Nevada Community Wildfire Risk Assessment Project

LANDER COUNTY

March 2005

This project was administered by the Nevada Fire Safe Council and funded through National Fire Plan grants from the Bureau of Land Management, the US Forest Service, and the Nevada Division of Forestry.

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Executive Summary

The Healthy Forests Initiative was announced by the White House in 2002 to implement the core components of the *National Fire Plan Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment Ten Year Comprehensive Strategy.* The Plan calls for more active forest and rangeland management to reduce the threat of wildland fire in the wildland-urban interface, the area where homes and wildland meet. This report was prepared specifically for communities in Lander County, Nevada, that were identified in the 2001 Federal Register list of communities at risk within the vicinity of federal lands.

The Nevada Fire Safe Council contracted with Resource Concepts, Inc. (RCI) to assemble a team of experts in the fields of fire behavior and suppression, natural resource ecology, and geographic information systems (GIS) to complete the assessment for each Lander County community listed in the Federal Register. The RCI Project Team spent several days inventorying conditions in Lander County, and completing the primary data collection and verification portion of the risk assessment. Field visits were conducted in May 2004.

Ten Lander County communities were included in this assessment. Tenabo was listed on the Federal Register, however no residents currently live in that community. As a result, it was not included in the assessment.

Austin and Battle Mountain are the only two communities included in this project in Lander County that contain urban neighborhoods. With the exception of Hilltop, which is a subdivision of Battle Mountain, and the Battle Mountain Colony, the remaining communities are rural ranching areas or historic mining sites that are home to comparatively few residents with wide expanses of undeveloped property (usually public lands) between private parcels.

Five primary factors that affect potential fire hazard were evaluated to develop a community hazard assessment score: community design, construction materials, defensible space, availability and capability of fire suppression resources, and physical conditions such as the vegetative fuel load and topography. Information on fire suppression capabilities and responsibilities for Lander County communities was obtained through interviews with local fire chiefs and fire management officers (federal and state). The Fire Specialists on the RCI Project Team assigned an ignition risk rating of low, moderate, or high to each community. That rating was based on historical ignition patterns, interviews with local fire department personnel, interviews with state and federal agency fire personnel, field visits to each community, and professional judgment based on experience with wildland fire ignitions in Nevada. Table 1-1 lists the communities and identifies the risk and hazard assessment results for each community.

Table 1-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CLASSIFICATION	FUEL HAZARD	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Altamira Farms	Rural	Low	Low	N/A
Austin	Intermix	High to Extreme	High	High
Battle Mountain	Intermix and Classic Interface	Low	Moderate	Low
Battle Mountain Colony	Classic Interface	Low	Low	Low
Carico Valley	Rural	Low to Moderate	Low	N/A
Gilman Springs	Classic Interface	Moderate	Moderate	Moderate
Grass Valley	Rural	Moderate to Extreme	High	N/A
Hilltop	Classic Interface	Low	Low	Low
Kingston	Intermix	Moderate to High	High	High
Smoky Valley	Rural	Moderate	Moderate	N/A

N/A - The Community Hazard Assessment procedures are not applicable in rural ranch communities.

EXISTING SITUATION

The predominant fuel type in Lander County is salt desert shrub. Communities near the Toiyabe Range, such as Austin and Kingston, have a pinyon-juniper tree component that significantly increases fuel loading and fuel hazard in the interface areas around those communities. Cheatgrass occurrence is widespread throughout Lander County. Cheatgrass growth depends on annual moisture. In years of high precipitation, cheatgrass can more than double its height and volume, dramatically increasing the annual fuel loading and the fuel hazard.

There are no paid fire departments in Lander County. Battle Mountain, Austin, and Kingston have volunteer fire departments. The Bureau of Land Management Battle Mountain Field Office provides additional fire suppression resources when requested, as do the US Forest Service Austin Ranger District and the Nevada Division of Forestry Carlin Conservation Camp. The BLM Winnemucca Field Office provides air attack resources when requested and available.

The communities most at risk in Lander County are Austin and Kingston. Austin has a high risk of ignition and high potential for structure loss from wildfire. The community sits in an east-west oriented canyon with predominant winds from the west-southwest. Heavy stands of pinyon-juniper, decadent sagebrush with cheatgrass understory, and tall brush are present in and around the community. Old, weathered historic buildings in the community are sometimes surrounded by hazardous vegetation. Vacant lots within the

community are overgrown with vegetation. High and extreme fuel hazard areas threaten a fuel tank storage area west of town. An ignition in any area around Austin could easily spread into the community if it is wind driven through continuous fuels. The topography of the canyon and the predominant wind direction would create a chimney effect, drawing fire up the canyon and through the community. This type of fire could exceed initial attack response capabilities and result in structure and property loss and potential loss of life.

Of the ten communities that were evaluated, Kingston received the highest community hazard score. This was attributed to community design and construction factors that can be addressed to reduce the hazards in the community. The lack of water sources for fire suppression and limited access roads in Kingston are of paramount concern.

RECOMMENDATIONS

There is no way to completely eliminate the threat of wildfire in the wildland-urban interface. The Bureau of Land Management has already initiated hazard mitigation by implementing fuel reduction treatments and establishing greenstrips around Austin. Further recommendations in this report are based on the analysis of community-specific conditions observed in Lander County and site assessments completed by the Bureau of Land Management Battle Mountain Field Office. Recommendations are focused on:

- Implementation and maintenance of defensible space throughout the wildland-urban interface areas to reduce the risk of wildland fires burning into communities and reduce the risk of wildfire ignitions from within the communities.
- Construction and maintenance of fuelbreaks around Austin and Kingston to slow the advance of an oncoming wildfire and provide a place where firefighters can defend the community.
- Increased public awareness of wildfire risks and hazards in communities and informing homeowners of actions that can be taken do to reduce those risks and hazards.
- Community-wide involvement to effectively reduce the risk of wildfire ignitions in and near communities. To be most effective, fire safe practices need to be implemented on a community-wide basis. When neighbors work together, much more can be accomplished to make a community more fire safe.

Close and continued coordination between citizens, county officials, local fire departments, the Bureau of Land Management, the Nevada Division of Forestry, and the US Forest Service is crucial in Lander County. There is no guarantee that a wildfire will not occur in any of these communities, even if all the recommendations in this report are implemented. Nonetheless, public awareness, neighbors helping neighbors, and concerned proactive individuals setting examples for others to follow are just some of the approaches necessary to reduce the risk of wildfire ignition and the hazards inherent in the wildland-urban interface areas.

Acknowledging the need for ongoing fuels management on public and private lands is vital for fire safe living in a wildfire-prone environment. The best possible assurance for long-term community safety from wildfire requires a permanent commitment to the enforcement of fire safe ordinances at the local level. Mandatory fuels management includes regular monitoring and evaluation of fuel conditions and maintenance or

implementation of additional fuel reduction treatments as development continues to encroach at the wildland-urban interface.

Further information and assistance regarding implementation of the recommendations in this report can be obtained from any of the following agencies or organizations.

Nevada Fire Safe Council	firesafe@renonevada.net www.nvfsc.org
Nevada Division of Forestry	Fire Program Coordinator (775) 684-2500
Nevada Association of Counties	nvnaco@nvnaco.org.
Bureau of Land Management Nevada State Office	Nevada BLM State Fire Management Officer khull@nv.blm.gov
Humboldt-Toiyabe National Forest Supervisors Office	H-T Supervisor's Office Fire Staff Officer mdondero@fs.fed.us

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

A key element of the Healthy Forests Initiative announced by the White House in 2002 is the implementation of core components of the National Fire Plan *Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment Ten Year Comprehensive Strategy.* Federal agencies and western state governors adopted the plan in the spring of 2002 in collaboration with county commissioners, state foresters, and tribal officials. The plan calls for more active forest and rangeland management to reduce the threat of wildfire in the wildland-urban interface.

The Healthy Forest Restoration Act (H.R. 1904) was signed into law in December 2003. The Act creates provisions for expanding activities outlined in the National Fire Plan. Also in 2003, the Nevada Fire Safe Council received National Fire Plan funding through the Bureau of Land Management to conduct a Community Risk/Hazard Assessment in communities at risk in Nevada. Communities to be assessed are included on a 2001 list in the Federal Register entitled "List of wildland-urban interface, at risk communities located within the vicinity of Federal lands" (66 FR 160). The list identifies Nevada communities adjacent to Federal lands that are most vulnerable to wildfire threat.

Resource Concepts, Inc. (RCI), a Carson City consulting firm, was selected to conduct the Community Risk/Hazard Assessments. During 2004, the RCI Project Team visited over 250 communities in seventeen Nevada counties to assess both the risk of ignition and the potential fire behavior hazard. Procedures accepted by Nevada's wildland fire agencies were employed to reach consistent and objective evaluations of each community. Specific goals of the Nevada Community Risk/Hazard Assessment Project are to:

- Assess wildfire hazards associated with each community on the Federal Register list of Communities at Risk in Nevada.
- Identify firefighting resource needs (equipment and infrastructure).
- Conduct fuel hazard mapping for communities with high and extreme hazard ratings.
- Describe proposed risk and hazard mitigation projects in sufficient detail to aid communities in applying for future implementation funds.
- Distribute assessment results and proposed mitigation project descriptions to each County in an easily updateable format. That format should also be useful for presentation at public meetings and other public education activities.

Community Risk/Hazard Assessments were conducted systematically. The RCI Project Team observed and recorded factors that significantly influence the risk of wildfire ignition along the wildland-urban interface, and catalogued features that can have an influence on hazardous conditions in the event of a wildfire. Local fire agency and emergency response personnel were interviewed to assess the availability of suppression resources and to identify opportunities for increased community preparedness. A description of the existing fuel hazard and fire behavior potential is presented for each community. Photo points and

fuel hazard maps are presented for each community where the community hazard is rated as high or extreme.

Individual community assessment results are formatted to facilitate ease of reference and reproduction. Assessments began with the preparation of a community map. Ignitions risks, fire hazards, and recommended mitigation projects are described for each community. Recommendations are summarized in a table and are depicted on a map (if the proposed project can be graphically represented). These tools will aid local, state, and federal agencies in strategic planning, raising public awareness, and securing funding to implement risk and hazard reduction projects. Mitigating risks and hazards identified during the community assessment process are not only crucial to meeting long term goals of the National Fire Plan, but also to ensuring the near and long-term viability of communities, natural resources, infrastructures, and watersheds in Lander County.

Numerous agencies and individuals were involved in the planning and implementation of this effort. Special thanks and acknowledgement is given to the following:

- Nevada Fire Safe Council (NFSC)
- USDI Bureau of Land Management (BLM)
- USDA Forest Service (USFS)
- USDA Natural Resource Conservation Service (NRCS)
- Nevada Division of Forestry (NDF)
- University of Nevada Cooperative Extension (UNCE)
- Nevada Association of Counties (NACO)
- Lander County Officials
- Fire Chiefs and firefighters statewide

1.2 COMMUNITIES ASSESSED

Ten Lander County communities were identified in the Federal Register as being in proximity to Federal Lands. All ten communities are addressed in this assessment.

- Altamira Farms
- Austin
- Battle Mountain
- Battle Mountain Colony
- Carico Valley
- Gilman Springs
- Grass Valley
- Hilltop
- Kingston
- Smoky Valley

Several of the listed locations (Altamira Farms, Carico Valley, Grass Valley, and Smoky Valley) are agricultural communities. These communities face a greater risk of economic loss from damage to agricultural commodities (e.g. livestock, hay, other crops) than to residential structures. General recommendations for rural ranch communities have been developed to address hazards that are unique to private lands in remote areas.

Other rural areas or small subdivisions may be present in Lander County that were not included on the Federal Register list and, thus are not included in the present assessment. Recommendations presented in this report for similar communities may apply to those other areas. Conditions in and around some of those areas may warrant future risk/hazard assessment.

1.3 COMMUNITIES NOT ASSESSED

Tenabo, located in the northwest part of Lander County, was included on the Federal Register list. However, no residents currently live in that community; as a result, it was not included in this assessment.

2.0 METHODOLOGY

2.1 PROJECT TEAM

The RCI Project Team was composed of experts in the fields of fire behavior and suppression, geographic information systems (GIS), natural resource ecology, and forest health who collaborated to complete a Community Risk/Hazard Assessment for each community. The RCI Project Team included personnel with extensive wildland fire prevention and suppression experience in Nevada and site specific experience in the natural resource environment of the Great Basin.

The RCI Project Team used standardized procedures developed in accordance with the *Draft Community Wildland Fire Assessment For Existing and Planned Wildland Residential Interface Developments in Nevada* (Nevada's Wildland Fire Agencies, Board of Fire Directors, April 2001; revised 2002). This approach incorporates values for hazardous fuels and landscape features, hazardous structural features, community design, and fire protection capabilities into an overall community rating.

2.2 BASE MAP DATA COLLECTION

Geographic Information System Specialists on the RCI Project Team compiled and reviewed existing statewide geospatial data to create field maps for recording baseline data and data verification. Data sources for the maps included the Nevada Fire Safe Council, the Nevada Department of Transportation, the NRCS, the Bureau of Land Management and the US Forest Service. Datasets and sources utilized are summarized in Table 2-1.

Table 2-1. Primary Datasets and Sources Utilized in the Lander County Community Wildfire Risk/Hazard Assessment

SPATIAL DATASET	DATA SOURCE
Land Ownership	BLM Nevada State Office Mapping Services
Vegetation Communities	Nevada Gap Analysis Program Data, Utah Cooperative Fish and Wildlife Research Unit, Utah State University
Topography	US Geological Survey Digital Elevation Models and Topographic Maps
Fire Suppression Resources	Field and Telephone Interviews
Roads	Nevada Department of Transportation 'TIGER' Census data (2000)
Current Aerial Photographs	US Geological Survey Digital Orthophoto Quadrangles (1994, 1996, or 1998)
Fuel Hazard Conditions	BLM Nevada State Office Fire Hazard Potential Data
Fire History	BLM Nevada State Office Mapping Services US Forest Service Humboldt-Toiyabe Supervisor's Office National Interagency Fire Center, Boise Idaho

2.2.1 Wildfire History

Wildfire history information was mapped using Bureau of Land Management and US Forest Service datasets and GIS databases that identify wildfire perimeters on federally managed lands from 1980 to 2003. This information was compiled by agency personnel using a global positioning system (GPS) and screen digitizing from source maps with a minimum detail level of 1:250,000. The dataset is updated at the BLM Nevada State Office and Humboldt-Toiyabe Supervisor's Office at the end of each fire season from information provided by each Nevada BLM field office and Humboldt-Toiyabe Ranger Districts. The datasets are the central source of historical GIS fire data used to support fire management and land use planning on federal lands.

During interviews with local fire experts, the RCI Project Team may have identified fire perimeters that were not included in BLM or USFS datasets. Fires that occurred on private land are generally recorded on paper maps and have not been consistently included in Federal agency GIS datasets. Fire locations identified during interviews with local fire personnel were recorded on field maps (where possible) and were added to the project wildfire perimeter dataset.

In addition to fire perimeter information, point data for fire ignitions in Nevada from 1980 to 2003 was obtained from the National Interagency Fire Center (NIFC) database in Boise, Idaho. This dataset includes an ignition point coordinate and an acreage component as reported to NIFC through a variety of agencies. These data, summarized in Table 3-2, provide the ignition point locations presented in this report. In many cases, the ignition point location is accurate only to the section. In such cases, the point coordinate is mapped in the center of the section.

The wildfire history and ignition history data were used to formulate ignition risk ratings and to develop recommendations specific to areas repeatedly impacted by wildland fires. Observations made by the RCI Project Team and comments from local fire agencies were used to develop recommendations for areas that lack recent wildfire activity where accumulations of fuels or an expansion of urban development into the interface area represents a growing risk.

2.3 COMMUNITY RISK/HAZARD ASSESSMENT

The wildland-urban interface is the place where homes and wildland meet. This project focused on identifying hazards and risks in the wildland-urban interface areas by assessing each community individually. Site-specific information for each community was collected during field visits in Lander County conducted May 17 through May 19, 2004. The predominant conditions recorded during these site visits served as the basis for development of Community Risk and Hazard Assessment ratings.

2.3.1 Ignition Risk Assessment Criteria

The Fire Specialist on the RCI Project Team assigned an ignition risk rating of low, moderate, or high to each community assessed. This rating is based four sources of information:

- ü Interpretation of the historical record of ignition patterns and fire polygons provided by the National Interagency Fire Center, Bureau of Land Management databases, and US Forest Service databases.
- ü Interviews with local fire department personnel and local area Fire Management Officers.
- ü Field visits to each community.
- ü Professional judgment of the RCI Fire Specialists based on their experience with wildland fire ignitions in Nevada.

2.3.2 Hazard Assessment Criteria

The Community Risk/Hazard Assessments were completed using the methodology outlined in the *Draft Community Wildland Fire Assessment For Existing and Planned Wildland Residential Interface Developments in Nevada*. This system assigns hazard ratings of low through extreme based on the scoring system shown in Table 2-2.

Table 2-2. Hazard Rating Point System Used in the Nevada Community Wildfire Risk/Hazard Assessment Project

HAZARD CATEGORY	SCORE
Low Hazard	< 41
Moderate Hazard	41-60
High Hazard	61-75
Extreme Hazard	76+

To arrive at a score for a community, five primary factors affecting potential fire hazard were assessed: community design, construction materials, defensible space, availability and capability of fire suppression resources, and physical conditions such as fuel loading and topography. A glossary of wildland fire terms is provided in Appendix A. A description of each factor and their importance in developing the overall score for a community is provided below. The point distribution for each factor is provided in Appendix B. A table is provided at the end of each community chapter that presents the point value assigned to each hazard assessment element.

Community Design

Aspects of community design account for 26 percent of the total assessment score. Many aspects of community design can be modified to improve community fire safety. Factors considered include:

- ü **Interface Condition**. Community safety is affected by the density and distribution of structures with respect to the surrounding wildland environment. Four situations are recognized and used to categorize the wildland-urban

interface: *Classic Interface, Intermix, Occluded*, and *Rural*. Definitions for each Condition Class are provided in Appendix A.

- ü **Access.** Design aspects of roadways influence the hazard rating assigned to a community. A road gradient of greater than five percent can increase response times for heavy vehicles carrying water. Roads less than 20 feet in width often impede two-way movement of vehicles and fire suppression equipment. Hairpin turns and cul-de-sacs with radii of less than 45 feet can cause problems for equipment mobility. Adequately designed secondary access routes and loop roads in a community can lower a hazard rating. Visible, fire-resistant street and address identification and adequate driveway widths also reduce the overall community hazard rating.
- ü **Utilities.** Poorly maintained overhead power lines can be a potential wildfire ignition source. It is important to keep power line corridors clear of flammable vegetation, as fires have been known to start from arcing power lines during windy conditions. Keeping flammable vegetation cleared from beneath power lines and around power poles reduces potential hazards from damaged power lines. Energized power lines may fall and create additional hazards for citizens and firefighters, including blocked road access. Power failures are especially dangerous if a community lacks backup sources for electrical power. Many communities rely on electric pumps to provide water to residents and firefighters for structure protection and fire suppression.

Construction Materials

Sixteen percent of the total assessment score is attributed to construction materials. While it is not feasible to expect all structures in the wildland-urban interface area to be rebuilt with non-combustible materials, there are steps that can be taken to reduce risks associated with hazardous construction in the interface area. Factors considered in this assessment include:

- ü **Building Materials.** The composition of building materials determines the length of time a structure can withstand high temperatures before ignition occurs. Houses composed of weathered wood siding and wood shake roofing are usually the most susceptible to ignition. Homes constructed with medium density fiberboard (MDF) siding are typically considered fire resistant. MDF siding burns only when exposed to high heat for a significant amount of time. Buildings that have stucco exteriors also can withstand high temperatures. Houses with tile, metal or composition roofing are able to withstand high temperatures and long durations of heat exposure.
- ü **Architectural Features.** Unenclosed or unscreened balconies, decks, porches, attic vents, and eaves on homes provide areas where sparks and embers can be trapped, smolder, and ignite, rapidly spreading fire to the home. A high number of houses within a wildland-urban interface with these features implies a greater risk to the community.

