more intense fire behavior, and future fires are expected to continue that trend. The development of transmission lines in the project area may result in short term impact to the resource during construction, and long term impact due to road construction. There may be positive and negative impacts from road building, as roads may increase access, but detract from solitude.

Under the Proposed Action alternative, the cumulative effects of transmission lines, and wildland fire would have some impacts on the recreation resource. Road building associated with transmission line development may lead to better access for recreationalists, but may detract from the experience of those desiring solitude. The negative impacts from fire would be expected to decrease over time under the action alternative. Construction of fencing and gates may be a hindrance but would not likely affect the overall experience of visitors.

4.1.9. Visual Resource Management

Because there are no appreciable impacts between the alternatives or reasonably foreseeable projects or past projects within the analysis area, cumulative impacts to visual resources are not expected.

4.1.10. Native American Concerns

Grazing is recognized and as an acceptable use of lands administered by the BLM under the Federal Land Policy and Management Act of 1976 (FLPMA). However, in accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM must also provide affected tribes an opportunity to comment and consult on Proposed Actions. BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities, and resources.

As stated above, if, as a result of this project of targeted grazing and associated vegetation treatments, all applicable laws, regulations, directives, SOPs, and stipulations and limitations will apply.

Because consultation and information sharing is ongoing, if BLM is informed that any portion of the project might impact locations having traditional/cultural or religious values to Native Americans, BLM will insure that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional values in the project area.

4.1.11. Noxious Weeds and Invasive, Non-native Plant Species

The Cumulative Effects Study Area for noxious weed and non-native invasive plants is the T Lazy S, Blue Basin, Hadley, and Carlin Field Allotments. This CESA was selected because it has the same context for direct and indirect impacts. The following past, present, and reasonable foreseeable actions that effect weeds in the CESA include grazing, road maintenance/construction, minerals and realty projects, wildland fires, and recreation.

All areas listed immediately above have the potential for ground disturbance and subsequently provide an opportunity for annual grass and broadleaf weed introduction and spread. Targeted grazing and existing IPM techniques aimed at controlling noxious weeds and non-native invasive plants, in conjunction with following SOPs, monitoring, and adaptive management will lessen these adverse impacts.

4.1.12. Wildlife and Fisheries

The cumulative effects study area (CESA) for Wildlife is the same 4-mile effects analysis buffer used in the Affected Environment and Environmental Effects sections above (see Map 3-15 in Appendix A). As stated in Section 3.2.6 (Vegetation), the majority of the CESA has been converted from the desired vegetation community of shrub/perennial grass to an annual grass dominated vegetation community (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures).

Past actions within the CESA include livestock grazing, mining activities (i.e., exploration drilling, mine pit and road construction), rights-of-ways (i.e., utility corridors, powerlines, pipelines, roads), recreational use (i.e., hunting, dispersed camping), travel and transportation (i.e., recreational use, highways), wildland fires, and emergency stabilization and rehabilitation activities (ES&R) (i.e., seeding burned areas). All of these actions have contributed to the conversion of the original shrub/perennial grass-dominated habitat into annual grassland overrun by invasive species such as cheatgrass. Each of the actions above are modes of transportation for cheatgrass and other invasive weed seeds to be spread. Livestock moving across the landscape pick up seeds in their fur and carry the seeds long distances into the middle of uninvaded habitat. Mining activities and surface disturbance associated with building rights-of-ways created bare ground available for cheatgrass/invasive species establishment. Mining equipment, recreational vehicles (i.e., 4x4 trucks, off-road vehicles), rights-of-way construction equipment, and fire suppression equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to another, uninvaded area. As seeds were dispersed throughout the shrub/perennial grass-dominated habitat, they established in bare ground areas or prior to native vegetation green-up. Wildland fires became more prominent with the increase in dry cheatgrass/invasive species and wiped out the contiguous shrub/perennial grass-dominated habitat; thus furthering the bare ground/cheatgrass/invasive species establishment cycle and decreasing the fire return interval (time between fires in a defined area; i.e., from a 50 year return interval to a 5-10 year return interval). Recreational vehicle use on dirt roads and two-track road and vehicular traffic on paved roads adjacent to the area contributed to increased human-caused wildland fires and increased invasion potential. ES&R equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to the next burned area and hindered the efficacy of seeding to rehabilitate burned areas. However, ES&R seeding activities minimally decreased some invasion potential when the seeded plant species became established.

Present actions within the CESA include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments (i.e., reclamation, ES&R, spraying weeds, fire resistant vegetation seedings, etc.). Management actions (i.e., mitigation measures, stipulations) have been established in order to control the spread of cheatgrass/invasive species during present actions. Management actions for mining activities, rights-of-ways, commercial recreational use, and fire suppression equipment requires vehicles be washed off before entering a new area in order to avoid spreading more cheatgrass/invasive species seeds. Vegetation treatment activities include cheatgrass/invasive species management actions (i.e., spraying herbicides, required management plans) and seeding protocols for all surface disturbing activities (i.e., mining, powerline construction, etc.). Wildland fires are reclaimed similarly to these surface disturbing activities. While these vegetation treatment management actions have decreased some of the modes for cheatgrass/invasive species spread, establishment of seeded/desired species is not enough to out-compete the well-established cheatgrass/invasive species population. Spraying herbicides in order to control the established cheatgrass/invasive species population is expensive, has

hazardous materials requirements, and doesn't cover enough ground to decrease the population enough for seeded/desired vegetation species to establish and take over the sites. Other vectors for invasive species spread are still active in the form of public recreational vehicles and interstate travel, livestock grazing, and human- and natural-caused wildland fires. The fire return interval continues to decrease as more and more shrub/perennial grass-dominated habitat is converted to cheatgrass/invasive species habitat/monocultures.

Reasonably foreseeable future actions include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments. Management actions for noxious and invasive weed treatments, seeding treatments, reclamation requirements, and vegetation treatments will continue to decrease the spread of cheatgrass/invasive species. However, surface disturbing activities associated with mining, rights-of-ways, and fire suppression will continue to open up previously disturbed and undisturbed areas and, consequently, increase cheatgrass/invasive species' opportunities for establishment. Although management actions for vegetation treatments would continue to be required, it doesn't decrease the already established cheatgrass/invasive species populations within the CESA and surrounding area. As a result, the fire return interval will continue to decrease, human- and natural-caused wildland fires will continue to burn thousands of acres, and the remaining shrub/perennial grass-dominated habitat will be converted to a cheatgrass/invasive species-dominated habitat.

Under the No Action Alternative, the cumulative effects would be increased for Wildlife. An increased risk of large wildland fires threatening or removing shrub/perennial grass-dominated habitat outside of the CESA would continue to be a concern. It is expected that the removal of this habitat would expand the cheatgrass/invasive species populations, continuing the cycle of vegetation community conversion and decreased fire return intervals. Loss of shrub/perennial grass-dominated habitat will decrease Wildlife populations by removing important life-cycle habitat for their survival (i.e., crucial winter range). Wildlife would eventually be removed entirely from the CESA as they move to other areas to survive. However, the new habitat areas can only support a certain population number before they begin to degrade. Increased Wildlife mortality due to starvation, dehydration, malnutrition, and decreased breeding success would decrease the population quickly. Livestock grazing management would continue as it is now, change during a permit renewal, or be removed altogether because of lack of forage; however, this would not slow the destruction of habitat by wildland fires or decrease the population of cheatgrass/invasive species. Mining activities, recreational use, and rights-of-way construction would continue to increase the opportunities for new or more cheatgrass/invasive species establishment. Vegetation treatments would continue to be conducted in response to wildland fire, in response to surface disturbing activities, or completed on small acreages for other types of habitat improvement/restoration projects. Wildlife and livestock are drawn to these seeded areas for the higher nutritional vegetation, suppressing the establishment of seeded/desired species. Vegetation treatments for wildland fires are closed to livestock grazing, but would still

be grazed by Wildlife. It is expected that vegetation treatments would not increase seeded/desired vegetation establishment or decrease cheatgrass/invasive species establishment, but would be invaded due to the grazing pressure from Wildlife and livestock. Wildlife dependent upon prey for food (i.e., red fox, coyote) would continue to hunt in the CESA, as the prey base (i.e., desert cottontail, black-tailed jackrabbit) is more adaptable to the cheatgrass/invasive species habitat. However, if the prey base can no longer support themselves, they would move to more appropriate habitat followed by the predators. The No Action Alternative would increase cumulative impacts within the CESA and in the surrounding contiguous shrub/perennial grass-dominated habitat for Wildlife.

Under the Proposed Action, the cumulative effects would be slightly decreased by providing fuel breaks which allow fire suppression personnel and equipment a greater opportunity to contain wildland fires at a smaller size and keep them in the cheatgrass/invasive species vegetation community. The risk of large wildland fires consuming shrub/perennial grass-dominated habitat outside of the CESA would be decreased. Mowing the small shrub portion of the treatment areas and using livestock to graze the cheatgrass to a short stubble height provides an area where fire spread slows down and fire suppression crews can anchor to safely conduct fire suppression activities. Wildlife (and livestock) would graze, use the portable water troughs/supplements when they are available, and would continue to use the CESA for life-cycle requirements. However, the treatment areas would be closed to livestock grazing once the stubble height is achieved, which would decrease the amount of grazing pressure on these areas. Conserving the shrub/perennial grass-dominated habitat outside of the CESA provides contingent habitat for Wildlife to utilize during important life-cycles, which would still strain the habitat, but would decrease the rate of mortality/population decreases. However, the vegetation treatments completed in response to the smaller wildland fires would also provide suitable feed for Wildlife when necessary and rest the shrub/perennial grass-dominated habitat from use. All other actions within the CESA would have the same cumulative effects as the No Action Alternative.

4.1.13. Migratory Birds

The cumulative effects study area (CESA) for Migratory Birds is the same 4-mile effects analysis buffer used in the Affected Environment and Environmental Effects sections above (see Map 3-15 in Appendix A). As stated in Section 3.2.6 (Vegetation), the majority of the CESA has been converted from the desired vegetation community of shrub/perennial grass to an annual grass dominated vegetation community (see Figures 1Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures).

Past actions within the CESA include livestock grazing, mining activities (i.e., exploration drilling, mine pit and road construction), rights-of-ways (i.e., utility corridors, powerlines, pipelines, roads), recreational use (i.e., hunting, dispersed camping), travel and transportation (i.e., recreational use, highways), wildland fires, and emergency stabilization and rehabilitation activities (ES&R) (i.e., seeding burned areas). All of these actions have contributed to the

conversion of the original shrub/perennial grass-dominated habitat into annual grassland overrun by invasive species such as cheatgrass. Each of the actions above are modes of transportation for cheatgrass and other invasive weed seeds to be spread. Livestock moving across the landscape pick up seeds in their fur and carry the seeds long distances into the middle of uninvaded habitat. Mining activities and surface disturbance associated with building rights-of-ways created bare ground available for cheatgrass/invasive species establishment. Mining equipment, recreational vehicles (i.e., 4x4 trucks, off-road vehicles), rights-of-way construction equipment, and fire suppression equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to another, uninvaded area. As seeds were dispersed throughout the shrub/perennial grass-dominated habitat, they established in bare ground areas or prior to native vegetation green-up. Wildland fires became more prominent with the increase in dry cheatgrass/invasive species and wiped out the contiguous shrub/perennial grass-dominated habitat; thus furthering the bare ground/cheatgrass/invasive species establishment cycle and decreasing the fire return interval (time between fires in a defined area; i.e., from a 50 year return interval to a 5-10 year return interval). Recreational vehicle use on dirt roads and two-track road and vehicular traffic on paved roads adjacent to the area contributed to increased human-caused wildland fires and increased invasion potential. ES&R equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to the next burned area and hindered the efficacy of seeding to rehabilitate burned areas. However, ES&R seeding activities minimally decreased some invasion potential when the seeded plant species became established.

Present actions within the CESA include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments (i.e., reclamation, ES&R, spraying weeds, fire resistant vegetation seedings, etc.). Management actions (i.e., mitigation measures, stipulations) have been established in order to control the spread of cheatgrass/invasive species during present actions. Management actions for mining activities, rights-of-ways, commercial recreational use, and fire suppression equipment requires vehicles be washed off before entering a new area in order to avoid spreading more cheatgrass/invasive species seeds. Vegetation treatment activities include cheatgrass/invasive species management actions (i.e., spraying herbicides, required management plans) and seeding protocols for all surface disturbing activities (i.e., mining, powerline construction, etc.). Wildland fires are reclaimed similarly to these surface disturbing activities. While these vegetation treatment management actions have decreased some of the modes for cheatgrass/invasive species spread, establishment of seeded/desired species is not enough to out-compete the well-established cheatgrass/invasive species population. Spraying herbicides in order to control the established cheatgrass/invasive species population is expensive, has hazardous materials requirements, and doesn't cover enough ground to decrease the population enough for seeded/desired vegetation species to establish and take over the sites. However, other vectors for invasive species spread are still active in the form of public recreational vehicles and interstate travel, livestock grazing, and human- and natural-caused wildland fires. The fire return

interval continues to decrease as more and more shrub/perennial grass-dominated habitat is converted to cheatgrass/invasive species habitat/monocultures.

Reasonably foreseeable future actions include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments. Management actions for noxious and invasive weed treatments, seeding treatments, reclamation requirements, and vegetation treatments will continue to decrease the spread of cheatgrass/invasive species. However, surface disturbing activities associated with mining, rights-of-ways, and fire suppression will continue to open up previously disturbed and undisturbed areas and, consequently, increase cheatgrass/invasive species' opportunities for establishment. Although management actions for vegetation treatments would continue to be required, it doesn't decrease the already established cheatgrass/invasive species populations within the CESA and surrounding area. As a result, the fire return interval will continue to decrease, human- and natural-caused wildland fires will continue to burn thousands of acres, and the remaining shrub/perennial grass-dominated habitat will be converted to a cheatgrass/invasive species-dominated habitat.

Under the No Action Alternative, the cumulative effects would be increased for Migratory Birds. An increased risk of large wildland fires threatening or removing shrub/perennial grass-dominated habitat outside of the CESA would continue to be a concern. It is expected that the removal of this habitat would expand the cheatgrass/invasive species populations, continuing the cycle of vegetation community conversion and decreased fire return intervals. Loss of shrub/perennial grass-dominated habitat would decrease some Migratory Bird populations (i.e., songbirds, passerines) by removing important life-cycle habitat for their survival (i.e., nesting and breeding habitats). For other Migratory Birds (i.e. raptors, predator-type birds) it would decrease their populations by decreasing habitat for their prey species (i.e., rodents, reptiles, hares/rabbits). Migratory Birds would eventually move to other areas to nest, breed, and hunt. However, the new habitat areas can only support a certain population number of breeding pairs and predators. Increased Migratory Bird mortality due to decreased breeding success and lack of prey would decrease the population or force the species to leave in search of more prey. Livestock grazing management would continue as it is now, change during a permit renewal, or be removed altogether because of lack of forage; however, this would not slow the destruction of habitat by wildland fires or decrease the population of cheatgrass/invasive species. Mining activities, recreational use, and rights-of-way construction would continue to increase the opportunities for new or more cheatgrass/invasive species establishment. Vegetation treatments would continue to be conducted in response to wildland fire, in response to surface disturbing activities, or completed on small acreages for other types of habitat improvement/restoration projects. However, required nesting and breeding habitat (i.e., tall shrubs) for Migratory Birds would not reestablish for approximately 20-30 years. With the decreased fire return interval, nesting and breeding habitat may never reestablish within the CESA. Vegetation treatments that include seeding native grass and forb species would provide an increase in food supplies in the

short term for Migratory Birds and their prey. However, it is expected that vegetation treatments would not increase native vegetation establishment or decrease cheatgrass/invasive species establishment, but would be invaded due to foraging of seeds resulting in a lack of establishment of seeded/native species. Migratory Birds dependent upon prey for food would continue to hunt in the CESA, as the prey base is more adaptable to the cheatgrass/invasive species habitat. However, if the prey species can no longer support themselves, they would move to more appropriate habitat and so would the predator Migratory Birds. The No Action Alternative would increase cumulative impacts within the CESA and in the surrounding contiguous shrub/perennial grass-dominated habitat for Migratory Birds.

Under the Proposed Action, the cumulative effects would be slightly decreased by providing fuel breaks which allow fire suppression personnel and equipment a greater opportunity to contain wildland fires at a smaller size and keep them in the cheatgrass/invasive species vegetation community. The risk of large wildland fires consuming shrub/perennial grass-dominated habitat outside of the CESA would be decreased. Mowing the small shrub portion of the treatment areas and using livestock to graze the cheatgrass to a short stubble height provides an area where fire spread slows down and fire suppression crews can anchor to safely conduct fire suppression activities. However, mowing would remove nesting/breeding/cover habitat still present. Migratory Birds would forage in the areas during migration, nesting/breeding, winter, and hunt prey species present, use the portable water troughs/supplements when they are available, use the fence posts and wires for perches for hunting/foraging and territory defense, and would continue to use the CESA for those life-cycle requirements still present. Conserving the shrub/perennial grass-dominated habitat outside of the CESA continues to provide contingent nesting, breeding, and prey species habitat for Migratory Birds; however, this may continue to strain that habitat's resources, but would decrease the rate of mortality/population decreases. All other actions within the CESA would have the same cumulative effects as the No Action Alternative.

4.1.14. Special Status Species

The cumulative effects study area (CESA) for Special Status Species is the same 4-mile effects analysis buffer used in the Affected Environment and Environmental Effects sections above (see Map 3-15 in Appendix A. As stated in Section 3.2.6 (Vegetation), the majority of the CESA has been converted from the desired vegetation community of shrub/perennial grass- to an annual grass-dominated vegetation community (see Figures 1 Average Percent of Cheatgrass and Sagebrush within the Treatment Areas & 2 Proposed Action Site Visit Pictures).

