Nevada Community Wildfire Risk/Hazard Assessment Project

ELKO COUNTY

August 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 10-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 the 44 communities in Elko County that were identified in the Federal Register as communities located at the wildland-urban interface within the vicinity of Federal lands that are at high risk from wildfire (66 FR 160). The Elko County communities are listed in Table 1-1.

The Nevada Fire Safe Council contracted Resource Concepts, Inc. (RCI) to assemble a project 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 Elko County community listed in the Federal Register. The RCI Project Team spent several days inventorying conditions in Elko County and completing the primary data collection and verification portion of the risk assessment. Field visits were conducted in August 2004.

This report describes in detail the data and information collected, analyzed, and considered during the assessment of each community, and is current as of August 2004. The general results are summarized in Table 1-1. Five primary factors that affect potential fire hazards were assessed to arrive at the community hazard assessment score: community design, construction materials, defensible space, availability of fire suppression resources, and physical conditions such as the vegetative fuel load and topography. Information on fire suppression capabilities and responsibilities for Elko County communities was obtained from local Fire Chiefs and state and federal Fire Management Officers. The Fire Specialists on the RCI Project Team assigned an ignition risk rating of low, moderate, or high to each community. The rating was based upon historical ignition patterns, the opinions of local, state, and federal fire agency personnel, field visits to each community, and professional judgment based on experience with wildland fire ignitions in Nevada.

Table 1-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
EXTREME HAZARD COMMUNITIES				
Jarbidge	Intermix	Low-Extreme	Moderate-High	Extreme
Jiggs/Smith Creek	Intermix	Moderate-Extreme	High	Extreme
Ruby Valley Indian Allotments	Rural	Low-High	High	Extreme
HIGH HAZARD COMMUNITIES				
Adobe Heights	Intermix	Low-Moderate	Moderate-High	High
Adobe Ranchos	Intermix	Moderate	Moderate-High	High
Contact	Intermix	Moderate-High	High	High
Deeth/Starr Valley	Intermix	Low-Extreme	High	High
Lamoille	Intermix	Low-Extreme	High	High
Lee /South Fork Indian Reservation	Intermix	Low-Extreme	Moderate	High
Lucky Nugget I & II	Intermix	Moderate	High	High
Midas	Classic	High	High	High
Mountain City	Classic	Low-High	High	High
Osino	Intermix	Low-Moderate	High	High
Ruby Lake Estates	Intermix	Low-Extreme	High	High
Ten Mile	Intermix	Moderate-High	High	High
Tuscarora	Intermix	Low-High	High	High
MODERATE HAZARD COMMUNITIES				
Carlin	Classic	Moderate-High	High	Moderate
Currie	Intermix	Low-Moderate	High	Moderate
Elburz	Classic	Moderate	Moderate	Moderate
Elko	Classic and Intermix	Moderate-High	Moderate	Moderate
Gold Creek	Intermix	Low-High	Low-Moderate	Moderate
Hidden Valley/Coal Mine	Intermix	Moderate	Moderate	Moderate
Humboldt Ranchettes	Intermix	Moderate	Moderate	Moderate
North Fork	Classic	Moderate	High	Moderate
Oasis	Classic	Moderate	Moderate-High	Moderate
Owyhee	Intermix	Moderate-High	Moderate	Moderate
Pilot Valley	Intermix	Low-Moderate	High	Moderate
Ruby Lake National Wildlife Refuge & Hatchery	Intermix	Moderate-High	High	Moderate
Ryndon	Intermix	Moderate	Moderate-High	Moderate
Spring Creek	Intermix	Low-High	High	Moderate
Wild Horse Estates	Intermix	Low-Moderate	High	Moderate

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
LOW HAZARD COMMUNITIES				
Jackpot	Intermix	Moderate	Moderate	Low
Montello	Intermix	Low-Moderate	Low-Moderate	Low
Wells	Classic	Low-Moderate	High	Low
West Wendover	Classic	Low	Low	Low
RURAL RANCH COMMUNITIES				
Charleston	Rural	Low-High	High	N/A[1]
Clover Valley	Rural	Moderate-High	Moderate	N/A[1]
Goose Creek	Rural	Low-High	High	N/A[1]
Independence Valley	Rural	Moderate	High	N/A[1]
Maggie Summit Road	Rural	Low-High	High	N/A[1]
Odger's Ranch	Rural	Moderate	High	N/A[1]
O'Neil Basin	Rural	Low-High	High	N/A[1]
Ruby Valley	Rural	Moderate-High	High	N/A[1]
PREVIOUSLY ASSESSED COMMUNITIES				
Shanty Town	Intermix	Moderate-High	High	N/A[2]

[1]The Community Hazard Assessment procedures are not applicable to rural ranch communities.

[2]The results for communities previously assessed by other procedures are not comparable to the procedures used for this assessment.

EXISTING SITUATION

Elko County has an extensive wildfire history. Almost 1.5 million acres were burned within the County between 1980 and 2004. The 2005 fire season has already added to this total and has impacted or imminently threatened six communities: Midas, Ten Mile, Tuscarora, Contact, Osino, Ryndon, Spring Creek, and Elburz. These conditions point to he need to update this report on an annual basis

The County is prone to dry lightning storms, the primary ignition risk in the county. Additional ignition risks include the railroad, utility lines, automobile fires, and other human causes that can occur at any time.

Fire protection throughout Elko County, with the exception of Carlin, Elko, West Wendover, Jackpot, and Wells, is provided by volunteer or combination career/volunteer fire departments as part of the Nevada Division of Forestry Elko County Fire Protection District. The Nevada Division of Forestry has an office in Elko and conservation camps in both Carlin and Wells that provide trained hand crews for wildfire suppression.

The Bureau of Land Management maintains four fire stations in Elko County in addition to the Elko Field Office: the Carlin Station, the Elko Helibase, the Midas Station, and the Wells Station. Each station has designated equipment and staff during the fire season. The US Forest Service has guard stations in Wells and Mountain City, with equipment and Type 2-Trained hand crews during the fire season. The US Fish and Wildlife Service, the Nevada Department of Wildlife, the Bureau of Indian Affairs, and the Sho-Pai Indian tribe provide

additional resources for local areas. Mutual aid agreements between state, local, and federal fire agencies provide coverage for most of Elko County including the few communities with no local fire department. The cooperation between fire agencies in Elko County deserves special recognition for their efforts.

The majority of the communities in Elko County are small and many are isolated from primary access routes. Many of the access roads to small communities are unpaved but provide adequate room for access and maneuverability of fire equipment apparatus. Emergency response plans have been completed for Elko County and are updated on a regular basis. Cooperating fire agencies meet annually to discuss pre-attack plans for wildfire scenarios. Radio communication compatibility between state and federal agencies with local and volunteer fire departments needs to be assured.

Fourteen communities with high and extreme community hazard ratings were identified in Elko County. These typically have high fuel loading and steep topography that contribute to extreme and dangerous fire behavior. Many of these communities rely on volunteer fire departments for initial attack of wildfires, and many are in need of additional water storage for fire suppression.

Seventeen communities assessed in Elko County have a moderate overall community hazard rating in the wildland-urban interface, due primarily to limited fire protection in isolated areas, limited water storage for fire suppression resources, high frequency of wildfire history, and the need for improvement in defensible space. Four communities with low community hazard scores generally are surrounded by light density fuels or agricultural lands and have fire safe community design features such as access, construction materials, and defensible space.

The Volunteer Fire Departments members are a critical component of the wildfire suppression resources in Elko County. The State of Nevada, Elko County, and the Nevada Division of Forestry need to cooperatively develop and offer incentives to recruit and maintain volunteer firefighters. Volunteer Fire Departments must make an extended effort to ensure that members attend training and are qualified for wildland fire suppression. Nevada Division of Forestry and the cooperating agencies offer training annually in several communities. Additional training locations could increase the attendance of volunteers from remote communities.

Another wildfire risk factor is the large component of cheatgrass in Elko County. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Once established, cheatgrass provides a continuous layer of fuel that is readily ignited and burns rapidly, especially under windy conditions.

RECOMMENDATIONS

Many of the recommendations in this report focus on efforts that can be easily initiated by homeowners to enhance the fire safe nature of their homes and communities. While many homeowners in Elko County have been aggressive in establishing and maintaining appropriate defensible space around their residences, more work is needed. Defensible space treatments are most effective when completed over large, continuous areas. Community-wide efforts will be much more effective in reducing wildfire threat than individual or incomplete treatments. Volunteer citizen groups, locally-based and organized

to take responsibility and provide leadership for community-wide fuels reduction have proven to be an effective way to achieve widespread action. The Nevada Fire Safe Council is one option for community organization to assist with improving community safety at the local level. As a last resort, NRS 472.041 authorizes the Nevada State Forester Firewarden to implement fire hazard reduction practices on private land when structures are threatened from fuel accumulation and the property owners do not implement hazard reduction treatments.

The state, local, and federal cooperating fire agencies have been very active and aggressive in Elko County in implementing fuel reduction treatments in the wildland-urban interface. This cooperative effort has allowed for maximum efficiency of labor and funding to accomplish high priority treatments on the ground. Numerous projects are currently underway or are in the final planning stages. The results of this assessment have identified additional fuel reduction treatments and fuelbreak recommendations in Jarbidge, Jiggs/Smith Creek, Ruby Valley Indian Allotments, Ruby Lake NWR and Hatchery, Ruby Valley Lake Estates, Midas, Gold Creek, Jackpot, Montello, Osino, Owyhee, and Spring Creek. A summary of the fuel reduction treatments in each community is listed in Table 1-2. Continued coordination between public land managers and communities is crucial in reducing ignition risks and wildfire hazards to improve community fire safety.

The need to improve street and address signage was common to many communities. Signage improvements should be prioritized to enable firefighters to easily locate at-risk homes or specific areas of communities in low visibility conditions during a fire.

There is no way to completely eliminate the threat of wildfire in the wildland-urban interface. Close and continued coordination between citizens, local fire departments, Elko County, the Nevada Division of Forestry, the US Forest Service, the Bureau of Land Management, and the Bureau of Indian Affairs is crucial for successful implementation of necessary fuel reduction projects that improve fire safety in the wildland-urban interface communities throughout Elko County. Recommendations in this report are intended to:

- Encourage implementation of defensible space and larger fuel reduction projects, where needed, to reduce the hazards inherent in wildland-urban interface areas as a first priority.
- Increase public awareness of wildfire risks and hazards in communities, and what homeowners can do to reduce those risks and hazards.
- Promote 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.

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 continued involvement and support of citizen-based organizations and 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.

Any of the following agencies or organizations can be contacted for further information and assistance.

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 Supervisors Office Fire Staff Officer

Table 1-2. Summary of Hazard Reduction Recommendations for Communities in Elko County

Community	Description	Estimated Treatment Area[1]	Cooperating Partners						
			Private	County	BLM	USFS	NDF	NDOT	Other
HIGH AND EXTREME HAZARD COMMUNITIES									
Jarbidge	Shaded fuelbreak, 300' x 1.5 mi	54 acres	X			X	X		
Jiggs/Smith Creek	Fuelbreak, 50' on each side of Smith Creek Road, 100' x 6.2 mi	75 acres	X	X	X		X		
Ruby Lake Estates	Greenstrip, 50' on east side and 100' on west side of Ruby Valley Road, 150' x 1.5 mi	27 acres	X	X		X	X		
Midas	Greenstrips, 300' x 2.2 mi	80 acres	X				X		
Osino	Greenstrips, 150' x 10.3 mi	187 acres	X		X		X	X	
MODERATE HAZARD COMMUNITIES									
Gold Creek	Fuelbreak, 200' x 0.8 mi	21 acres	X				X		
Owyhee	Fuelbreak, 100' x 1.4 mi	17 acres							Tribe
Ruby Lake NWR and Hatchery	Fuelbreak, 200' x 0.6 mi	16 acres							FWS
	Fuelbreak, 300' x 0.4 mi	13 acres							NDOW
Spring Creek	Fuelbreak, 200' x 4.4 mi	106 acres	X				X		
LOW HAZARD COMMUNITIES									
Jackpot	Fire Access Road (firebreak) 15' x 1.6 mi	3 acres	X		X		X		
Montello	Fuelbreak, 50' x 1.5 mi	9 acres	X		X		X		

[1] Roadside fuelbreak areas are measured from the edge of road. Treatment area estimates include both sides of the road.

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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 10-year Comprehensive Strategy.* Federal agencies and Western State Governors adopted the plan in Spring 2002, in collaboration with County Commissioners, State Foresters, and tribal officials. The plan calls for more active forest and rangeland management to reduce wildfire hazards 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 the activities outlined in the National Fire Plan. In the same year the Nevada Fire Safe Council received National Fire Plan funding through the Department of Interior Bureau of Land Management to conduct a Community Risk/Hazard Assessment for at risk communities in Nevada. The communities to be assessed are among those named in the 2001 Federal Register list of wildland-urban interface communities at risk within the vicinity of Federal lands (66 FR 160). The list identifies Nevada communities adjacent to Federal lands that are most vulnerable to the threat of wildfire.

Resource Concepts, Inc. (RCI), a Carson City-based 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 used to reach consistent and objective evaluations of each community.

The specific goals of the Nevada Community Risk/Hazard Assessment Project are to:

- Assess the wildfire hazards present to 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 community hazard ratings.
- Describe proposed risk and hazard mitigation projects in enough detail to aid communities in applying for future implementation funds.
- Distribute assessment results and proposed mitigation project descriptions to each county in an easily updated and useful form for public meetings and other public education activities.

The Community Risk/Hazard Assessments were conducted systematically. The RCI Project Team observed and recorded the factors that 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. Interviews with local fire agency and emergency response personnel were conducted to assess the availability of suppression resources and identify opportunities for increased community preparedness. A description of the existing fuel hazard and fire behavior potential is discussed for each community. Photo points and

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

The results of each community assessment are formatted to facilitate ease of reference and reproduction for individual communities. Each community is mapped along with descriptions of ignition risks, fire hazards, and recommended mitigation projects. The recommendations are summarized in table form and presented on a map, if the proposed mitigation 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 the risks and hazards identified by these assessments is not only crucial to the long term goals of the National Fire Plan, but also to the short and long term viability of Nevada's communities, natural resources, infrastructures, and watersheds.

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

- Nevada Fire Safe Council (NFSC)
- USDI Bureau of Land Management (BLM)
- USDA Forest Service (FS)
- Nevada Division of Forestry (NDF)
- University of Nevada Cooperative Extension (UNCE)
- Nevada Association of Counties (NACO)
- Nevada's Counties
- Fire Chiefs and firefighters statewide

1.2 COMMUNITIES ASSESSED

The Federal Register (66 FR 160) identified 42 communities at risk within Elko County within proximity to Federal Lands. Two additional communities were added to the assessment for a total of 44. Table 1-3 lists all of the Elko County communities included in this assessment.

Table 1-3. Elko County Communities Included in the Risk and Hazard Assessment

- Adobe Heights
- Adobe Ranchos
- Carlin
- Charleston
- Clover Valley
- Contact
- Currie
- Deeth/Starr Valley
- Elburz
- Elko
- Gold Creek
- Goose Creek
- Hidden Valley/ Coal Mine Canyon
- Humboldt Ranchettes
- Independence Valley
- Jackpot
- Jarbidge
- Jiggs/Smith Creek
- Lamoille
- Lee/South Fork Indian Reservation
- Lucky Nugget I & II
- Maggie Summit Road
- Midas
- Montello
- Mountain City
- North Fork
- O'Neil Basin
- Oasis
- Odger's Ranch
- Osino
- Owyhee
- Pilot Valley
- Ruby Lake Estates
- Ruby Lake NWR and Hatchery
- Ruby Valley
- Ruby Valley Indian Allotments
- Ryndon
- Shanty Town
- Spring Creek
- Ten Mile
- Tuscarora
- Wells
- West Wendover
- Wild Horse Estates

There are several agricultural ranch communities in Elko County. Goose Creek, Independence Valley, Maggie Summit Road, O'Neil Basin, Odger's Ranch, and Ruby Valley have livestock or agricultural interests and face more of a risk of economic losses from damage to ranch improvements and crop stockpiles than risks to residential structures. Ranches typically have agricultural fields, stockyards, feedlots or other areas with low fuel hazards that provide a buffer zone between homes and wildland fuels. Recommendations specific to ranching communities have been developed to help keep property and ranch holdings fire safe.

There may be additional rural areas or small subdivisions in Elko County that were not included on the Federal Register list, and thus not included in this project. Many of the recommendations developed for similar communities in this report may apply to additional areas. However, conditions in and around some communities may warrant future wildfire hazard/risk assessment.

2.2.1 Wildfire History

Recorded wildfire history 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. Fire perimeters were mapped by agency personnel using a global positioning system (GPS) and screen digitizing on source maps with a minimum detail level of 1:250,000. The datasets have been updated at the Bureau of Land Management Nevada State Office and the US Forest Service Humboldt-Toiyabe National Supervisor's Office at the end of each fire season from information provided by each Nevada Bureau of Land Management Field Office and Humboldt-Toiyabe Ranger District. The datasets are intended to be the central sources of historical GIS fire data used for fire management and land use planning on federal lands.

In addition to the fire perimeter information, point data for all fire ignitions within 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. This data is summarized in Table 3-2 and provides the ignition point locations for the maps in this report. In many cases, the ignition point location is only accurate to within the section; in such cases, the point coordinate is located in the section center on the maps.

The wildfire history and ignition history data were used to formulate risk ratings and develop recommendations specific to areas that have been repeatedly impacted by wildland fires. Observations made from the RCI Project Team and comments from local fire agencies were used to develop recommendations in areas without recent wildfire activity where accumulations of fuels or 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 risks and hazards in the wildland-urban interface areas countywide by assessing each community individually. Site-specific information for each community was collected during field visits in Elko County conducted August 23 through September 3, 2004. The predominant conditions recorded during these site visits were used as the basis for the Community Risk/Hazard Assessment ratings.

2.3.1 Ignition Risk Assessment Criteria

The Fire Specialists on the RCI Project Team assigned an ignition risk rating of low, moderate, or high to each community assessed. This rating was based on four sources of information: the interpretation of the historical record of ignition patterns and fire polygons provided by the National Interagency Fire Center, Bureau of Land Management, and US Forest Service databases; interviews with local fire department personnel and regional Fire Management Officers; field visits to each community; and the professional judgment of the RCI Fire Specialists based on their professional experience with wildfire ignitions in Nevada.

2.3.2 Community Hazard Assessment Criteria

The Community Hazard Assessments were completed using methodology outlined in the *Draft Community Wildland Fire Assessment For Existing and Planned Wildland*

Residential Interface Developments in Nevada (Nevada's Wildland Fire Agencies 2001, revised 2002). This system assigns hazard ratings of low through extreme based on the scoring system shown in Table 2-2 and detailed in Appendix B.

Table 2-2. Community Hazard Ratings Utilized in the Nevada Community Wildfire Community Hazard Assessment

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

To arrive at a score for the community, five primary factors that affect 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 description of each of these factors and their importance in developing the overall score for the community is provided below. Individual community score sheets are provided at the end of each community assessment.

Community Design

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

- **Interface Condition.** Community safety is affected by the density and distribution of structures with respect to the surrounding wildland environment. Four condition classes are used to categorize the wildland-urban interface: Classic Interface, Intermix, Occluded, and Rural. Definitions for each interface condition class are included in the glossary of wildland fire terms in Appendix A.
- **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 twenty 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.
- **Utilities.** Poorly maintained overhead power lines can be a potential ignition source for wildfires. It is important to keep power line corridors clear of flammable vegetation, especially around power poles and beneath transformers, 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 to a community without a backup energy source. Many communities rely on electric pumps to provide water to residents and firefighters for structure protection and fire suppression.

Construction Materials

The type of materials used for building construction accounts for sixteen percent of the total hazard assessment score. 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 the risks associated with hazardous construction in the interface area. Factors considered in the assessment include:

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

Defensible Space

Defensible space accounts for sixteen percent of the hazard assessment score. The density and type of fuels around a home determines 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 ignite more readily, produce more intense heat during a fire, and increase the threat of property damage or loss. Defensible space is one of the factors that homeowners can easily manipulate in order to improve the chances that a home or other property will avoid damage or complete lost from a wildfire.

Suppression Capabilities

The availability and capability of fire suppression resources account for sixteen percent of the total hazard 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 to respond quickly is critical to saving structures. Whether there is a local paid fire department, volunteer department, or no local fire department impacts how long it takes for firefighting personnel to respond to a reported wildland fire or to a threatened community.

- **Quantity and Type of Fire Suppression Equipment**. The quantity and type of available fire suppression equipment has an important role in minimizing the effect of a wildfire on a community. Effective wildland firefighting requires specialized equipment.
- **Water Resources**. The availability and location of water resources is critical to fighting a wildland fire. Whether there is a community water system with adequate fire flow capabilities or whether firefighters must rely on local ponds or other drafting sites affects how difficult it will be for firefighters to protect the community.

Physical Conditions

Physical conditions account for 26 percent of the hazard rating. Physical conditions include slope, aspect, topography, fuel type, and fuel density. With the exception of changes to the fuel composition, 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 activities such as fuel reduction treatments. Physical conditions considered in the assessment include:

- **Slope, Aspect, and Topography.** In addition to local weather conditions, slope, aspect, and topographic features are also 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; however, it usually burns downhill at a slower rate and with shorter flame lengths than in upslope burns. East aspect slopes in the Great Basin may experience afternoon downslope winds that 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. Homes built mid-slope, at the crest of slopes, or in saddles are most at risk due to wind-prone topography in the event of a wildfire.
- **Fuel Type and Density.** Vegetation type, fuel moisture values, and fuel density around a community affect the potential fire behavior. Areas with dense, continuous, vegetative fuels carry a higher hazard rating than communities situated in areas of irrigated, sparse, or non-continuous fuels. Several consecutive years of above normal precipitation will result in excessive cheatgrass growth and ground litter. These conditions in combination with hot and dry weather, steep slopes, or high winds can create a situation in which the worst-case fire severity scenario can occur.

2.3.3 Hazard Mapping

Fuel hazard maps were initially generated by the Bureau of Land Management (Nevada and Utah State Offices) using wildfire hazard delineations derived from vegetation data (Nevada GAP Analysis Program satellite dataset at thirty-meter resolution). A total of 65 vegetation types were mapped statewide and reclassified into four wildfire hazard categories (low, moderate, high, and extreme) based on the anticipated fire behavior for each vegetation cover type. For example, pinyon-juniper cover types were generally rated

as extreme fuel hazards, while sparse shadscale cover types were rated as low fuel hazards.

The RCI Project Teams visited high and extreme fuel hazard communities and verified the Bureau of Land Management hazard information by comparing the hazard ratings on the existing fuel hazard map to vegetation, slope, and aspect conditions directly observed in the field. Where necessary, changes to the ratings were drawn on the maps and used to update the wildfire hazard potential layer in the project database. Photo points were established in high and extreme fuel hazard areas to monitor future changes in the fuel hazard conditions. Fuel hazard mapping was completed and figures prepared for all communities with high or extreme community hazard ratings. Photos of representative fuel types in Elko County are included in Appendix C.

2.3.4 Fire Behavior Worst-Case Scenario

Fire Specialists on the RCI Project Team described a worst-case wildfire scenario for each community based on the analyses of the severe fire behavior that could occur given a set of weather conditions, observed fuel load conditions, and minimal fire suppression resources. The worst-case scenario does not describe the most likely outcome of a wildfire event in the interface, but illustrates the potential for damage if a given set of conditions were to occur simultaneously. The worst-case scenarios are described in this document for public education purposes and are part of the basis for the fuel reduction recommendations.

2.4 INTERVIEWS WITH FIRE PERSONNEL

The Fire Specialists on the RCI Project Team interviewed local fire department personnel and regional 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 wildfires was added to the datasets when possible. A list of fire agency personnel contacted for information used in the assessments is included in Appendix D.

2.5 RECOMMENDATION DEVELOPMENT

A wide variety of treatments and alternative measures can be used to reduce ignition risks, mitigate fire hazards, and promote fire safe communities. Proposed recommendations typically include physical 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 to reduce existing risks and hazards were formulated based upon professional experience, the hazard assessment results, and information developed in conjunction with the "*Living with Fire"* publications, the National Fire Plan, and FIREWISE resources (National Fire Plan website: http://www.fireplan.gov/reports/7-19-en.pdf; FIREWISE website: http://www.firewiese.org; and the Nevada Cooperative Extension publications). 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

Elko County is located in northern Nevada, south of Idaho and east of Humboldt County, Nevada. Elko County is approximately eleven million acres in size. A jurisdictional summary of land management administration and coverage is provided in Table 3-1 and presented on Figure 3-1. The majority of land within Elko County is administered and managed by federal agencies. However there is a coordinated interagency effort throughout Elko County to wildfire response, risk reduction, and planning between the Bureau of Land Management, the US Forest Service, Nevada Division of Forestry, the Bureau of Indian Affairs, and local fire departments.

Table 3-1. Land Management Acreage Within Elko County

LAND ADMINISTRATOR	APPROXIMATE ACREAGE	PERCENT OF COUNTY
Federal		
Bureau of Land Management	6,900,000	63
US Forest Service	1,100,000	10
Bureau of Indian Affairs	160,000	1
US Fish and Wildlife Service	6,000	< 1
Department of Defense	15,000	< 1
Private		
	2,800,000	25
Other		
	37,000	< 1

Source: Approximate values from the Bureau of Land Management land ownership GIS database.

In 2003 the population for Elko County was estimated at 45,805 persons (Nevada State Demographer). According to the Nevada Department of Employment, Training, and Rehabilitation, the primary employers in the County are trade industries, government, and service industries. The biggest employer in the County is the Elko County School District (Nevada Commission on Economic Development, 2004).

Elevations within the County range from 11,387 feet above sea level at Ruby Dome in the Ruby Mountains to about 4,265 feet south of West Wendover at the Wendover Air Force Range. There are many mountain ranges in Elko County including but not limited to the Adobe Range, Antelope Range, Bull Run Mountains, Cherry Creek Range, Dolly Varden Mountains, East Humboldt Range, Elko Hills, Goshute Mountains, Granite Range, Independence Mountains, Jarbidge Mountains, Medicine Range, Pequop Range, Pilot Range, Piñon Range, Ruby Mountains, Snake Mountains, Spruce Mountain Ridge, Toano Range, Tuscarora Mountains, Windermere Hills, and Wood Hills. Some of the major valleys include Antelope Valley, Clover Valley, Goshute Valley, Huntington Valley, Independence Valley, Lamoille Valley, Pilot Creek Valley, Ruby Valley, Starr Valley, and Steptoe Valley. The Owyhee Desert lies in the northwestern portion of the County.

Climatic records for the past thirty years in Elko County show the average high/low temperatures range from 37°F/14°F in January to 89°F/48°F in July. Annual precipitation in Elko County is variable and averages 9.5 inches countywide. Precipitation in higher elevation communities such as Jarbidge reaches twenty inches or more each year (Western Regional Climate Center website). The majority of the precipitation received in Elko County arrives in the form of snow during the winter months with rain also occurring in the spring. The winter and early spring precipitation are most important for production of ground fuels that consist primarily of perennial and annual grasses. The summer and fall months are relatively dry with isolated thunderstorms providing the precipitation during these months. Dry lightning storms pose a high ignition risk to many communities in Elko County.

3.2 WILDFIRE HISTORY

There is a consistent and dynamic record of wildland fire activity in Elko County (BLM Elko Field Office 2005). The fire records show that approximately fifteen percent of the County has burned since 1980. Table 3-2 summarizes the fire history and fire ignitions by year that have been reported in the database. Many additional small fires, especially lightning strikes have not been recorded. Figure 3-2 illustrates the large fire history and fire ignitions on a map of Elko County. The most extensive wildfires on record burned between 1999 and 2001.

Table 3-2. Summary of Fire Occurrence and Estimated Acreage, 1980-2005

YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE	YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE
1980	42	5,669	**1993**	46	99
1981	119	18,525	**1994**	110	56,659
1982	34	1,035	**1995**	109	5,472
1983	53	7,534	**1996**	144	87,247
1984	84	74,563	**1997**	68	1,392
1985	228	164,404	**1998**	84	14,753
1986	132	16,228	**1999**	134	357,160
1987	99	16,483	**2000**	148	303,160
1988	98	22,820	**2001**	173	205,525
1989	103	10,170	**2002**	64	11,176
1990	90	18,541	**2003**	12	7,171
1991	161	17,607	**2004**	2	921
1992	126	21,423	**2005**	6	152,699
			TOTAL	**2,469**	**1,598,436**

Source: Fire history data provided by the National Interagency Fire Center, Boise, Idaho. Fire acreage is derived from Bureau of Land Management and US Forest Service fire perimeter data and is specific to acreage within Elko County.

Fires that occur on private lands are often not included in the GIS datasets used to develop Table 3-2 and Figure 3-2. Where possible, this data has been included into the project database. Spring Creek, Lucky Nugget I &II, and Ten Mile were all noted to have had several fires that are not incorporated in the fire history databases. During interviews

with local volunteer fire departments, the following fires were noted as missing from the databases and maps:

AREA AND FIRE NAME	ACREAGE	YEAR
Ruby Valley		
Battle Creek	5,000 ac	1994/1995
Harrison Pass	2,000 ac	1999
Dolly Creek	2-3,000 ac	1997
Bald Mountain	4,500 ac	2004
Midas		
Buffalo complex	100,000 ac	2001
Tuscarora		
Snow Canyon	60 ac	2001

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: fires started along roads from burning material thrown out of vehicle windows or ignited during auto accidents; off-road vehicles; railroads; arcing power lines; agricultural fires; ditch burning; debris burning in piles or burn barrels; target shooting; unattended campfires; and fireworks. In Elko County, railroads are the cause of many fires, especially from track maintenance work. The ignition source records for Elko County indicate that for the 2,469 ignitions reported, 1,571 were due to lightning (approx. 64 percent), 351 were human caused (approx. 14 percent), and the cause of 547 ignitions (approx. 22 percent) was not recorded.

3.2.2 Fire Ecology

The science of fire ecology is the study of how fire contributes to plant community structure and species composition. A 'fire regime' is defined in terms of 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. Large areas that formerly burned with high frequency but low intensity (fires more amenable to control and suppression) are now characterized by large accumulations of unburned fuels, which once ignited, will 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 the interim these areas can provide the conditions for establishment and spread of invasive species and in some cases inhibit sagebrush reestablishment. The most common invasive species to reoccupy burned areas in northern Nevada is cheatgrass.

Effect of Cheatgrass on Fire Ecology

Cheatgrass is a common introduced annual grass that aggressively invades disturbed areas, especially burns. Replacement of a native shrub community with a pure stand of cheatgrass increases the susceptibility of an area to repeated wildfire ignitions, especially in late summer when desiccating winds and lightning activity are

more prevalent. The total height and volume of cheatgrass fuel produced each year is highly variable and dependent on winter and spring precipitation. In years with above normal precipitation cheatgrass will produce much higher volumes of highly flammable fuels and can fully occupy interspaces between shrubs. As the grass matures and dries, a continuous and receptive fuel bed is created that is capable of rapidly burning into adjacent cover types that may be characterized by more severe and hazardous fire behavior. The ecologic risk 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 functions are additional consequences.

Eliminating, or at least controlling cheatgrass presents a difficult challenge. Mowing defensible space and fuelbreak areas each year before seed maturity is effective in the reduction of cheatgrass growth. In areas where livestock may be utilized, implementing early season intensive grazing up to and during flowering may aid in depleting the seed bank and reduce the annual fuel load (BLM 2003, Davison and Smith 2000, Montana State University 2004).[1] The use of pre-emergent herbicides has also proven effective in reducing growth and depleting the seed bank. Any herbicide treatment on public lands must be done in accordance with federal guidelines. Private landowners should proceed with caution if using herbicides,, should comply with all label instructions, and should consult their local extension specialist prior to use.

Fire Ecology in Pinyon-Juniper Woodlands

Single-leaf pinyon and Utah juniper are the dominant components of a plant community commonly referred to as pinyon-juniper (P-J). P-J woodlands were primarily confined to the steeper slopes commonly found at higher elevations in the Great Basin prior to European settlement. These woodland communities were characterized by a discontinuous distribution on the landscape and a heterogeneous internal fuel structure; a mosaic pattern of shrubs and trees resulting from the canopy openings created by small and frequent wildfires.

Both pinyon and juniper trees have relatively thin bark with continuous branching all the way to the ground. In denser stands, lower tree branches frequently intercept adjacent ladder fuels, e.g. shrubs, herbaceous groundcover, and smaller trees. This situation creates a dangerous fuel condition where ground fires can be carried into tree canopies and create crown fires. A crown fire is the most perilous of all wildfire conditions and is usually catastrophic in nature since the danger to firefighters is generally too great to deploy ground crews.

Over the last 100 years, wildfires in most of the western United States have been aggressively suppressed and P-J woodlands have encroached over areas traditionally occupied by other plant communities. Tree canopy coverage has been greatly expanded and has reached as high as sixty percent or more in some areas, contributing to the loss of diverse shrublands. These dense woodlands are perceived as being desirable for urban expansion in contrast to the surrounding deserts. In

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

areas where human occupation in P-J woodlands has grown over the last fifty years, the option of returning to a natural fire regime becomes increasingly problematic.

3.3 NATURAL RESOURCES AND CRITICAL FEATURES POTENTIALLY AT-RISK

Critical features at risk of loss during a wildfire event can natural resources, or can be economic assets such as agricultural and industrial resources, communication towers, or power poles. Cultural features such as historic structures, archaeological sites, and recreation-based resources can also be at risk.

3.3.1 Historical Registers

The potential for adverse effects to historic resources depends upon site-specific factors that vary one place to another such as the surrounding fuel hazard conditions, topography, and building materials. The majority of historic buildings that remain in Elko County's historic mining communities, stage stops, and railway corridors are not formally listed in state or federal registers. Four sites listed on the Nevada State Register of Historical Places and additional unlisted resources that could potentially be damaged or lost by a wildfire in the wildland-urban interface are summarized in Table 3-3.

Table 3-3. Historical Resources Potentially At Risk in Elko County

SITE NAME	LOCATION	SOURCE REGISTER
Henderson Bank Building	Elko	Nevada State Register of Historic Places
Metropolis Dam	10.5 miles north of Wells	
Midas Schoolhouse	Midas	
Skelton Hotel	Jiggs	
Historic mining era buildings	Contact Midas Tuscarora	BLM Elko Field Office
Stage stop, railroad depot, schoolhouse	Curry North Fork	
Presbyterian church	Lamoille	
Ranch and school houses	Ruby/Clover Valley Deeth/Star Valley Montello	

3.3.2 Flora and Fauna

There are thirty species with potential habitat in Elko County that are listed as threatened or endangered under the Endangered Species Act or are otherwise protected by state legislation (Nevada Natural Heritage Program database; last updated for Elko County March 18, 2004). These species are identified in Table 3-4. 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 and prior to the occurrence of a catastrophic wildfire. Project recommendations involving federally listed threatened of endangered species or their critical habitat require formal consultation with the US Fish and Wildlife Service.

Table 3-4. Federal and State Listed Flora and Fauna At-Risk in Elko County

SCIENTIFIC NAME	COMMON NAME	LEGISLATION
Plants		
Astragalus yoder-williamsii	Osgood Mountains milkvetch	NRS 527.260.300
Eriogonum argophyllum	Sulpher Springs buckwheat	NRS 527.260.300
Optunia pulchella	Sand cholla	NRS 527.060.120
Fish		
Gila bicolor isolata	Independence Valley tui chub	NRS 501
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	ESA–Listed Threatened NRS 501
Oncorhynchus clarki utah	Bonneville cutthroat trout	NRS 501
Oncorhynchus mykiss gairdneri	Inland Columbia Basin redband trout	NRS 501
Relictus solitarius	Relict dace	NRS 501
Rhinichthys osculus lethoporus	Independence Valley speckled dace	ESA–Listed Endangered NRS 501
Rhinichthys osculus oligoporus	Clover Valley speckled dace	ESA–Listed Endangered NRS 501
Salvelinus confluentus (population)	Bull trout (Jarbidge River basin population)	ESA–Listed Threatened NRS 501
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	Greater sage-grouse	NRS 501
Charadrius alexandrinus nivosus	Western snowy plover	NRS 501
Chlidonias niger	Black tern	NRS 501
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	NRS 501
Cygnus buccinator	Trumpeter swan	NRS 501
Falco peregrinus	Peregrine falcon	NRS 501
Gavia immer	Common loon	NRS 501
Haliaeetus leucocephalus	Bald eagle	ESA – Listed Threatened NRS 501
Ixobrychus exilis hesperis	Western least bittern	NRS 501
Oreortyx pictus	Mountain quail	NRS 501
Otus flammeolus	Flammulated owl	NRS 501
Plegadis chihi	White-faced ibis	NRS 501

3.3.3 Special Wildlife Areas

Nevada Department of Wildlife Gallagher Fish Hatchery

The Gallagher Fish Hatchery is situated on the western edge of the Ruby Marshes. The hatchery produces trout for stocking Nevada lakes and rivers, as well as producing eggs for other Nevada hatcheries. The fish hatchery is located on the eastern slope of the Ruby Mountains with several large canyons and drainages that open into the area. Slopes reach over thirty percent in some places. The higher slopes, previously covered by a pinyon-juniper woodland, burned in 1979. Recommendations to reduce wildfire hazards to the Gallagher Fish Hatchery are included in Chapter 32.

Ruby Lake National Wildlife Refuge

The refuge encompasses 39,928 acres and consists of a marsh bordered by meadows, grasslands, and brush-covered uplands. The refuge has been designated one of 500 Globally Important Bird Areas by the American Bird Conservancy. A wide variety of other wildlife inhabits the refuge including deer, antelope, and sage-grouse. A wildfire near the refuge would damage valuable habitat for these species Recommendations to reduce wildfire hazards to the Ruby Lake National Wildlife Refuge are included in Chapter 32.

3.3.4 Recreation

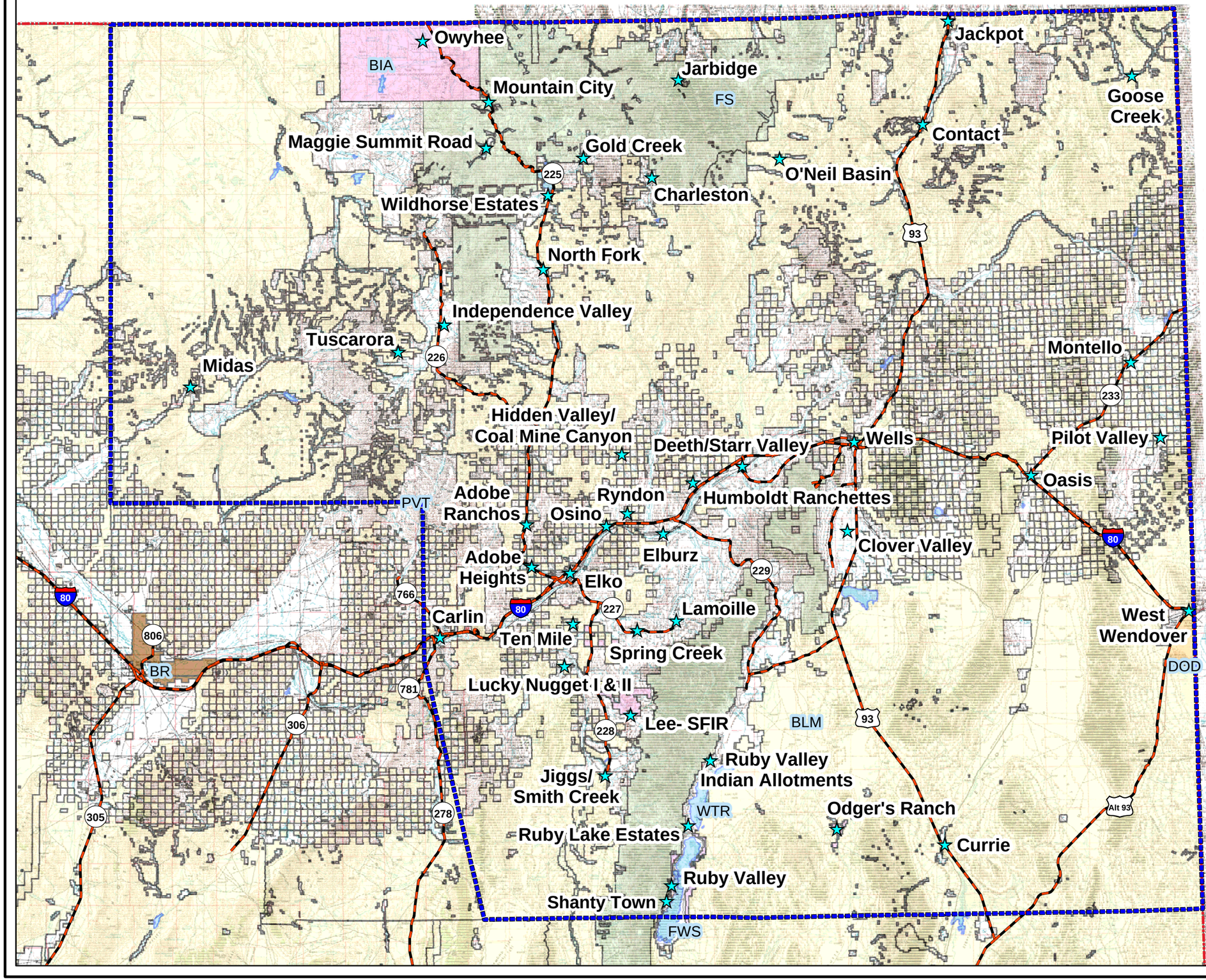
Large expanses of Elko County support outdoor recreation activity such as camping, hunting, fishing, hiking, wildlife viewing, and photography. Wildfires that affect the aesthetic values or wildlife habitat can indirectly affect local economies in Elko County.

3.3.5 Previously Completed Fuels Reduction and Hazard Mitigation Projects

The Bureau of Land Management Elko Field Office, US Forest Service Humboldt-Toiyabe Mountain City, Jarbidge, and Ruby Mountains Ranger Districts, and the Nevada Division of Forestry Northern Region coordinate to plan, propose, and implement fuel reduction and hazard mitigation projects throughout Elko County. Over the last two or three years, fuelbreaks and greenstrips have been constructed or are planned within the wildland-urban interface areas in the communities of Jarbidge, Lucky Nugget I & II, Midas, Mountain City, O'Neil Basin, Osino, Owyhee, Shanty Town, Spring Creek, Ten Mile, and Tuscarora. These projects are described more fully in each community's section of this report.

3.4 PREVIOUSLY COMPLETED FUELS REDUCTION AND HAZARD MITIGATION PROJECTS

The Bureau of Land Management Elko Field Office, US Forest Service Humboldt-Toiyabe Mountain City, Jarbidge, and Ruby Mountains Ranger Districts, and the Nevada Division of Forestry Northern Region coordinate to plan, propose, and implement fuel reduction and hazard mitigation projects throughout Elko County. Over the last two or three years, fuelbreaks and greenstrips have been constructed or are planned within the wildland-urban interface areas in the communities of Jarbidge, Lucky Nugget I & II, Midas, Mountain City, O'Neil Basin, Owyhee, Ryndon, Shanty Town, Spring Creek, Ten Mile, and Tuscarora. These projects are described more fully in each community's section of this report.



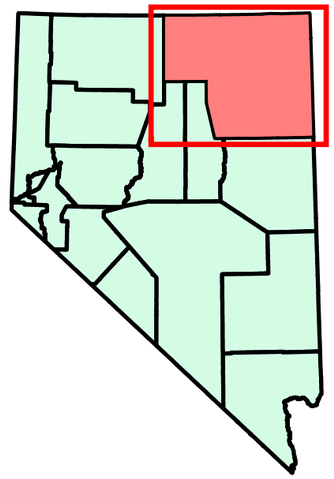


Figure 3-1. Community Locations and Land Ownership, Elko County, Nevada

Legend

- Elko Community
- Elko County
- Nevada State Line
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Fish and Wildlife Service
- Forest Service
- Private
- Water
- Highways and State Routes

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Miles

Nevada Community Wildfire Risk/Hazard Assessment

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

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.

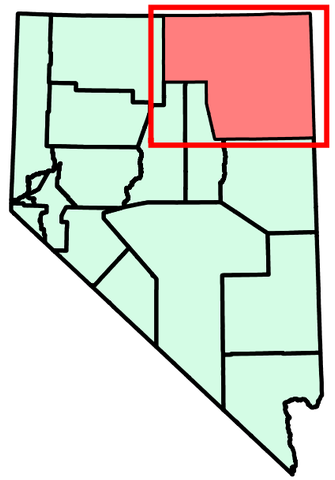


Figure 3-2. Fire History and Critical Features Potentially at Risk, Elko County, Nevada

Owyhee
Jarbidge
Mountain City
Jackpot
Goose Creek
Maggie Summit Road
Gold Creek
Contact
O'Neil Basin
Gold Creek Ranger Station
Charleston
Wildhorse Estates
North Fork
Independence Valley
Tuscarora
Montello
Midas
Midas School
Hidden Valley/ Coal Mine Canyon
Deeth/Starr Valley
Wells
Pilot Valley
Oasis
Adobe Ranchos
Osino
Ryndon
Humboldt Ranchettes
Clover Valley
Elburz
Adobe Heights
Elko
Elko County Courthouse
Ruby Valley Pony Express Station
U. S. Post Office
Lamoille
West Wendover
Ten Mile
Carlin
Spring Creek
Lucky Nugget I & II
Lee- SFIR
Skelton Hotel
Ruby Valley Indian Allotments
Jiggs/ Smith Creek
Odger's Ranch
Currie
Ruby Lake Estates
Ruby Valley
Shanty Town
XJ Ranch
225
226
227
228
229
233
93
80
806
781
306
305
278
Alt 93

Legend

- Elko Community
- Fire Ignition
- Elko County
- Nevada State Line
- Highways and State Routes
- Ruby Lake National Wildlife Area
- Past Fires (1980-2005)

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Miles

Nevada Community Wildfire Risk/Hazard Assessment

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

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 RISK AND HAZARD ASSESSMENT OVERVIEW

The RCI Project Team evaluated the communities in Elko County described in this report between August 23 and September 3, 2004. The hazard rating for each community, fuel conditions in the interface areas, and ignition risks are summarized in Table 4-1.

Table 4-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
EXTREME HAZARD COMMUNITIES				
Jarbidge	Intermix	Low-Extreme	Moderate-High	Extreme
Jiggs/Smith Creek	Intermix	Moderate-Extreme	High	Extreme
Ruby Valley Indian Allotments	Rural	Low-High	High	Extreme
HIGH HAZARD COMMUNITIES				
Adobe Heights	Intermix	Low-Moderate	Moderate-High	High
Adobe Ranchos	Intermix	Moderate	Moderate-High	High
Contact	Intermix	Moderate-High	High	High
Deeth/Starr Valley	Intermix	Low-Extreme	High	High
Lamoille	Intermix	Low-Extreme	High	High
Lee /South Fork Indian Reservation	Intermix	Low-Extreme	Moderate	High
Lucky Nugget I & II	Intermix	Moderate	High	High
Midas	Classic	High	High	High
Mountain City	Classic	Low-High	High	High
Osino	Intermix	Low-Moderate	High	High
Ruby Lake Estates	Intermix	Low-Extreme	High	High
Ten Mile	Intermix	Moderate-High	High	High
Tuscarora	Intermix	Low-High	High	High
MODERATE HAZARD COMMUNITIES				
Carlin	Classic	Moderate-High	High	Moderate
Currie	Intermix	Low-Moderate	High	Moderate
Elburz	Classic	Moderate	Moderate	Moderate
Elko	Classic and Intermix	Moderate-High	Moderate	Moderate
Gold Creek	Intermix	Low-High	Low-Moderate	Moderate
Hidden Valley/Coal Mine	Intermix	Moderate	Moderate	Moderate
Humboldt Ranchettes	Intermix	Moderate	Moderate	Moderate
North Fork	Classic	Moderate	High	Moderate

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Oasis	Classic	Moderate	Moderate-High	Moderate
Owyhee	Intermix	Moderate-High	Moderate	Moderate
Pilot Valley	Intermix	Low-Moderate	High	Moderate
Ruby Lake National Wildlife Refuge & Hatchery	Intermix	Moderate-High	High	Moderate
Ryndon	Intermix	Moderate	Moderate-High	Moderate
Spring Creek	Intermix	Low-High	High	Moderate
Wild Horse Estates	Intermix	Low-Moderate	High	Moderate
LOW HAZARD COMMUNITIES				
Jackpot	Intermix	Moderate	Moderate	Low
Montello	Intermix	Low-Moderate	Low-Moderate	Low
Wells	Classic	Low-Moderate	High	Low
West Wendover	Classic	Low	Low	Low
RURAL RANCH COMMUNITIES				
Charleston	Rural	Low-High	High	N/A[1]
Clover Valley	Rural	Moderate-High	Moderate	N/A[1]
Goose Creek	Rural	Low-High	High	N/A[1]
Independence Valley	Rural	Moderate	High	N/A[1]
Maggie Summit Road	Rural	Low-High	High	N/A[1]
Odger's Ranch	Rural	Moderate	High	N/A[1]
O'Neil Basin	Rural	Low-High	High	N/A[1]
Ruby Valley	Rural	Moderate-High	High	N/A[1]
PREVIOUSLY ASSESSED COMMUNITIES				
Shanty Town	Intermix	Moderate-High	High	N/A[2]

[1]The Community Hazard Assessment procedures are not applicable to rural ranch communities.

[2]The results for communities previously assessed by other procedures are not comparable to the procedures used for this assessment.

4.1.1 Wildfire Protection Resources

Wildfire protection resources are provided throughout Elko County by cooperating state, federal and local agencies. The Nevada Division of Forestry manages fire protection on private lands within the Elko Fire Protection District and oversees fourteen volunteer fire departments established under NRS 473. NDF Volunteer Fire Departments in Elko County are located in the following communities.

- Clover Valley
- Deeth
- Independence Valley
- Jarbidge
- Jiggs
- Lamoille
- Midas
- Montello (Tecoma FPD)
- Mountain City
- North Fork (inactive)
- Ryndon
- Ruby Valley
- Spring Creek
- Ten Mile

2.0 METHODOLOGY

2.1 PROJECT TEAM

The RCI Project Team consisted of experts in the fields of fire behavior and suppression, forest and range ecology, and geographic information systems (GIS). The RCI Project Team collaborated to complete a Community Risk/Hazard Assessment for each of the identified communities in Elko County. The RCI Field Teams included a Fire Specialists with extensive working wildland fire experience in Nevada and Resource Specialists experienced in the natural resource environment of the Great Basin.

The RCI Project Team used standardized procedures developed from 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 fuel hazards, structural hazards, community preparedness, and fire protection capabilities into an overall community rating. A glossary of wildland fire terms frequently used in describing assessment results and recommendations is included in Appendix A.

2.2 BASE MAP DATA COLLECTION

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

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

DATASET	DATA SOURCE
LAND OWNERSHIP	Bureau of Land Management Nevada State Office Mapping Services
VEGETATION COMMUNITIES	Nevada Gap Analysis Program Data, Utah Cooperative Fish and Wildlife Research Unit, Utah State University
TOPOGRAPHY	USGS Digital Elevation Models and Topographic Maps
FIRE SUPPRESSION RESOURCES	Field Interviews
ROADS	'TIGER' Census data 2000
CURRENT AERIAL PHOTOGRAPHS	USGS Digital Orthophoto Quadrangles (1994, 1996, or 1998)
FUEL HAZARD CLASSES	Bureau of Land Management Utah State Office Fire Hazard Potential Data
FIRE HISTORY	Bureau of Land Management Nevada State Office Mapping Services US Forest Service Humboldt-Toiyabe Supervisor's Office National Interagency Fire Center, Boise ID

Two additional volunteer fire departments are established in Carlin and Wells. The Cities of Elko, Wendover and Jackpot have combination career-volunteer fire departments in their cities.

The Bureau of Land Management Elko Field Office has three annex stations in addition to the Elko Field Office that include the Wells Station, Midas Station, and the Elko Helibase. The US Forest Service stations fire suppression resources at the Mountain City and Wells Guard Stations. Table 4-2 summarizes the types of wildfire suppression resources available from the Nevada Division of Forestry, Bureau of Land Management Elko Field Office, and US Forest Service. Federal agency equipment is only fully staffed during the fire season from May to September. The local wildfire suppression resources located within each community are detailed in the community chapters of this report.

Table 4-2. Wildfire Suppression Resources Available from Cooperating Agencies in Elko County During Fire Season

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engines	3	Bureau of Land Management (Carlin Station)
Type 4 Engines Type 2 Water Tender Hotshot Crew	3 1 1	Bureau of Land Management (Elko Field Office)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management (Elko Helibase)
Type 4 Engines SEAT	4 1	Bureau of Land Management (Wells Station)
Type 4 Engine	1	Bureau of Land Management (Midas Station)
Type 6 Engine Type 3 Engine Type I Water Tender Dozers	1 1 1 2	Nevada Division of Forestry Northern Region (Elko)
Type 2-Trained Hand Crews	1 each	Nevada Division of Forestry (Carlin and Wells Honor Camps)
Type 6 Engine Patrol	1 1	US Forest Service (Mountain City)
Type 6 Engine Patrol	1 1	US Forest Service Wells Ranger District
Type _ Engine Water Tender	1 1	US Fish and Wildlife Service (Ruby Valley)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

4.1.2 Fire Suppression Training and Equipment

The Nevada Division of Forestry and the other cooperating agencies provide annual basic wildland training to each volunteer fire department in Elko County and provide annual

refresher training opportunities for all volunteer departments. The Nevada Division of Forestry offers wildland firefighting training several times per year in Wells, Spring Creek, Elko, and Carlin. Volunteer Fire Chiefs need to strongly encourage all volunteer firefighters to attend every available training.

Many of the volunteer firefighters have not received State Fire Marshal structural firefighting training. Lack of structure training is a safety concern. Wildfires can be started when a structure fire escapes into wildland fuels.

Another concern for the volunteer fire departments is the difficulty in recruiting and retaining volunteers, with some volunteer fire stations having fewer than five members. Volunteer stations need an adequate volunteer base in order to properly protect their communities. The State of Nevada, Nevada Division of Forestry and Elko County should work cooperatively to establish an incentive program to recruit and maintain volunteer firefighters.

Many of the volunteer fire departments have equipment that is well over twenty years old. Outdated equipment can lead to delays in response and/or limit response if the equipment is not working properly. Volunteer stations should coordinate with Nevada Division of Forestry and Elko County to access federal grant programs for funding to replace outdated equipment.

4.1.3 Detection and Communication

Fires are reported to the Interagency Dispatch Center in Elko. The Elko County Sheriff's Office has access to the state mutual aid frequencies and the radio system is compatible with neighboring agencies. The Nevada Division of Forestry and federal agencies are on a narrow band radio system to meet federal mandates and can communicate directly to each other during an emergency incident. If volunteer or local fire departments or other fire protection agencies do not have narrow band capabilities, there will be gaps in communication that could lead to delayed directions and response. Elko County, the Nevada Division of Forestry, and the other cooperating agencies should make it a priority to assure that compatible communications are maintained with volunteers.

4.1.4 Financial Support

The Elko County Fire Protection District is organized under NRS 473 authorization. Under a mutual aid agreement between Elko County and the Nevada Division of Forestry, each volunteer fire department receives payment for equipment used at each fire event. In Elko County, volunteer fire departments within the Elko County Fire Protection district are funded by allocations from the Elko County General Fund, not by a separate property tax for the Fire Protection District as is typically the case elsewhere in Nevada. The Carlin, Elko, Jackpot, Wells, and West Wendover municipal fire departments are funded through property tax receipts from the respective areas of responsibility.

4.1.5 Community Preparedness

Elko County has an active Local Emergency Planning Committee. The Emergency Management Plan includes a disaster plan. The Elko Fire Department and City of Elko coordinate on a pre-attack plan, and the Elko Police and Fire Departments coordinate in the development of evacuation plans. All plans are updated annually. Elko County is also included in the Department of Emergency Management Statewide Emergency Management Plan through the Division of Forestry.

The Bureau of Land Management, Nevada Division of Forestry, US Forest Service, and Bureau of Indian Affairs coordinate annually with Elko County volunteer fire departments on a pre-attack plan for the County.