Defensible Space

Defensible Space accounts for sixteen percent of the assessment score. The density and type of fuels around a home determine the potential fire exposure levels to the home. A greater volume of trees, shrubs, dry weeds, dry grass, woodpiles,

and other combustible materials near the home will produce more intense heat during a fire, and increase the threat of damage or loss of the home. Defensible space is one of the most manageable factors in improving the chance that a home or other property will avoid being damaged or lost in a wildfire.

Suppression Capabilities

Suppression capabilities accounts for sixteen percent of the total assessment score. Knowledge of the capabilities or limitations of the fire suppression resources in a community can help the residents take action to maximize the resources available. Factors considered in the assessment include:

- **Availability, Quantity, and Training Level of Firefighting Personnel**. When a fire begins in or near a community, having the appropriate firefighting personnel available to respond quickly is critical to saving structures and lives. Whether there is a local paid fire department, volunteer department, or no local fire department impacts how long it will take for firefighting personnel to respond to a wildfire.
- **Quantity and Type of Fire Suppression Equipment**. The quantity and type of fire suppression equipment available has an important role in minimizing the effect of wildfire on a community. Effective wildland firefighting requires specialized equipment not commonly kept in urban fire departments.
- **Water Resources**. The availability of water resources is critical to fighting a wildland fire. The nature of the water resources available (for example, a community water system with adequate fire flow capabilities versus local ponds or other drafting sites) will affect how easy or difficult it will be for firefighters to protect the community.

Physical Conditions

Physical conditions accounts for 26 percent of the assessment score. Fire behavior is influenced by numerous physical conditions and is dynamic throughout the life of the fire. With the exception of changes to fuel types and density, the physical conditions in and around a community cannot be altered to make the community more fire safe. An understanding of how these physical conditions can influence fire behavior is essential to planning effective preparedness measures, such as fuel reduction treatments. Physical conditions considered in this assessment include:

- **Slope, Aspect, and Topography.** Slope, aspect, and topographic features are used to predict fire behavior. Steep slopes greatly influence fire behavior. Fire usually burns upslope with greater speed and longer flame lengths than on flat areas. Fire will burn downslope but it usually does so at a slower rate and with shorter flame lengths than in upslope burns. East aspect slopes in the Great Basin may experience downslope winds in the afternoon. These winds may rapidly increase downhill burn rates. West and south facing aspects are subject to more intense solar exposure, which preheats vegetation and lowers the moisture content of fuels. Canyons, ravines, and saddles are topographic features that are prone to higher wind speeds than adjacent areas. Fires pushed by winds grow at an accelerated rate compared to fires burning in non-windy conditions. Because the surrounding topography is more wind-prone,

homes built mid-slope, at the crest of slopes, or in saddles are more at risk in the event of a wildfire.

- **Fuel Type and Density.** Vegetation types, fuel moisture values, and fuel densities around a community affect potential fire behavior. Areas with dense, continuous, vegetative fuels carry a higher hazard rating than communities in areas of irrigated, sparse, or non-continuous fuels. Hot and dry weather conditions, or years with above normal precipitation and cheatgrass production in combination with steep slopes or high winds can create situations in which the worst-case fire severity scenario can occur. Photographs of representative fuel types in Lander County interface areas are provided in Appendix C.

2.3.3 Fuel Hazard Mapping

Fuel hazard maps were initially prepared by the BLM (Nevada and Utah State Offices) using wildfire hazard delineations derived from vegetation data (Nevada GAP Analysis Program satellite dataset at 30-meter resolution). A total of 65 vegetation cover types were mapped statewide and reclassified into four wildfire hazard categories (low, moderate, high, and extreme) based on anticipated fire behavior. For example, pinyon-juniper cover types were generally rated as having an extreme fuel hazard, while sparse salt desert shrub cover types were rated as having a low fuel hazards.

The RCI Project Teams visited high and extreme fuel hazard communities and verified the BLM hazard information by comparing the hazard ratings on the existing fuel hazard map to observed vegetation, slope, and aspect conditions. Where necessary, changes to the ratings were drawn on maps and used to update the wildfire hazard potential layer of the project database. Photo points were established in high and extreme fuel hazard areas to monitor future changes in fuel hazard conditions. Hazard mapping was reviewed for the listed Lander County communities. In this report hazard maps are provided only for those communities where high and extreme fuel types were noted. These include Austin, Grass Valley, and Kingston.

2.3.4 Fire Behavior Worst-Case Scenario

RCI Project Team Fire Specialists developed worst-case wildfire scenarios based on their analysis of the severe fire behavior that could occur given a set of weather conditions, observed fuel load conditions, and minimal fire suppression resources. These scenarios describe a maximum potential for loss of property and, in some cases, human lives. The worst-case scenario does not describe the most likely outcome of a wildfire in the interface but it illustrates the potential for damage if a given set of conditions were to occur simultaneously. The worst-case scenarios were developed to serve two purposes: to assist in public education efforts and to be considered during development of fuel reduction recommendations.

2.4 INTERVIEWS WITH FIRE PERSONNEL

The RCI Project Team interviewed local fire department personnel and local agency Fire Management Officers to obtain information on wildfire training, emergency response time, personnel and equipment availability, evacuation plans, pre-attack plans, and estimates of possible worst-case scenarios. Local fire personnel reviewed maps showing the history of

wildfires to ensure that local information on wildland fires was included. Refer to Appendix D for a list of persons contacted.

2.5 RECOMMENDATION DEVELOPMENT

A wide variety of treatments and alternative measures can be used to reduce ignition risks, to mitigate fire hazards, and to promote fire safe communities. Proposed recommendations typically include the removal or reduction of flammable vegetation, increased community awareness of the risk of fires and how to reduce those risks, and coordination among fire suppression agencies to optimize efforts and resources. The RCI Project Team met repeatedly to analyze community risks, treatment alternatives, and treatment benefits. Treatment recommendations were formulated based on professional experience, quantitative hazard assessment, and information developed in conjunction with the National Fire Plan, FIREWISE resources, and University of Nevada Cooperative Extension publications. (A comprehensive listing of references used in the compilation of this report is given in Section 16.0.) The recommendations included in this report are considered high priorities for individual communities and are presented in a relative order of importance.

3.0 DESCRIPTION OF THE COUNTY

3.1 DEMOGRAPHICS, LOCATION, TOPOGRAPHY, AND CLIMATIC DATA

Lander County is located in the north central portion of Nevada and covers approximately 3.5 million acres of land. Land ownership and administration in Lander County is summarized in Table 3-1 (see also Figure 3-1). The majority of land in Lander County is administered by federal agencies.

Table 3-1. Land Management Acreage within Lander County

LAND ADMINISTRATOR	ACRES
Bureau of Land Management	2,668,611
US Forest Service	294,575
Bureau of Indian Affairs	689
Bureau of Reclamation	30,150
Private	534,908
Other (water)	732

Source: BLM land ownership GIS database.

In 2003 the Nevada State Demographer estimated the population of Lander County at 6,822 persons. The Nevada Commission on Economic Development listed major employers in the county as the Cortez Gold Mine, the Echo Bay Minerals Company, and the Lander County School District (Nevada Commission on Economic Development, 2004).

Elevation within the county ranges from 11,473 feet at Bunker Hill in the Toiyabe Range to 4,510 feet at Battle Mountain in the northwest corner of the county. In addition to the Toiyabe Range, most of the Shoshone Range lies within Lander County. Rainfall averages about 7.5 inches (Battle Mountain Chamber of Commerce; Lander County Convention and Tourism, 2004).

3.2 WILDFIRE HISTORY

A moderate number of wildfires occurred between 1980 and 2003 in Lander County, with some fires of extensive acreage during the last decade. Figure 3-2 illustrates the wildfire history in Lander County during that period. Table 3-2 summarizes the fire history and fire ignitions by year.

Table 3-2. Summary of Available Fire History Data 1980-2003

YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE	YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE
1980	15	1,136	1992	16	691
1981	18	121	1993	19	1,248
1982	22	84	1994	11	123
1983	11	4	1995	8	23,921
1984	35	2,516	1996	33	45,884
1985	41	35,622	1997	20	42
1986	30	6,361	1998	11	7,834
1987	11	7	1999	47	229,332
1988	18	156	2000	26	12,036
1989	20	1,901	2001	34	85,923
1990	18	114	2002	14	275
1991	20	823	2003	24	351
			TOTAL	**522**	**456,505**

Source: National Interagency Fire Center, Boise, Idaho, Bureau of Land Management, and US Forest Service.

3.2.1 Ignition Risk Factors

Ignition risks for wildfires fall into two categories: lightning and human caused. Human caused ignitions can come from a variety of sources such as burning material thrown out of vehicle windows, sparks from auto accidents, off-road vehicles, railroads, arcing power lines, agricultural fires, campfires, debris burning in piles or burn barrels, unextinguished matches, and fireworks. Database records indicate that of the 522 Lander County wildland fire ignitions between 1980 and 2003, 352 were due to lightning and 120 were human caused. The cause of 50 fires was not reported.

3.2.2 Fire Ecology

Fire ecology is the study of how fire contributes to plant community structure and species composition. A 'fire regime' is defined based on the average number of years between fires under natural conditions (fire frequency), and the extent to which dominant vegetation is replaced by fire (fire severity). Natural fire regimes have been affected throughout most of Nevada by twentieth century fire suppression policies. Areas that formerly burned with high frequency but low intensity (fires more amenable to control and suppression) are now characterized by accumulations of unburned fuels, which once ignited burn at higher intensities.

Big sagebrush is the most common plant community in Nevada with an altered fire regime, now characterized by infrequent, high-intensity fires. Sagebrush requires ten to twenty or more years to reestablish on burned areas. During that interim period, these areas can provide conditions for the establishment and spread of invasive species that, in some cases, inhibit sagebrush reestablishment.

Cheatgrass is a common introduced annual grass that aggressively invades disturbed areas, especially burned areas. Replacement of a native shrub community with a pure

stand of cheatgrass increases the susceptibility of that area to repeated wildfire ignitions, especially in mid to late summer when desiccating winds and lightning activity are more prevalent. The annual production (volume) of cheatgrass fuel produced each year is highly variable and dependent on winter and spring precipitation amounts. Plants can be sparse and only a few inches tall in a dry year to over two feet tall on the same site in a wet year. In a normal or above normal precipitation year, cheatgrass can be considered a high hazard fuel type. In dry years cheatgrass poses a low fire behavior hazard because it tends to burn with a relatively low intensity. Nevertheless, in every year dried cheatgrass creates a highly flammable fuel bed that is easily ignited and has the propensity to rapidly burn into adjacent cover types that may be characterized by more severe and hazardous fire behavior. The ecological consequence of a fire spreading from a cheatgrass stand into adjacent unburned native vegetation is that additional disturbed areas are thereby opened and vulnerable to cheatgrass invasion. Associated losses of natural resource values such as wildlife habitat, soil stability, and watershed function are additional risks.

Eliminating cheatgrass is an arduous task that focuses on depleting the cheatgrass seed bank in the soil. Mowing defensible space and fuelbreaks annually before seeds mature will reduce cheatgrass growth and reproduction over time. Use of pre-emergent herbicides can have the same effect. Any herbicide treatment on public lands must be done in accordance with federal guidelines. Private landowners should proceed with caution if using herbicides, complying with all label instructions and consulting their local extension specialist. Early season livestock grazing prior to and during flowering is another mechanism for depleting the seed bank (Davison and Smith 2000, BLM 2003, Montana State University 2004)[1]. It may take years of intensive treatment with any of these efforts to fully eliminate cheatgrass from being a dominant component of the vegetation, but it is a necessary process in order to return the landscape to a natural fire cycle and reduce the occurrence of large, catastrophic wildfires.

3.3 NATURAL RESOURCES AND CRITICAL FEATURES POTENTIALLY AT RISK

Critical features at risk of loss during a wildfire event include economic assets (agricultural and industrial resources) and cultural features (historic structures, archaeological sites, recreation and tourist centers). Key critical features include schools (often used as staging areas or incident command centers during a fire event), and fire stations. Critical features identified in each community are shown on the community map at the end of each community chapter.

3.3.1 Historical Sites

The Austin Historic District and the Lander County School (aka Austin High School) are listed on the National Register of Historical Places and the Nevada State Register of Historical Places. Battle Mountain is the county seat and a historic mining town, however there are no historic sites listed there on either historic register. Established sometime between 1850-60, the town eventually became a major regional freight and trade center. In 1917 the Battle Mountain Colony was established. Austin is an historic Nevada mining town as well, established in 1862. Numerous historic buildings are preserved in Austin, Battle

[1] Proposed changes to livestock grazing on national forests and public lands for cheatgrass control must be approved by the appropriate land management agency prior to implementation.

Mountain, and the Battle Mountain Colony and are at risk of being damaged or lost during a major wildfire event.

3.3.2 Recreation

The US Forest Service manages the 294,575 acres of the Humboldt-Toiyabe National Forest that lie within Lander County. Within the National Forest numerous outdoor activities take place, including but not limited to camping, hiking, wildlife viewing, and photography that could be impacted by wildfire. The USFS is responsible for fire safety on National Forest lands, as well as any fuels reduction projects. The Humboldt-Toiyabe National Forest area within Lander County is detailed on Figure 3-1.

3.3.3 Flora and Fauna

Potential habitat is present in Lander County for one species listed as threatened or endangered under the Endangered Species Act. An additional thirteen species are protected by state legislation (Nevada Natural Heritage Program database; last updated for Lander County 18 March 2004). These species are identified in Table 3-3. The Nevada Natural Heritage Program, the Nevada Division of Forestry, and the Nevada Department of Wildlife should be consulted regarding specific concerns and potential mitigation to minimize impacts to these species prior to implementing fuel reduction projects or the occurrence of a wildfire.

Table 3-3. Federal and State Listed Flora and Fauna At Risk in Lander County

SCIENTIFIC NAME	COMMON NAME	LEGISLATION
Plants		
Opuntia pulchella	Sand cholla	NRS 527.060.120
Fish		
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	ESA–Listed Threatened NRS 527.260.300
Mammals		
Brachylagus idahoensis	Pygmy rabbit	NRS 501
Euderma maculatum	Spotted bat	NRS 501
Lontra Canadensis	River otter	NRS 501
Birds		
Accipiter gentilis	Northern goshawk	NRS 501
Athene cunicularia hypugaea	Western burrowing owl	NRS 501
Buteo regalis	Ferruginous hawk	NRS 501
Buteo swainsoni	Swainson's hawk	NRS 501
Centrocercus urophasianus	Western sage-grouse	NRS 501
Chlidonias niger	Black tern	NRS 501
Oreortyx pictus	Mountain quail	NRS 501
Otus flammeolus	Flammulated owl	NRS 501
Plegadis chihi	White-faced ibis	NRS 501

3.4 PREVIOUS FUEL HAZARD REDUCTION PROJECTS

The Bureau of Land Management Battle Mountain Field Office Fuels Management Team was recognized in 2004 with a national BLM award for their plans and implementation of fuel reduction projects in the communities within their district. The BLM Battle Mountain Field Office conducted site assessments of the fuel conditions surrounding the communities of Austin, Battle Mountain, Battle Mountain Colony, Hilltop, and Kingston between 2002 and 2003. The Site Assessments include narrative descriptions of fuels, expected fire behavior, treatment alternatives, reference photos, and maps of proposed project areas. An Environmental Assessment was also completed for the proposed fuel reduction treatments in the Austin and Kingston communities.

Treatment alternatives proposed by the BLM to reduce fuel hazards included high intensity, low frequency grazing and greenstrips. Documentation and additional details on these projects are available at the BLM Battle Mountain Field Office. At the time of this report, the BLM greenstrip treatments acres around Austin were reported as completed and some thinning of pinyon and juniper was done. The remainder of the seeding and thinning is scheduled to occur in 2005. The Kingston project is scheduled to be implemented as soon as the community constructs a fence to restrict livestock to the BLM treatment area.

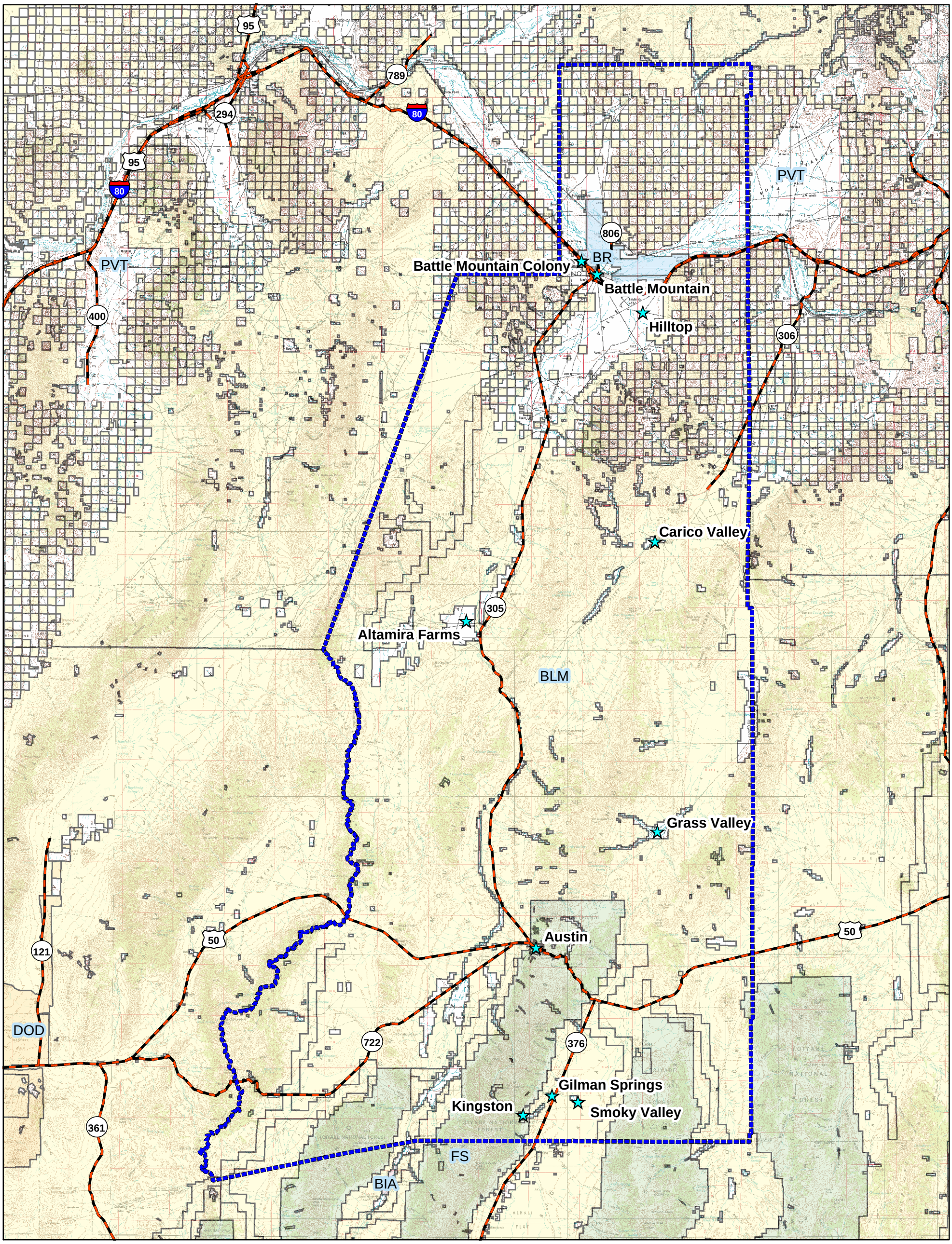

Figure 3-1. Community Locations and Land Ownership, Lander County, Nevada

Legend
- Lander Community
- Lander County
- Highways and State Routes

Land Ownership
- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Reclamation (BR)
- Department of Defense (DOD)
- Forest Service (FS)
- Private (PVT)

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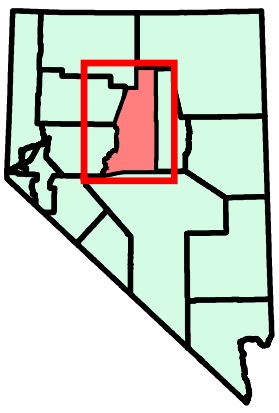


Resource Concepts, Inc.
340 N. Minnesota St.
Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk/Hazard Assessment Project

Resource Concepts, Inc. has made every effort to accurately compile the information depicted on this map but cannot warrant the reliability or completeness of the source data.