Past actions within the CESA include livestock grazing, mining activities (i.e., exploration drilling, mine pit and road construction), rights-of-ways (i.e., utility corridors, powerlines, pipelines, roads), recreational use (i.e., hunting, dispersed camping), travel and transportation (i.e., recreational use, highways), wildland fires, and emergency stabilization and rehabilitation activities (ES&R) (i.e., seeding burned areas). All of these actions have contributed to the conversion of the original shrub/perennial grass-dominated habitat into annual grassland overrun

by invasive species such as cheatgrass. Each of the actions above are modes of transportation for cheatgrass and other invasive weed seeds to be spread. Livestock moving across the landscape pick up seeds in their fur and carry the seeds long distances into the middle of uninvaded habitat. Mining activities and surface disturbance associated with building rights-of-ways created bare ground available for cheatgrass/invasive species establishment. Mining equipment, recreational vehicles (i.e., 4x4 trucks, off-road vehicles), rights-of-way construction equipment, and fire suppression equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to another, uninvaded area. As seeds were dispersed throughout the shrub/perennial grass-dominated habitat, they established in bare ground areas or prior to native vegetation green-up. Wildland fires became more prominent with the increase in dry cheatgrass/invasive species and wiped out the contiguous shrub/perennial grass-dominated habitat; thus furthering the bare ground/cheatgrass/invasive species establishment cycle and decreasing the fire return interval (time between fires in a defined area; i.e., from a 50 year return interval to 5-10 year return interval). Recreational vehicle use on dirt roads and two-track road and vehicular traffic on paved roads adjacent to the area contributed to increased human-caused wildland fires and increased invasion potential. ES&R equipment driven through patches of cheatgrass/invasive species in one area transported those seeds to the next burned area and hindered the efficacy of seeding to rehabilitate burned areas. However, ES&R seeding activities minimally decreased some invasion potential when the seeded plant species became established.

Present actions within the CESA include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments (i.e., reclamation, ES&R, spraying weeds, fire resistant vegetation seedings, etc.). Management actions (i.e., mitigation measures, stipulations) have been established in order to control the spread of cheatgrass/invasive species during present actions. Management actions for mining activities, rights-of-ways, commercial recreational use, and fire suppression equipment requires vehicles be washed off before entering a new area in order to avoid spreading more cheatgrass/invasive species seeds. Vegetation treatment activities include cheatgrass/invasive species management actions (i.e., spraying herbicides, required management plans) and seeding protocols for all surface disturbing activities (i.e., mining, powerline construction, etc.). Wildland fires are reclaimed similarly to these surface disturbing activities. While these vegetation treatment management actions have decreased some of the modes for cheatgrass/invasive species spread, establishment of seeded/desired species is not enough to out-compete the well-established cheatgrass/invasive species population. Spraying herbicides in order to control the established cheatgrass/invasive species population is expensive, has hazardous materials requirements, and doesn't cover enough ground to decrease the population enough for seeded/desired vegetation species to establish and take over the sites. However, other vectors for invasive species spread are still active in the form of public recreational vehicles and interstate travel, livestock grazing, and human- and natural-caused wildland fires. The fire return interval continues to decrease as more and more shrub/perennial grass-dominated habitat is converted to cheatgrass/invasive species habitat/monocultures.

Reasonably foreseeable future actions include livestock grazing management, mining activities, rights-of-ways, recreational use, travel and transportation, wildland fires, and vegetation treatments. Management actions for noxious and invasive weed treatments, seeding treatments, reclamation requirements, and vegetation treatments will continue to decrease the spread of cheatgrass/invasive species. However, surface disturbing activities associated with mining, rights-of-ways, and fire suppression will continue to open up previously disturbed and undisturbed areas and, consequently, increase cheatgrass/invasive species' opportunities for establishment. Although management actions for vegetation treatments would continue to be required, it doesn't decrease the already established cheatgrass/invasive species populations within the CESA and surrounding area. As a result, the fire return interval will continue to decrease, human- and natural-caused wildland fires will continue to burn thousands of acres, and the remaining shrub/perennial grass-dominated habitat will be converted to a cheatgrass/invasive species-dominated habitat.

Under the No Action Alternative, the cumulative effects would be increased for Special Status Species. An increased risk of large wildland fires threatening or removing shrub/perennial grass-dominated habitat outside of the CESA would continue to be a concern. It is expected that the removal of this habitat would expand the cheatgrass/invasive species populations, continuing the cycle of vegetation community conversion and decreased fire return intervals. Loss of shrub/perennial grass-dominated habitat would decrease Special Status Species populations by removing important life-cycle habitat for their survival (i.e., nesting, breeding, wintering). Special Status Species would eventually be removed entirely from the CESA as they move to other areas to survive. However, the new habitat areas can only support a certain population number before they begin to degrade. Increased Special Status Species mortality due to starvation, dehydration, malnutrition, and decreased breeding success would decrease the population quickly. Livestock grazing management would continue as it is now, change during a permit renewal, or be removed altogether because of lack of forage; however, this would not slow the destruction of habitat by wildland fires or decrease the population of cheatgrass/invasive species. Mining activities, recreational use, and rights-of-way construction would continue to increase the opportunities for new or more cheatgrass/invasive species establishment. Vegetation treatments would continue to be conducted in response to wildland fire, in response to surface disturbing activities, or completed on small acreages for other types of habitat improvement/restoration projects. However, required nesting and breeding habitat and cover (i.e., tall shrubs) for Special Status Species would not reestablish for approximately 20-30 years. With the decreased fire return interval, nesting/breeding/cover habitat may never reestablish within the CESA. Vegetation treatments that include seeding native grass and forb species would provide an increase in food supplies in the short term for Special Status Species and their prey. However, this use would suppress the establishment of native and/or seeded species. It is expected that vegetation treatments would not increase native vegetation establishment or decrease cheatgrass/invasive species establishment, but would be invaded due to lack of establishment of seeded/native species. Special Status Species dependent upon prey

for food will continue to hunt in the CESA, as the prey base is more adaptable to the cheatgrass/invasive species habitat. However, if these species can no longer support themselves, they would move to more appropriate habitat and so would the predator Special Status Species. The No Action Alternative would increase cumulative impacts within the CESA and in the surrounding contiguous shrub/perennial grass-dominated habitat for Special Status Species.

Under the Proposed Action, the cumulative effects would be slightly decreased by providing fuel breaks which allow fire suppression personnel and equipment a greater opportunity to contain wildland fires at a smaller size and keep them in the cheatgrass/invasive species vegetation community. The risk of large wildland fires consuming shrub/perennial grass-dominated habitat outside of the CESA would be decreased. Mowing the small shrub portion of the treatment areas and using livestock to graze the cheatgrass to a short stubble height provides an area where fire spread slows down and fire suppression crews can anchor to safely conduct fire suppression activities. However, mowing would remove nesting/breeding/cover habitat still present. Special Status Species would forage in the areas during migration, nesting/breeding, winter, and hunt prey species present, use the portable water troughs/supplements when they are available, use the fence posts and wires for perches for hunting/foraging and territory defense, and would continue to use the CESA for those life-cycle requirements still present. Conserving the shrub/perennial grass-dominated habitat outside of the CESA (specifically, protecting Priority Habitat Management Areas [PHMAs] for greater sage-grouse) provides contingent habitat for Special Status Species to utilize during important life-cycles, which would still strain the habitat, but would decrease the rate of Special Status Species mortality/population decreases. However, the vegetation treatments completed in response to the smaller fires would also provide suitable feed for Special Status Species when necessary and rest the shrub/perennial grass-dominated (PHMA) habitat from foraging use. All other actions within the CESA would have the same cumulative impacts as the No Action Alternative.

4.1.15. Wildland Fire Management

The scope of analysis for cumulative impacts includes the project area and adjacent grazing allotments for the effective life of the network of fuel breaks. This scope is appropriate as fuel breaks within the project may impact wildland fires in nearby areas.

Past actions in the area have shaped the management of wildland fire. Present and foreseeable future impacts would continue to shape the way wildland fire is managed.

Ongoing livestock grazing may also contribute to cumulative effects. Grazing can reduce vegetation height and biomass and could alter fuel loading within and adjacent to treatment areas, potentially reducing the rate of spread for fire or fire severity.

The effects of climate change on the analysis area are likely to be substantial; as the region becomes dryer and hotter, restoration of vegetated fuel breaks could become harder to establish and fires would likely become more prevalent. However, the proposed treatments should make

the analysis area more resilient to fire, potentially mitigating the effects of climate change on vegetation in the analysis area.

Under the No Action Alternative, the effects of past, present, and foreseeable actions in the analysis area are expected to continue current trends for wildland fire occurrence. This means that vegetation would continue to be converted to annual invasive grass communities and that fire would likely remove any existing or recovering shrub stands.

With the Proposed Action, wildland fire size and frequency could be reduced. With a reduction in frequency, vegetative communities within the analysis area are expected to gradually increase in species and structural diversity. A more native fire return interval would also allow for reestablishment of woody shrub components such as sagebrush and rabbit brush.

5. Consultation and Coordination

5.1. Public Involvement and Scoping

A scoping package, initiating a 30-day scoping period, was sent to the interested parties listed below on September 22, 2016. The package provided a general description of the Proposed Action and a link to project maps and additional project information.

Bar L Ranch
Carl Slagowski
Congressman Mark Amodei
Elko County
Elko Land and Livestock Company
Eureka County Department of Natural Resources
Eureka County District Attorney
Heguy Ranches, Inc.
Jerry Todd
Jim Baumann
John Ross
Kathy Gregg
Ken Conley
Laurel Marshall
Lenny Fiorenzi
Maggie Cr. Ranch LP
Natural Resources Management Advisory Commission
Nevada Cattlemen's Association
Nevada Department of Agriculture Nevada Department of Wildlife
Nevada State Clearing House
Newmont USA Limited
Pattani Ranch Partnership
Resource Concepts, Inc.
Sustainable Grazing Coalition
U.S. Senator Harry Reid
US Fish & Wildlife Service
US Senator Dean Heller
USFS Mountain City Ranger District
Western Watersheds Project
Wildlands Defense

The BLM Tuscarora Field Office received comments during the scoping period from two entities and are summarized and addressed in Table 21. A targeted grazing public outreach meeting was held on October 6, 2016.

Table 21. Public Scoping Comments

Comment	BLM Response
Elko Land and Livestock: **In its planning and analysis, we suggest that the Bureau of Land Management (BLM) Consider:**	
Ensuring that monitoring methods are appropriate for long-term evaluation and management needs; similarly, ensuring that resources are available and committed for monitoring for the full duration of the Project	This project has a significant monitoring component (Appendix B). Monitoring includes but is not limited to: Bare Ground, Foliar and Basal Cover, Vegetation Composition, Vegetation Height, and Bulk Density. The AIM Protocol will be used as the Bureau of Land Management has adopted this protocol nationally. This will allow the data to be used as part of a national data set.
Continuing to work directly with permittees in developing the Targeted Grazing prescription for the Project	Direct coordination will continue with the permittee in developing the Targeted Grazing prescriptions.
Providing appropriate incentives to permittees participating in the Project to maintain operational aspects of the ranches and long-term durability of the Project	Comment Noted
Providing to existing permittees a preference or option for first refusal for precision Targeted Grazing implementation for the Project	Per the direction of Secretarial Order 3336 livestock permittees have had this opportunity.
Ensuring information transfer to user groups and land managers	The data collected from this project will contribute to a national dataset and be shared with agencies and user groups alike.
Comments From Eureka County Board of Commissioners:	
We provide our approval and support of BLM's recognition of grazing as a powerful tool in reducing fine fuels.	Comment Noted
This proposal seems consistent with Eureka County's plans and policies outlined in the Eureka County Master Plan.	Comment Noted
For this proposal, we ask that you use and implement the available research completed by Dr. Barry Perryman (and others) in Nevada and Oregon showing the benefits and utility of fall grazing in addition to any spring grazing that may be planned.	Fall grazing has been identified as a component of the EA

Public Comment
On December 12, 2016 the Bureau of Land Management, Tuscarora Field Office sent a letter to interested publics soliciting comments on the draft Targeted Grazing Fuel Breaks Environmental Assessment posted at: bit.ly/2cAoTjQ.

The comment period was open for 30 days and closed January 12, 2016. Timely comments were received from six entities.

5.2. Tribal Consultation and Information Sharing

BLM sent letters on 10-25-2016 sharing project information and offering the opportunity to initiate formal government to government consultation to the following tribes (see also Table 13 in Native American Concerns Section 3.2.10):

- The Te-Moak Tribe of the Western Shoshone Indians of Nevada
- The Battle Mountain Band Council of the Te-Moak Tribe
- The Elko Band Council of the Te-Moak Tribe
- The South Fork Band Council of the Te-Moak Tribe
- The Wells Band Council of the Te-Moak Tribe
- The Shoshone-Paiute Tribes of the Duck Valley Indian Reservation

BLM has had face-to-face consultation meetings on the Targeted Grazing EA with:

- The Battle Mountain Band of the Te-Moak Tribe, 11-10-16.

Information Sharing and Coordination has taken place with:

- Elko Band Council of the Te-Moak Tribe Environmental Coordinator, 11-1-16 and 12-9-2016.
- Te-Moak Tribe of the Western Shoshone Indians of Nevada Environmental Coordinator, 12-9-2016.
- Wells Band Council of the Te-Moak Tribe Environmental Coordinator, 12-9-2016

This project are may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The Bureau of Land Management (BLM) will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to fence lines to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

5.3. List of Preparers

C. John Mitchell, Rangeland Management Specialist, Project Lead

Beth Wood, Natural Resource Specialist (Fisheries)

Dan Broockmann, Archaeologist

Dylan Rader, Fire Ecologist

Elisabeth Puentes, Realty Specialist

John Daniel, Hydrologist

Kelly Michelsen, Natural Resource Specialist (Wildlife)

Mike Setlock, Outdoor Recreation Planner

Richard Adkins, Native American Coordinator

Sam Cisney, Weed Management Specialist

6. References

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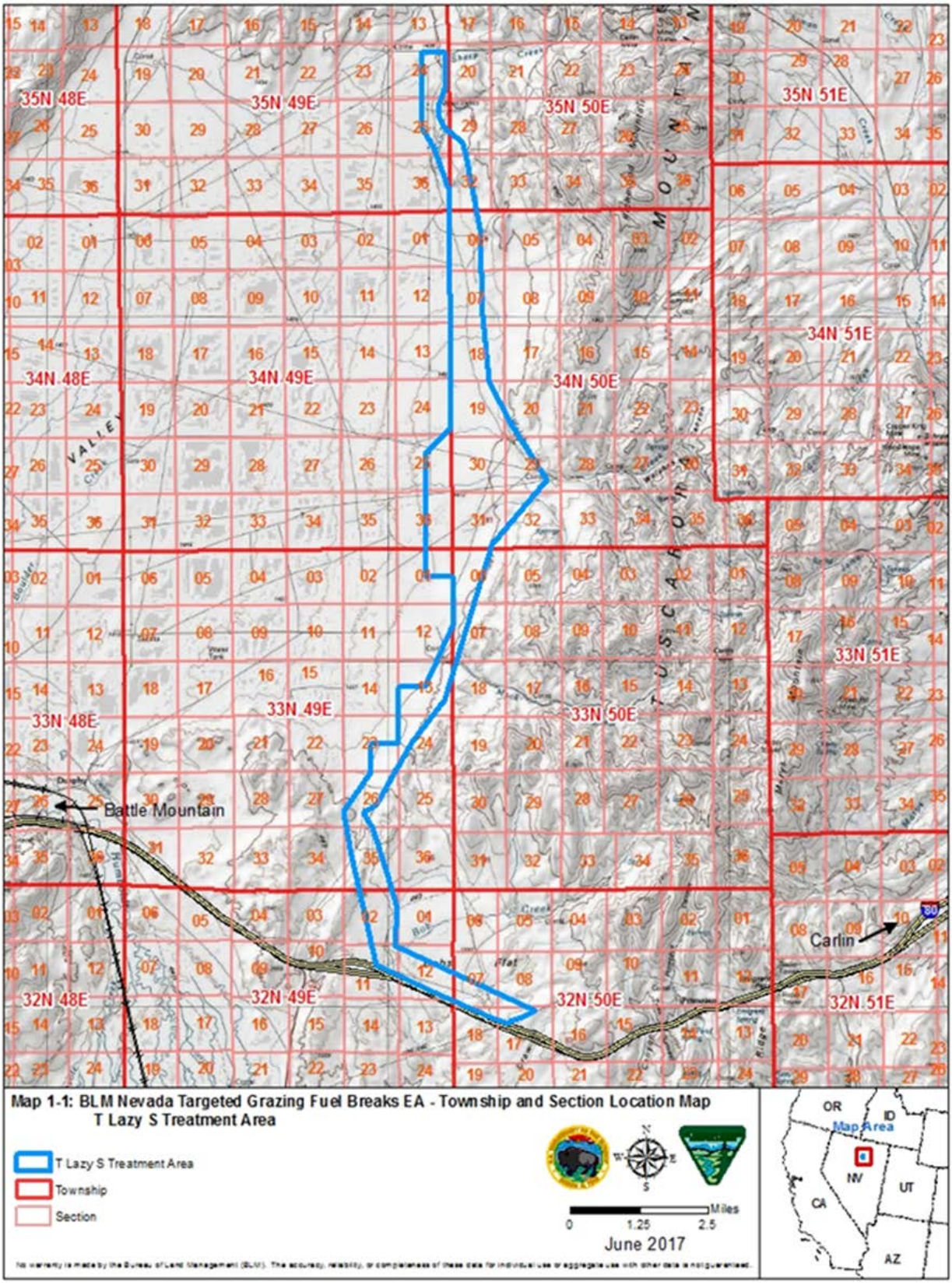
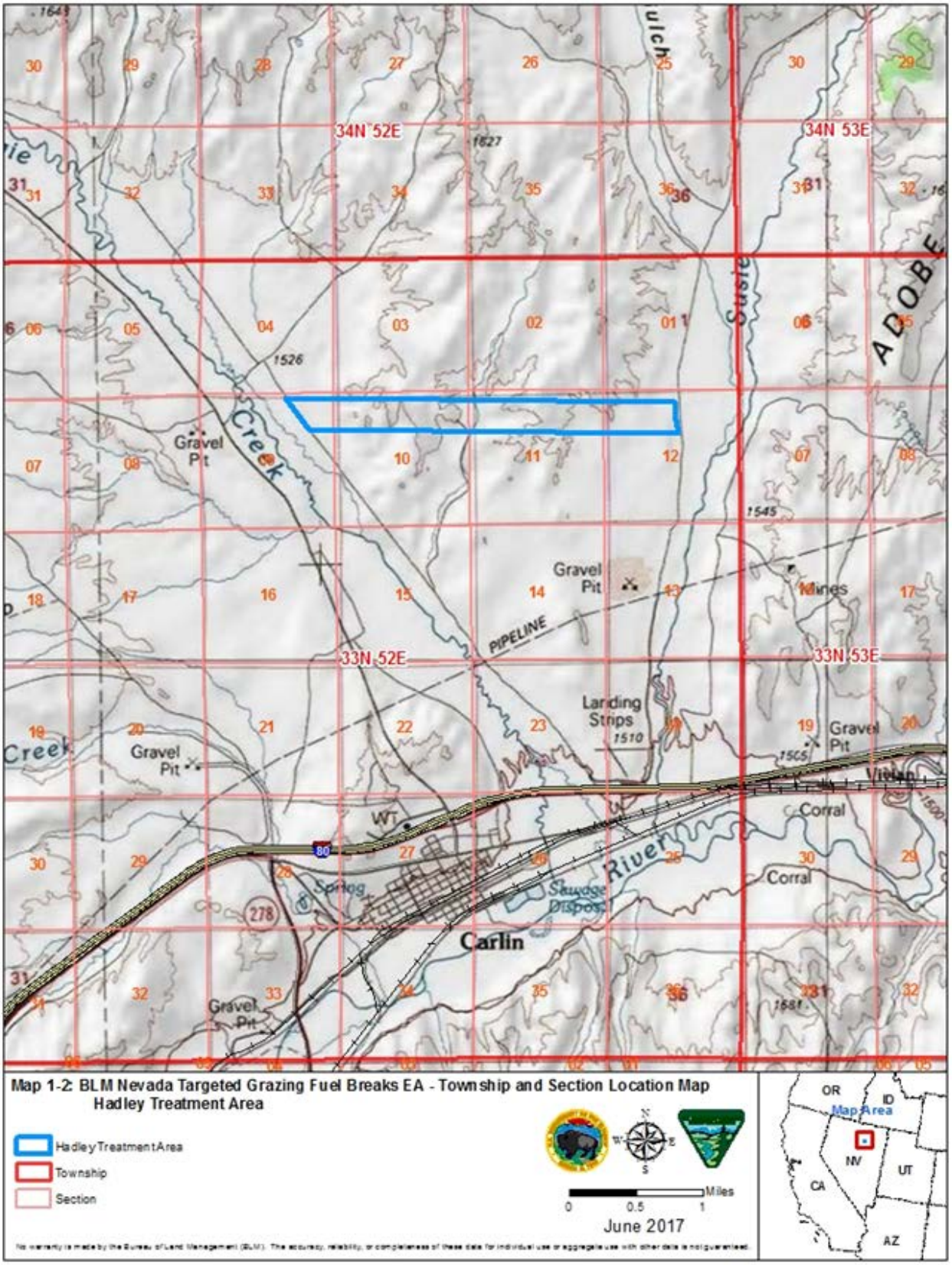
Appendix A Project Maps