The Nevada Division of Forestry reviews development plans for communities within the Elko County Fire Protection District. The Nevada Division of Forestry Northern Region has had a Fire Protection Officer based in Ely since 2003. The Fire Protection Officer has worked with communities to improve community preparedness.

Extreme Hazard Communities

5.0 JARBIDGE

5.1 RISK AND HAZARD ASSESSMENT

Jarbidge is located 100 miles north of Elko in northern Elko County. The town serves as the northern gateway to the Jarbidge Wilderness Area. Jarbidge is situated at an elevation of 6,200 feet. The community hazard assessment resulted in classifying Jarbidge in the **Extreme Hazard** category (85 points). A summary of the factors that contributed to the hazard rating is included in Table 5-3. The extreme rating is attributed to limited access, inadequate defensible space, and the potential for extreme fire behavior. The community boundary identified for this report is shown in Figure 5-1.

5.1.1 Community Design

The wildland-urban interface area around Jarbidge is an intermix condition. There is no clear line of demarcation between the structures and the wildland fuels along roads, back fences, etc. Therefore, fuels extend into the development area. All but one of the 76 homes included in this assessment are located on parcels less than one acre in size, and one home is on a lot that is one to ten acres in size.

Access: Jarbidge is accessed via a series of dirt roads from the south in Nevada, or via the north through Idaho. The condition of the roads varies throughout the year. Accessibility within the community varies with some roads being too narrow to provide adequate space for fire suppression equipment to maneuver.

Signage: Street signs are not clearly posted on any of the residential streets, and residential addresses are visible on only two homes in Jarbidge. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. The utility ignition risk hazard was considered moderate to high because the power lines are often blown down after large storms. Additional maintenance of vegetation under and adjacent to power lines is needed.

5.1.2 Construction Materials

Sixty-three percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety-six percent of the homes have fire resistant roofing such as composition roofing, metal, or tile. Approximately one third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

5.1.3 Defensible Space

Less than half of the homes observed meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

5.1.4 Suppression Capabilities

Wildfire Protection Resources

Jarbidge is protected by the Jarbidge Volunteer Fire Department with additional support from the Jackpot Fire Department. The Jarbidge VFD has fifteen active members, with at least five responders at every fire incident. Table 5-1 lists the types of local wildfire resources and equipment available for initial response to Jarbidge in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 5-1. Jarbidge Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine Type 2 Engine	1 1	Jarbidge VFD (Jarbidge)
Type 6 Engine	1	Nevada Division of Forestry (Seasonal patrol - weekends only)
Type 3 Engine Type 6 Engine	1 1	Jackpot Fire Department (Jackpot)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 6 Engine	2	US Forest Service (Mountain City and Wells Guard Stations)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Kenny Heil, Jarbidge VFD Chief; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Joe Freeland, Bureau of Land Management Elko Field Office FMO.

Water Sources and Infrastructure

Water available for fire suppression resources in Jarbidge includes:

- Hydrants within 500 feet of structures with a minimum flow of 500 gallons per minute.
- Two water storage tanks totaling 315,000 gallons.
- Hose cabinets containing 1½-inch nozzle and 250-foot 1½-inch hose and hydrant wrenches are scattered throughout the community at intersections and along roads in front of homes.

The water system operates on gravity. The filtration system is capable of supplying 150 gpm of treated water directly out of Bear Creek.

Fire Protection Personnel Qualifications

All Jarbidge VFD firefighters have been trained in-house for structure protection and have received Nevada Division of Forestry Basic Wildland Firefighter training. The Jarbidge volunteers are trained to minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year the Jarbidge VFD responds to the following annual calls:

- Eight to ten emergency medical calls.
- Four to five wildland/brush fire calls.
- Ten to fifteen rescue calls.

Community Preparedness

The Nevada Division of Forestry in conjunction with the Bureau of Land Management Elko Field Office and the US Forest Service completed a 200-foot wide shaded fuelbreak on the north side of Jarbidge and a 200-foot wide greenstrip along Bear Creek. The project was begun in 2001 and was completed in June of 2003. Brush was removed in the Bear Creek greenstrip using both mechanical mastication equipment and hand treatments (Figure 5-1).

5.1.5 Factors Affecting Fire Behavior

Fuels in the community vary with slope and aspect. West facing slopes have mountain mahogany, Rocky Mountain juniper, subalpine fir, and aspen trees with sagebrush, rabbitbrush, cheatgrass, and basin wildrye in the understory. The fuel loading was estimated at two to eight tons per acre and the fuel hazard for the west facing slopes varied from low to extreme on steep slopes. The east facing slopes have similar vegetation, but lack subalpine fir and aspen. Fuel loading was estimated at one to eight tons per acre on east facing slopes, and was considered a moderate to high fuel hazard. Figure 5-2 shows fuel hazard conditions in the interface area. Fuel hazard photos are shown in Figure 5-3.

Jarbidge is situated in the bottom of a rugged, steep north-south trending canyon. The sides of the canyon are vertical in some areas. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

5.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Jarbidge would come from a dry lightning storm in late afternoon in July or August during a year of normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions south of the community, strong erratic winds, and thunderstorms coupled with predominant south winds would push a fire down canyon into the community. Since additional fire resources are well over one hour away, fires could easily exceed initial attack capabilities of the local volunteer fire department. Fires starting to the north of Jarbidge could be drawn through the community by the chimney effect of the canyon.

5.1.7 Ignition Risk Assessment

Jarbidge has a moderate to high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The primary risk of ignition in Jarbidge is lightning, although human caused ignitions are unpredictable and can occur at any time.

5.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Jarbidge area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on community coordination and public education efforts that could be undertaken to enhance fire safety.

5.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Remove pine needles, leaves, and debris from roofs and rain gutters.
- Replace wood shake roofs with fire resistant materials such as metal, tile, or composition.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Install spark arrestors on chimneys.
- Prune limbs from fir trees to a height of fifteen feet, but not more than one-third the height of the total tree height. Prune limbs from juniper trees to a minimum height of four feet from the ground, but not more than one-third the total tree height. Pruning should be completed to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.

- Maintain the defensible space as needed.
- Remove all dead vegetation and other flammable materials minimum of five feet from the exterior of the structure.
- Consider the purchase of fire suppression products such as fire blocking gels or foams that can be applied to structures and vegetation to create an added layer of flame resistance in the event of a fire.

5.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.

Nevada Division of Forestry and US Forest Service

- Construct a shaded fuelbreak along both sides of the main road for a distance of one mile above and below the community. The fuelbreak should be 300 feet wide as shown in Figure 5-1.

Elko County

- Remove all trees from the edge of the roads to increase accessibility during a fire, reduce the flame lengths, and reduce the chances of spotting across the roads.

5.2.3 Fire Suppression Resources

Nevada Division of Forestry

- Work with the Jarbidge community to find seasonal staffing for firefighter coverage seven days-per-week.
- Station a Type 2 water tender at the Jarbidge Volunteer Fire Station during the fire season.
- If available, move additional resources into the area or ensure adequate volunteer resources for high hazard days.

5.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The

Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
210 South Roop Street Suite 101
Carson City, NV 89701
www.nvfsc.org

- Ensure addresses are easily visible from the roads. Address characters should be at least four inches high, reflective on a dark background on dark backgrounds, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

5.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Jarbidge VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

5.3 SUMMARY OF RECOMMENDATIONS

Table 5-2. Jarbidge Risk and 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 the defensible space annually.
	Community Coordination	Ensure addresses are easily visible from the community roads. Form a local community-based organization to provide leadership and be responsible for community-wide fuel reduction treatments and community fire safety.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance in utility corridors. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.
Nevada Division of Forestry **US Forest Service**	Fuels Reduction	Construct a shaded fuelbreak along both sides of the main road for a distance of one mile above and below the community. The fuelbreak should be 300 feet wide.
Elko County	Fuels Reduction	Remove all trees from the edge of the roads to increase accessibility during a fire, reduce the flame lengths, and reduce the chances of spotting across the roads.
Nevada Division of Forestry	Fire Suppression Resources	Provide funding to staff a seasonal fire engine in Jarbidge seven days a week during the fire season. Station a Type 2 water tender at the Jarbidge Volunteer Fire Station during the fire season. Move additional suppression resources into the area on high hazard days, if available, and ensure adequate volunteer firefighter availability.
Jarbidge VFD	Public Education	Distribute copies of the publication *"Living With Fire"* to all Jarbidge property owners.

Table 5-3. Jarbidge Wildfire Hazard Rating Summary

A. Urban Interface Condition	*1*	
B. Community Design		
1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	3	/5
C. Construction Materials		
1. Roofs	1	/10
2. Siding	5	/5
3. Unenclosed Structures	3	/5
D. Defensible Space		
1. Lot Size	5	/5
2. Defensible Space	7	/15
F. Fire Behavior		
1. Fuels	5	/5
2. Fire Behavior	10	/10
3. Slope	10	/10
4. Aspect	10	/10
E. Suppression Capabilities		
1. Water Source	1	/10
2. Department	7	/10

TALLIES

76 Total Houses **5 Residential Streets**

B5. Street Signs

5 not visible	0 visible	0% visible

B6. Address Signs

74 not visible	2 visible	3% visible

C1. Roofs

3 combust	73 not combust	96% not combust

C2. Siding

28 combust	48 not combust	63% not combust

C3. Unenclosed Structures on Lot

30 not enclosed	46 enclosed	39% not enclosed

D1. Lot Sizes

75 <1ac	1 >1ac <10ac	0 >10ac

D2. Defensible Space

42 not adequat	34 adequate	45% adequate

Score 85 /128

(Corrected)

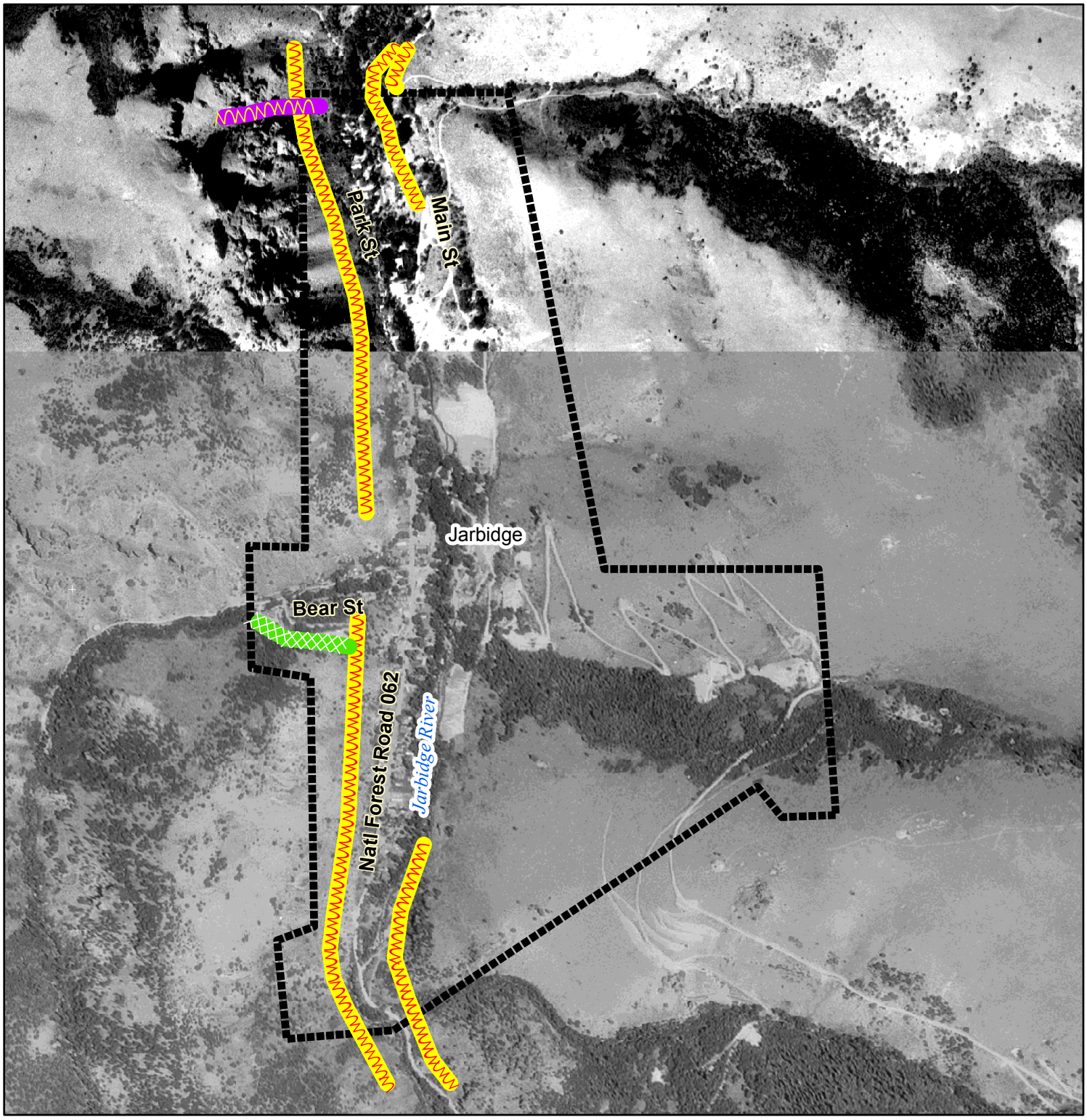


Figure 5-1. Jarbidge
Mitigation Projects

Legend

Community Boundary

Fuel Treatment

Completed Fuelbreak

Completed Greenstrip

Proposed Fuelbreak

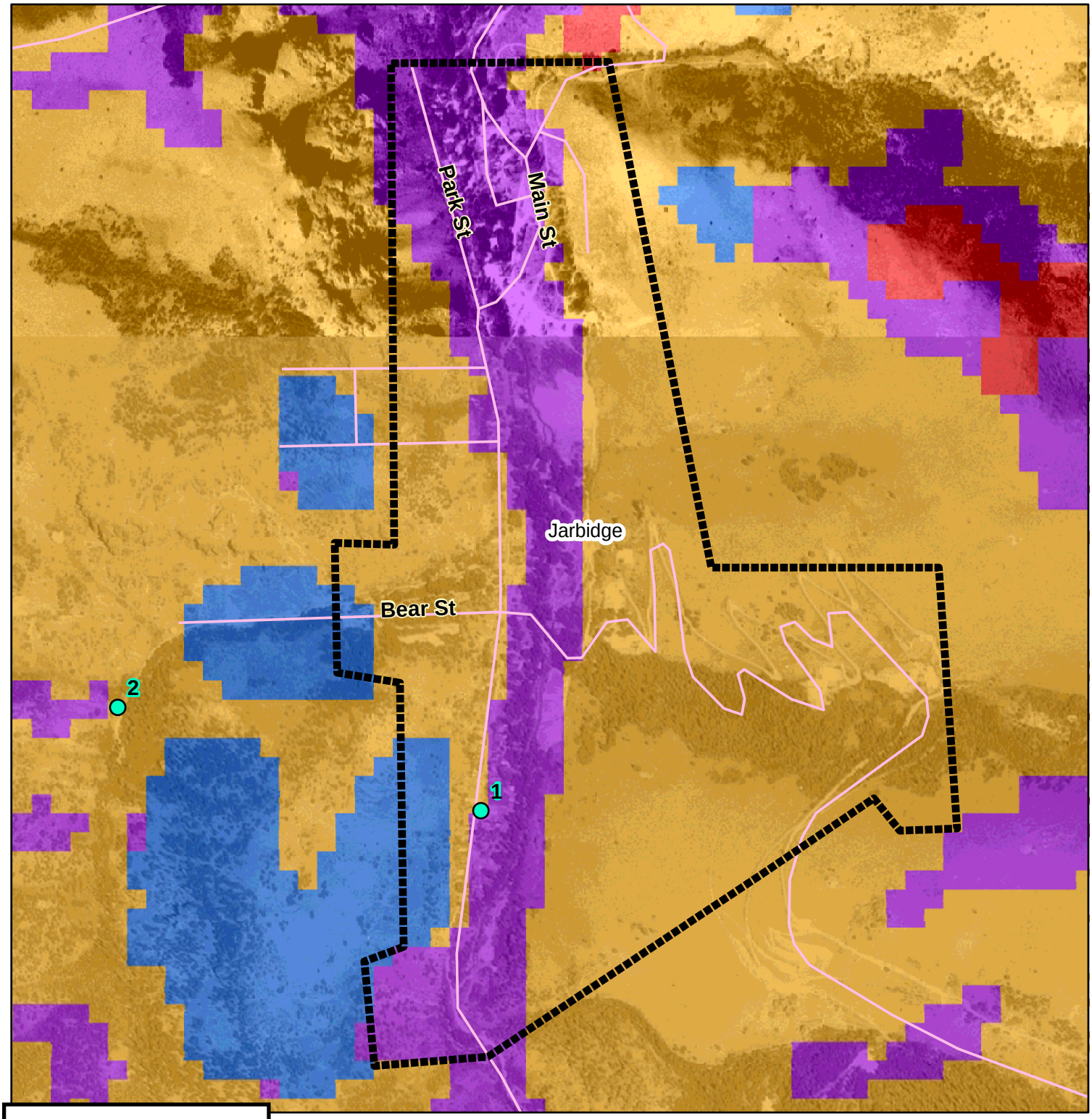
N
W E
S

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

Community Boundary

Secondary Roads

Fuel Hazard

Extreme

High

Moderate

Low

Fuel Photo Point

Figure 5-2. Jarbidge
Classification of Fuel Hazard

N
W E
S

0 500 1,000 2,000
Feet

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 5-3. Jarbidge Fuel Hazard Photo Points



Jarbidge Photo Point 1 - 4636728N, 630185E, 090°E. Fuels on the west side of Jarbidge consist of juniper, subalpine fir, aspen, and mountain mahogany. Ladder and ground fuels include basin wildrye, cheatgrass, perennial grasses, big sagebrush, elderberry, and rabbitbrush. Steep slopes in the community increase the potential for hazardous wildfire behavior.



Jarbidge Photo Point 2 - 4636891N, 629611E, 180°S. This water treatment facility is situated at the base of a steep canyon with heavy fuel loading. Critical features such as this need special attention to fuels reduction treatments to protect the resources.

6.0 JIGGS/SMITH CREEK

6.1 RISK AND HAZARD ASSESSMENT

Jiggs is a small community located approximately thirty miles south of Elko on State Route 228 in western Elko County. Jiggs is situated at an elevation of approximately 5,500 feet at the sound end of Smith Creek. The community hazard assessment resulted in classifying Jiggs/Smith Creek in the **Extreme Hazard** category (79 points). A summary of the factors that contributed to the hazard rating is included in Table 6-3. The extreme rating is attributed to limited access, inadequate defensible space, and the potential for extreme fire behavior. The community boundary identified for this report is shown in Figure 6-1.

6.1.1 Community Design

The interface area around Jiggs/Smith Creek is an intermix condition. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. Twelve of the fourteen homes included in this assessment are on parcels larger than ten acres in size and two homes are on parcels less than one acre in size.

Access: State Route 228 leads to the west boundary of the Jiggs/Smith Creek community. Smith Creek Road traverses the length of the community and provides access to the community from the northern and southern ends. The community roads are typically less than 24 feet wide and there are several long dead-end roads. These narrow and dead-end roads do not provide adequate access for fire suppression equipment or for two-way vehicle passage.

Signage: Street signs and residential addresses are visible on approximately half of the streets and homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. The utilities were considered a high ignition risk because they are in need of proper maintenance to minimize wildfire damage to electric utilities and to reduce the possibility that sparks could start a fire in adjacent vegetation.

6.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All but one of the homes observed have fire resistant roofing materials such as composition roofing, metal, or tile. Half of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

6.1.3 Defensible Space

About half of the homes observed in the interface do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

6.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection for the Jiggs/Smith Creek community is provided by the Jiggs Volunteer Fire Department. The Jiggs VFD is staffed by nine wildland fire trained volunteers, three emergency medical technicians, and five first responders. Additional Fire Department resources are available through the Elko Fire Department and the Spring Creek and Ten Mile Volunteer Fire Departments. Table 6-1 lists the types of local wildfire resources and equipment available for initial response to Jiggs/Smith Creek in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 6-1. Jiggs/Smith Creek Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engines Water Tender	1 2 1	Jiggs VFD (Jiggs)
Type 2 Engine	1	Spring Creek VFD (Station 1)
Type 4 Engine	1	Ten Mile VFD Ten Mile
Type 4 Engine	1	Bureau of Land Management (Elko Field Office)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Frank Zaga, Jiggs/Smith Creek VFD Chief.

Water Sources and Infrastructure

Water available for fire suppression in Jiggs/Smith Creek is limited to the nearby creeks and ponds. There are two livestock ponds in the area and each holds about 10,000 gallons. The fire suppression trucks are equipped with draft pumps. In the past, helicopters have dipped from the livestock ponds as well as beaver ponds in the nearby mountains. Current plans include installation of a dry hydrant near the Jiggs fire station.

Fire Protection Personnel Qualifications

All Jiggs VFD firefighters have been trained in-house for structure protection and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Jiggs VFD responds to the following annual calls:

- Ten to twenty emergency medical calls.
- Ten to thirty wildland/brush fire calls.

Community Preparedness

Jiggs Volunteer fire Department is in the process of developing emergency plans for each home in the community.

6.1.5 Factors Affecting Fire Behavior

The terrain within the community boundary is gently rolling. The primary aspects are to the west and south. The dominant wind is from the south and southwest. Fuel loading in the interface area varies from two to six tons per acre, and was considered a moderate to extreme fuel hazard as shown in Figure 6-2. The fuel type northeast of the community consists of broom snakeweed, sagebrush, bitterbrush, and rabbitbrush. The shrub layer was estimated to be four to eight feet tall. Ground fuels include basin wildrye, wheatgrasses, and cheatgrass. The shrubs are densely spaced. The fuels in the central and west portions consist of sagebrush and rabbitbrush two to three feet tall with cheatgrass and basin wildrye ground fuels. Adjacent to Smith Creek, the fuels are dominated by basin wildrye and cheatgrass, with some rabbitbrush. The fuels are continuous and in close proximity to structures. Fuel hazard photo points are shown in Figure 6-3.

6.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Jiggs/Smith Creek would start southwest of the homes located in Smith Creek. A fire burning north along the west side of the Ruby Mountains would quickly threaten the larger custom houses and ranches in the Smith Creek area. The vegetation on the west facing aspect varies from pasture grasses to sagebrush six to eight feet tall. If a fire started downslope from the homes, the occupants could be forced to shelter-in-place because access routes would be blocked by fire.

6.1.7 Ignition Risk Assessment

Jiggs/Smith Creek has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The primary risk of ignition in Jiggs/Smith Creek is lightning, unattended or improperly extinguished campfires, and vehicle activity on the highway.

6.1.8 XJ Ranch Community Considerations

The XJ Ranch, located approximately 25 miles south of Jiggs, is a summer youth camp with approximately 100 seasonal residents. The ranch receives fire protection from the Jiggs Volunteer Fire Department, located approximately 45 to 60 minutes from the ranch. Additional resources are available by request from the Bureau of Land Management Elko Field Office, the Nevada Division of Forestry, and the US Forest Service. Water available for fire suppression near the XJ Ranch includes one dry hydrant that can be filled from the ranch pond. The pond can also be used as a helicopter dip site. The buildings have wood shake roofs, which provide places where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the structure.

The vegetative fuel density in the XJ Ranch area is generally heavy, estimated at five to six tons per acre. Fuels in the community consist of a pinyon-juniper tree layer, and a shrub layer of sagebrush, rabbitbrush, and bitterbrush up to five feet high. Understory fuels consist of perennial grasses and some crested wheatgrass. The terrain within the community boundary is moderately sloped with a west aspect. The prevailing wind direction is south or west. There is a history of afternoon thunderstorms and dry lightning strikes in the area and an extensive wildfire history in the public lands surrounding the community.

The XJ Ranch has a high risk of ignition based on fire history in the area, topography, and fuels. The primary risk of ignition at the ranch is lightning, although human caused ignitions are unpredictable and can occur at any time.

6.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Jiggs/Smith Creek area focus primarily on the ongoing and additional efforts to create and maintain defensible space, and on future requirements that new developments will be planned and constructed to create fire safe communities. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety. Defensible space treatments, listed below, are also recommended for implementation around structures at the XJ Ranch and youth camp.

6.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.

- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[2] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.
- Create defensible space around farm equipment and haystacks.

6.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

XJ Ranch Property Owner

- Clear vegetation a minimum width of fifty feet on both sides of the driveway into the ranch.
- Construct a shaded fuelbreak for an additional 100 feet on both sides of the driveway by thinning pinyon and junipers to a minimum canopy spacing of two times the height of the trees. Create turnout areas every 600 feet along the main driveway.

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

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from edge of road on both sides of the road. Remove biomass and dispose of it at an appropriate site.

Elko County and Nevada Division of Forestry

- Coordinate with residents to construct a fuelbreak along Smith Creek Road as shown in Figure 6-1. Mow grasses to maximum height of four inches and remove all shrubs and trees within twenty feet from the edge of the road on both sides of the road. For an additional thirty feet on each side of the road thin shrubs to a canopy spacing of two times the height of the shrubs. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion. The proposed treatment will improve the main evacuation route for the community, reduce chance of ignition along the roadway, and provide a fuelbreak for parts of the community.

6.2.3 Fire Suppression Resources and Training

Jiggs VFD and Nevada Division of Forestry

- Continue to provide wildland fire training and equipment for all volunteers.
- Install a minimum capacity 10,000-gallon water tank in the community for drafting water.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies.
- If available, move additional resources into the area and ensure adequate volunteer resources for high hazard days.

6.2.4 Community Coordination

Jiggs VFD and Nevada Division of Forestry and Cooperating Agencies

- Develop an evacuation plan for the XJ Ranch and youth camp.
- Assure that residents of the Jiggs/Smith Creek Community and the operators of the XJ Ranch are knowledgeable of the existing shelter-in-place plan.
- Develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.
- Develop and enforce brush clearance and biomass disposal programs.

- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Elko County

- Promote coordination between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

6.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Jiggs VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

6.3 SUMMARY OF RECOMMENDATIONS

Table 6-2. Jiggs/Smith Creek Risk and Hazard 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 the defensible space annually.
	Community Coordination	Ensure addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and fire safety.
XJ Ranch	Fuels Reduction	Clear vegetation a minimum width of fifty feet on both sides of the driveway into the ranch. Construct a shaded fuelbreak for an additional 100 feet on both sides of the driveway by thinning pinyon and junipers to a minimum canopy spacing of two times the height of the trees. Create turnout areas every 600 feet along the main driveway.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.
Jiggs VFD **Nevada Division of Forestry**	Fuels Reduction	Coordinate with residents to construct a fuelbreak along Smith Creek Road. Mow grasses to maximum height of four inches and remove all shrubs and trees within twenty feet from the edge of the road on both sides of the road. Thin shrubs an additional thirty feet on each side of the road to a canopy spacing of two times the height of the shrubs.
	Fire Suppression Resources	Continue to provide wildland fire training and equipment for all volunteers. Upgrade VFD radios with narrow band technology to ensure communication compatibility with cooperating agencies. Install a minimum capacity 10,000-gallon water tank in the community for drafting water. If available, move additional resources into the area on high hazard days or ensure adequate volunteer resources for high hazard days.

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
	Community Coordination	Develop an evacuation plan for the XJ Ranch and youth camp. Assure that residents of the Jiggs/Smith Creek Community and the operators of the XJ Ranch are knowledgeable of the existing shelter-in-place plan. Develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents. Develop and enforce brush clearance and biomass disposal programs. Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove biomass and dispose of it at an appropriate site.
	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the county to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
Jiggs VFD	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 6-3. Jiggs/Smith Creek Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	5	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	3	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	1	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	10	/10
3. Slope	4	/10
4. Aspect	7	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	7	/10

TALLIES

14 Total Houses **2 Residential Streets**

B5. Street Signs

1 not visible | 1 visible | 50% visible

B6. Address Signs

7 not visible | 7 visible | 50% visible

C1. Roofs

1 combust | 13 not combust | 93% not combust

C2. Siding

0 combust | 14 not combust | 100% not combust

C3. Unenclosed Structures on Lot

7 not enclosed | 7 enclosed | 50% not enclosed

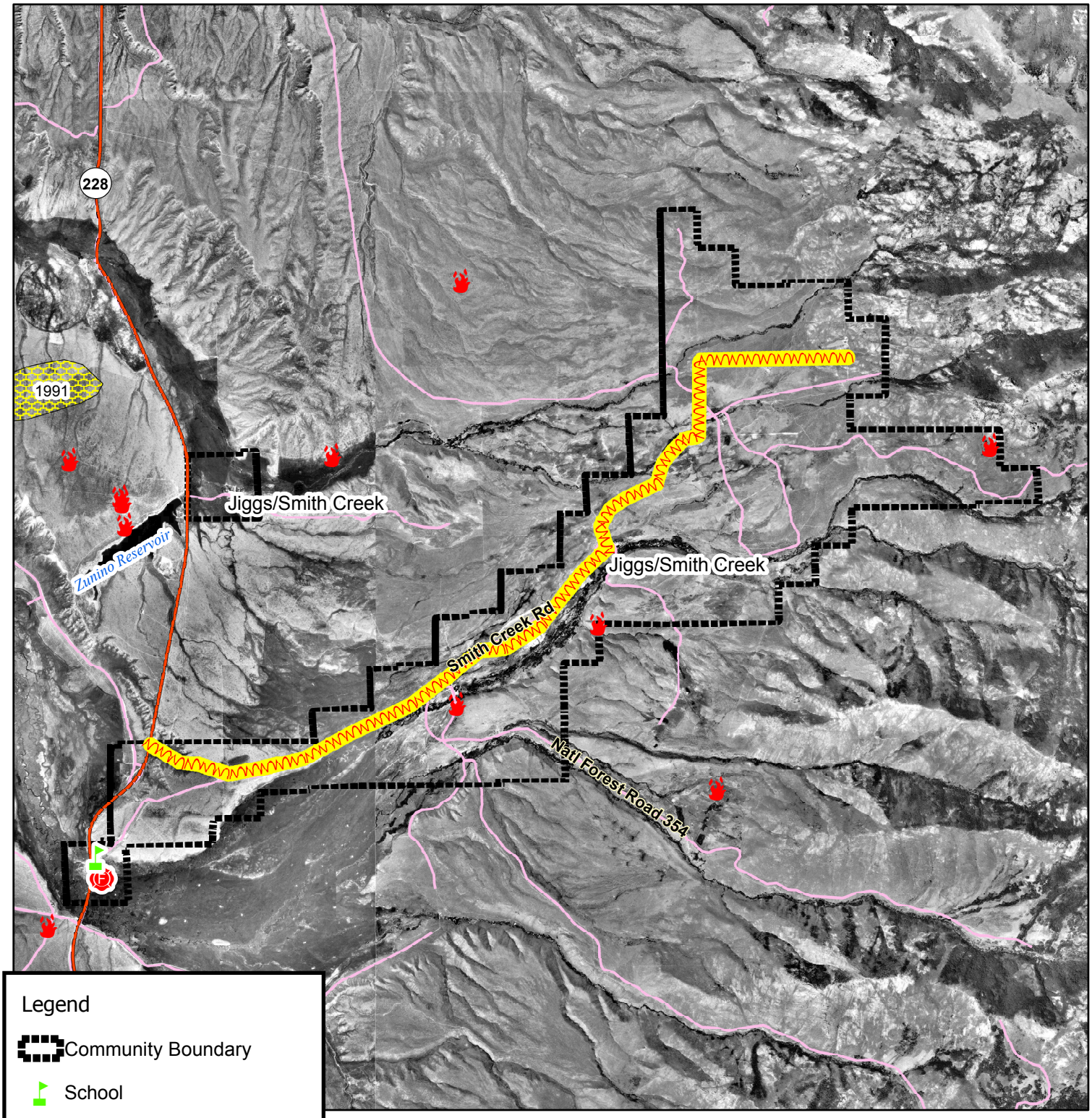
D1. Lot Sizes

2 <1ac | 0 >1ac <10ac | 12 >10ac

D2. Defensible Space

6 not adequat | 8 adequate | 57% adequate

Score **79** /128



Legend

- Community Boundary
- School
- Fire Station
- Fire Ignition
- Fire Boundary and Date

Fuel Treatment

- Fuelbreak
- Highways and State Routes
- Secondary Roads
- Fire Ignition

Figure 6-1. Jiggs/Smith Creek
Fire History, Suppression Resources,
Critical Features, and
Proposed Mitigation Projects

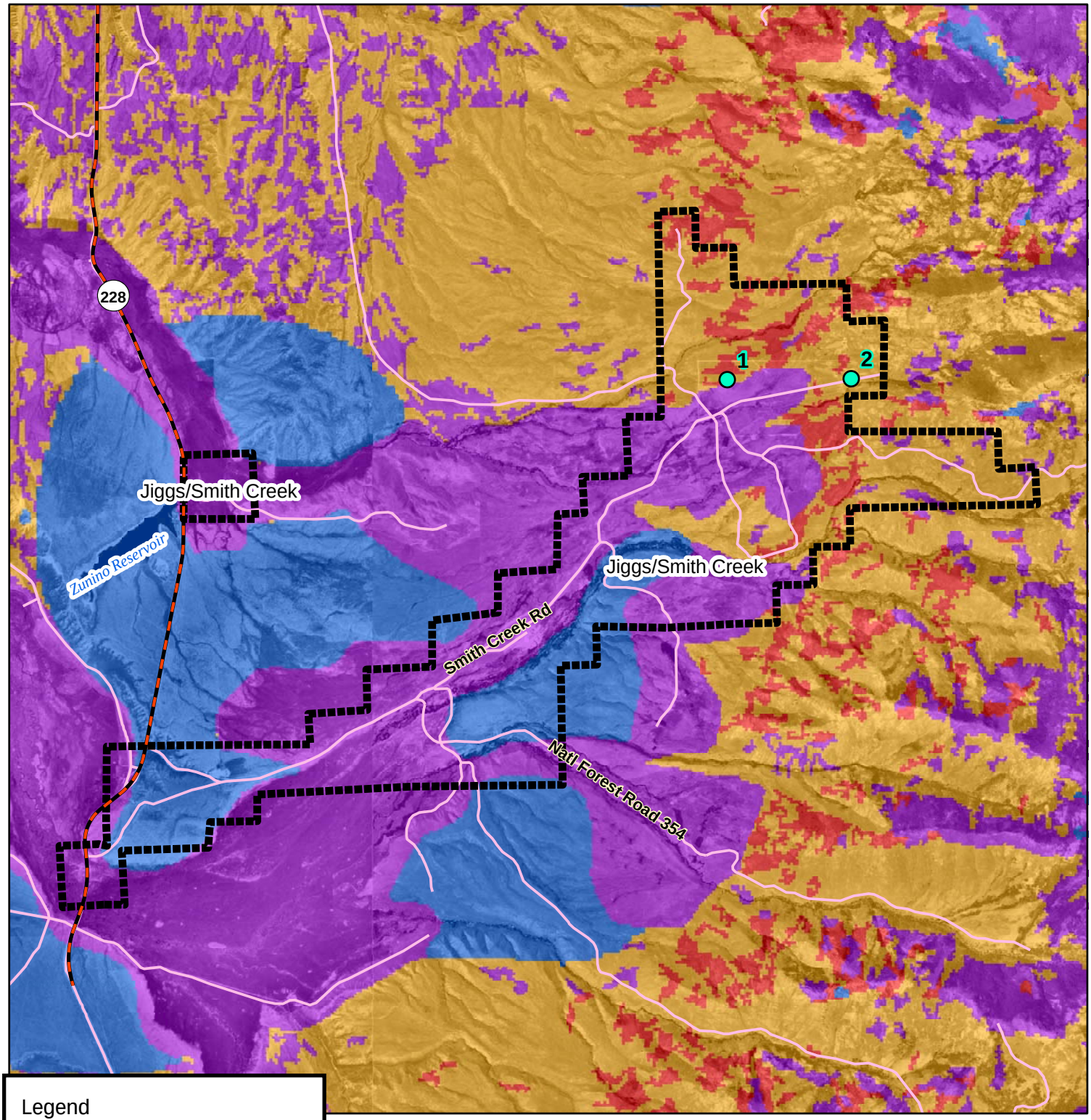
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0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 6-2. Jiggs/Smith Creek
Classification of Fuel Hazard

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0 0.5 1 2
Miles

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 6-3 Jiggs/Smith Creek Fuel Hazard Photo Points



Jiggs/Smith Creek Photo Point 1 – 4481264N, 620043E, 190°SW. Extreme fuel loading in Smith Creek. Some homes are in close proximity to high fuel hazard conditions. The shrub layer is sagebrush, bitterbrush, broom snakeweed, and rabbitbrush; the ground fuels are basin wildrye, wheatgrasses, bluegrasses, needlegrasses, and cheatgrass. Fuel loading is estimated at five to six tons per acre.



Jiggs/Smith Creek Photo Point 2 – 4481274N, 621369E, 100°SE. Smith Creek community overlooking Smith Creek to the west. The narrow road and lack of roadside clearance raise concerns for evacuation during a wildfire if the road were to become blocked.

7.0 RUBY VALLEY INDIAN ALLOTMENTS

7.1 RISK AND HAZARD ASSESSMENT

The Ruby Valley Indian Allotments are located on the eastern flank of the Ruby Mountains and are part of the South Fork Indian Reservation. The community hazard assessment resulted in classifying the Ruby Valley Indian Allotments in the **Extreme Hazard** category (76 points). A summary of the factors that contributed to the hazard rating is included in Table 7-3. The extreme rating is primarily attributed to limited access, inadequate defensible space, lack of water for fire suppression, and the potential for extreme fire behavior. The community boundary identified for this report is shown in Figure 7-1.

7.1.1 Community Design

The wildland-urban interface area within and around the Ruby Valley Indian Allotments are considered a interface condition. Small, scattered clusters of structures (ranches, farms) are intermixed with wildland fuels. There are seven homes in the area, all on parcels of one to ten acres in size.

Access: Ruby Valley Road is the only road to the Ruby Valley Indian Allotments. The narrow roads within the community do not provide adequate turn-around space for fire suppression equipment to maneuver.

Signage: Street signs and residential addresses are not visible on any streets or any homes in the Ruby Valley Indian Allotments. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

7.1.2 Construction Materials

In the Ruby Valley Indian Allotments, all but one of the homes observed in the interface area were built with non-combustible or highly fire resistant siding materials. All but one of the homes had fire resistant roofing materials. Six of the homes had unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

7.1.3 Defensible Space

None of the homes observed in the Ruby Valley Indian Allotments meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

7.1.4 Suppression Capabilities

Wildfire Protection Resources

The Ruby Valley Indian Allotments do not have an organized fire department. The closest fire suppression resources are the Ruby Valley Volunteer Fire Department, the Ruby Valley National Wildlife Refuge, and the Nevada Department of Wildlife Gallagher Fish Hatchery. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1. Table 7-1 lists the types of wildfire resources, cooperating partners and equipment available for initial response to the Ruby Valley Indian Reservation in the event of a reported wildfire.

Table 7-1. Ruby Valley Indian Allotments Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine Type 2 Engine	1 1	Ruby Valley VFD (Secret Pass)
Type 2 Engine Water Tender	1 1	Ruby Valley VFD (School Station)
Type 6 Engine Type 3 Engine	1 1	NDOW Gallagher Fish Hatchery (Ruby Valley)
Type 4 Engine Water Tender	1 1	Ruby Valley National Wildlife Refuge (Ruby Valley)
Type 2 Engine	1	Spring Creek Station 1 (Spring Creek)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Larry Burton, Ruby Valley VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression in the Ruby Valley Indian Allotments is limited to individual wells.

7.1.5 Factors Affecting Fire Behavior

Overall, the community is considered to have a high fuel hazard because of the heavy fuels. The terrain surrounding the Ruby Valley Indian Allotments is gently rolling. The prevailing wind is from the south and southwest. Lightning and strong winds in the summer are common. Fuels in the Ruby Valley Indian Allotments consist of sagebrush and rabbitbrush, with cheatgrass, wildrye, and squirreltail, estimated from one to six tons per acre and were considered to be a moderate fuel hazard. At the southern end of the community, the sagebrush and rabbitbrush are taller and denser and considered to be a high fuel hazard. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes in years of higher than average precipitation. East of Ruby Valley Road, irrigated

agricultural lands and periodically wet grasslands were considered low to moderate fuel hazards.

7.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding the Ruby Valley Indian Allotments would be a fire starting on the south end of the community with strong winds, greater than twenty miles per hour, from the south/southwest pushing fire toward structures. The few structures in the area could be lost before adequate fire suppression resources could arrive.

7.1.7 Ignition Risk Assessment

Ruby Valley Indian Allotment has a moderate risk of ignition based on fire history, fuel loading, and some residences with inadequate defensible space. The primary risk of ignition in the Ruby Valley Indian Allotments is lightning.

7.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Ruby Valley Indian Allotments focus primarily on the ongoing and additional efforts to create and maintain defensible space and on community coordination and public education efforts that could be undertaken to enhance fire safety.

7.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Resident Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-

emergent herbicide.[3] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.

7.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Ruby Valley Tribal Council/ Bureau of Indian Affairs/ Bureau of Land Management

- Reduce vegetation and maintain roads by mowing all vegetation to a height less than four inches for a distance of twenty feet from the edge of the road on both sides of the road at the north end of the community.
- Develop and enforce brush clearance and biomass disposal programs.

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

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

7.2.3 Fire Suppression Resources

Bureau of Land Management and Cooperating Agencies

- If available, move additional resources into the area, on high hazard days or ensure adequate volunteer resources for high hazard days.

7.2.4 Community Coordination

Resident Recommendations

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material.

Ruby Valley Tribal Council

- Improve street sign and address visibility.
- Work with homeowners to identify non-ambulatory persons within the community who may need evacuation assistance.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

7.3 SUMMARY OF RECOMMENDATIONS

Table 7-2. Ruby Valley Indian Allotments Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Residents	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space condition annually.
	Community Coordination	Ensure addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Ruby Valley Tribal Council **Bureau of Indian Affairs** **Bureau of Land Management**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road at the north end of the community. Develop and enforce brush clearance and biomass disposal programs.
Ruby Valley Tribal Council	Community Coordination	Improve street sign and address visibility. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Work with homeowners to identify non-ambulatory persons within the community who may need evacuation assistance.
Bureau of Land Management	Fire Suppression Resources	If available, move additional resources into the area or ensure adequate volunteer resources for high hazard days.

Table 7-3. Ruby Valley Indian Allotment Wildfire Hazard Rating Summary

A. Urban Interface Condition	2	
B. Community Design		
1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	3	/5
C. Construction Materials		
1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	5	/5
D. Defensible Space		
1. Lot Size	3	/5
2. Defensible Space	15	/15
F. Fire Behavior		
1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	1	/10
E. Suppression Capabilities		
1. Water Source	10	/10
2. Department	7	/10

TALLIES

7 Total Houses **1 Residential Streets**

B5. Street Signs

0	not visible	1	visible	100%	visible

B6. Address Signs

7	not visible	0	visible	0%	visible

C1. Roofs

0	combust	7	not combust	100%	not combust

C2. Siding

1	combust	6	not combust	86%	not combust

C3. Unenclosed Structures on Lot

6	not enclosed	1	enclosed	86%	not enclosed

D1. Lot Sizes

0	<1ac	7	>1ac <10ac	0	>10ac

D2. Defensible Space

7	not adequat	0	adequate	0%	adequate

Score 76 /128

(Corrected)

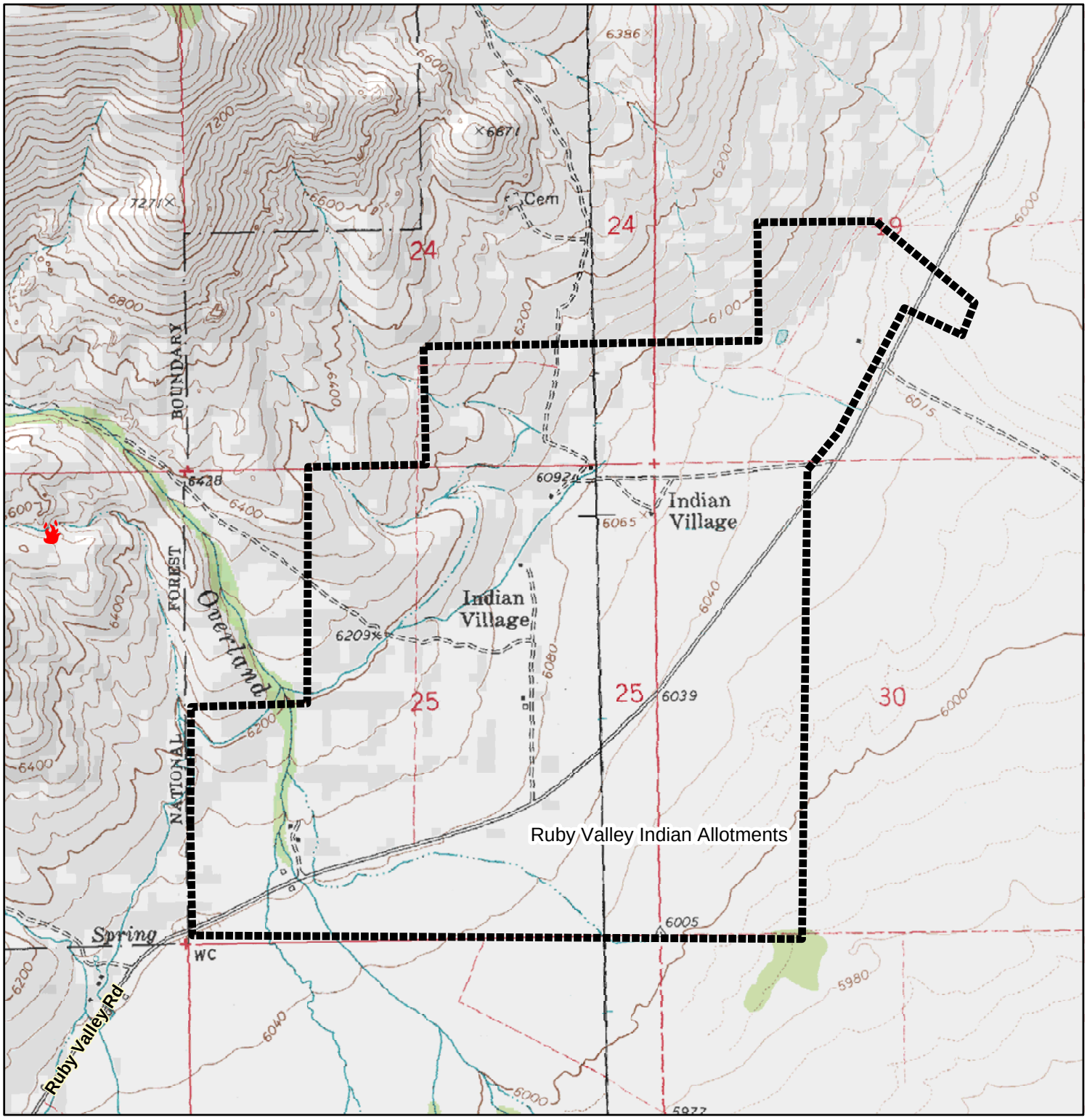


Figure 7-1. Ruby Valley Indian Allotments
Fire History

N
W E
S

Legend

- Community Boundary
- Fire Ignition
- Highways and State Routes

0 1,000 2,000 4,000
Feet

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Carson City, NV 89703
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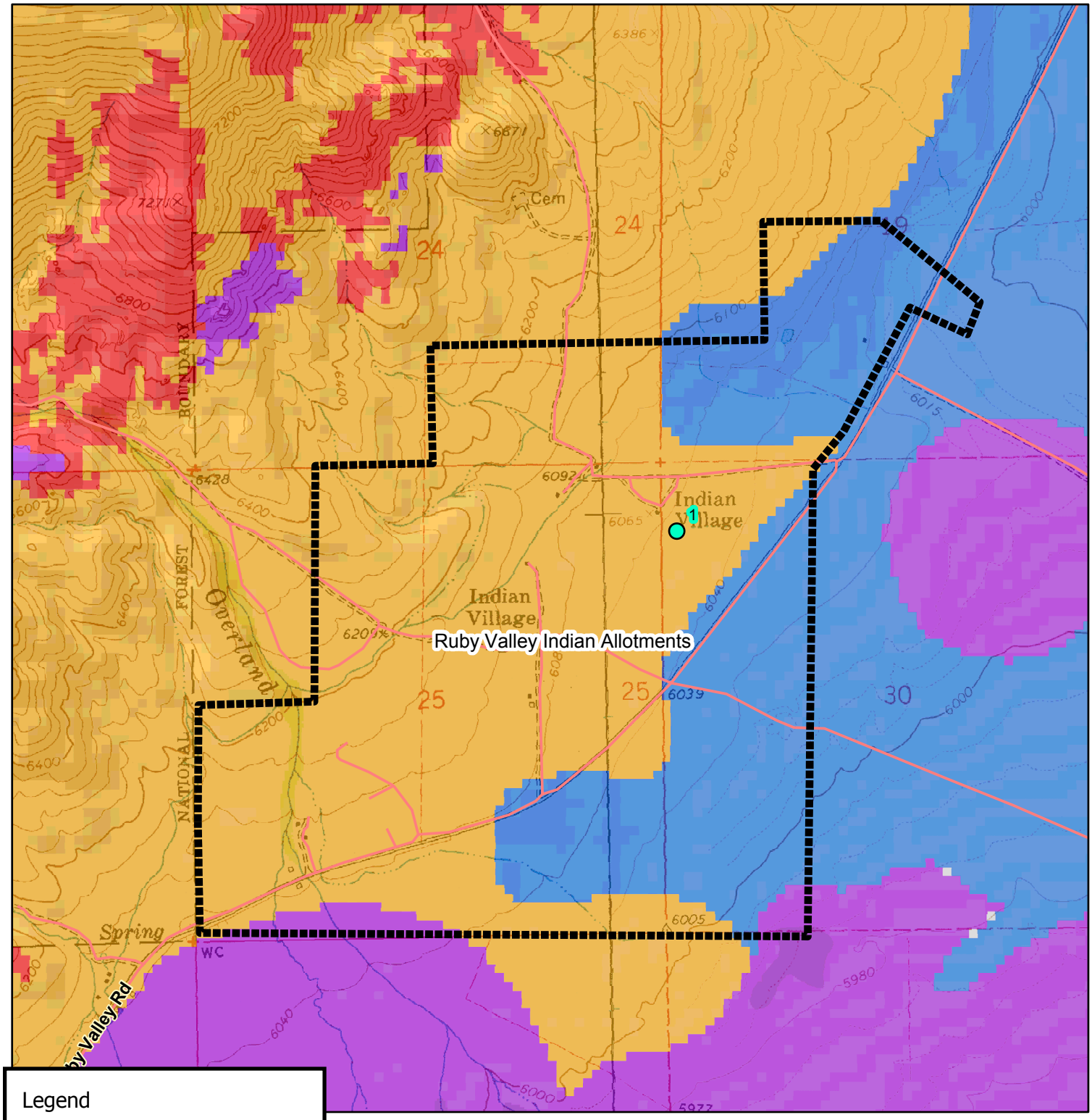


Figure 7-2. Ruby Valley Indian Allotments
Classification of Fuel Hazard

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

Nevada Community Wildfire Risk / Hazard Assessment Project

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Figure 7-3 Ruby Valley Indian Allotments Fuel Hazard Photo Points



Ruby Valley Photo Point 1. 4479830N, 0637957E, 163°SE. Vegetative fuels in the Ruby Valley Indian Allotments consist of sagebrush and rabbitbrush, with cheatgrass, wildrye, and squirreltail in the ground fuels. The fuel load at this location was estimated at four to six tons per acre and was considered a high fuel hazard.

High Hazard Communities

8.0 ADOBE HEIGHTS

8.1 RISK AND HAZARD ASSESSMENT

Adobe Heights is located approximately three miles northwest of Elko. Adobe Heights is accessed via State Route 225. The community lies among gently rolling hills. The community hazard assessment resulted in classifying Adobe Heights in the **High Hazard** category (69 points). A summary of the factors that contributed to the hazard rating is included in Table 8-3. The high rating is primarily attributed to limited access, inadequate defensible space, the potential for hazardous fire behavior, the lack of fire protection resources, and the lack of water availability for fire suppression. The community boundary identified for this report is shown in Figure 8-1.

8.1.1 Community Design

The wildland-urban interface area around Adobe Heights is an intermix condition. Structures are scattered throughout the community and in wildland fuels, with no clear line of demarcation between structures and wildland fuels. All of the sixteen homes included in the assessment are on parcels larger than ten acres in size.

Roads: State Route 225 is the primary transportation route to Adobe Heights from Elko. The road is between twenty and 24 feet wide, with a gradient steeper than five percent. There are several dead-end roads in the community with inadequate turnaround space for fire suppression equipment to maneuver.

Signage: All of the street signs are visible, but only 63 percent of the homes have clearly visible address signage. Clear and visible signage is important to help emergency personnel in locating homes in limited visibility conditions during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

8.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard and roofing materials such as composition roofing, metal, or tile. Twenty-five percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

8.1.3 Defensible Space

Sixty-three percent of the homes observed do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

8.1.4 Suppression Capabilities

Wildfire Protection Resources

Adobe Heights has no organized fire department. Fire suppression resources are provided to Adobe Heights by the Elko Fire Department. Table 8-1 lists the types of wildfire resources and equipment available for initial response to Adobe Heights in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 8-1. Adobe Heights Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine	1	Elko Fire Department
Type 3 Engine	2	Lee Company
Type 4 Engine	1	
Water tender	1	
Type 3 Helicopter	1	Bureau of Land Management
Air Attack Platform	1	(Elko Helibase)
Type 2 Engine	1	Nevada Division of Forestry
Type 1 Water Tender	1	(Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Alan Kightlinger, Elko Fire Department Chief

Water Sources and Infrastructure

Private wells are the only water source available in Adobe Heights. There is no water designated for fire suppression.

8.1.5 Factors Affecting Fire Behavior

The terrain within the community boundary is gently rolling with slopes up to twenty percent and aspects in all directions. The prevailing wind direction is from the south and west. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The vegetative fuel density in the Adobe Heights interface area is low to moderate, with fuel loads estimated at one to three tons per acre. Fuels in the community consist primarily of cheatgrass, squirreltail, basin wildrye, sagebrush, and rabbitbrush. Burned areas from 1983 and 2002 have less sagebrush cover and more cheatgrass than non-burned areas and were considered a lower fuel hazard at the time of this assessment. However, cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation.

8.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Adobe Heights would start along the road near Adobe Heights and State Route 225 with strong wind blowing greater than twenty miles per hour from the south/southwest. An ignition in the fine grass fuels and

brush on the south facing aspect would rapidly spread north into homes and could block any means of access into or out of the community.

8.1.7 Ignition Risk Assessment

Adobe Heights has a moderate to high ignition risk based on fire history and dry lightning from thunderstorms in the area. The primary risk of ignition in Adobe Heights is lightning, although many human-caused fires have occurred and ignitions are unpredictable and can occur at any time.

8.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for Adobe Heights focus primarily on the ongoing and additional efforts to create and maintain defensible space, and on future requirements that new developments will be planned and constructed in a fire safe manner. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

8.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.

- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.

- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[4] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.

8.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Elko County Roads Department and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

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

8.2.3 Fire Suppression Resources

Nevada Division of Forestry

- Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.
- Continue to meet annually with the cooperating fire agencies to discuss pre-attack plans for the community.

8.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches tall and reflective on a dark background. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions caused by a wildland fire.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

8.3 SUMMARY OF RECOMMENDATIONS

Table 8-2. Adobe Heights Risk and 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 the defensible space area annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of it at an appropriate site.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
Nevada Division of Forestry	Fire Suppression Resources	Install a minimum capacity 10,000-gallon water tank in the community for fire suppression. Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.