4.0 COUNTY-WIDE ASSESSMENT RESULTS

4.1 COUNTY-WIDE HAZARD AND RISK ASSESSMENT OVERVIEW

The RCI Project Team visited the ten communities in Lander County from May 17 through 19, 2004. The inventory and evaluation of community design aspects (roads, signage, utility infrastructure), defensible space conditions, construction materials, architectural features, wildland-urban interface characteristics, fuel type, and fuel densities resulted in the overall hazard ratings for each community. Assessment results are summarized in Table 4-1.

Table 4-1. Assessment Results Summary

COMMUNITY	INTERFACE CLASSIFICATION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Altamira Farms	Rural	Low	Low	N/A
Austin	Intermix	High to Extreme	High	High
Battle Mountain	Intermix and Classic Interface	Low	Moderate	Low
Battle Mountain Colony	Classic Interface	Low	Low	Low
Carico Valley	Rural	Low to Moderate	Low	N/A
Gilman Springs	Classic Interface	Moderate	Moderate	Moderate
Grass Valley	Rural	Moderate to Extreme	High	N/A
Hilltop	Classic Interface	Low	Low	Low
Kingston	Intermix	Moderate to Extreme	High	High
Smoky Valley	Rural	Moderate	Moderate	N/A

N/A - The Community Hazard Assessment procedures are not applicable in rural ranch communities.

4.1.1 Wildfire Protection Resources

Local volunteer fire departments are responsible for fire protection in the communities where they are located. Wildland fire suppression resources are described for each volunteer department in the respective community chapter. The initial response to a wildland fire by volunteer-staffed fire departments will vary depending on the day of the week and the time of day that the fire is reported. Some volunteer fire department members may be unable to respond to fire calls immediately during typical workday hours.

Additional wildland fire suppression resources are available throughout Lander County from the US Forest Service Austin Ranger District, the Bureau of Land Management Battle Mountain Field Office, and the Nevada Division of Forestry Carlin Conservation Camp. Air attack resources are available from the BLM Winnemucca Field Office, when requested and available. BLM, NDF, and USFS firefighters receive National Wildfire Coordinating Group wildland firefighting training. Table 4-2 lists the types of wildfire resources, cooperating partners and equipment available to respond to wildland fires within Lander County.

Table 4-2. Lander County Wildfire Suppression Resources, Cooperating Partners and Available Equipment

TYPE OF RESOURCE	AMOUNT OF EQUIPMENT	AGENCY PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender	1 1	US Forest Service- BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	Bureau of Land Management Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camps (Carlin, Winnemucca, Tonopah)

Source: Chad Lewis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin, Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

4.1.2 Detection and Communication

In Lander County fires are reported through 911 calls to the Lander County Sheriff's Office in Battle Mountain and are communicated to volunteer fire response personnel by the Lander County Sheriff's Office. Federal agency fire response personnel are dispatched to fires by the Central Nevada Interagency Dispatch Center using radios, pagers and telephones. The NDF Conservation Camps are dispatched through the Sierra Front Interagency Dispatch Center and the Elko Interagency Dispatch Center. The Lander County Sheriff's Office has access to state mutual aid frequencies. The radio system is compatible with neighboring agencies.

4.1.3 Community Preparedness

Lander County has an active Local Emergency Planning Committee and has adopted an all-risk emergency plan that includes disaster and hazardous materials handling plans.

5.0 ALTAMIRA FARMS

5.1 ALTAMIRA FARMS RISK/HAZARD ASSESSMENT

Altamira Farms is located in west Lander County in Antelope Valley, adjacent to State Route 305. See Figure 5-1 for a detail of the community boundary. Altamira Farms is a rural ranch community composed of widely spaced residences interspersed with large tracts of agricultural or public lands. The rural ranch community type does not lend itself to standard community assessment procedures. Defensible space, suppression resources, and fuel hazard conditions are described qualitatively for the community.

5.1.1 Community Design

Twenty-two residences were observed in Altamira Farms, all on parcels greater than ten acres in size.

5.1.2 Construction Materials

All of the observed homes were constructed of non-combustible, highly ignition resistant material such as medium density fiberboard. All but one residence had non-combustible roofing material such as tile, metal, or composition.

5.1.3 Defensible Space

Rural homes are generally surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These characteristics usually contribute to a low risk of damage or direct loss of property due to wildfires. Hay and alfalfa fields, haystacks, livestock feed yards, farming equipment storage areas, and fuels tanks require special attention when establishing defensible space for protection during a wildfire. Many such areas may not meet recommendations intended to minimize the potential for damage or loss during a wildfire.

5.1.4 Suppression Capabilities

Wildfire Suppression Resources

Altamira Farms receives fire protection from the Battle Mountain Volunteer Fire Department approximately fifty miles away. The Battle Mountain VFD is an all-volunteer department reported to be staffed by 25 volunteers at the time that interviews were conducted for this report. Federal and state resources are available from the BLM Battle Mountain and Winnemucca Field Offices, the US Forest Service Austin Ranger District, and the Nevada Division of Forestry. Table 5-1 provides a summary of fire suppression resources potentially available for initial attack of a wildland fire in the vicinity of Altamira Farms. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 5-1. Altamira Farms Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 1 Engine Water Tender Command Officer	2 1 1 1	Battle Mountain Volunteer Fire Department (Battle Mountain)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	Bureau of Land Management Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Carlin, Winnemucca)

Source: Bart Negro, Battle Mountain VFD Fire Chief; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

The only sources of water for fire suppression at Altamira Farms are domestic and irrigation wells. There is no hydrant or other water delivery system, and no water sources designated for fire suppression.

Detection and Communication

In the Altamira Farms area, fires are reported through 911 calls to the Lander County Sheriff's Office. The Lander County Sheriff's Office uses pagers and radios to communicate fires to local fire response personnel and by the Central Nevada Interagency Dispatch Center who dispatches the federal fire personnel. The NDF Carlin Conservation Camp is dispatched by either the Sierra Front Interagency Dispatch Center in Minden, or the Elko Interagency Dispatch Center in Elko, Nevada.

Fire Protection Personnel Qualifications

All Battle Mountain VFD firefighters receive training to meet minimum State Fire Marshal standards for Firefighter I and II. Some members of the Battle Mountain VFD have had training for Red Card certification. The Red Card certification system is part of a fire qualifications management system used by many state and all federal wildland fire management agencies. This certification indicates at what level an individual is qualified to fight wildland fires.

5.1.5 Factors That Affect Fire Behavior

The terrain around the Altamira Farms community is flat in aspect and the predominant wind is from the south/southwest in the late afternoon. Much of the agricultural land in the Altamira Farms area is irrigated and is considered to represent a low fuel hazard. The Reese River flows through the farmlands on the east, where willows and other associated riparian vegetation line the river corridor. Burned areas south, east, and west of the

community currently represent a low fuel hazard. Fuel density on unburned rangeland is light, estimated at one ton per acre or less. Fuels consist primarily of sagebrush, greasewood, or shadscale with some cheatgrass. Cheatgrass growth and continuity in the fuel bed is dependent on annual moisture levels. In wet years, cheatgrass production can increase the fuel hazard and increase the potential for hazardous fire behavior.

5.1.6 Worst-Case Wildfire Scenario

Wildfires in remote rural areas can cover immense areas before suppression crews are able to reach and contain them. The worst-case scenario of a major wildland fire in the Altamira Farms area would occur as a wind-driven fire in a wet year through dense cheatgrass and other fine fuels that surround the community. If the fire began during normal working hours, the response by volunteer firefighters would be limited or delayed, which would allow the fire to spread before fire suppression resources could respond. However, the agricultural land provides a buffer that would cause the fire to slow once it reached the farmland-wildland interface. Ranch improvements located near wildland fuels would be at risk of damage or loss.

5.2 HAZARD REDUCTION RECOMMENDATIONS

Despite the reduced risk of damage or loss to structural properties, residences of Altamira Farms exhibit unique conditions because of their remote location and relative isolation. Recommendations for Altamira Farms include defensible space measures for outbuildings and farm infrastructure, improved water availability for fire suppression, and training local residents for initial response to small lightning strikes.

5.2.1 Defensible Space Treatments

Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, fences, and fuel tanks are assets that require special protection because of their value to ranchers and farmers. Not only can stockpiled hay combust or ignite easily, but smoke can make the hay unpalatable and unusable for livestock feed.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes, outbuildings, and hay and equipment storage areas according to the guidelines in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material, including woodpiles.
  - Green: Existing plants are healthy and green during the fire season.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and presents a fire hazard if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.

- ü Create a firebreak of bare ground or gravel for 100 feet around hay storage areas. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[2] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for approved seed mixes and planting guidelines that can be used in conjunction with removal of this annual grass.
- ü Plant fire-resistant vegetation in the defensible space area around residential structures and outbuildings. This will enhance fire abatement, which is especially important in rural areas where water sources are limited or distant.
- ü Clear a minimum ten-foot area around fuel tanks.
- ü Maintain defensible space areas annually.

5.2.2 Suppression Resources and Training

Property Owner Recommendations

- ü Establish backup power systems to assure that functional water sources are available for fire suppression.
- ü Develop water storage for fire protection and install water outlets with fire department threads on new and existing water developments for filling water tenders and engines. Pursue grant funding to assist with financing these improvements.

Lander County

- ü Identify a minimum of four people from Altamira Farms who would be likely to provide the initial response to a nearby ignition. Coordinate with the Bureau of Land Management or the Nevada Division of Forestry to provide them with Basic Wildland Firefighter Training.
- ü Pursue grant funding and station a pick-up truck and a one-piece, slip-on, 100 to 200-gallon tank and pump unit with hose and hose reel in Altamira Farms during the fire season. This equipment, fitted properly for the size and weight limitations of the truck, can be used to provide initial attack of small ignitions.

5.2.3 Public Education and Community Coordination

University of Nevada Cooperative Extension Recommendations

- ü Develop a version of the *"Living With Fire"* publication tailored to the concerns of rural Nevada ranchers. The publication should include solutions for power back up, foam and other fire retardant products, fire resistant seeding, suggested site plans, and water storage adapted for filling fire engines and water tenders.

[2] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

Table 5-2. Altamira Farms Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Develop and maintain defensible space around structures and storage areas according to guidelines in Appendix E. Mow and/or treat cheatgrass to deplete the seed bank.
	Equipment and Training	Establish back-up power sources to assure water supply during a power outage. Develop water storage with compatible outlets for filling fire engines and water tenders.
Lander County	Equipment and Training	Identify at least four people who would be likely to provide the initial response to a nearby ignition and coordinate with the fire agencies to provide Basic Wildland Firefighter training. Pursue grant funding and station a pick-up truck fitted with a 100 to 200 gallon tank, pump, and hose in Altamira Farms during the fire season.
University of Nevada Cooperative Extension	Public Education	Develop a rural Nevada version of the "*Living With Fire*" publication tailored to the concerns of rural Nevada ranchers and farmers.

6.0 AUSTIN

6.1 AUSTIN COMMUNITY RISK/HAZARD ASSESSMENT

Austin is located in south-central Lander County on US Highway 50, almost at the geographic center of Nevada. Based on the risk assessment Austin was assigned to the **High Hazard** C**ategory** (62 points). A summary of factors that contributed to the hazard rating is included in Table 6-3. The high rating was attributed primarily to fire behavior related to topography, aspect, fuels, and poor defensible space. Additionally, numerous vacant lots in town are occupied by decadent stands of sagebrush and associated fuels that could cause a wildfire ignition from within the community.

6.1.1 Community Design

The wildland-urban interface area around Austin is characterized as an intermixed condition. There is no clear line of demarcation between structures in the community and wildland fuels. The majority of residences are on lots of one acre or less indicating a high density of houses.

Roads: US Interstate 50 is the major transportation route through Austin. The highway is a paved, two-lane highway, 24 feet in width; wide enough for two-vehicle passage and fire suppression equipment to maneuver. Many secondary roads lead away from the community, eventually transitioning into unimproved dirt roads. Within the community, secondary roads are typically unpaved, twenty feet in width or less, with grades of more than five percent. The secondary roads generally do not have adequate turnaround space for fire suppression equipment to maneuver or for two vehicles to pass.

Signage: Street signs were present and visible along 95 percent of the streets. Residential addresses were visible on 79 percent of the homes observed. Clear and visible signage is important in locating homes during low visibility conditions that may occur during a wildfire.

Utilities: Utilities were all above ground. Power lines have been properly maintained minimizing the possibility that arcing may start fires in nearby vegetation.

6.1.2 Construction Materials

Ninety-six percent of the structures observed in the interface were built with non-combustible or highly ignition resistant siding materials such as medium density fiberboard, and 98 percent of the homes had fire resistant roofing materials such as composition, tile, or metal. Twenty-one percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that create drafts and provide areas where sparks and embers can be trapped, smolder, and ignite, rapidly spreading fire to the home.

6.1.3 Defensible Space

Only 48 percent of the homes surveyed in Austin had landscaping that met the minimum standard for defensible space.

6.1.4 Suppression Capabilities

Wildfire Suppression Resources

Fire protection in Austin consists of an all-volunteer department of eleven volunteers. Additional resources are available from the Bureau of Land Management Battle Mountain and Winnemucca Field Offices, the US Forest Service Austin Ranger District, and the Nevada Division of Forestry Carlin Conservation Camp. Table 6-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to Austin to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 6-1. Suppression Resources Available to Austin for Initial Attack of a Wildland Fire

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 3 Engine Type 1 Water Tender	1 1 2	Austin Volunteer Fire Department (Austin)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	Bureau of Land Management Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Tonopah)

Source: Austin VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water availability for fire suppression in Austin includes:

- ü 500 gpm hydrants within 500 feet of structures for fire protection.
- ü Two 250-gpm wells.
- ü Three 575,000-gallon storage tanks.

The water system operates on gravity and electric pumps. There is no backup source of power in the case of power failure during a wildfire.

Detection and Communication

Austin has a community siren to warn residents of emergencies. In addition to this notification system the Austin Volunteer Fire Department has a lightning plan that assigns volunteers to lookout posts on high hazard lightning days during the fire season. Fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local fire response personnel by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency

fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

Fire Protection Personnel Qualifications

The Austin Volunteer Fire Department provides fire protection to the community of Austin. The Austin VFD volunteers receive training to meet State Fire Marshal minimum standards for Entry Level Firefighter, and Firefighter I and II. The Austin VFD does not utilize the Red Card system. Red Card certification is part of a fire qualifications management system used by many state and all federal wildland fire management agencies. This certification indicates that an individual is qualified to fight wildland fires. Federal agency fire suppression personnel receive training to meet National Wildfire Coordinating Group standards.

Work Load

The Austin VFD responded to 125 calls in 2003. Twelve of these were wildland/ brush fire calls.

Financial Support

The Austin VFD receives funding from the Lander County General Fund.

Community Preparedness

Lander County has an active Local Emergency Planning Committee and has adopted an all-risk emergency plan that includes disaster and hazardous materials handling plans. Austin has its own pre-attack plan for fire incidents.

6.1.5 Factors That Affect Fire Behavior

Austin is located in a narrow east/west canyon. Numerous steep drainages extend directly into the west end of town. The predominant wind is from the west/southwest in the afternoon. Fuel hazard mapping was reviewed for Austin and the community was found to have high and extreme fuel hazards surrounding the community boundary. Fuel hazard mapping is provided in Figure 6-2 and Fuel type Photo Points and conditions are provided in Figure 6-4.

The existing fuel conditions around Austin are conducive to crown fires or high intensity surface fires. Sagebrush and rabbitbrush have recovered in the 1981-burned area east of Austin with cheatgrass, crested wheatgrass, needleandthread grass, and bluegrass providing nearly continuous ground fuel conditions estimated at one to two tons per acre. Drainages contain dense pinyon-juniper stands estimated at eight or more tons per acre. Steep slopes and the prevailing wind direction may reduce fire suppression effectiveness.

A bulk fuel tank storage area, located west of Austin, near the arena, is of considerable concern. Dense fuels estimated at five to six tons per acre adjacent to the tanks are littered with abandoned barrels of unknown origin and old tires. A wildfire carried through this area could create intense heat and smoke and potential tank explosions. (See Figure 6-4 Photo Point 2.)

6.1.6 Worst-Case Wildfire Scenario

The worst-case wildland fire scenario for Austin would occur late on a summer afternoon and would begin west of the community. An ignition in the pinyon-juniper stands in any one of the numerous drainages could lead to an intense crown fire, and winds from the west/southwest would create a chimney effect, drawing the fire directly into town. The rate of spread could reach 2,500 to 4,000 feet per hour with flame lengths of fifty to seventy feet. There is a high risk for structure loss if the fire was pushed into the community given the heavy vegetation that occurs in close proximity to structures. The fuel storage tank area west of town poses an additional threat. The tanks (which appear to hold heating oil, gasoline, and diesel) could explode. In addition to fire spreading into the town, winds would push toxic fumes and smoke into the residential areas.

6.1.7 Ignition Risk Assessment

Based on previous fire history, topography, and fuel type, Austin has a high risk of ignition. The area is prone to thunderstorms in the summer and dry lightning is a major cause of ignitions.

6.2 FUEL REDUCTION TREATMENTS IN PROGRESS

In August of 2003, the Bureau of Land Management Battle Mountain Field Office completed an Environmental Assessment for the *Wildland Urban Interface/Fire Defense Systems Austin and Kingston, Nevada*. The BLM plans include fuel reduction treatments on a total of 2,300 acres around Austin. In 2003 and 2004, BLM completed greenstrips on approximately 1,000 acres (see Figure 6-3). In general, greenstrips ranged between thirty and fifty feet in width with small strips of native vegetation left between each greenstrip. Greenstrip locations and widths varied depending upon topography, fuel types, and presence of cultural resources. Mechanical equipment was used to masticate the shrubs, which left the shredded mulch on the ground, effectively redistributing the fuels. Seeding with fire-resistant species including forage kochia, wildrye, wheatgrass and some native species was also completed on approximately 1,000 acres. Another 1,000 acres are scheduled to be completed in 2005. Fifty acres of pinyon and juniper thinning has been completed with an additional 50 acres to be completed in 2005. Either high intensity, low-frequency grazing, or other managed grazing will be used to maintain the greenstrips if the fuel load of the treatment area ever exceeds 700 pounds per acre.

6.3 HAZARD REDUCTION RECOMMENDATIONS

Risk reduction recommendations for Austin focus primarily on efforts that can be taken by community members and public agencies to increase defensible space, continue to construct and maintain fuels reduction treatments around the community, and increased water storage for helicopter access during wildfire events. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety in Austin.

6.3.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of

property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes, businesses, and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[3] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for approved seed mixes and planting guidelines that can be used in conjunction with removal of this annual grass.
- ü Remove leaves and debris from roofs and rain gutters.
- ü Install spark arrestors on chimneys.
- ü Prune or remove trees so that branches are at least fifteen feet from structures and chimneys. Limb remaining trees within the defensible space zone to a height of four feet above ground level (but not more than one-third the height of the tree). Prune all dead and diseased branches. Remove all duff, shrubs, and other flammable material from beneath the crowns of remaining trees.
- ü Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- ü Reduce vegetation along both sides of private driveways within a ten-foot wide swath. Flammable vegetation should be replaced with fire-resistant species or non-flammable groundcover. Refer to Appendix E for seeding recommendations and planning guidelines.
- ü Remove vegetation that has grown on or accumulated along fences.
- ü Maintain defensible space annually.