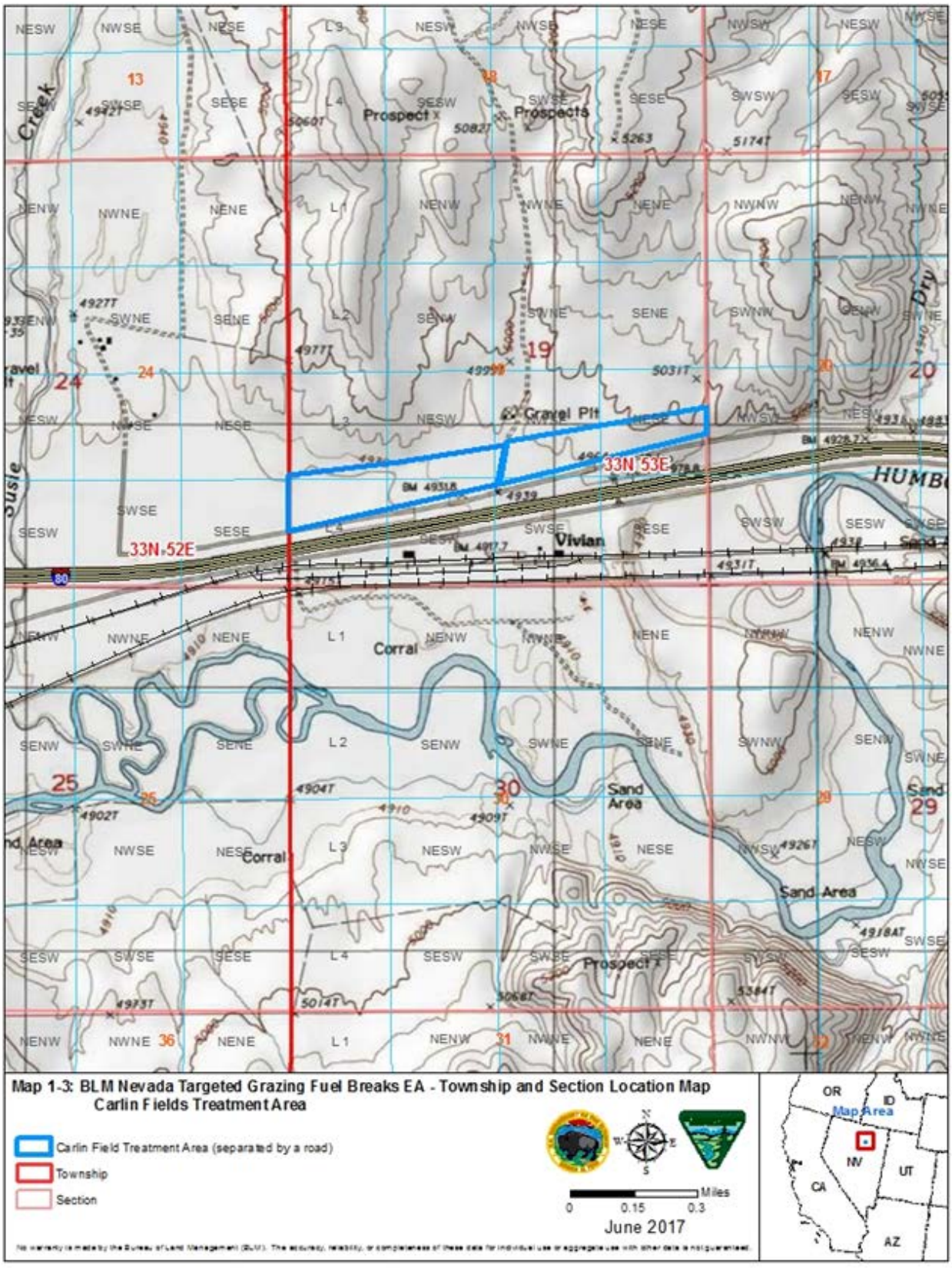
Map 1-1. T Lazy S Treatment Area Location



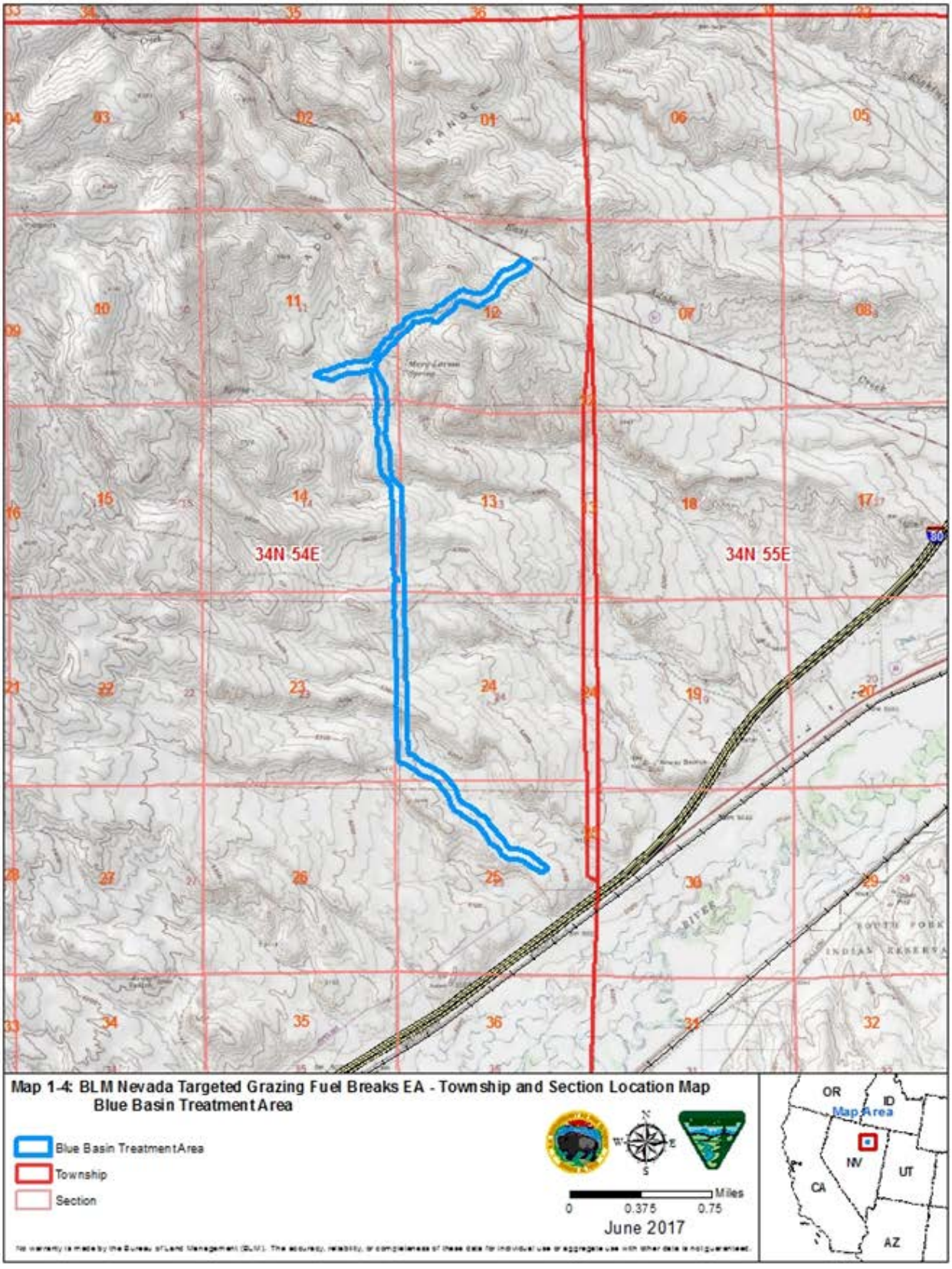
Map 1-2. Hadley Treatment Area Location Map



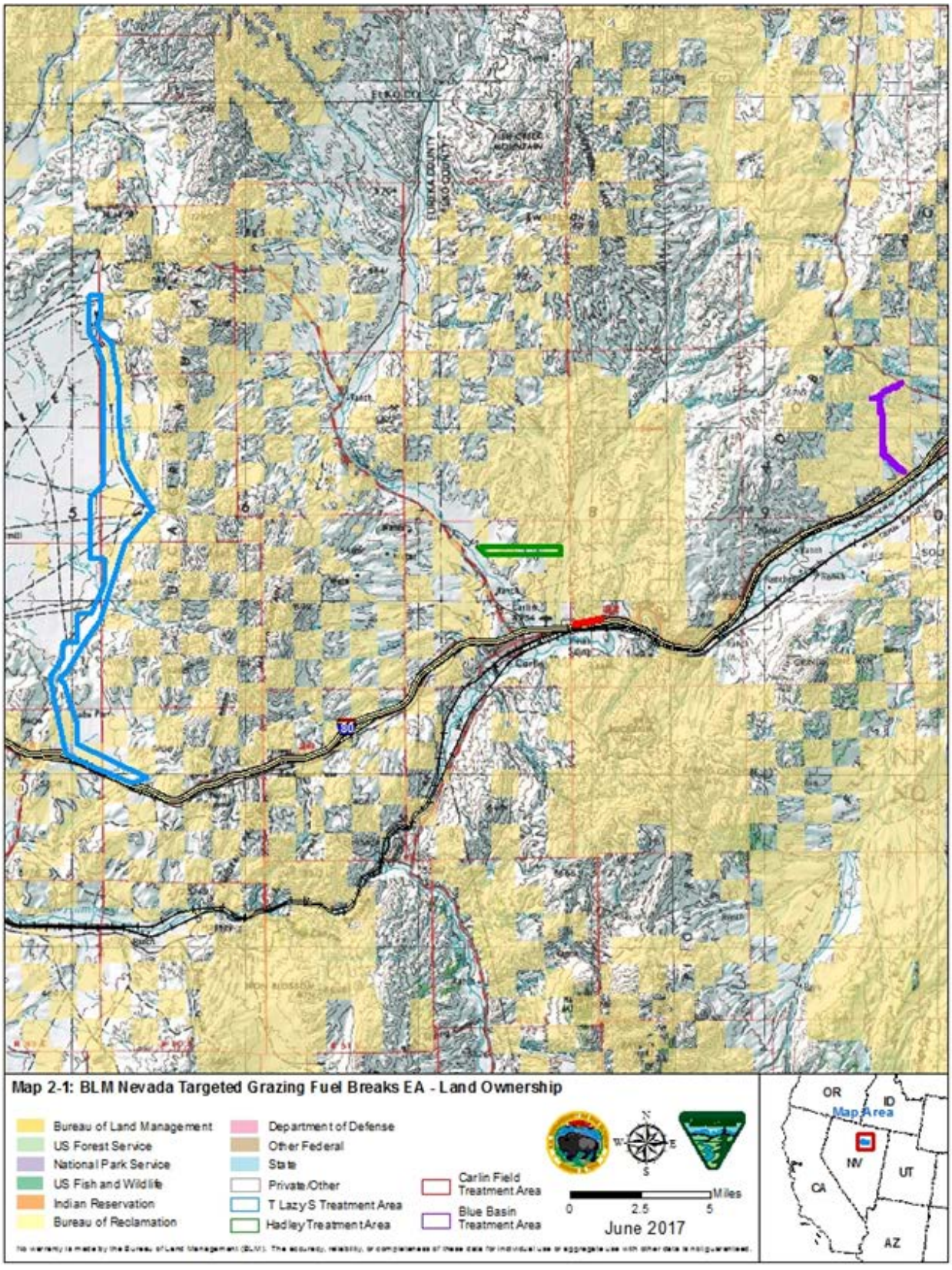
Map 1-3. Carlin Field Treatment Area Location



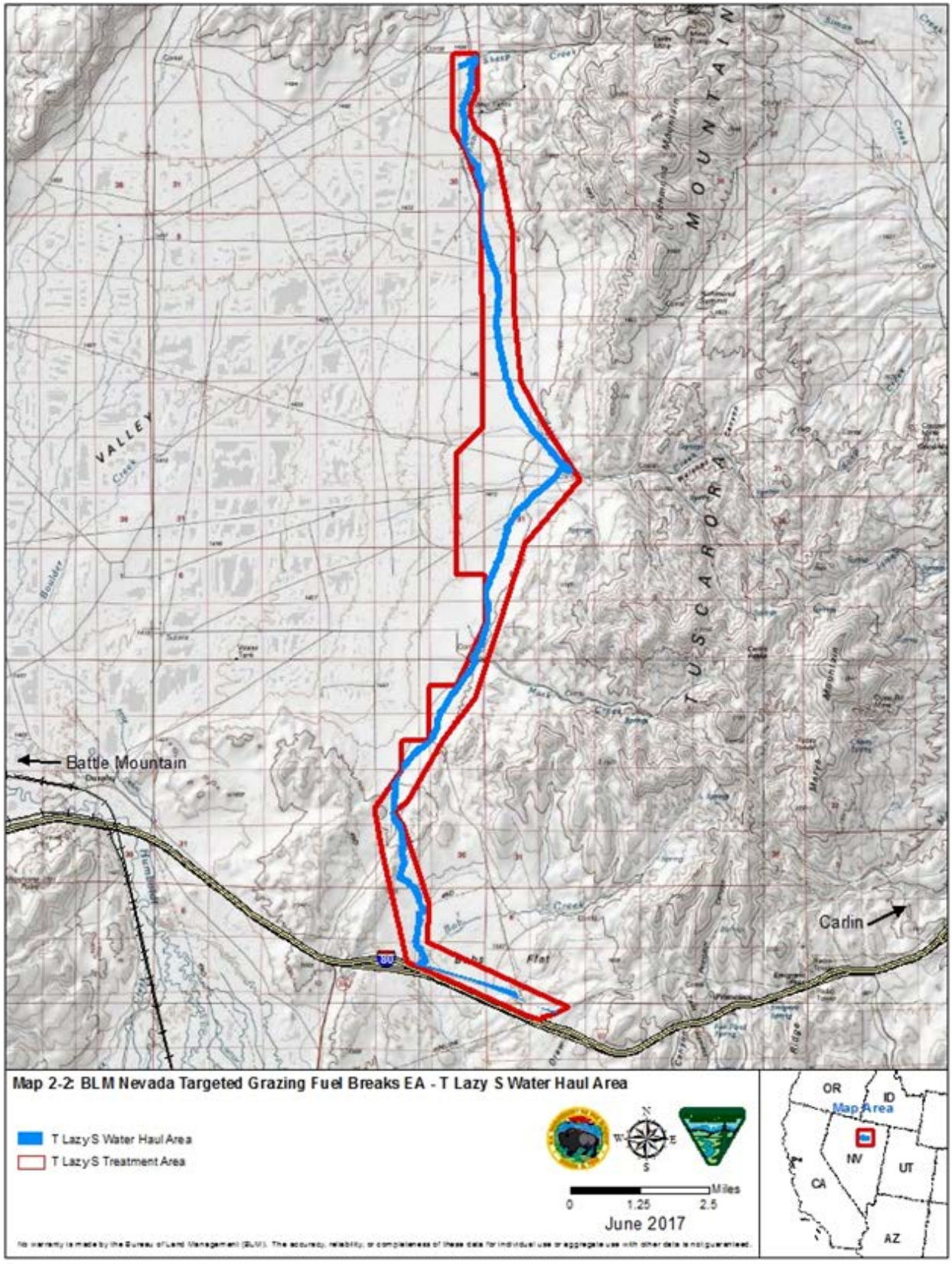
Map 1-4. Blue Basin Treatment Area Location