Table 8-3. Adobe Heights Wildfire Hazard Rating Summary

A. Urban Interface Condition 2

B. Community Design

1. Ingress / Egress	5	/5
2. Width of Road	3	/5
3. Accessibility	3	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	1	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	10	/10

Score 69 /128

TALLIES

16 Total Houses **4 Residential Streets**

B5. Street Signs

0 not visible	4 visible	100% visible

B6. Address Signs

6 not visible	10 visible	63% visible

C1. Roofs

0 combust	16 not combust	100% not combust

C2. Siding

0 combust	16 not combust	100% not combust

C3. Unenclosed Structures on Lot

4 not enclosed	12 enclosed	25% not enclosed

D1. Lot Sizes

0 <1ac	0 >1ac <10ac	16 >10ac

D2. Defensible Space

10 not adequat	6 adequate	38% adequate

(Corrected)

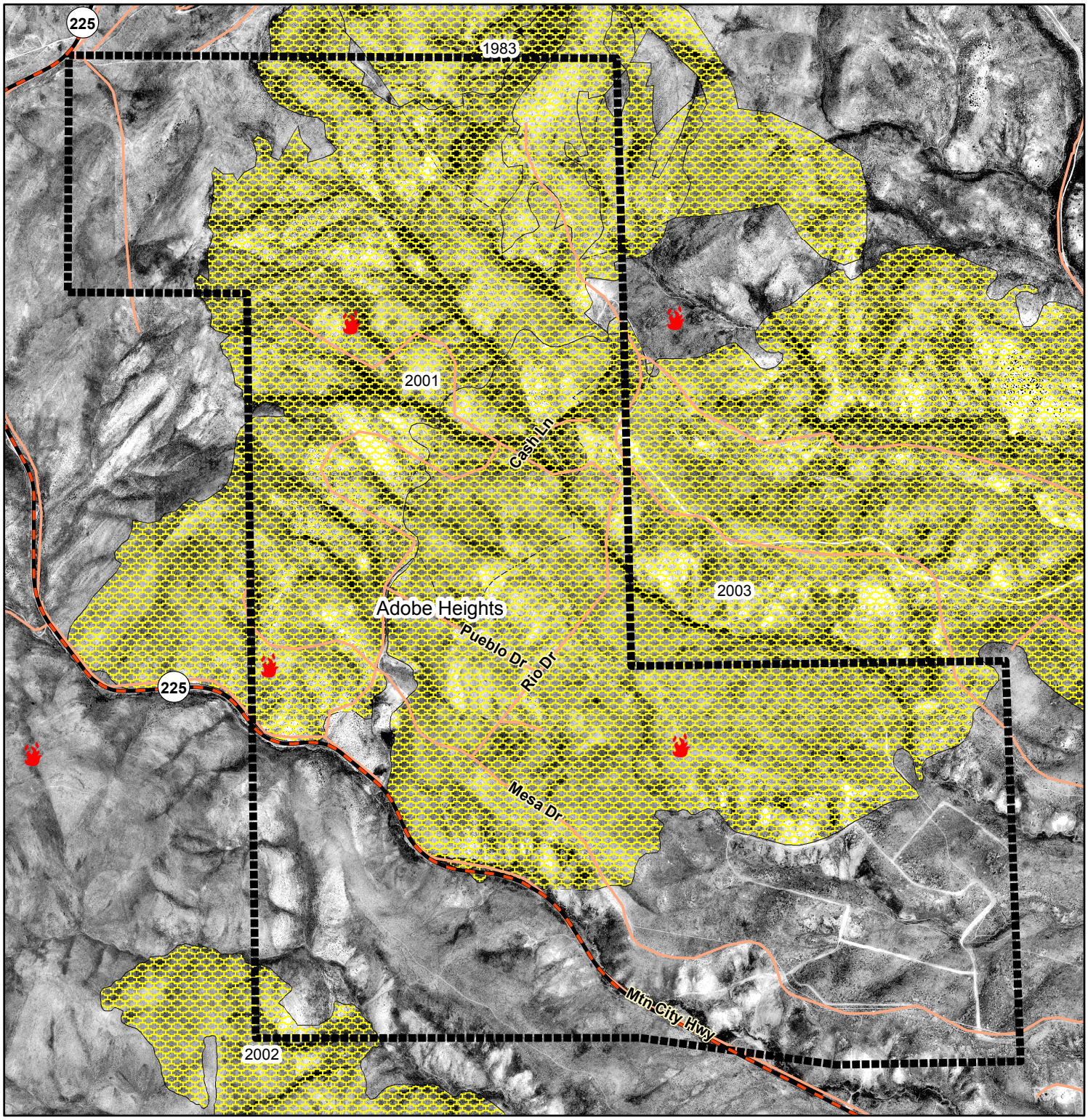


Figure 8-1. Adobe Heights
Fire History

Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads
- Fire Ignition
- Fire Boundary and Date

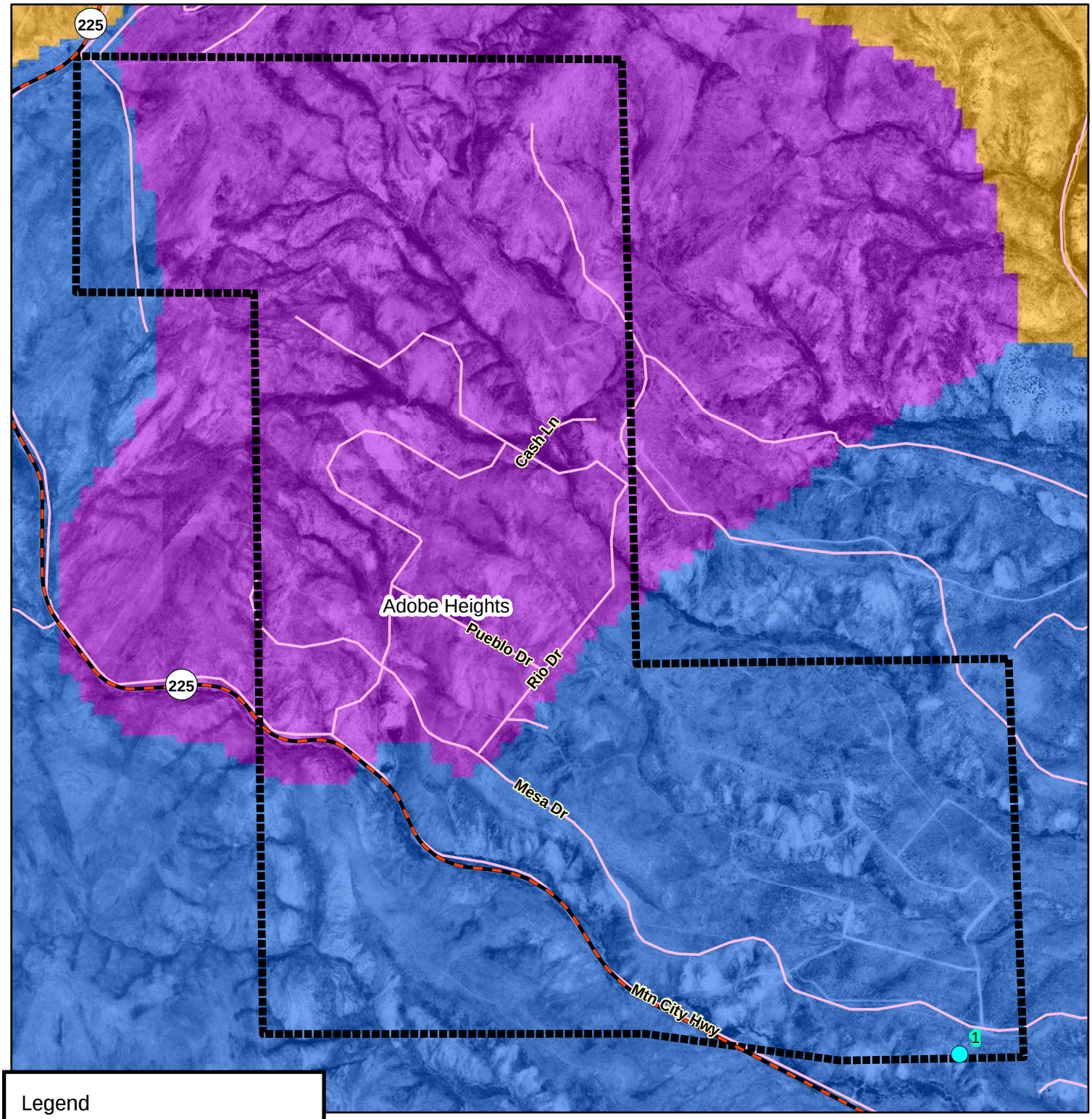
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Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 8-2. Adobe Heights
Classification of Fuel Hazard

N
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0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 8-3. Adobe Heights Fuel Hazard Photo Point



Adobe Heights Photo Point 1 – 4523228N, 0598026E, 340°NW. Moderate fuel hazard sagebrush dominated vegetation is in close proximity to homes in the Adobe Heights community. Other common species in this fuel type include rabbitbrush, cheatgrass, basin wildrye, and bottlebrush squirreltail, with the total fuel load estimated at three tons per acre. Cheatgrass is the dominant species in the low hazard fuel type, where the fuel load was estimated at less than one ton per acre. However in a year of normal or higher than normal winter and spring precipitation, cheatgrass can create high fuel hazard conditions.

9.0 ADOBE RANCHOS

9.1 RISK AND HAZARD ASSESSMENT

Adobe Ranchos is a small community located along Highway 225 approximately fifteen miles north of Elko in western Elko County. The town is situated along Adobe Creek at an elevation of approximately 6,000 feet. The community hazard assessment resulted in classifying Adobe Ranchos in the **High Hazard** category (63 points). A summary of the factors that contributed to the hazard rating is included in Table 9-3. The high rating is primarily attributed to limited access, inadequate defensible space, the potential for hazardous fire behavior, and the lack of fire protection resources and water availability. The community boundary identified for this report is shown in Figure 9-1.

9.1.1 Community Design

The wildland-urban interface area around Adobe Ranchos is an intermix condition. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. All of the 21 homes assessed for this report are on parcels of one to ten acres in size.

Access: State Route 225 is the major transportation route through Adobe Ranchos. The highway is at least 24 feet wide, paved, and has adequate space for fire suppression equipment to maneuver.

Signage: All of the street signs are clearly posted, but only 33 percent of the homes have clearly visible address signage. Clear and visible signage is important to help emergency personnel in locating homes under low visibility conditions during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

9.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard and roofing materials such as composition roofing, metal, or tile. Twenty-four percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

9.1.3 Defensible Space

Sixty-seven percent of the homes observed in the interface do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

9.1.4 Suppression Capabilities

Wildfire Protection Resources

Adobe Ranchos has no organized fire department. Fire suppression resources are provided to Adobe Ranchos by the Elko Fire Department. Table 9-1 lists the types of wildfire resources and equipment available for initial response to the Adobe Ranchos in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 9-1. Adobe Ranchos Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 4 Engine Type 5 Engine Water tender	1 1 1 1	Elko Fire Department Lee Company
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management (Elko Helibase)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Alan Kightlinger, Elko Fire Department Chief

Water Sources and Infrastructure

Water available for fire suppression in Adobe Ranchos is limited to private wells and a reservoir about two miles away on Sixteen Mile Creek that could be used as a helicopter dip site.

9.1.5 Factors Affecting Fire Behavior

The terrain within the community boundary is gently rolling with slopes up to twenty percent and aspects in all directions. The prevailing wind direction is from the south and west. There is a history of afternoon thunderstorms and dry lightning strikes in the area. The vegetative fuel density in the Adobe Ranchos interface area is generally moderate, estimated at one to three tons per acre with a moderate fuel hazard. The fuel hazards in the interface area are shown in Figure 9-2. Fuels in the community consist primarily of cheatgrass, bluegrass, bottlebrush squirreltail, basin wildrye, big sagebrush, and low sagebrush. The grasses are typically six inches to three feet tall and the shrubs are one to three feet tall with moderate spacing. The fuel hazard photo point is shown in Figure 9-3.

9.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Adobe Ranchos would be an ignition south of the community along State Route 225 with a strong south wind greater than twenty miles per hour pushing the fire north into residences. There is no local water storage for fire suppression and no local fire protection resources. Initial response fire suppression personnel are at least thirty minutes away.

9.1.7 Ignition Risk Assessment

Adobe Ranchos has a moderate to high risk of ignition based on fire history and dry lightning from thunderstorms in the area. The primary risk of ignition is lightning, although human caused ignitions are unpredictable and can happen at any time.

9.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Adobe Ranchos area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on future requirements that new developments will be planned and constructed to create fire safe communities. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

9.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.

- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[5] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.

9.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Elko County Roads Department and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

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

9.2.3 Fire Suppression Resources

Nevada Division of Forestry

- Enforce the existing brush clearance program to include cleaning weeds and debris from around structures and fences in the community.
- Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.
- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.

9.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches tall and reflective on a dark background. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

9.3 SUMMARY OF RECOMMENDATIONS

Table 9-2. Adobe Ranchos Risk and 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 the defensible space area annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
Nevada Division of Forestry	Fire Suppression Resources	Install a minimum capacity 10,000-gallon water tank in the community for fire suppression. Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.

Table 9-3. Adobe Ranchos Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	10	/10

TALLIES

21 Total Houses **6 Residential Streets**

B5. Street Signs

0 not visible | 6 visible | 100% visible

B6. Address Signs

14 not visible | 7 visible | 33% visible

C1. Roofs

0 combust | 21 not combust | 100% not combust

C2. Siding

0 combust | 21 not combust | 100% not combust

C3. Unenclosed Structures on Lot

5 not enclosed | 16 enclosed | 24% not enclosed

D1. Lot Sizes

0 <1ac | 21 >1ac <10ac | 0 >10ac

D2. Defensible Space

7 not adequat | 14 adequate | 67% adequate

Score **63** /128

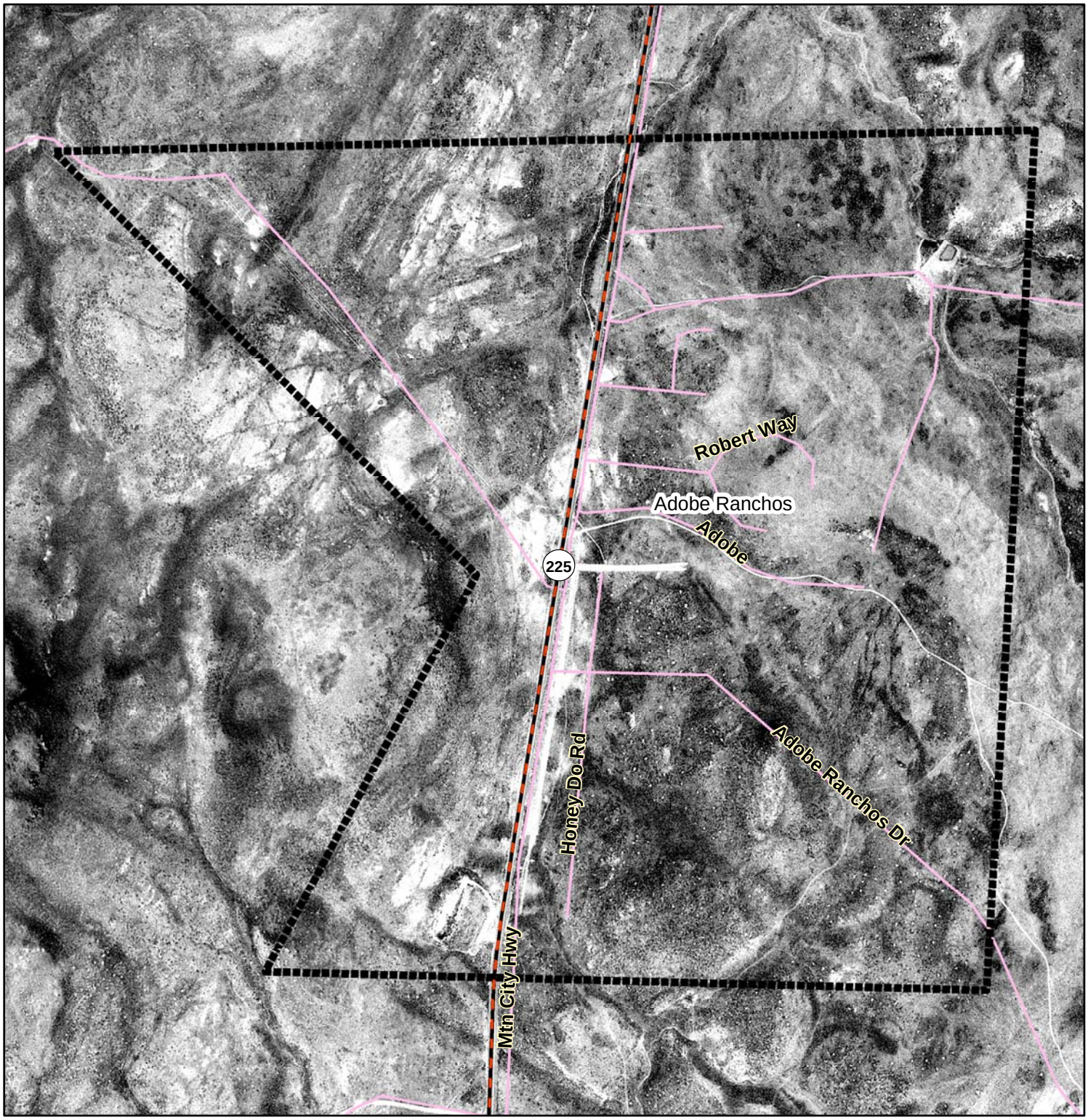


Figure 9-1. Adobe Ranchos Community

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Legend

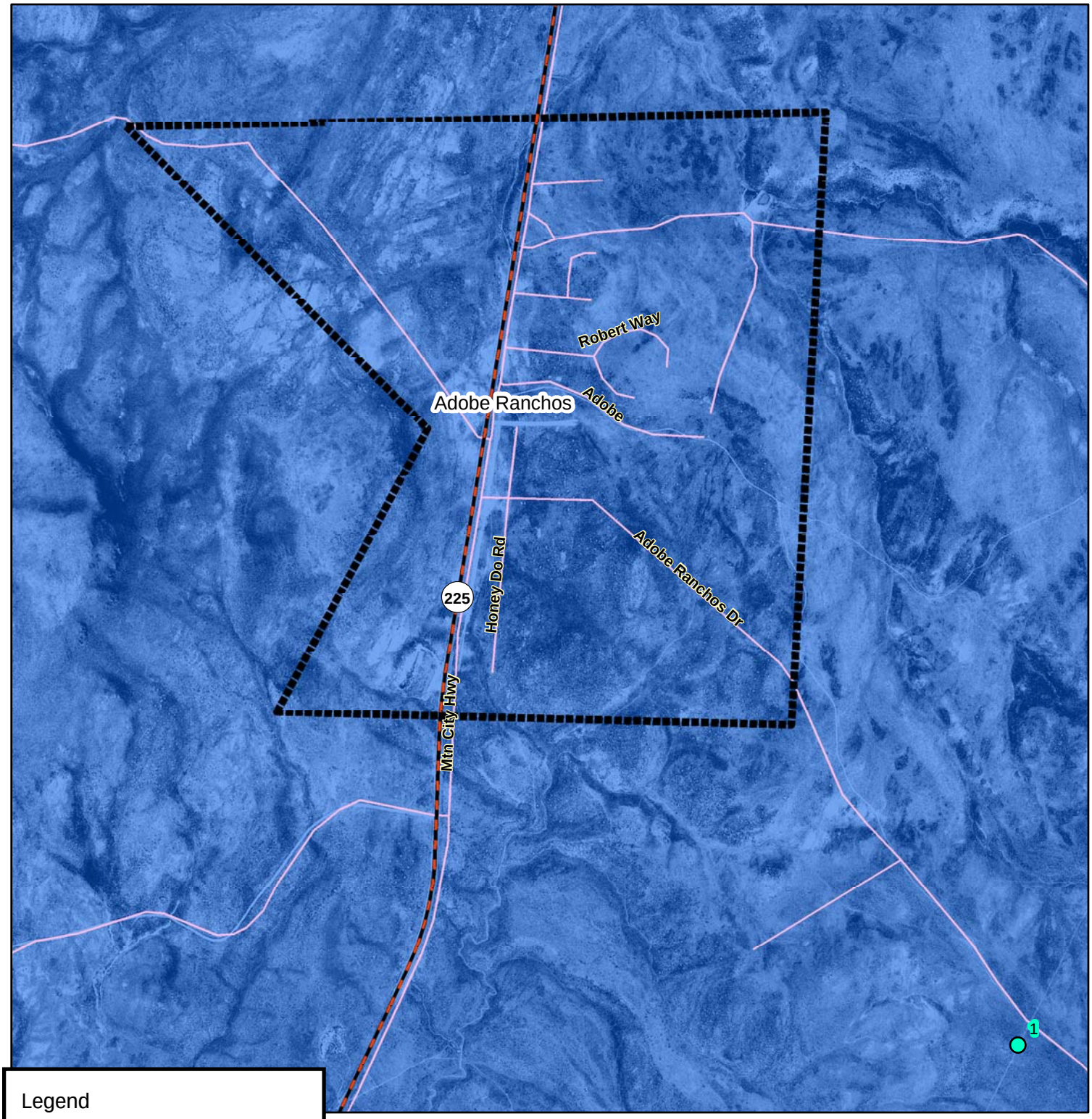
- Community Boundary
- Highways and State Routes
- Secondary Roads

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 9-2. Adobe Ranchos
Classification of Fuel Hazard

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0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 9-3. Adobe Ranchos Fuel Hazard Photo Points



Adobe Ranchos Photo Point 1 – 4532116N, 0596097E, 135°SE. The dominant vegetation in the Adobe Ranchos community includes cheatgrass, bluegrass, bottlebrush squirreltail, basin wildrye, big sagebrush, and low sagebrush. The fuel load was estimated between one and three tons per acre and considered a moderate fuel hazard.

10.0 CONTACT

10.1 RISK AND HAZARD ASSESSMENT

The small community of Contact is located in northern Elko County along Highway 93 and east of Salmon Falls Creek. Contact is located at approximately 5,560 feet in elevation. The population of Contact has traditionally been small since it's beginning as a mining town in 1887. The community hazard assessment resulted in rating Contact in the **High Hazard** category (75 points). A summary of the factors that contributed to the rating is included in Table 10-3. The primary factors that contributed to the high rating were poor access, inadequate address signage, inadequate defensible space, lack of water for fire suppression, and no local fire department. The community boundary identified for this report s shown in Figure 10-1.

10.1.1 Community Design

The wildland-urban interface area around Contact is an intermix condition. There is no clear line of demarcation between structures and wildland fuels. Eleven homes included in the assessment. Eight of the homes are on parcels of one to ten acres in size, with the remainder on lots that are one acre or less.

Access: Highway 93 and Old Highway 93 are the major transportation routes through Contact. The highways are paved; the secondary roads are at least twenty feet wide, dirt, and have adequate turnaround space for fire suppression equipment.

Signage: Street signs in the community are clearly posted on three of the four community roads. Addresses are not clearly visible on any of the homes observed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

10.1.2 Construction Materials

All of the homes observed in the interface area were built with non-combustible or highly fire resistant siding material such as medium density fiberboard. Only two homes were not constructed with fire resistant roofing materials such as composition, metal, or tile. Two of the homes had unenclosed porches, decks, or balconies that can create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the home.

10.1.3 Defensible Space

Over one-third of the homes observed in the interface did not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

10.1.4 Suppression Capabilities

Wildfire Protection Resources

Contact has no organized fire department. The area is protected by the Jackpot and Wells Volunteer Fire Departments and BLM automatic dispatch from Wells. Table 10-1 lists the local wildfire resources and equipment available for initial response to Contact in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 10-1. Contact Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 2 Engine Type 1 Engine Type 6 Engine	2 1 1 1	Jackpot VFD (Jackpot)
Type 2 Engine	1	Wells VFD (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells - Seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Verl Jarvie, Jackpot VFD Chief.

Water Sources and Infrastructure

There was no designated water source for fire suppression. Water may be available for drafting from local ponds and streams.

10.1.5 Factors Affecting Fire Behavior

The community lies within a north-south canyon along US Highway 93. The terrain within the community boundary is gently rolling with slopes of eight to twenty percent. The prevailing wind direction is from the south and southwest and there is a history of afternoon thunderstorms and dry lightning strikes in the area. Dense vegetative fuels in the interface area were estimated at two to four tons per acre and considered a high fuel hazard. Fuels in the community consist primarily of annual mustard, cheatgrass, perennial grasses, big sagebrush, rabbitbrush, and greasewood. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes in years of higher than average precipitation and can significantly increase the fuel load and fuel continuity. The fuel loading in the riparian areas was heavy, estimated at four to six tons per acre, comprised mostly of willow and Russian olive. Due to higher moisture levels found in riparian soils and vegetation, the fuel hazard in the riparian area was considered low. Fuel hazard mapping in the interface areas around Contact is shown in Figure 10-2. Fuel hazard photo points are included in Figure 10-3.

10.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Contact would be a dry lightning storm on a late summer afternoon during a year of normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions to the south and west of community and strong erratic winds from thunderstorms could rapidly push a fire into the community.

10.1.7 Ignition Risk Assessment

Contact has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The record of historic fires on the surrounding public land shows a moderate level of ignition potential, however lighting strikes in the vicinity are not uncommon. The primary risk of ignition in Contact is lightning, although human caused ignitions are unpredictable and can occur at any time.

10.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Contact area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on community coordination and public education efforts that could be undertaken to enhance fire safety.

10.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.6 Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been

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

depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Replace wood shake roofs with fire resistant materials such as metal, tile, or composition.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Install spark arrestors on chimneys.
- Prune limbs from fir trees to a height of fifteen feet, but not more than one-third the height of the total tree height. Prune limbs from juniper trees to a minimum height of four feet from the ground, but not more than one-third the total tree height. Pruning should be completed to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

10.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County Roads Department and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

10.2.3 Fire Suppression Resources

Elko County and Nevada Division of Forestry

- Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.

10.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

10.3 SUMMARY OF RECOMMENDATIONS

Table 10-2. Contact Risk and 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 the defensible space annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County **Nevada Division of Forestry**	Fire Suppression Resources	Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.

Table 10-3. Contact Wildfire Hazard Rating Summary

A. Urban Interface Condition	2	
B. Community Design		
1. Ingress / Egress	1	/5
2. Width of Road	3	/5
3. Accessibility	3	/3
4. Secondary Road	3	/5
5. Street Signs	3	/5
6. Address Signs	5	/5
7. Utilities	3	/5
C. Construction Materials		
1. Roofs	5	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5
D. Defensible Space		
1. Lot Size	3	/5
2. Defensible Space	7	/15
F. Fire Behavior		
1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	3	/10
E. Suppression Capabilities		
1. Water Source	10	/10
2. Department	10	/10

TALLIES

11 Total Houses **4 Residential Streets**

B5. Street Signs

1	not visible	3	visible	75%	visible

B6. Address Signs

11	not visible	0	visible	0%	visible

C1. Roofs

2	combust	9	not combust	82%	not combust

C2. Siding

0	combust	11	not combust	100%	not combust

C3. Unenclosed Structures on Lot

2	not enclosed	9	enclosed	18%	not enclosed

D1. Lot Sizes

3	<1ac	8	>1ac <10ac	0	>10ac

D2. Defensible Space

4	not adequat	7	adequate	64%	adequate

Score	75	/128

(Corrected)

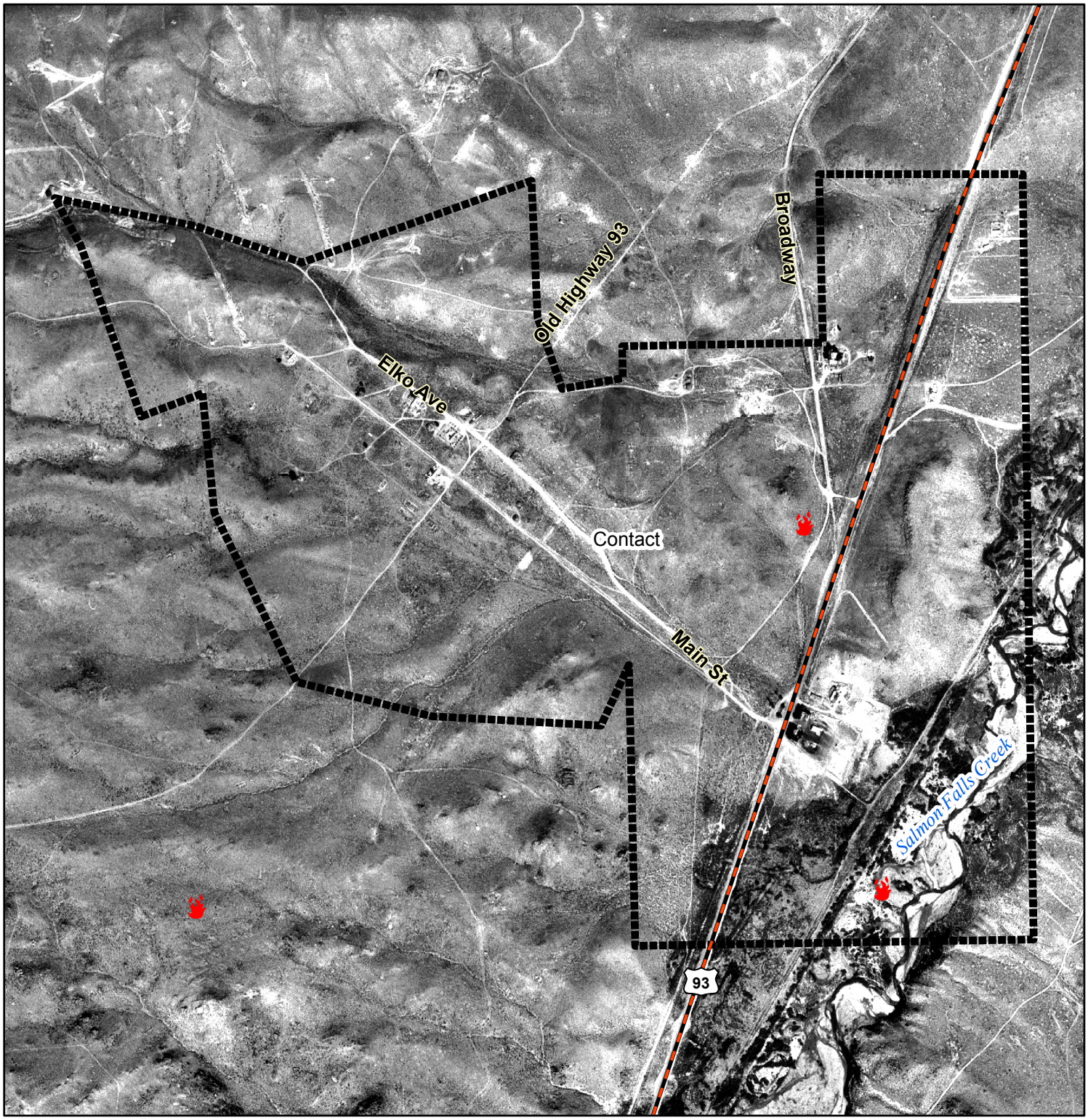


Figure 10-1. Contact
Fire History

N
W E
S

Legend

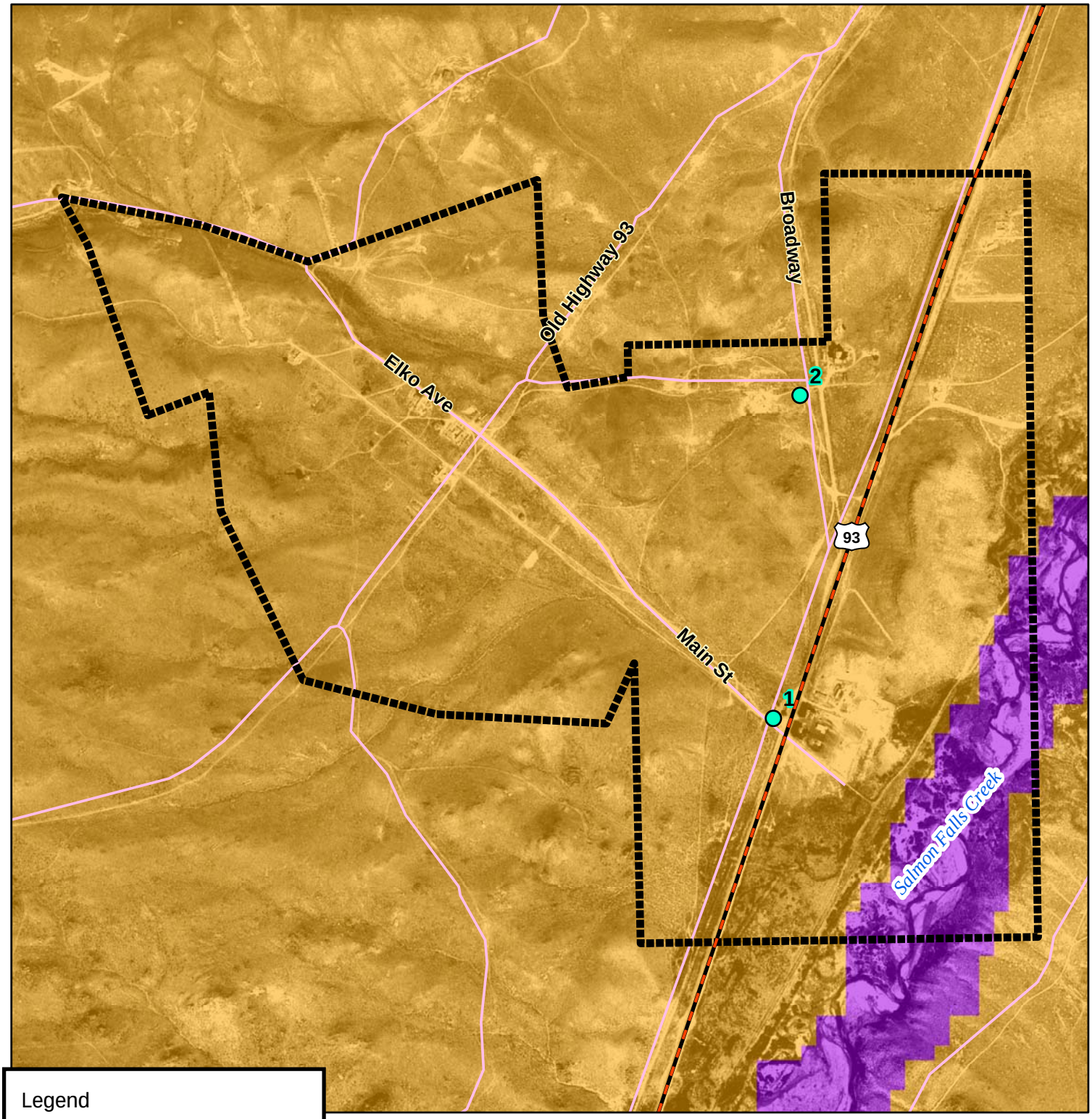
- Community Boundary
- Highways and State Routes
- Fire Ignition

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 10-2. Contact Classification of Fuel Hazard

N
W E
S

0 500 1,000 2,000
Feet

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 10-3. Contact Fuel Hazard Photo Points



Contact Photo Point 1 - 4626644N, 686720E, 280°NW. Fuels west of the NDOT maintenance station consist of annual mustard, cheatgrass, perennial grasses, and a shrub layer of sagebrush and greasewood that is two to four feet high. Fuel loading was estimated at two to four tons per acre and was considered a high fuel hazard.



Contact Photo Point 2 - 4627297N, 686774E, 280°NW. Fuels in the interface area are typically dominated by sagebrush and rabbitbrush shrubs two to four feet tall with a fine fuel component of cheatgrass and perennial grasses.

11.0 DEETH/STARR VALLEY

11.1 RISK AND HAZARD ASSESSMENT

Deeth/Starr Valley is located thirty miles east of Elko along Interstate 80 in northern Elko County. The town of Deeth is situated at the confluence of the Humboldt and Mary's Rivers, at the northern end of Starr Valley. The area was settled in 1868 during the construction of the transcontinental railroad. The community hazard assessment resulted in rating Deeth/Starr Valley in the **High Hazard** category (62 points). A summary of the factors that contributed to the rating is included in Table 11-3. The primary factors that contributed to the moderate rating were the lack of street and address signage, inadequate water storage for fire suppression, and the potential for extreme fire behavior. The community boundary identified for this report is shown in Figure 11-1.

11.1.1 Community Design

The wildland-urban interface area around Deeth/Starr Valley is an intermix condition. Structures are scattered throughout the community and in wildland fuels, with no clear line of demarcation between structures and wildland fuels. Seventeen homes were included in this assessment. Twelve of the homes are on parcels of one to ten acres in size; the remainder are on lots of one acre or less.

Access: State Route 230 provides access to the northern end of the valley. State Route 229 provides access to the south end. The community roads are at least 24 feet wide and have adequate turnaround space for fire suppression equipment to maneuver.

Signage: Only one of the residential roads has a posted sign and only two of the homes have clearly visible addresses. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

11.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant roofing materials such as composition, metal, or tile. Three-quarters of the homes have fire resistant siding materials such as medium density fiberboard. One quarter of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

11.1.3 Defensible Space

Only one of the seventeen homes observed in the interface did not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

11.1.4 Suppression Capabilities

Wildfire Protection Resources

The Deeth Volunteer Fire Department has six volunteers. An engine is housed seasonally at the Howell Ranch in northeastern Starr Valley. Table 11-1 lists the types of local wildfire resources and equipment available for initial response to Deeth/Starr Valley in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 11-1. Deeth/Starr Valley Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender Type 4 Engine	1 1 1	Deeth VFD (Howell Ranch)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells)
Type 3 Engine	1	Wells Volunteer Fire Department (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Walt Howell; Deeth/Starr Valley VFD

Water Sources and Infrastructure

Water availability for fire suppression resources in Deeth/Starr Valley includes wells, ranch ponds, the Humboldt River, seasonal streams, and water tanks throughout the community varying from 200 to 500 gallon capacity. Several irrigation wells and wheel lines in the valley are equipped with fire hose connections to fill fire apparatus.

Fire Protection Personnel Qualifications

All Deeth VFD firefighters have been trained for structure protection and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year the Deeth Volunteer Fire Department responds to the following annual calls:

- Five to fifteen emergency medical calls.
- Six to 25 wildland/brush fire calls.
- Ten to fifteen other calls.

11.1.5 Factors Affecting Fire Behavior

The terrain within the community boundary is gently rolling with steep slopes to the south and east of the community. The prevailing wind direction is from the south and southwest through the Humboldt River Valley. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The vegetative fuel density throughout most the Deeth/Starr Valley interface area was estimated at one to two tons per acre, which was considered a moderate fuel hazard. Irrigated and riparian areas were considered a low fuel hazard. Higher density fuel loading on steeper slopes east of the community, estimated at five to six tons per acre, was considered an extreme fuel hazard along the west slope of the East Humboldt Range where pinyon and juniper trees are encroaching. Fuels consist of big sagebrush, rabbitbrush, cheatgrass, squirreltail, and crested wheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes in high precipitation years, which can exacerbate fuel hazard conditions from one year to another. Fuel hazard conditions in the interface area around Deeth/Star Valley are shown in Figure 11-2. Fuel hazard photo points are shown in Figure 11-3.

11.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the Deeth area would be an ignition west of the community along Interstate 80. A fire pushed by west winds could threaten the few structures present in the Deeth community.

The worst-case scenario for a wildfire in the Starr Valley area would be an ignition southwest of the community along the west-facing slopes of the East Humboldt Mountains on a summer afternoon. There are large areas of heavy sagebrush and pinyon-juniper on steep slopes, with homes and ranches exposed. A fire driven by strong winds out of the south or southwest could quickly threaten these properties and endanger the occupants if the fire blocked escape routes.

11.1.7 Ignition Risk Assessment

Deeth/Starr Valley has a high ignition risk based on the potential for rail road ignitions and the fire history in the area. There is moderate wildfire history in the surrounding public lands and a history of lightning strikes around the community. The primary risks of ignition in Deeth/Starr Valley are railroad ignitions, lightning strikes, and vehicle fires.

11.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Deeth/Starr Valley area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on community coordination and public education efforts that could be undertaken to enhance fire safety.

11.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within

a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.

  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[7] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.

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

- Maintain the defensible space as needed.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.
- Mow or remove brush growing near or against haystacks, farm equipment, wellheads, and electrical services.

11.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Nevada Division of Forestry and Deeth/Starr Valley VFD

- Work with local residents to enforce brush clearance and biomass disposal programs.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.

Union Pacific Railroad

- Clear and maintain free of vegetation a minimum space of fifteen feet on either side of the railroad tracks.

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

11.2.3 Fire Suppression Resources

Deeth/Starr Valley VFD and Nevada Division of Forestry

- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies and construct additional repeaters for adequate communication.
- If available, move additional resources into the area, on high hazard days and ensure adequate volunteer availability for high hazard days.
- Obtain funding for a fire station to store a fire engine seasonally in the northeastern portion of Starr Valley, rather than at the Howell Ranch.

- Coordinate with the appropriate agencies to clearly mark and map water tanks available for fire suppression.

11.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.

11.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Deeth/Starr Valley VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

11.3 SUMMARY OF RECOMMENDATIONS

Table 11-2. Deeth/Starr Valley Risk and 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 the defensible space condition annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Form a local community based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site.
Union Pacific Railroad	Fuels Reduction	Clear and maintain free of vegetation a minimum space of fifteen feet on either side of the railroad tracks.
Utility Company	Fuels Reduction	Thin shrubs within fifty feet wide under the main transmission lines on the west slope of the East Humboldt Mountains. Clear vegetation within fifteen feet of utility poles. Remove all trees from beneath power lines.
Deeth/Starr Valley VFD **Nevada Division of Forestry**	Fire Suppression Resources	If available, move additional resources into the area on high hazard days and ensure adequate volunteer availability on high hazard days. Work with local residents to enforce brush clearance and biomass disposal programs. Upgrade the communication system to narrow band technology to maintain communication compatibility with cooperating agencies and include repeaters for adequate communication. Obtain funding for a fire station to store a fire engine seasonally in the northeastern portion of Starr Valley, rather than at the Howell Ranch. Coordinate with the appropriate agencies to clearly mark and map water tanks available for fire suppression water supply.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
Deeth/ Star Valley VFD	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 11-3. Deeth/Starr Valley Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	3	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	10	/10
3. Slope	4	/10
4. Aspect	7	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

17 Total Houses **4 Residential Streets**

B5. Street Signs

3 not visible | 1 visible | 25% visible

B6. Address Signs

15 not visible | 2 visible | 12% visible

C1. Roofs

0 combust | 17 not combust | 100% not combust

C2. Siding

4 combust | 13 not combust | 76% not combust

C3. Unenclosed Structures on Lot

4 not enclosed | 13 enclosed | 24% not enclosed

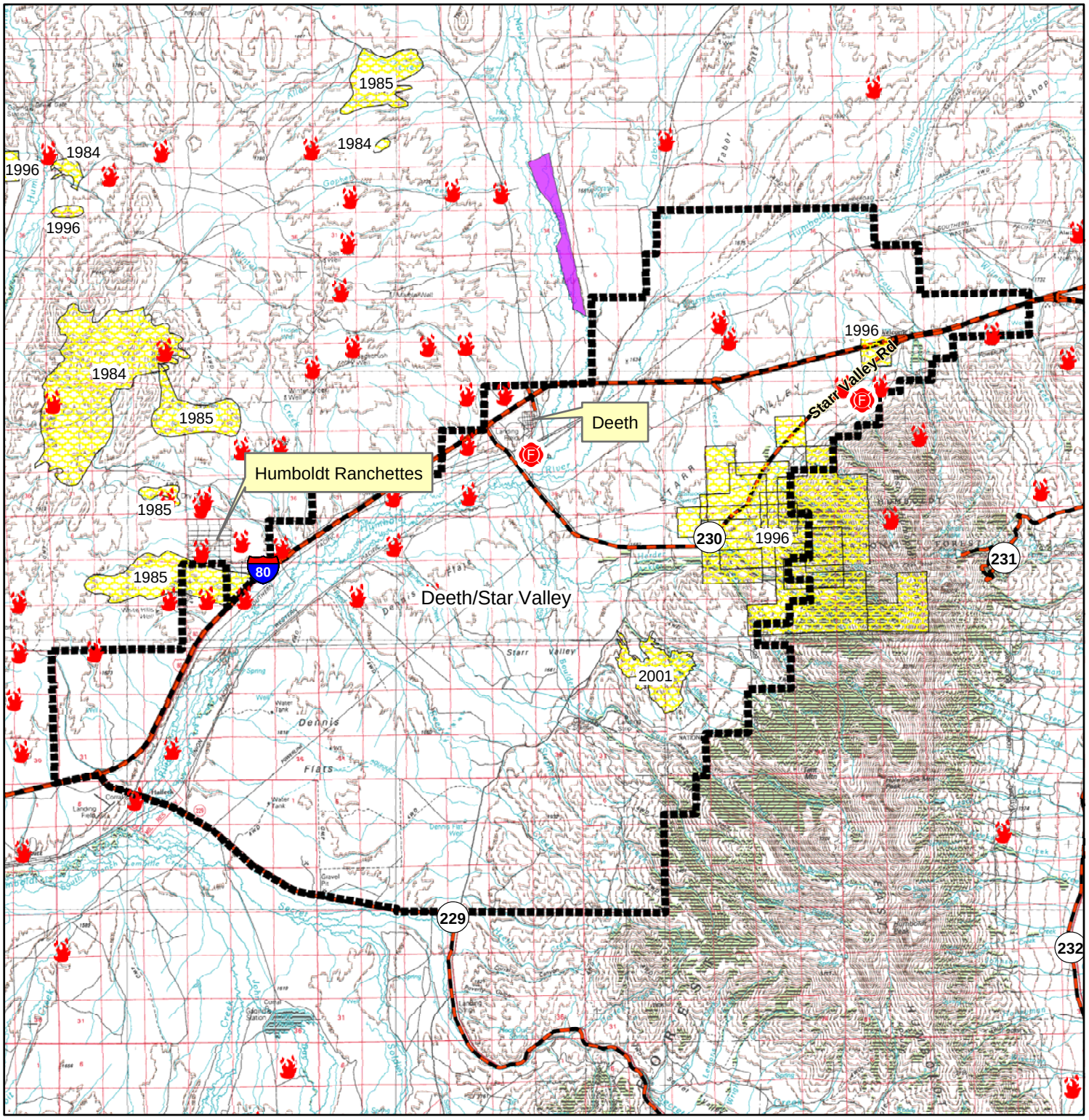
D1. Lot Sizes

5 <1ac | 12 >1ac <10ac | 0 >10ac

D2. Defensible Space

1 not adequat | 16 adequate | 94% adequate

Score **62** /128



Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Highways and State Routes
- Prescribed Burn
- Fire Boundary and Date

Figure 11-1. Deeth/Starr Valley
Fire History, Suppression Resources,
and Prescribed Burns

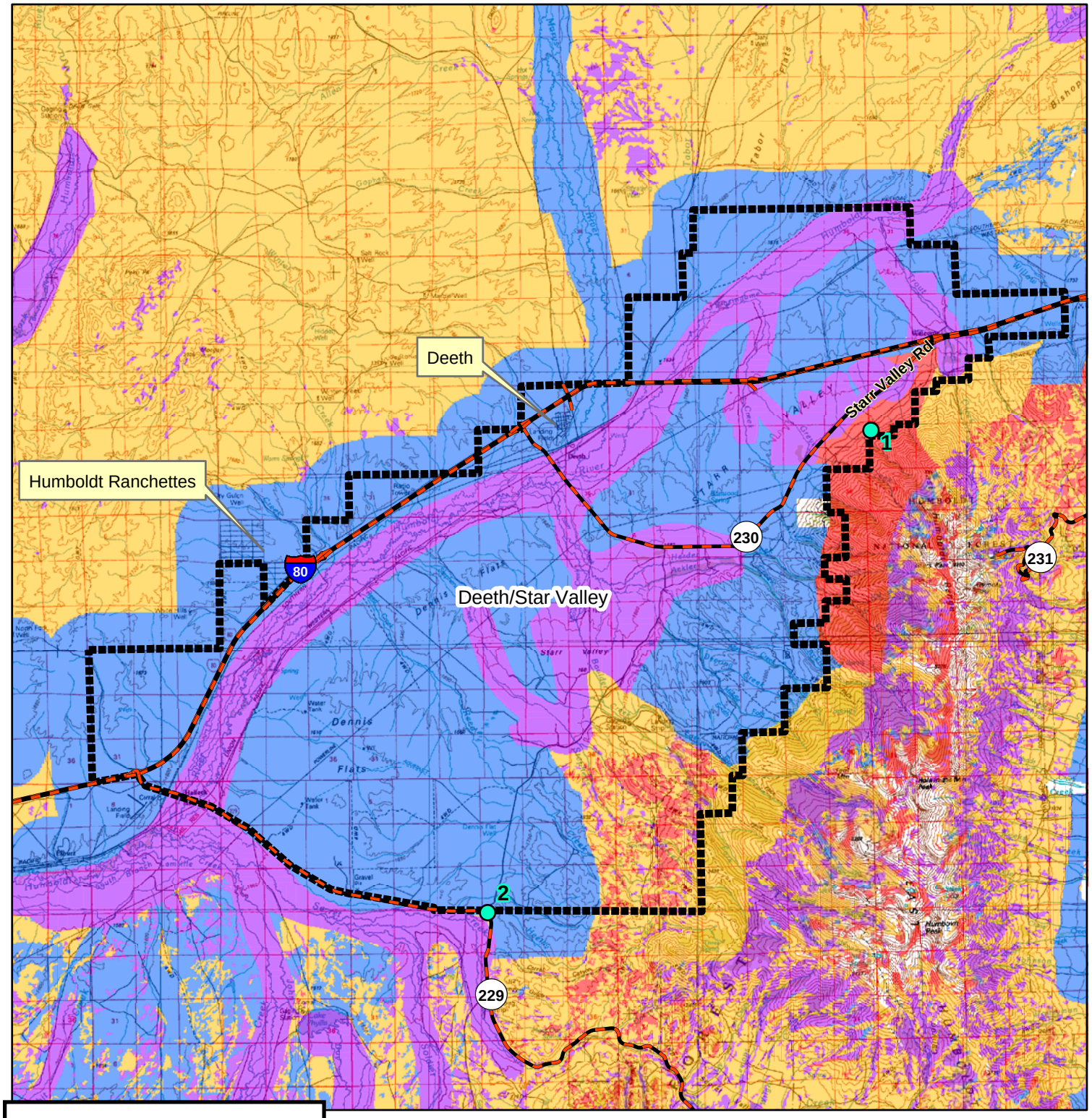
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Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 11-2. Deeth/Starr Valley
Classification of Fuel Hazard

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W E
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0 1 2 4
Miles

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Resources 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.

Figure 11-3. Deeth/Starr Valley Fuel Hazard Photo Points



Deeth/Starr Valley Photo Point 1 - 4548026N, 0656373E, 325°NW. Dense vegetation adjacent to agricultural fields on the western edge of the Valley. Fuel loading is estimated at five to six tons per acre. The overall moderate fuel hazard throughout the community increases in this area with steeper slopes and heavier vegetation.



Deeth/Starr Valley Photo Point 2 - 4530092N, 0642093E, 140°SE. Vegetation at the north and south ends of the community includes cheatgrass, bluegrass, squirreltail, crested wheatgrass, and a shrub layer of sagebrush, rabbitbrush, and snakeweed.

12.0 LAMOILLE

12.1 RISK AND HAZARD ASSESSMENT

Lamoille is located approximately twenty miles east of Elko on State Route 227 in western Elko County. Lamoille and the surrounding valley is a ranching community in the foothills of the Ruby Mountains. The town is situated at an elevation of approximately 5,700 feet. The community hazard assessment resulted in classifying Lamoille in the **High Hazard** category (71 points). A summary of the factors that contributed to the hazard rating is included in Table 12-3. The high rating is attributed to limited access, limited water resources for fire suppression, and the potential for extreme fire behavior. The community boundary identified for this report is shown in Figure 12-1.

12.1.1 Community Design

The wildland-urban interface around Lamoille is an intermix condition. Structures are scattered throughout the community and in wildland fuels, with no clear line of demarcation between structures and wildland fuels. Approximately one-half of the homes are on parcels less than one acre in size, one-half are on parcels of one to ten acres in size.

Access: State Route 227 is the primary access into Lamoille with smaller dirt roads throughout the community. Many of the secondary roads are less than twenty feet wide, and there are several dead-end roads that do not provide adequate turnaround space for fire suppression equipment to maneuver.

Signage: Street signs are visible on all of the streets, and addresses are visible on approximately half of the homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: Utilities are both above and below ground and were considered a moderate ignition risk because there are many old power poles and old cross-arms that would be vulnerable during a wildland fire. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

12.1.2 Construction Materials

Ninety-three percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety-seven percent of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. One-third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

12.1.3 Defensible Space

Eighty-six percent of the homes in the interface do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

12.1.4 Suppression Capabilities

Wildfire Protection Resources

Lamoille is protected by an eight member volunteer fire department. Table 12-1 lists the local resources and equipment available to Lamoille in the event of a wildland fire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 12-1. Lamoille Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Water Tender Type 2 Engine Type 6 Engine	1 1 1	Lamoille VFD
Type 2 Engine Type 6 Engine Water Tender	2 2 2	Spring Creek (Stations #1 and #2)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management (Elko Helibase)
Type 4 Engine	1	Bureau of Land Management (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Jess Sustacha, Jr., Lamoille VFD Fire Chief.

Water Sources and Infrastructure

There is a very limited supply of water for fire suppression in Lamoille. There are community hydrants that are gravity operated from one 2,000-gallon storage tank. Additional water may be available from private agricultural wells in the area.

Fire Protection Personnel Qualifications

Lamoille VFD firefighters have been trained in-house for structure protection and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Lamoille VFD responded to 33 calls in 2003:

- Fifteen emergency medical calls.
- Ten wildland/brush fire calls.
- Eight other calls.

12.1.5 Factors Affecting Fire Behavior

Two main fuel types are found within and in close proximity to the Lamoille community. Irrigated haylands are found throughout most of the central part of the community, and native upland vegetation is located on the benches and alluvial fans surrounding the

community. Irrigated haylands are usually harvested annually and were considered a low fuel hazard. Fuel loading in the upland area varies from one to two tons per acre in the northern portion of the community, to five to six tons per acre in the southeastern area. The fuel hazard in the upland areas varies from moderate to extreme depending on fuel density and slope. Fuels in the southeastern portion of the community consist of sagebrush, bitterbrush, rabbitbrush, and spiny hopsage four to eight feet tall and densely spaced. In the understory thee is basin wildrye, crested wheatgrass, and cheatgrass, two to four feet tall. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and in years of higher than average precipitation. The fuels along the north and west sides of the community consist of sagebrush and rabbitbrush two to three feet tall with cheatgrass and basin wildrye in the understory. The fuels are continuous and in close proximity to structures. The terrain within the community boundary is gently rolling. The primary aspects are to the west and the prevailing wind direction is from the west and southwest. [Figures 12-2 and 12-3 detail fuel hazard mapping and fuel hazard photos.]

12.1.6 Fire Behavior Worst Case Scenario

Most of the Lamoille community is at a low risk of a serious wildland fire due to the presence of irrigated pasture and haylands throughout the community. The exception to this condition is the developed areas along Dysart Drive. The homes in this area are surrounded by high density, six to seven foot tall, sagebrush and bitterbrush. The worst-case scenario for a wildfire would be a fire starting west of the Dysart Drive development on a high hazard summer afternoon with west winds in excess of twenty miles per hour. A fire starting during these or similar conditions could quickly threaten homes and lives. Residents need to pre-plan for evacuation or be trained to shelter-in-place.

12.1.7 Ignition Risk Assessment

Lamoille has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The primary risk of ignition in Lamoille is lightning, although human caused ignitions are unpredictable and can occur at any time.

12.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents of the community, businesses, and local governments. The recommendations for the Lamoille area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on future requirements that new developments will be planned and constructed to create fire safe communities. The main area of concern in Lamoille is the Dysart Drive area. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

12.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[8] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

12.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the

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

likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

12.2.3 Fire Suppression Resources

Lamoille VFD and Nevada Division of Forestry

- Encourage volunteer firefighters to attend wildland fire training and to achieve minimum National Wildfire Coordinating Group basic wildland standards.
- Create drafting ponds and install a minimum capacity 10,000-gallon underground water tank.
- Upgrade VFD radios with narrow band technology for compatibility with the new 2005 system.
- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community and test radio compatibility.
- Coordinate with the Lamoille Water District Board to upgrade the existing water system to National Fire Protection Association (NFPA) standards.