[3] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

6.3.2 Fuel Reduction Treatments

Permanently reducing the fuel structure and fuel volume over large, continuous blocks of land reduces the risk of a catastrophic wildfire and increases firefighter safety. The ridgelines north and south of Austin provide opportunities to create fuelbreaks or greenstrips to effectively slow an advancing wildfire approaching from the north or south and provided firefighters a safe area for fire suppression.

Nevada Department of Transportation Recommendations

- ü Reduce vegetation by mowing to a height of not more than four inches for a distance of 150 to 200 feet from the edge of pavement along both sides of Highway 50. Continue this treatment for a distance of at least one mile on both sides of the community. Immediately remove mowed vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site. Mow annually or as necessary to maintain fuel reduction along the Highway.

Lander County Recommendations

- ü Mow a swath at least 25 feet wide or to the limit of the road right-of-way on both sides of all community roads. Reduce fuels to a height of not more than four inches. Reseed according to the recommendations in Appendix E if necessary to prevent cheatgrass or other noxious weed invasion.
- ü Adopt and enforce county laws, regulations, and ordinances that support implementation and maintenance of defensible space and fuel reduction responsibilities for absentee homeowners and vacant lots.
- ü Create and maintain a greenstrip 200 feet wide around the tank storage area. Reseed with fire-resistant vegetation such as recommended in Appendix E.
- ü Remove all unmarked containers and dispose of the contents in accordance with current hazardous materials standards.

Humboldt-Toiyabe National Forest Recommendations

- ü Complete and implement plans for pinyon and juniper fuels reduction treatment in the interface areas around Austin. Trees should be thinned to twice the height of the trees and limbed to four feet from the ground.

Humboldt-Toiyabe National Forest Service and Lander County

- ü Create and maintain a greenstrip along the south ridgeline dirt road extending from Stokes Castle Road to the Austin 'A'. Vegetation should be cleared for a distance of 150 feet north of the road and 300 feet south of the road. The area should be reseeded with a fire resistant seed mixture such as the one recommended in Appendix E, and treated for cheatgrass control if necessary.
- ü Create and maintain a fuelbreak along the road between Highway 50 and Stokes Castle. Trees and shrubs should be thinned within a distance of 50 feet below and 100 feet above the road. Create spacing between trees and shrubs equal to twice the height of remaining plants. Prune the limbs on pinyon and juniper trees within four feet of the ground.

- ü Extend a fuel reduction treatment for an additional width of 150 feet beyond the south edge of the south ridgeline greenstrips. Thin pinyon and juniper trees to a distance between tree crowns that is equal to twice the tree height. Limb remaining trees to a height of four feet above ground level. Thin shrubs to a distance equal to twice the shrub height between shrubs. Immediately remove culled vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Create a 200 feet wide fuelbreak along the dirt road on the north side of the community. Thin trees and shrubs to a spacing equal to twice the height of the remaining plants.
- ü Permit livestock grazing prior to seed maturity to reduce cheatgrass. Balance annual stocking rates with annual cheatgrass grass productivity.

Utility Company Recommendations

- ü Maintain a minimum fifteen feet of vegetation clearance around utility poles and transformers.
- ü Remove trees within power line right-of -ways.
- ü Create and maintain a firebreak cleared of all vegetation around electrical transfer stations for a distance of 50 feet outside of the perimeter fence. Treat for cheatgrass control if necessary.

6.3.3 Suppression Resources and Training

Austin Volunteer Fire Department

- ü Require all volunteer members to attend annual Wildland Fire Training provided by the Bureau of Land Management or the US Forest Service with specific emphasis on safety and use of fire shelters.

6.3.4 Community Coordination and Public Education

Many of the most effective activities aimed at reducing the threat of wildfire for the Austin community require that individual property owners coordinate with each other and with local fire authorities. Public education and awareness, neighbors helping neighbors, and proactive individuals setting examples for others to follow are just some of the approaches that will be necessary to meet the fire safe goals in the community.

Property Owner Recommendations

- ü Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council facilitates solutions to reduce the loss of lives and property from wildfire in Nevada's communities. Through the establishment of a local Chapter, local communities will become part of a large network for sharing information, including notification of programs and funding opportunities for fire mitigation projects such as those listed in this report. The Nevada Fire Safe Council will accept and manage grants and contracts on the Chapter's behalf through its non-profit status. The Nevada Fire Safe Council will provide assistance and support to communities to complete fire safe plans, set priorities, educate and train community members and

promote success stories of its members. To form a local Chapter or for more information contact the:

Nevada Fire Safe Council
1187 Charles Drive
Reno, Nevada 89509
(775) 322-2413

- ü Post residential addresses so that they are visible from the road. Address characters should be at least four inches high, reflective, and fire resistant. Improving visibility of addresses will make it easier for firefighters unfamiliar with the area to navigate during a wildland fire.

Austin Volunteer Fire Department Recommendations

- ü Meet annually with the Bureau of Land Management and the US Forest Service to discuss pre-attack plans for the Austin area.
- ü Distribute copies of the publication *"Living With Fire"* to all property owners. This publication can be obtained free of charge from the University of Nevada Cooperative Extension.
- ü Meet annually with US Forest Service and the Bureau of Land Management to discuss pre-attack plans for the area around Austin.
- ü Contact the BLM Battle Mountain Field Office for assistance with public education.

Table 6-2. Austin Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space Treatments	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E. Limb trees within the defensible space zone, remove branches near chimneys, and remove dead and diseased branches.
	Community Coordination	Form a local chapter of the Nevada Fire Safe Council. Assure the address signs are reflective and visible from the road.
Utility Company	Fuel Reduction Treatments	Reduce and remove vegetation around power lines and utility poles. Remove pinyon and juniper trees from power line right-of-ways. Maintain a firebreak 50 feet wide around power transfer stations.
Austin Volunteer Fire Department	Community Coordination and Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners. Meet annually with US Forest Service and the Bureau of Land Management to discuss pre-attack plans.
	Suppression Resources and Training	Require all members to attend BLM or USFS Wildland Fire Training annually.

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Nevada Department of Transportation	Fuel Reduction	Mow both sides of Highway 50 to reduce vegetation to a height of four inches for a width of 150 to 200 feet from the edge of pavement. Continue this treatment for a distance of at least one mile on both sides of the community.
Lander County	Fuel Reduction	Mow a swath at least 25 feet wide or to the limit of the road right-of-way on both sides of all community roads. Treat for cheatgrass control if necessary in accordance with the guidelines in Appendix E. Adopt and enforce county laws, regulations, and ordinances that support implementation and maintenance of defensible space and fuel reduction responsibilities for absentee homeowners and vacant lots. Clear and maintain a fuelbreak 200 feet wide around the fuel tank storage area. Remove all unmarked containers and dispose of the contents in accordance with current hazardous materials standards.
US Forest Service	Fuel Reduction Fuelbreaks	Complete and implement plans for pinyon and juniper fuels reduction treatment in the interface areas around Austin. Coordinate with Lander County to create and maintain a greenstrip 450 feet wide along the ridgeline road from Stokes Castle Rd. to the Austin 'A'. Implement and maintain an addition 150 feet wide fuel reduction treatment on the south side of the greenstrip. Coordinate with Lander County to create and maintain a fuelbreak 150 feet wide along the road from Highway 50 to Stokes Castle. Permit livestock grazing prior to seed maturity to reduce cheatgrass. Balance annual stocking rates with annual cheatgrass grass productivity.

Figure 6-4 Austin Fuel Hazard Photo Points

Austin Photo Point 1. 4371426N, 494536E, 280°NW. North of Austin, pinyon-juniper and dense sagebrush occur adjacent to the community. Fuel loading was estimated at eight to nine tons per acre and considered a high fuel hazard.

Austin Photo Point 2. 4371817N, 492891E, 180°S. This is the fuel tank storage area west of Austin. Cheatgrass and other fuels here, estimated at five tons per acre, pose a severe hazard because of the risk of the tanks exploding during a wildfire.

Figure 6-4 Austin Fuel Hazard Photographs *(continued)*

Austin Photo Point 3. 4371758N, 0494015E, 180° S. Dense brush and pinyon in the foreground is typical of canyon slopes. The south ridgeline road (background) is proposed for greenstrip treatment.

Austin Photo Point 4. 4370152N, 0495864E, 0°N. Sagebrush, other shrubs, and ground fuels have reestablished in the1981 burned area. Dense shrubs and steep slopes create high fuel hazard conditions.

7.0 BATTLE MOUNTAIN

7.1 BATTLE MOUNTAIN COMMUNITY RISK/HAZARD ASSESSMENT

Battle Mountain is located in northern Lander County, at the Junction of US Interstate 80 and State Route 305. The Union Pacific Railroad runs through town, parallel to Interstate 80. The community risk hazard assessment assigned Battle Mountain to the **Low Hazard Category** (38 points). A summary of factors that contributed to this hazard rating is included in Table 7-3. The low hazard rating is primarily due to good defensible space, appropriate construction materials, adequate address signage, good access, and low, sparse vegetation.

7.1.1 Community Design

The urban interface surrounding Battle Mountain is primarily a classic interface with small areas that would be considered intermixed. Of the 237 Battle Mountain homes reviewed as part of this assessment, 133 were on lots of less than one acre and 104 were on lot sizes of one to ten acres.

Roads: US Interstate 80 and State Route 305 are the major transportation routes into and out of Battle Mountain. Both roads are paved, two lane roads. All secondary roads are paved and provide adequate room for fire suppression equipment to maneuver.

Signage: Street signs were present and visible on 89 percent of the streets observed. Residential addresses were visible on 78 percent of the homes surveyed. Clear and visible signage is important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: Utilities are all above ground. Power lines have been properly maintained minimizing the possibility that arcing may start fires in nearby vegetation. Dry weeds and grasses have accumulated around a power substation west of Battle Mountain. This dry material poses a fire ignition risk.

7.1.2 Construction Materials

Nearly all of the homes observed in the interface (97 percent) were built with non-combustible or highly fire-resistant siding such as medium density fiberboard, and non-combustible roofing materials such as tile, metal, or composition. Eighty-eight percent of the homes assessed had unenclosed balconies, porches, decks or other architectural features that can create drafts and provide areas where sparks and embers can be trapped and smolder, eventually igniting and rapidly spreading fire to the home.

7.1.3 Defensible Space

Ninety-one percent of the homes assessed in Battle Mountain met the minimum standard for defensible space.

7.1.4 Suppression Capabilities

Wildfire Suppression Resources

Battle Mountain is protected by an all-volunteer fire department staffed by 25 members. Additional resources are available from the BLM Field Offices in Battle Mountain and Winnemucca, the Nevada Division of Forestry Carlin Conservation Camp, and the US Forest Service Austin Ranger District. Table 7-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to Battle Mountain to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 7-1. Battle Mountain Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 1 Engine Water Tender Command Officer	2 1 1 1	Battle Mountain Volunteer Fire Department (Battle Mountain)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Carlin, Winnemucca)

Source: Bart Negro and Dan Baldini, Battle Mountain VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water availability for fire suppression in Battle Mountain includes:

- ü 500 gpm hydrants within 500 feet of structures.
- ü Community wells.
- ü Two one-million gallon water storage tanks.

The community water system operates on gravity and electric pumps. Other sources of water include ranch ponds and the Humboldt River, when weather conditions and water levels permit.

Detection and Communication

There is a community siren to notify Battle Mountain residents of an emergency. Fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local fire response personnel by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the

Elko Interagency Dispatch Center. The Battle Mountain VFD has access to the state mutual aid frequencies and has compatibility with neighboring agencies. There are no gaps in radio coverage.

Fire Protection Personnel Qualifications

The Battle Mountain VFD volunteers receive structure firefighting training to meet the State Fire Marshal Firefighter I and II standards. Some staff members have completed the 40-hour BLM Wildland Fire Training course and the Department utilizes the Red Card System for individual qualifications. Red Card certification is part of a fire qualifications management system used by many state and all federal wildland fire management agencies. This certification indicates that an individual is qualified to fight wildland fires. Federal agency fire suppression personnel receive training to meet National Wildfire Coordinating Group standards.

Work Load

The Battle Mountain VFD emergency call log averages 170 calls per year. Twenty of these are wildland/brush fires. The Battle Mountain VFD does not respond to emergency medical calls.

Financial Support

Funding for the Battle Mountain VFD comes from the Lander County General Fund.

Community Preparedness

Battle Mountain has an active Local Emergency Planning Committee and a hazardous material response plan. Lander County administers an evacuation plan, an all risk disaster plan, a pre-attack plan, and soil conservation and noxious weed mitigation plans. The Lander County Sheriff Department is responsible for the evacuation plan, the County is responsible for the all risk disaster plan, and the VFD is responsible for the pre-attack plan. The plans are updated annually. The Battle Mountain VFD does not review plans to ensure that proposed developments meets current fire code standards. The VFD does look at hydrant placement in proposed developments.

7.1.5 Factors That Affect Fire Behavior

The vegetative fuel density in the Battle Mountain interface area is variable depending upon species composition, and was estimated to range between one to two tons per acre. Greasewood is the dominant shrub type with various components of shadscale, Wyoming big sagebrush, budsage, halogeton, squirreltail, and cheatgrass contributing to the fuel loading. Overall, the fuel hazard was considered low. However during a wet year, increased cheatgrass production would increase the fuel hazard and create conditions that could carry a fire through the shrub layer.

7.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for Battle Mountain would occur during a wet year with increased cheatgrass production and hazardous fuel conditions. A dry lightning ignition southwest of the community with winds from the south, southwest, or west could drive the fire into the Echo subdivision area, located on the west side of Battle Mountain.

7.1.7 Ignition Risk Assessment

Battle Mountain has a moderate ignition history around the community with historic fires nearby to the northeast and east. The interface area around Battle Mountain is considered a low ignition risk area due to sparse, low brush in and around the community.

7.2 FUEL REDUCTION TREATMENTS IN PROGRESS

In 2003, the Bureau of Land Management Battle Mountain Field Office completed a Site Assessment for Battle Mountain (2824-DD-JF19) that included descriptions of fuel conditions and expected fire behavior around the community. Permanent photo points were established. Treatment alternatives proposed in the assessment include developing an interpretive trail that would serve as a firebreak (Figure 7-2), reseeding the 'Tracy' and 'Airport' Greenstrips east of the community, noxious weed monitoring and control, fuel reduction and seeding with fire-resistant species, and controlled grazing to reduce fine fuels. The majority of the proposed treatments are located on private land as shown in Figure 7-3. Community support, county support, and cooperative agreements will be important for full implementation.

7.3 HAZARD REDUCTION RECOMMENDATIONS

The Battle Mountain risk reduction recommendations focus on maintaining good defensible space, some fuel reduction measures, fuel reduction along roads and railroad right-of-ways, and cheatgrass control.

7.3.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes, businesses, and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.

- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[4] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.[5]
- ü Clear all vegetation and combustible materials around propane tanks for a minimum of ten feet.
- ü Remove or board up abandoned mobile homes and other structures to prevent sparks entering and igniting the structure.
- ü Maintain defensible space annually.

7.3.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments, typically along roads, railroads, community open space, power line corridors, or community perimeters. Permanently changing the fuel characteristics over large blocks of land to a lower volume and altered distribution reduces hazardous fire behavior and provides an opportunity to slow or suppress an approaching wildfire before it burns through a community.

Lander County Roads Department Recommendations

- ü Mow a swath at least 25 feet wide or to the limit of the road right-of-way on both sides of all community roads. Reduce fuels to a height of not more than four inches. Reseed according to the recommendations in Appendix E if necessary to prevent cheatgrass or other noxious weed invasion.[2]

Union Pacific Railroad Recommendations

- ü Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks. Reseed according to the recommendations in Appendix E, if necessary to prevent cheatgrass or other noxious weed invasion.[2] Maintain low density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

[4] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

[5] Saline and alkaline soil conditions are common in the vicinity of Battle Mountain and warrant site-specific soil chemistry analysis prior to finalizing species selection for reseeding.

7.3.3 Public Education

Battle Mountain Volunteer Fire Department Recommendations

- ü Conduct courtesy inspections of home defensible space measures.
- ü Distribute copies of the publication *"Living With Fire"* to all property owners. This publication can be obtained free of charge from the University of Nevada Cooperative Extension.

Table 7-2. Battle Mountain Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space Treatments	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E. Remove or board-up windows and doors of abandoned structures and skirt all trailers.
Union Pacific Railroad	Fuel Reduction Treatments	Mow or remove vegetation with twenty feet of both sides of railroad tracks.
Lander County Roads Department	Fuel Reduction Treatment	Mow vegetation to a height of four inches within 25 feet along both sides of county roads.
Battle Mountain VFD	Public Education	Distribute copies of the publication "*Living With Fire"* to all property owners. Provide courtesy inspections of defensible space. Contact the BLM Battle Mountain Field Office for assistance with public education.

8.0 BATTLE MOUNTAIN COLONY

8.1 BATTLE MOUNTAIN COLONY COMMUNITY RISK/HAZARD ASSESSMENT

The Battle Mountain Colony is a tribal community located in northern Lander County, at the Junction of US Interstate 80 and State Route 305. The community encompasses two separate parcels totaling 688 acres. The Colony was established in 1917. Risk assessment classified the Battle Mountain Colony in the **Low Hazard Category** (32 points). A summary of factors that are incorporated in the hazard rating is included in Table 8-3. Primary factors that contributed to the low hazard rating were adequate defensible space, construction materials, good address and street signage, good access through the community, and low density fuels in the interface areas.

8.1.1 Community Design

The urban interface surrounding the Battle Mountain Colony represents a classic interface condition. There is a clear line of demarcation between the community and the surrounding wildland fuels. All 65 of the homes assessed were on lots of less than one acre, indicating high density housing.

Roads: State Route 305 and Allen Road are the major transportation routes into and out of the Battle Mountain Colony. These roadways are paved, two lane roads of typical 24-foot width, adequate for two-vehicle passage and fire suppression equipment to maneuver. All secondary roads were paved and provide adequate room for fire suppression equipment maneuverability.

Signage: Street signs were present and visible on all of the streets. Residential addresses were visible on 92 percent of the homes surveyed. Clear and visible street signage is important in locating homes during low visibility conditions that occur during a wildland fire.

Utilities: Utilities are all above ground. Power lines have been properly maintained minimizing the possibility that arcing may start fires in nearby vegetation.

8.1.2 Construction Materials

All of the homes in the interface were built with non-combustible or highly fire-resistant siding such as medium density fiberboard, and 98 percent of the homes were constructed with non-combustible roofing materials such as tile, metal, or composition. Thirty-two percent of the homes assessed had unenclosed balconies, porches, decks or other architectural features that can create drafts and provide areas where sparks and embers can be trapped, smolder, and ignite, rapidly spreading fire to the home.

8.1.3 Defensible Space

Eighty-two percent of the homes assessed in the Battle Mountain Colony met the minimum standard for defensible space.

8.1.4 Suppression Capabilities

Wildfire Suppression Resources

Fire protection in the Battle Mountain Colony is provided by the Battle Mountain Volunteer Fire Department. At the time the interviews were conducted for this report, the Battle Mountain Volunteer Fire Department consisted of 25 members. Additional resources are available from the BLM Field Offices in Battle Mountain and Winnemucca, the Nevada Division of Forestry Carlin Conservation Camp, and the US Forest Service Austin Ranger District. Table 8-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to the Battle Mountain Colony to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 8-1. Battle Mountain Colony Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 1 Engine Water Tender Command Officer	2 1 1 1	Battle Mountain Volunteer Fire Department (Battle Mountain)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camps (Carlin, Winnemucca)

Source: Bart Negro and Dan Baldini Battle Mountain VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Fire Protection Personnel Qualifications

The Battle Mountain VFD volunteers receive structure firefighting training to meet the State Fire Marshal Firefighter I and II standards. Some staff members have completed the 40-hour BLM Wildland Fire Training course and the Department utilizes the Red Card System for individual qualifications. Red Card certification is part of a fire qualifications management system used by many states and all federal wildland fire management agencies. This certification indicates that an individual is qualified to fight wildland fires. Federal agency fire suppression personnel receive training to meet National Wildfire Coordinating Group standards.