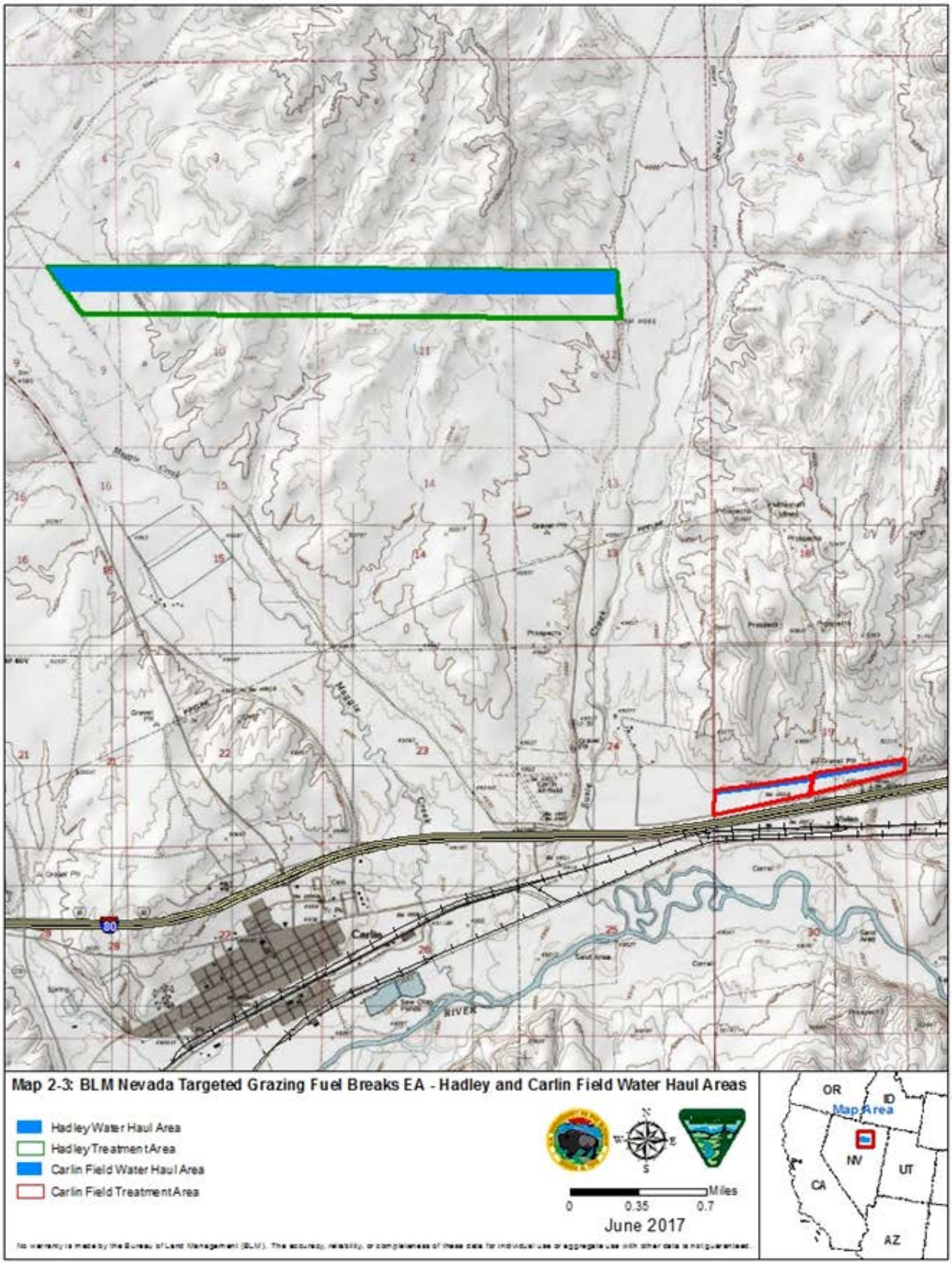
Map 2-1. Land Ownership



Map 2-2. T Lazy S Water Haul Area

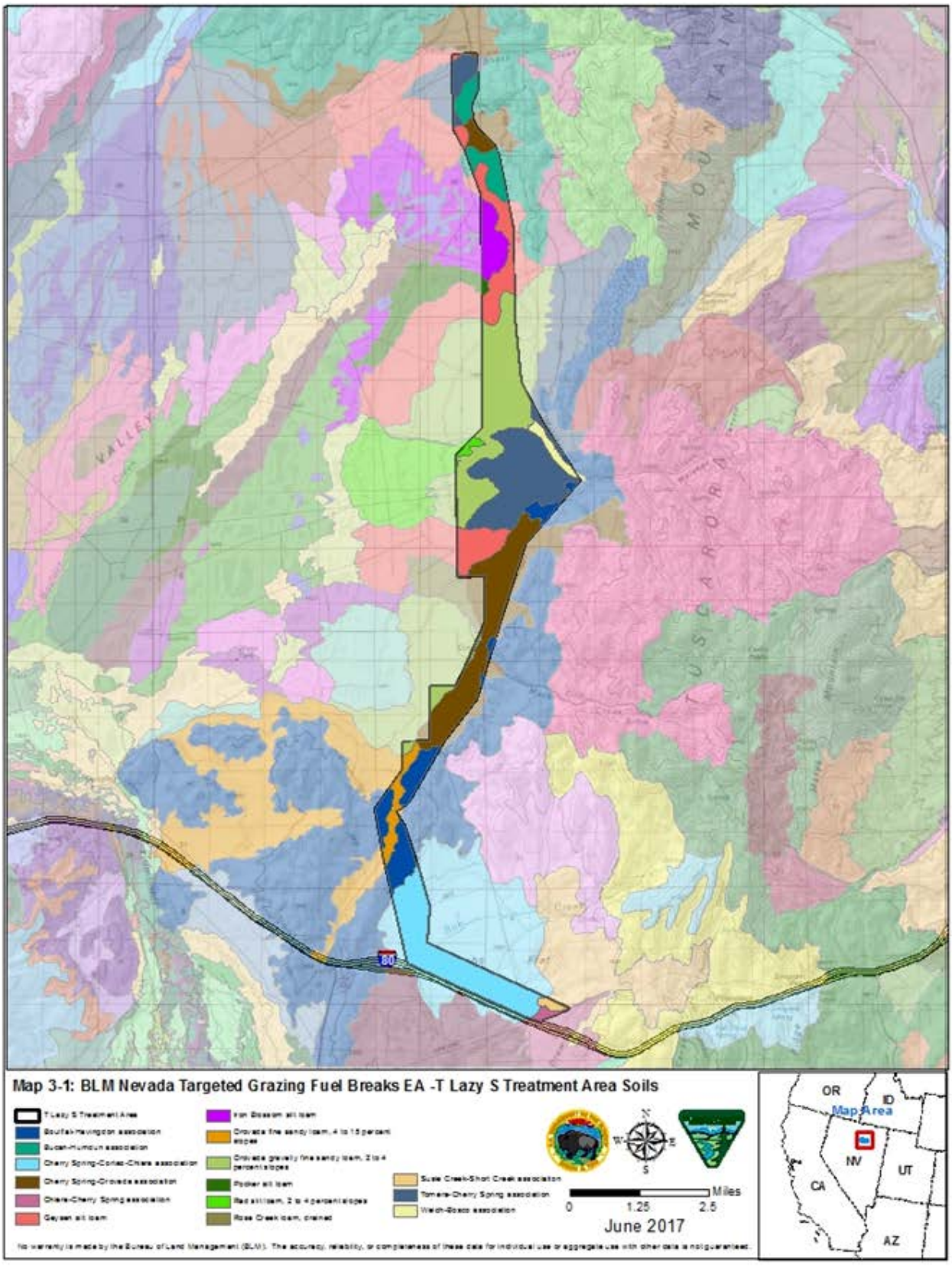


Map 2-3. Hadley and Carlin Field Water Haul Areas

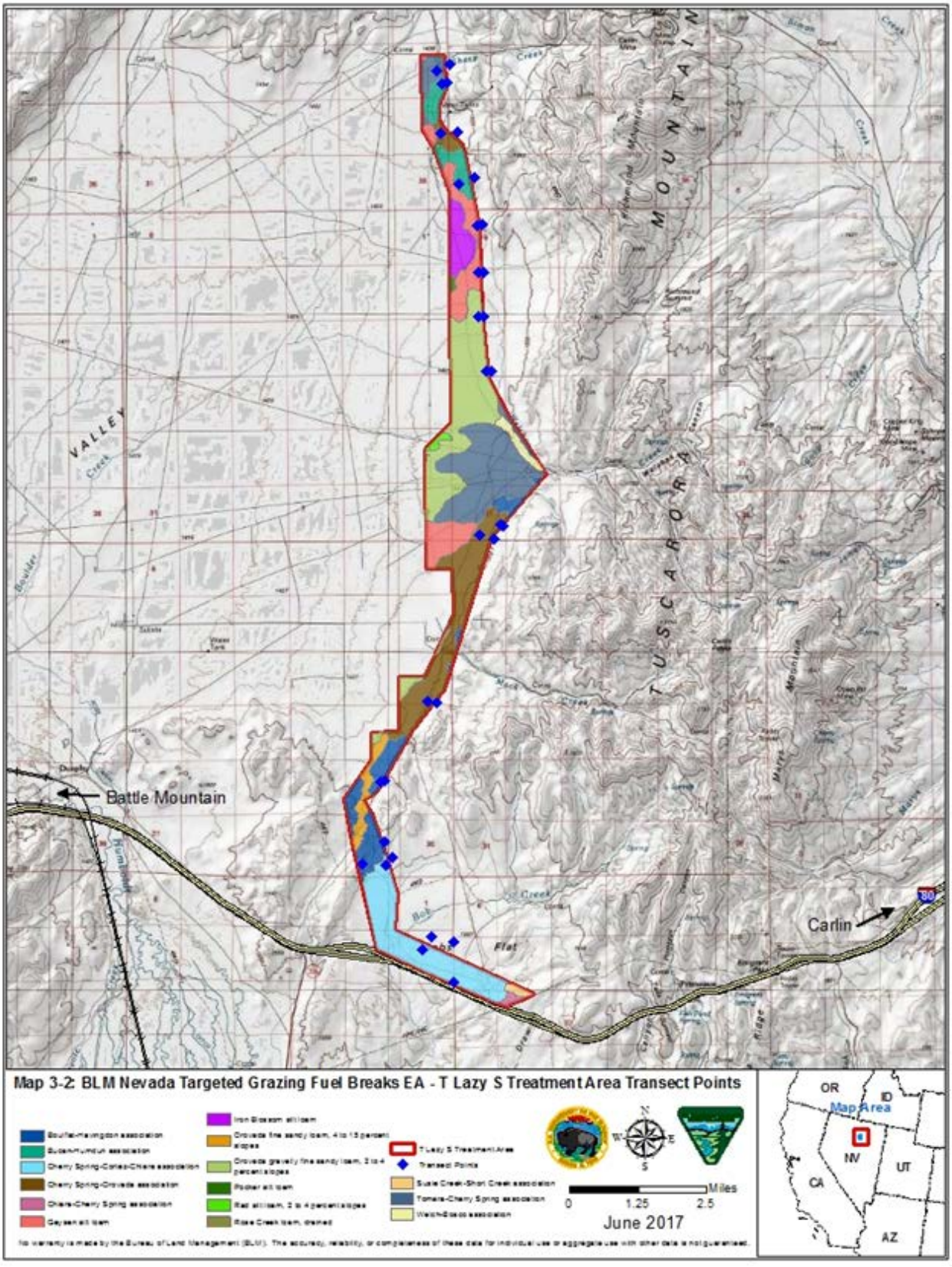


Map 2-4. Blue Basin Water Haul Area

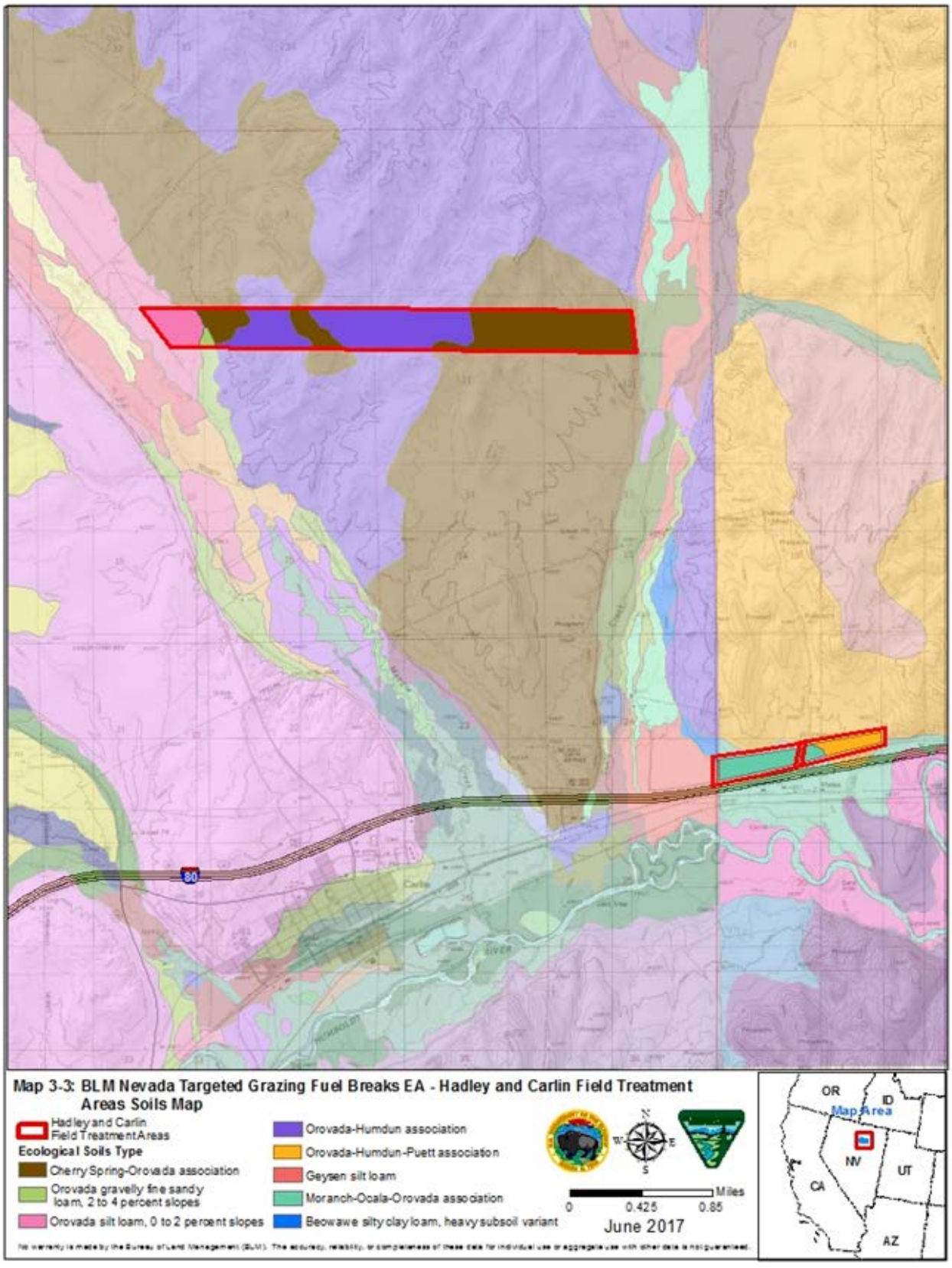
Map 3-1. T Lazy S Treatment Area Soils



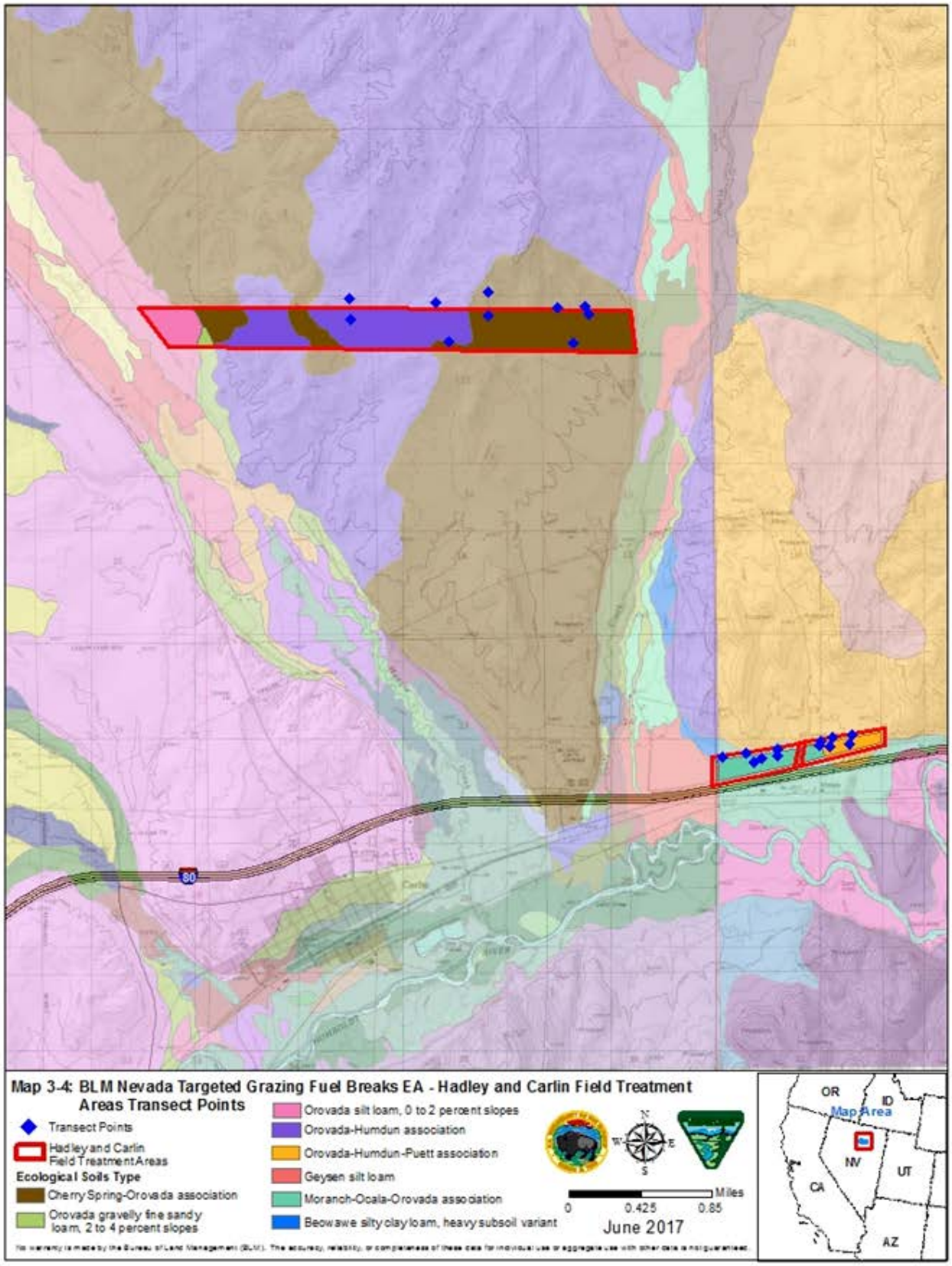
Map 3-2. T Lazy S Treatment Area Transect Points