12.2.4 Community Coordination

Lamoille VFD and Nevada Division of Forestry

- Work with local residents to develop and enforce local brush clearance and biomass disposal programs.
- Coordinate with the appropriate agencies to improve street sign visibility.
- Develop an evacuation plan for the Dysart Drive area that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

12.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Lamoille VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

12.3 SUMMARY OF RECOMMENDATIONS

Table 12-2. Lamoille Risk and 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 annually.
	Community Coordination	Ensure addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Lamoille VFD and Nevada Division of Forestry	Fire Suppression Resources	Encourage volunteer firefighters to attend wildfire training to achieve minimum National Wildfire Coordinating Group basic wildland standards. Continue to provide wildland firefighting training for all volunteers. Pursue grant funding to create drafting ponds and install a minimum capacity 10,000-gallon underground water tank. Upgrade radios with narrow band technology for compatibility with the new 2005 system. Coordinate with the Lamoille Water District Board to apply for grants to upgrade the existing limited firefighting water system to National Fire Protection Association (NFPA) standards. Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.
	Community Coordination	Work with local residents to develop and enforce brush clearance and biomass disposal programs. Coordinate with the appropriate agencies to improve street sign visibility. Develop an evacuation plan for the Dysart Drive area that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site.
	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access.

Table 12-3. Lamoille Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	3	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	5	/5
2. Fire Behavior	10	/10
3. Slope	4	/10
4. Aspect	7	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	7	/10

TALLIES

88 Total Houses **3 Residential Streets**

B5. Street Signs

0 not visible | 3 visible | 100% visible

B6. Address Signs

47 not visible | 41 visible | 47% visible

C1. Roofs

3 combust | 85 not combust | 97% not combust

C2. Siding

6 combust | 82 not combust | 93% not combust

C3. Unenclosed Structures on Lot

26 not enclosed | 62 enclosed | 30% not enclosed

D1. Lot Sizes

40 <1ac | 46 >1ac <10ac | 2 >10ac

D2. Defensible Space

12 not adequat | 76 adequate | 86% adequate

Score **71** /128

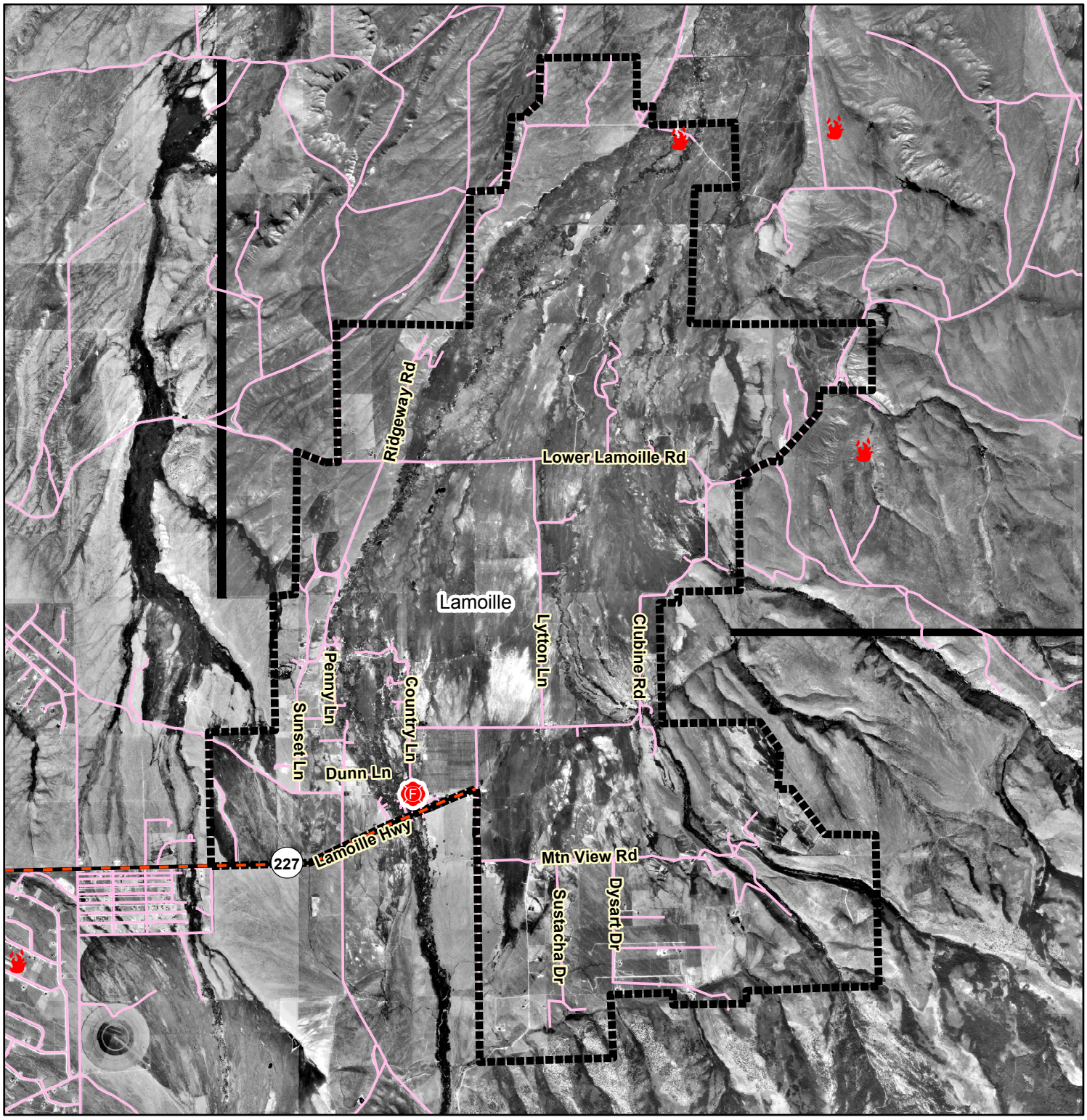


Figure 12-1. Lamoille
Fire History and Suppression Resources

Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads
- Fire Station
- Fire Ignition

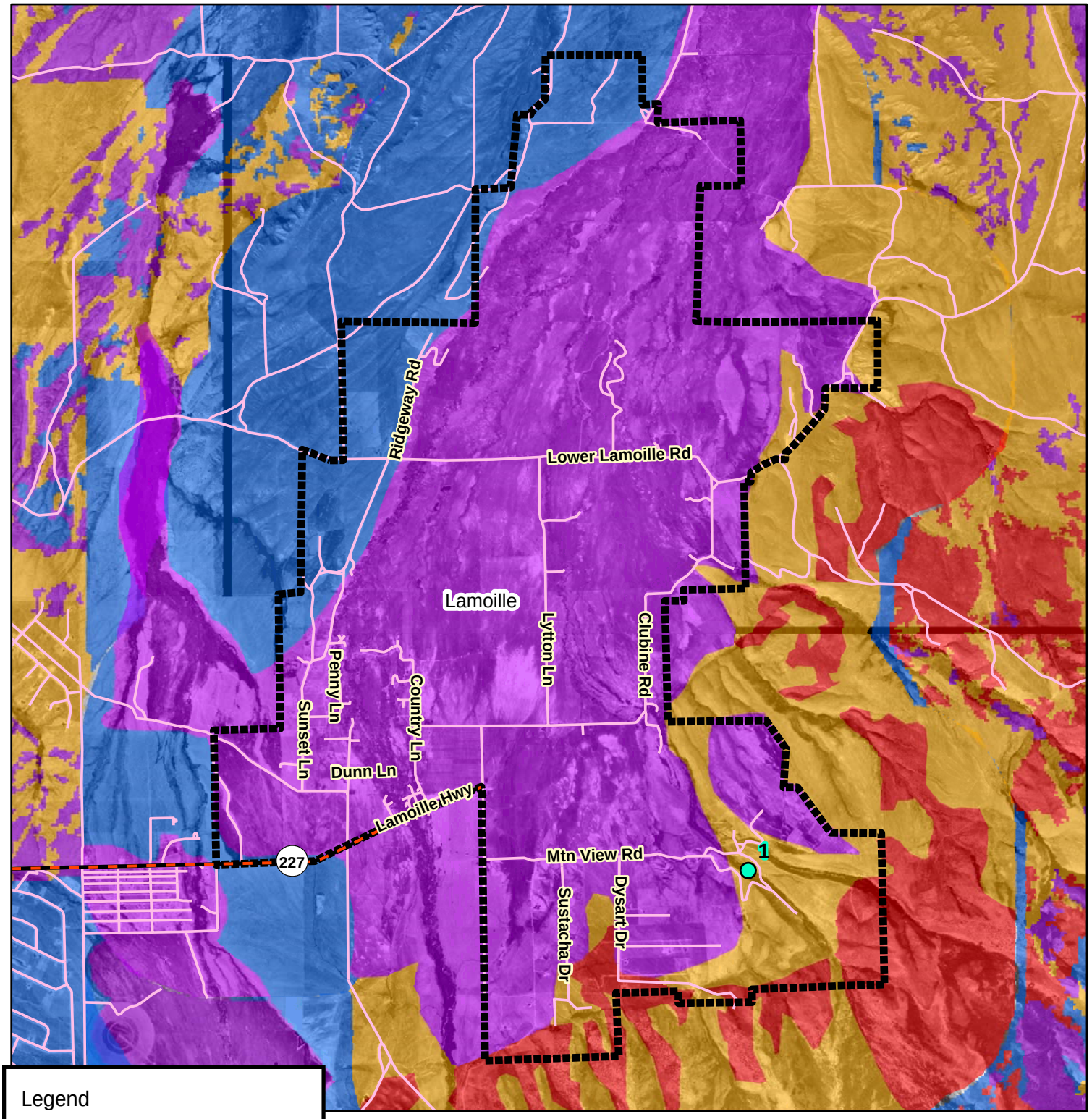
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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 12-2. Lamoille
Classification of Fuel Hazard

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Figure 12-3. Lamoille Fuel Hazard Photo Point



Lamoille Photo Point 1. 4508932N,0632364E, 080°NE. Vegetation on the south end of the community along Dysart Drive includes basin wildrye, crested wheatgrass, bluegrass, needle grass, and cheatgrass. The shrub layer poses an extreme fuel hazard. It is four to eight feet high with dense spacing and is composed of sagebrush, bitterbrush, broom snakeweed, and rabbitbrush.

13.0 LEE/SOUTH FORK INDIAN RESERVATION

13.1 RISK AND HAZARD ASSESSMENT

Lee/ South Fork Indian Reservation is a mixed ownership community of tribal trust land and private land located in western Elko County between State Routes 228 and 227 along the south fork of the Humboldt River. The community hazard assessment resulted in classifying Lee/SFIR in the **High Hazard** category (61 points). A summary of the factors that contributed to the hazard rating is included in Tables 13-3. The high rating is primarily attributed to limited access and inadequate defensible space. The community boundary identified for this report is shown in Figure 13-1.

13.1.1 Community Design

The wildland-urban interface area around Lee/SFIR is an intermix condition. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. A total of 53 homes were assessed for this report. Twenty of the homes are on parcels between one and ten acres in size; the remainder are on lots of one acre or less.

Access: State Route 228 is the primary access to Lee/SFIR. County Road 714/Lee Road is the primary road through the community. There are several dead-end roads in the community and narrow roads that do not provide adequate turn-around space for fire suppression equipment to maneuver.

Signage: Street signs and residential addresses are not visible on any streets or homes in Lee/SFIR. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

13.1.2 Construction Materials

In Lee/SFIR, all but four of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Three of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

13.1.3 Defensible Space

In Lee/SFIR half of the homes observed in the interface do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

13.1.4 Suppression Capabilities

Wildfire Protection Resources

Lee/SFIR does not have an organized fire department. The closest fire suppression resources to Lee/SFIR are located in Jiggs, Ten Mile, Spring Creek, and Elko. Table 13-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Lee/SFIR area in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 13-1. Lee Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine Water Tender	1 2 1	Jiggs VFD (Jiggs)
Type 2 Engine	1	Spring Creek VFD (Spring Creek)
Type 4 Engine	1	Ten Mile VFD (Ten Mile)
Type 4 Engine	1	Bureau of Land Management (Elko)

Source: *Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain;* Lorayne London, SFIR Environmental Coordinator.

Water Sources and Infrastructure

Water available for fire suppression resources for Lee/SFIR is limited to a community well and the Humboldt River. There are three hydrants in the Te-Moak housing development, which are fed from a 65,000-gallon municipal water tank.

13.1.5 Factors Affecting Fire Behavior

Fuels in the southeastern portion of Lee/SFIR community consist of shrubs, four to eight feet tall, including sagebrush, bitterbrush, and rabbitbrush. Basin wildrye, crested wheatgrass, and cheatgrass compose the understory at a height of two to four feet tall. Fuel loading is estimated at five to six tons per acre. The shrubs are densely spaced in the interface area which was determined to be a high to extreme fuel hazard. At the north end of the community juniper trees from ten to twenty feet tall with five to fifty foot spacing dominate the vegetation and are considered an extreme fuel hazard. Fuel loading in this area was estimated at eight to ten tons per acre. Along the west side of the community there is sagebrush from two to three feet tall with moderate density. Irrigated native hayland, a low fuel hazard, is located throughout the center of the community along the South Fork of the Humboldt River, Pearl Creek, and Rattlesnake Creek. Generally, the terrain in Lee/SFIR is generally flat to gently rolling slopes. The prevailing wind is from the south and southwest. Lightning and strong winds in the summer are common. Fuel hazard mapping in the community and wildland-urban interface is shown in Figure 13-2. Fuel hazard photo points are shown in Figure 13-3.

13.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Lee/SFIR would start with an ignition fire in the sagebrush fuels. If the fire started near structures, the strong winds, greater than twenty miles per hour could quickly drive the fire toward the structures before resources could arrive.

13.1.7 Ignition Risk Assessment

Lee/SFIR has a moderate ignition risk based on wildfire history and areas with moderate to extreme fuel hazards. The primary risk of ignition in Lee/SFIR is lightning, although human caused ignitions are unpredictable and can occur at any time.

13.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Lee/SFIR area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

13.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Residents and Property Owner Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[9] Treatments may need to be repeated for several years to

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

ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.

13.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

South Fork Indian Reservation

- Mow or otherwise remove all vegetation within ten feet of the three fire hydrants to improve visibility and access for fire personnel.
- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the road. Treatment is especially needed along dead-end community roads to provide additional turn-around space for fire suppression apparatus. Remove biomass and disposed of it at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

13.2.3 Community Coordination

Property Owners and Residents

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material.

South Fork Indian Reservation

- Improve street sign and address visibility.
- Develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.
- Develop and enforce brush clearance and biomass disposal programs.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

13.3 SUMMARY OF RECOMMENDATIONS

Table 13-2. Lee/South Fork Indian Reservation Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Residents and Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space condition annually.
	Community Coordination	Ensure addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
South Fork Indian Reservation	Fuels Reduction	Mow or otherwise remove all vegetation within ten feet of the three fire hydrants to improve visibility and access for fire personnel. Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the road. Treatment is especially needed along dead-end community roads to provide additional turn-around space for fire suppression apparatus.
	Community Coordination	Improve street sign and address visibility. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents. Develop and enforce brush clearance and biomass disposal programs.

Table 13-3. Lee/South Fork Indian Reservation Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	5	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	10	/10

TALLIES

53 Total Houses **3 Residential Streets**

B5. Street Signs

3	not visible	0	visible	0%	visible

B6. Address Signs

53	not visible	0	visible	0%	visible

C1. Roofs

0	combust	53	not combust	100%	not combust

C2. Siding

4	combust	49	not combust	92%	not combust

C3. Unenclosed Structures on Lot

3	not enclosed	50	enclosed	6%	not enclosed

D1. Lot Sizes

33	<1ac	20	>1ac <10ac	0	>10ac

D2. Defensible Space

26	not adequat	27	adequate	51%	adequate

Score **61** /128

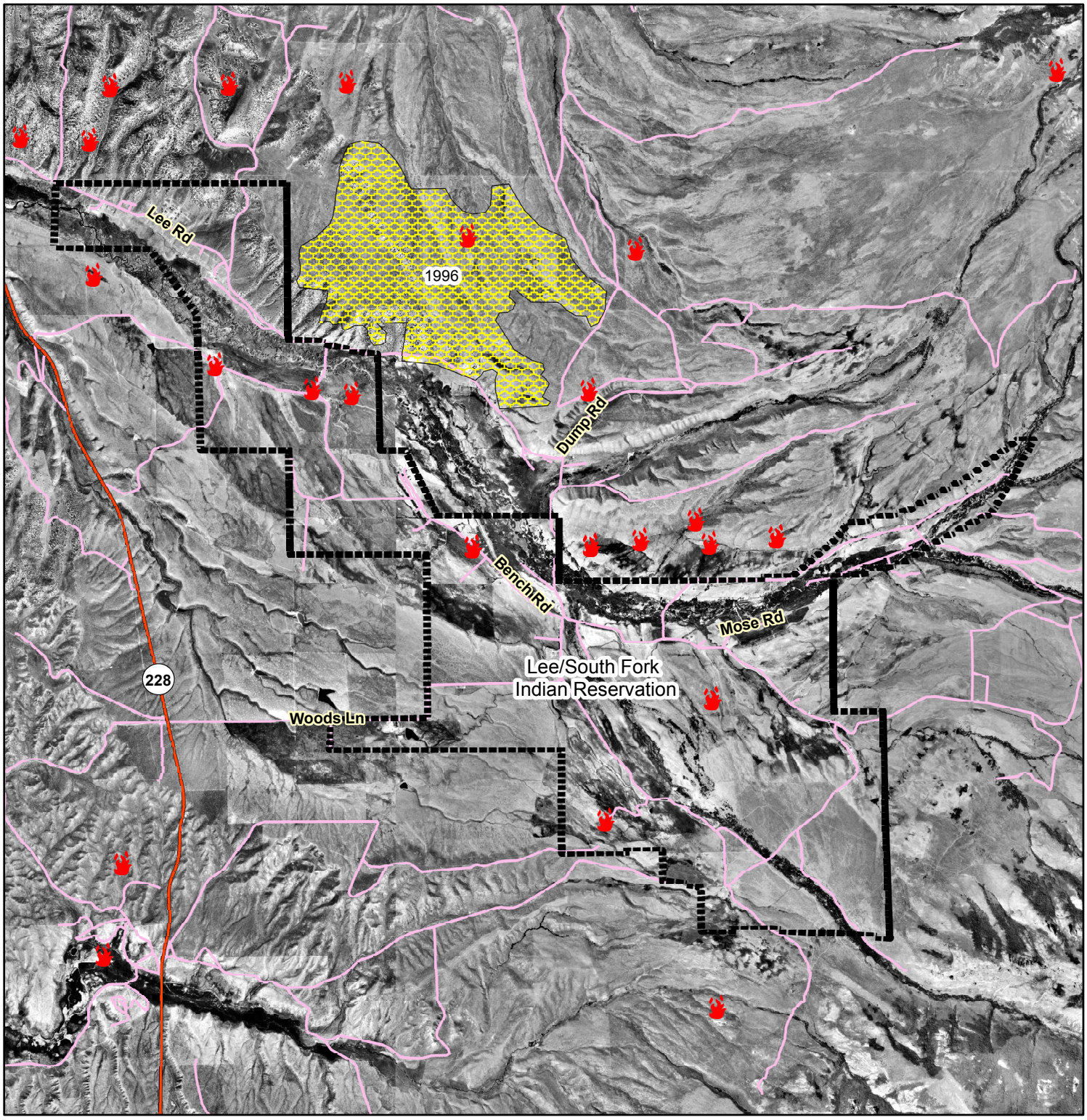


Figure 13-1. Lee/South Fork Indian Reservation
Fire History

Legend

- Community Boundary
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads
- Fire Ignition

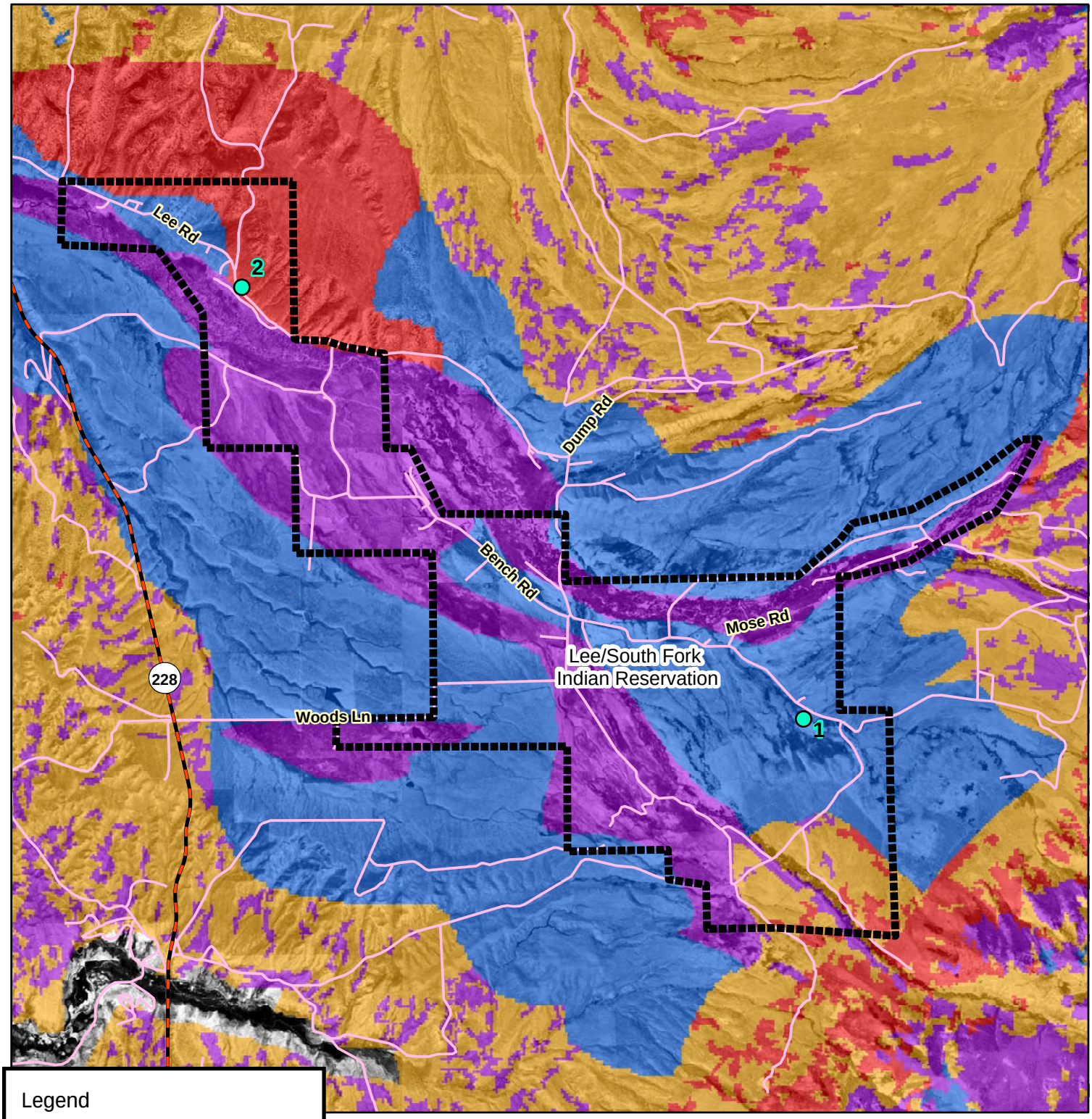
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Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 13-2. Lee/South Fork Indian Reservation Classification of Fuel Hazard

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Figure 13-3. Lee/South Fork Indian Reservation Fuel Hazard Photo Points



Lee/SFIR Photo Point 1 - 4489498N, 0620885E, 000°N. Fuels in Lee/SFIR consist of basin wildrye, wheatgrass, bluegrass, needlegrasses, and cheatgrass, and are two to four feet high with dense spacing**.** The shrub layer consists of sagebrush, bitterbrush, rabbitbrush, bitterbrush, and desert peach, and are four to eight feet high with dense spacing. These areas represent high to extreme fuel hazards.



Lee/SFIR Photo Point 2 - 4494635N, 0614189E, 320°NW. The fuel hazard at the north end of the community increases with the additional fuel loading from pinyon and juniper trees.

14.0 LUCKY NUGGET I & II

14.1 RISK AND HAZARD ASSESSMENT

The Lucky Nugget community is located twenty miles south of Elko near the South Fork State Recreation Area. The elevation of Lucky Nugget I & II is approximately 5,400 feet. The community hazard assessment resulted in classifying Lucky Nugget I & II in the **High Hazard** category (70 points). A summary of the factors that contributed to the hazard rating is included in Table 14-3. The high rating is attributed to limited access, lack of street signs and visible addresses, lack of water for fire suppression, and the potential for hazardous fire behavior. The community boundary identified for this report is shown in Figure 14-1.

14.1.1 Community Design

The wildland urban interface area around the Lucky Nugget I & II community is an intermix condition. Structures are scattered throughout the community and in wildlands with no clear line of demarcation between structures and wildland fuels. All of the 122 homes included in the assessment are on parcels of one to ten acres in size.

Access: The primary access roads to Lucky Nugget from SR 288 are Lower South Fork Road and Lucky Nugget Road (formerly Sherman Avenue). Some of the secondary roads within the community are dead-ends without adequate turnaround space for fire suppression equipment.

Signage: Only 67 percent of the street signs and ten percent of the residential addresses are visible. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: The utilities are both above and below ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

14.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Twenty-one percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

14.1.3 Defensible Space

Ninety-eight percent of the homes met the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

14.1.4 Suppression Capabilities

Wildfire Protection Resources

Lucky Nugget I & II does not have an organized fire department; however, the community is protected by the closest available resources in Ten Mile, a distance of less than five miles away. Table 14-1 lists the types of local wildfire resources and equipment available for initial response to Lucky Nugget I & II in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 14-1. Lucky Nugget I & II Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine Type 4 Engine Type 6 Engine Type 2 Water Tender	2 1 2 1	Ten Mile VFD (Ten Mile)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 2 Engine	1	Spring Creek Station 1 (Spring Creek)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Blake O'Donnell, Ten Mile VFD Chief.

Water Sources and Infrastructure

Water available for fire suppression for Lucky Nugget I & II is provided by private wells, a dry hydrant on Ten Mile Creek, South Fork Reservoir, and the Humboldt River. An additional hydrant is located nearby at the South Fork State Park headquarters.

14.1.5 Factors Affecting Fire Behavior

Fuels in the community consist primarily of sagebrush and rabbitbrush, with cheatgrass and halogeton in the understory. Fuel loading is estimated at three to four tons per acre. The shrubs are moderately dense and were considered a moderate fuel hazard. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and increase the fuel hazard in years of higher than average precipitation. The terrain within the community boundary is mostly flat, however there are some short drainages on about twenty percent slopes.

In 2003, the Bureau of Land Management Elko Field Office constructed a greenstrip in the Lucky Nugget I & II community. The greenstrip is 300 to 500 feet wide and was seeded with perennial grass species. Approximately 335 acres were treated with either mechanical mastication or roller/chopper equipment.

14.1.6 Existing Mitigation Projects

In 2003, the Bureau of Land Management Elko Field Office constructed a greenstrip in the Lucky Nugget I & II community. The greenstrip is 300 to 500 feet wide and was seeded with perennial grass species. Approximately 335 acres were treated with either mechanical mastication or roller/chopper equipment.

14.1.7 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Lucky Nugget I & II would start with an ignition from a dry lightning storm late on a summer afternoon during a normal to above normal precipitation year and high annual grass and forb production. Multiple fire ignitions south of the community area and strong erratic winds, greater than twenty miles per hour, could push fires towards the residential area.

14.1.8 Ignition Risk Assessment

Lucky Nugget I & II has a high risk of ignition based on fire history in the area and moderate fuel loading with annual grasses and pinyon-juniper stands. The primary risk of ignition in Lucky Nugget I & II is lightning, although human caused ignitions are unpredictable and can occur at any time.

14.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Lucky Nugget I & II area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

14.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.

- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Replace wood shake roofs with fire resistant materials such as metal, tile, or composition.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[10] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Prune limbs from fir trees to a height of fifteen feet, but not more than one-third the height of the total tree height. Prune limbs from juniper trees to a minimum height of four feet from the ground but not more than one-third the total tree height. Pruning should be completed to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

14.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Bureau of Land Management

- Maintain the greenstrip constructed on the public lands managed by the Bureau of Land Management south of the community, as shown in Figure 14-1.

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

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.

Elko County

- Reduce vegetation and maintain community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the roads. Remove biomass and disposed of it at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

14.2.3 Community Coordination

Elko County

- Post street signs at all street intersections in the Lucky Nugget communities.

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

14.3 SUMMARY OF RECOMMENDATIONS

Table 14-2. Lucky Nugget I & II Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Post addresses so they are clearly visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.
Bureau of Land Management	Fuels Reduction	Maintain the greenstrip south of the community.
Elko County	Fuels Reduction	Reduce vegetation and maintain community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the roads.
	Community Coordination	Ensure street signs are posted at each intersection in the Lucky Nugget communities.

Table 14-3. Lucky I & II Nugget Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	3	/3
4. Secondary Road	3	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

122 Total Houses **30 Residential Streets**

B5. Street Signs

10 not visible | 20 visible | 67% visible

B6. Address Signs

110 not visible | 12 visible | 10% visible

C1. Roofs

0 combust | 122 not combust | 100% not combust

C2. Siding

0 combust | 122 not combust | 100% not combust

C3. Unenclosed Structures on Lot

26 not enclosed | 96 enclosed | 21% not enclosed

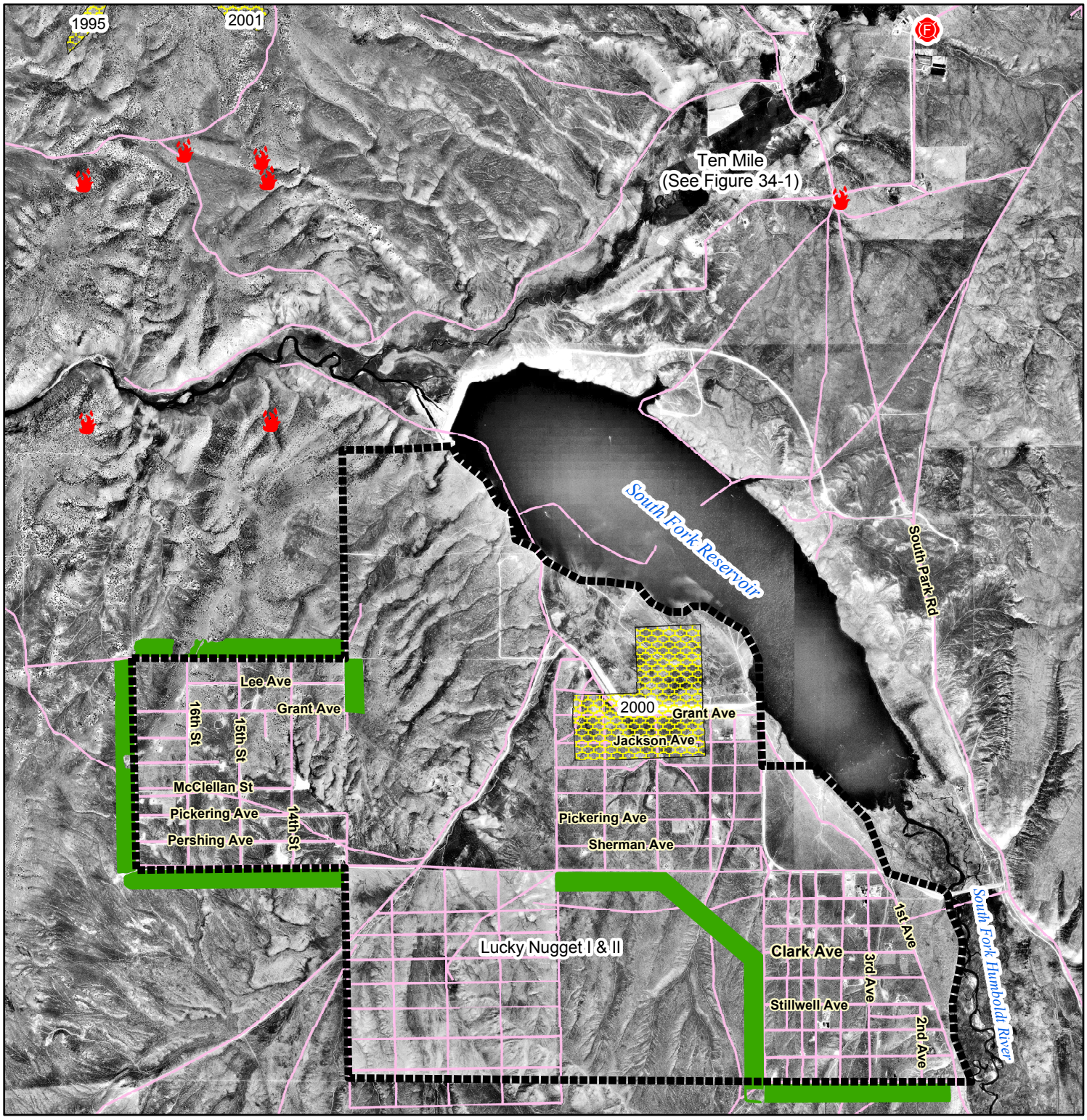
D1. Lot Sizes

0 <1ac | 122 >1ac <10ac | 0 >10ac

D2. Defensible Space

37 not adequat | 85 adequate | 70% adequate

Score **70** /128



Legend

- Community Boundary
- Existing BLM Greenstrip
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

Figure 14-1. Lucky Nugget I & II
Fire History and Mitigation Projects

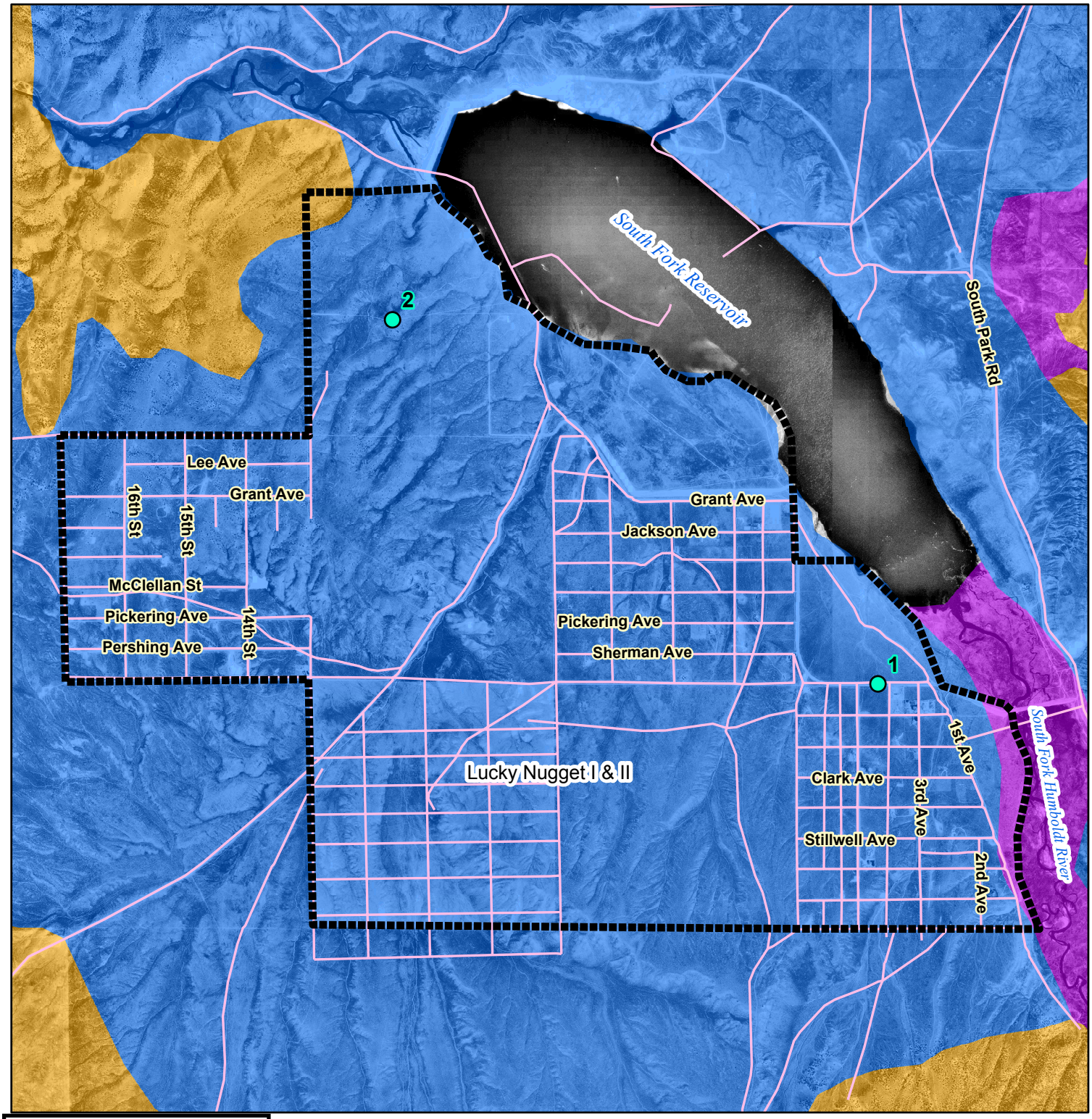
N
W E
S

0 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Secondary Roads
- Fuel Photo Point

Fuel Hazard

- Extreme
- High
- Moderate
- Low

Figure 14-2. Lucky Nugget I & II
Classification of Fuel Hazard

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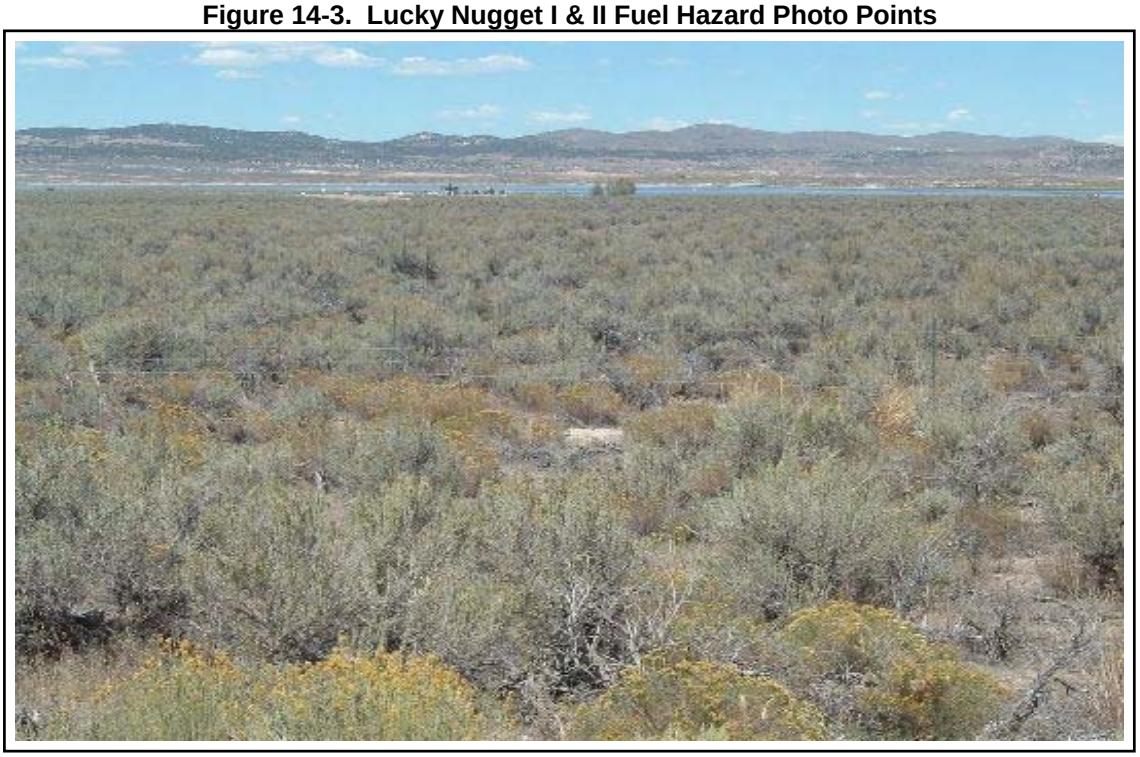
0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 14-3. Lucky Nugget I & II Fuel Hazard Photo Points



Lucky Nugget I & II Photo Point 1 - 4500832N, 605630E, 360°NW. Fuels within the community consist of sagebrush, rabbitbrush, perennial grasses, halogeton and cheatgrass.



Lucky Nugget I & II Photo Point 2 – 4503220N, 602439E, 150°SE. This community overview shows the early stage of pinyon and juniper encroachment that will increase the fuel hazard over time.

15.0 MIDAS

15.1 RISK AND HAZARD ASSESSMENT

Midas is a small community located in northwestern Elko County about ten miles east of Humboldt County. The town is located in a narrow canyon in a mountainous area between the Osgood Mountains and the Tuscarora Mountains at an elevation of approximately 5,745 feet. Midas Creek flows north-south through the town. The community hazard assessment resulted in rating Midas in the **High Hazard** category (71 points). A summary of the factors that contributed to the hazard rating is included in Table 15-3. The primary factors that contributed to the high rating were poor access, inadequate signage, and fire behavior factors related to fuel loading and topography. The community boundary identified for this report is shown in Figure 15-1.

15.1.1 Community Design

The wildland-urban interface area around Midas is a classic condition. There is a clear line of demarcation between structures and wildland fuels. Of the fifty homes included in this assessment, twenty-four are on parcels of less than one acre; the remaining homes are on lots of one to ten acres in size.

Access: State Route 18 is the primary transportation route through Midas. The road is less than twenty feet wide and has adequate turnaround space for fire suppression equipment, but with a grade greater than five percent. Secondary roads in the community are less than twenty feet wide and have a gradient steeper than a five percent that could make access difficult for heavy fire apparatus.

Signage: Three out of four streets in Midas do not have posted signs. Residential addresses are clearly posted on four homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

15.1.2 Construction Materials

Eighty-four percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding material. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Thirty percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

15.1.3 Defensible Space

Eighty-six percent of the homes observed in the interface meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

15.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Midas is provided by the Midas Volunteer Fire Department which is staffed by fifteen volunteers. Table 15-1 lists the types of local wildfire resources, cooperating partners, and equipment available for response to Midas in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 15-1. Wildfire Suppression Resources Available to Midas

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine Type 6 Engine	1 1	Midas VFD (Midas)
Type 2 Engine Type 6 Engine	1 1	Golconda VFD (Golconda – Humboldt County)
Type 4 Engine	1	Bureau of Land Management (Midas)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief.

The Midas VFD has some equipment that is old but has been retrofitted with new pumps in the last five years. It is important that fire suppression equipment be adequate and in proper working condition in order for fire protection personnel to be able to protect the community in the event of a wildfire.

Water Sources and Infrastructure

Water available for fire suppression in Midas includes:

- A gravity-fed hydrant system with hydrants within 500 feet of structures.
- One 30,000-gallon water storage tank and one 50,000-gallon water storage tank.
- The town well, which supplies approximately 50 gpm.
- Ranch ponds.

Fire Protection Personnel Qualifications

The Midas VFD firefighters have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Midas VFD responded to three calls in 2003:

- Two wildland/brush fire calls.
- One other type of call.

15.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Midas interface area is generally moderate, estimated at two to six tons per acre, with a high fuel hazard related to slope and aspect. Fuels in the community consist primarily of shrubs two to four foot tall that include sagebrush, rabbitbrush, serviceberry, and wild rose. Ground fuels include basin wildrye, cheatgrass, and perennials. Cheatgrass growth is dependent on annual moisture and will result in greater volumes of fuel and elevated fuel hazards in years of higher than average precipitation. The terrain varies from about an eight to twenty percent slope with a south aspect. A fuelbreak was constructed around the community in 2002-03. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area. Wildland-urban interface fuel hazard conditions are shown in Figure 15-2. Fuel hazard photo points are shown in Figure 15-3.

15.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Midas would come from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions south to southwest of the community and strong erratic winds, greater than twenty miles per hour, could push fires up canyon into the community. The narrow canyon could create a chimney effect, drawing fire directly toward structures.

15.1.7 Ignition Risk Assessment

Midas has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of ignitions around the community. The primary risk of ignition in Midas is lightning, although human caused ignitions are unpredictable and can occur at any time.

15.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Midas area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

15.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Install spark arrestors on chimneys.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[11] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

15.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Midas VFD, Nevada Division of Forestry, Bureau of Land Management

- Continue the BLM greenstrip treatment south to the main road to Midas (Old State Route 18) and construct two greenstrips on both sides of the community as shown in Figure 15-1.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

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

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

15.2.3 Fire Suppression Resources

Midas VFD and Nevada Division of Forestry

- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area and test radio compatibility.
- The Midas VFD has several absentee members of their Fire Board. Absentee Fire Board members must work more closely with full time residents and VFD members to provide better fire protection for the community.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies.
- Upgrade wildfire suppression apparatus.

15.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

15.2.5 Public Education

Midas VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

15.3 SUMMARY OF RECOMMENDATIONS

Table 15-2. Midas Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Midas VFD **Nevada Division of Forestry**	Fuels Reduction	Continue the BLM greenstrip treatment south to the main road to Midas (Old State Route 18) and construct two greenstrips on both sides of the community as shown in Figure 15-1.
	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to review their pre-attack plan for the area. The Midas VFD has several absentee members of their Fire Board. Absentee Fire Board members must work more closely with full time residents and VFD members to provide better fire protection for the community. Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies. Upgrade outdated wildfire suppression apparatus`.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 15-3. Midas Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	5	/5
3. Accessibility	3	/3
4. Secondary Road	5	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	10	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	7	/10

TALLIES

50 Total Houses **3 Residential Streets**

B5. Street Signs

3 not visible | 0 visible | 0% visible

B6. Address Signs

46 not visible | 4 visible | 8% visible

C1. Roofs

0 combust | 50 not combust | 100% not combust

C2. Siding

8 combust | 42 not combust | 84% not combust

C3. Unenclosed Structures on Lot

15 not enclosed | 35 enclosed | 30% not enclosed

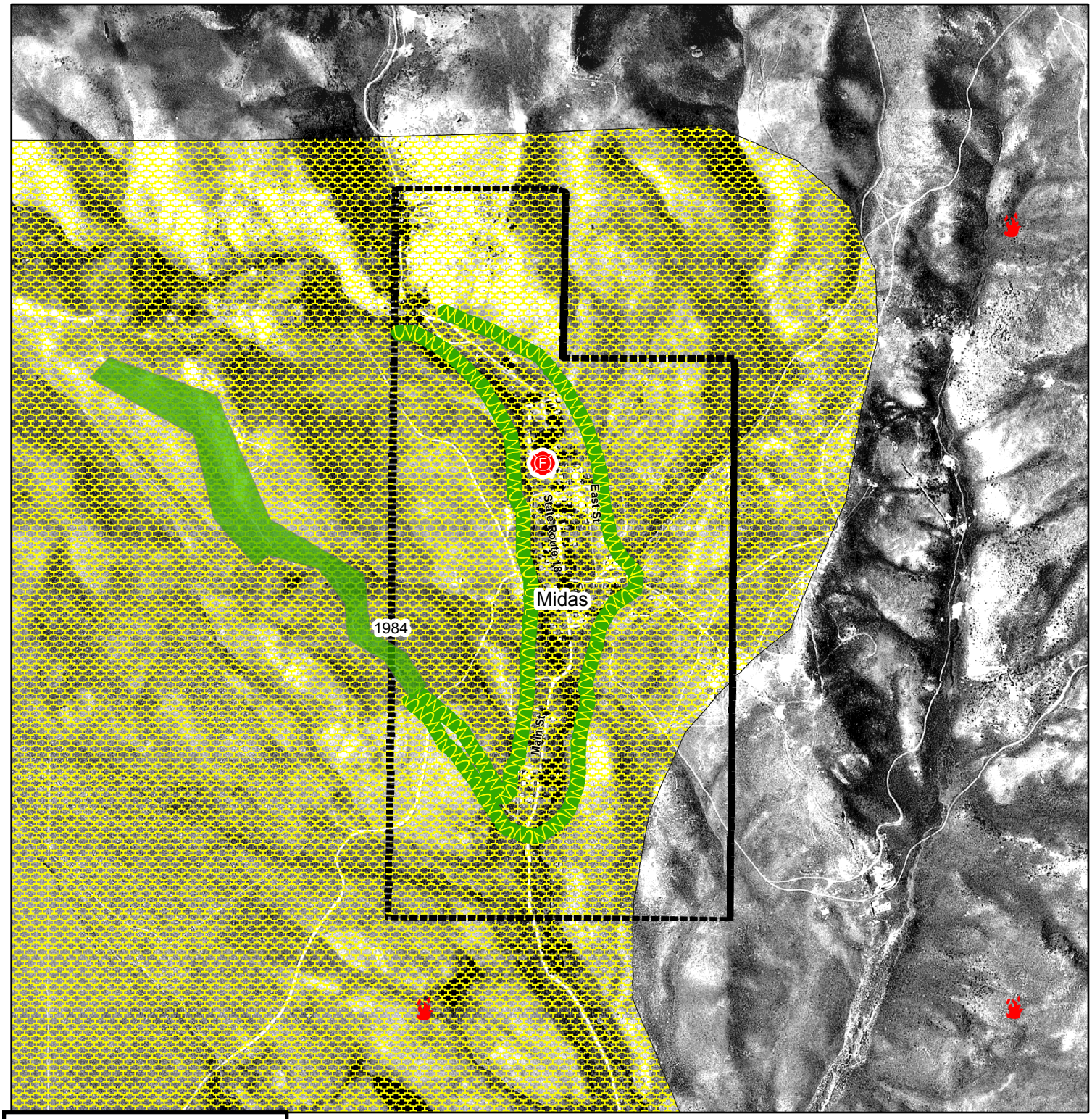
D1. Lot Sizes

24 <1ac | 26 >1ac <10ac | 0 >10ac

D2. Defensible Space

7 not adequat | 43 adequate | 86% adequate

Score **71** /128



Legend

- Community Boundary
- Fire Station
- Fire Boundary and Date
- Fire Ignition
- Existing Greenstrip

Proposed Mitigation

- Greenstrip

Figure 15-1. Midas
Fire History, Suppression Resources,
and Mitigation Projects

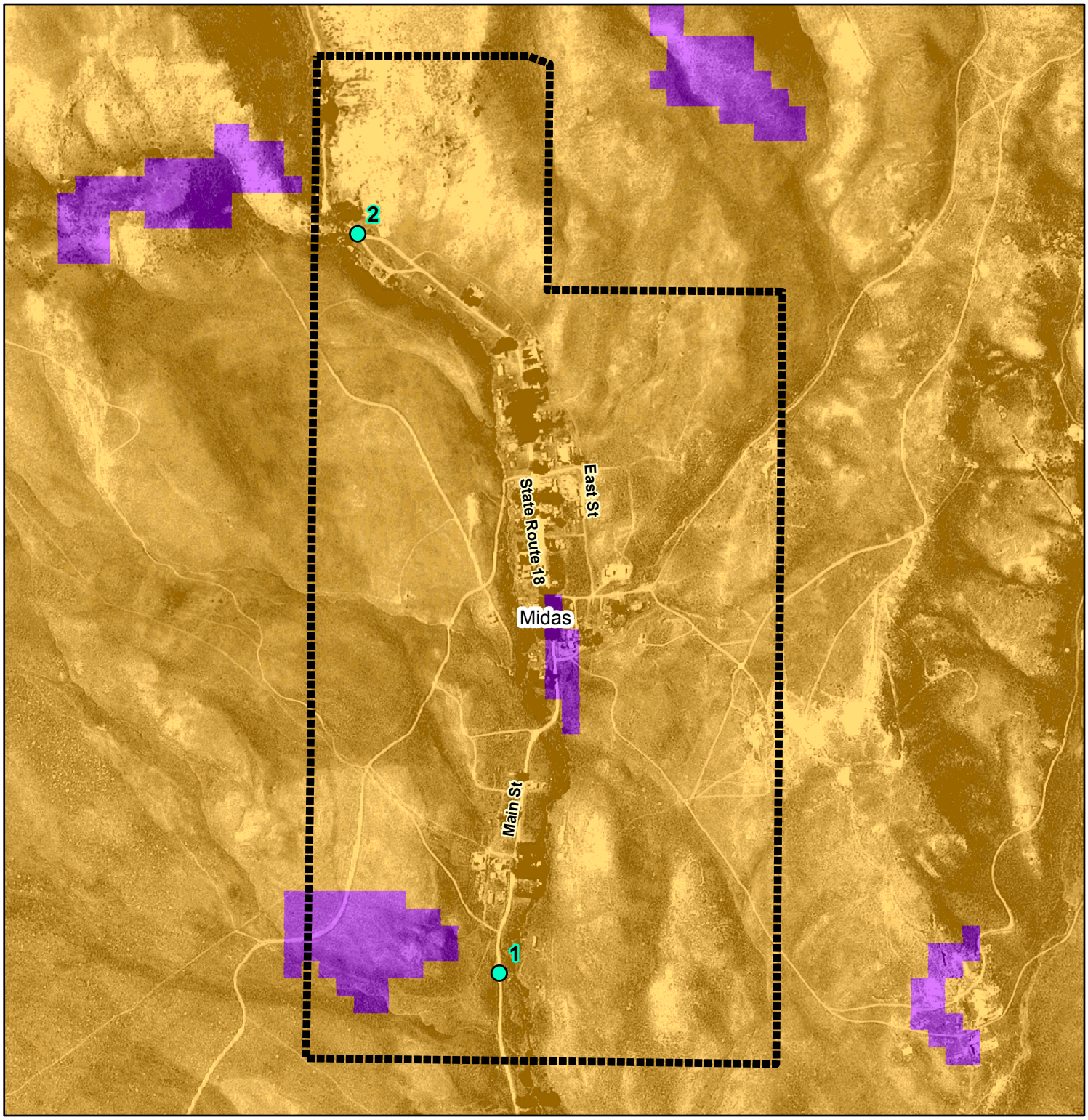
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W E
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0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

Community Boundary

Fuel Hazard

Extreme

High

Moderate

Low

Fuel Photo Point

Figure 15-2. Midas
Classification of Fuel Hazard

N
W E
S

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

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Figure 15-3. Midas Fuel Hazard Photo Points



Midas Photo Point 1 – 4565032N, 516927E, 40°NE. Fuels throughout the community consist of wild rose, willows, rabbitbrush, basin wildrye, cheatgrass, perennial grasses and sagebrush. Fuel loading varies from two to six tons per acre and is considered a high fuel hazard. The community lies within a steep canyon with heavy fuels close to structures.



Midas Photo Point 2 – 4566304N, 516683E, 140°SE. Steep slopes within the community with a west aspect increase the fuel hazard

16.0 MOUNTAIN CITY

16.1 RISK AND HAZARD ASSESSMENT

Mountain City is located on State Route 225, approximately sixteen miles south of the Idaho border. Mountain City is situated on the Owyhee River at an elevation of approximately 5,620 feet. The community hazard assessment resulted in classifying Mountain City in the **High Hazard** category (61 points). A summary of the factors that contributed to the hazard rating is included in Table 16-3. The primary factors that contributed to the rating were inadequate signage, inadequate defensible space, and potentially hazardous fire behavior. The community boundary identified for this report is shown in Figure 16-1.

16.1.1 Community Design

Mountain City has a classic wildland-urban interface condition. There is a clear line of demarcation between structures and wildland fuels. Of the 31 homes included in the assessment, 25 are on lots of less than one acre and six are on lots of one to ten acres.

Access: State Route 225 is the major transportation route through Mountain City. The highway is at least 24 feet wide and has adequate turnaround space for fire suppression equipment to maneuver. Secondary roads are of adequate width and grade for two-way passage.