Work Load

The Battle Mountain VFD emergency call log averages 170 calls per year. Twenty of these are wildland/brush fires. The Battle Mountain VFD does not respond to emergency medical calls.

Financial Support

Funding for the Battle Mountain VFD comes from the Lander County General Fund.

Water Sources and Infrastructure

Water availability for fire suppression in the Battle Mountain Colony includes:

- ü 500 gpm hydrants within 500 feet of structures.
- ü Community wells.
- ü Two 1-million gallon water storage tanks.

The community water system operates on gravity and electric pumps. Other sources of water for fire suppression include dip spots in the Humboldt River and ranch ponds.

Detection and Communication

There is a community siren to notify Battle Mountain Colony residents of an emergency. Fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local fire response personnel by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to state and federal fire response personnel by the Central Nevada Interagency Dispatch Center. The Battle Mountain VFD has access to the state mutual aid frequencies and compatibility with neighboring agencies. There are no gaps in radio coverage.

8.1.5 Factors That Affect Fire Behavior

The vegetative fuel density in the Battle Mountain Colony interface area is light, estimated at one ton or less per acre. Greasewood is the dominant shrub type with various components of shadscale, Wyoming big sagebrush, budsage, halogeton, squirreltail and cheatgrass contributing to the fuel loading. Overall, the fuel hazard was considered low. However during a wet year, increased cheatgrass production would increase the fuel hazard and create conditions that could carry fire through the shrub layer.

8.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for the Battle Mountain Colony would occur during a wet year with increased cheatgrass production and hazardous fuel conditions. A dry lightning ignition southwest of the community with winds from the south, southwest, or west could drive the fire into the community.

8.1.7 Ignition Risk Assessment

There is some ignition history around the Battle Mountain Colony community with historic fires nearby to the northeast and east. The interface area around the Battle Mountain Colony is considered a low ignition risk area due to sparse, low brush in and around the community.

8.2 HAZARD REDUCTION RECOMMENDATIONS

Recommendations for the Battle Mountain Colony to reduce wildfire risks and hazards focus on maintaining good defensible space and public education to promote annual fire safety maintenance.

8.2.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes, businesses, and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Where cheatgrass has become dominant within the defensible space zone, the plants should be mowed, raked, and removed prior to seed maturity or treated with an application of pre-emergent herbicide prior to initiation of the growing season. Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seed has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.
- ü Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- ü Remove or board up abandoned mobile homes and other structures to prevent sparks entering and igniting the structure.
- ü Maintain defensible space annually.

8.2.2 Public Education

Battle Mountain Volunteer Fire Department Recommendations

- ü Conduct courtesy inspections of home defensible space measures.
- ü Distribute copies of the publication *"Living With Fire"* to all property owners. This publication can be obtained free of charge from the University of Nevada Cooperative Extension.
- ü Contact the Battle Mountain Field Office for assistance with public education.

Table 8-2. Battle Mountain Colony Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space Treatments	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E. Remove or board-up windows and doors of abandoned structures and skirt all trailers.
Battle Mountain Volunteer Fire Department	Public Education	Conduct courtesy inspections of home defensible space. Distribute copies of the publication "*Living With Fire"* to all residents. Contact the BLM Battle Mountain Field Office for assistance with public education.

9.0 CARICO VALLEY

9.1 CARICO VALLEY RISK/HAZARD ASSESSMENT

Carico Valley is located in eastern Lander County, isolated from any major transportation routes or other communities. See Figure 9-1 for a detail of the community boundary. Carico Valley is a rural ranch community composed of widely spaced residences interspersed with large tracts of agricultural or public lands. The rural ranch community type does not lend itself to the standard community assessment procedures. Defensible space, suppression resources, and fuel hazard conditions are described qualitatively for the community.

9.1.1 Community Design

Four widely scattered ranches were noted in the Carico Valley community area.

9.1.2 Construction Materials

This element of the risk/hazard assessment was not completed for residences in Carico Valley. Because agricultural fields abut all of the residential properties, there is no risk of a wildland fire spreading to residences. Construction materials are not a primary factor in determining wildfire risks and hazards in Carico Valley.

9.1.3 Defensible Space

Agricultural fields surround all of the residential properties and fulfill the objectives for defensible space.

9.1.4 Suppression Capabilities

Wildfire Suppression Resources

The closest resources potentially available to Carico Valley in the event of a wildfire are at least one to two hours away and include the BLM Battle Mountain and Winnemucca Field Offices, the US Forest Service Austin Ranger District, and the Nevada Division of Forestry Carlin Station. Table 9-1 lists wildfire suppression resources potentially available for initial attack to a wildland fire call in Carico Valley. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 9-1. Wildfire Suppression Resources Available for Initial Response to a Wildland Fire Call in Carico Valley

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Carlin, Winnemucca)

Source: Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water sources for fire suppression in Carico Valley are limited to irrigation wells and ranch ponds.

Detection and Communication

In Carico Valley fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local volunteer fire departments by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

9.1.5 Factors That Affect Fire Behavior

The predominant wind is from the south/southwest in the late afternoon. The terrain in the vicinity of the residences is predominantly flat. The fuel types in Carico Valley are either agricultural fields or native shrub in the interface areas. The shrub type fuel loading was estimated at two to three tons per acre. The primary fuels of concern include sagebrush, greasewood, shadscale, and cheatgrass. The overall fuel hazard rating was low to moderate. However, during a wet year, increased cheatgrass production would increase the fuel hazard and create conditions that could carry a more hazardous fire through the shrub layer.

9.1.6 Worst-Case Wildfire Scenario

Wildfires in remote rural areas can cover immense areas before suppression crews are able to reach and contain them. The worst-case scenario of a major wildland fire in Carico Valley would occur as a wind-driven fire in a wet year through dense cheatgrass and other fine fuels that surround the individual ranches. Agricultural land provides a buffer that would cause the fire to slow once it reached the farmland-wildland interface. Ranch improvements located near wildland fuels would be at risk of damage or loss.

9.1.7 Ignition Risk

Ignitions around Carico Valley have mostly been recorded in the adjacent Shoshone and Toiyabe Mountain Ranges with a lower occurrence of ignitions around the community. There is a low potential for ignition from lightning in Carico Valley, although human caused

ignitions can occur at any time. As fire history maps show, wildfires in nearby Eureka County can cover immense acreages before suppression resources are able to reach and contain them.

9.2 HAZARD REDUCTION RECOMMENDATIONS

Despite the reduced risk of damage or loss to structural properties, residences in Carico Valley exhibit unique conditions because of their remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special protection because of their considerable value to ranchers and farmers. Not only can stockpiled hay combust or ignite easily, but smoke can make the hay unpalatable and unusable for livestock feed.

9.2.1 Defensible Space Treatments

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Where cheatgrass has become dominant within the defensible space zone, the plants should be mowed, raked, and removed prior to seed maturity or treated with an application of pre-emergent herbicide prior to initiation of the growing season. Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seed has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.
- ü Create a firebreak of bare ground or gravel for 100 feet around hay storage areas. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- ü Plant fire-resistant vegetation in the defensible space area around residential structures and outbuildings. This will enhance fire abatement, especially important in rural areas where water sources are limited or distant.
- ü Clear a minimum ten-foot area around fuel tanks.
- ü Maintain defensible space areas annually

9.2.2 Fire Suppression and Training

Property Owner Recommendations

- ü Establish backup power systems to assure that functional water sources are available for fire suppression.
- ü Develop water storage for fire protection and install water outlets with fire department threads on new and existing water developments for filling water tenders and engines. Pursue grant funding as it becomes available to assist with financing these improvements.

Lander County

- ü Identify a minimum of four people from Carico Valley who would be likely to provide the initial response to a nearby ignition and coordinate with the Bureau of Land Management, the Nevada Fire Marshall, or the Nevada Division of Forestry to provide them with Basic Wildland Firefighter Training.
- ü Pursue grant funding and station a pick-up truck and a one-piece, slip-on, 100 to 200-gallon tank and pump unit with hose and hose reel in Carico Valley during the fire season. This equipment, fitted properly for the size and weight limitations of the truck, can be used to provide initial attack of small wildfires.

Bureau of Land Management

- ü Continue to plan and implement greenstrip projects to slow the spread of a wildfire and allow more time for the arrival of suppression resources.

9.2.3 Public Education and Community Coordination

University of Nevada Cooperative Education

- ü Develop a version of the *"Living With Fire"* publication tailored to the concerns of rural Nevada ranchers. The publication should include solutions for power back up, foam and other fire retardant products, fire resistant seeding, water storage adaptations for filling fire engines and water tenders, and suggested site plans.

Table 9-2. Carico Valley Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain defensible space as needed to keep the space lean, clean, and green.
	Suppression Resources	Provide back-up power systems to assure water availability for fire suppression. Develop water storage for fire protection and adapt new and existing water developments for filling water tenders and engines.
Lander County	Suppression Resources	Identify at least four people who would be likely to provide the initial response to a nearby ignition and coordinate with the fire agencies to provide Basic Wildland Firefighter training. Pursue grant funding and station a pick-up truck fitted with a 100 to 200 gallon tank, pump, and hose in Carico Valley during the fire season.
University of Nevada Cooperative Extension	Public Education	Develop a rural version of *"Living With Fire"* tailored to the needs of rural ranch communities.
Bureau of Land Management	Fire Suppression	Continue to plan and implement greenstrip projects to slow the spread of a wildfire and allow more time for the arrival of suppression resources.

10.0 GILMAN SPRINGS

10.1 GILMAN SPRINGS COMMUNITY RISK/HAZARD ASSESSMENT

Gilman Springs is located on State Route 376 about twelve miles south of US Highway 50. The community is a neighboring community to Kingston, and is composed of one-acre family farms. Nine residences were included in the risk and hazard assessment that classified Gilman Springs in the **Moderate Hazard Category** (52 points). A summary of factors that contributed to the hazard rating is included in Table 10-3. The primary factors affecting the moderate hazard score were the lack of fire suppression and protection resources, the lack of water resources, and a high number of residences with unenclosed architectural features and inadequate defensible space.

10.1.1 Community Design

The urban interface surrounding Gilman Springs reflects a classic interface condition. There is a clear line of demarcation between wildland fuels and the community. All of the homes are on parcels of one to ten acres.

Roads: State Route 376 provides the only access to Gilman Springs. The road is a paved two-lane highway at least 24 feet in width. Two secondary roads in the community are paved and provide adequate space for fire suppression equipment to maneuver.

Signage: Gilman Springs is a very small community. All of the homes are located along the highway and are easily visible from the community access roads. There would be little chance of fire suppression personnel being unable to locate a particular structure that needed protection even under the low visibility conditions that may occur during a wildfire.

Utilities: Utilities were all above ground. Power lines have been properly maintained minimizing the possibility that arcing may start fires in nearby vegetation.

10.1.2 Construction Materials

All of the homes in the interface area were built with non-combustible or highly fire-resistant siding material such as medium density fiberboard. All of the homes but one had a roof composed of non-combustible material such as tile, metal, or composition roofing. Over half of the homes observed had unenclosed balconies, porches, decks or other architectural features that could create drafts and provide areas where sparks and embers can be trapped, smolder, and ignite, rapidly spreading fire to the home.

10.1.3 Defensible Space

Only half of the homes in the community had landscaping that met the minimum standard for defensible space. Within the defensible space zone, many residents are cultivating Russian knapweed as part of their landscape. Russian knapweed is a state listed noxious weed that without control can spread rapidly through both disturbed and undisturbed rangelands replacing native plants. It is critically important for property owners to eradicate

this noxious weed. Around the homes, Russian knapweed contributes to the fuel hazard. Information regarding Russian knapweed problems and control is provided in Appendix E.

10.1.4 Suppression Capabilities

Wildfire Suppression Resources

There is no volunteer fire department in Gilman Springs. The community receives fire protection from the Kingston Volunteer Fire Department, approximately five miles away. Additional resources are available from the US Forest Service, the Bureau of Land Management, and the Nevada Division of Forestry. Table 10-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to Gilman Springs to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 10-1. Gilman Springs Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 3 Engine Water Tender	1 1 1	Kingston Volunteer Fire Department (Kingston)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2-Trained)	3	Nevada Division of Forestry Conservation Camp (Tonopah)

Source: Roger James and Shannon Thiss, Kingston VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

There is no hydrant system in Gilman Springs or any water source designated for fire suppression.

Detection and Communication

In the Gilman Springs area fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to the Kingston Volunteer Fire Department by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to the Bureau of Land Management, the US Forest Service, through the Central Nevada Interagency Dispatch Center. The Nevada Division of Forestry Conservation Camp is dispatched through the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

Fire Protection Personnel Qualifications

Kingston Volunteer Fire Department members do not receive standard required training for structural or wildland firefighting. They do not utilize the Red Card system. Red Card certification is part of a fire qualifications management system used by many state and all federal wildland fire management agencies. This certification indicates an individual's qualifications to fight wildland fires. Federal agency fire suppression personnel receive training to meet National Wildfire Coordinating Group standards.

10.1.5 Factors That Affect Fire Behavior

Gilman Springs is located on an alluvial fan on the east side of the Toiyabe Mountains in Big Smoky Valley. Slopes to the west of the community vary from ten to fifty percent as the elevation increases toward the Toiyabe Mountains. Fuel density is light in the interface area, and was estimated at approximately one to 1½ tons per acre. Fuels consist primarily of sagebrush, greasewood, shadscale, and budsage. There are also some stands of pinyon-juniper trees. Cheatgrass was noted as a fine fuel component throughout all brush types. During a wet year, increased cheatgrass production would increase the fuel hazard and create conditions that could carry a more hazardous fire through the shrub layer.

10.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for Gilman Springs would occur in a wet year with above normal cheatgrass production. A dry lightning ignition with winds from the west would drive the fire through the community. Given the long distances for agency resources to travel, the fire could exceed the capabilities of initial attack resources before help could arrive.

10.1.7 Ignition Risk Assessment

The ignition risk in Gilman Springs is moderate, given the topography, vegetation and potential for ignitions from dry lightning. Human-caused ignitions can occur at any time.

10.2 HAZARD REDUCTION RECOMMENDATIONS

The recommendations for Gilman Springs risk reduction focus on defensible space and fuel reduction treatments as described below.

10.2.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[6] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for approved seed mixes and planting guidelines that can be used in conjunction with removal of this annual grass.
- ü Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- ü Maintain defensible space annually.
- ü Eradicate Russian knapweed. Refer to Appendix E for detailed information on treatments to control Russian knapweed.

10.2.2 Community Coordination

Private Property Owner Recommendations

- ü Coordinate with the residents in Kingston and form a joint local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council facilitates solutions to reduce the loss of lives and property from wildfire in Nevada's communities. Through the establishment of a local Chapter, local communities will become part of a large network for sharing information, including notification of programs and funding opportunities for fire mitigation projects such as those listed in this report. The Nevada Fire Safe Council will accept and manage grants and contracts on the Chapter's behalf through its non-profit status. The Nevada Fire Safe Council will provide assistance and support to communities to complete fire safe plans, set priorities, educate and train community members and promote success stories of its members. To form a local Chapter or for more information contact the:

[6] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

Nevada Fire Safe Council
1187 Charles Drive
Reno, Nevada 89509
(775) 322-2413

Table 10-2. Gilman Springs Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E. Eradicate Russian knapweed in accordance with the Fact Sheet in Appendix E.
	Community Coordination	Coordinate with the Kingston community to form a local chapter of the Nevada Fire Safe Council.

11.0 GRASS VALLEY

11.1 GRASS VALLEY RISK/HAZARD ASSESSMENT

Grass Valley is located in eastern Lander County, isolated from any major transportation routes or other communities. The valley is bound to the west by the Toiyabe Mountains, and to the east by the Simpson Park Mountains. The portion of Grass Valley that lies within Lander County is shown in Figure 11-1. Grass Valley is a rural ranch community composed of widely spaced ranches interspersed with large tracts of agricultural or public lands. The rural ranch community type does not lend itself to the standard community assessment procedures. Defensible space, suppression resources, and fuel hazard conditions are described qualitatively for the community.

11.1.1 Community Design

There were six ranches noted in Grass Valley, all on parcels of greater than ten acres.

11.1.2 Construction Materials

This element of the risk/hazard assessment was not completed for residences in Grass Valley. Agricultural fields abut the residential properties and the risk of a wildland fire spreading to residences is low.

11.1.3 Defensible Space

Rural homes are generally surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These characteristics usually contribute to a low risk of damage or direct loss of property due to wildfires. Hay and alfalfa fields, haystacks, livestock feed yards, farming equipment storage areas, and fuel tanks require special attention when establishing defensible space for protection during a wildfire. Many such areas may not meet recommendations intended to minimize the potential for damage or loss during a wildfire.

11.1.4 Suppression Capabilities

Wildfire Protection Resources

The closest suppression resources for Grass Valley are located in Austin, approximately 25 miles away. The Austin Volunteer Fire Department and the Battle Mountain BLM Field Office respond to wildland fires in Grass Valley, with US Forest Service Austin Ranger District and Nevada Division of Forestry resources available as necessary. Table 11-1 provides a summary of fire suppression resources potentially available to respond to a wildland fire in the Grass Valley area. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 11-1. Grass Valley Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 3 Engine Type 1 Water Tender	1 1 2	Austin Volunteer Fire Department (Austin)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Tonopah)

Source: Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water sources include irrigation wells and ranch ponds.

Detection and Communication

In Grass Valley fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local volunteer fire departments by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

11.1.5 Factors That Affect Fire Behavior

The predominant wind direction in Grass Valley is from the west/southwest in the afternoon. The fuel conditions vary with changes in elevation. The low lands are typically agricultural fields or greasewood flats and the associated fuel hazard is low. Beyond the flats and agricultural fields, the rangelands become steeper and the hills are shrub dominated with sagebrush, rabbitbrush, and other brush as the primary fuel types. Encroaching pinyon and juniper create high fuel hazard conditions. As the hills become steeper, the density of pinyon and juniper trees increases and creates extreme fuel hazard conditions. Cheatgrass can be found throughout most areas and will increase the fuel hazard even more in years of above normal precipitation. Ground fuels, ladder fuels, and a tree layer provide the potential conditions for a hazardous crown fire. Figures 11-2 shows the general fuel hazard conditions in Grass Valley. Figure 11-3 shows examples of agricultural and rangeland conditions in the community.

11.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for a wildland fire in Grass Valley would occur west of the community in a wet year with abundant cheatgrass production. An ignition from a dry lightning strike in the surrounding hills would easily ignite cheatgrass and easily be carried through the shrub layer. Downslope winds would drive the fire into the valley. However, as the fire approached the agricultural fields the low fuel condition would cause the fire to slow once it reached the agricultural-wildland interface. Only the ranch improvements located near the interface would be at risk of damage or loss.

11.1.7 Ignition Risks

There is a high potential for ignition from lightning in Grass Valley, and human caused ignitions can occur at any time. There is some ignition history in Grass Valley, and extensive wildfire history to the east.

11.2 HAZARD REDUCTION RECOMMENDATIONS

Despite the reduced risk of damage or loss to structural properties, residences in Grass Valley exhibit unique conditions because of their remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special protection because of their considerable value to ranchers and farmers. Not only can stockpiled hay combust or ignite easily, but smoke can make the hay unpalatable and unusable for livestock feed.