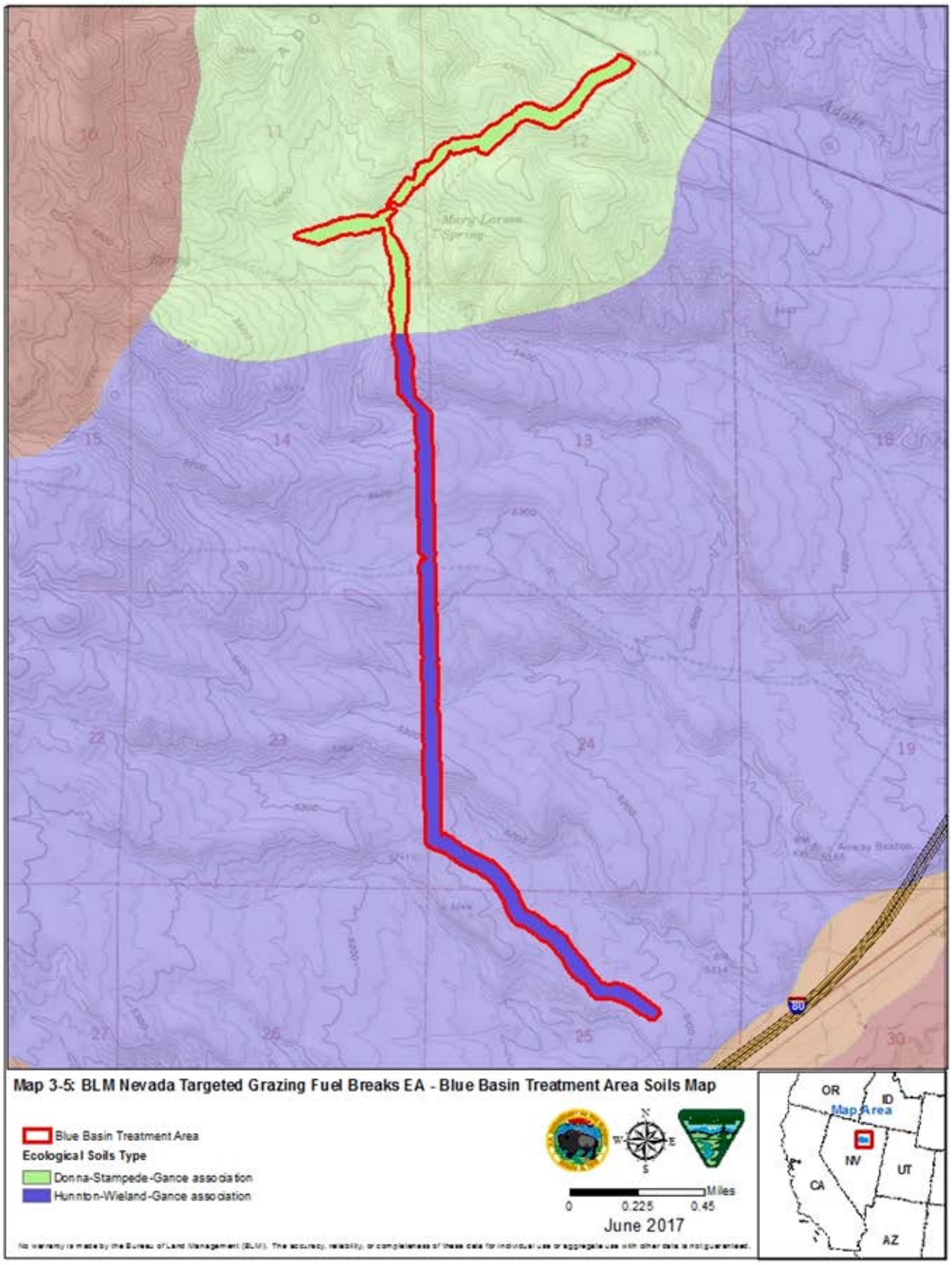
Map 3-3. Hadley and Carlin Field Treatment Areas Soils



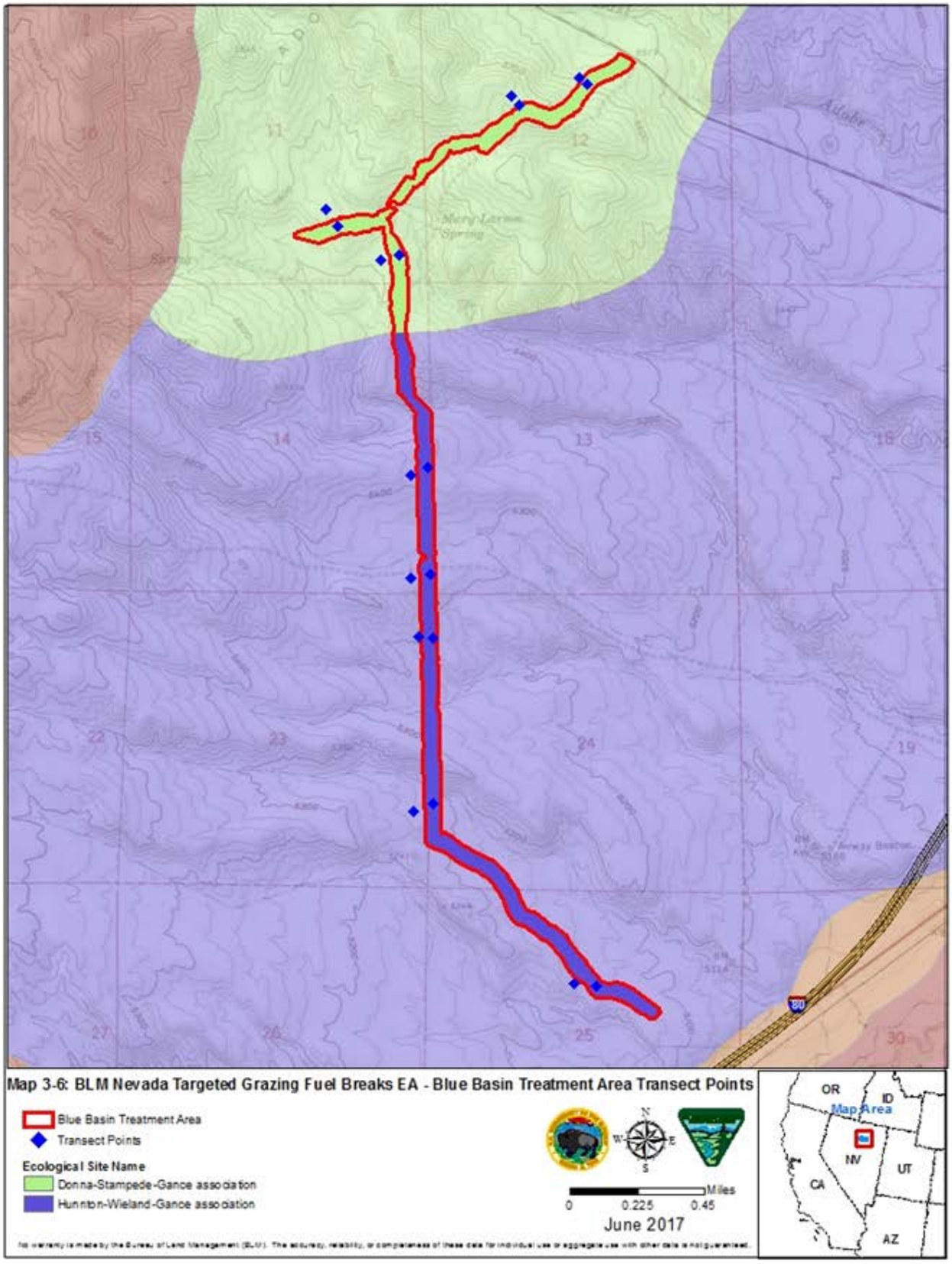
Map 3-4. Hadley and Carlin Field Treatment Areas Transect Points



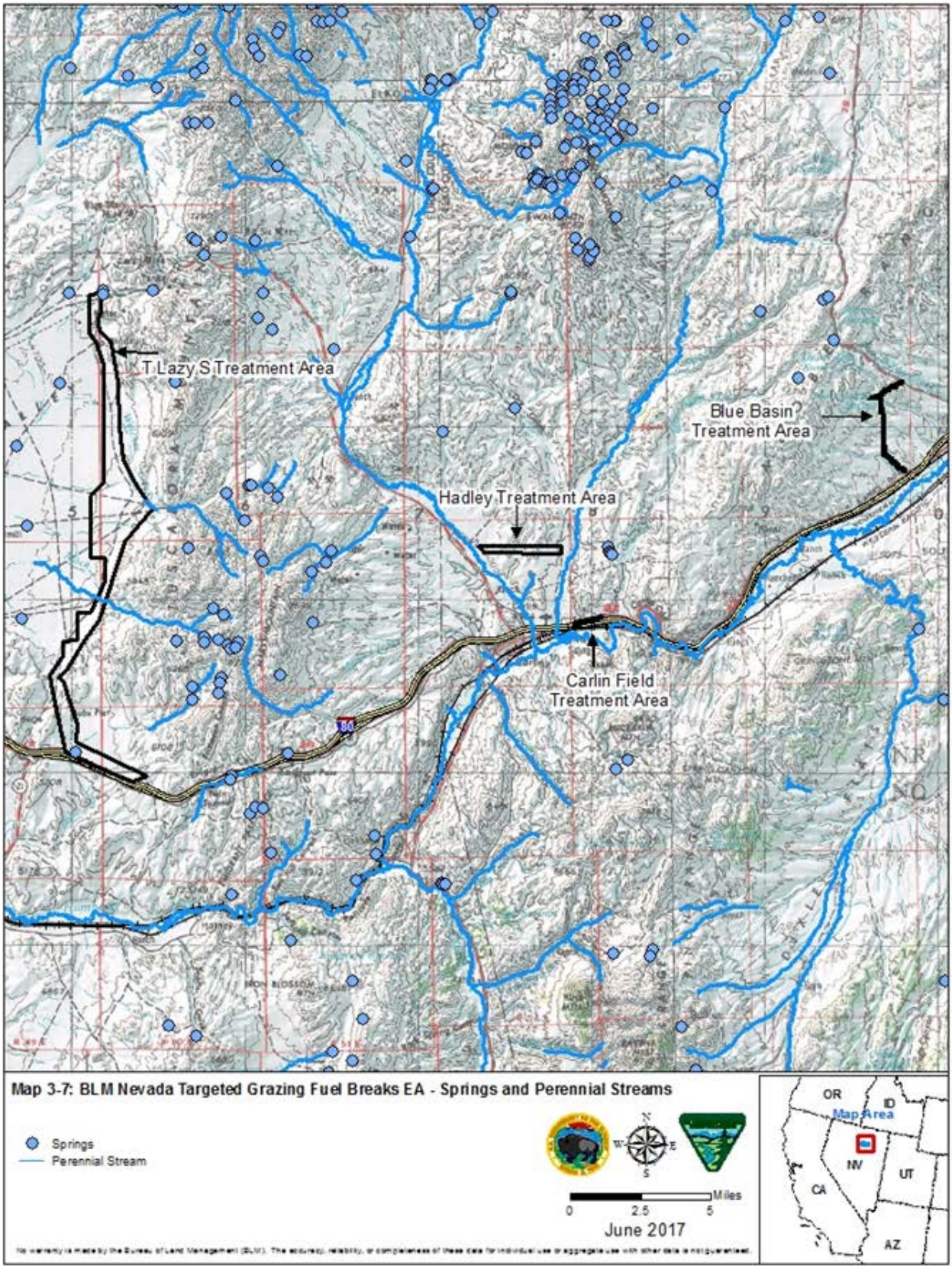
Map 3-5. Blue Basin Treatment Area Soils



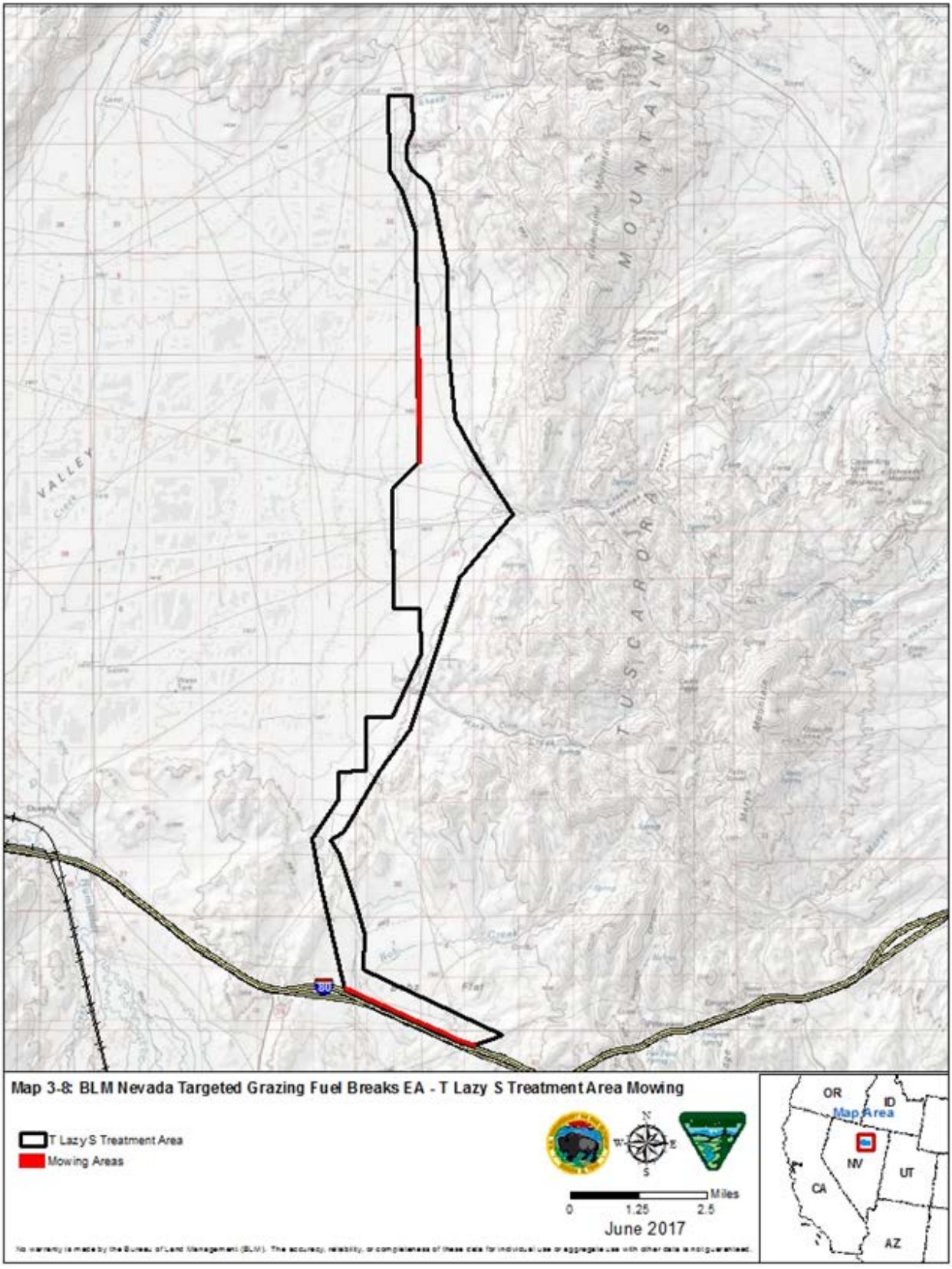
Map 3-6. Blue Basin Treatment Area Transect Points