Signage: Street signs are posted on four of the five streets in the community. Residential addresses are clearly visible on only 61 percent of the homes observed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

16.1.2 Construction Materials

Eighty-four percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety-four percent of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Twenty-six percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

16.1.3 Defensible Space

Sixty-eight percent of the homes observed in the interface meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

16.1.4 Suppression Capabilities

Wildfire Protection Resources

The Mountain City Volunteer Fire Department, staffed by four volunteers, provides fire protection in Mountain City. Table 16-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Mountain City in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 16-1. Wildfire Suppression Resources Available to Mountain City

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine	1	Mountain City VFD (Mountain City)
Type 6 Engine	1	US Forest Service (Mountain City)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

Water available for fire suppression in Mountain City includes hydrants within 500 feet of structures; the minimum flow for these hydrants is 500 gallons per minute, operated by gravity flow into the tank from four springs at a rate of approximately 60 gpm. From one 150,000-gallon water storage tank, a single hydrant at the bottom of the hill is capable of 2,000 gpm. The Owyhee River and local ponds can be used as helicopter dip spots or draft sites.

Fire Protection Personnel Qualifications

The Mountain City volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Mountain City VFD responded to three calls in 2003:

- Two wildland/brush fire calls.
- One other type of call.

16.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Mountain City interface area is generally moderate, estimated at two to four tons per acre. The fuel hazard is low along the river corridor, but increases to a high hazard elsewhere within the community due to slope and aspect. Fuels in the community consist primarily of shrubs one to four feet high that include sagebrush and rabbitbrush, with ground fuels of basin wildrye, lupine, cheatgrass, and

perennial grasses. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Riparian areas along the Owyhee River are predominantly meadow grasses, willows, and sagebrush. Fuel hazard mapping is shown in Figure 16-2. Fuel hazard photo points are shown in Figure 16-3. The terrain within the community boundary is gently sloping from eight to twenty percent, with a west aspect. The prevailing wind direction is south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

16.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Mountain City would come from a dry lightning storm late on a summer afternoon during a year of normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions in the area would spread firefighting resources thin. High erratic winds would push fires into the community.

16.1.7 Ignition Risk Assessment

Mountain City has a high ignition risk based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Mountain City is lightning, although human caused ignitions are unpredictable and can occur at any time.

16.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Mountain City area focus primarily on the ongoing and additional efforts to create and maintain defensible space and the community coordination and public education efforts that could be undertaken to enhance fire safety.

16.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Responsibilities

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store woodpiles a minimum distance of thirty feet from any structure.

- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Replace wood shake roofs with fire resistant materials such as metal, tile, or composition.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[12] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Prune limbs from fir trees to a height of fifteen feet, but not more than one-third the height of the total tree height. Prune limbs from juniper trees to a minimum height of four feet from the ground, but not more than one-third the total tree height. Pruning should be completed to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

16.2.2 Fire Suppression Resources

Mountain City VFD and Nevada Division of Forestry

- Continue to meet annually with cooperating agencies to review pre-attack plans and test radio compatibility.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.
- Upgrade fire suppression apparatus.

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

16.2.3 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

16.2.4 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Mountain City VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

16.3 SUMMARY OF RECOMMENDATIONS

Table 16-2. Mountain City Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Mountain City VFD and Nevada Division of Forestry	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to review pre-attack plans and test radio compatibility. Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility. Upgrade fire suppression apparatus.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 16-3. Mountain City Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	3	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	7	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	7	/10

TALLIES

31 Total Houses **5 Residential Streets**

B5. Street Signs

1 not visible | 4 visible | 80% visible

B6. Address Signs

8 not visible | 23 visible | 74% visible

C1. Roofs

2 combust | 29 not combust | 94% not combust

C2. Siding

5 combust | 26 not combust | 84% not combust

C3. Unenclosed Structures on Lot

8 not enclosed | 23 enclosed | 26% not enclosed

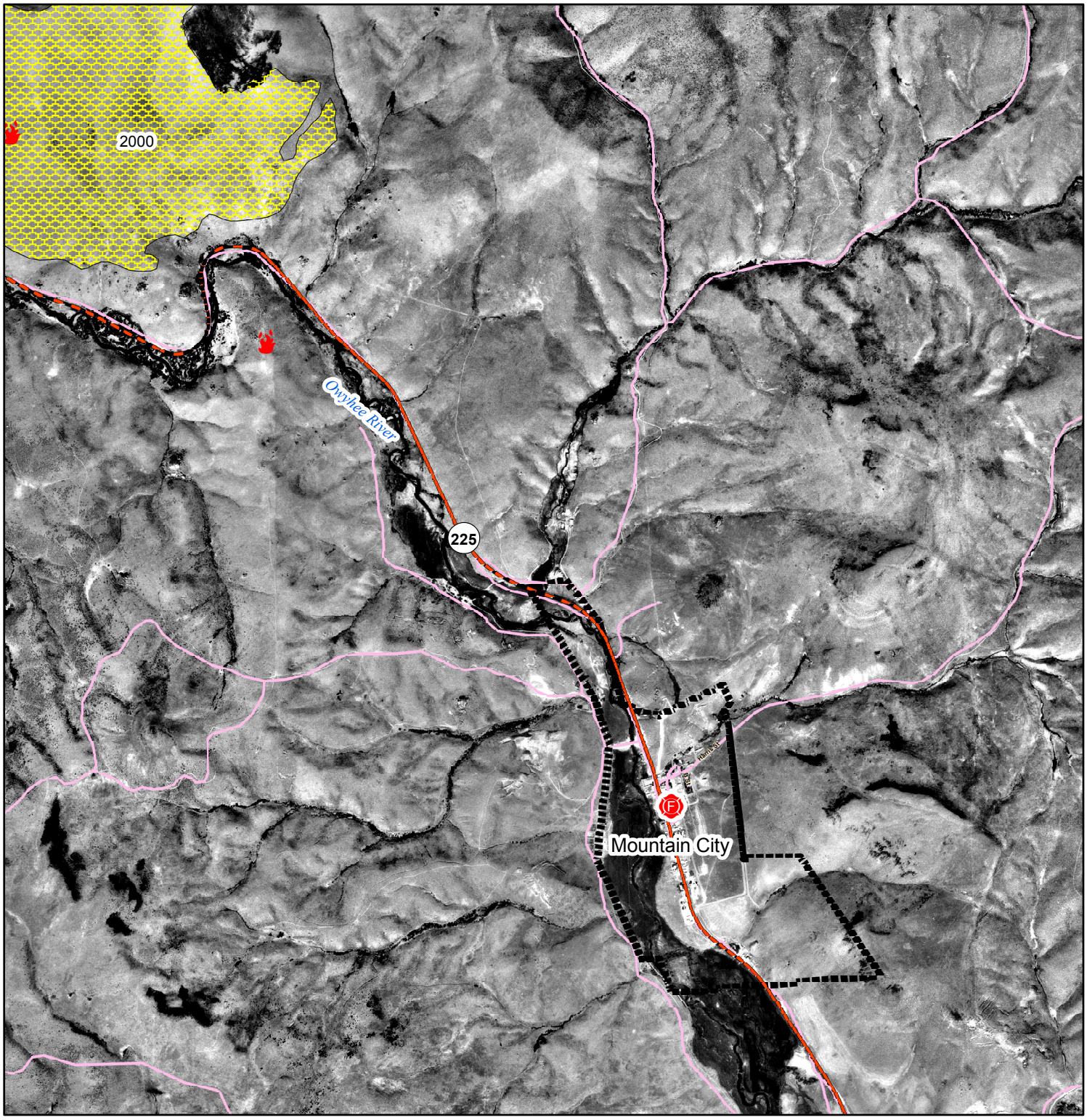
D1. Lot Sizes

25 <1ac | 6 >1ac <10ac | 0 >10ac

D2. Defensible Space

10 not adequat | 21 adequate | 68% adequate

Score **61** /128



Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

Figure 16-1. Mountain City
Fire History and Suppression Resources

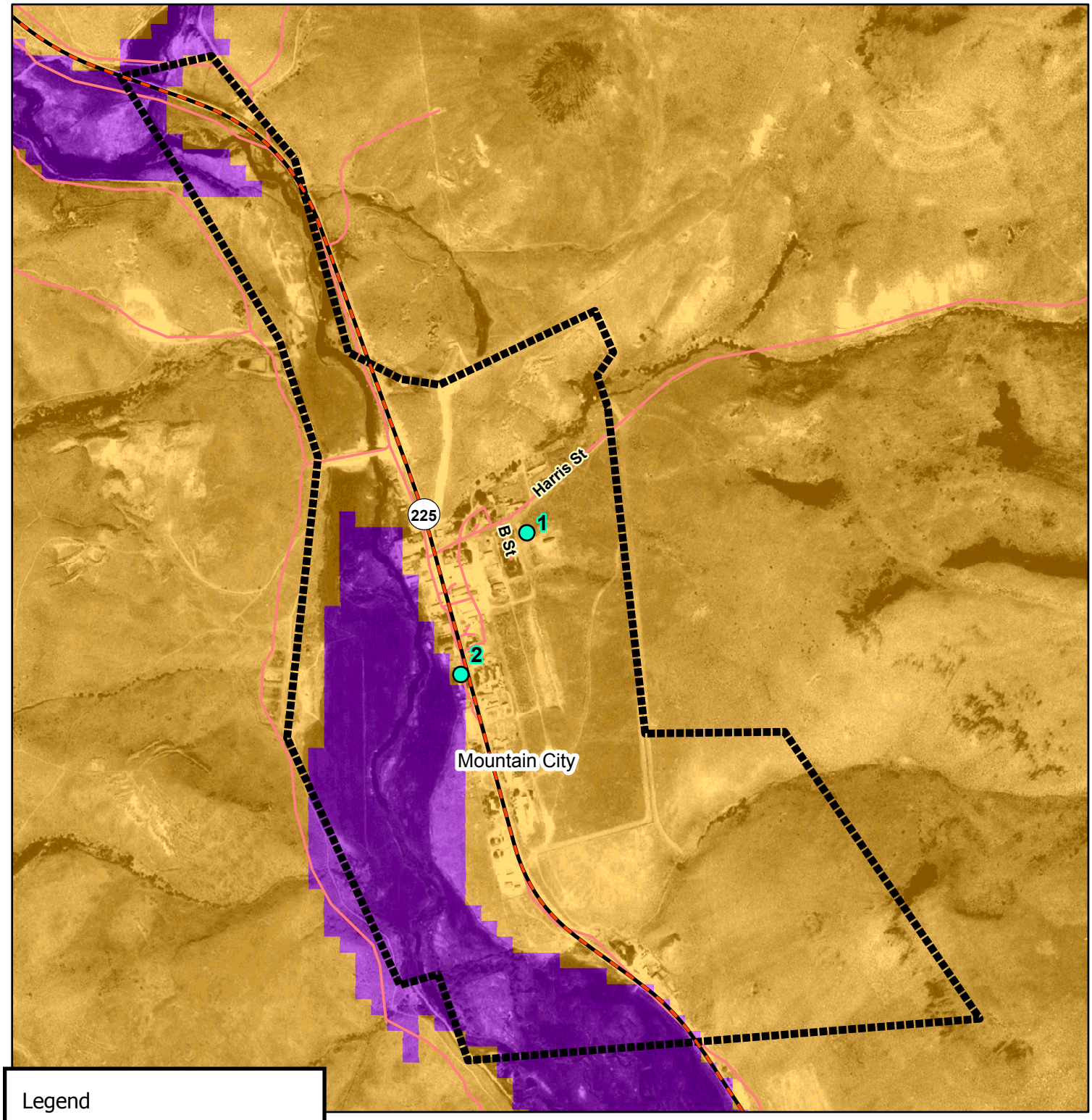
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Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 16-2. Mountain City
Classification of Fuel Hazard

N
W E
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0 500 1,000 2,000
Feet

Resource Concepts, Inc.
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Nevada Community Wildfire Risk / Hazard Assessment Project

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Figure 16-3. Mountain City Fuel Hazard Photo Points



Mountain City Fuel Hazard Photo Point 1 - 4632453N, 586093E, 060°NE. Mountain City ground fuels include cheatgrass, basin wildrye, lupine, and perennial grasses. The shrub layer is rabbitbrush and sagebrush that is one to four feet high, with a fuel loading density of one to two tons an acre.



Mountain City Fuel Hazard Photo Point 2 - 4632183N, 585967, 070°NE. Perennial grasses on steep slopes add to the hazard in the community if they are not mowed or grazed to reduce biomass.

17.0 OSINO

17.1 RISK AND HAZARD ASSESSMENT

Osino is a small community located on Interstate 80 approximately ten miles east of Elko in central Elko County. Jackstone Creek flows through the community and the Humboldt River flows along the south side of I-80. Osino is situated near the base of Elko Mountain at an elevation of approximately 5,130 feet. The community hazard assessment resulted in classifying Osino in the **High Hazard** category (70 points). A summary of the factors that contributed to the hazard rating is included in Table 17-3. The primary factors that contributed to the high rating were poor signage, a high number of homes with unenclosed architectural features, inadequate defensible space, the potential for hazardous fire behavior factors related to fuel loading and topography, and no local fire department or water sources. The community boundary identified for this report is shown in Figure 17-1.

17.1.1 Community Design

Osino has an intermix wildland-urban interface condition. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. All 206 homes included in the assessment are located on parcels one to ten acres in size.

Access: Interstate 80 is the major transportation route through Osino. The road is at least 24 feet wide, dirt, and has adequate turnaround space for fire suppression equipment. The community roads have grades less than five percent and have adequate turnaround space for fire suppression equipment. Road are not regularly maintained, and access can be difficult due to rut formation following thunder showers.

Signage: Few street signs are posted in Osino. Only 33 percent of residential addresses are clearly visible. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

17.1.2 Construction Materials

Ninety-nine percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Eighty-nine percent of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Approximately forty percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

17.1.3 Defensible Space

Eighty-five percent of homes observed in the interface meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

17.1.4 Suppression Capabilities

Wildfire Protection Resources

There are no local fire department or fire suppression resources in Osino. The closest community with a fire department is Ryndon or Elko, about five miles away. Table 17-1 lists the types of local wildfire resources and equipment available for initial response to Osino in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 17-1. Wildfire Suppression Resources Available to Osino

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine Type 6 Engine	1 1	Ryndon VFD (Ryndon)
Type 3 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 2 Engine Type 3 Engine	1 1	Lee Engine Company (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bill Krohn, Ryndon VFD Fire Chief; Walt Howell, Deeth/Starr Valley VFD Chief.

Water Sources and Infrastructure

There is no local water system or water storage for fire suppression in Osino. Some small creeks could be used for draft sites, depending on water levels. A 30,000-gallon water storage tank across Interstate 80 could be used during an emergency.

17.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Osino interface area is high, estimated at three to five tons per acre. Along the Humboldt River corridor the fuel hazard is low and in other areas of the community the fuel hazard is moderate, with the potential to increase to high in years of increased annual grass production. Fuels in the community consist primarily of shrubs three to six feet tall that include sagebrush and rabbitbrush. Ground fuels consist of halogeton, perennial grasses, and some cheatgrass. Cheatgrass growth is dependent on annual moisture and will result in higher volumes of fuel and elevated fuel hazard conditions in years of higher than average precipitation. Kochia and Russian thistle grow in vacant lots, abandoned agricultural fields, and along roadsides. Both are highly flammable when dry. The terrain within the community boundary is sloping from eight to twenty percent with a south aspect. The prevailing wind direction is from the southwest/west. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The Bureau of Land Management Elko Field Office is planning the third phase of the Elko North greenstrip along the north side of Interstate 80 from Elko to the northwest boundary of Osino. The greenstrip will be 300 feet wide for a total treatment area of approximately 285 acres and will reduce the fuel hazard for the communities of Osino and Elko.

17.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Osino would come from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions south and west of the community on the north side of I-80 with predominant southwest to west winds would push fires into the community. Poor roads and some steep slopes would slow initial attack forces. There is no water system or fire hydrants to support fire suppression operations.

17.1.7 Ignition Risk Assessment

Osino has a high ignition risk based on fire history in the area and the potential for increased fuel loading from annuals in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Osino is lightning, although human caused ignitions are unpredictable and can occur at any time.

17.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Osino area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the future requirements that new developments will be planned and constructed to create fire safe communities. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

17.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.

- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[13] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where brush and Russian thistle (tumbleweed) have accumulated in vacant lots or agricultural fields, mow or use a brush hog to remove the fuel load. Mowing will need to be repeated in the following years to ensure that the seed bank has been depleted.
- Maintain the defensible space as needed.

17.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Continue to reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove biomass and disposed of it at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Nevada Division of Forestry and Bureau of Land Management

- Coordinate with property owners to develop a 150 foot-wide greenstrip around the entire development area and construct a greenstrip within the I-80 corridor and the old Highway 40 corridor, as shown in Figure 17-1.

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

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Nevada Division of Forestry, Bureau of Land Management, Nevada Department of Transportation, and Elko County Roads Dept.

- Construct a 150 foot-wide greenstrip around the entire development area and I-80 corridor and Highway 40 corridors. The greenstrip should tie into Phase III of the Elko North greenstrip planned by the Elko BLM Field Office, as shown in Figure 17-1.

17.2.3 Fire Suppression Resources

Elko County and Nevada Division of Forestry

- Install a minimum capacity10,000 gallon water storage tank.

17.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

Elko County

- Bring all roads up to Elko County all-weather standards.

17.3 SUMMARY OF RECOMMENDATIONS

Table 17-2. Osino Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Nevada Division of Forestry and Bureau of Land Management and NDOT	Fuels Reduction	Construct a 150 foot-wide greenstrip around the entire development area and I-80 corridor and Highway 40 corridors.
Elko County and Nevada Division of Forestry	Fire Suppression Resources	Install a minimum capacity 10,000-gallon water storage tank.
Nevada Division of Forestry and Bureau of Land Management	Fuels Reduction	Coordinate with property owners to develop a 150 foot-wide fuelbreak around the entire development area. Construct a greenstrip within the I-80 corridor and the old Highway 40 corridor as shown in Figure 17-1.
Elko County	Fuels Reduction	Continue to reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
	Community Coordination	Bring all roads up to Elko County all-weather standards.

Table 17-3. Osino Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	10	/10

TALLIES

206 Total Houses **16 Residential Streets**

B5. Street Signs

16 not visible | 0 visible | 0% visible

B6. Address Signs

138 not visible | 68 visible | 33% visible

C1. Roofs

0 combust | 206 not combust | 100% not combust

C2. Siding

2 combust | 204 not combust | 99% not combust

C3. Unenclosed Structures on Lot

86 not enclosed | 120 enclosed | 42% not enclosed

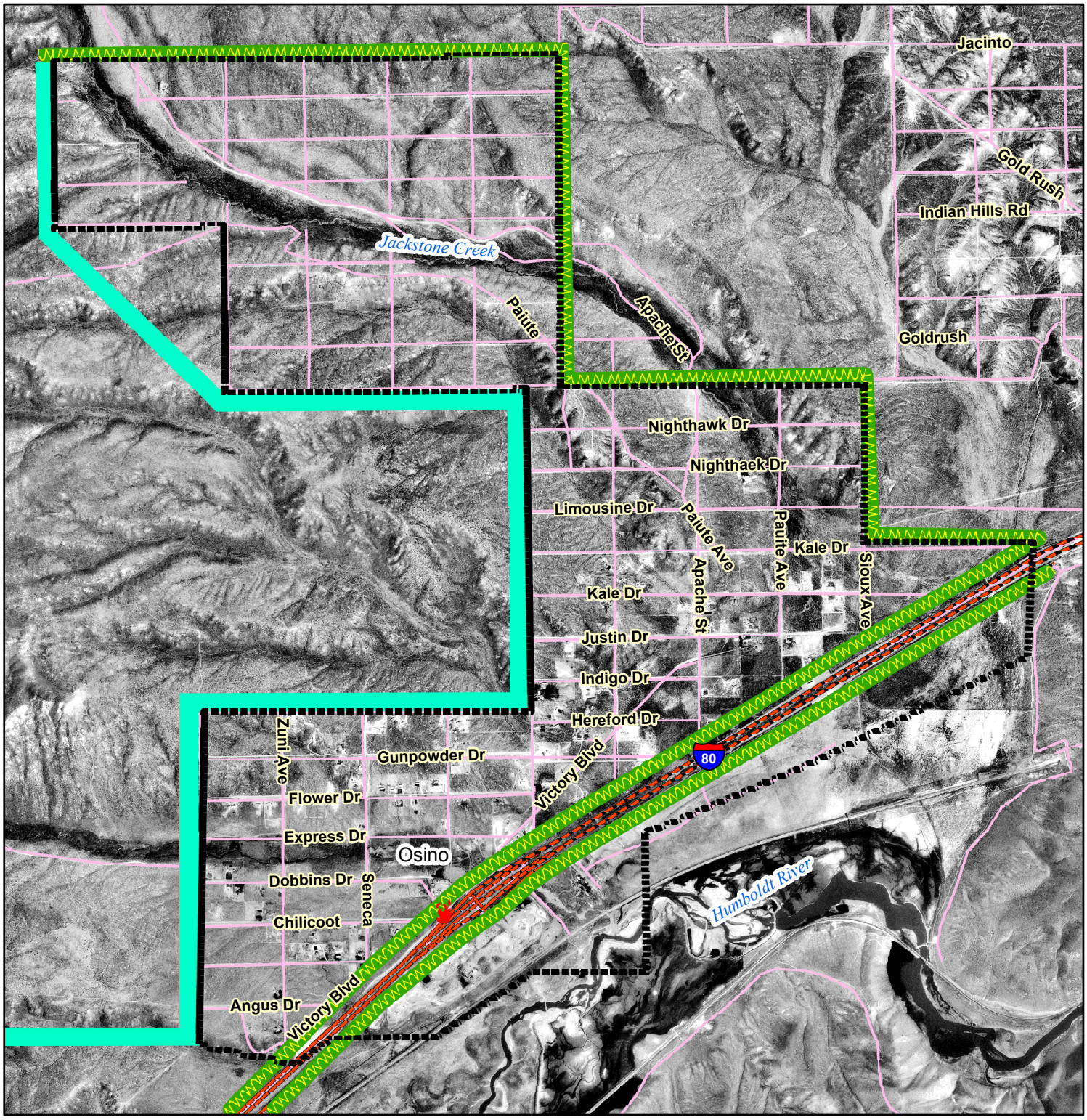
D1. Lot Sizes

0 <1ac | 206 >1ac <10ac | 0 >10ac

D2. Defensible Space

30 not adequat | 176 adequate | 85% adequate

Score **70** /128



Legend

- Community Boundary
- Proposed Greenstrip
- Planned BLM Greenstrip
- Highways and State Routes
- Secondary Roads
- Fire Ignition

Figure 17-1. Osino
Fire History and Proposed Mitigation Projects

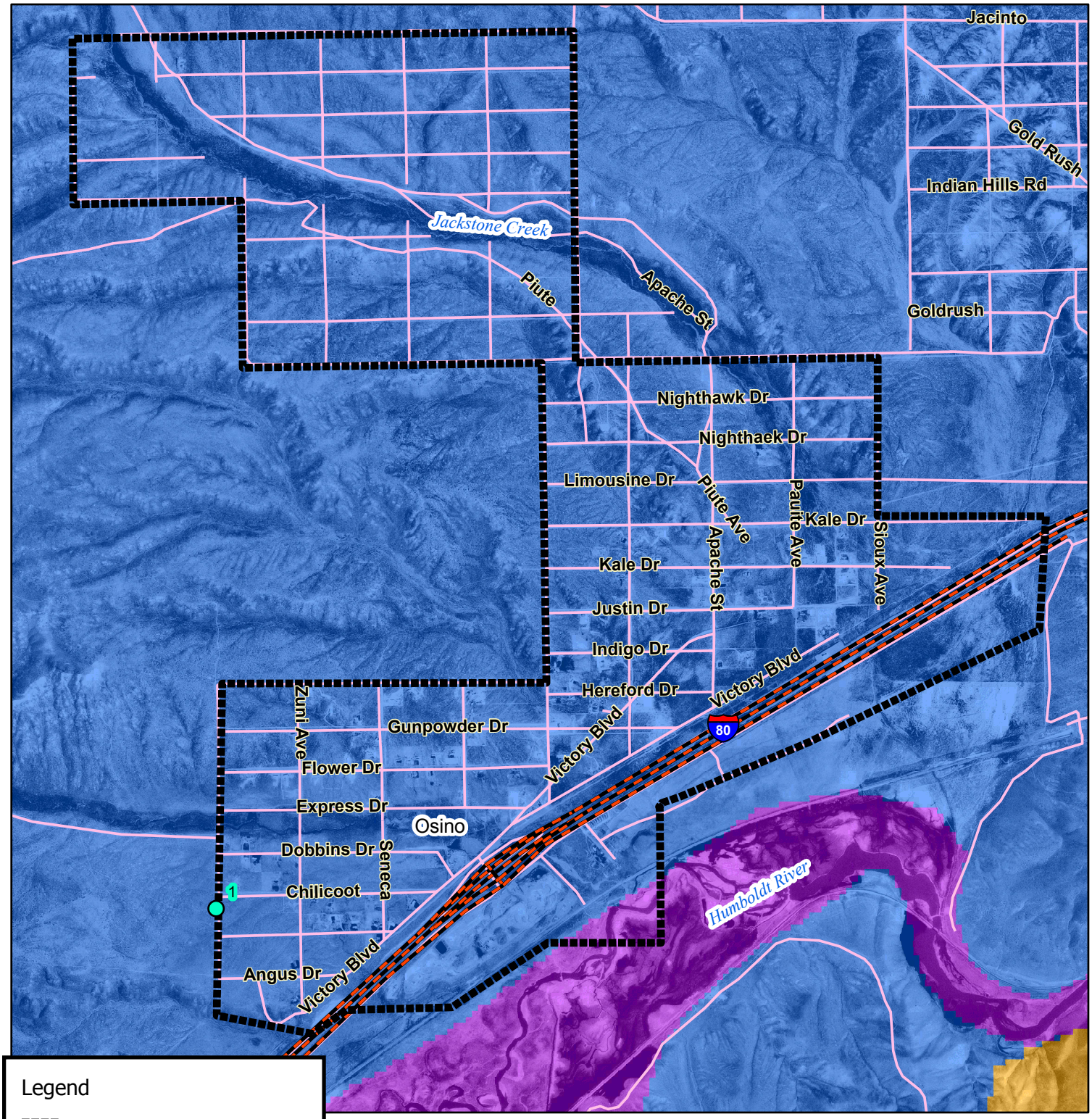
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0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 17-2. Osino
Classification of Fuel Hazard

N
W E
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0 1,000 2,000 4,000
Feet

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 17-3. Osino Fuel Hazard Photo Point



Osino Photo Point 1 – 4532071N, 0610976E, 320°NW. Vegetative fuels in the community consist primarily of shrubs three to four feet tall that include sagebrush and rabbitbrush. The fuel hazard was considered moderate on flat terrain.

18.0 RUBY LAKE ESTATES

18.1 RISK AND HAZARD ASSESSMENT

Ruby Lake Estates is located in the south portion of Ruby Valley, on the east side of Harrison Pass, and north of the junction with Ruby Valley Road. The community hazard assessment resulted in classifying the community in the **High Hazard** category (63 points). A summary of the factors that contributed to the hazard rating is included in Table 18-3. The primary factors that contributed to the rating were inadequate defensible space, unenclosed architectural features, and fire behavior factors related to fuels and topography. The community boundary identified for this report is shown in Figure 18-1.

18.1.1 Community Design

Ruby Lake Estates has an intermix wildland-urban interface condition. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. All nine homes included in the assessment are on parcels of one to ten acres in size.

Access: Ruby Valley Road is the only transportation route through Ruby Lake Estates. The road is twenty to 24 feet wide and has adequate turnaround space for fire suppression equipment to maneuver. There are some secondary roads in an area planned for future growth.

Signage: Street signs are clearly posted on all streets in the community. Residential addresses are not clearly visible on any of the homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

18.1.2 Construction Materials

Eighty-nine percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard, and fire resistant roofing materials such as composition roofing, metal, or tile. Just over half of the homes had unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

18.1.3 Defensible Space

Nearly half of the homes in the community do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

18.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Ruby Lake Estates is provided by the Ruby Valley Volunteer Fire Department. The department has several stations situated throughout the valley with seventeen volunteers and one chief. The Ruby Valley National Wildlife Refuge has three full time staff and three seasonal paid staff members. The Nevada Department of Wildlife Gallagher Fish Hatchery has equipment and trained staff as well. Additional resources are available through the Bureau of Land Management Elko Field Office and the Nevada Division of Forestry as requested. Table 18-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to Ruby Lake Estates in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 18-1. Wildfire Suppression Resources Available to Ruby Lake Estates

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine	2	Ruby Valley VFD (Secret Pass)
Type 3 Engine Water Tender	1 1	Ruby Valley VFD School Station (Ruby Valley)
Type 6 Engine Type 3 Engine	1 1	Nevada Department of Wildlife (Gallagher Fish Hatchery)
Type 4 Engine Water Tender	1 1	Ruby Valley National Wildlife Refuge (Ruby Valley)
Type 2 Engine	1	Spring Creek VFD (Station #1)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Larry Burton, Ruby Valley VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression resources for Ruby Lake Estates includes three 10,000-gallon underground water storage tanks with one drafting hydrant for a total of 30,000-gallons. Several irrigation wells and wheel lines in the valley are equipped with fire hose connections to fill fire apparatus.

Fire Protection Personnel Qualifications

The Ruby Valley volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year the Ruby Valley VFD responds to the following annual calls:

- Three to four emergency medical calls.
- Six to twelve wildland/brush fire calls.
- Six other calls.

18.1.5 Factors Affecting Fire Behavior

The vegetative fuel hazard in the Ruby Lake Estates interface area is generally low to moderate, with fuel loads estimated at one to four tons per acre. Fuels in the community consist primarily of a shrub layer of big sagebrush and rabbitbrush. Ground fuels consist of perennial grasses and cheatgrass, an invasive annual grass that establishes on burned sites. Cheatgrass production is dependent on annual moisture and will increase in years of high precipitation. On slopes west of the community, the presence of pinyon and juniper trees increase the fuel load to between six and eight tons per acre. The fuel hazard was considered high to extreme on the west side of Ruby Valley Road.

The terrain within the community boundary is steep to the west of the community where Harrison Pass opens into Ruby Valley. Several canyons and drainages extend out of the mountains in close proximity to the community. The prevailing winds are downslope from the mountains and are erratic with unpredictable direction. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

18.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Ruby Lake Estates would be a dry lightning storm west of the community upslope in pinyon-juniper and annual grass fuels. Erratic downslope winds would drive the fire toward residences. The community is somewhat protected because it is situated on the east side of the County Road and the road creates a fuel break. Initial response from fire suppression resources could be an hour or more away dependent on availability during normal working hours.

18.1.7 Ignition Risk Assessment

Ruby Lake Estates was determined to have a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grass in high precipitation years. There is some wildfire history surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Ruby Lake Estates is lightning, although human caused ignitions are unpredictable and can occur at any time.

18.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Ruby Lake Estates area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

18.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[14] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Create defensible space around all wellheads for easy access and to protect the wellhead from damage in the event of a wildfire.

18.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the

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

likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Clear and maintain free of vegetation a minimum space of fifty feet from the edge of road on both sides of Smith Canyon Drive by mowing to a height of four inches on both sides of road. This fuel reduction treatment is to extend from the County road east to Griswold.
- Construct a greenstrip by clearing vegetation 100 feet from the edge of the road on the west side and fifty feet on the east side of Ruby Valley Road for a distance of approximately 1.5 miles as shown in Figure 18-1.
- Reduce vegetation and maintain community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.

Nevada Division of Forestry

- Create a defensible space zone of 100 feet around the wellhead of the irrigation well used as a fire suppression water source (located one mile east of the community at County Road and CCC Road intersection). Clearly mark the standpipe for easy visibility.

18.2.3 Fire Suppression Resources

Ruby Valley VFD Nevada Division of Forestry

- Continue to provide wildland firefighting training and Firefighter I training for all volunteers.
- Work with Elko County and the State of Nevada to create incentives for recruiting and retaining volunteers.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies.
- Clearly mark and map all underground tanks and drafting hydrants in the community including the agricultural well.

18.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
210 South Roop Street Suite 101
Carson City, NV 89701
www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

18.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Ruby Valley VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

18.3 SUMMARY OF RECOMMENDATIONS

Table 18-2. Ruby Lake Estates Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Elko County	Fuels Reduction	Clear and maintain free of vegetation a minimum space of fifty feet from the edge of the road on both sides of Smith Canyon Drive by mowing to a height of four inches on both sides of the road. This fuel reduction treatment is to extend from the County road east to Griswold, as detailed on Figure 18-1. Clear vegetation 100 feet from the edge of the road on the west side and fifty feet on the east side of Ruby Valley Road as it runs through the community. Reduce vegetation and maintain community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Ruby Valley VFD and Nevada Division of Forestry	Fuels Reduction	Create a defensible space zone of 100 feet around the wellhead of the irrigation well used as a fire suppression water source. Clearly mark the standpipe for easy visibility.
	Fire Suppression Resources	Continue to provide wildland firefighting training and Firefighter I training for all volunteers. Work with Elko County and the State of Nevada to create incentives for recruiting and retaining volunteers. Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies. Clearly mark and map all underground tanks and drafting hydrants in the community including the agricultural well.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 18-3. Ruby Lake Estates Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	5	/10
2. Siding	1	/5
3. Unenclosed Structures	5	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	3	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

9 Total Houses **3 Residential Streets**

B5. Street Signs

0 not visible | 3 visible | 100% visible

B6. Address Signs

5 not visible | 4 visible | 44% visible

C1. Roofs

1 combust | 8 not combust | 89% not combust

C2. Siding

1 combust | 8 not combust | 89% not combust

C3. Unenclosed Structures on Lot

5 not enclosed | 4 enclosed | 56% not enclosed

D1. Lot Sizes

0 <1ac | 9 >1ac <10ac | 0 >10ac

D2. Defensible Space

5 not adequat | 4 adequate | 44% adequate

Score **63** /128



Legend

- Community Boundary
- Fire Boundary and Date
- Fire Ignition
- Highways and State Routes
- Secondary Roads
- Proposed Greenstrip

Figure 18-1. Ruby Lake Estates
Fire History and
Proposed Mitigation Projects

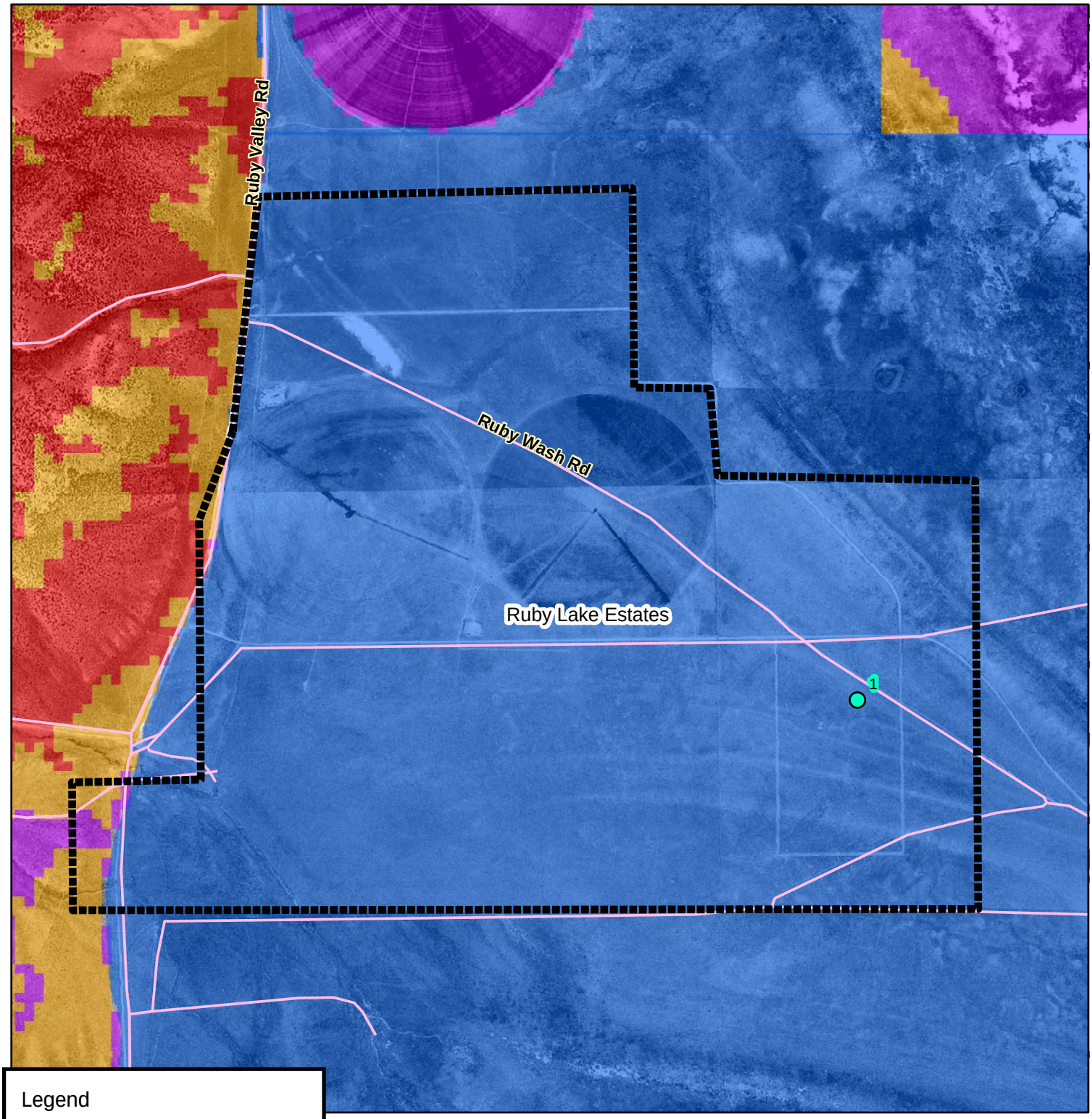
N
W E
S

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 18-2. Ruby Lake Estates
Classification of Fuel Hazard

N
W E
S

0 500 1,000 2,000
Feet

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 18-3. Ruby Lake Estates Fuel Hazard Photo Point



Ruby Lake Estates Photo Point 1 – 446393N, 0632091E, 290°NW. Vegetative fuels in the community consist primarily of big sagebrush, rabbitbrush, perennial grasses, and cheatgrass. The fuel hazard was considered moderate and fuel loads estimated at one to four tons per acre.

19.0 TEN MILE

19.1 RISK AND HAZARD ASSESSMENT

Ten Mile is a small community located west of State Route 228 approximately ten miles south of Elko. It is situated at an elevation of approximately 5,000 feet on the north side of South Fork Reservoir at the South Fork State Recreation Area. The community hazard assessment resulted in classifying Ten Mile in the **High Hazard** category (66 points). A summary of the factors that contributed to the hazard rating is included in Table 19-3. The primary factors that contributed to the rating were the lack of street and address signage, fire behavior factors related to fuels and topography, and limited fire suppression resources. The community boundary identified for this report is shown in Figure 19-1.

19.1.1 Community Design

Ten Mile has an intermix wildland-urban interface condition. The community is made up of homes on parcels that are one acre or larger. Structures are scattered throughout the community with no clear line of demarcation between structures and wildland fuels. There were 67 homes included in the assessment.

Access: Ten Mile is accessed by small community roads that lead from State Route 228. Some of the secondary roads are inadequate for fire suppression equipment access and two-vehicle passage.

Signage: Street signs are not visibly posted in Ten Mile. Addresses are not clearly visible on any of the homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

19.1.2 Construction Materials

Ninety-nine percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety-seven percent of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Twenty-one percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

19.1.3 Defensible Space

Less than seventy percent of homes observed in the interface meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

19.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Ten Mile is provided by the Ten Mile Volunteer Fire Department. The VFD has two stations and thirteen volunteers. Table 19-1 lists the types of local wildfire resources, cooperating partners, and equipment available to Ten Mile in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 19-1. Wildfire Suppression Resources Available to Ten Mile

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine	2	Ten Mile VFD
Type 4 Engine	1	(Ten Mile)
Type 6 Engine	2	
Type 2 Water Tender	1	
Type 1 Water Tender	2	
Type 2 Engine	1	Spring Creek Station 1 (Spring Creek)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Blake O'Donnell, Ten Mile VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression in Ten Mile includes community wells. Additional drafting sites for fire suppression include Ten Mile Creek, South Fork Reservoir, and a pond one mile away. There is one hydrant located at the South Fork State Park and one dry hydrant on Ten Mile Creek.

Fire Protection Personnel Qualifications

The Ten Mile volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year the Ten Mile VFD responds to the following annual calls:

- Ten to fifteen emergency medical calls.
- Fifteen to twenty wildland/brush fire calls.

19.1.5 Factors Affecting Fire Behavior

The vegetative fuel density and fuel hazard throughout much of the Ten Mile interface area is generally moderate, estimated at two to four tons per acre. Fuels in the community consist primarily of sagebrush, and rabbitbrush. Ground fuels include perennial grasses, halogeton, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes in years of higher than average precipitation. Higher fuel hazards are attributed to an increased occurrence of juniper at higher elevations. In areas that have previously burned, crested wheatgrass is the dominant species intermixed with

sagebrush and rabbitbrush. The terrain within the community boundary is generally gently sloping, although some slopes reach twenty percent. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area and a history of large fires.

The Bureau of Land Management Elko Field Office constructed a greenstrip along the southwest and east sides of the Ten Mile community in 2004 (Figure 19-1). Sagebrush fuels were removed within a minimum 300-foot wide treatment area. The treatment area was seeded with perennial grass species. During the summer of 2005, the BLM maintained the greenstrip by mowing the quickly established seeding.

19.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Ten Mile would come from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions south and west of the community area with strong erratic winds could push fires through the community.

19.1.7 Ignition Risk Assessment

Ten Mile has a high ignition risk based on fire history in the area, and the potential for increased fuel loading from annuals in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Ten Mile is lightning, although human caused ignitions are unpredictable and can occur at any time.

19.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Ten Mile area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

19.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, outbuildings, and equipment and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[15] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain the defensible space as needed.

19.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Ten Mile VFD and Nevada Division of Forestry

- Coordinate additional shrub thinning treatments on private lands throughout the community, especially in areas that have not previously burned. Thin shrubs to reduce overall shrub density by fifty percent.

Elko County

- Continue to reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

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

19.2.3 Fire Suppression Resources

Ten Mile VFD and Nevada Division of Forestry

- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.
- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.

19.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

19.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Ten Mile VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

19.3 SUMMARY OF RECOMMENDATIONS

Table 19-2. Ten Mile Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Ensure residential addresses are easily visible from the road.
Elko County	Fuels Reduction	Continue to reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Electric Utility	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Ten Mile VFD and Nevada Division of Forestry	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community. Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 19-3. Ten Mile Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

67 Total Houses **11 Residential Streets**

B5. Street Signs

11 not visible | 0 visible | 0% visible

B6. Address Signs

67 not visible | 0 visible | 0% visible

C1. Roofs

2 combust | 65 not combust | 97% not combust

C2. Siding

1 combust | 66 not combust | 99% not combust

C3. Unenclosed Structures on Lot

14 not enclosed | 53 enclosed | 21% not enclosed

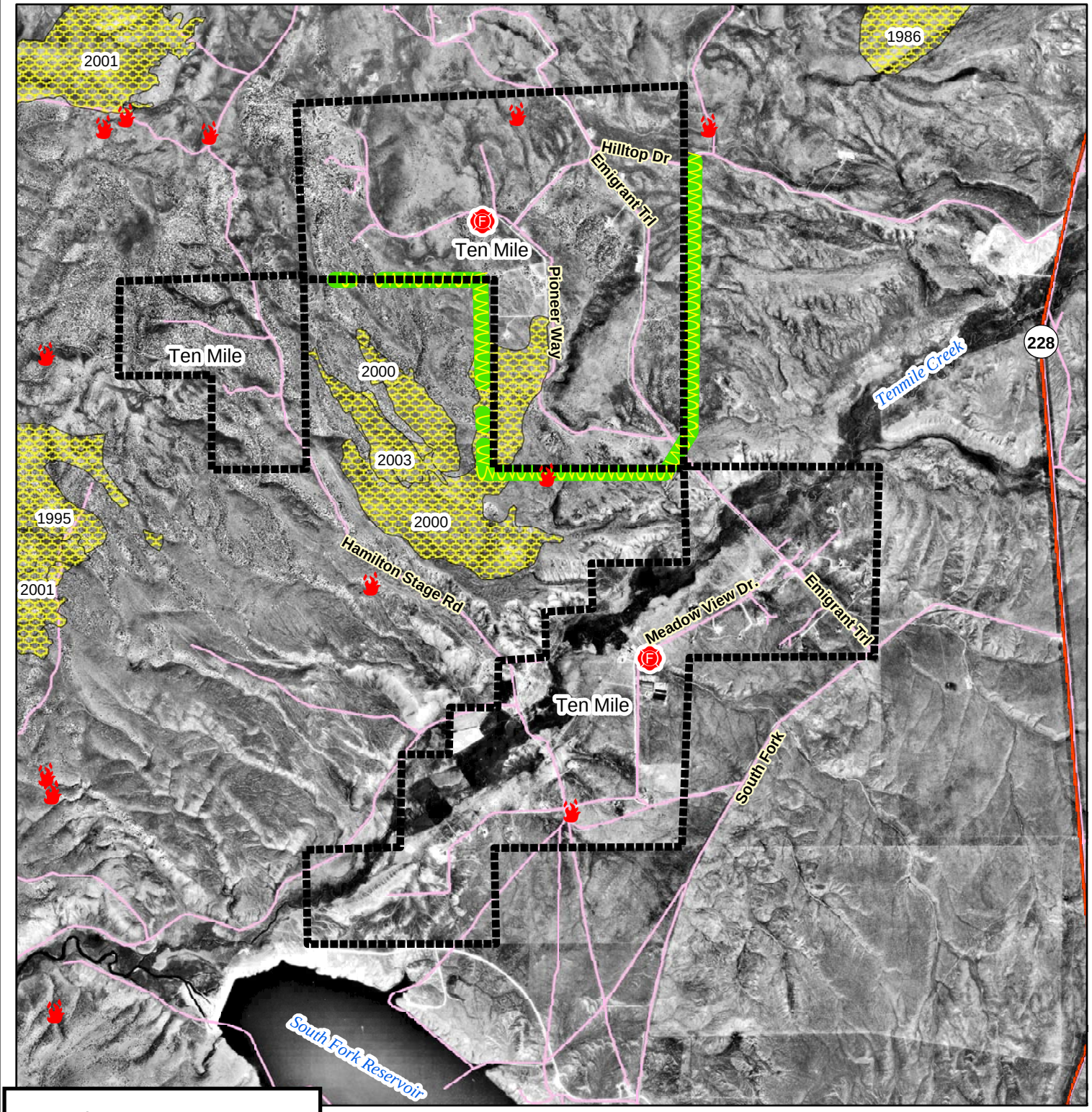
D1. Lot Sizes

0 <1ac | 39 >1ac <10ac | 28 >10ac

D2. Defensible Space

21 not adequat | 46 adequate | 69% adequate

Score **66** /128



Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Existing BLM Greenstrip
- Highways and State Routes
- Secondary Roads

Figure 19-1. Ten Mile
Fire History, Suppression Resources,
and Mitigation Projects

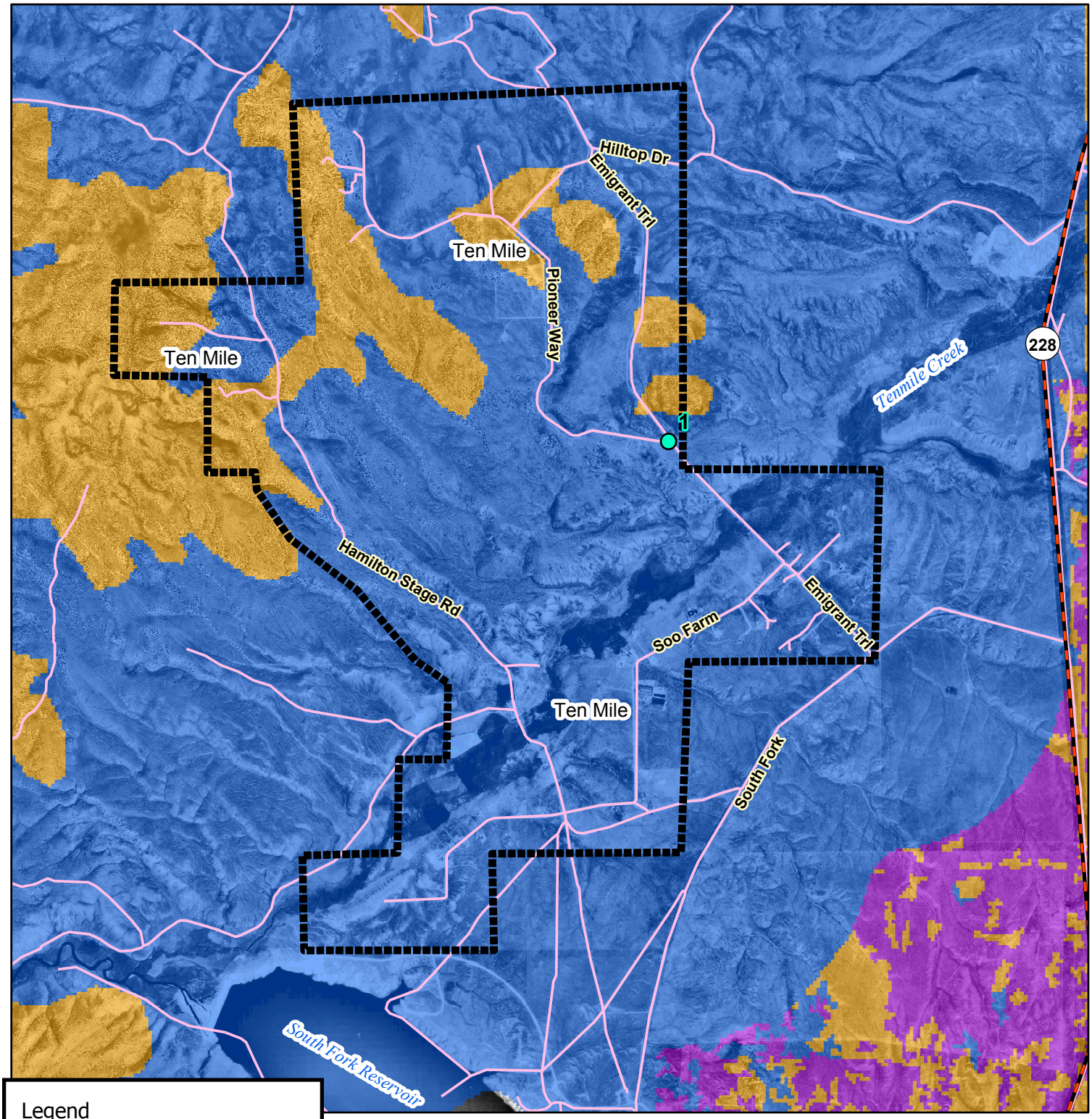
N
W E
S

0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

- Community Boundary
- Highways and State Routes
- Secondary Roads

Fuel Hazard

- Extreme
- High
- Moderate
- Low
- Fuel Photo Point

Figure 19-2. Ten Mile
Classification of Fuel Hazard

N
W E
S

0 0.5 1 2
Miles

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(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 19-3.Ten Mile Fuel Hazard Photo Point



Ten Mile Fuel Hazard Photo Point 1 - 4509121N, 606517E, 350°NE. Vegetative fuel loads in Ten Mile were considered a moderate hazard. Ground fuels in the community consist of cheatgrass, perennial grasses, and halogeton. Sagebrush and rabbitbrush are the dominant species in the shrub layer.

20.0 TUSCARORA

20.1 RISK AND HAZARD ASSESSMENT

Tuscarora is a small community located approximately eight miles west of State Route 226 in Independence Valley which is in northwest Elko County. Tuscarora is situated at an elevation of approximately 6,100 feet. Tuscarora was founded as a mining town in 1867. Approximately twenty people currently reside in the community. The community hazard assessment resulted in classifying Tuscarora in the **High Hazard** category (67 points). A summary of the factors that contributed to the hazard rating is included in Table 20-3. The primary factors that contributed to the rating were inadequate signage and defensible space, limited fire protection, some construction factors, and topography. The community boundary identified for this report is shown in Figure 20-1.

20.1.1 Community Design

Tuscarora has an intermix wildland-urban interface condition. Structures are scattered throughout the community and in wildland fuels with no clear line of demarcation between structures and wildland fuels. All 27 homes included in the assessment are on lots of one acre or less.

Access: Tuscarora is accessed by roads leading from State Route 226. The roads are between twenty to 24 feet wide and have adequate turnaround space for fire suppression equipment, although the majority of the roads are steeper than five percent grade.

Signage: Street signs are clearly posted on two of the three community roads. Only one residence has a clearly visible address. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

20.1.2 Construction Materials

Seventy percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Fifteen percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

20.1.3 Defensible Space

Seventy percent of the homes observed meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire. The greatest fuel threat within the community is from homes with inadequate defensible space and from the numerous old, weathered buildings in town.

20.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Tuscarora is provided by the Independence Valley Volunteer Fire Department, staffed by ten volunteers. Table 20-1 lists the types of local wildfire resources and equipment available for initial response to Tuscarora in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 20-1. Wildfire Suppression Resources Available to Tuscarora

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine	1 1	Independence Valley VFD (Independence Valley)
Type 3 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 6 Engine	1	US Forest Service (Mountain City)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Jay Wright, Independence Valley VFD Fire Chief.

The Independence Valley VFD has some old, outdated equipment (1977 Dodge 4x4 and a 1974 6x6). It is important that fire suppression equipment be adequate and in proper working condition in order for fire protection personnel to be able to protect the community in the event of a wildfire.

Water Sources and Infrastructure

Water available for fire suppression in Tuscarora includes:

- Hydrants within 500 feet of structures with a flow of approximately 300gpm.
- One well at the Independence Valley Fire Station.
- Two gravity-fed water storage tanks totaling 129,000 gallons.

Ranch ponds in the area could be used as draft sources. There is also a large mine pond at the south end of the community.

Fire Protection Personnel Qualifications

The Independence Valley VFD firefighters have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Independence Valley VFD responds to an annual average of two to three wildland/brush fire calls.

20.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Tuscarora interface area is light to moderate, with fuel loads estimated at one to three tons per acre. The fuel hazard is generally high within the community and surrounding the community. Fuels in the community consist primarily of big sagebrush and rabbitbrush, with perennial grasses and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years of higher than average precipitation. Fuel hazard mapping is shown in Figure 20-2. Fuel hazard photo points are shown in Figure 20-3. Within the community boundary the topography varies from flat with south aspect slopes on the east side reaching twenty percent. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The Nevada Division of Forestry in conjunction with the Bureau of Land Management, Elko Field Office completed a 300-foot wide greenstrip near Tuscarora, as shown in Figure 20-1. The project implementation began in 2001 and was completed in June of 2003. Brush was removed using both mechanical mastication equipment and hand treatments. A rangeland drill was used to seed the greenstrip with crested wheatgrass. Control of whitetop (or Hoary cress) (*Cardaria draba)* using herbicide treatments was also completed.

20.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Tuscarora would come from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions and strong erratic winds could push fires into the community from any direction. This historic community is at risk due to poor defensible space, old weathered historic buildings, an old water system, and additional suppression resources over two hours away.

20.1.7 Ignition Risk Assessment

Tuscarora has a high ignition risk based on fire history in the area and the potential for increased fuel loading from annuals in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Tuscarora is lightning, although human caused ignitions are unpredictable and can occur at any time.

20.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Tuscarora area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

20.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended

defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[16] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain the defensible space as needed.

20.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site.

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

Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Electric Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

20.2.3 Fire Suppression Resources

Independence Valley VFD and Nevada Division of Forestry

- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.
- Upgrade fire apparatus for the VFD.