11.2.1 Defensible Space Treatments

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Where cheatgrass has become dominant within the defensible space zone, the plants should be mowed, raked, and removed prior to seed maturity or treated with an application of pre-emergent herbicide prior to initiation of the growing season. Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seed has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.
- ü Create a firebreak of bare ground or gravel for 100 feet around hay storage areas. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- ü Plant fire-resistant vegetation in the defensible space area around residential structures and outbuildings. This will enhance fire abatement, especially important in rural areas where water sources are limited or distant.
- ü Clear a minimum ten-foot area around fuel tanks.

- ü Maintain defensible space areas annually.

11.2.2 Fire Suppression

Property Owner Recommendations

- ü Establish backup power systems to assure that functional water sources are available for fire suppression.
- ü Develop water storage for fire protection and install water outlets with fire department threads on new and existing water developments for filling water tenders and engines. Pursue grant funding as it becomes available to assist with financing these improvements.

Lander County

- ü Identify a minimum of four people from Grass Valley who would be likely to provide the initial response to a nearby ignition and coordinate with the Bureau of Land Management, the Nevada Fire Marshall, or the Nevada Division of Forestry to provide them with Basic Wildland Firefighter Training.
- ü Pursue grant funding and station a pick-up truck and a one-piece, slip-on, 100 to 200-gallon tank and pump unit with hose and hose reel in Grass Valley during the fire season. This equipment, fitted properly for the size and weight limitations of the truck, can be used to provide initial attack of small wildfire ignitions.

Bureau of Land Management

- ü Continue to plan and implement greenstrip projects to slow the spread of a wildfire and allow more time for the arrival of suppression resources.

11.2.3 Public Education and Community Coordination

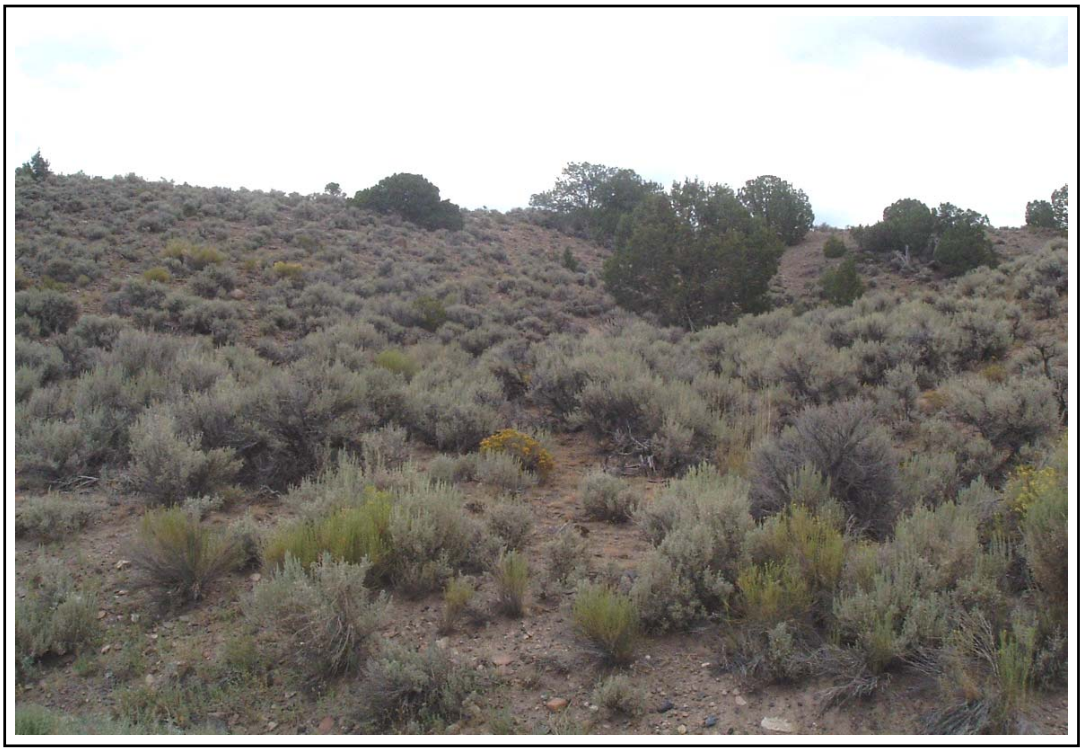
University of Nevada Cooperative Education

- ü Develop a version of the *"Living With Fire"* publication tailored to the concerns of rural Nevada ranchers. The publication should include solutions for power back up, foam and other fire retardant products, fire resistant seeding, water storage adaptations for filling fire engines and water tenders, and suggested site plans.

Table 11-2. Grass Valley Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space Treatments	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain defensible space as needed to keep the space lean, clean, and green.
	Fire Suppression	Provide back-up power systems to assure water availability for fire suppression. Develop water storage for fire protection and adapt new and existing water developments for filling water tenders and engines.
Lander County	Fire Suppression	Identify at least four people who would be likely to provide the initial response to a nearby ignition and coordinate with the fire agencies to provide Basic Wildland Firefighter training. Pursue grant funding and station a pick-up truck fitted with a 100 to 200 gallon tank, pump, and hose in Grass Valley during the fire season.
University of Nevada Cooperative Extension	Public Education	Develop a rural version of *"Living With Fire"* tailored to the needs of rural ranch communities.
Bureau of Land Management	Fire Suppression	Continue to plan and implement greenstrip projects to slow the spread of a wildfire and allow more time for the arrival of suppression resources.

Figure 11-3 Grass Valley Fuel Hazard Photo Points



Grass Valley Fuel Hazard Photo Point 1. 4372058N, 500712E, East. Vegetation in Grass Valley consists of sagebrush, rabbitbrush, and a tree layer of pinyon-juniper that increases the fuel hazard. The cheatgrass component throughout the valley, and rolling hills in the south end of the valley, increase the fuel loading and hazard.

Grass Valley Fuel Hazard Photo Point 2. 4390218N, 508408E, 300°NW. A typical ranch setting in Grass Valley. Note the slopes, pinyon-juniper trees, and isolated residence.

12.0 HILLTOP

12.1 HILLTOP HAZARD AND RISK REDUCTION

Hilltop is a subdivision community located southeast of Battle Mountain. The community hazard assessment classified Hilltop in the **Low Hazard Category** (36 points). Factors that contributed to the low hazard rating are shown in Table 12-3 and included adequate defensible space, good construction materials, and sparse fuels on flat terrain in the interface area. See Figure 12-1 for a detail of the Hilltop community boundary.

12.1.1 Community Design

The urban interface surrounding Hilltop is a classic interface condition. There is a clear line of demarcation between the community and the wildland that do not continue into the development area. A total of 370 residences were assessed in Hilltop. All are on parcels of approximately one to ten acres.

Roads: The subdivision is accessed by Hilltop Road, which leads from State Route 304. This road and all secondary roads are paved and are typically 24 feet wide.

Signage: Street signs were present and visible on 75 percent of the streets. Residential signs were present and visible on 69 percent of the homes surveyed. Clear and visible signage is important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: Utilities were all above ground. Power lines have been properly maintained minimizing the possibility that arcing may start fires in nearby vegetation.

12.1.2 Construction Materials

Ninety-nine percent of the residences assessed were built with non-combustible or highly ignition resistant siding such as medium density fiberboard and non-combustible roofing materials including composition, tile, or metal. One third of the homes observed had unenclosed balconies, porches, decks or other architectural features that could create drafts and provide areas where sparks and embers can be trapped, smolder, and ignite, rapidly spreading fire to the home.

12.1.3 Defensible Space

Ninety percent of the homes assessed in Hilltop had landscaping that met the minimum standard for defensible space.

12.1.4 Suppression Capabilities

Wildfire Suppression Resources

The Battle Mountain Volunteer Fire Department provides fire protection to the Hilltop community. At the time that interviews were conducted for this report, Battle Mountain VFD had a 25-member all-volunteer force. Additional resources are available from the Bureau of Land Management Field Offices in Battle Mountain and Winnemucca, the Nevada Division of Forestry Conservation Camp in Carlin, and the US Forest Service Austin Ranger District. Table 12-1 lists the types of wildfire resources, cooperating partners, and

equipment potentially available to the Hilltop community to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources potentially available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 12-1. Hilltop Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 1 Engine Water Tender Command Officer	2 1 1 1	Battle Mountain Volunteer Fire Department (Battle Mountain)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Carlin, Winnemucca)

Source: Bart Negro and Dan Baldini, Battle Mountain VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water sources for fire protection in Hilltop include individual domestic wells.

Detection and Communication

Fires are reported in the Hilltop area through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local volunteer fire departments by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

Fire Protection Personnel Qualifications

All volunteer firefighters in Battle Mountain are trained to the State Fire Marshall Firefighter I and II standards. Some members have BLM wildland fire training under the Red Card system. Red Card certification is part of a fire qualifications management system used by many state and all federal wildland fire management agencies. This certification indicates that an individual is qualified to fight wildland fires. Federal agency firefighters receive wildland firefighting training according to the National Wildfire Cooperating Group standards.

12.1.5 Factors That Affect Fire Behavior

Fuel density in the interface around the Hilltop subdivision is light and was estimated between one to two tons per acre. Fuels consist primarily of greasewood as the dominant shrub type. Wyoming big sagebrush, budsage, and squirreltail are also present. Cheatgrass was noted to

occur in many areas. At the time the field observations were made for this report, the cheatgrass load was sparse and the fuel hazard condition was rated low. However during a wet year, increased cheatgrass production would increase the fuel hazard and create conditions that could carry a fire through the shrub layer.

12.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for Hilltop would occur in a year of high cheatgrass production. A dry lightning ignition starting south or west of the community would be driven by winds from the south and southwest into the subdivision.

12.1.7 Ignition Risk Assessment

The primary ignition risk in Hilltop is lightning, although human caused ignitions can occur at any time.

12.2 FUEL REDUCTION TREATMENTS IN PROGRESS

In 2003, the Bureau of Land Management Battle Mountain Field Office completed a Site Assessment for Battle Mountain (2824-DD-JF19) that included the Hilltop community. A summary of the BLM recommendations is included in section 7.2. The majority of the proposed treatments were located on private land as shown in Figure 7-3. Community support, county support, and cooperative agreements will be important for full implementation.

12.3 HAZARD REDUCTION RECOMMENDATIONS

Recommendations for the Hilltop community focus on maintaining good defensible space and controlling cheatgrass.

12.3.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.

- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[7] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.[8]
- ü Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- ü Maintain defensible space annually.
- ü Remove or board up abandoned mobile homes and other structures to prevent sparks entering and igniting the structure.
- ü Post residential addresses so that they are visible from the road. Address characters should be at least four inches high and fire resistant. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate during a wildland fire.

12.3.2 Fuel Reduction Treatments

Fuels reduction treatments are applied on a larger scale than defensible space treatments, typically along roads, railroads, vacant lots, power line corridors, or on the outer boundaries of a community to provide fuelbreaks. Permanently changing fuel characteristics over large blocks of land to a lower volume and altered distribution reduces the risk of a catastrophic wildfire in the treated area.

Nevada Department of Transportation and Lander County Road Department Recommendations

- ü Mow a swath at least 25 feet wide or to the limit of the road right-of-way on both sides of all community roads. Reduce fuels to a height of not more than four inches. Reseed according to the recommendations in Appendix E if necessary to prevent cheatgrass or other noxious weed invasion.[3]

[7] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

[8] Saline and alkaline soil conditions are common in the vicinity of Battle Mountain and warrant site-specific soil chemistry analysis prior to finalizing species selection for reseeding.

12.3.3 Public Education

Battle Mountain Volunteer Fire Department Recommendations

- ü Conduct courtesy inspections of home defensible space measures.
- ü Distribute copies of the publication *"Living With Fire"* to residents. This publication is available free of charge from the University of Nevada Cooperative Extension.
- ü Contact the BLM Battle Mountain Field Office for assistance with public education.

Table 12-2. Hilltop Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E.
	Community Coordination	Assure that address signs are clearly visible from the road. Board-up windows and doors of abandoned structures and skirt all trailers.
NDOT/Lander County Roads Department	Fuel Reduction Treatment	Mow on both sides of community roads to reduce the fuel hazard and revegetate if necessary to control cheatgrass and noxious weed invasion according to the guidelines in Appendix E.[3]
Battle Mountain Volunteer Fire Department	Public Education	Distribute copies of the publication "*Living With Fire"* to all property owners. Provide courtesy inspections of defensible space. Contact the BLM Battle Mountain Field Office for assistance with public education.

13.0 KINGSTON

13.1 KINGSTON HAZARD AND RISK REDUCTION

Kingston is located in the southernmost part of Lander County, in Kingston Canyon off of State Route 376. The risk assessment classified Kingston in the **High Hazard Category** (64 points). A summary of factors that contributed to this hazard rating is included in Table 13-3. The score was primarily attributed to inadequate defensible space, a high number of unenclosed architectural features, fire behavior factors, and the isolated location of the community.

13.1.1 Community Design

The urban interface surrounding Kingston is characterized as an intermix condition. Structures are scattered throughout the wildland area with no clear line of demarcation between the community and wildland. There were 127 homes observed during the assessment, all on parcels of approximately one to ten acres.

Roads: SR 376 is the primary transportation route to Kingston. It is a paved two-lane highway, and is 20 to 24 feet wide.

Signage: Street signs and addresses were visible on all of the homes assessed in Kingston.

Utilities: Utilities were all above ground. Vegetation in the power line corridor needs to be cleared. This will minimize the possibility that arcing could start fires in nearby vegetation.

13.1.2 Construction Materials

Ninety-eight percent of the homes were constructed of non-combustible or highly ignition resistant siding material such as medium density fiberboard. Ninety-five percent of the homes had non-combustible roofing material such as composition, metal, or tile.

13.1.3 Defensible Space

Seventy-seven percent of the homes assessed in Kingston did not have adequate defensible space to protect the home from damage or loss in the event of a wildfire.

13.1.4 Suppression Capabilities

Wildfire Suppression Resources

At the time that interviews were conducted for this report, the Kingston Volunteer Fire Department was staffed by twelve volunteers. Table 13-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to Kingston to respond to a reported wildland fire. Initial response time by volunteers may vary based on the day of the week and time of day. Some volunteers may be unable to respond immediately to fire calls during typical workday hours. It is also important to note that the actual number and type of suppression resources available to respond

from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 13-1. Kingston Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type I Engine Type 3 Engine Water Tender	1 1 1	Kingston Volunteer Fire Department (Kingston)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Tonopah)

Source: Personal communication with Roger James and Shannon Thiss, Kingston VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water sources for fire suppression in Kingston are provided by:

- ü 500 gpm hydrants within 500 feet of structures.
- ü Community wells.
- ü One 250,000 gallon storage tank.

The water system is operated by gravity.

Detection and Communication

In Kingston fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local volunteer fire departments by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

Fire Protection Personnel Qualifications

The Kingston VFD firefighters have no formal firefighter training. Federal agency fire suppression personnel receive training to meet National Wildfire Coordinating Group standards.

Work Load

The Kingston VFD responded to five emergency calls in 2003. Two were wildland fire calls. They do not respond to medical calls.

Financial Support

The Kingston VFD receives funding from the Town General Fund.

Community Preparedness

Kingston has a pre-attack plan for response to fires. The plan is managed by the Volunteer Fire Department and is updated annually. The volunteer fire department does not review development plans for fire safety issues.

13.1.5 Factors That Affect Fire Behavior

Kingston is located in lower Kingston Canyon on south facing slopes, and extends along alluvial fans into Big Smoky Valley. Prevailing winds are from the west/southwest. The terrain varies from flat (less than five percent slope) east of Kingston, to very steep terrain higher up the canyon. In steeper canyon areas, pinyon-juniper and associated fuels were estimated at ten to fifteen tons per acre and were considered an extreme fuel hazard. Lower in the canyon the fuel load was estimated at six to eight tons per acre, a high fuel hazard. The lower flats in Big Smoky Valley consist primarily of salt desert shrub vegetation such as shadscale, bottlebrush, squirreltail, and budsage. These fuels were estimated at less than one ton per acre, and considered a low fuel hazard. Within the community, black sagebrush is the predominant shrub with greasewood, ephedra, shadscale and budsage. The riparian corridor along Kingston Creek has a thick accumulation of dead and diseased willow. Fuel hazard mapping and photo points for Kingston are shown in Figure 13-2 and Figure 13-3.

13.1.6 Worst-Case Wildfire Scenario

The worst-case scenario for Kingston would be a wildland fire ignition that begins west of the community. Southwest or west winds would drive the fire through the canyon, funneled by drainages that would create a chimney effect and draw the fire through the community. Steep slopes would hinder fire suppression equipment. The Kingston Volunteer Fire Department has no formal wildfire training. This factor, in addition to the potential for delayed response from volunteer personnel, and the travel distance of additional resources, could mean a fire would exceed initial response capabilities.

13.1.7 Ignition Risk Assessment

There is an ignition history in and around Kingston Canyon, however no existing wildfire polygons are recorded in the fire history database. Kingston has a high potential for fire ignition and structure loss. The primary ignition risk in Kingston is lightning, although human caused ignitions can occur at any time.

13.2 FUEL REDUCTION TREATMENTS IN PROGRESS

In August of 2003, the Bureau of Land Management Battle Mountain Field Office completed an Environmental Assessment for the *Wildland Urban Interface/Fire Defense Systems Austin and Kingston, Nevada*. Approximately 2,900 acres in the vicinity of the community of Kingston are scheduled for treatment with high intensity, low-frequency (HILF) livestock grazing. Livestock grazing will be permitted to reduce fuels within a fenced pasture (completed in 2003) in the treatment area shown in Figure 13-4. The BLM Battle Mountain Field Office will seek an agreement with the current grazing permittee to complete grazing

treatments using temporary, non-renewable permits, with the necessity for grazing treatments to be determined on an annual basis.

13.3 HAZARD REDUCTION RECOMMENDATIONS

The recommendations to reduce fire hazards for the Kingston community focus on creating good defensible space, developing water sources for fire suppression, and fuelbreaks and fuel reduction treatments.

13.3.1 Defensible Space Treatments

Vegetation density, type of fuel, and slope gradient around a home affect the potential fire exposure levels to the home. The goals of defensible space are to reduce the risk of property loss from wildfire by eliminating flammable vegetation near the home; thereby, lowering the potential to burn and providing firefighters a safer working area to defend the home or outbuilding during a wildland fire. Guidelines for improving defensible space around residences and structures in the community are given below and are described in detail in Appendix E.

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Where cheatgrass has become dominant within the defensible space zone, the plants should be mowed, raked, and removed prior to seed maturity or treated with an application of pre-emergent herbicide prior to initiation of the growing season. Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seed has been depleted. Refer to Appendix E for seeding recommendations and planting guidelines that can be used in conjunction with cheatgrass removal.
- ü Remove leaves and debris from roofs and rain gutters.
- ü Install spark arrestors on chimneys.
- ü Prune or remove trees so that branches are at least fifteen feet from structures and chimneys. Limb remaining trees within the defensible space zone to a height of four feet above ground level (but not more than one-third the height of the tree).

Prune all dead and diseased branches. Remove all duff, shrubs, and other flammable material from beneath the crowns of remaining trees.

- ü Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- ü Reduce vegetation along both sides of private driveways within a ten-foot wide swath on both sides. Flammable vegetation should be replaced with fire-resistant species or non-flammable groundcover. Refer to Appendix E for seeding recommendations and planning guidelines.
- ü Remove vegetation that has grown on or accumulated along fences.
- ü Remove or board up windows and doors on abandoned trailers and structures to prevent sparks entering and igniting the structure.
- ü Prune trees so that the branches are at least fifteen feet away from chimneys and/or structures.
- ü Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Clear dead and diseased willow accumulations on properties along the creek bottom.
- ü Maintain defensible space annually.

Kingston Volunteer Fire Department Recommendations

- ü Establish and maintain defensible space around the fire department.