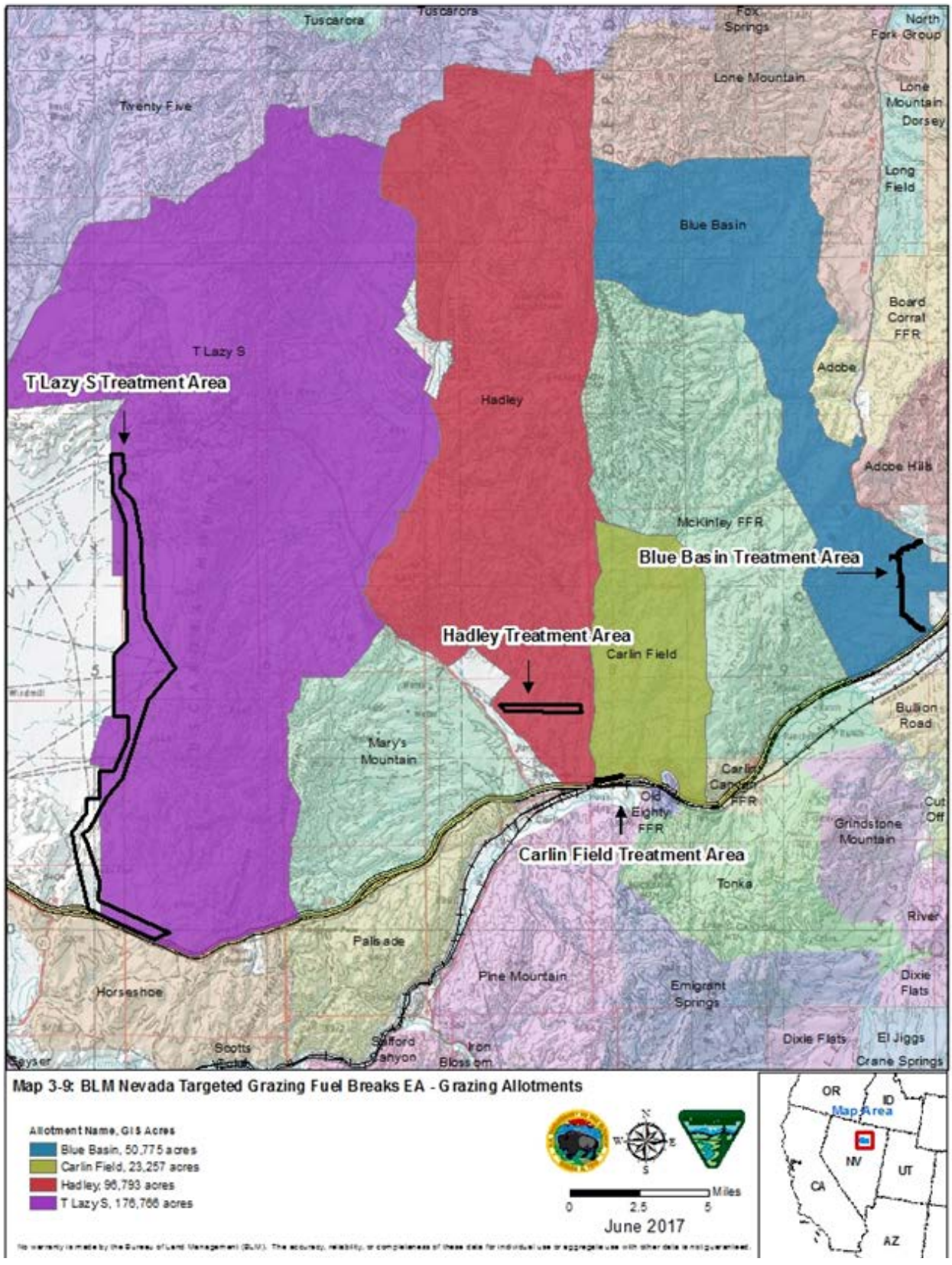
Map 3-7. Springs and Perennial Streams



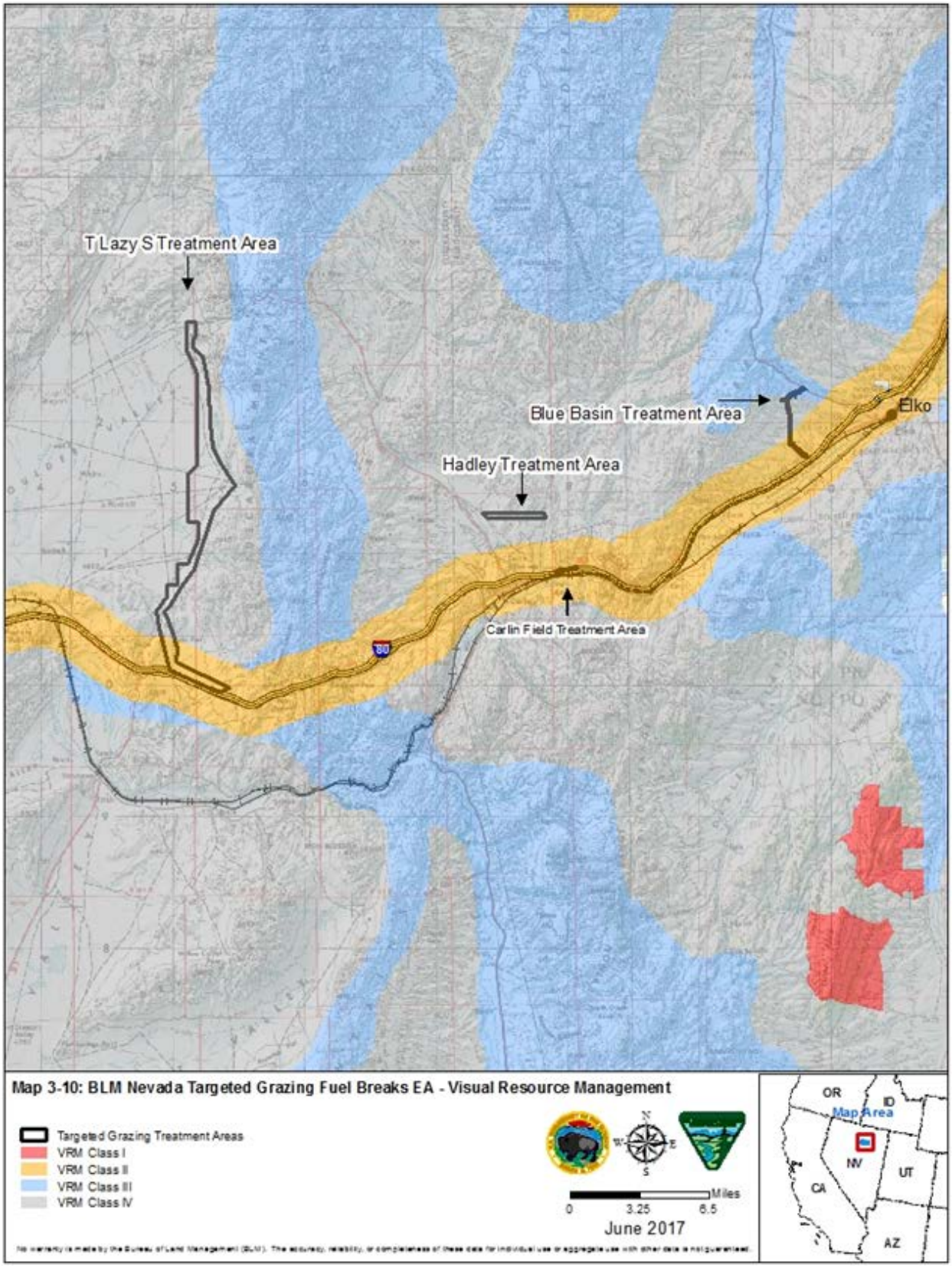
Map 3-8. T Lazy S Treatment Area Mowing



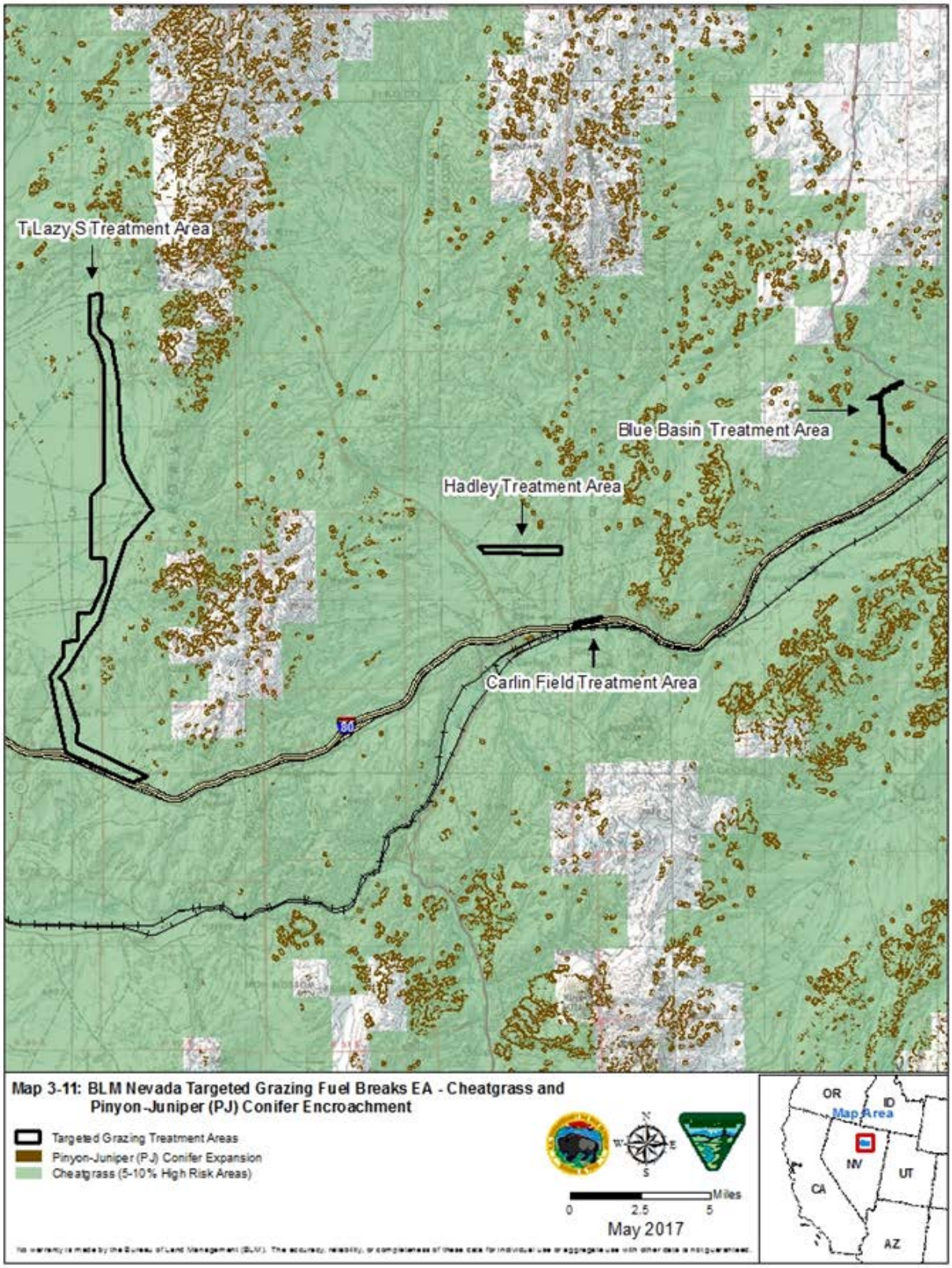
Map 3-9. Grazing Allotments



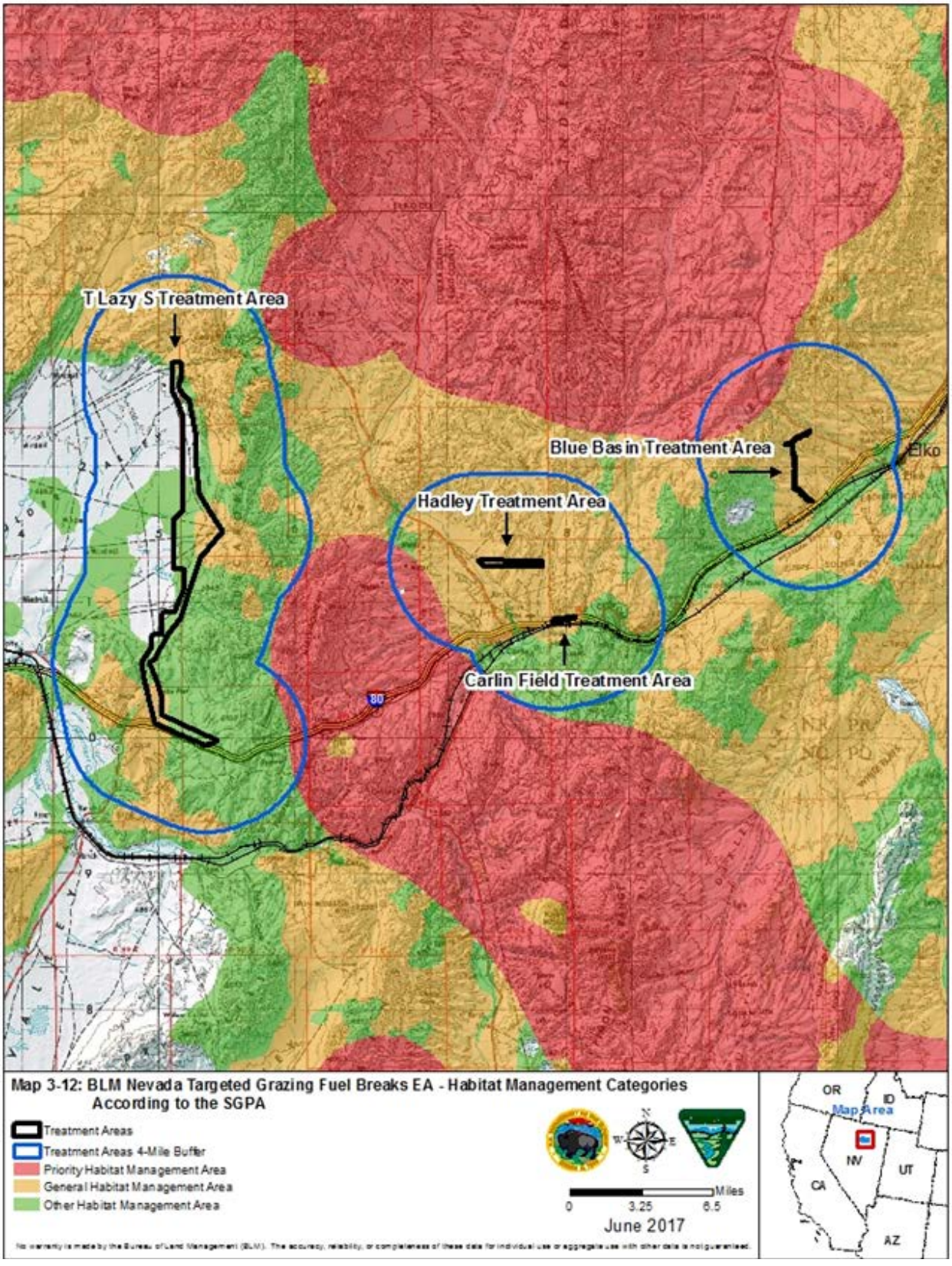
Map 3-10. Visual Resource Management Classes



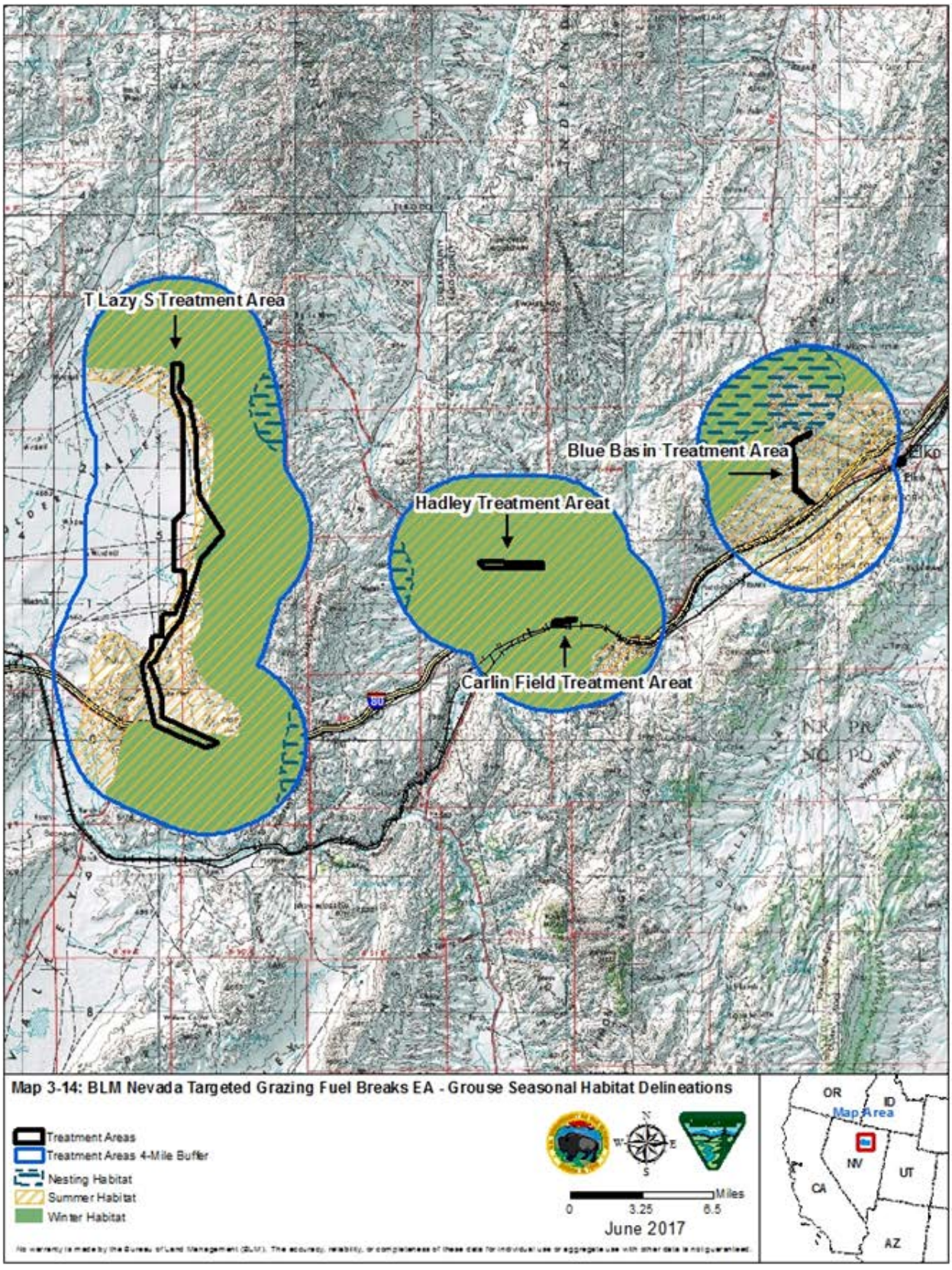
Map 3-11. Cheatgrass and Pinyon-Juniper Conifer Encroachment