20.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

20.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community

members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Independence Valley VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

20.3 SUMMARY OF RECOMMENDATIONS

Table 20-2. Tuscarora Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Independence Valley VFD and Nevada Division of Forestry	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community. Upgrade VFD radio system to narrow band technology to ensure proper communication compatibility. Upgrade fire apparatus.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 20-3. Tuscarora Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	3	/3
4. Secondary Road	3	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	5	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	2	/10
2. Department	7	/10

TALLIES

27 Total Houses **3 Residential Streets**

B5. Street Signs

1 not visible | 2 visible | 67% visible

B6. Address Signs

26 not visible | 1 visible | 4% visible

C1. Roofs

0 combust | 27 not combust | 100% not combust

C2. Siding

8 combust | 19 not combust | 70% not combust

C3. Unenclosed Structures on Lot

4 not enclosed | 23 enclosed | 15% not enclosed

D1. Lot Sizes

27 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

8 not adequat | 19 adequate | 70% adequate

Score **67** /128

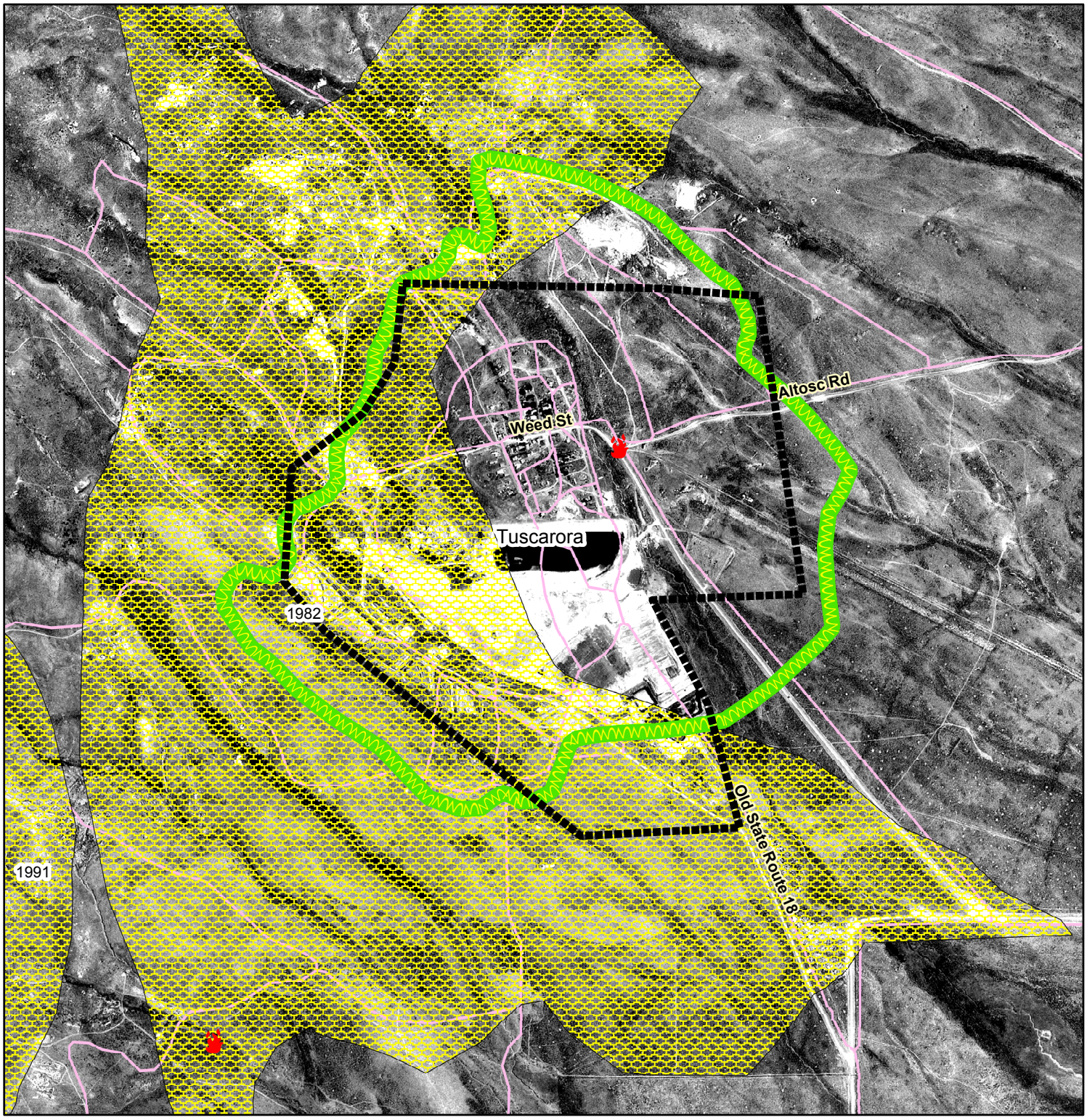


Figure 20-1. Tuscarora
Fire History and Mitigation Projects

Legend

- Community Boundary
- Fire Boundary and Date
- Fire Ignition
- Completed Greenstrip
- Secondary Roads

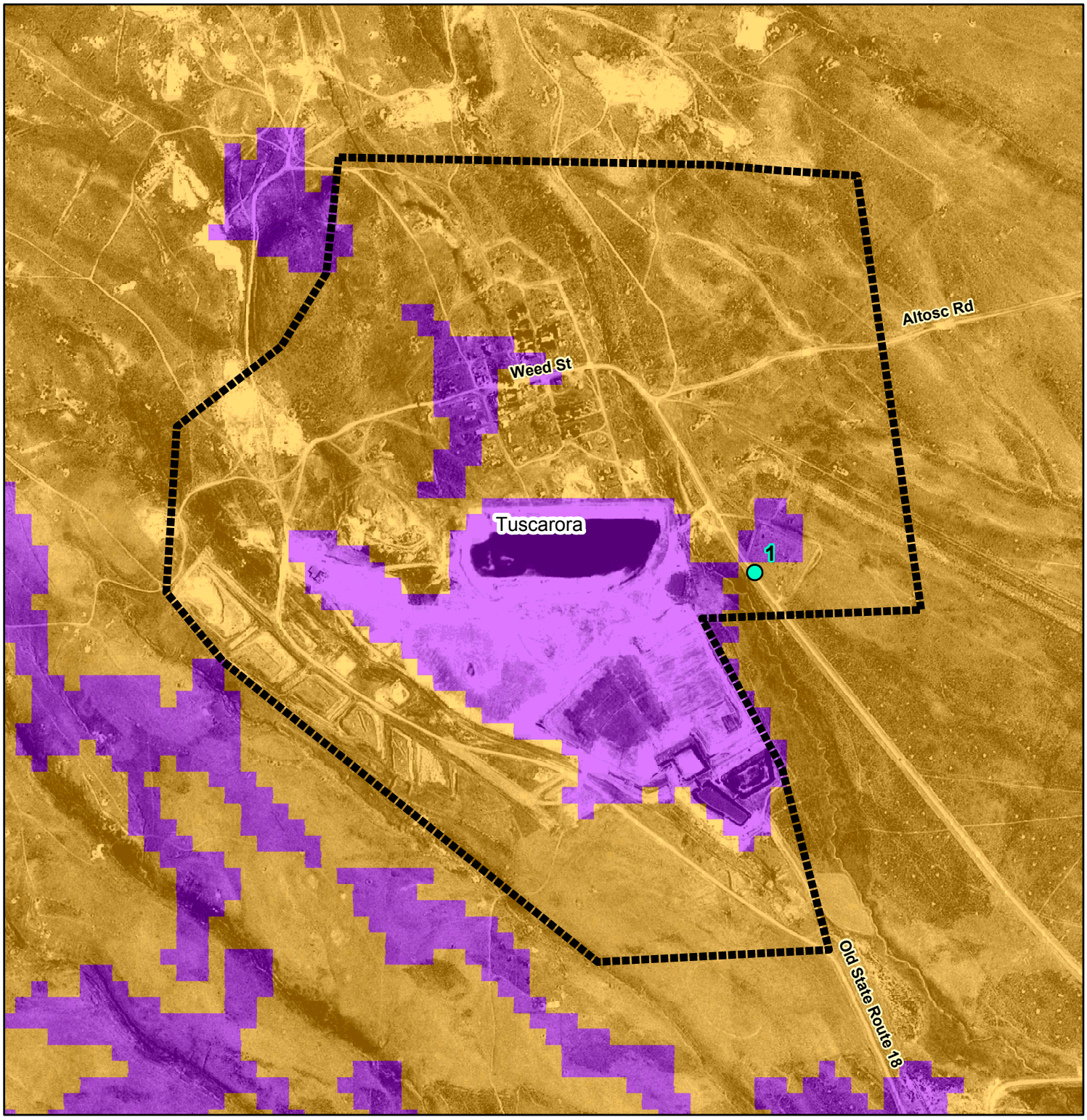
N
W E
S

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.



Legend

Community Boundary

Fuel Hazard

Extreme

High

Moderate

Low

Fuel Photo Point

Figure 20-2. Tuscarora
Classification of Fuel Hazard

N
W E
S

0 500 1,000 2,000
Feet

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Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Figure 20-3. Tuscarora Fuel Hazard Photo Point



Tuscarora Fuel Hazard Photo Point 1 - 4573614N, 565396E, 170°SE. Fuels in the community consist of sagebrush, rabbitbrush, cheatgrass, and perennial grasses that are two to four feet tall. The fuel loading is estimated at three tons per acre.

Moderate Hazard Communities

21.0 CARLIN

21.1 RISK AND HAZARD ASSESSMENT

Carlin is a small community located in northeast Nevada, 23 miles west of Elko along Interstate 80, situated at an elevation of approximately 4,900 feet. The community hazard assessment resulted in classifying Carlin in the **Moderate Hazard** category (50 points). A summary of the factors that contribute to this hazard rating is included in Table 21-3. The moderate rating is primarily attributed to inadequate address visibility, inadequate defensible space, and the potential for difficult fire control resulting from high fire intensity. Fuel hazard mapping was reviewed for Carlin and the community was found to have areas of high or extreme fuel hazards. The community boundary identified for this report is shown in Figure 21-1.

21.1.1 Community Design

The wildland-urban interface surrounding Carlin is a classic interface condition: where property and structures abut wildland fuels a clear line of demarcation exists between residential areas and wildland fuels. Roads and back fences characteristically mark this type of interface and wildland fuels do not typically continue into developed areas. There were 172 homes included in the assessment. All of the homes are on parcels of one acre or less in size.

Access: Interstate 80, State Route 766, and State Route 221 are the primary transportation routes to Carlin. There are numerous access routes into the community from these primary roads. All of the primary roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment.

Signage: Street signs are clearly posted on all streets and addresses are clearly visible on three-quarters of the homes. Clear signage assists firefighters in locating homes during low visibility conditions that can occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

21.1.2 Construction Materials

Ninety-seven percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Approximately half of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

21.1.3 Defensible Space

Approximately one quarter of the homes do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

21.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Carlin is provided by the Carlin Volunteer Fire Department, which is staffed by 31 volunteers. Table 21-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Carlin in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 21-1. Carlin Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine Water Tender	2 1 1	Carlin VFD (Carlin)
Type 4 Engine	3	Bureau of Land Management (Carlin Station)
Type 6 Engine	1	Nevada Division of Forestry (Eureka County)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; William Johnston, Carlin VFD Chief

Water Sources and Infrastructure

Water available for fire suppression in Carlin includes fire hydrants within 500 feet of structures with minimum flow capacity of 500 gallons per minute. There are also four water storage tanks totaling over one million gallons, and a 200,000-gallon water tank at the UNR Fire Training Academy.

The community water system operates on gravity and electrical pumps. There are backup emergency generators to run the pumps in the event of an electrical power outage.

Fire Protection Personnel Qualifications

The Carlin volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Carlin VFD responded to 225 calls in 2003:

- 150 emergency medical calls.
- 50 wildland/brush fire calls.
- 25 other calls.

21.1.5 Factors Affecting Fire Behavior

Fuels in the community primarily consist of rabbitbrush, sagebrush, cheatgrass, and Russian thistle in disturbed areas. Fuel loading is estimated at two to four tons per acre, with the heavier density fuels located in drainages west of the community and along the railroad. The fuel hazard is generally moderate; however, in the heavier density fuel areas the fuel hazard is high. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. The terrain within the community boundary is mostly flat with little or no slope; however, there are mountains to the south and north of the community. The prevailing wind direction is from the southwest and west. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

21.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Carlin would be a fire starting southwest of town along the railroad tracks with strong southwest winds pushing the fire through brush, annual grasses, and invasive weeds into structures. The town has many areas with heavy vegetation and extensive debris that could carry fire and threaten structures.

21.1.7 Ignition Risk Assessment

Carlin has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The primary risks of ignition in Carlin are lightning, highway traffic, and the railroad.

21.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Carlin area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

21.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix F for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[17] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Install spark arrestors on chimneys.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.

21.2.2 Fuel Reduction Treatment

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the

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

likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Carlin VFD and Nevada Division of Forestry

- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for fire personnel.
- Develop and enforce brush clearance and biomass disposal programs.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Union Pacific Railroad

- 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. Maintain low growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.
- Clear all vegetation between the railroad tracks and structures along the railroad right-of-way.

21.2.3 Fire Suppression Resources

Carlin VFD and Nevada Division of Forestry

- Upgrade the VFD communication system to narrow band technology to assure communication compatibility.
- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.
- Develop a mutual aid agreement with the UNR Fire Training Academy in Carlin for response with a Type 1 engine.

21.2.4 Community Coordination

Carlin VFD and Nevada Division of Forestry

- Conduct courtesy inspections of defensible space condition and defensible space treatments on private property.

City of Carlin

- Continue to require all future development in the community to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.

Property Owners

- Ensure residential addresses are easily visible from the road. The best place to post an address is where the driveway meets the road. Address characters should be at least four inches tall and reflective on a dark background. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

21.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Carlin VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

Table 21-2. Carlin Risk and 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 the defensible space annually.
	Community Coordination	Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks. Clear all vegetation between the railroad tracks and structures along the railroad right-of-way.
City of Carlin	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access.
Carlin VFD and Nevada Division of Forestry	Fuels Reduction	Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for fire personnel.
	Fire Suppression Resources	Upgrade the VFD communication system to narrow band technology to assure communication compatibility. Continue to meet annually with the cooperating agencies to discuss their pre-attack plan for the community. Develop a mutual aid agreement with the UNR Fire Training Academy in Carlin for response with a Type 1 engine.
	Community Coordination	Conduct courtesy inspections of defensible space condition and defensible space treatments on private property.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 21-3. Carlin Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	3	/5
7. Utilities	3	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	5	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	5	/10

TALLIES

172 Total Houses **15 Residential Streets**

B5. Street Signs

0 not visible | 15 visible | 100% visible

B6. Address Signs

20 not visible | 152 visible | 88% visible

C1. Roofs

0 combust | 172 not combust | 100% not combust

C2. Siding

5 combust | 167 not combust | 97% not combust

C3. Unenclosed Structures on Lot

91 not enclosed | 81 enclosed | 53% not enclosed

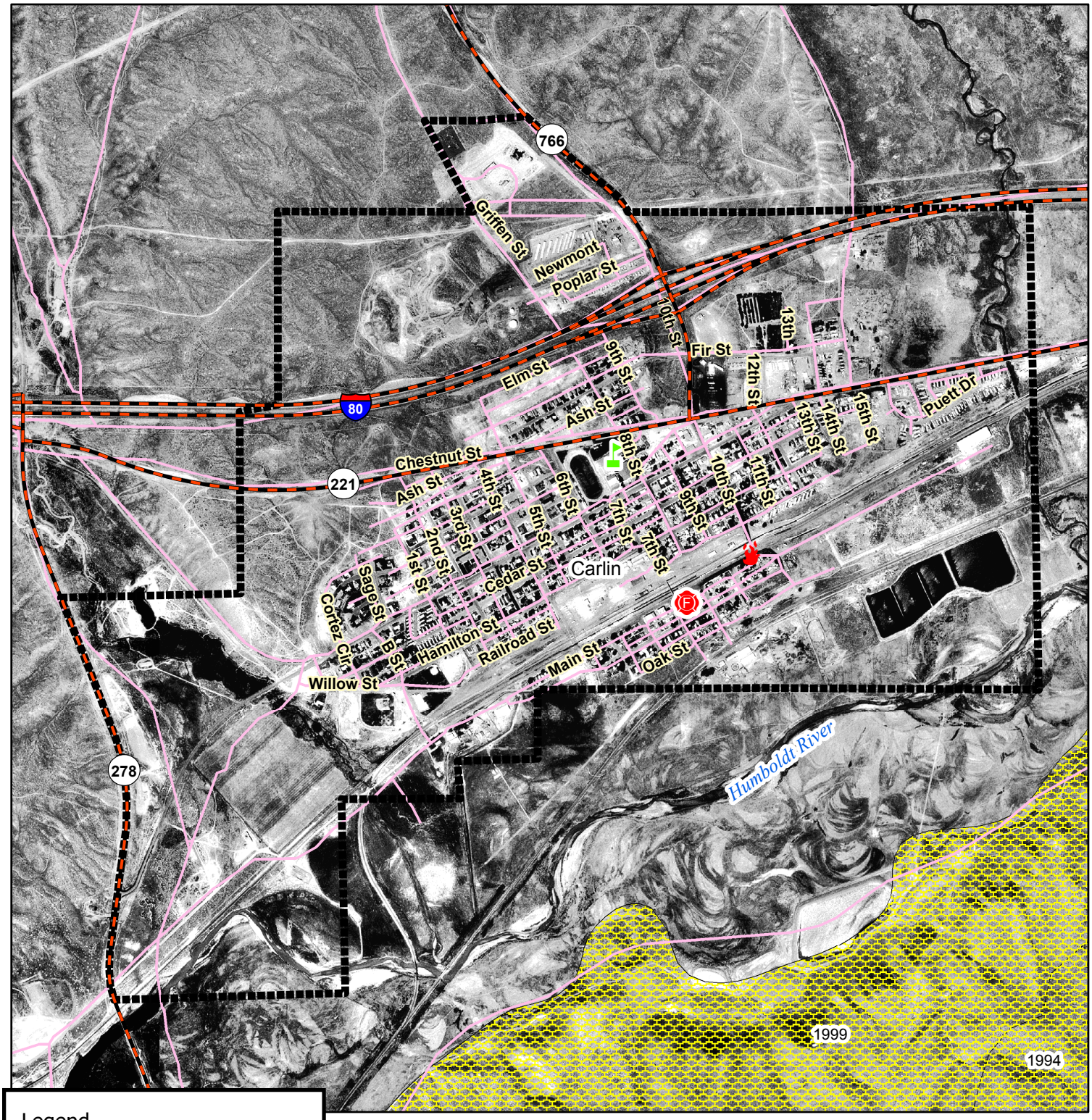
D1. Lot Sizes

172 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

52 not adequat | 120 adequate | 70% adequate

Score **50** /128



Legend

- Community Boundary
- School
- Fire Station
- Fire Ignition
- Fire Boundary
- Highways and State Routes
- Secondary Roads

Figure 21-1. Carlin
Fire History, Suppression Resources,
and Critical Features

N
W E
S

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

22.0 CURRIE

22.1 RISK AND HAZARD ASSESSMENT

Currie is located in southeast Elko County along Highway 93, between the Cherry Creek Range and Dolly Varden Mountains. Currie is situated at approximately 5,800 feet in elevation. The community hazard assessment resulted in classifying Currie in the **Moderate Hazard** category (50 points). A summary of the factors that contribute to this hazard rating is included in Table 22-3. The primary factors that contribute to the moderate rating are poor access, lack of water for fire suppression, and no local fire department. The community boundary identified for this report is shown in Figure 22-1.

22.1.1 Community Design

The wildland-urban interface surrounding Currie is an intermix condition: structures and wildland fuels are scattered throughout the community, with no clear line of demarcation separating structures and wildland fuels. Four homes were included in the assessment; all of the homes are on parcels less than one acre in size.

Access: US Highway 93 is the primary transportation route through Currie. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment.

Signage: Street signs and residential addresses were not heavily weighted in the assessment for the four homes located along the highway in Currie. While clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire, it is unlikely that fire protection personnel would be unable to rapidly locate any home in the community threatened by wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

22.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard and fire resistant roofing materials made of composition materials, metal, or tile. Half of the homes have unenclosed porches, decks, or balconies that can create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

22.1.3 Defensible Space

One of the homes observed in the interface does not meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

22.1.4 Suppression Capabilities

Wildfire Protection Resources

There is no organized fire department in Currie. The closest suppression resources are at the Cherry Creek Volunteer Fire Department in White Pine County. Table 22-1 lists the types of wildfire resources, cooperating partners and equipment available for initial response to Currie in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 22-1. Currie Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engines SEAT	1 1	Bureau of Land Management (Wells)
Type 3 Engine Type 6 Engine Water Tender (2,000 gallon)	1 1 1	Steptoe/Cherry Creek VFD (Cherry Creek)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management (Elko Helibase)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO; John Evans, Steptoe/Cherry Creek VFD Chief.

Water Sources and Infrastructure

There is no designated water source for fire suppression. Water may be available from local wells, ponds, and streams.

22.1.5 Factors Affecting Fire Behavior

The community lies at the south end of a north-south valley with mountains to the west, east and south. The terrain within the community boundary is generally flat. The prevailing wind direction is from the south and southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area. The vegetative fuel density in the Currie interface area is generally moderate, estimated at two to three tons per acre and considered a moderate fuel hazard. Fuels in the community consist primarily of basin wildrye, greasewood, rabbitbrush, perennial grasses, halogeton, and other annuals. In the hills east of Currie, the fuel loading of sagebrush and halogeton is less than one ton per acre with a low fuel hazard.

22.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Currie would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Erratic winds from thunderstorms could drive the fire into the community from any direction and threaten structures before suppression resources could arrive.

22.1.7 Ignition Risk Assessment

Currie has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annuals in high precipitation years. There is a moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Currie is lightning, although human caused ignitions are unpredictable and can occur at any time.

22.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for Currie focus primarily on the ongoing and additional efforts to create and maintain defensible space, and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

22.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain the defensible space as needed.

22.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower

volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Nevada Department of Transportation

- Reduce vegetation and maintain Highway 93 by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

22.2.3 Fire Suppression Resources

Nevada Division of Forestry

- Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.

Table 22-2. Currie Risk and 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 the defensible space as needed.
Nevada Department of Transportation	Fuels Reduction	Reduce vegetation and maintain Highway 93 by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Nevada Division of Forestry	Fire Suppression	Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.

Table 22-3. Currie Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	10	/10

TALLIES

4 Total Houses **1 Residential Streets**

B5. Street Signs

0 not visible | 1 visible | 100% visible

B6. Address Signs

0 not visible | 4 visible | 100% visible

C1. Roofs

0 combust | 4 not combust | 100% not combust

C2. Siding

0 combust | 4 not combust | 100% not combust

C3. Unenclosed Structures on Lot

2 not enclosed | 2 enclosed | 50% not enclosed

D1. Lot Sizes

3 <1ac | 1 >1ac <10ac | 0 >10ac

D2. Defensible Space

1 not adequat | 3 adequate | 75% adequate

Score **50** /128

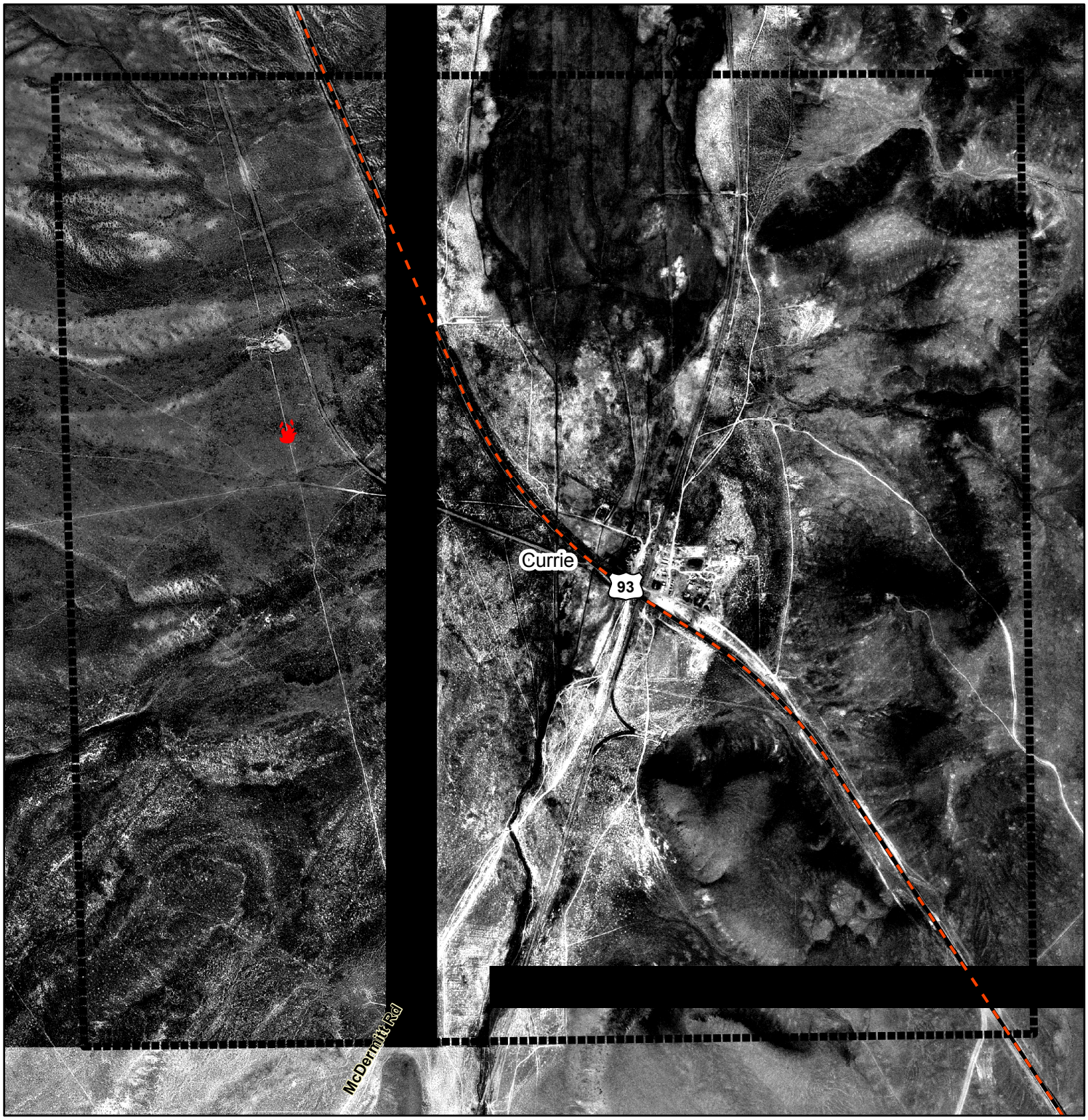


Figure 22-1. Currie
Fire History

N
W E
S

Legend

- Community Boundary
- Fire Ignition
- Highways and State Routes

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

23.0 ELBURZ

23.1 RISK AND HAZARD ASSESSMENT

Elburz is located approximately twenty miles east of Elko along Interstate 80 at an elevation of approximately 5,210 feet. The community hazard assessment resulted in classifying Elburz in the **Moderate Hazard** category (52 points). A summary of the factors that contribute to this hazard rating is included in Table 23-3. The moderate rating is primarily attributed to inadequate street and address signage, lack of fire protection resources, and scant water availability. The community boundary identified for this report is shown in Figure 23-1.

23.1.1 Community Design

The wildland-urban interface surrounding Elburz is an intermix condition: structures and wildland fuels are scattered throughout the community, with no clear line of demarcation separating structures and wildland fuels. Forty homes were included in this assessment. Thirty-eight of those homes are on parcels of one to ten acres in size; the remaining homes are on lots of one acre or less.

Access: Old Devil's Gate Road and Columbia River Boulevard are the access routes to Elburz from Interstate 80. The roadways are at least 24 feet wide and have adequate turnaround space for fire suppression equipment to maneuver.

Signage: Street signs are not visible on any of the streets in Elburz. Only fifteen percent of the residential addresses are visible. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

23.1.2 Construction Materials

Ninety percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing of composition materials, metal, or tile. A third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

23.1.3 Defensible Space

Eighty-five percent of the homes observed met the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

23.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection for Elburz is provided by the Ryndon Volunteer Fire Department, which is located six miles west of the community. Table 23-1 lists the types of local wildfire resources and equipment available for initial response to Elburz in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 23-1. Wildfire Suppression Resources Available to Elburz

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine	1 1	Ryndon VFD (Ryndon)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 2 Engine	1	Lee Engine Company (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bill Krohn, Ryndon VFD Chief

Water Sources and Infrastructure

There are water resources designated for fire suppression in Elburz. While there are some private wells in the area, reliable water sources are generally farther than 45 minutes away, round trip. Though the Humboldt River is nearby, the flow can be very low in this reach of the river during the summer months.

23.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Elburz interface area is generally light, estimated at one to two tons per acre and considered a moderate fuel hazard. Fuels in the community and interface area consist primarily of big sagebrush, rabbitbrush, greasewood, cheatgrass, squirreltail, and basin wildrye. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years of higher than average precipitation. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south and southwest. There is a history of afternoon summer thunderstorms and dry lightning strikes in the area.

23.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Elburz would start south of Elburz and north of I-80 with strong winds, greater than twenty miles per hour, from the south/southwest. Mobile homes in the area could be quickly threatened before suppression resources could arrive.

23.1.7 Ignition Risk Assessment

Elburz has a moderate risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. There is a history of lightning strikes around the community. The primary risks of ignition in Elburz are lightning, auto accidents on I-80 that could spark nearby vegetation, railroad sparks, and other human caused ignitions that can occur at any time.

23.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Elburz area focus primarily on the ongoing and on additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

23.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[18] Treatments may need to be repeated for several years to

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

ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Install spark arrestors on chimneys.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.

23.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Union Pacific Railroad

- 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. Maintain low growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove biomass and disposed of it at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.

23.2.3 Fire Suppression Resources

Nevada Division of Forestry

- Install a minimum capacity 10,000-gallon water tank in the north Elburz area for fire suppression.

23.2.4 Community Coordination

Nevada Division of Forestry

- Work with the residents to develop and enforce a brush clearance and biomass disposal program to include cleaning weeds and debris from around structures and fences in the community.

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

Property Owners

- Ensure residential addresses are easily visible from the road. The best place to post an address is where the driveway meets the road. Address characters should be at least four inches tall and reflective on a dark background. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression.
- Coordinate through the ROWE Group (Ryndon, Osino, White Rock, Elburz) to form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

23.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire".* This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

23.3 SUMMARY OF RECOMMENDATIONS

Table 23-2. Elburz Risk and 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 the defensible space as needed.
	Community Coordination	Coordinate through the ROWE Group to form a local community-based organization to provide leadership and be responsible for community-wide fuel reduction treatments and community fire safety.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
Nevada Division of Forestry	Community Coordination	Develop and enforce a brush clearance and biomass disposal program to include cleaning weeds and debris from around structures and fences in the community.
	Fire Suppression Resources	Install a minimum capacity 10,000-gallon water tank in the community for fire suppression.
	Public Education	Obtain copies of the publication *"Living With Fire".* This publication is free of charge.

Table 23-3. Elburz Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	10	/10

TALLIES

40 Total Houses **9 Residential Streets**

B5. Street Signs

9 not visible | 0 visible | 0% visible

B6. Address Signs

34 not visible | 6 visible | 15% visible

C1. Roofs

0 combust | 40 not combust | 100% not combust

C2. Siding

4 combust | 36 not combust | 90% not combust

C3. Unenclosed Structures on Lot

15 not enclosed | 25 enclosed | 38% not enclosed

D1. Lot Sizes

2 <1ac | 38 >1ac <10ac | 0 >10ac

D2. Defensible Space

6 not adequat | 34 adequate | 85% adequate

Score **52** /128

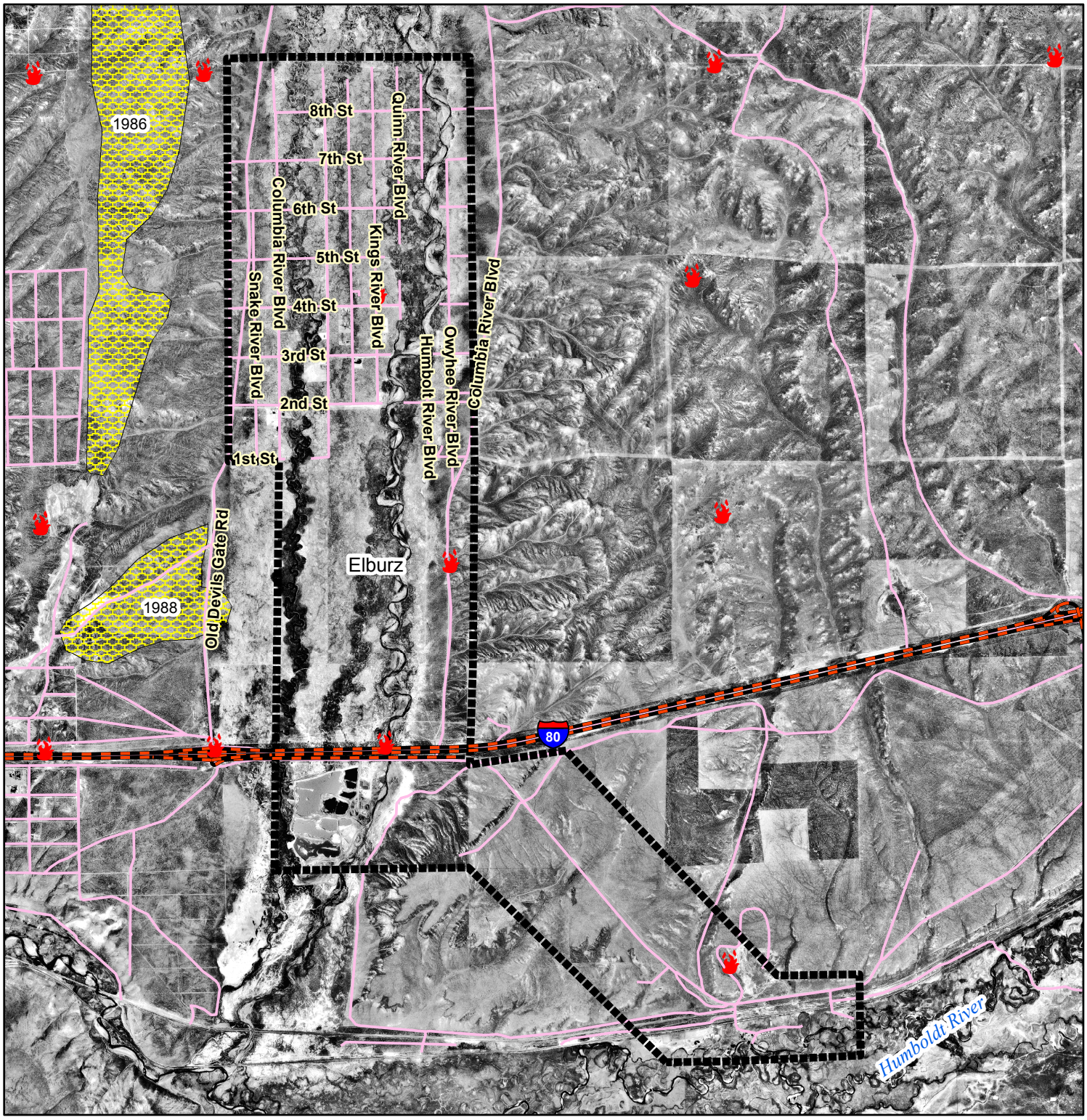


Figure 23-1. Elburz
Fire History

Legend

- Community Boundary
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

N
W E
S

0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

24.0 ELKO

24.1 RISK AND HAZARD ASSESSMENT

The city of Elko is the County seat of Elko County with a population of approximately 18,400 people. It is located on Interstate 80 at an elevation of approximately 4,500 feet. The Humboldt River runs through the town. The community hazard assessment resulted in classifying Elko in the **Moderate Hazard** category (58 points). A summary of the factors that contribute to this hazard rating is included in Table 24-3. The rating is primarily attributed to inadequate defensible space and potentially erratic fire behavior and high fire intensity that could result in difficult fire control conditions. The community boundary identified for this report is shown in Figure 24-1.

24.1.1 Community Design

The Elko wildland-urban interface has a mix of classic and intermix interface conditions. In most of the community, clear boundary between structures and wildland fuels exists. In other areas structures and wildland fuels are scattered throughout the community, with no clear separation between structures and wildland fuels. A total of 973 homes were included in the assessment: 720 on lots of one acre or less in size, 249 on parcels of one to ten acres; and four on parcels of over ten acres in size.

Access: Interstate 80 is the major transportation route through Elko. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. Some of the rural roads are narrow, steep, and in poor condition. This is especially true for the northwest side of town.

Signage: Ninety-two percent of the streets have clearly posted signs and approximately two-thirds of the homes have clearly visible addresses. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: Utilities are both above and below ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

24.1.2 Construction Materials

Ninety-six percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety-nine percent of the homes have fire resistant roofing made of composition materials, metal, or tile. One-third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

24.1.3 Defensible Space

Only two-thirds of the homes observed in the interface meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

24.1.4 Suppression Capabilities

Wildfire Protection Resources

The Elko Fire Department consists of the career department staffed by seventeen career firefighters and the Lee Company volunteers with 35 volunteer firefighters. Table 24-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Elko in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 24-1. Elko Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 3 Engine Type 4 Engine Type 5 Engine Water Tender	4 3 1 2 1	Elko Fire Department/Lee Company (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Alan Kightlinger, Elko Fire Department Chief

Water Sources and Infrastructure

Water resources available to the community for fire suppression include hydrants within 500 feet of structures with minimum flows of 500 gpm. There are nine storage tanks in the area with a total capacity of 23 million gallons. The water system is powered by gravity and electric pumps. There are emergency generators for the water system in the event of a power outage.

Fire Protection Personnel Qualifications

All Elko Fire Department and Lee Company firefighters have a minimum of State Fire Marshal Entry Level firefighting training and Nevada Division of Forestry Basic Wildland Firefighting training.

Work Load

The Elko Fire Department responded to approximately 1500 calls in 2003:

- 980 emergency medical calls.
- 30 wildland/brush fire calls.
- Over 400 other calls.

Financial Support

Funding for the Elko Fire Department is provided through the City of Elko Emergency Funds, the Elko County General Fund, and through agreements with the Nevada Division of Forestry and the Bureau of Land Management.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. The City of Elko maintains an Emergency Plan, a Pre-attack Plan, and an emergency evacuation plan. The Elko Fire Department reviews development plans and has an enforced brush clearance program. The Elko Fire Department strictly enforces the fire code and the city ordinance for minimum clearance around structures.

24.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Elko interface area is generally moderate, estimated at two to three tons per acre. The fuel hazard is moderate. Fuels consist primarily of two to four feet tall sagebrush and rabbitbrush, with an understory of cheatgrass, squirreltail, crested wheatgrass, basin wildrye, and other annuals. In the southeast area of the community pinyon and juniper trees increase the fuel loading to five to eight tons per acre, resulting in a high fuel hazard. The terrain within the community boundary is gently rolling with slopes of eight to twenty percent. The prevailing wind direction is from the south and southwest. There is a history of summer afternoon thunderstorms and dry lightning strikes in the area.

The Bureau of Land Management Elko Field Office has been actively planning and implementing fuels reduction treatments near Elko and along Interstate 80 between Elko and the Osino area. Phases I and II of the Elko North greenstrip have been completed in 2004 and 2005 respectively. The greenstrips were constructed using mechanical mastication equipment to remove sagebrush fuels. Approximately 387 acres were treated. A third phase of the greenstrip is planned for construction on the north side of Interstate 80 from Elko to the northwest boundary of Osino. The greenstrip will be 300 feet wide for a total treatment area of approximately 285 acres.

24.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Elko would start southwest of town in a year with high cheatgrass production. A strong southwest wind would drive the fire towards town, fueled by annual grasses. The fire could spot across the firebreak and spread through the brush, threatening homes in the community.

24.1.7 Ignition Risk Assessment

Elko has a moderate ignition risk based on fire history in the area and the potential for increased fuel loading from annuals in high precipitation years. The primary risk of ignition in Elko is lightning, although human caused ignitions are unpredictable and can occur at any time.

24.1.8 Completed Fuels Reduction Treatments

The Bureau of Land Management Elko Field Office has been actively planning and implementing fuels reduction treatments near Elko and along Interstate 80 between Elko and the Osino/Ryndon area. Phases I and II of the Elko North greenstrip were completed in 2004 and 2005 respectively. The City of Elko also maintains a 75 to 150 foot wide firebreak around portions of the city.

24.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Elko area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the future requirements that new developments will be planned and constructed to create fire safe communities. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

24.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-

emergent herbicide.[19] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Install spark arrestors on chimneys.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.

24.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of fifty feet from fences around power substations.

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

24.2.3 Fire Suppression Resources

Elko Fire Department

- Upgrade the communication system to narrow band technology to assure communication compatibility and include additional repeaters for adequate communication.
- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.

24.2.4 Community Coordination

Elko Fire Department

- Continue to conduct courtesy inspections of defensible space condition and defensible space treatments on private property.
- Coordinate with the appropriate agencies to improve street sign visibility.

Elko County

- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

Property Owners

- Ensure residential addresses are easily visible from the road. The best place to post an address is where the driveway meets the road. Address characters should be at least four inches tall and reflective on a dark background. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

24.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Elko Fire Department

- Distribute copies of the publication “Living With Fire” to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

24.3 SUMMARY OF RECOMMENDATIONS

Table 24-2. Elko Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines. Reduce and remove vegetation to maintain a minimum clearance of fifty feet from fences around power substations.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Elko Fire Department	Fire Suppression Resources	Upgrade the communication system to narrow band technology for communication compatibility. Continue to meet annually with the cooperating agencies to review their pre-attack plans for the community.
	Community Coordination	Continue to conduct courtesy inspections of defensible space condition and defensible space treatments on private property. Coordinate with the appropriate agencies to improve street sign visibility.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.
Elko County	Community Coordination	Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

Table 24-3. Elko Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	10	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	3	/10

TALLIES

973 Total Houses **78 Residential Streets**

B5. Street Signs

6 not visible | 72 visible | 92% visible

B6. Address Signs

281 not visible | 692 visible | 71% visible

C1. Roofs

14 combust | 959 not combust | 99% not combust

C2. Siding

41 combust | 932 not combust | 96% not combust

C3. Unenclosed Structures on Lot

333 not enclosed | 640 enclosed | 34% not enclosed

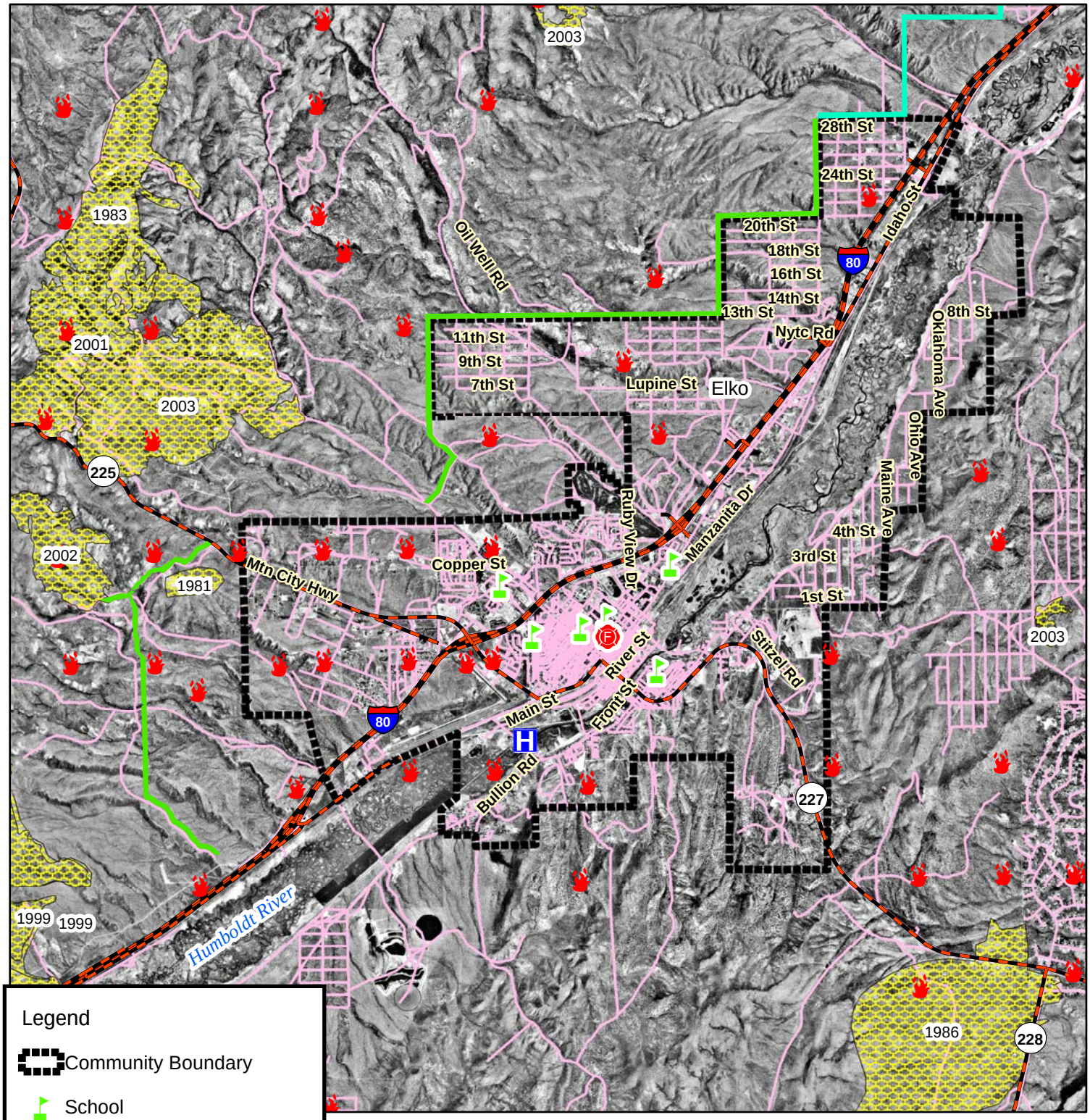
D1. Lot Sizes

720 <1ac | 249 >1ac <10ac | 4 >10ac

D2. Defensible Space

302 not adequat | 671 adequate | 69% adequate

Score **58** /128



Legend

- Community Boundary
- School
- Hospital
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads
- Existing BLM Greenstrip
- Planned BLM Greenstrip

Figure 24-1. Elko
Fire History, Suppression Resources,
Critical Features, and Mitigation Projects

N
W E
S

0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

25.0 GOLD CREEK

25.1 RISK AND HAZARD ASSESSMENT

Gold Creek is a former mining town located in northern Elko County on Forest Service Road 037. Gold Creek is situated near the confluence of Gold Creek and Martin Creek, approximately six miles northeast of Wild Horse Reservoir. The community hazard assessment resulted in classifying Gold Creek in the **Moderate Hazard** category (50 points). A summary of the factors that contribute to this hazard rating is included in Table 25-3. The moderate rating is primarily attributed to limited access, the potential for hazardous fire behavior, and the lack of an active fire department. The community boundary identified for this report is shown in Figure 25-1.

25.1.1 Community Design

The wildland interface in Gold Creek is an intermix condition: structures and wildland fuels are scattered throughout the community, with no clear separation between wildland fuels and developed properties. The community consists of a few homes, two ranches and a US Forest Service Guard Station. Sixteen homes were included in the assessment. Two of the homes are on parcels less than one acre in size and eleven of the homes are on parcels larger than ten acres.

Access: Gold Creek Road (County Road 037) is the only access in and out of Gold Creek. This narrow road does not provide adequate access, evacuation room, or turnaround space for fire suppression equipment.

Signage: Street signs and residential addresses were not heavily weighted in the assessment for the few homes and the Guard Station located in Gold Creek. While clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire, it is unlikely that fire protection personnel would be unable to rapidly locate any home or structure in the community threatened by wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

25.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard and fire resistant roofing materials such as composition roofing, metal, or tile. None of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

25.1.3 Defensible Space

All of the homes observed in the interface meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

25.1.4 Suppression Capabilities

Wildfire Protection Resources

There is no organized fire department or suppression resources in Gold Creek. Table 25-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to Gold Creek in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 25-1. Wildfire Suppression Resources Available to Gold Creek

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine	1	US Forest Service (Mountain City)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

Water available for fire suppression resources in Gold Creek is limited to ranch ponds and private wells.

25.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Gold Creek interface area is low to medium, varying in different areas of the community. On the west side fuel loading is estimated at less than one ton per acre with a low fuel hazard. Northeast of the meadow area fuel loading is estimated at four to six tons per acre with a high fuel hazard, due to the increase in moisture and moisture-dependent grasses and annuals. Fuels throughout the community consist primarily of sagebrush, rabbitbrush, and bitterbrush in some areas, cheatgrass, basin wildrye, and other annuals. The terrain within the community boundary is gently rolling. The prevailing wind direction is from the south and southwest. There is no history of fires in the immediate area.

25.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Gold Creek would come from a dry lightning storm on a late summer afternoon with multiple fire ignitions, during an above normal precipitation year and high annual grass and forb production. Strong erratic winds from thunderstorms could push fires from any direction through the Gold Creek area. With fire suppression resources more than thirty minutes away, a wildfire could exceed initial attack resources and spread rapidly.

25.1.7 Ignition Risk Assessment

Gold Creek has a low to moderate risk of ignition based on fire history in the area. The primary risk of ignition in Gold Creek is lightning, although human caused ignitions are unpredictable and can occur at any time.

25.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for Gold Creek focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

25.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Maintain the defensible space as needed.
- Install spark arrestors on chimneys.

25.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the

treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Property Owners

- Construct a 200-foot wide fuel reduction treatment in the big sagebrush fuel type on the southern aspects of Little Island Mountain around ranch structures. The brush should be masticated a minimum distance of 200 feet wide around structures.

Forest Service and Elko County

- Reduce vegetation and maintain Gold Creek Road (Forest Service 037) by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the road. Remove and disposed of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

25.2.3 Fire Suppression Resources

US Forest Service

- Station a Type 6 Engine and fire crew at the Gold Creek Guard Station during the fire season for seven-day coverage.

25.3 SUMMARY OF RECOMMENDATIONS

Table 25-2. Gold Creek Risk and 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 the defensible space condition annually.
	Fuels Reduction	Construct a 200-foot wide fuel reduction treatment in the big sagebrush fuel type on the southern aspects of Little Island Mountain around ranch structures. The brush should be masticated a minimum distance of 200 feet wide around structures.
US Forest Service **Elko County**	Fuels Reduction	Reduce vegetation and maintain Gold Creek Road by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of both sides of the road.
US Forest Service	Fire Suppression Resources	Station a Type 6 Engine and fire crew at the Gold Creek Guard Station during the fire season.

Table 25-3. Gold Creek Wildfire Hazard Rating Summary

A. Urban Interface Condition ***4***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	1	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	3	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	10	/10

TALLIES

16 Total Houses **1 Residential Streets**

B5. Street Signs

0 not visible | 1 visible | 100% visible

B6. Address Signs

0 not visible | 16 visible | 100% visible

C1. Roofs

0 combust | 16 not combust | 100% not combust

C2. Siding

0 combust | 16 not combust | 100% not combust

C3. Unenclosed Structures on Lot

0 not enclosed | 16 enclosed | 0% not enclosed

D1. Lot Sizes

2 <1ac | 0 >1ac <10ac | 11 >10ac

D2. Defensible Space

0 not adequat | 16 adequate | 100% adequate

Score **50** /128

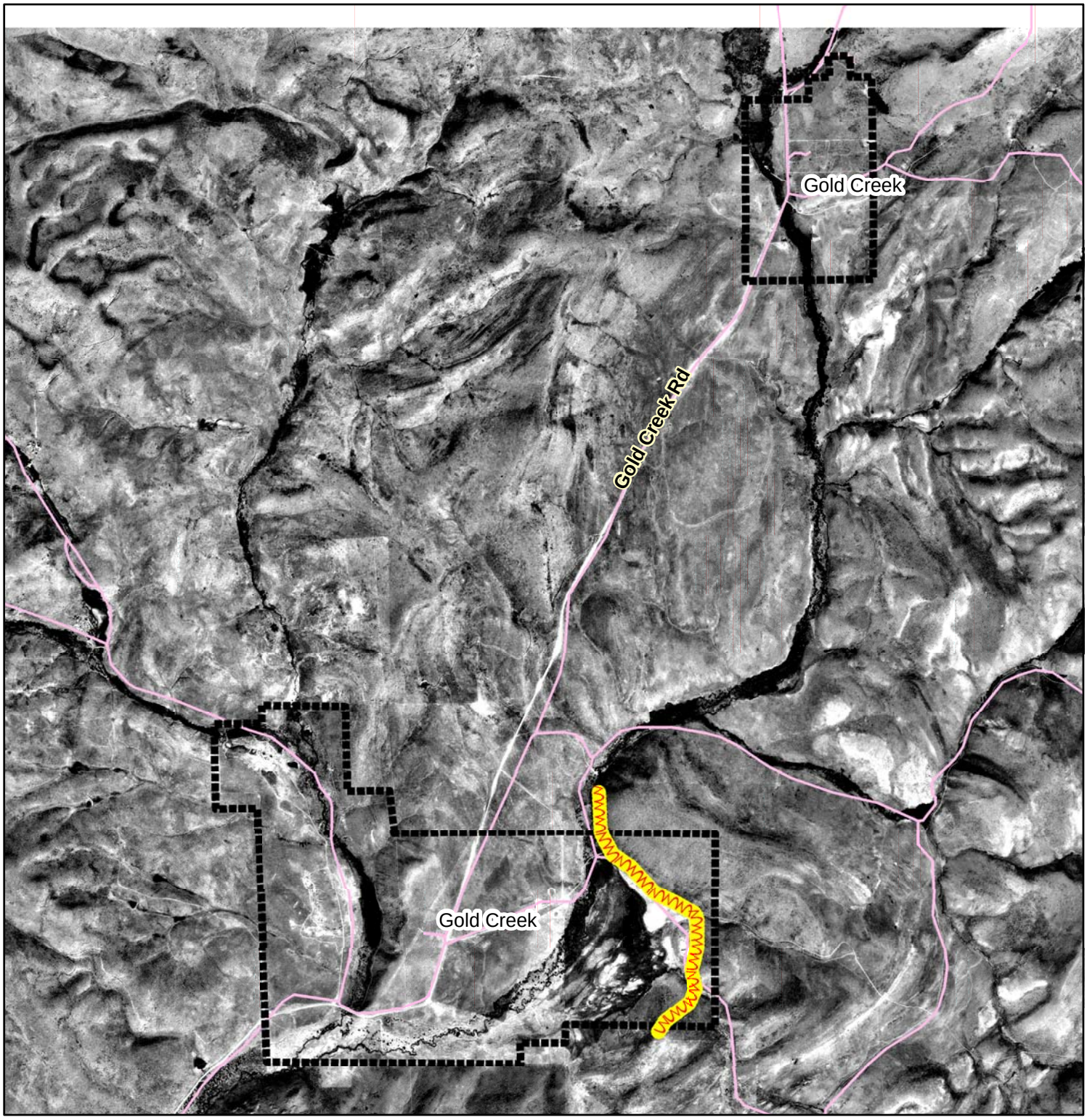


Figure 25-1. Gold Creek
Proposed Mitigation Projects

N
W E
S

Legend

Community Boundary

Fuel Reduction Treatment

Secondary Roads

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

26.0 HIDDEN VALLEY/COAL MINE CANYON

26.1 RISK AND HAZARD ASSESSMENT

Hidden Valley is a small community situated on rolling hills and surrounded by canyons in west Elko County, north of Ryndon. The elevation is approximately 5,700 feet. Coal Mine Creek flows through the valley. The community hazard assessment resulted in classifying Hidden Valley/Coal Mine Canyon in the **Moderate Hazard** category (56 points). A summary of the factors contributing to this hazard rating is included in Table 26-3. The high rating is attributed to limited access, limited fire protection resources, limited water availability, and some residential structure concerns. The community boundary identified for this report is shown in Figure 26-1.

26.1.1 Community Design

The wildland-urban interface in Hidden Canyon/Coal Mine Canyon is an intermix condition: structures and wildland fuels are scattered throughout the community, with no clear separation between wildland fuels and developed parcels. Seven homes were included in this assessment. All of the homes are on parcels of one to ten acres in size.