13.3.2 Fuel Reduction Treatments

Fuels reduction treatments such as fuelbreaks are applied on a larger scale than defensible space treatments, typically along roads, along power line corridors, or on the outer boundaries of a community to reduce the potential for hazardous fire behavior and provide fire suppression resources a better opportunity for protecting a community. Permanently changing the fuel characteristics over large blocks of land to a lower volume and altered distribution reduces the risk of a catastrophic wildfire in the treated area.

Humboldt-Toiyabe National Forest and Lander County Recommendations

- ü Create and maintain a fuelbreak 300 foot wide along Black Hill Ridge Road and following the ridgeline to the north and east and intersecting Toquima Road as shown in Figure 13-1. Thin trees and shrubs to a spacing equal to twice their height. Immediately remove all biomass to an approved disposal site.
- ü Create and maintain a fuelbreak 150 feet wide along Smoky Court as shown in Figure 13-1. Thin trees and shrubs to a spacing equal to twice their height. Immediately remove all biomass to an approved disposal site.
- ü Complete and implement plans to thin pinyon, juniper, and shrubs within a minimum distance of 0.5 miles of town. Trees and shrubs should be thinned to a spacing equal to twice their height. Remaining stands should be cleared of dead and down trees. Remaining trees should be limbed within four feet from the ground.

Lander County Road Department

- ü Mow a swath at least 25 feet wide or to the limit of the road right-of-way along both sides of all community roads. Reduce fuels to a height of not more than four inches. Thin pinyon trees to a spacing equal to twice their height for an additional distance of 25 feet on each side of roads. Reseed according to the recommendations in Appendix E if necessary to prevent cheatgrass or other noxious weed invasion.

Utility Company Recommendations

- ü Clear vegetation to maintain a minimum distance of 25 feet from all utility transformers. Thin trees to a spacing equal to twice their height for an additional 25 feet.

13.3.3 Fire Suppression Resources and Training

Water District Recommendations

- ü Pursue grant funding to obtain an emergency generator for water system pumps to keep water storage tanks full.
- ü Create and maintain a 300 feet wide firebreak around all water tanks. Clear all vegetation and implement treatments to control cheatgrass and noxious weed invasion with the use of pre-emergent herbicides.[9]

Kingston Volunteer Fire Department Recommendations

- ü Require all volunteer members to attend annual Wildland Fire Training provided by the Bureau of Land Management or the US Forest Service with specific emphasis on safety and use of fire shelters.
- ü Pursue grants to obtain or upgrade wildland fire equipment including fire shelters, Pulaskis, McLeods, and personal protective equipment including hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- ü Meet annually with BLM and USFS to discuss the pre-attack plan for the community.

13.3.4 Community Coordination Public Education

Kingston Volunteer Fire Department and Lander County Recommendations

- ü Prepare an evacuation plan and post or otherwise distribute this plan to residents. This plan should include information regarding evacuation routes, evacuation procedures, designated fire safe zones (e.g. Lee Baker Park), and procedures for sheltering in place in case evacuation becomes infeasible during a fast moving firestorm.
- ü Provide courtesy inspections of defensible space on private property.

[9] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

Property Owner Recommendations

- ü Coordinate with the Gilman Springs community to form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council facilitates solutions to reduce the loss of lives and property from wildfire in Nevada's communities. Through the establishment of a local Chapter, local communities will become part of a large network for sharing information, including notification of programs and funding opportunities for fire mitigation projects such as those listed in this report. The Nevada Fire Safe Council will accept and manage grants and contracts on the Chapter's behalf through its non-profit status. The Nevada Fire Safe Council will provide assistance and support to communities to complete fire safe plans, set priorities, educate and train community members and promote success stories of its members. To form a local Chapter or for more information contact the:

  Nevada Fire Safe Council
  1187 Charles Drive
  Reno, Nevada 89509
  (775) 322-2413

- ü As an evacuation plan becomes available, become fully knowledgeable of evacuation procedures, fire safety zones, and safety procedures for sheltering in place in the event that evacuation is not possible.

Kingston Volunteer Fire Department

- ü Distribute copies of the publication *"Living With Fire"* to all residents. This publication is free of charge and can be obtained from the University of Nevada Cooperative Extension.
- ü Contact the BLM Battle Mountain Field Office for assistance with public education.

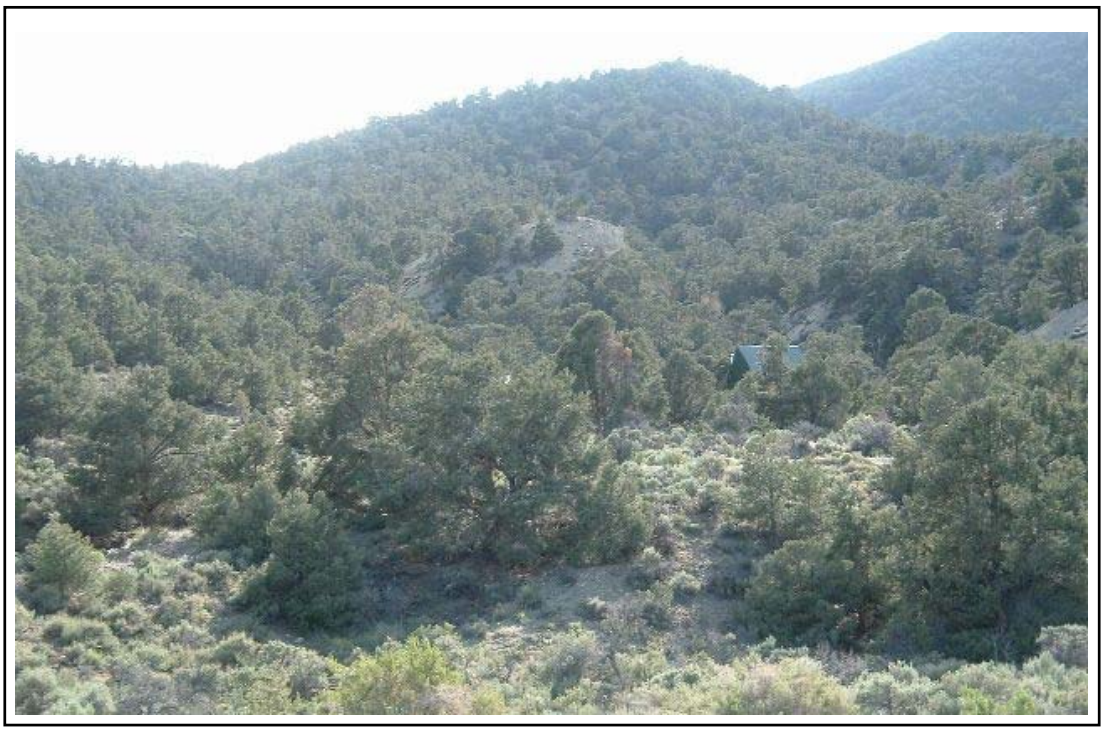
Lander County and Kingston Volunteer Fire Department Recommendations

- ü Prepare an evacuation plan and post or otherwise distribute this plan to residents. This plan should include information regarding evacuation routes, evacuation procedures, designated fire safe zones, and procedures for sheltering in place in case evacuation becomes infeasible during a fast moving firestorm.

Table 13-2. Kingston Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space Treatments	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E.
	Community Coordination	Coordinate with the community of Gilman Springs to form a local chapter of the Nevada Fire Safe Council. Become knowledgeable of community evacuation plans and procedures.
Lander County Road Department	Fuel Reduction Treatment	Mow a 25-feet wide swath on both sides of all community roads to reduce vegetation to a height of 4 inches. Thin trees for an additional distance of 25 feet.
Kingston Volunteer Fire Department	Defensible Space	Establish and maintain defensible space around the fire department.
	Community Coordination and Public Education	Distribute copies of the publication "*Living With Fire"* to all property owners. Provide courtesy inspections of defensible space. Coordinate with Lander County to prepare and distribute a community evacuation plan.
	Suppression Resources and Training	Pursue grants to obtain or upgrade wildland fire equipment including fire shelters, Pulaskis, McLeods, and personal protective equipment including hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing. Require all members to attend Wildland Firefighter Training and structural firefighter training annually. Meet BLM and USFS to discuss the community pre-attack plan.
Water District	Suppression Resources	Pursue grants to obtain an emergency generator. Create a 300 feet wide firebreak around all water storage tanks.
US Forest Service and Lander County	Fuel Reduction Treatments	Create and maintain a 300 feet wide fuel break along Black Hill Ridge road and following the ridgeline around to Toquima Road. Create and maintain a 150 feet wide fuelbreak along Smoky Court. Complete and implement pinyon-juniper thinning projects within a minimum distance of 0.5 miles of the community. Remove all dead and down trees, and dispose of biomass at an approved site. Limb remaining trees within 4 feet of the ground.

Figure 13-3 Kingston Fuel Hazard Photo Points



Kingston Photo Point 1. 4339448N, 491262E, 180°S. Pinyon-juniper fuel loading in Kingston Canyon is estimated at ten to fifteen tons per acre. Dense pinyon-juniper stands around structures with no defensible space creates an extreme hazard.

Kingston Photo Point 2. 4339401N, 493695E, 130°SE. Black sagebrush on flat terrain southeast of Kingston is a low fuel hazard estimated at one to two tons per acre.

14.0 SMOKY VALLEY

14.1 SMOKY VALLEY HAZARD AND RISK REDUCTION

Smoky Valley is located in southern Lander and Nye Counties on the east side of the Toiyabe Mountains. The Lander County portion of Smoky Valley includes three ranches, adjacent to State Route 376. See Figure 14-1 for a detail of the community boundary. The Smoky Valley community is composed of widely spaced ranch properties interspersed with large tracts of agricultural and/or public lands. The rural ranch community type does not lend itself to the standard community assessment procedures. Defensible space, suppression resources, and fuel hazard conditions are described qualitatively for the community.

14.1.1 Community Design

This rural ranch community is comprised of three widely dispersed ranches.

14.1.2 Construction Materials

This element of the risk/hazard assessment was not completed for residences in Smoky Valley. Because agricultural fields abut all of the residential properties, there is no risk of a wildland fire spreading to residences, and construction materials are not a primary factor in determining wildfire risks and hazards in Smoky Valley.

14.1.3 Defensible Space

Rural homes are generally surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These characteristics usually contribute to a low risk of damage or direct loss of property due to wildfires. Hay and alfalfa fields, haystacks, livestock feed yards, farming equipment storage areas, and fuels tanks require special attention when establishing defensible space for protection during a wildfire. Many such areas may not meet recommendations intended to minimize the potential for damage or loss during a wildfire.

14.1.4 Suppression Capabilities

Wildfire Protection Resources

The Kingston Volunteer Fire Department provides the closest fire suppression resources for Smoky Valley. Table 14-1 lists the types of wildfire resources, cooperating partners and equipment potentially available to Smoky Valley to respond to a reported wildland fire. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Table 14-1. Smoky Valley Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type I Engine Type 3 Engine Water Tender	1 1 1	Kingston Volunteer Fire Department (Kingston)
Type 3 Engine Water Tender	1 1	US Forest Service / BLM Interagency (Austin)
Type 3 Engine Type 4 Engine	1 1	BLM Battle Mountain Field Office (Battle Mountain)
Hand Crew (Type 2- Trained)	3	Nevada Division of Forestry Conservation Camp (Tonopah)

Source: Roger James and Shannon Thiss, Kingston VFD; Chad Lewis, Donovan Walker, and Dave Davis, BLM Battle Mountain Field Office; Mike Pattison, Interagency FMO Austin; Kacey KC, NDF State Office; Butch Hayes, BLM Nevada State Office.

Water Sources and Infrastructure

Water sources for fire suppression in Smoky Valley include irrigation wells and ranch ponds.

Detection and Communication

In Smoky Valley fires are reported through 911 calls to the Lander County Sheriff's Office. Fires are communicated to local volunteer fire departments by the Lander County Sheriff's Office using radios and pagers. Fires are communicated to federal agency fire personnel by the Central Nevada Interagency Dispatch Center. Nevada Division of Forestry fire crews are dispatched from the Sierra Front Interagency Dispatch Center or the Elko Interagency Dispatch Center.

14.1.5 Factors That Affect Fire Behavior

Smoky Valley is situated on an alluvial fan along the east side of the Toiyabe Range. The terrain is generally flat or gently sloping and winds are primarily from the west to southwest. Fuel density in Smoky Valley is light to moderate. Fuels surrounding the agricultural lands are typical shrub types including big sagebrush, shadscale, and greasewood, with some fourwing saltbush and hopsage. Cheatgrass is common.

14.1.6 Worst-Case Wildfire Scenario

The worst-case scenario in Smoky Valley would be a wind-driven fire ignited by dry lightning in the mountains west of the valley. Downslope winds could drive the fire close to residences, fueled by dry vegetation. Fine fuels, such as cheatgrass, grow more densely in higher than normal precipitation years, leaving a thick fuel bed that feeds fire into the shrub layer. Agricultural lands provide a buffer between residences and wildland fuels.

14.1.7 Ignition Risk

There is a moderate potential for ignition from lightning in Smoky Valley, although human caused ignitions can occur at any time.

14.2 HAZARD REDUCTION RECOMMENDATIONS

Despite the reduced risk of damage or loss to structures, residences in Smoky Valley exhibit unique conditions because of their remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special protection because of their considerable value to ranchers and farmers. Not only can stockpiled hay combust or ignite easily, but smoke can make the hay unpalatable and unusable for livestock feed. Defensible space guidelines and other fire safe information that ranchers and other residents in Smoky Valley can use in order to reduce the threat of wildfire to property are provided to ranch operators through the Nevada Cattlemen's Association and Nevada Farm Bureau. Residents of Smoky Valley can use that information to reduce the threat of wildfire to their property.

14.2.1 Defensible Space Treatments

Property Owner Recommendations

- ü Remove, reduce, and replace vegetation around homes and outbuildings according to guidelines provided in Appendix E. This area should be kept:
  - Lean: There are only small amounts of flammable vegetation.
  - Clean: There is no accumulation of dead vegetation or other flammable material including woodpiles.
  - Green: Existing plants are healthy and green during the fire season. Irrigate all trees and large shrubs in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- ü Immediately remove cleared vegetation to an approved disposal site. This material dries quickly and poses a fire risk if left on site.
- ü Keep the area beneath unenclosed porches and decks free of accumulated vegetation or other flammable debris. Screen or enclose these areas where possible.
- ü Cheatgrass or other annual grasses that have become dominant within the defensible space zone should be mowed or treated with an application of pre-emergent herbicide prior to seed set.[10] Treatments may need to be repeated the following year to ensure that the seed bank of unwanted grasses has been depleted. Refer to Appendix E for approved seed mixes and planting guidelines that can be used in conjunction with removal of this annual grass.
- ü Create a firebreak of bare ground or gravel for 100 feet around hay storage areas. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- ü Plant fire-resistant vegetation in the defensible space area around residential structures and outbuildings. This will enhance fire abatement, especially important in rural areas where water sources are limited or distant.
- ü Clear a minimum ten-foot area around fuel tanks.

[10] Extreme caution should be taken when using herbicides to completely follow all label instructions. Consult with University of Nevada Cooperative Extension specialists for assistance with appropriate herbicide products and application procedures.

- ü Maintain defensible space areas annually.

14.2.2 Fire Suppression

Property Owner Recommendations

- ü Establish backup power systems to assure that functional water sources are available for fire suppression.
- ü Coordinate with the Bureau of Land Management to pursue grant funding to develop water storage for fire protection and to install water outlets with fire department threads on new and existing water developments for filling water tenders and engines.

Lander County

- ü Identify a minimum of four people from Smoky Valley who would be likely to provide the initial response to a nearby ignition and coordinate with the Bureau of Land Management or the Nevada Division of Forestry to provide them with Basic Wildland Firefighter Training.
- ü Pursue grant funding and station a pick-up truck and a one-piece, slip-on, 100 to 200-gallon tank and pump unit with hose and hose reel in Smoky Valley during the fire season. This equipment, fitted properly for the size and weight limitations of the truck, can be used to provide initial attack of small wildfire ignitions.

14.2.3 Public Education and Community Coordination

University of Nevada Cooperative Education

- ü Develop a version of the *"Living With Fire"* publication tailored to the concerns of rural Nevada ranchers. The publication should include solutions for power back up, foam and other fire retardant products, fire resistant seeding, water storage adaptations for filling fire engines and water tenders, and suggested site plans.

Table 14-2. Smoky Valley Risk/Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the defensible space guidelines in Appendix E.
	Suppression Resources	Establish backup power systems to assure that functional water sources are available for fire suppression. Coordinate with the BLM to pursue grant funding to develop water storage for fire protection and to install water outlets with fire department threads on new and existing water developments for filling water tenders and engines.
University of Nevada Cooperative Extension	Public Education	Develop a "*Living With Fire*" type of publication tailored to the concerns of rural Nevada ranchers.
Lander County	Community Coordination and Public Education	Identify at least four people who would be likely to provide the initial response to a nearby ignition and coordinate with the fire agencies to provide Basic Wildland Firefighter training. Pursue grant funding and station a pick-up truck fitted with a 100 to 200 gallon tank, pump, and hose in Smoky Valley during the fire season.

15.0 CONCLUSIONS

15.1 LANDER COUNTY RISK ASSESSMENT CONCLUSIONS

The RCI Team developed the recommendations in this report for Lander County communities based on site-specific conditions and characteristics observed during the wildfire risk and hazard assessments and from information provided by local fire departments and agencies. General and specific recommendations provide a starting point for each community to take a proactive approach in implementing projects to reduce the likelihood of loss of life, property, and natural resources during a wildland fire.

The communities in Lander County vary from having a low risk of ignition and low community hazard conditions, as in Battle Mountain, to having a high risk of ignition and high hazard condition, such as in Austin and Kingston. There has been widespread wildfire activity in Lander County and some temporarily reduced fuel loading. However, cheatgrass has become prevalent in many of these areas and has also become established across undisturbed rangelands. Although cheatgrass may not currently pose a serious fuel hazard due to recent drought conditions, the local fuel hazard conditions can increase dramatically in wet years when cheatgrass growth is dense and tall, filling interspaces between shrubs and creating a continuous fuel bed in otherwise sparse fuel conditions.

Austin and Kingston have the highest potential for ignition and structure loss. The primary ignition risk factor is dry lightning. The Bureau of Land Management has already taken steps to implement fuel reduction treatments around these communities. Additional fuel reduction work and defensible space is needed on the Toiyabe National Forest and on private property to complete a comprehensive fuel management strategy. Once these plans are completed and implemented, continual maintenance will be required to achieve lasting protection.

The communities of Altamira Farms, Carico Valley, Grass Valley, and Smoky Valley were assessed as rural ranch communities. In these communities, agricultural fields and pastures generally serve as fuelbreaks between residences and wildland, and the risk of losing a home from a wildfire is diminished. These areas are more at risk of economic loss from damage to ranch improvements, equipment, haystacks, and fences than from residential structure loss. Recommendations for these rural communities in Lander County focus on protection of ranch assets.

All the Lander County communities must rely on limited fire suppression resources provided by the Battle Mountain, Austin and Kingston Volunteer Fire Departments. Additional resources are available from the BLM Battle Mountain and Winnemucca Field Offices, the Nevada Division of Forestry Carlin Conservation Camp, and the US Forest Service Austin Ranger District. However in most cases, additional state and federal resources are more than an hour away. Under the worst-case conditions on a high hazard day, a wildfire could escape the initial response capabilities of volunteer fire departments and burn through communities before additional resources could arrive. This is why it is critically important that every property owner in Lander County create adequate defensible space to protect their homes and property in the event of a wildfire. Learning about fire risks and hazards and how to avoid damage from a wildland fire is critical to the safety and well being of Lander County residents. Assistance with public education can be requested from the

Bureau of Land Management, the US Forest Service, the Nevada Division of Forestry, University of Nevada Cooperative Extension, and Nevada Fire Safe Council. Assistance with training volunteer firefighters for wildfire suppression can be requested from the Bureau of Land Management and the US Forest Service.