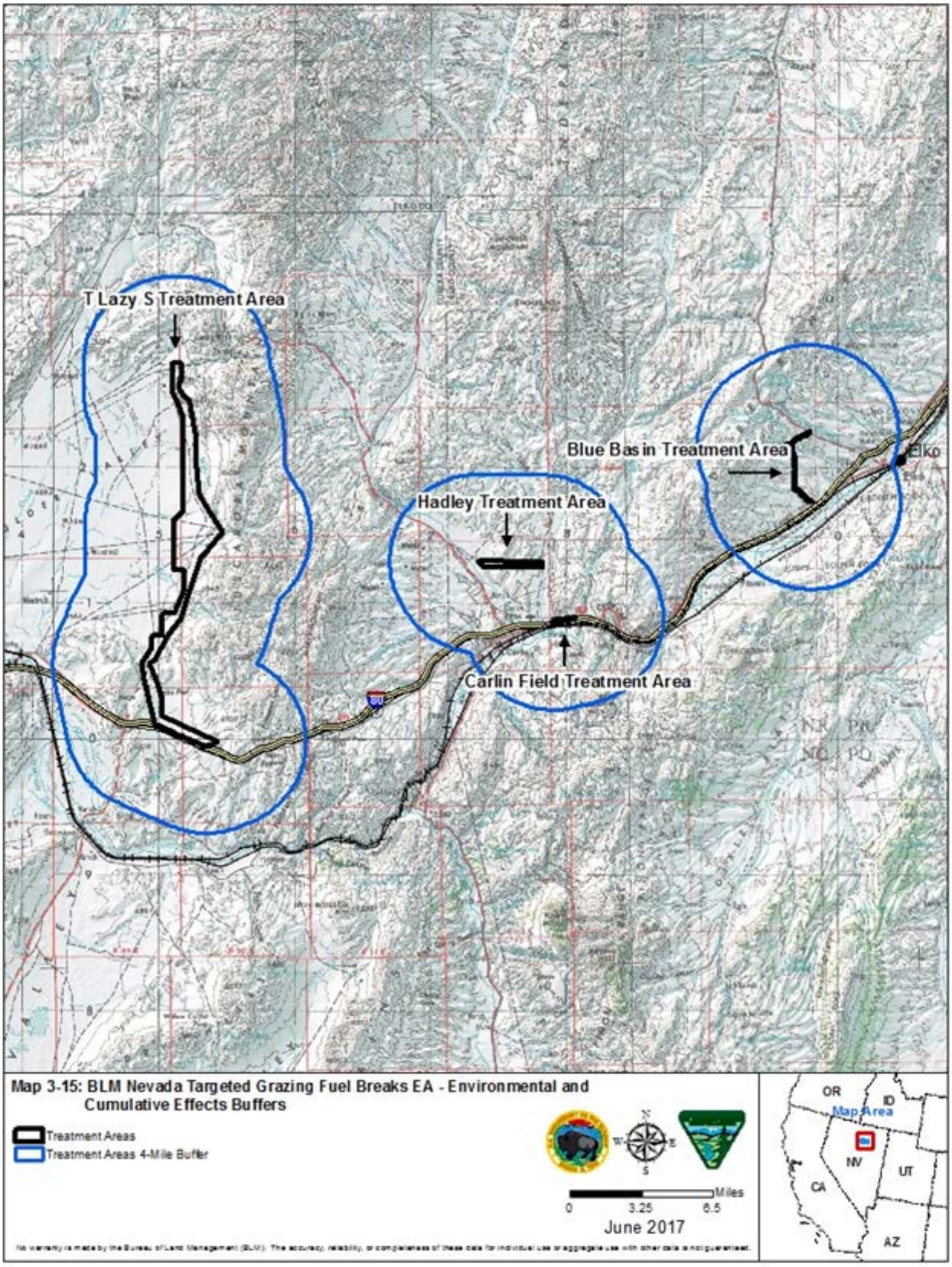
Map 3-12. Habitat Management Categories



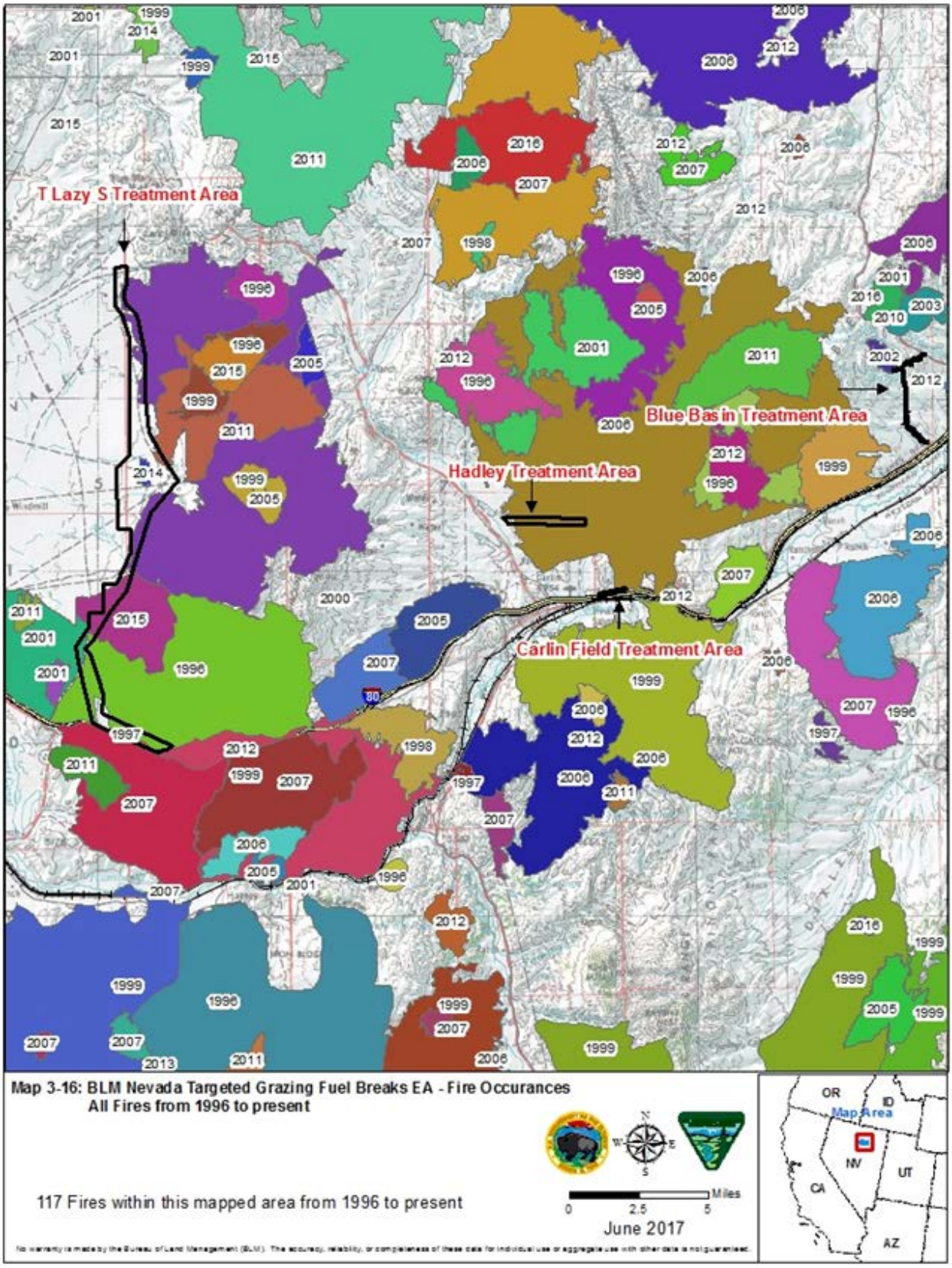
Map 3-14. Grouse Seasonal Habitat Delineations



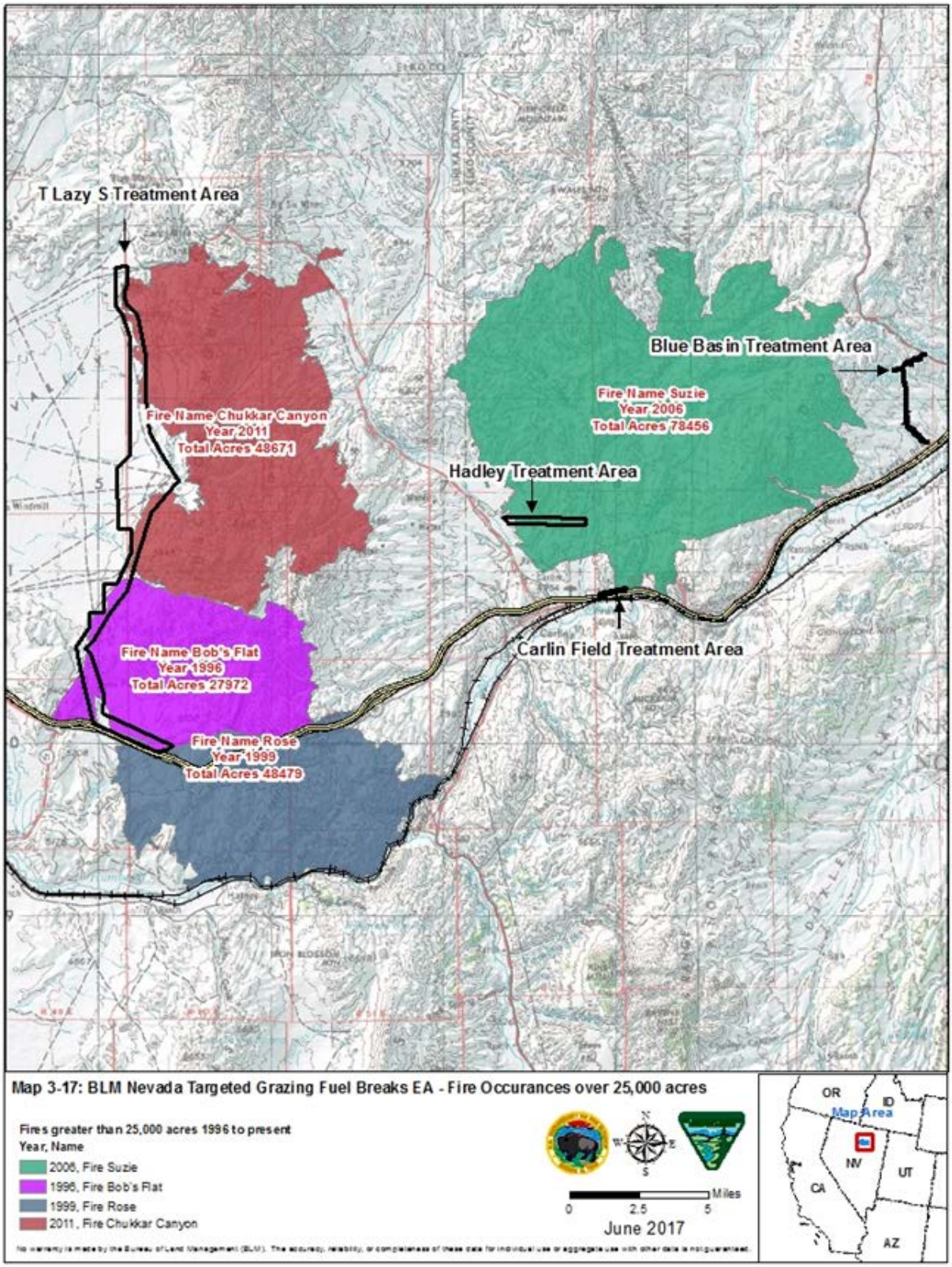
Map 3-15. Environmental and Cumulative Effects Buffers



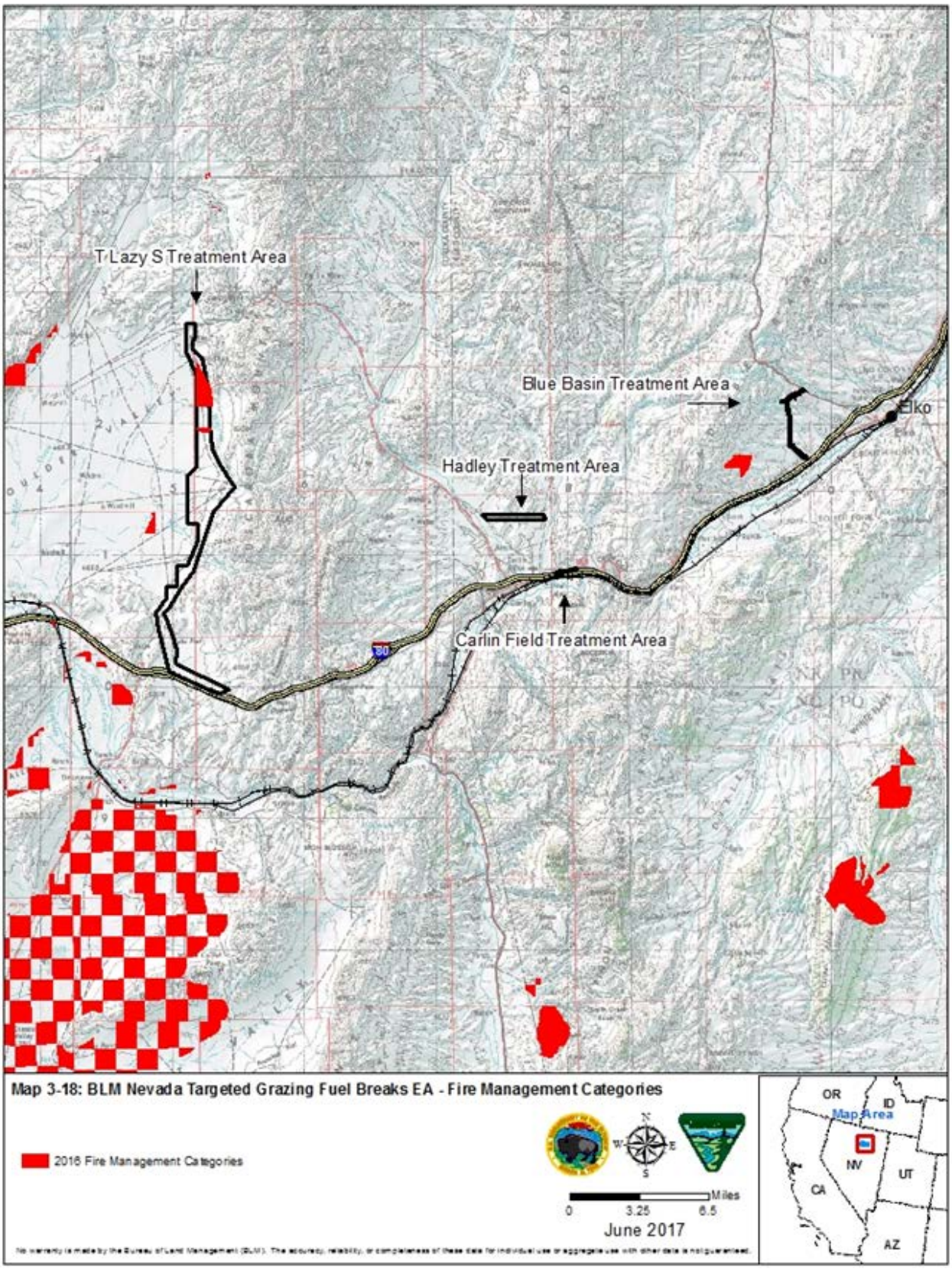
Map 3-16. Fire Occurrences: All Fires 1996- Present



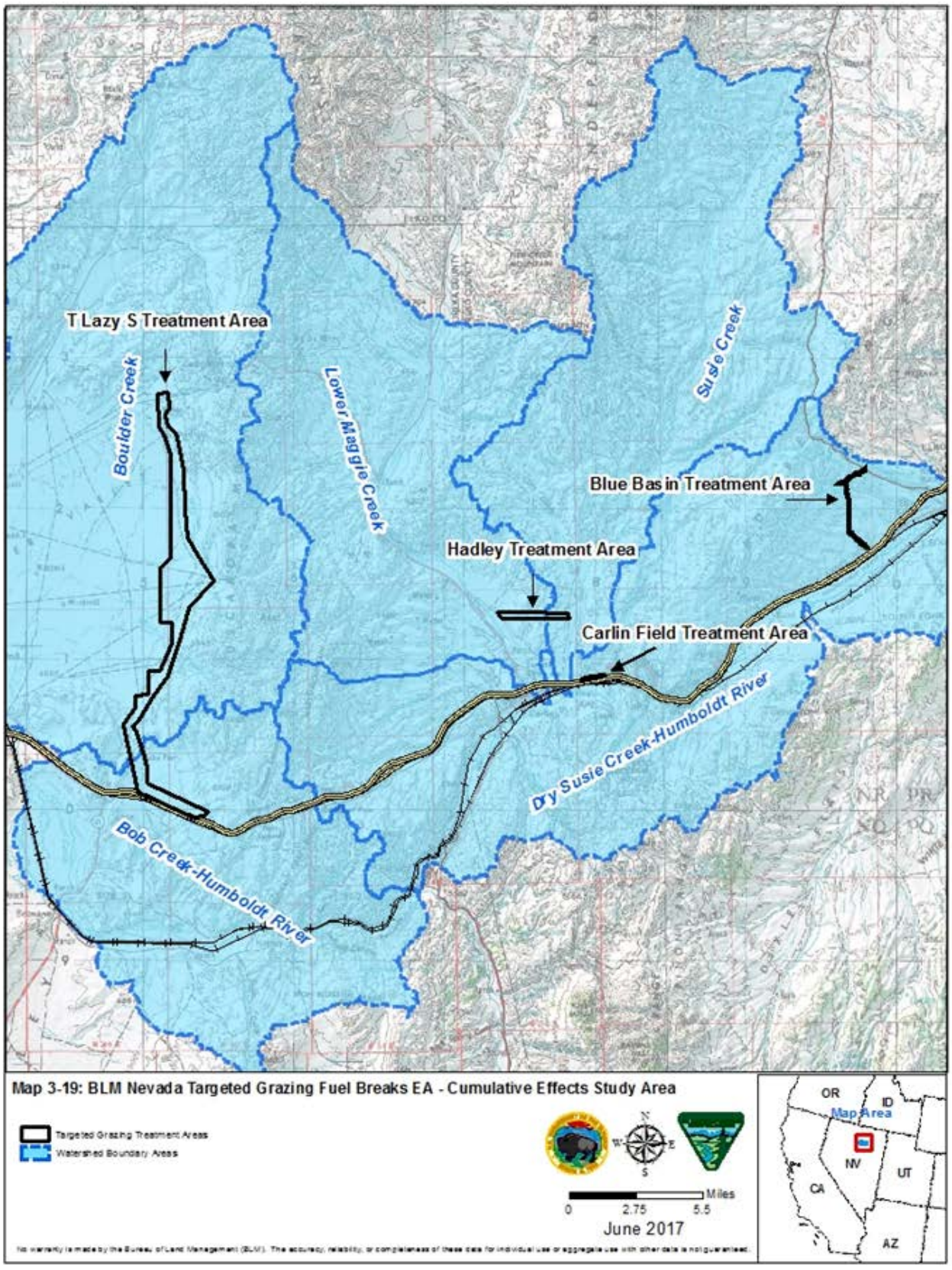
Map 3-17. Fire Occurrences Over 25,000 Acres



Map 3-18. Fire Management Categories



Map 3-19. Cumulative Effects Study Area



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Appendix B Standardized Monitoring & Assessment Protocols

Mode	Parameter	Protocol	Purpose	Comments
Treatment Application	Visual Record	Photo Points, Repeated	Document before-after state of treated area.	Important technology- transfer information.
	Phenology	Grass, 6-class Phenology	Document phenological timing of grazing.	See phenological class description below in Details section.
	Residual Fuel Height	Stubble Height with Pace Transects	Iteratively assess fuel height-reduction for target species.	NOT intended as a stand-alone measure of utilization (see below).
	Utilization	Paired-Plots with Utilization Cages	Assess utilization by % weight removed for target species.	Treatment applications of > 7 days during active growth require multiple assessments using movable cages.
Response Assessment	Bare Ground, Foliar and Basal Cover	Line-Point Intercept (LPI)	Assess erosion potential and habitat quality.	AIM Terrestrial Core Indicator.
	Vegetation Composition	Line-Point Intercept with Plot-Level Inventory	Assess species richness, abundance and identify presence of nonnative invasive plant species, species of management concern (e.g., T&E).	AIM Terrestrial Core Indicators.
	Inter-Canopy Gaps	Canopy Gap Intercept	Assess fuel continuity and potential for wind erosion and weed invasion.	AIM Terrestrial Core Indicator.
	Vegetation Height	Cylindrical Neighborhood	Assess vertical structure, habitat quality, and potential for wind erosion.	AIM Terrestrial Core Indicator.
	Production	Protected Plot with Cages	Assess fuel load and annual aboveground net primary productivity.	Sort by species, for shrub and tree species also sort by fuel-size class.
	Soil Compaction	Bulk Density	Assess soil compaction response to livestock grazing.	Compaction is of particular concern for early-spring grazing on moist soils.
Contingent Assessments	Soil Stability	Soil Aggregate Stability	Assess soil structural development, resistance to erosion, and biotic integrity.	AIM Terrestrial Contingent Indicator.