Access: Coal Mine Canyon Road is the primary access into the community. This road has adequate width for two-way vehicle passage and turnaround space for fire suppression equipment. Some of the secondary roads are narrow and do not have adequate width for two vehicles to pass.

Signage: One of the two residential streets in the community has a street sign. Residential addresses are visible on about half of the residences. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and to reduce the possibility that sparks could start a fire in adjacent vegetation.

26.1.2 Construction Materials

Eighty-six percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing made of composition materials, metal, or tile. Half of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

26.1.3 Defensible Space

Three quarters of the homes observed in the interface meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

26.1.4 Suppression Capabilities

Wildfire Protection Resources

Hidden Valley/Coal Mine Canyon does not have a local fire department. The closest fire suppression resources are located in Ryndon, approximately thirty minutes to the south. Table 26-1 lists the type of local wildfire resources and equipment available for initial response to Hidden Valley/Coal Mine Canyon in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 26-1. Hidden Valley/Coal Mine Canyon Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine Type 2 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 2 Engine Type 6 Engine	1 1	Ryndon VFD (Ryndon)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Engine	1	Lee Engine Company (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bill Krohn, Ryndon VFD Chief

Water Sources and Infrastructure

Water available for fire suppression resources in Hidden Valley/Coal Mine Canyon is limited to private wells. Additional water resources are farther than 45 minutes away round trip.

26.1.5 Factors Affecting Fire Behavior

Fuels in the community consist primarily of moderately dense big sagebrush, rabbitbrush, and wild rose. The ground fuels consist of cheatgrass, squirreltail, and basin wildrye. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. The fuel load was estimated between one and two tons per acre and was considered a moderate fuel hazard. Pockets of heavier fuels exist along the drainage bottoms where sagebrush is between eight and ten feet tall. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

26.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the Hidden Valley/Coal Mine Canyon area would start south of the community with a strong south wind pushing the fire to the north. A wildland fire could rapidly be pushed through dense shrubs and ground fuels, and quickly threaten homes before suppression resources could arrive.

26.1.7 Ignition Risk Assessment

Hidden Valley/Coal Mine Canyon has a moderate risk of ignition. There is a moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Hidden Valley/Coal Mine Canyon is lightning, although human caused ignitions are unpredictable and can occur at any time.

26.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Hidden Valley/Coal Mine Canyon area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

26.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-

emergent herbicide.[20] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Install spark arrestors on chimneys.
- Remove or board up abandoned trailers and other structures to prevent ignition from sparks or firebrands.

26.2.2 Community Coordination

Elko County

- Coordinate with the appropriate agencies to improve street sign visibility.
- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

Property Owners

- Ensure residential addresses are easily visible from the road. The best place to post an address is where the driveway meets the road. Address characters should be at least four inches tall and reflective on a dark background. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

26.2.3 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

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

Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

26.3 SUMMARY OF RECOMMENDATIONS

Table 26-2. Hidden Valley/Coal Mine Canyon Risk and 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 the defensible space condition annually.
	Community Coordination	Post addresses so they are visible from the road.
Elko County	Community Coordination	Coordinate with the appropriate agencies to improve street sign visibility. Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
Nevada Division of Forestry	Public Education	Distribute copies of the publication "*Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

Table 26-3. Hidden Valley/Coal Mine Canyon Wildfire Hazard Rating Summary

A. Urban Interface Condition	2	
B. Community Design		
1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	5	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5
C. Construction Materials		
1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5
D. Defensible Space		
1. Lot Size	3	/5
2. Defensible Space	1	/15
F. Fire Behavior		
1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10
E. Suppression Capabilities		
1. Water Source	10	/10
2. Department	10	/10
Score	56	/128

TALLIES

7 Total Houses — **2 Residential Streets**

B5. Street Signs

0	not visible	2	visible	100%	visible

B6. Address Signs

0	not visible	7	visible	100%	visible

C1. Roofs

0	combust	7	not combust	100%	not combust

C2. Siding

1	combust	6	not combust	86%	not combust

C3. Unenclosed Structures on Lot

3	not enclosed	4	enclosed	43%	not enclosed

D1. Lot Sizes

0	<1ac	7	>1ac <10ac	0	>10ac

D2. Defensible Space

2	not adequat	5	adequate	71%	adequate

(Corrected)

Table 26-3. Hidden Valley/Coal Mine Canyon Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	5	/5
5. Street Signs	5	/5
6. Address Signs	3	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	10	/10

TALLIES

7 Total Houses **2 Residential Streets**

B5. Street Signs

2 not visible | 0 visible | 0% visible

B6. Address Signs

1 not visible | 6 visible | 86% visible

C1. Roofs

0 combust | 7 not combust | 100% not combust

C2. Siding

1 combust | 6 not combust | 86% not combust

C3. Unenclosed Structures on Lot

3 not enclosed | 4 enclosed | 43% not enclosed

D1. Lot Sizes

0 <1ac | 7 >1ac <10ac | 0 >10ac

D2. Defensible Space

2 not adequat | 5 adequate | 71% adequate

Score **60** /128

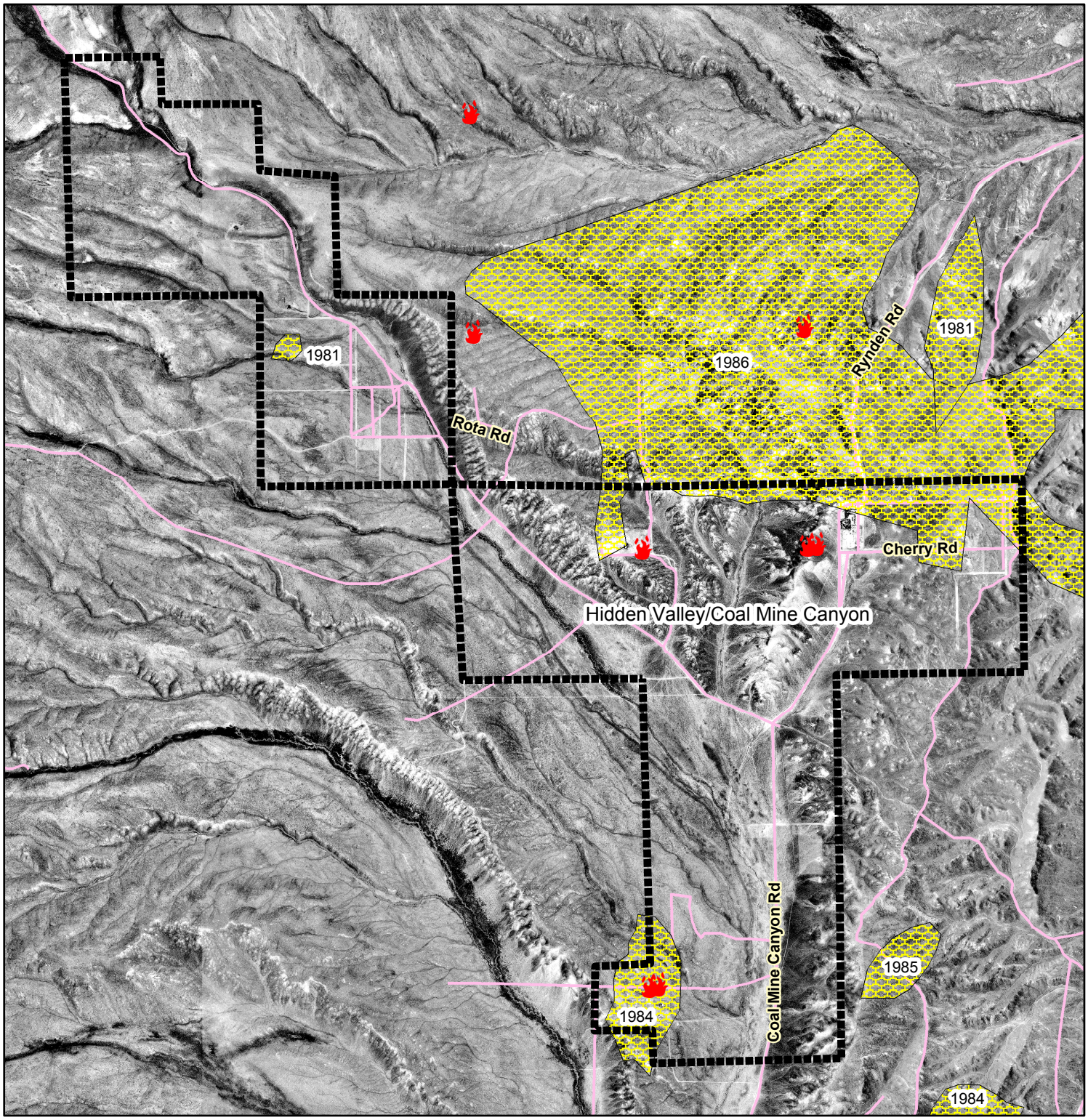


Figure 26-1. Hidden Valley/Coal Mine Canyon Fire History

N
W E
S

Legend

- Community Boundary
- Fire Ignition
- Fire Boundary and Date
- Secondary Roads

0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

27.0 HUMBOLDT RANCHETTES

27.1 RISK AND HAZARD ASSESSMENT

Humboldt Ranchettes, also known as River Ranch Estates is located at the northwest end of Starr Valley, approximately thirty miles east of Elko. The community hazard assessment resulted in classifying Humboldt Ranchettes in the **Moderate Hazard** category (51 points). A summary of the factors that contribute to this hazard rating is included in Table 27-3. The moderate rating is attributed to limited street and address signage, a high number of unenclosed architectural features, and some factors related to potential fire behavior. The community boundary identified for this report is shown in Figure 27-1.

27.1.1 Community Design

The wildland-urban interface in the Humboldt Ranchettes is an intermix condition: structures and wildland fuels are scattered throughout the community with no clear separation between wildland fuels and developed parcels. Thirty-nine homes were included in the assessment; all of the homes are on parcels between one and ten acres in size.

Access: Interstate 80 is the primary access road to Humboldt Ranchettes. There are numerous secondary community roads. The community is designed in a grid pattern. The interstate and community roads are of adequate width, grade, and turnaround space for fire suppression equipment.

Signage: All of the street signs in the community are clearly posted. Only 36 percent of the homes have visible addresses. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: The utilities are all above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

27.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials. Likewise, all of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Nearly half of the homes have unenclosed porches, decks, or balconies that can create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

27.1.3 Defensible Space

Twenty-one percent of the homes do not meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

27.1.4 Suppression Capabilities

Wildfire Protection Resources

There is no organized fire department of fire suppression resources in the Humboldt Ranchettes community. Fire protection is provided by the Deeth/Star Valley VFD. The Deeth/Starr Valley VFD had six volunteers at the time that interviews were conducted for this assessment and one fire station in Deeth. An engine is placed seasonally at the Howell Ranch in northeastern Starr Valley. Table 27-1 lists the types of wildfire resources and equipment available for initial response to Humboldt Ranchettes in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 27-1. Humboldt Ranchettes Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender Type 4 Engine	1 1 1	Deeth VFD (Howell Ranch)
Type 3 Engine	1	Wells VFD (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells - seasonal)
Type 2 Engine	1	Nevada Division of Forestry (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Walt Howell, Deeth/Starr Valley VFD Chief.

Water Sources and Infrastructure

Water available for fire suppression resources for the Humboldt Ranchettes includes individual private wells, seasonal springs and streams, and the Humboldt River. There is more than a twenty minute turn around time to ponds or individual ranch tanks in Starr Valley. Several irrigation wells and wheel lines in the valley are equipped with fire hose connections to fill fire apparatus.

27.1.5 Factors Affecting Fire Behavior

Fuels primarily consist of big sagebrush, rabbitbrush, squirreltail, crested wheatgrass, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Fuel loading was estimated at one to three tons per acre and is considered a moderate fuel hazard. The terrain within the community boundary is flat to gently rolling. The prevailing wind direction is from the south and southwest up the Humboldt River valley. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

27.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Humboldt Ranchettes would start during a year of normal or above normal precipitation and high annual grass and forb

production. A dry lightning storm with multiple ignitions south and west of the community boundaries with strong southwest to west winds could push a fire toward the community and toward structures with inadequate defensible space.

27.1.7 Ignition Risk Assessment

Humboldt Ranchettes has a moderate risk of ignition based on fire history in the area, and the potential for increased fuel loading from annual grasses in high precipitation years. There is some wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Humboldt Ranchettes is lightning, although human-related ignitions, such as auto accidents, are unpredictable and can happen at any time.

27.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Humboldt Ranchettes focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

27.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, other structures, and stockpiled hay and ranch equipment, 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-

emergent herbicide.[21] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Board up or remove abandoned trailers and other structures to prevent ignition from sparks or firebrands.

27.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.

27.2.3 Fire Suppression Resources

Nevada Division of Forestry

- If available move additional resources into the area, on high hazard days or ensure adequate volunteer resources for high hazard days.

27.2.4 Community Coordination

Deeth/Starr Valley VFD and Nevada Division of Forestry

- Develop and enforce brush clearance and biomass disposal programs to include cleaning weeds and debris from around structures and fences in the community.

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

Elko County

- Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

27.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Deeth/Starr Valley VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

27.3 SUMMARY OF RECOMMENDATIONS

Table 27-2. Humboldt Ranchettes Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space condition annually.
	Community Coordination	Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations.
Nevada Division of Forestry	Fire Suppression Resources	Move additional resources into the area on high hazard days if available.
Deeth/Starr Valley VFD **Nevada Division of Forestry**	Community Coordination	Develop and enforce brush clearance and biomass disposal programs to include cleaning weeds and debris from around structures and fences in the community.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 27-3. Humboldt Ranchettes Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

39 Total Houses **12 Residential Streets**

B5. Street Signs

0 not visible | 12 visible | 100% visible

B6. Address Signs

25 not visible | 14 visible | 36% visible

C1. Roofs

0 combust | 39 not combust | 100% not combust

C2. Siding

0 combust | 39 not combust | 100% not combust

C3. Unenclosed Structures on Lot

16 not enclosed | 23 enclosed | 41% not enclosed

D1. Lot Sizes

0 <1ac | 39 >1ac <10ac | 0 >10ac

D2. Defensible Space

8 not adequat | 31 adequate | 79% adequate

Score **51** /128

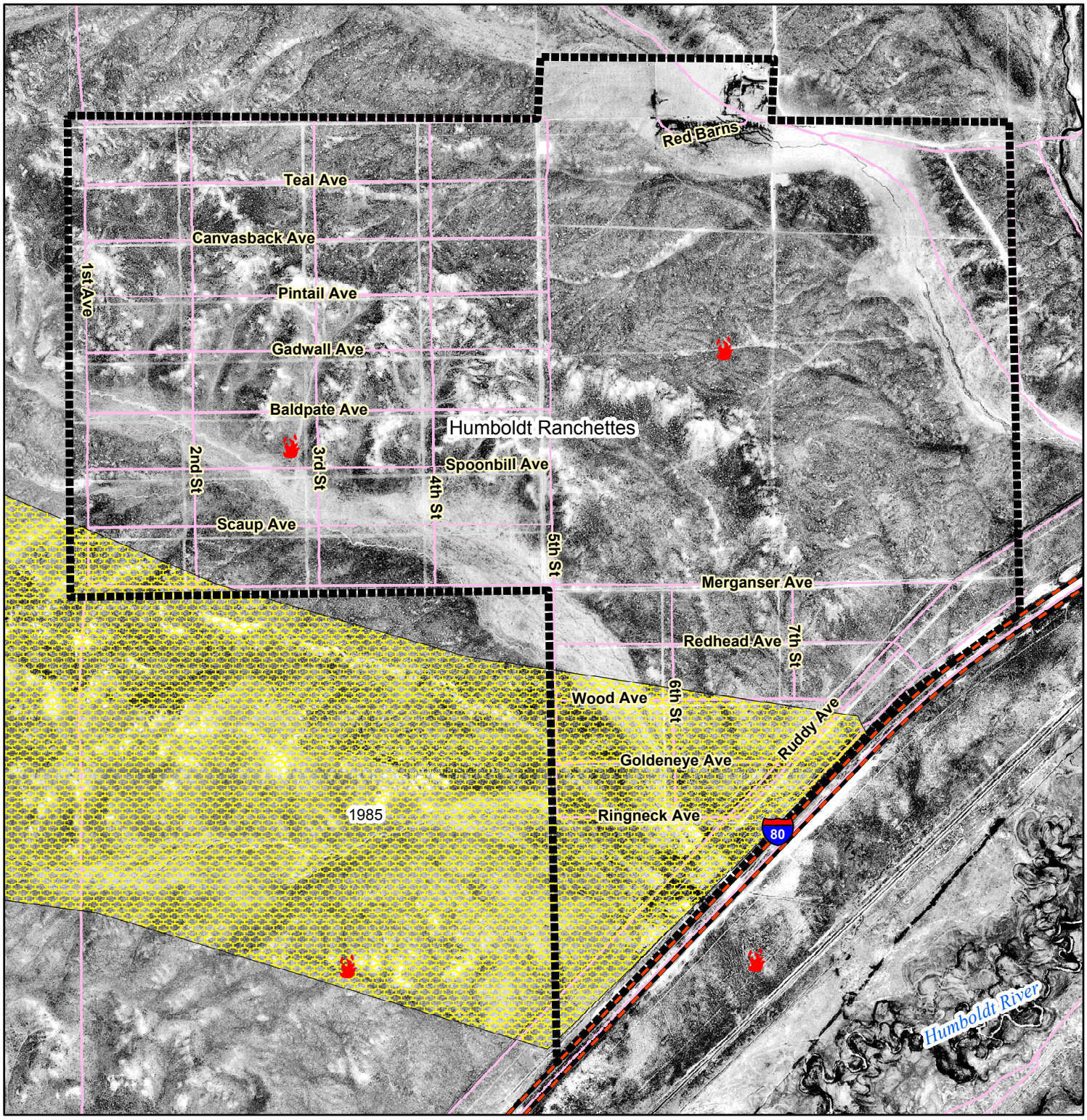


Figure 27-1. Humboldt Ranchettes
Fire History

Legend

- Community Boundary
- Highways and State Routes
- Fire Boundary and Date
- Secondary Roads
- Fire Ignition

0 500 1,000 2,000
Feet

N
W E
S

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

28.0 NORTH FORK

28.1 RISK AND HAZARD ASSESSMENT

North Fork is located in northwest Elko County on State Route 225, approximately 35 miles south of the Idaho border and sixty miles north of Elko. It is situated at an elevation of approximately 6,140 feet. The results of the community hazard assessment classified North Fork in the **Moderate Hazard** category (60 points). A summary of the factors that contribute to this hazard rating is included in Table 28-3. Primary factors include the lack of fire suppression resources, a high fuel load, and topography conducive to erratic fire behavior. The community boundary identified for this report is shown in Figure 28-1.

28.1.1 Community Design

The wildland-urban interface in North Fork has the characteristics of a classic interface condition: a clear line of demarcation exists where the Nevada Department of Transportation facility abuts wildland fuels. All four of the homes included in the assessment are on lots of one acre or less.

Access: State Route 225 is the major transportation route through North Fork. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment.

Signage: Street signs and residential addresses were not heavily weighted in the assessment for the four homes located along the highway in North Fork. While clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire, it is unlikely that fire protection personnel would be unable to rapidly locate any home in the community threatened by wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

28.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding and roofing materials. One of the homes has an unenclosed architectural feature (a porch, deck, or balcony). Such features can create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

28.1.3 Defensible Space

All of the homes meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

28.1.4 Suppression Capabilities

Wildfire Protection Resources

North Fork has an inactive volunteer fire department. Table 28-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to North Fork in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 28-1. Wildfire Suppression Resources Available to North Fork

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management (Elko Helibase)
Type 6 Engine Type 3 Engine Type I Water Tender	1 1 1	Nevada Division of Forestry (Elko)
Type 6 Engine	1	US Forest Service (Mountain City)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

Water available for fire suppression in North Fork includes:

- Community wells.
- One water storage tank of unknown capacity.
- Local ponds, small lakes, and the North Fork Humboldt River.

28.1.5 Factors Affecting Fire Behavior

Fuels in the North Fork interface area consist primarily of moderately dense sagebrush and rabbitbrush with perennial grasses and some cheatgrass, estimated at two to three tons per acre Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Willows line riparian corridors. The terrain is mostly flat west and south of the community, and steep to the north and east, with some slopes reaching over a thirty percent grade. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

28.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding North Fork would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions in the hills and mountains

around the valley and strong erratic winds could push fires towards the valley floor. Surrounding agricultural lands somewhat mitigates the potential for hazardous fire behavior.

28.1.7 Ignition Risk Assessment

North Fork has a high risk of ignition. This determination is based on fire history in the area and the potential for increased fuel loading from annual grasses and forbs in high precipitation years. There is a moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in North Fork is lightning, although human caused ignitions are unpredictable and can occur at any time.

28.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the North Fork area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

28.2.1 Defensible Space Treatment

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[22] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

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

- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain the defensible space as needed.

28.2.2 Fire Suppression Resources

North Fork VFD

- Coordinate with the Nevada Division of Forestry to reactivate the North Fork VFD, enhance recruitment of volunteers, establish training, and obtain personal protective equipment and fire suppression apparatus.

28.2.3 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Property Owners

- Obtain copies of the publication *"Living With Fire"*. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

28.3 SUMMARY OF RECOMMENDATIONS

Table 28-2. North Fork Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually.
	Public Education	Obtain copies of the publication "*Living With Fire*."
North Fork VFD	Fire Suppression Resources	Coordinate with the Nevada Division of Forestry to reactivate the North Fork VFD, establish training, and obtain equipment.

Table 28-3. North Fork Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	10	/10
4. Aspect	7	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	10	/10

TALLIES

4 Total Houses **1 Residential Streets**

B5. Street Signs

0 not visible | 1 visible | 100% visible

B6. Address Signs

0 not visible | 4 visible | 100% visible

C1. Roofs

0 combust | 4 not combust | 100% not combust

C2. Siding

0 combust | 4 not combust | 100% not combust

C3. Unenclosed Structures on Lot

1 not enclosed | 3 enclosed | 25% not enclosed

D1. Lot Sizes

4 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

0 not adequat | 4 adequate | 100% adequate

Score **60** /128

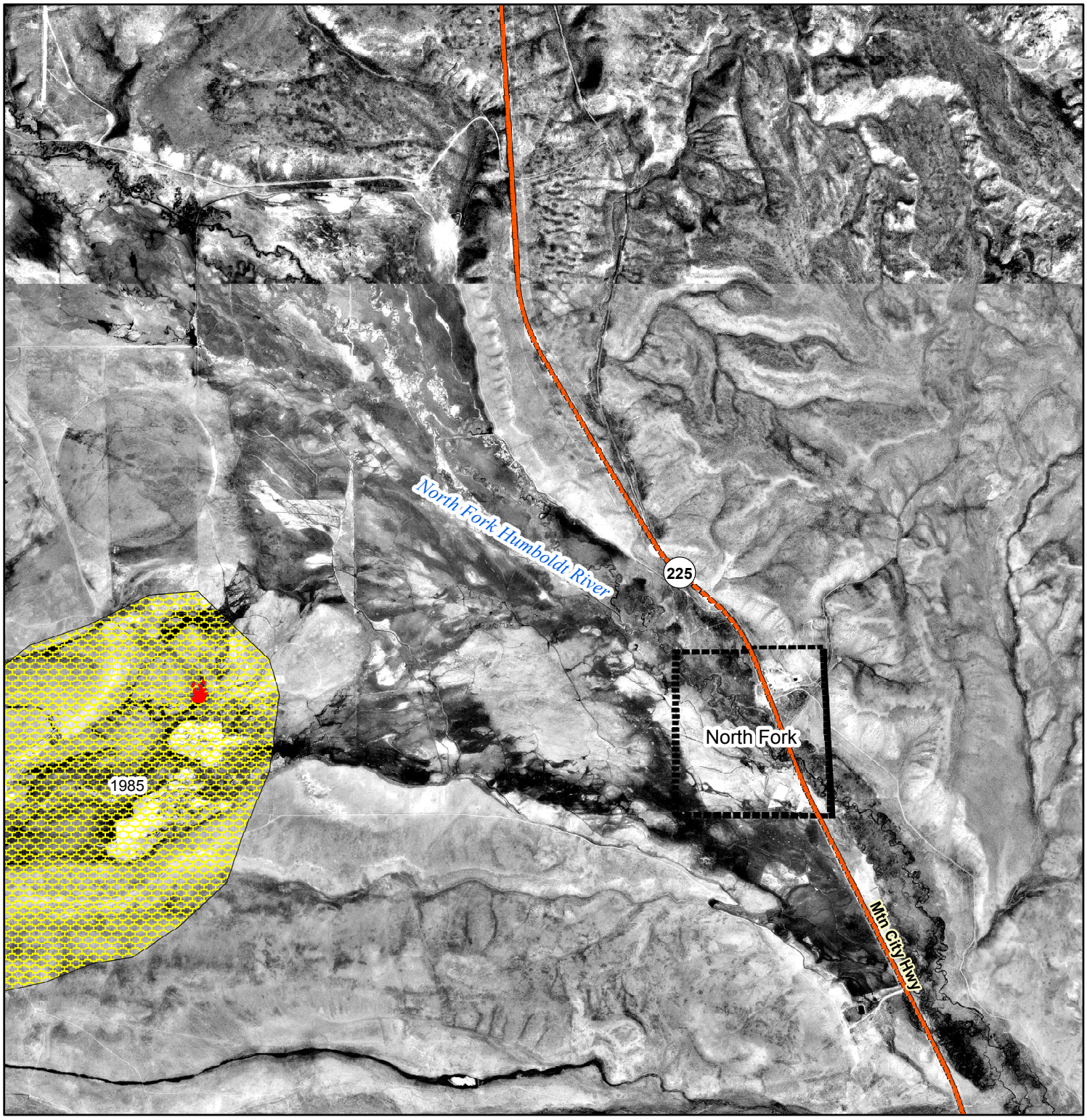


Figure 28-1. North Fork
Fire History

N
W E
S

Legend

- Community Boundary
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

29.0 OASIS

29.1 RISK AND HAZARD ASSESSMENT

The community of Oasis is a small, high desert community located in eastern Elko County at the junction of State Route 233 and Interstate 80. It is approximately forty miles from the Nevada-Utah state line. Oasis is located in the Goshute Valley between the Pequop Mountains and the Toano Range at an elevation of approximately 5,860 feet. The Central Pacific railroad runs along the north side of the town.

The results of the community hazard assessment classified Oasis in the **Moderate Hazard** category (46 points). A summary of the factors that contribute to this hazard rating is included in Table 29-3. Primary factors include inadequate address signage and a lack of fire protection resources. The community boundary identified for this report is shown in Figure 29-1.

29.1.1 Community Design

The wildland-urban interface in Oasis is a classic interface condition: a clear line of demarcation exists where developed areas abut wildland fuels in the form of an exterior road encircling the entire development. All twenty-seven homes included in the assessment are on parcels of one to ten acres in size.

Access: Interstate 80 and State Route 233 are the major transportation routes through Oasis. The roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment. The secondary access roads are of adequate width and gradient for passage.

Signage: Street signs are posted on seven of the eight community roads. Residential addresses are clearly visible on only 56 percent of the homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

29.1.2 Construction Materials

Ninety-three percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. Twenty-two percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

29.1.3 Defensible Space

Of the 27 homes observed in the interface, two do not meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

29.1.4 Suppression Capabilities

Wildfire Protection Resources

There is no organized fire department in Oasis. Fire protection is provided by the Wells Volunteer Fire Department, approximately 25 miles away. Table 29-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to Oasis in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 29-1. Wildfire Suppression Resources Available to Oasis

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine	1	Wells VFD (Wells)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Patrol	1	US Forest Service (Wells)
Type 6 Engine	1	West Wendover VFD (Wendover)
Type 4 Engine	1	Tecoma VFD (Montello)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Randy Dedman, Wells VFD Fire Chief

Water Sources and Infrastructure

Water available for fire suppression in Oasis includes hydrants within 500 feet of structures. The water system operates on gravity from a 30,000 gallon water storage tank located in the mobile home park.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Oasis is included in the County plans.

29.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Oasis interface area is generally moderate, estimated at two tons per acre, which was considered a moderate fuel hazard. Fuels consist primarily of sagebrush and rabbitbrush one to two feet high. Ground fuels consist of perennial grasses and annuals. The terrain within the community boundary is mostly flat. The prevailing wind direction is south/southeast. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

29.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area around Oasis would come from dry lightning storms late on a summer afternoon. Multiple fire ignitions and strong erratic winds could push fires from any direction toward the community.

29.1.7 Ignition Risk Assessment

Oasis was determined to have a moderate to high risk of ignition based on fire history. There is a moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Oasis is lightning, although human caused ignitions are unpredictable and can occur at any time.

29.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Oasis area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

29.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Maintain the defensible space as needed.

29.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation along the perimeter road around the community by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site and maintain the roadside fuel reduction treatment.

Union Pacific Railroad

- 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. Maintain low growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

29.2.3 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.
- Coordinate through the ROWE Group (Ryndon, Osino, White Rock, Elburz) to form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

29.3 SUMMARY OF RECOMMENDATIONS

Table 29-2. Oasis Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Post addresses so they are visible from the road. Coordinate through the ROWE Group to form a local community-based organization to provide leadership and be responsible for community-wide fuel reduction treatments and community fire safety.
Elko County	Fuels Reduction	Reduce vegetation along the perimeter road around the community by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.

Table 29-3. Oasis Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	3	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	2	/10
2. Department	10	/10

TALLIES

27 Total Houses **8 Residential Streets**

B5. Street Signs

1 not visible | 7 visible | 88% visible

B6. Address Signs

12 not visible | 15 visible | 56% visible

C1. Roofs

0 combust | 27 not combust | 100% not combust

C2. Siding

2 combust | 25 not combust | 93% not combust

C3. Unenclosed Structures on Lot

5 not enclosed | 22 enclosed | 19% not enclosed

D1. Lot Sizes

0 <1ac | 27 >1ac <10ac | 0 >10ac

D2. Defensible Space

2 not adequat | 25 adequate | 93% adequate

Score **46** /128



Figure 29-1. Oasis
Fire History

N
W E
S

Legend

Community Boundary

Highways and State Routes

Fire Ignition

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

30.0 OWYHEE

30.1 RISK AND HAZARD ASSESSMENT

Owyhee is located along SR 225 in northern Elko County approximately five miles from the Idaho-Nevada state line. The town is situated within the Duck Valley Indian Reservation at an elevation of approximately 5,400 feet. The results of the community hazard assessment classified Owyhee in the **Moderate Hazard** category (48 points). A summary of the factors contributing to this hazard rating is included in Table 30-3. Primary factors include inadequate street and address signage and inadequate defensible space. The community boundary identified for this report is shown in Figure 30-1.

The *Duck Valley Reservation Wildland-Urban Interface Wildfire Management Plan* (Northwest Management Inc. 2004) was reviewed for community design, construction factors, defensible space, and wildfire suppression information and was summarized in the following sections. The RCI Project Team Resource Specialist visited Owyhee to review fuels and potential fire behavior and to formulate some additional recommendations for Owyhee.

30.1.1 Community Design

The wildland-urban interface around Owyhee has an intermix condition: structures and wildland fuels are scattered throughout the community, with no clear separation between wildland fuels and structures. A majority of the 566 homes in the community are on lots measuring between one and ten acres.

Access: State Route 255 is the major transportation route through Owyhee. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. Secondary roads in the community are generally of adequate width for two-way passage, although some homes are accessed only by long, narrow driveways with dense vegetation along both sides.

Signage: Street signs and residential addresses are not posted or visible for the majority of streets and residences in Owyhee. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

30.1.2 Construction Materials

A vast majority of the homes in the interface area are built with non-combustible or highly fire resistant siding materials and fire resistant roofing materials such as composition, metal, or tile. Some of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

30.1.3 Defensible Space

Sixty-six percent of the community residences do not meet the minimum defensible space requirement recommended to help protect the homes in the event of a wildfire.

30.1.4 Suppression Capabilities

Wildfire Protection Resources

Owyhee is protected by the Shoshone-Paiute Fire Management Office (Sho-Pai), located two miles from Owyhee. The Sho-Pai Fire Management Office is a combination department of 25 structural firefighters and forty wildland firefighters with an additional 45 seasonal camp crew members during the summer fire season. All structure and wildland firefighters are cross-trained to respond to either type of fire. Table 30-1 lists the types of local wildfire resources and equipment available for initial response to Owyhee in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1. The Bureau of Land Management Idaho Lower Snake River District also provides additional resources as requested.

Table 30-1. Wildfire Suppression Resources Available to Owyhee

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine	1	Sho-Pai Fire
Type 4 Engine*	2	
Type 2 Engine	2	
Type 7 Wildland Engine	1	
Type 2 Water Tender	1	

Source: Duck Valley Reservation, Wildland-Urban Interface Wildfire Management Plan and Brian Pete, Sho-Pai Fire Engine Boss.

*One Type 4 Engine is a Bureau of Land Management cooperative seasonal engine.

Water Sources and Infrastructure

Water available for fire suppression for Owyhee includes hydrants within the community and some of the outlying areas. The Owyhee River and several ranch reservoirs could be used as draft sites for fire suppression apparatus.

Fire Protection Personnel Qualifications

All Sho-Pai Fire Management firefighters have been trained for structure protection and wildland fire training in accordance with National Wildfire Coordinating Group standards and the BIA Western Region standards.

Financial Support

Funding for the Sho-Pai Fire Management Office comes from the Bureau of Indian Affairs. Preparedness activities such as salaries, equipment, facilities operation and maintenance, and engine operation and maintenance are directly funded, while the Tribe and the BIA have a cooperative agreement for reimbursement of annual training and any costs the tribe incurs for wildfire suppression incidents.

Community Preparedness

The Duck Valley Reservation has the following cooperative, mutual aid, and operating agreements:

- **Annual Operating Plan, Elko Interagency Dispatch Center:** The EIDC responds to requests for fire suppression resources, funding to support dispatch, and cooperation between neighboring fire organizations.
- **Master Cooperative Agreement, Bureau of Land Management Elko Field Office:** To provide equipment, personnel, and facilities when requested and to provide cooperation between both agencies for assistance during wildfires.
- **Annual Operating Plan, Bureau of Land Management Elko Field Office:** To provide detailed specific procedures required by the Master Cooperative Agreement.
- **Wildland Fire Engine Mutual Aid Agreement, Bureau of Land Management Lower Snake River District**: To supplement existing fire suppression resources on Tribal land and Bureau of Land Management lands, placing Bureau of Land Management fire engines on the Duck Valley Reservation; to provide initial attack capabilities on the reservation and in remote areas of the lower Snake River District during fire season.
- **Cooperative Agreement, Bureau of Indian Affairs Western Region Office:** To facilitate the use of tribal employees in wildland fire preparedness, suppression, rehabilitation, prescribed fires, and other emergency situations. Also to provide fiscal management for suppression and preparedness.

30.1.5 Factors Affecting Fire Behavior

The vegetative fuel in the Owyhee interface area consists of moderately dense sagebrush, rabbitbrush, serviceberry, and bitterbrush, estimated at one to three tons per acre. The fuel hazard is generally moderate with the exception of the northeastern portion of the community where the fuel hazard increases to high because of significant cheatgrass growth. The understory grass layer is composed of basin wildrye, perennial grasses, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. The riparian area at the south end of the community are characterized by willows, Russian olive, and cottonwood trees, with wild rose and meadow grasses. Fuels were estimated at six to sixteen tons per acre. There are numerous alfalfa fields on the west side of the community. Some fields are out of production and returning to native shrubs. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The Bureau of Land Management Elko Field Office completed a ten miles of greenstrip treatment in the Owyhee community in November of 2004. In 2005, an additional three miles of greenstrip will be completed. The finished greenstrip will be approximately thirteen miles long with widths varying between 300 and 500 feet, for a total project area of approximately 590 acres. The greenstrip specifications include using brush mastication equipment to mow sagebrush in a mosaic pattern, leaving small islands of sagebrush within the greenstrip.

30.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Owyhee would start from an ignition on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Strong winds could quickly spread fire to residential areas before initial attack resources could suppress the fire.

30.1.7 Ignition Risk Assessment

Owyhee has a moderate ignition risk based on wildfire history in the area surrounding the community and the potential for increased fuel loading from annual grasses in high precipitation years. The primary risk of ignition in Owyhee is lightning, although human caused ignitions are unpredictable and can occur at any time.

30.1.8 Completed Fuels Reduction Treatments

The Bureau of Land Management Elko Field Office completed ten miles of greenstrip treatment in the Owyhee community in November of 2004. In 2005, an additional three miles of greenstrip will be completed. The finished greenstrip will be approximately thirteen miles long with widths varying between 300 and 500 feet, for a total project area of approximately 590 acres (Figure 30-1). The greenstrip specifications include using brush mastication equipment to mow sagebrush in a mosaic pattern, leaving small islands of sagebrush within the greenstrip.

30.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

Recommendations in Table 30-2 were made in the *Duck Valley Reservation Wildland-Urban Interface Wildfire Management Program* report. Additional recommendations were made by the RCI Project Team.

30.2.1 Additional Recommendations for Fuel Reduction Treatments

Sho-Pai Fire Department

- Establish a 100-foot wide fuelbreak along the eastern edge of Owyhee as shown in Figure 30-1 by masticating brush and grass. Reseed treated areas with fire resistant species such as recommended in Appendix E.
- Mow along roads and clear vegetation in close proximity to structures to reduce fuel hazard.

30.2.2 Additional Recommendations for Community Coordination

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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 of for more information contact the:

Nevada Fire Safe Council
210 South Roop Street Suite 101
Carson City, NV 89701
www.nvfsc.org

Table 30-2. Wildfire Management Plan Mitigation Recommendations for the Duck Valley Reservation Wildland-Urban Interface

INVOLVED PARTY	MITIGATION ACTIVITY
PROPOSED SAFETY AND POLICY ACTIVITIES	
Tribal Council/Sho-Pai Fire	Develop building codes with awareness of wildland fire risks.
	Develop Reservation Policy concerning building materials used in high-risk WUI areas on existing structures and new construction.
Tribal Council/Sho-Pai Fire/Tribal Resources and Environmental Management Departments Bureau of Indian Affairs	Develop a formal Wildland-Urban Interface Advisory Committee to advise the Tribal Council on interface issues and treatments.
	Support development of an Integrated Resources Management Plan and Range Management Plan for the Duck Valley Reservation that will include the Fire Management Plan.
Tribal Council and Bureau of Indian Affairs	Develop Reservation Policy to support applications for grant funding for projects resulting from recommendations in this report.
	Expand the Sho-Pai Fire Management Organization to include a Burned Area Emergency Rehabilitation (BAER) team capable of developing and implementing an emergency response immediately following a wildfire.
WILDLAND-URBAN INTERFACE ACTION ITEMS FOR PEOPLE AND STRUCTURES	
Tribal Council/Sho-Pai Fire	Update Wildfire Risk Assessments of homes that were completed in 2002-2003 by SCA volunteers.
	Implement home, business, and support structure Wildland-Urban Interface treatments.
	Expand community defensible zone Wildland-Urban Interface treatments in those areas beyond structure defensibility zones.
	Maintain home site Wildland-Urban Interface treatments.
WILDLAND-URBAN INTERFACE ACTION ITEMS FOR INFRASTRUCTURE	
Tribal Council/Sho-Pai Fire	Initiate roadside fuels management.
	Acquire a satellite telephone for use by the Sho-Pai Fire Chief.
WILDLAND URBAN INTERFACE ACTION ITEMS FOR FIREFIGHTING RESOURCES AND CAPABILITIES	
Sho-Pai Fire	Recruit and retain volunteer firefighters.
Sho-Pai Fire Bureau of Indian Affairs Bureau of Land Management US Forest Service State Fire Marshal	Increase training and capabilities of firefighters.
Sho-Pai Fire/Tribal Land Management/Wildlife Management	Plan and implement prescribed perimeter fire in conjunction with mechanical treatments in the interim. Utilize livestock grazing as a fuels management tool.

Source: Northwest Management, Inc, 2004

Table 30-3. Owyhee Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	5	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	1	/10

TALLIES

566 Total Houses **138 Residential Streets**

B5. Street Signs

138 not visible | 0 visible | 0% visible

B6. Address Signs

566 not visible | 0 visible | 0% visible

C1. Roofs

6 combust | 560 not combust | 99% not combust

C2. Siding

515 combust | 51 not combust | 9% not combust

C3. Unenclosed Structures on Lot

178 not enclosed | 388 enclosed | 31% not enclosed

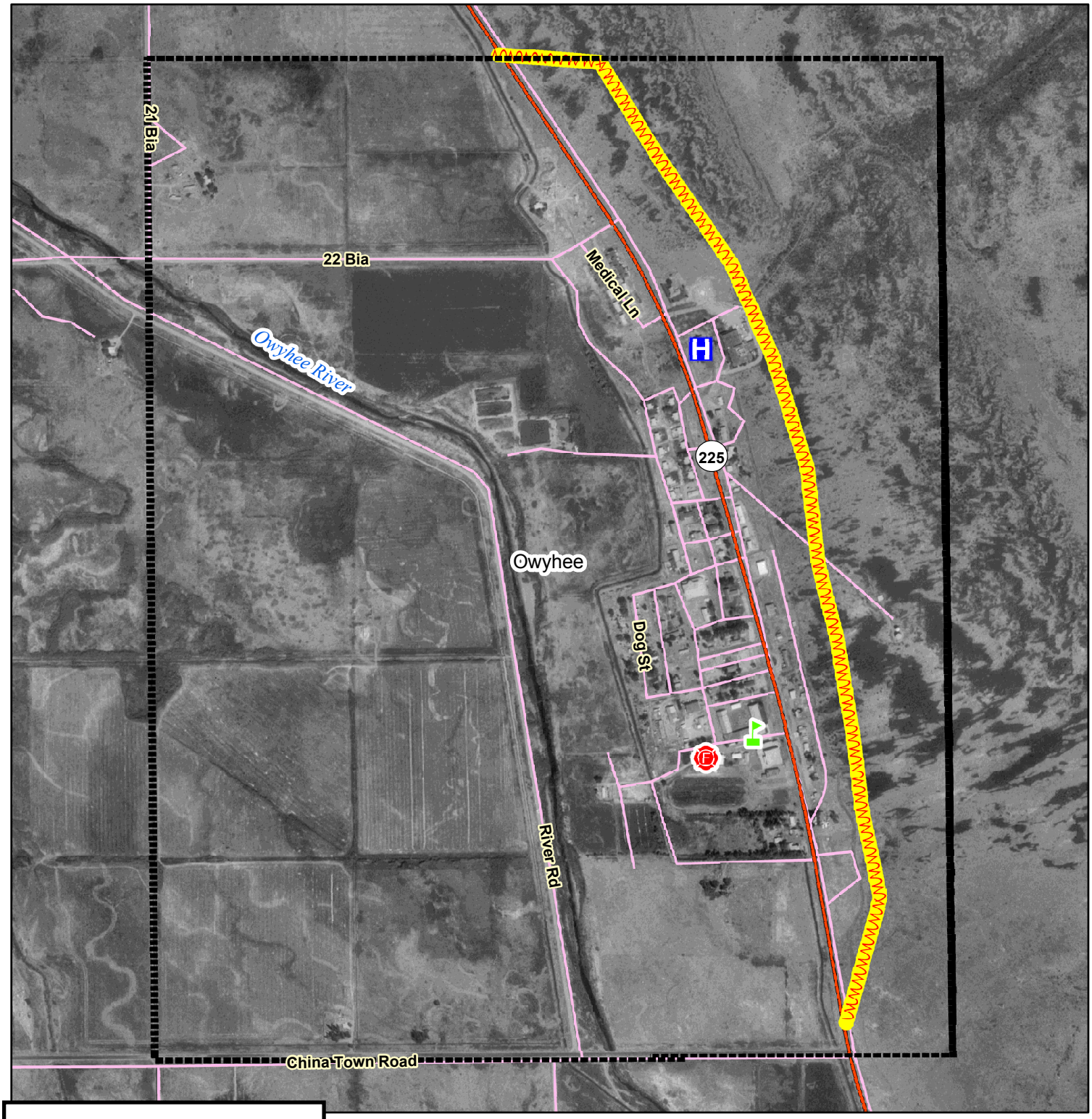
D1. Lot Sizes

184 <1ac | 221 >1ac <10ac | 161 >10ac

D2. Defensible Space

376 not adequat | 190 adequate | 34% adequate

Score **48** /128



Legend

- Community Boundary
- School
- Hospital
- Proposed Fuelbreak
- Fire Station
- Highways and State Routes
- Secondary Roads

Figure 30-1. Owyhee Suppression Resources, Critical Features, and Proposed Mitigation Projects

N
W E
S

0 500 1,000 2,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

31.0 PILOT VALLEY

31.1 RISK AND HAZARD ASSESSMENT

Pilot Valley is located in eastern Elko County north of Interstate 80 and east of State Route 233 near the Nevada-Utah state line. Pilot Valley is situated between the Toano and Pilot Mountain Ranges. Pilot Creek flows through the valley, along with several small drainages originating in the mountains. This community hazard assessment classifies Pilot Valley in the **Moderate Hazard** category (60 points). A summary of the factors contributing to this hazard rating is provided in Table 31-3. Primary factors include inadequate signage, inadequate defensible space, and topographical features conducive to dangerous fire behavior. The community boundary identified for this report is shown in Figure 31-1.

31.1.1 Community Design

The community of scattered ranches and homes in Pilot Valley are within an intermix condition wildland-urban interface. Ranches and homes are on parcels of two and one-half to forty acres. Structures and wildland fuels are scattered throughout the community, with no clear separation between wildland fuels and developed parcels. Seventy-seven homes were included in the assessment. Fifty of the homes are on parcels of one to ten acres in size; 27 are on lots of ten acres or more.

Access: Pilot Valley is accessed by Pilot Valley Road from State Route 233 to the north or Interstate 80 to the south. The road is twenty to 24 feet wide with adequate turnaround space for fire suppression equipment to maneuver, although it has a grade greater than five percent. The secondary roads are typically twenty feet wide with adequate room for passage.

Signage: Street signs are posted on only 45 percent of the community roads. Residential addresses are posted on only sixteen percent of the homes observed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire. However, many of the homes in Pilot Valley are miles apart and posting addresses may not be necessary to reducing the fire hazard.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

31.1.2 Construction Materials

Eighty-four percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard siding. All of the homes have fire resistant roofing made of composition materials, metal, or tile. About one-third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

31.1.3 Defensible Space

Sixty-nine percent of the homes observed do not meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

31.1.4 Suppression Capabilities

Wildfire Protection Resources

Pilot Valley is included in the Tecoma Township Fire Protection District (FPD)/Montello VFD, along with Montello and Wendover, Nevada. The Tecoma Township Fire Protection District/Montello VFD provides fire protection to Pilot Valley and has 25 volunteers. Table 31-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Pilot Valley in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 31-1. Wildfire Suppression Resources Available to Pilot Valley

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engine	1	Tecoma Township FPD-Montello VFD (Pilot Valley)
Type 6 Engine Type 3 Engine	1 1	Tecoma Township FPD- Montello VFD (Montello)
Type 6 Engine Type 4 Engine	2 1	Wendover VFD (Wendover)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bob Farrell, Tecoma Township FPD/Montello VFD Fire Chief.

The Tecoma Township FPD/Montello VFD has old, outdated equipment. Recently, the Montello VFD received a 1990's Type 4 Engine that is stationed in Pilot Valley. It is important that fire suppression equipment be adequate and in proper working condition in order for fire protection personnel to be able to protect the community in the event of a wildfire.

Water Sources and Infrastructure

Water available for fire suppression in Pilot Valley includes two 10,000-gallon water storage tanks at the fire station. There is also a pump that is accessible for filling trucks at the Pilot Valley Station. Irrigation wells and ranch ponds may also be used for filling fire suppression apparatuses.

Fire Protection Personnel Qualifications

The Montello volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Tecoma Township FPD/Montello VFD responds to the following annual calls:

- Five to ten emergency medical calls.
- Five to ten wildland/brush fire calls.
- One to five other calls.

31.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Pilot Valley interface area is generally moderate, estimated at one to three tons per acre and was considered a moderate fuel hazard. Agricultural fields pose a low fuel hazard. Fuels throughout the community consist primarily of a shrub layer of greasewood, shadscale, sagebrush, rabbitbrush and spiny hopsage, with an understory of halogeton and cheatgrass. Cheatgrass will produce higher volumes of fuel and elevate fuel hazard conditions in years of above normal precipitation. Russian thistle and kochia was noted along roadsides and in disturbed areas. Both are highly flammable when dry. Russian thistle dries as tumbleweed and tends to accumulate along fence lines and against structures. The terrain within the community boundary is generally flat with little or no slope. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

31.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Pilot Valley would come from a dry lightning storm late on a summer afternoon during a normal to above normal precipitation year and high annual grass and forb production. Multiple fire ignitions and strong erratic winds could push fires through the community from any direction. Potential delayed response by the Tecoma Township FPD/Montello VFD during normal working hours, coupled with additional firefighting resources located one to two hours away or more, increases fire danger for the community.

31.1.7 Ignition Risk Assessment

Based on an analysis of fire history in the area, Pilot Valley has a high risk of ignition. Ignition risk is increased during years of high precipitation, when fuel loading from annual grasses becomes heavier. There is an extensive wildfire history and a history of lightning strikes in the public lands surrounding the community. The primary risk of ignition in Pilot Valley is lightning, although human caused ignitions are unpredictable and can occur at any time.

31.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Pilot Valley area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

31.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush or weeds that accumulate against fences in the community.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[23] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain the defensible space as needed.

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

31.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

31.2.3 Fire Suppression Resources

Tecoma Township Fire Protection District /Montello VFD and Nevada Division of Forestry

- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.
- Upgrade fire suppression apparatus.
- Upgrade the radio system to narrow band technology to ensure proper communication compatibility.
- Continue to coordinate with local ranchers to ensure that fire protection personnel can use agricultural wells to fill firefighting apparatus.

31.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Make sure address characters are at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate during a wildfire in smoky conditions.

31.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Tecoma Township FPD/Montello VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

31.3 SUMMARY OF RECOMMENDATIONS

Table 31-2. Pilot Valley Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Post addresses so they are visible from the road.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation along the perimeter road around the community by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Tecoma Township Fire Protection District Montello VFD and Nevada Division of Forestry	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to review pre-attack plans for the area. Upgrade fire suppression apparatus. Upgrade the radio system to narrow band technology to ensure proper communication compatibility. Continue to coordinate with local ranchers to ensure that fire protection personnel can use agricultural wells to fill firefighting apparatus.
	Public Education	Distribute copies of the publication "*Living With Fire*" to all property owners. This publication is free of charge.

Table 31-3. Pilot Valley Wildfire Hazard Rating Summary

A. Urban Interface Condition ***4***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	3	/3
4. Secondary Road	5	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	3	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

TALLIES

77 Total Houses **20 Residential Streets**

B5. Street Signs

11 not visible | 9 visible | 45% visible

B6. Address Signs

65 not visible | 12 visible | 16% visible

C1. Roofs

0 combust | 77 not combust | 100% not combust

C2. Siding

12 combust | 65 not combust | 84% not combust

C3. Unenclosed Structures on Lot

27 not enclosed | 50 enclosed | 35% not enclosed

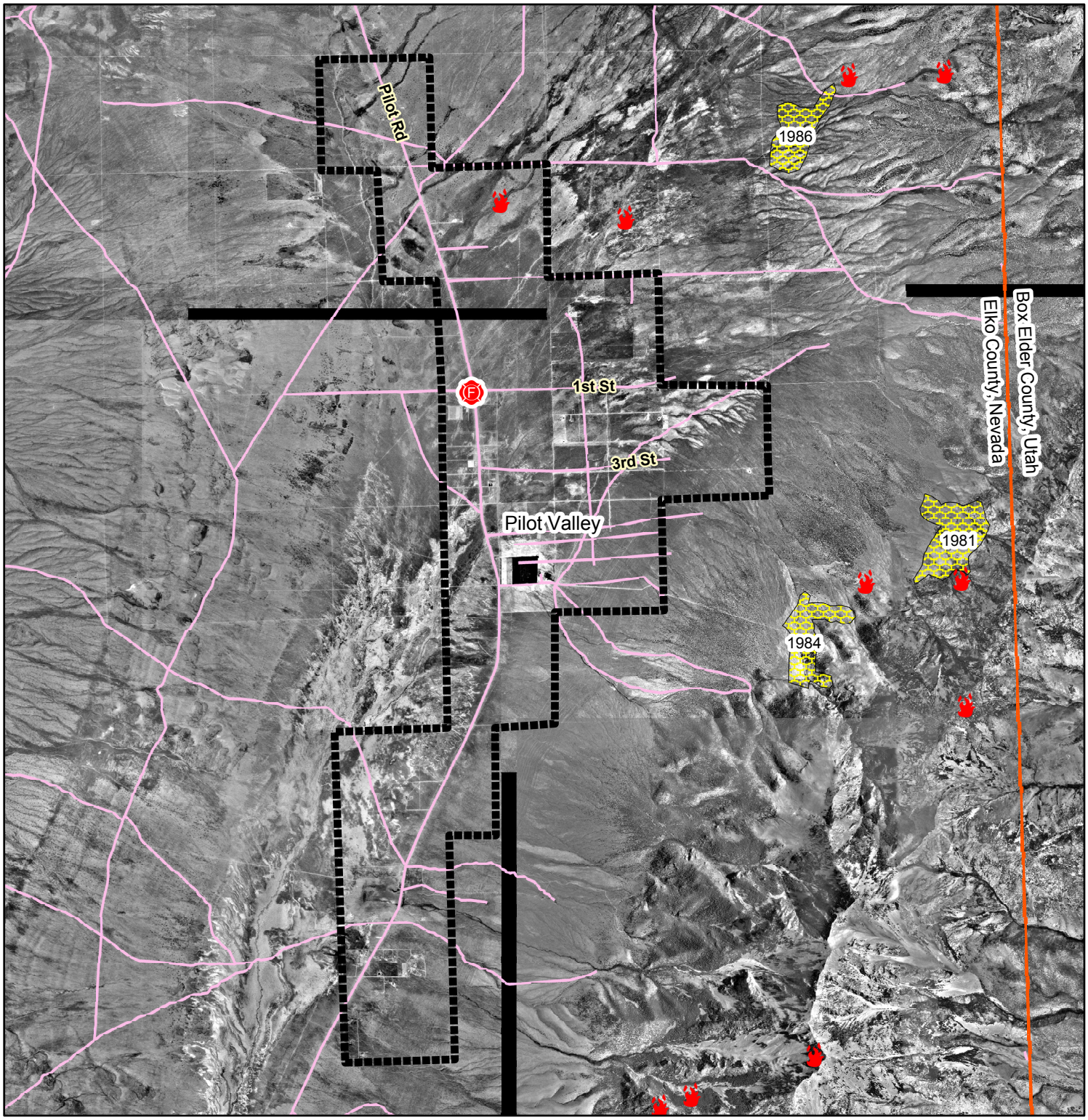
D1. Lot Sizes

0 <1ac | 50 >1ac <10ac | 27 >10ac

D2. Defensible Space

24 not adequat | 53 adequate | 69% adequate

Score **60** /128



Legend

- Community Boundary
- County Boundary
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Secondary Roads

Figure 31-1. Pilot Valley
Fire History and Suppression Resources

N
W E
S

0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

32.0 RUBY LAKE NATIONAL WILDLIFE REFUGE & HATCHERY

32.1 RISK AND HAZARD ASSESSMENT

The Ruby Lake National Wildlife Refuge (NWR) and Nevada Department of Wildlife Gallagher Fish Hatchery residences comprise a small community at the south end of Ruby Valley. The community is located along Ruby Valley Road, south of Ruby Lake Estates, and north of Shanty Town. The area is situated at an elevation of approximately 6,000 feet. The results of the community hazard assessment classified the Ruby Lake NWR and Hatchery in the **Moderate Hazard** category (47 points). A summary of the factors that contribute to this hazard rating is provided in Table 32-3. Primary factors include homes with inadequate defensible space and the presence of areas with heavy fuel loading. The community boundary identified for this report is shown in Figure 32-1.

32.1.1 Community Design

The wildland-urban interface around the Ruby Lake NWR and Hatchery has an intermix interface condition: structures are scattered throughout the community with no clear separation between wildland fuels. Fifteen homes were included in the assessment, all on parcels of at least one acre in size.