There is no way to completely eliminate the threat that wildfires present to communities at the wildland-urban interface. However, the recommendations in this report are intended to increase public responsibility and encourage concerned community members to be proactive in reducing the risk of wildfire ignitions near their communities. Creating and maintaining defensible space on private property and increasing public awareness of the risks and potential for damage or loss of lives and property associated with living in a fire-prone environment are best accomplished at the local level.

The recommendations presented for each community in this report should be considered a starting point for addressing community wildfire safety. Long-term community safety from wildfire requires a permanent commitment to the enforcement of fire safe ordinances at the local level and dedicated attention to fuels management. Regular monitoring of fuel conditions and periodic updates to this report should include new recommendations for maintenance or implementation of additional treatments as development continues to encroach at the wildland-urban interface.

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APPENDICES

Appendix A

Glossary of Terms Used in Wildfire Management and Scientific Plant Names

Appendix A Glossary of Terms used in Wildfire Management

Agency: Any federal, state, or county government organization with jurisdictional responsibilities.

Air Attack: The deployment of fixed-wing or rotary aircraft on a wildland fire to drop retardant or suppressant, shuttle and deploy crews and supplies, or perform aerial reconnaissance of the overall fire situation. Can also refer to the person functioning as air attack officer and directing aerial operations.

All-Risk County Plan: Similar to a pre-attack (pre-fire) plan but encompasses action plans for responding to all types of natural and human caused emergencies such as earthquakes, floods, structure fires, hazardous materials situations, terrorism, train and vehicle accidents.

Annual Grass Treatment: The purpose of this treatment is to reduce the volume of flashy fuels associated with annual grass growth (e.g. cheatgrass and red brome). Fuel reduction can be accomplished by chemical treatment or mechanical removal of plant biomass. Pre-emergent herbicides can be applied near residential areas at the proper rates and following all label instructions to inhibit seed germination. After plants have started growth, mowing annual grasses before seed maturity reduces the amount of fine fuels during the summer fire season, limits seed production, and reduces the potential for annual grass in the following year. Repeated mowing over several years should reduce the density of the annual grass in the long term.

Aspect: Direction toward which a slope faces.

Biomass Utilization and Disposal: Biomass utilization is an alternative to open pile burning or landfill disposal. It results in the use of the natural resource for beneficial purposes such as firewood, wood chips, compost, and other products. If residents cannot find an alternative to burning, then proper burning procedures should be followed.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth.

Buffer Zones: An area of reduced vegetation that separates wildland areas from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is often used for another purpose such as agriculture or recreation, or parks or golf courses.

Classic Interface: Structures abut native vegetation with a clear line of separation between structures and the wildland vegetation along roads and fences. The fuels do not extend into the developed areas.

Contain a Fire: A fuel break around the fire has been completed. This break may include natural barriers such as a river or road, and/or fireline built by hand, and/or fireline constructed mechanically.

Control a Fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through the line.

Crown Fire: The movement of fire through the crowns or tops of trees or shrubs more or less independently of the surface fire. A fire is said to be crowning when the flames get up into the tops of trees and spreads.

Defensible Space: Defensible space is defined as a *minimum of a 30-foot area* around houses and other structures where vegetation has been significantly modified or removed. The purpose of creating defensible space is to reduce the risk of losing homes and other property improvements to a wildfire (Smith and Adams, 1991).

Defensible space is especially important in communities with structures directly adjacent to wildland vegetation, as in the intermix or rural interface conditions, where wildfires can spread quickly through the wildland fuels, threatening homes and lives.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following are usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, a strong convection column. Predictability is difficult because such fires often exercise influence on their environment and behave erratically, sometimes dangerously.

Fine Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than ¼-inch in diameter and have a timelag of one hour or less. These fuels ignite readily and are rapidly consumed by fire when dry.

Fire Behavior: The manner in which a fire reacts to the influences of fuels, weather, and topography.

Firebrands: Pieces of burning material carried on the wind ahead of an advancing wildfire that, in extreme cases, can ignite spot fires up to a mile removed from the flame front.

Firebreak: A strip of land cleared of brush and trees down to the mineral soil.

Fire Front: The part of a wildland fire in which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Hazard: As used in this report, vegetative factors that affect the intensity and the rate a fire spreads as well as urban factors that can facilitate or inhibit public safety and the containment of a fire in an interface area.

Fire Perimeter: The entire outer edge or boundary of a fire, which may contain within it substantial areas of unburned fuels.

Fire Regime: A term used by fire ecologists to describe the recurrence and intensity of fire relative to a specific plant community.

Fire Risk: Potential ignition sources and factors that facilitate ignition of wildfires.

Flash Fuels: Fuels such as grass, leaves, pine needles, ferns, tree moss, and some types of slash, flash fuels or flashy fuels ignite readily and are consumed rapidly when dry. Also called fine fuels.

Fuel Bed: In a research setting, an array of fuels usually constructed with specific loading, depth, and particle size to meet experimental requirements; also commonly used to describe the fuels composition in natural settings.

Fuelbreaks: Fuelbreaks are constructed in strategic locations where a cover of dense, heavy, or flammable vegetation has been permanently changed to one of lower fuel volume or reduced flammability. Fuelbreak construction may include removing, controlling and possible replacing highly flammable vegetation with more fire resistant species. Ridge top fuelbreaks should have continuous length and width, which requires long-range planning.

A fuelbreak network system could be used to protect critical watersheds while more remote areas might have narrower fuelbreaks that might serve as anchor points for prescribed fires. A fuelbreak strategy can be effective even if fuelbreaks are not connected.

Fuel Loading: The amount of fuels present expressed quantitatively in terms of weight per unit area.

Fuel Reduction Treatment: This treatment involves strategically locating blocks of land near communities where flammable vegetation has been permanently changed to one of lower fuel volume or reduced flammability.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Greenstrips: Greenstrips are usually non-irrigated linear bands of open space on private or public land (usually a minimum of 300 feet wide) that serve as a buffer zone between wildland and adjacent urban development to promote safer environments. These areas are usually seeded to establish vegetation that is relatively fire resistant or slow burning and with shortened flame lengths. Seedings also decrease soil erosion and prevent invasion of noxious weeds and other aggressive plants such as cheatgrass and Russian knapweed.

Ground Fuels: All combustible materials below the surface litter, including duff, tree or shrub roots, punky wood, peat, sawdust, and other materials that can support a glowing combustion without flame.

High Hazard Day: Also known as a "red flag day", a combination of conditions such as low humidity (<15 percent), high winds (>25 mph), and low fuel moisture create a high probability of ignition and subsequent increased fire intensity. Various agencies have different trigger points to establish a "high hazard day".

Initial Attack: The actions taken by the first resources upon arrival at a wildfire to protect lives and property and prevent further expansion of the fire.

Interface Condition: The density and distribution of structures with respect to the surrounding wildland environment. The four Interface Conditions are Rural, Intermixed, Occluded, and Classic.

Intermix Interface: Structures are scattered throughout the wildland, with no clear boundary between the wildland vegetation and the community.

Ladder Fuels: Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help start and continue crowning on a fire.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request by furnishing personnel and equipment.

Occluded Interface: This condition is usually within towns and cities where there are small islands of wildland fuels such as parks or open space. There is a clear boundary between the community and the wildland vegetation.

Pre-Attack Plan: Also known as a pre-fire plan. A plan written in anticipation of a fire in a given community or specific area. This plan is made readily available to all local agencies and typically lists expected need and availability of initial and extended attack resources, includes radio frequencies, name and number of contact person for each agency, and identifies the staging base, incident command post, evacuation center, location of water resources, and additional details unique to the locality being described.

Red Card Certification: A fire qualifications management system used by many state and all federal wildland fire management agencies to ensure that individuals are qualified to fight wildland fires.

Rural Interface: Clusters of structures such as ranches or summer homes are widely spaced, sometimes more than a mile apart. The rural homes are surrounded by the wildland vegetation, with no clear line of separation between the fuels and homes.

Shaded Fuelbreaks: A shaded fuelbreak is created by altering surface fuels, and increasing the height of the base of the live crown, and opening the canopy by removing a portion of the woody plants in the treatment area. This type of fuelbreak spans a wide range of understory and overstory prescriptions. Construction methods include mechanical thinning, manual biomass removal, and the use of prescribed fires.

Structure Fire: Fire burning any part or all of any building or structure.

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

Water Tender: A ground vehicle capable of transporting water in the field, generally used to supply engines.

Wildland Fire: Any non-structure fire, other than prescribed fire, that occurs in a wildland area.

Wildland-Urban Interface: The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

SOURCES:

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SCIENTIFIC PLANT NAMES

Dominant Vegetation of the Wildland-Urban Interface, Lander County

Common Name	Scientific Name*
Trees	
Pinyon pine	*Pinus monophylla*
Utah juniper	*Juniperus osteosperma*
Shrubs	
Black sagebrush	*Artemisia nova*
Ephedra	*Ephedra viridis*
Fourwing saltbush	*Atriplex canadensis*
Greasewood	*Sarcobatus vermiculatus*
Hopsage	*Grayia spinosa*
Rabbitbrush	*Chrysothamnus nauseosus, C. viscidiflorus*
Mountain Big Sagebrush	*Artemisia tridentata ssp. vaseyana*
Shadscale	*Atriplex confertifolia*
Willow	*Salix sp.*
Wyoming big sagebrush	*Artemisia tridentata ssp. wyomingensis*
Grasses/Forbs	
Bluegrass	*Poa sandbergii; Poa sp.*
Budsage	*Artemisia spinescens*
Crested wheatgrass	*Agropyron cristatum*
Cheatgrass	*Bromus tectorum*
Forage kochia	*Kochia prostrata*
Great Basin wildrye	*Leymus cinereus*
Halogeton	*Halogeton glomeratus*
Needlleandthread grass	*Hesperostipa comata*
Russian thistle	*Salsola kali*
Sandberg bluegrass	*Poa sandbergii*
Squirreltail	*Elymus elymoides*

*All scientific names taken from: Hickman, J.C. editor. 1993. *The Jepson manual: Higher plants of California.* University of California Press, Berkely, CA.

Appendix B

Community Wildfire Assessment Rating System

Appendix B – Community Wildfire Assessment Rating System

Community Design	Score
1. Ingress/Egress	
Two or more primary roads	1
One Road	3
One-way road in, one way out	5
2. Width of Primary Road	
>24 feet	1
>20 feet and <24 feet	3
<20 feet	5
3. Accessibility	
Road grade 5% or less	1
Road grade more than 5%	3
4. Secondary Road Terminus	
Loop roads, cul-de-sac w/outside turning radius of 45' or greater	1
Dead-end roads 200' or less in length	3
Dead-end roads greater than 200'	5
5. Street Signs	
Present 90-100%	1
Present 75-89%	3
Present <75%	5
6. Address Signage	
Present 90-100%	1
Present 75-89%	3
Present <75%	5

Existing Building Materials	Score
1. Roofing Materials	
Non-combustible covering 90-100%	1
Non-combustible covering 80-90%	5
Non-combustible covering 70-80%	8
Non-combustible <70%	10
2. Siding Materials	
Non-combustible siding >75%	1
Non-combustible siding <75%	5
3. Unenclosed Features	
Less than 25%	1
25 - 50%	3
>50%	5

Utilities	Score
Low risk of ignition	1
Moderate risk of ignition	3
High risk of ignition	5

Defensible Space	Score
1. Average Lot Size	
10 acres or larger	1
1 to 10 acres	3
<1 acre	5
2. Defensible Space	
70% or more adequate	1
30-70% adequate	7
<30% adequate	15

Fire Protection	Score
1. Water Source	
500 gpm hydrants within 500' of structures	1
500 gpm hydrants or draft source within 1000 feet of structures	2
Water source 20 minutes away roundtrip	5
Water source > 45 minutes away roundtrip	10
2. Fire Department Protection Within 5 Miles	
Career Department	1
Combination Career/Volunteer	3
Volunteer with Seasonal Staffing	5
All Volunteer Department	7
No Organized Department	10

Fire Behavior	Score
1. Slope	
8% or less	1
8% - 20%	4
20% - 30%	7
>30%	10
2. Aspect	
North or <8% slope	1
East	3
West	7
South	10
3. Fuels	
Light density	1
Medium density	3
High density	5

Fire Behavior *(continued)*	Score
Situation #3 – Fine and/or sparse fuels surround structures; infrequent wind exposure; flat terrain with little slope and/or north aspect. No large wildland fire history and/or moderate fire occurrence.	3
Situation #2 – Moderate slopes; broken moderate fuels; some ladder fuels; composition of fuels is conducive to torching and spotting; conditions may lead to moderate suppression success; some fire history and/or moderate fire occurrence.	7
Situation #1 – Continuous fuels in close proximity to structures; composition of fuels is conducive to crown fires or high intensity surface fires; steep slopes; predominately south aspects; dense fuels; heavy duff; prevailing wind exposure and/or ladder fuels that may reduce suppression effectiveness; history of some large fires and/or moderate fire occurrence.	10

Appendix C

Photographs of Representative Fuel Types in Lander County Communities

Photo Point 1. A primary fuel type in Lander County, salt desert shrub dominates the vegetation in most communities assessed for this report. Typical composition includes greasewood, budsage, and shadscale, with understory vegetation such as squirreltail and cheatgrass.

Photo Point 2. Rural ranch communities typically have agricultural buffer zones between wildland fuels and structures. In Lander County salt desert shrub abuts fields and pastures in Altamira Farms, Carico Valley, Grass Valley, and Smoky Valley, but the irrigated croplands protect residents from most of the hazards of wildfire. Residents need to take care that hay and equipment storage areas are protected by defensible space.

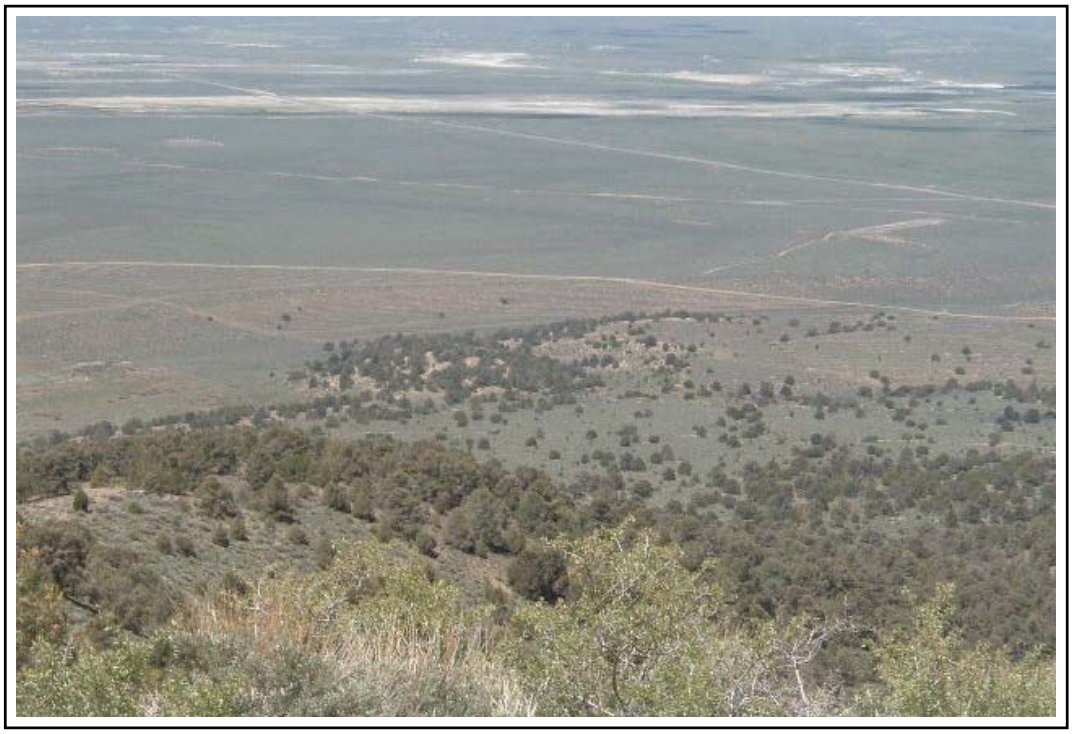

Photo Point 3. This photo, taken south of Austin, shows the transition of typical vegetation in Lander County between pinyon-juniper on higher elevations to sagebrush on alluvial fans, and salt desert shrub in valley bottoms.

Photo Point 4. The BLM greenstrip project west of Austin was successful in breaking up the fuel bed continuity and creating an irregular shaped vegetative mosaic.

Appendix D

List of Persons Contacted

Appendix D – List of Persons Contacted

CONTACT NAME	***POSITION***	***DATE CONTACTED***
Mickey Yarbro	*County Commissioner*	*Dec. 8, 2003*
Dennis Sparks	*Lander County Exec. Director*	*Dec. 8, 2003*
Bert Negro	*Battle Mountain VFD*	*May 17, 2004*
Dan Baldini	*Battle Mountain VFD*	*May 17, 2004*
Ray Williams, Jr.	*Austin VFD*	*May 17, 2004*
Roger James	*Kingston VFD*	*May 18, 2004*
Shannon Thiss	*Kingston VFD*	*May 18, 2004*
Dave Davis	*Battle Mountain BLM-FMO*	*April 30, 2004*
Donovan Walker	*Battle Mountain BLM*	*May 17, 2004*
Chad Lewis	*Battle Mountain BLM*	*May 17, 2004*
Bernice Laylo	*Battle Mt. Colony Env. Spec.*	*May 13, 2004*
Mike Pattison	*USFS Austin Ranger District*	*May 20, 2004*

Appendix E

Homeowner Guidelines

Defensible Space Guidelines
Homeowner's Annual Checklist
Fuelbreaks and Fuel Reduction Treatments
Seed Mix and Planting Specifications
Russian Knapweed Fact Sheets

SEED MIX AND PLANTING SPECIFICATIONS

COMMON NAME	SCIENTIFIC NAME	SEEDING RATE (PLS LBS/ACRE)	
		Broadcast Application	Drill Application
'Vavilov' Siberian Wheatgrass	*Agropyron fragile spp. sibericum*	5.0	3.0
'Sodar' Streambank Wheatgrass	*Elymus lanceolatus ssp. psammophilus*	4.0	2.0
'Immigrant' Forage Kochia	*Kochia prostrata*	2.0**	
Indian Ricegrass	*Achnatherum hymenoides*	3.0	1.5
Bottlebrush Squirreltail	*Elymus elymoides*	1.5	1.0
	TOTAL PLS POUNDS PER ACRE	***15.5***	***7.5***

***Kochia prostrata* should always be broadcast seeded on the soil surface.

This seed mixture is for treating all disturbed areas and areas cleared for fuel reduction purposes. Seeding application rates are specified on a "pure live seed" (PLS) basis. All seeds should be thoroughly mixed and seeded together at the same time. Drill seeding is recommended where feasible. Drill rows should be spaced as far as12 inches apart and seed should be planted at a depth of 1/2 inch. Broadcast seeding is recommended for rocky, steep, or small treatment areas. The seed can be broadcast using hand held seeders such as a "Whirlybird" or a broadcast seeder mounted on an ATV. Continually mix the seed while seeding to equally distribute the small seeds throughout the mix. Following the broadcast seed application, seeded areas should be lightly raked to assure seed placement at an average depth of 1/2 inch. This can be done with hand held rakes, or by pulling a drag or piece of chain link fence behind a truck or ATV in areas that are less rocky.

Use of a pre-emergent herbicide prior to seeding may be advisable in areas where cheatgrass is an apparent problem.

These guidelines are provided as overall recommendations. However, site-specific evaluation of the treatment areas by a specialist from a land management agency, the Natural Resources Conservation Service, or the University of Nevada Cooperative Extension will provide even greater assurance for success.