DETAILS

NOTICE: These protocols are intended specifically for monitoring research applications of target grazing for creating, enhancing, or rehabilitating fuel breaks. Fuel breaks are, by definition, narrow, linear features which may, however, extend substantial distances. These protocols are NOT intended for grazing applications involving large, broad areal extents (i.e., prescribed grazing on entire rangeland pastures).

I. General Information and Guidance

Most data collection will occur along randomly-located, independent transect clusters:

- A transect cluster should consist of three 50-m transects either radiating from a single base point (i.e., the Spoke Design) or lain out in parallel from a single baseline (i.e., the Parallel Transect Design; see descriptions and diagrams in the Monitoring Manual, Vol. 1: Core Methods 2nd Ed. by Herrick et al. 2016). Use of the Parallel Transect Design will likely be preferable because this design provides a rectangular footprint and thus is easier to situate within long, narrow fuel-break treatment areas than would be the circular footprint of the Spoke Design.
- A minimum of six transect clusters per 1 km of fuel break length are required to provide a statistically-valid assessment of vegetation response to targeted grazing treatment.
- Three of transect clusters should be installed inside the fuel-break treatment area and the remaining 3 transect clusters should be installed outside the treatment area (please consult your project-specific, experimental design documents for additional treatment-control layout details).

It is best to keep in mind that, in terms of statistical analysis, each independent transect cluster represents only a single sample. The minimum case above would thus yield only 3 samples per treatment level. Consequently, do not be tempted to reduce the number of transect clusters below 3 per treatment area as this is not a viable approach for cutting costs or improving efficiency. Doing so would invalidate the experiment regardless of how many individual measurements were collected along the transects.

II. Assessing Attainment of Grazing Treatment Application Targets

Visual Record

Follow the Photo Point methodology described in the Monitoring Manual, Vol. 1: Core Methods, 2nd Ed. (Herrick et al., 2016), specifically:

- Establish a photo point for each transect;
- The photo point should be located 5 m distant from the transect and transect base point in a direction parallel to that of the transect;
- Fill out a transect ID board, position it 1 m to the left of the transect base point, and orient the board so it squarely faces the photo point;
- Acquire an oblique photo of the transect using a camera with a 50-mm lens or equivalent zoom setting and with the camera body supported 1.5 m above ground level;

- The base point of the transect should appear at the base of the photo, the transect line should bisect the photo, and the distal end of the transect should be visible at the upper edge of the photo;
- A second photo should be acquired from a photo point 5 m beyond the distal end of the transect and with a view angle looking back down the transect toward the original photo point; and
- Make sure the transect ID board is visible and the writing on it is legible in all photos acquired.

Phenology

- Use the following 6-class scheme to classify grass plant phenology at the time the targeting grazing treatment is applied:
  1. Vegetative = new spring foliar growth evident;
  2. Jointing = from boot, culm elongation, to seedhead fully formed;
  3. Anthesis = flowering and pollination;
  4. Seed Ripe = from seeds firm to dispersal;
  5. Dormant/Dead = growth senesced; and
  6. Fall regrowth;
- Phenology should be recorded for exotic annual grasses (i.e., cheatgrass and medusahead) and for dominant perennial grass species encountered including, but not limited to Sandberg bluegrass, squirreltail, bluebunch wheatgrass, Idaho fescue, and crested wheatgrass.

Residual Fuel Height

Follow the Stubble Height methodology involving quick assessment, pace transects as described in the Interagency Technical Reference 1734-3 (BLM, 1999), specifically:

- Define the key species (e.g., BRTE) and associated target stubble height at which treatment of the key species will be considered fully attained;
- Establish at least 3 random base points per 1 km of fuel-break length which are different and separate from the base points to be used for 50-m, taped transects (above);
- At the first base point, select a compass bearing which is parallel to the long axis of the fuel break;
- Take 5 steps along this bearing;
- Identify the plant of the target species which is nearest to the observers right foot;
- Measure and record the maximum height of this plant;
- Repeat for 30 height samples per transect;
- Sample the 2 remaining pace transects;
- Compare mean height from these samples to the target stubble height for the key species.
- Repeat this assessment periodically (e.g., daily) until mean sampled height is equivalent to the target stubble height.

Utilization

Rigorously assess utilization (% weight removed) using the Paired-Plot methodology described in the Interagency Technical Reference 1734-3 (BLM, 1999), specifically:

- For each transect cluster location, 2 utilization cages should be established at random locations greater than 55 m but less 100 m from the base point for the cluster. Intent here is for the cage locations to be relatively near the transect locations but not so near that the cage occurs on a transect or interferes with other measurements made along or near a transect. Obviously, cage locations which occur in a treatment level differing from that of the transect cluster should be rejected. For example, if the transect cluster is located inside the fuel break, then cage locations occurring outside the fuel break should be rejected. Cage locations which occur in an ecological site differing from that of the transect cluster should be rejected.
- Cages should be installed prior to the start of the grazing season (i.e., prior to the livestock turn-in date);
- These cage locations should be different and separate from those intended for assessment of annual production (below);
- Each cage should be at least 1.2 x 1.2 x 1.2 m (W x L x H) and sturdy enough to withstand substantial livestock activity (e.g., rubbing, butting, etc.) without collapse;
- For example, a heavy wire fence panel cut into 4 equal lengths of 1.2 m (4 ft.) can be used to form the sides of the cage and a fifth 1.2 m (4 ft.) length of panel used as the top or lid of the cage;
- Cages should be securely fastened in place using a steel t-post at each corner to prevent displacement;
- For each cage location, identify an additional location which is at least 30 m distant but within a 100-m radius of the cage location, and which with appears to have vegetation cover, composition, productivity, and other site characteristics similar to that of the cage location. Use the same rejection criteria used for cage locations when selecting these associated "uncaged" locations;
- A cage location and its associated uncaged location will serve as paired plots;
- Utilization will be assessed through destructive harvest (i.e., clip and bag) in both the caged and uncaged plots of each plot-pair;
- A 0.5-m^2 circular quadrat should be centered within the caged plot and all plant parts of the key species occurring within the cylindrical volume extending above the quadrat should be clipped to ground level and stored in paper sample bags;
- Repeat this harvesting process for the uncaged plot;
- If the treatment application is to occur during the active growing season and will require longer than 7 days to complete, utilization will need to be assessed on day 7 and then the cages moved to new paired locations to thus account for regrowth in determination of utilization amounts. If the treatment application is to extend beyond 14 days during the active growing season, then the cages will need to be moved to a third set of paired locations, and so;
- Harvested sample should be oven-dried at 50^o C until a constant dry weight is reached and recorded;
- Utilization is determined as the mean difference in weight between paired caged and uncaged plots and is expressed as a proportion of the mean weight from the caged plot;
- A new starting set of random paired-plot locations should be selected for each year;

III. Assessing Vegetation and Soil Responses Targeted Grazing Applications

Bare Ground, Foliar and Basal Cover

Follow the Line-Point Intercept (LPI) methodology described in the Monitoring Manual, Vol. 1: Core Methods, 2nd Ed. (Herrick et al., 2016), specifically:

- Drop 50 pins at 1-m intervals along each transect;
- Record all species intercepted by each pin rather than just the first 3 foliar intercepts; and
- Code and record intercepts with standing dead material separately from standing live material (e.g., BRTE* vs. BRTE, where dead material is denoted with *).
- Calculate percentages for bare ground, foliar cover, and basal cover based on the 150 pins total read for each transect cluster.

Vegetation Composition

Follow plant species inventory and abundance methodologies adapted from the Monitoring Manual, Vol. 1: Core Methods, 2nd Ed. (Herrick et al., 2016) and the NRCS National Resource Inventory Grazing Land On-Site Study Handbook (NRCS, 2009: Chapter 16).

- Use the transect tape to define the long edge of a 545-m^2 rectangular plot (10.9 m by 50 m) situated along one side (i.e., the untrampled side) of the transect line;
- Record all species previously encountered within the inventory plot during application of other techniques (e.g., line-point intercept for cover [above]);
- Systematically search for additional species within the entire inventory plot for at least 15 minutes;
- Continue the search until the elapsed time required to discover an additional species exceeds 2 minutes; and
- Classify each species in the inventory to one of the 5 abundance classes.
    - 1 = 1-10 plants
    - 2 = 11-100 plants
    - 3 = 101-500 plants
    - 4 = 501-1,000 plants
    - 5 = greater than 1,000 plants per 545-m^2 plot.
- Repeat on the remaining 2 transects of the cluster such that the total sampled area equals 1,635 m^2 (3 * 545 m^2) and thus comparable to the standard NRI plot size.

Inter-Canopy Gaps

Follow the Canopy Gap Intercept methodology described in the Monitoring Manual, Vol. 1: Core Methods, 2nd Ed. (Herrick et al., 2016), specifically:

- Define minimum canopy gap size as greater than 20 cm;
- Identify and record start and end points of canopy gaps (i.e., > 20 cm) occurring along the transect line; and
- Include canopy of all growth forms, including both annual grasses and forbs;

Vegetation Height

Follow the Vegetation Height methodology described in the Monitoring Manual, Vol. 1: Core Methods, 2nd Ed. (Herrick et al., 2016), with specific adaptations:

- Vegetation height sampling will occur at each intercept point sampled during the Line-Point Intercept sampling for cover (above);
- At each of the 50 intercept points per transect, measure the height of the tallest vegetation part occurring within a 30-cm dia. cylindrical volume tangent to intercept point;
- Record the height measurement of the tallest shrub and herbaceous plant by species and live vs. dead status.

Production: Use the following Protected Plot methodology to assess annual production by species and fuel type and size class, specifically:

- For each transect cluster location, 2 production cages should be established at random locations greater than 55 m but less 100 m from the base point for the cluster. Intent here is for the cage locations to be relatively near the transect locations but not so near that the cage occurs on a transect or interferes with other measurements made along or near a transect. Obviously, cage locations which occur in a treatment level differing from that of the transect cluster should be rejected. For example, if the transect cluster is located inside the fuel break, then cage locations occurring outside the fuel break should be rejected. Cage locations which occur in an ecological site differing from that of the transect cluster should be rejected.
- Use the same cage dimensions and construction design as described above for utilization cages;
- Cages should be securely fastened in place using a steel t-post at each corner;
- Destructive sample harvest should take place when the earliest-maturing, dominant grass species present reaches the seed-ripe phenological stage;
- All vegetation in a 0.5-m^2 circular quadrat centered within the cage interior should be clipped to ground level and sorted into separate paper sample bags by species and, for shrub and tree species only, by fuel-size classes;
- Each harvested sample should be oven-dried at 50^o C until a constant dry weight is reached and recorded;
- A new set of random cage locations should be selected each year;

Soil Compaction

Follow the soil bulk density methodology described in the Soil Quality Test Kit Guide (NRCS, 2001), specifically:

- Utilize soil map resources (e.g., Web Soil Survey http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm?TARGET_APP=Web_Soil_Survey_application_hu55iqqsdazdq4tillvuajhr) to identify the dominant soil series occurring with the targeted-grazing treatment area;
- If multiple soil series occur with the fire-break length, identify the 3 most dominant series (i.e., series which occupy the greatest areal proportions of the treatment area);
- Randomly select 5 bulk-density sampling locations in each of these dominant soil series within the treatment area;

- Use the cylinder method, involving a 7.6 dia. by 7.6 high ring (e.g., PVC pipe), to collect a cylindrical soil sample from each sampling location;
- Oven-dry each sample at 105^{o} C until a constant dry weight is reached and recorded;
- Calculate bulk density (g/cm^{3}) based on the oven-dry weight and volume of the sample.

IV. Contingent Assessments

Soil Stability
Follow the Soil Aggregate Stability methodology described in the Monitoring Manual, Vol. 1 Quick Start (Herrick et al., 2009).

REFERENCES

BLM. 1999. Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3. USDI Bureau of Land Management. National Business Center. Denver, CO.

Herrick, J.E., J.W. Van Zee, S.E. McCord, E.M. Courtright, J.W. Karl, and L.M. Burkett. 2016 Monitoring Manual for Grassland, Shrubland and Savanna Ecosystems. Second Edition, Volume 1: Core Methods. USDA Agricultural Research Service, Jornada Experimental Range, Las Cruses, NM.

NRCS. 2001. Soil Quality Test Kit Guide. USDA Natural Resources Conservation Service. Soil Quality Institute. St. Paul, MN.

NRCS. 2009. National Resources Inventory Grazing Land On-Site Study. Handbook of Instructions. USDA Natural Resources Conservation Service. Fort Worth, TX.

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Appendix C Required Design Features Documentation

GRSG Proposed Activities Form IM Attachment 2: Required Design Features (RDF) identified in the Nevada and Northeastern California Greater Sage-Grouse Approved Resource Management Plan Amendment (SGPA Appendix C)

General RDFs		Applied	If RDF not applied, select reason:
RDF Gen 1:	Locate new roads outside of GRSG habitat to the extent practical	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road construction associated with project.	
RDF Gen 2:	Avoid constructing roads within riparian areas and ephemeral drainages. Construct lowwater crossings at right angles to ephemeral drainages and stream crossings (note that such construction may require permitting under Sections 401 and 404 of the Clean Water Act).	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road construction associated with project.	
RDF Gen 3:	Limit construction of new roads where roads are already in existence and could be used or upgraded to meet the needs of the project or operation. Design roads to an appropriate standard, no higher than necessary, to accommodate intended purpose and level of use.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat
		Rationale: No road construction associated with project.	
RDF Gen 4:	Coordinate road construction and use with ROW holders to minimize disturbance to the extent possible.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road construction associated with project.	
RDF Gen 5:	During project construction and operation, establish and post speed limits in GRSG habitat to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No increased traffic associated with project.	

RDF Gen 6:	Newly constructed project roads that access valid existing rights would not be managed as public access roads. Proponents will restrict access by employing traffic control devices such as signage, gates, and fencing.	☐ Yes ☑ No	☑	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road construction associated with project.		
RDF Gen 7:	Require dust abatement practices when authorizing use on roads.	☐ Yes ☑ No	☑	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road authorization required.		
NO RDF Identified				
RDF Gen 9:	Upon project completion, reclaim roads developed for project access on public lands unless, based on site-specific analysis, the route provides specific benefits for public access and does not contribute to resource conflicts.	☐ Yes ☑ No	☑	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No road construction associated with project.		
RDF Gen 10:	Design or site permanent structures that create movement (e.g., pump jack/ windmill) to minimize impacts on GRSG habitat.	☐ Yes ☑ No	☑	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: None associated with project.		
RDF Gen 11:	Equip temporary and permanent aboveground facilities with structures or devices that discourage nesting and perching of raptors, corvids, and other predators.	☑ Yes ☐ No	☐	A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
			☐	An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____
			☐	A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:		

RDF Gen 12:	Control the spread and effects of nonnative, invasive plant species (e g., by washing vehicles and equipment, minimize unnecessary surface disturbance; Evangelista et al. 2011). All projects would be required to have a noxious weed management plan in place prior to construction and operations.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	
RDF Gen 13:	Implement project site-cleaning practices to preclude the accumulation of debris, solid waste, putrescible wastes, and other potential anthropogenic subsidies for predators of GRSG.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	
RDF Gen 14:	Locate project related temporary housing sites outside of GRSG habitat.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: None associated with the project.	
RDF Gen 15:	When interim reclamation is required, irrigate site to establish seedlings more quickly if the site requires it.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: Not required for project.	
RDF Gen 16:	Utilize mulching techniques to expedite reclamation and to protect soils if the site requires it.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No reclamation associated with project.	

RDF Gen 17:	Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.	☐ Yes ☑ No	☑ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale: No reclamation associated with project.	
RDF Gen 18:	When authorizing ground-disturbing activities, require the use of vegetation and soil reclamation standards suitable for the site type prior to construction.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	
RDF Gen 19:	Instruct all construction employees to avoid harassment and disturbance of wildlife, especially during the GRSG breeding (e.g., courtship and nesting) season. In addition, pets shall not be permitted on site during construction (BLM 2005b).	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	
RDF Gen 20:	To reduce predator perching in GRSG habitat, limit the construction of vertical facilities and fences to the minimum number and amount needed and install anti-perch devices where applicable.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	
RDF Gen 21:	Outfit all reservoirs, pits, tanks, troughs or similar features with appropriate type and number of wildlife escape ramps (BLM 1990; Taylor and Tuttle 2007).	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat.
		Rationale:	

RDF Gen 22:	Load and unload all equipment on existing roads to minimize disturbance to vegetation and soil.	☑ Yes ☐ No	☐ A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations) Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable. ☐ An alternative RDF is determined to provide equal or better protection for GRSG or its habitat. Alternative RDF # _____ ☐ A specific RDF will provide no additional protection to GRSG or its habitat. **Rationale:**

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