Access: Ruby Valley Road is the primary transportation route through Ruby Valley. The road is between twenty to 24 feet wide, dirt and gravel base, and has adequate turnaround space for fire suppression equipment.

Signage: Street signs and residential addresses were not heavily weighted in the assessment for this community. While clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire, the residences at the Refuge and Hatchery are situated at such distances from each other that it is highly unlikely that fire crews would be unable to visually locate individual residences that were threatened by wildfire.

Utilities: All of the utilities are above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

32.1.2 Construction Materials

Ninety-three percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard, and fire resistant roofing such as composition material, metal, or tile. Thirteen percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

32.1.3 Defensible Space

Eighty-seven percent of the homes in this area meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

32.1.4 Suppression Capabilities

Wildfire Protection Resources

The Ruby Lake NWR and Hatchery is protected by the Ruby Valley Volunteer Fire Department. The department has several stations situated throughout the valley, with a total of seventeen volunteers and one chief. The Ruby Valley NWR has three full time staff and three seasonal paid staff members. The Nevada Division of Wildlife Gallagher Fish Hatchery has equipment and trained personnel as well. Table 32-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Ruby Lake NWR in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 32-1. Wildfire Suppression Resources Available to Ruby Valley NWR

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine Type 2 Engine	1 1	Ruby Valley VFD Secret Pass Station (Ruby Valley
Type 2 Engine Water Tender	1 1	Ruby Valley VFD School Station (Ruby Valley)
Type 6 Engine Type 3 Engine	1 1	NDOW Gallagher Fish Hatchery (Ruby Valley)
Type 4 Engine Water Tender	1 1	Ruby Valley NWR (Ruby Valley)
Type 2 Engine	1	Spring Creek Station 1 (Spring Creek)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Larry Burton, Ruby Valley VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression in the vicinity of the Ruby Lake NWR and Hatchery includes ranch ponds, individual residence and irrigation wells, and numerous creeks that could be used for drafting sites in the event of a wildfire.

Fire Protection Personnel Qualifications

The Ruby Valley volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Ruby Valley VFD responds to the following annual calls:

- Three to four emergency medical calls.

- Six to twelve wildland/brush fire calls.
- Six other calls.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Ruby Valley is included in the County plans.

32.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Ruby Lake NWR and Hatchery interface area varies. In the lower elevation areas of the valley fuels consist of sagebrush and rabbitbrush, with an understory of perennial grasses, crested wheatgrass, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Fuel loads along the valley bottom are estimated at two to four tons per acre and were considered a moderate fuel hazard. On slopes to the west of the community the fuels are of a greater density, with some pinyon-juniper stands. Fuel loading was estimated at four to eight tons per acre and was considered a high fuel hazard. The prevailing wind direction is from the south/southwest; however downslope winds from the mountains are erratic and unpredictable. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

32.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire threatening the Ruby Lake NWR and Hatchery would be a dry lightning storm west of the community upslope in pinyon-juniper and annual grass fuels. Erratic downslope winds would drive the fire toward residences. Initial response from fire suppression resources could be an hour or more away dependent on availability during normal working hours.

32.1.7 Ignition Risk Assessment

Ruby Lake National Wildlife Refuge and the Gallagher Fish Hatchery have a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The area has seen two large wildfires; one in 1979 that burned 8,500 acres, and a second in the early 1990's that burned 2,000 acres within the previous burn. Several lightning strike fires have ignited trees, but those fires have not spread over large areas. The primary risks of ignition are lightning, prescribed burns, and other human caused ignitions that can occur at any time.

32.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

Recommendations for the Ruby Lake National Wildlife Refuge and the Gallagher Fish Hatchery focus on defensible space and landscape scale fuel reduction treatments.

32.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[24] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Install spark arrestors on chimneys.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

32.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the

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

likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

US Fish and Wildlife Service

- Construct a 200-foot wide fuelbreak along the south and west sides of the National Wildlife Refuge facilities by removing all shrubs within the first 100 feet (closest to structures) and thinning shrubs in the remaining 100-foot width to a spacing equivalent to two times the shrub heights. The fuelbreak should be maintained through annual mowing or grazing treatments as shown in Figure 32-1. Reseed treated areas without adequate crested wheatgrass stands with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Nevada Department of Wildlife

- Construct a 300-foot wide fuelbreak along the west side of the Gallagher Fish Hatchery facilities by removing all shrubs within the first 100 feet (closest to structures) and thinning shrubs in the remaining 200 feet to a spacing equivalent to two times the shrub heights as shown in Figure 32-2. The fuelbreak should be maintained through annual mowing or grazing treatments. Reseed treated areas without adequate crested wheatgrass stands with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of other community roads. Remove and disposed of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E.

32.2.3 Fire Suppression Resources

Ruby Valley VFD and Nevada Division of Forestry

- Continue to encourage all volunteer firefighters to attend wildland firefighting training and Firefighter I training.
- Work with Elko County and the State of Nevada to create incentives for recruiting and retaining volunteers.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility with cooperating agencies.

32.2.4 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Ruby Valley VFD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

32.3 SUMMARY OF RECOMMENDATIONS

Table 32-2. Ruby Lake NWR and Hatchery Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENT	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed.
US Fish and Wildlife Service	Fuels Reduction	Construct a 200-foot wide fuelbreak on the south and west sides of the National Wildlife Refuge facilities.
Nevada Department of Wildlife	Fuels Reduction	Construct a 300-foot wide fuelbreak on the west side of the fish hatchery facilities.
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of other community roads.
Ruby Valley VFD Nevada Division of Forestry	Fire Suppression Resources	Continue to encourage all volunteer firefighters to attend wildland firefighting training and Firefighter I training. Upgrade VFD radio systems to ensure communication compatibility with cooperating agencies. Work with Elko County and the State of Nevada to identify incentives to recruit and retain volunteers.
	Public Education	Distribute copies of the publication "*Living With Fire*" to all property owners.

Table 32-3. Ruby Lake NWR and Hatchery Wildfire Hazard Rating Summary

A. Urban Interface Condition 2

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	3	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	7	/10

Score 47 /128

TALLIES

14 Total Houses **1 Residential Streets**

B5. Street Signs

0 not visible | 1 visible | 100% visible

B6. Address Signs

0 not visible | 14 visible | 100% visible

C1. Roofs

0 combust | 14 not combust | 100% not combust

C2. Siding

0 combust | 14 not combust | 100% not combust

C3. Unenclosed Structures on Lot

3 not enclosed | 11 enclosed | 21% not enclosed

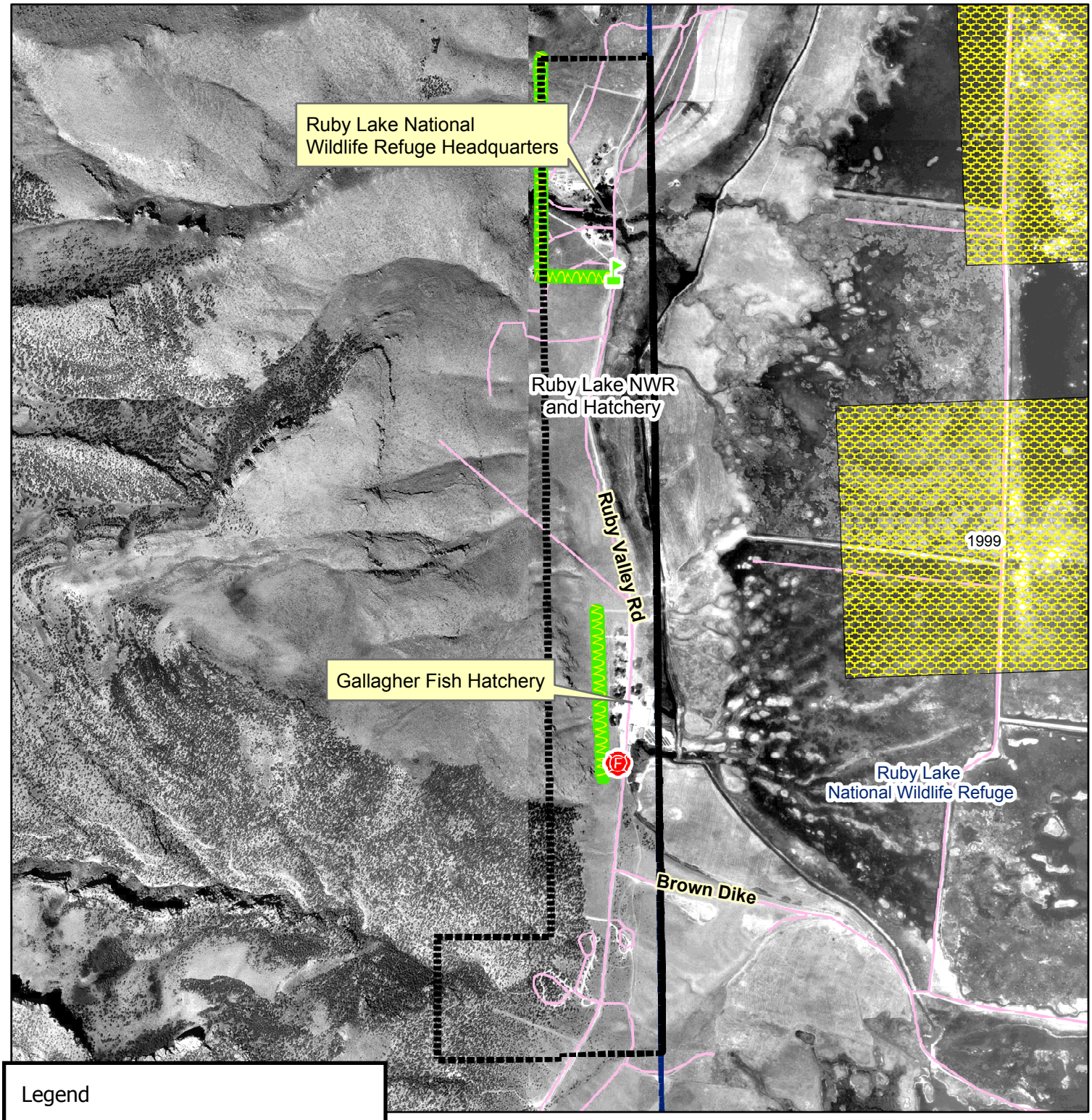
D1. Lot Sizes

0 <1ac | 14 >1ac <10ac | 0 >10ac

D2. Defensible Space

2 not adequat | 12 adequate | 86% adequate

(Corrected)



Legend

- Community Boundary
- School
- Fire Station
- Proposed Greenstrip
- Ruby Lake National Wildlife Refuge
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

Figure 32-1. Ruby Lake NWR and Hatchery
Fire History, Suppression Resources,
Critical Features, and
Proposed Mitigation Projects

N
W E
S

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

33.0 RYNDON

33.1 RISK AND HAZARD ASSESSMENT

Ryndon is a small town located in west central Elko County along Interstate 80 approximately 22 miles east of Elko. Ryndon is situated along the Humboldt River at an elevation of approximately 5,170 feet. The results of the community hazard assessment classified Ryndon in the **Moderate Hazard** category (57 points). A summary of the factors that contribute to this hazard rating is provided in Table 33-3. Primary factors include inadequate address signage, a high number of homes with unenclosed decks, and limited fire suppression resources. The community boundary identified for this report is shown in Figure 33-1.

33.1.1 Community Design

The wildland-urban interface condition in Ryndon is intermixed: structures and wildland fuels are scattered throughout the community, with no clear separation between wildland fuels and developed parcels. Of the 246 homes were included in this assessment, 198 are on lots of one acre or less, and 48 homes are on lots of one to ten acres in size.

Access: Interstate 80 is the primary transportation route through Ryndon. The road is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. Secondary community roads were all of adequate width and grade for passage.

Signage: Street signs are clearly posted on ninety percent of the roads in Ryndon. Residential addresses are visible on only thirty percent of homes. Clear and visible street signs and addresses are important to aid firefighters in locating homes in low visibility conditions during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

33.1.2 Construction Materials

Ninety-six percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. All of the homes have fire resistant roofing materials such as composition roofing, metal, or tile. About half of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

33.1.3 Defensible Space

About three-quarters of the homes observed meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

33.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Ryndon is provided by the Ryndon Volunteer Fire Department. Table 33-1 lists the types of local wildfire resources and equipment available for initial response to Ryndon in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 33-1. Wildfire Suppression Resources Available to Ryndon

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine Type 6 Engine	1 1	Ryndon VFD (Ryndon)
Type 1 Engine Type 3 Engine Type 6 Engine	1 1 1	Lee Engine Company (Elko)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bill Krohn, Ryndon VFD Fire Chief. 1

The Ryndon VFD received a Fire Assistance grant this year to purchase a Type 1 Engine that is expected to be delivered at the end of 2005. As the community continues to grow, the needs for building improvements and equipment upgrades will become high priorities.

Water Sources and Infrastructure

Water available for fire suppression in Ryndon includes one gravity-fed 30,000-gallon water storage tank. The Humboldt River can also be used as a drafting source or helicopter dip site, however the river is typically dry in summer. Most available water sources are at least a twenty to 45 minute turnaround time to refill fire apparatus.

Fire Protection Personnel Qualifications

The Ryndon volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Ryndon VFD responds to an average of twelve to fifteen total calls annually, including emergency medical and wildland/brush fire calls.

33.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Ryndon interface area is generally light, estimated at one to two tons per acre, which was considered a moderate fuel hazard. Fuels in the community consist primarily of sagebrush, rabbitbrush, and greasewood shrubs one to three feet in height. Ground fuels consist of basin wildrye, Indian ricegrass, bluegrass, squirreltail, and

cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southwest.

33.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Ryndon would start along Interstate 80 on the north side of the freeway within the community. A strong southwest wind would blow the fire northeast through the community. Many mobile homes would be quickly threatened with limited local fire resources to protect the structures.

33.1.7 Ignition Risk Assessment

Ryndon has a moderate to high risk of ignition. The potential for heavier fuel loading from annual grasses during years of high precipitation exacerbates this risk. There is a history of lightning strikes around the community. The primary risks of ignition in Ryndon would be an auto accident on Interstate 80, railroad sparking, lightning, and other human caused ignitions that are unpredictable and can occur at any time.

33.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Ryndon area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

33.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.

- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[25] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Maintain the defensible space as needed.
- Install spark arrestors on chimneys.
- Remove or board up abandoned trailers and other structures to prevent sparks entering and igniting the structures.

33.2.2 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove biomass and disposed of it at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

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

Ryndon VFD and Nevada Division of Forestry

- Coordinate residents to develop and enforce a community brush clearance and biomass disposal program.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Union Pacific Railroad

- Clear and maintain free of vegetation a minimum space of twenty feet on either side of the railroad tracks.

33.2.3 Fire Suppression Resources

Elko County and Nevada Division of Forestry

- Pursue grants to upgrade or replace the existing fire station, obtain wildland firefighting equipment, and install a minimum capacity 10,000-gallon water storage tank.

Ryndon VFD and Nevada Division of Forestry

- Continue to provide wildland firefighting training for all volunteers.
- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.
- Upgrade the VFD radio system to narrow band technology to ensure communication compatibility.

33.2.4 Community Coordination

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

Property Owners

- Coordinate through the ROWE Group (Ryndon, Osino, White Rock, Elburz) to form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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
210 South Roop Street Suite 101
Carson City, NV 89701
www.nvfsc.org

Elko County

- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

33.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Ryndon VFD

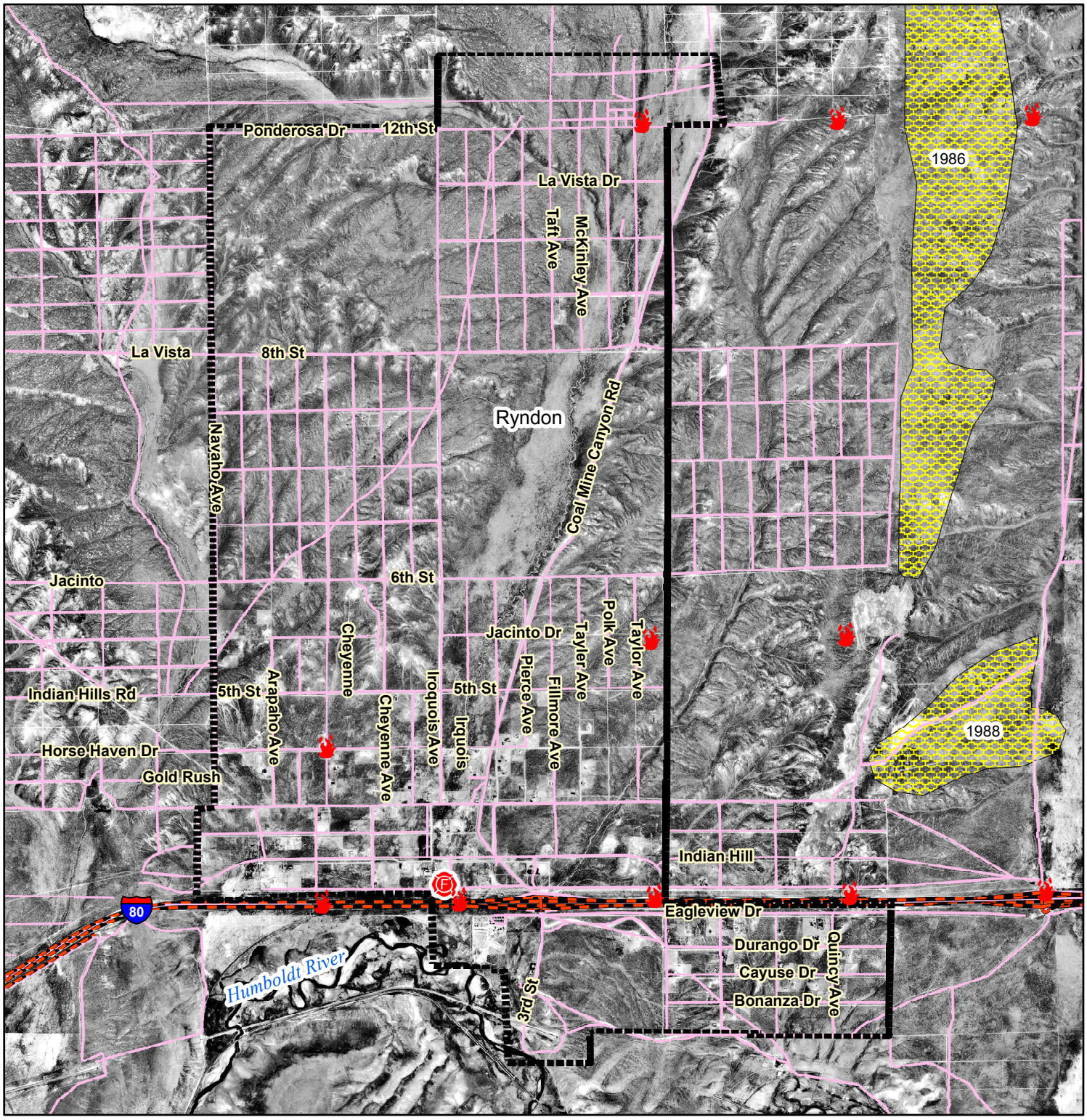
- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

33.3 SUMMARY OF RECOMMENDATIONS

Table 33-2. Ryndon Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space annually.
	Community Coordination	Ensure residential addresses are easily visible from the road. Coordinate through the ROWE Group to form a local community-based organization to provide leadership and be responsible for community-wide fuel reduction treatments and community fire safety.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
	Community Coordination	Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access.
Elko County and Nevada Division of Forestry	Fire Suppression Resources	Upgrade or replace the existing fire station, obtain wildland firefighting equipment, and install a minimum capacity 10,000-gallon water storage tank.
Ryndon VFD and Nevada Division of Forestry	Fuels Reduction	Coordinate with residents to develop and enforce a community brush clearance and biomass disposal program.
	Fire Suppression Resources	Upgrade or replace the existing fire station, obtain wildland firefighting equipment, and install a minimum capacity 10,000-gallon water storage tank. Continue wildland firefighting training for all volunteers. Continue to meet annually with the cooperating agencies to review pre-attack plan for the area. Upgrade radio system to narrow band technology to ensure proper communication compatibility.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.



Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

Figure 33-1. Ryndon
Fire History and Suppression Resources

N
W E
S

0 0.25 0.5 1
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

Table 33-3. Ryndon Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	3	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	5	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	7	/10

TALLIES

246 Total Houses **39 Residential Streets**

B5. Street Signs

4 not visible | 35 visible | 90% visible

B6. Address Signs

171 not visible | 75 visible | 30% visible

C1. Roofs

1 combust | 245 not combust | 100% not combust

C2. Siding

11 combust | 235 not combust | 96% not combust

C3. Unenclosed Structures on Lot

138 not enclosed | 108 enclosed | 56% not enclosed

D1. Lot Sizes

198 <1ac | 48 >1ac <10ac | 0 >10ac

D2. Defensible Space

66 not adequat | 180 adequate | 73% adequate

Score **57** /128

34.0 SPRING CREEK

34.1 RISK AND HAZARD ASSESSMENT

Spring Creek is located at the junction of State Route 227 and State Route 228 in west central Elko County, approximately twelve miles southeast of Elko. Spring Creek is situated at an elevation of approximately 5,700 feet. The results of the community hazard assessment classified Spring Creek in the **Moderate Hazard** category (41 points). A summary of the factors that contributed to the hazard rating is provided in Table 34-3. Primary factors include high hazard fuels, the potential for high intensity fires, a lack of visible address signs, and the number of structures with unenclosed exterior features. The community boundary identified for this report is shown in Figure 34-1.

34.1.1 Community Design

The wildland-urban interface condition in Spring Creek is intermixed: structures and wildland fuels are scattered throughout the community with no clear separation between wildland fuels and developed parcels. Of the 2,883 homes assessed, 649 are on lots of less than one acre, 2,221 are on lots of one to ten acres, and thirteen are on parcels greater than ten acres in size.

Access: State Route 227 is the primary transportation route through Spring Creek. The road is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. Secondary community roads are of adequate width and grade for two-way vehicle passage.

Signage: Street signs are clearly posted on all community roads in Spring Creek. Residential addresses are visible on 81 percent of the homes observed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: The utilities in Spring Creek are both above and below ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

34.1.2 Construction Materials

Ninety-nine percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials and fire resistant roofing such as composition material, metal, or tile. Approximately one quarter of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

34.1.3 Defensible Space

Just over three-quarters of the homes meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

34.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Spring Creek is provided by the Spring Creek Fire Department, a combination career/volunteer department with two stations, four career members, and fifteen volunteers. Table 34-1 lists the types of local wildfire resources and equipment available for initial response to Spring Creek in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 34-1. Wildfire Suppression Resources Available to Spring Creek

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine	2	Spring Creek Station 1
Type 2 Engine	1	(Spring Creek)
Type 6 Engine	1	
Water Tender	1	
Type 1 Engine	1	Spring Creek Station 3
Type 2 Engine	1	(Spring Creek)
Type 6 Engine	1	
Water Tender	1	
Type 6 Rescue	1	

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Rod Mothershead, Spring Creek VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression resources for Spring Creek includes a community water system with:

- 326 gravity fed- water hydrants within 1,000 feet of structures with a minimum flow capacity of 500 gpm.
- Community wells with eight water storage tanks totaling a three million gallon capacity. There are no backup generators for the pumps in the event of an electrical power outage.
- The marina and other ponds at the golf course could be used as helicopter dip sites.
- Two dip sites for helicopters and a dry hydrant at the Marina.

Fire Protection Personnel Qualifications

The Spring Creek volunteer firefighters have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards and Hazardous Materials response training.

Work Load

In a typical year the Spring Creek Fire Department responds to the following annual calls:

- 250 emergency medical calls.

- 40 wildland/brush fire calls.
- 75 other calls.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Spring Creek is included in the County plans.

The Spring Creek Fire Department does not currently review development plans, but would like to be involved in the development review process to ensure that all new development conforms to National Fire Code standards for community design and construction. The Fire Department has a brush clearance program enforced through public education. The department in the past has had a fire education program presented at Elko-area schools and would like to reinstate that education program.

34.1.5 Factors Affecting Fire Behavior

The terrain within the community boundary is generally flat with some rolling hills. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

The vegetative fuel density in the Spring Creek interface area is moderate to high, estimated at three to fifteen tons per acre. The fuel hazard accordingly varies throughout the community with high hazard fuels interspersed low and moderate fuel hazard areas. Most of Spring Creek was built on the Six-Bar Ranch, which was seeded to crested wheatgrass before development. Crested wheatgrass is a fire resistant species. However, sagebrush reestablishment in the original seeding has progressed to the point where the fuels are dominated by big sagebrush with sparse rabbitbrush and broom snakeweed. Fuel loading is highest on the northeast side of the community where and juniper trees increase the fuel hazard. Ground fuels consist of bluegrasses, squirreltail, basin wildrye, and some cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years with higher than average precipitation.

The Spring Creek subdivision has a network of equestrian trails that range from fifty to 100 feet wide owned by the Spring Creek Homeowners Association. The trails frequently follow washes and drainages, areas that have higher soil moisture content and thus heavier vegetation density. These areas contain high hazard fuels that could “wick” a fire along the drainages and through the community. Despite the increased hazard these areas pose to the community, the opportunity exists to use the trails to slow the advance of a fire rather than fueling a fire. The treatments would not only enhance fire safety in Spring Creek, but also improve the trails for more pleasant equestrian use.

The Bureau of Land Management Elko Field Office completed a seven to eight mile fuelbreak along Lower Lamoille Road on the north side of the community in 2004. The greenstrip was constructed using mechanical mastication equipment to reduce sagebrush fuel loads. The greenstrip was constructed in a mosaic type pattern with widths ranging between 200 and 600 feet. Then entire project totaled approximately 961 acres. The homeowners association has completed limited clearing along community roads. Also

portions of the green belts (open space areas) have been thinned within the community (Figure 34-1).

34.1.6 Existing Mitigation Projects

The Bureau of Land Management Elko Field Office has completed several fuel reduction treatments within the Spring Creek community. A seven to eight mile fuelbreak was constructed along Lower Lamoille Road on the north side of the community. The homeowners association has completed limited clearing along community roads. Also portions of the green belts (open space areas) have been thinned within the community as shown on Figure 34-1.

34.1.7 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in Spring Creek would start next to or within the community where moderate to heavy fuels surround the homes. With a strong wind from the south-southwest, homes could be quickly threatened. The heavy sagebrush within the community locally called “green belts” could carry extreme fire through large areas, exposing many homes to the risk of damage or loss from wildfire.

34.1.8 Ignition Risk Assessment

Spring Creek has a high ignition risk based on fire history in the area and the potential for increased fuel loading from cheatgrass in high precipitation years. There are no large historic wildfires in the public lands surrounding the community. A history of lightning strikes around the community indicates that rapid responses to these ignitions have kept these fires small. The primary risks of ignition in Spring Creek are human caused, although lightning storms occur regularly through the summer.

34.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for the Spring Creek area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the future requirements that new developments will be planned and constructed to create fire safe communities. Other recommendations pertain to community coordination and public education efforts that could be undertaken to enhance fire safety.

34.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Clear weeds and brush to a width of ten feet along both sides of the driveways.
- Trim and remove tree branches a minimum of four feet from the ground to reduce ladder fuels on all deciduous and coniferous trees within the defensible space zone. Prune all dead and diseased branches.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention to areas around chimneys.
- Mow grass within the defensible space zone to maintain a maximum height of four inches.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where possible, irrigate all trees and large shrubs that remain in close proximity to structures to increase their fire resiliency. This is especially important during drought conditions.
- Maintain the defensible space as needed.
- Board up or remove abandoned structures or trailers to prevent sparks entering and igniting the structure.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[26] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- In areas with heavy pinyon-juniper stands, consider purchasing a fire blocking gel to spray on the home in the event of a wildfire.

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

34.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation for a distance of fifty feet on both sides of roads in pinyon-juniper vegetation areas.

Nevada Department of Transportation

- Reduce vegetation along long State Route 227 through the community by mowing all vegetation to a height of no more than four inches from the edge of the road to the right-of-way fence line on both sides of the road.

Spring Creek Fire Department, Nevada Division of Forestry, Bureau of Land Management

- Construct and maintain a 200-foot wide fuelbreak along the north and west sides of the community near the mobile home development. The fuelbreak should extend downslope into the drainages. The area is rapidly being developed and a fuelbreak should be constructed along the northwest extent of the community during each development stage, as shown in Figure 34-1.

Spring Creek Homeowners Association

- Work with the Spring Creek Fire Department to develop and implement a brush control – brush-beating treatment to reduce sagebrush density and release and enhance growth of crested wheatgrass along the equestrian trails.

34.2.3 Fire Suppression Resources

Spring Creek Fire Department and Nevada Division of Forestry

- Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.

Spring Creek Homeowners Association

- Purchase a tractor and brush beating equipment for an association-maintained fuel reduction program, as well as for the use of property owners who wish to conduct fuel reduction treatment on their private property.

34.2.4 Community Coordination

Elko County

- Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.
- All new roads should be named, mapped, and identified with GPS locations.

Spring Creek Fire Department

- Conduct courtesy inspections of defensible space condition and defensible space treatments on private property.

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire. Work with Elko County to ensure house numbers are correct.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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 of for more information contact the:

  Nevada Fire Safe Council
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

34.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Spring Creek Homeowners Association

- Implement an education program to inform residents of the benefits of fuel reduction and brush beating to increase crested wheatgrass growth along equestrian trails.

Spring Creek FD and Nevada Division of Forestry

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

34.3 SUMMARY OF RECOMMENDATIONS

Table 34-2. Spring Creek Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Ensure that residential addresses are visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Spring Creek Homeowners Association	Fuels Reduction	Work with the Spring Creek Fire Department and the cooperating agencies to develop and implement a brush control program to reduce sagebrush density and to release and enhance growth of crested wheatgrass along the equestrian trails.
	Public Education	Deliver an education program that informs residents of the benefits of fuel reduction and brush beating to increase crested wheatgrass growth along equestrian trails.
	Fire Suppression Resources	Purchase a tractor and brush beating to maintain fuel reduction on equestrian trails and for property owners to use for fuel reduction on their private property.
Nevada Department of Transportation	Fuels Reduction	Reduce vegetation along State Route 227 through the community by mowing all vegetation to a height of no more than four inches for from the edge of the road to the right-of-way fence line on both sides of the road.
Elko County	Fuels Reduction	Reduce vegetation along roads for fifty feet on both sides in areas of pinyon-juniper growth.
Spring Creek Fire Department Elko County Bureau of Land Management	Fuels Reduction	Construct and maintain a 200-foot wide fuelbreak along the west side of the community from the mobile home establishment to Hayland Street. The fuelbreak should extend downslope into the drainages.
Spring Creek Fire Department **Elko County**	Community Coordination	Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction, water supply and emergency access. All new roads should be named, mapped, and identified with GPS locations.

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Spring Creek Fire Department and Nevada Division of Forestry	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to discuss pre-attack plans for the community. Upgrade the radio system to narrow band technology to ensure proper communication compatibility. Conduct courtesy inspections of defensible space condition and defensible space treatments on private property.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 34-3. Spring Creek Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	3	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	4	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	5	/10
2. Department	3	/10

TALLIES

2883 Total Houses **92 Residential Streets**

B5. Street Signs

0 not visible | 92 visible | 100% visible

B6. Address Signs

542 not visible | 2341 visible | 81% visible

C1. Roofs

34 combust | 2849 not combust | 99% not combust

C2. Siding

38 combust | 2845 not combust | 99% not combust

C3. Unenclosed Structures on Lot

735 not enclosed | 2148 enclosed | 25% not enclosed

D1. Lot Sizes

649 <1ac | 2221 >1ac <10ac | 13 >10ac

D2. Defensible Space

626 not adequat | 2257 adequate | 78% adequate

Score **41** /128

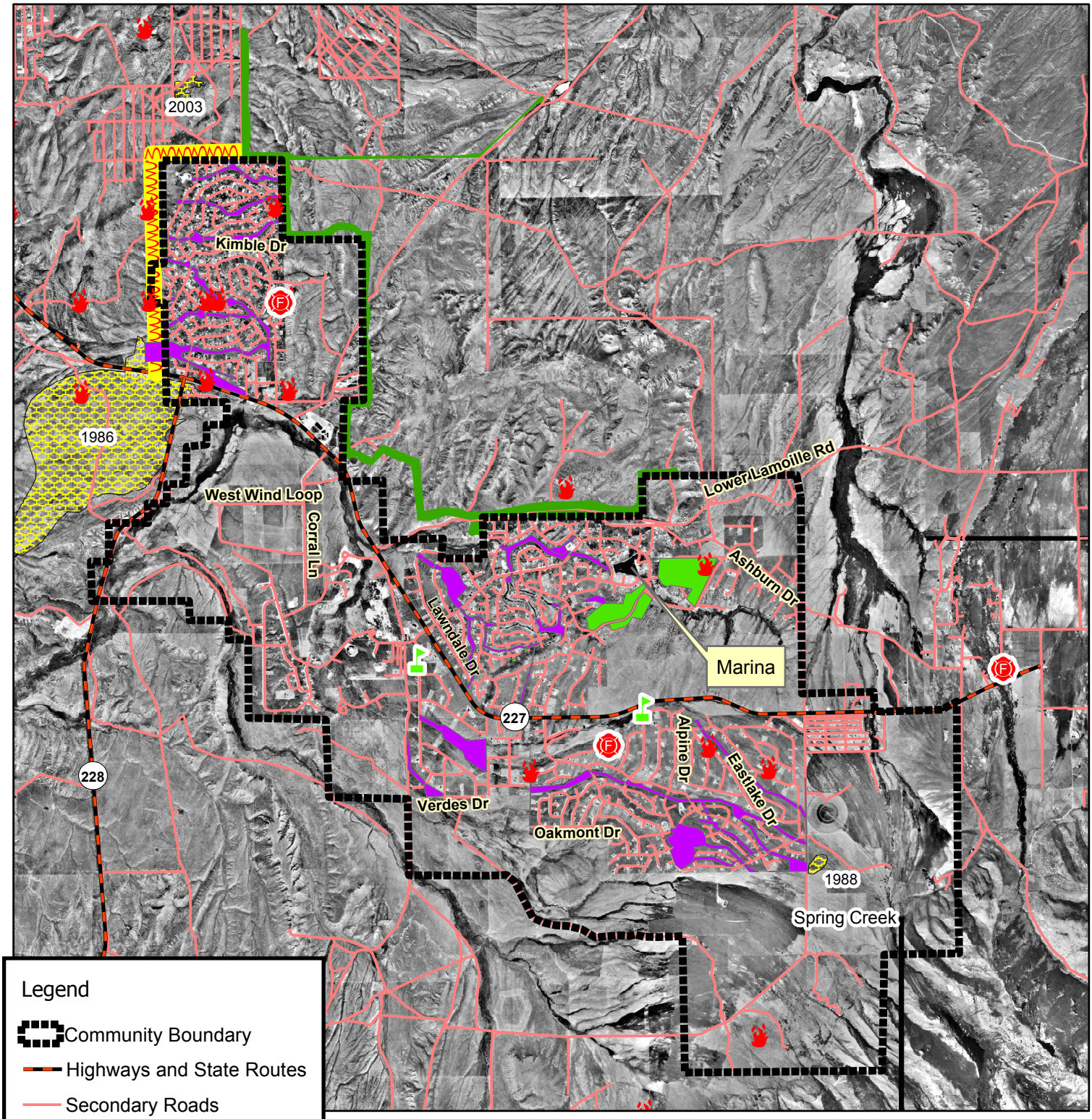


Figure 34-1. Spring Creek
Fire History, Suppression Resources,
Critical features, and Mitigation Projects

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

35.0 WILD HORSE ESTATES

35.1 RISK AND HAZARD ASSESSMENT

Wild Horse Estates is located in northwest Elko County along State Route 225. The community is situated at the south end of Wild Horse Reservoir, at an elevation of approximately 6,200 feet. The results of the community hazard assessment classified Wild Horse Estates in the **Moderate Hazard** category (58 points). A summary of the factors that contribute to this hazard rating is provided in Table 35-3. Primary factors include inadequate defensible space, inadequate address signage, and an absence of local fire suppression resources. The community boundary identified for this report is shown in Figure 35-1.

35.1.1 Community Design

The wildland-urban interface condition in Wild Horse Estates is intermixed: there is no clear separation between wildland fuels and developed parcels. Sixty-eight homes were assessed on parcels of between one and ten acres in size.

Access: State Route 225 is the primary transportation route through Wild Horse Estates. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. Secondary roads are of adequate width and grade for passage as well.

Signage: Street signs are clearly posted on all the community roads. Residential addresses are not visible on any of the homes in the area. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

35.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard, and 99 percent of the homes have fire resistant roofing of composition materials, metal, or tile. Less than one-third of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

35.1.3 Defensible Space

Only 62 percent of the homes observed in the interface meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

35.1.4 Suppression Capabilities

Wildfire Protection Resources

Wild Horse Estates has no local fire department or suppression resources. Previously the North Fork VFD responded to fires in Wild Horse Estates, but that volunteer fire department is now inactive. Table 35-1 lists the types of wildfire resources, cooperating partners, and equipment available for response to Wild Horse Estates in the event of a reported wildfire. Additional resources are available upon request from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 35-1. Wildfire Suppression Resources Available to Wild Horse Estates

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 3 Helicopter Air Attack Platform	1 1	Bureau of Land Management Elko Helibase
Type 3 Engine Type I Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 6 Engine	1	US Forest Service (Mountain City)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

Water available for fire suppression resources for Wild Horse Estates includes the Wild Horse Reservoir and the Owyhee River that could be used as drafting sources or helicopter dip sites.

35.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Wild Horse Estates interface area is light, estimated at one ton per acre. The fuel hazard is low along the Owyhee River and Deep Creek corridors and moderate elsewhere. Fuels in the community consist primarily of sagebrush and rabbitbrush, with basin wildrye, halogeton, kochia, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. There are meadow grasses in riparian areas of the community near the reservoir. Russian thistle and annual mustards have invaded areas that have been disturbed. These species are highly flammable when dry. Russian thistle dries as tumbleweeds and tends to accumulate along fences and structures, increasing fuel loading and ignition hazards. The terrain within the community boundary is flat. The prevailing wind direction is from the south to southwest.

35.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Wild Horse would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and

high annual grass and forb production. Multiple ignitions south and west of the community fueled by strong south/southwest winds would push fires into the community. Fire resources are more than thirty minutes away. Without a community water system, structures could be threatened before suppression resources could arrive.

35.1.7 Ignition Risk Assessment

Wild Horse Estates has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from cheatgrass in high precipitation years. The primary risks of ignition in Wild Horse Estates are human carelessness and lightning strikes.

35.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents of the community and local governments. The recommendations for the Wild Horse Estates focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

35.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush or dried weeds growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.

- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[27] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain the defensible space as needed.

35.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Elko County

- Reduce vegetation along community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.

35.2.3 Fire Suppression Resources

Property Owners

- Coordinate with Elko County, the Nevada Division of Forestry, and residents in North Fork to reactivate the North Fork VFD, enhance recruitment of volunteers, establish training, and obtain personal protective equipment and fire suppression apparatus.

35.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for

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

those unfamiliar with the area to navigate under smoky conditions during a wildfire.

35.3 SUMMARY OF RECOMMENDATIONS

Table 35-2. Wild Horse Estates Risk and 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 the defensible space as needed.
	Community Coordination	Ensure residential addresses are easily visible from the road. Work with North Fork to re-activate North Fork VFD. Contact Nevada Division of Forestry for information and assistance.
	Fire Suppression Resources	Coordinate with Elko County, the Nevada Division of Forestry, and residents in North Fork to reactivate the North Fork VFD, enhance recruitment of volunteers, establish training, and obtain personal protective equipment and fire suppression apparatus.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County	Fuels Reduction	Reduce vegetation along community roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.

Table 35-3. Wild Horse Estates Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	3	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	3	/5

D. Defensible Space

1. Lot Size	3	/5
2. Defensible Space	7	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	10	/10
2. Department	10	/10

TALLIES

68 Total Houses **9 Residential Streets**

B5. Street Signs

0 not visible | 9 visible | 100% visible

B6. Address Signs

68 not visible | 0 visible | 0% visible

C1. Roofs

1 combust | 67 not combust | 99% not combust

C2. Siding

0 combust | 68 not combust | 100% not combust

C3. Unenclosed Structures on Lot

21 not enclosed | 47 enclosed | 31% not enclosed

D1. Lot Sizes

0 <1ac | 68 >1ac <10ac | 0 >10ac

D2. Defensible Space

26 not adequat | 42 adequate | 62% adequate

Score **58** /128

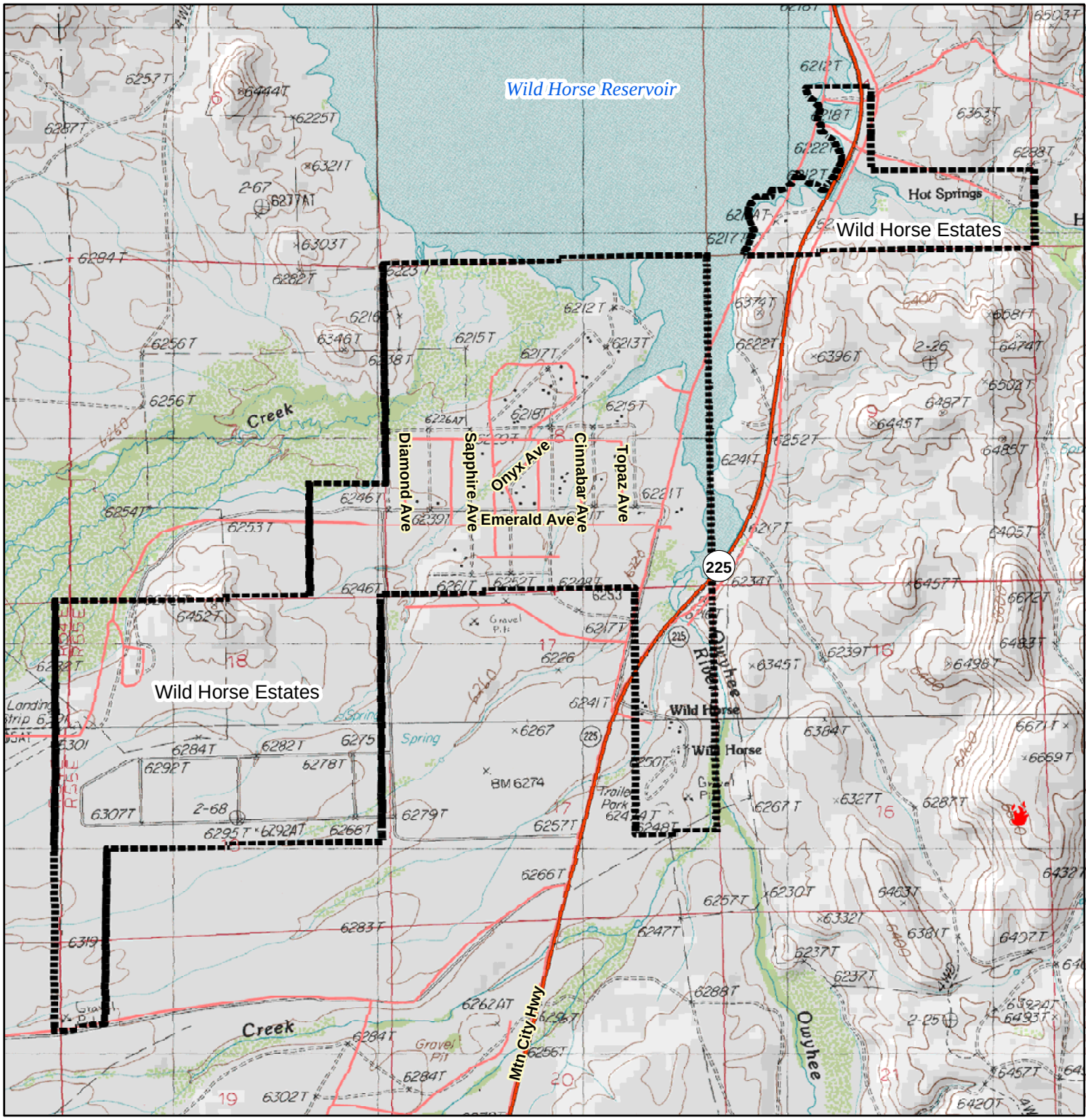


Figure 35-1. Wild Horse Estates
Fire History

N
W E
S

Legend

- Community Boundary
- Fire Ignition
- Highways and State Routes
- Secondary Roads

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

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

Low Hazard Communities

36.0 JACKPOT

36.1 RISK AND HAZARD ASSESSMENT

Jackpot is located northeast of Elko on the Nevada-Idaho state line along US Highway 93. The town is located at an elevation of 5,213 feet on the banks of the Salmon River. The results of the community hazard assessment classified Jackpot in the **Low Hazard** category (38 points). A summary of the factors that contribute to this hazard rating is included in Table 36-3. The low rating is attributed to adequate access and defensible space and the predominant use of fire resistant construction materials. The community boundary identified for this report is shown in Figure 36-1.

36.1.1 Community Design

The wildland-urban interface in Jackpot is a classic interface condition: a clear line of demarcation exists where developed areas abut wildland fuels. Roads and back fences characteristically mark this type of interface, and wildland fuels do not typically continue into residential areas. Seventy-four homes were included in this assessment. All of the homes are on parcels of one acre or less in size.

Access: US Highway 93 is the primary transportation route through Jackpot, and there are numerous secondary roads. The highway and community roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment to maneuver

Signage: All but one of the streets observed are clearly signed. Eighty-six percent of the homes observed have visible addresses. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: Utilities are both above and below ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

36.1.2 Construction Materials

Eighty-five percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. They also have fire resistant roofing made of composition material, metal, or tile. Less than ten percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

36.1.3 Defensible Space

All but three of the homes observed meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

36.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Jackpot is provided by the Jackpot Fire Department, a combination career and volunteer fire department with by one paid firefighter and 21 volunteer firefighters. Table 36-1 lists the types of local wildfire resources and equipment available for initial response to Jackpot in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1. The Salmon Tract Fire District in Idaho, twenty miles to the north, also provides mutual aid to Jackpot.

Table 36-1. Jackpot Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine	2	Jackpot FD
Type 2 Engine	1	(Jackpot)
Type 1 Engine	1	
Type 6 Engine	1	
Type 6 Engine	1	Nevada Division of Forestry (Wells- Seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Verl Jarvie, Jackpot Fire Department Chief

The Jackpot Fire Department recently acquired a 1990's model fire engine, but still may need additional equipment upgrades.

Water Sources and Infrastructure

Water available for fire suppression in Jackpot includes fire hydrants within 500 feet of structures with 1,500 gpm flow capacity. The community water system includes five community capable of producing 4,300 gpm and storage tanks totaling 1.4 million gallons. The water system operates on gravity and electrical pumps. There is a backup emergency generator to run one of the pumps on a four-inch well in the event of an electrical power outage.

Fire Protection Personnel Qualifications

Approximately half of the Jackpot Fire Department firefighters have received Fire Fighter I and/or EMT training. Half of the Jackpot volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Jackpot Fire Department responded to over 250 calls in 2003:

- 240 emergency medical calls.
- 4 wildland/brush fire calls.
- 36 other calls.

Financial Support

Funding for the Jackpot Fire Department is provided through the Elko County General Fund and the Nevada Division of Forestry as authorized under NRS 473. The Nevada Division of Forestry pays the Jackpot Fire Department per run in the County where NDF has fire protection responsibility as outlined in the agreement.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Jackpot is included in the County plans.

36.1.5 Factors Affecting Fire Behavior

Fuels in the community consist of sagebrush and rabbitbrush that are two to three foot tall with an understory of cheatgrass, crested wheatgrass, halogeton, and Russian thistle in disturbed areas. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years of higher than average precipitation. The area east of Highway 93 has been successfully seeded with crested wheatgrass as some time in the past. Crested wheatgrass is a fire resistant species often used in burned area rehabilitation. The fuel load was estimated at between two to three tons per acre and was considered a moderate fuel hazard.

The terrain within the community boundary is mostly flat. The community lies in a north-south valley along both sides of Highway 93. Slopes along the west side of the community are moderate and on the east side, the terrain is gently rolling. The prevailing wind direction is from the south/southwest.

36.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Jackpot would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions and strong erratic winds, greater than twenty miles per hour could push fires into the community from any direction. The golf course, sewer ponds, and crested wheatgrass seedings should slow the spread of a fire.

36.1.7 Ignition Risk Assessment

Jackpot has a moderate ignition risk based on fire history and moderate fuel loading. The primary risk of ignition in Jackpot is lightning, although human caused ignitions are unpredictable and can occur at any time.

36.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for the Jackpot area focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

36.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[28] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.
- Maintain the defensible space as needed.

36.2.2 Fire Suppression Resources

Jackpot Fire Department

- Construct a fire access road (which will also serve as a firebreak) west of structures in the town from the Rodeo Grounds to Highway 93 north of the community as shown in Figure 36-1. The access road should be twelve to fifteen feet wide to provide fire engine access.

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

Jackpot Fire Department

- Provide structure firefighting training to all volunteers to bring them up to minimum State of Nevada Fire Marshal standards.
- Provide all firefighters with basic wildland fire training and equipment as described in the National Wildfire Coordinating Group (NWCG) Wildland and Prescribed Fire Qualification System Guide 310-1. Provide annual wildland firefighting refresher training and fire shelter training.
- Upgrade the radio system to narrow band technology to ensure proper communication compatibility.
- Upgrade fire suppression apparatus.

36.2.3 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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 of for more information contact the:

  Nevada Fire Safe Council
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

36.3 SUMMARY OF RECOMMENDATIONS

Table 36-2. Jackpot Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Maintain the defensible space as needed.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Jackpot Fire Department	Fire Suppression Resources	Construct a fire access road west of structures in town from the Rodeo Grounds to Highway 93 north of the community. The road should be twelve to fifteen feet wide to provide fire engine access.
	Fire Suppression Resources	Provide structure firefighting training to all volunteers to bring them up to minimum State of Nevada Fire Marshal standards. Provide all firefighters with basic wildland fire training and equipment as described in the National Wildfire Coordinating Group (NWCG) Wildland and Prescribed Fire Qualification System Guide 310-1. Provide annual wildland firefighting refresher training and fire shelter training. Upgrade radios with narrow band technology for compatibility with cooperating agencies. Upgrade fire suppression apparatus.

Table 36-3. Jackpot Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	3	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	5	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	7	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	3	/10

TALLIES

74 Total Houses **16 Residential Streets**

B5. Street Signs

1	not visible	15	visible	94%	visible

B6. Address Signs

10	not visible	64	visible	86%	visible

C1. Roofs

11	combust	63	not combust	85%	not combust

C2. Siding

11	combust	63	not combust	85%	not combust

C3. Unenclosed Structures on Lot

6	not enclosed	68	enclosed	8%	not enclosed

D1. Lot Sizes

74	<1ac	0	>1ac <10ac	0	>10ac

D2. Defensible Space

3	not adequat	71	adequate	96%	adequate

Score **38** /128

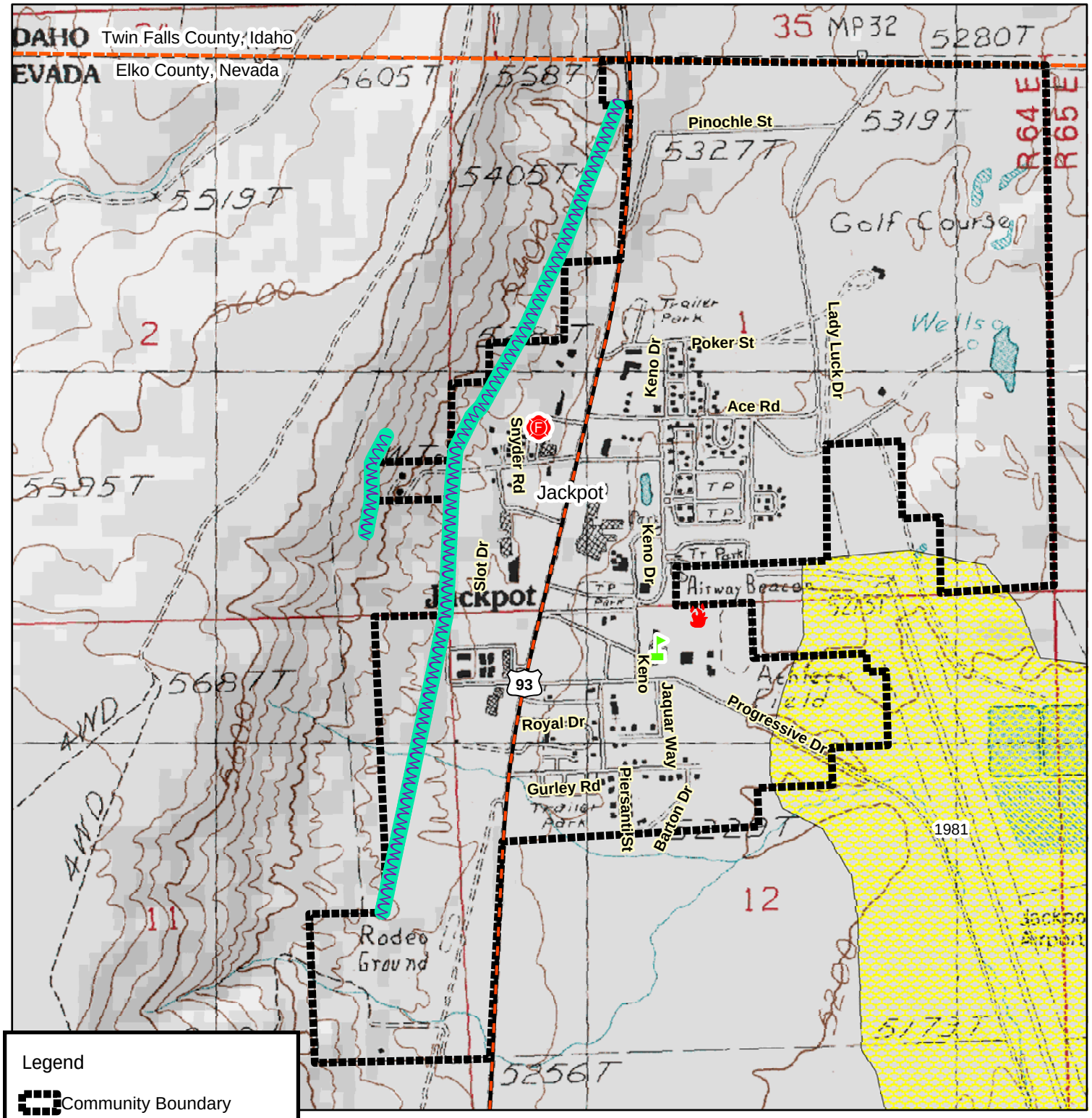


Figure 36-1. Jackpot
Fire History, Suppression Resources,
Critical Features, and
Proposed Mitigation Projects

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

Nevada Community Wildfire Risk / Hazard Assessment Project

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

37.0 MONTELLO

37.1 RISK AND HAZARD ASSESSMENT

Montello is a small town in northeastern Elko County located at the north end of Pilot Valley along State Route 233, approximately 24 miles northeast of the junction State Route 233 and Interstate 80. Montello is situated at an elevation of approximately 4,880 feet. The Union Pacific Railroad runs along the south side of the community boundary.

The results of the community hazard assessment classified Montello in the **Low Hazard** category (39 points). A summary of the factors that contribute to this hazard rating is presented in Table 37-3. Primary factors that contribute to the rating are a low fuel hazard, mild topography, good access, fire resistant construction materials, and a reliable water source. The community boundary identified for this report is shown in Figure 37-1.

37.1.1 Community Design

The wildland-urban interface condition in Montello is intermixed: there is no clear separation between wildland fuels and structures. Of the 82 homes included in this assessment, the majority are located in a residential core area on lots less than one acre in size. Twenty-nine additional residences are located on lots larger than one acre within five miles of the community core.

Access: State Route 233 is the primary transportation route through Montello. The highway is at least 24 feet wide, paved, and has adequate turnaround space for fire suppression equipment. All of the secondary roads were of adequate width and gradient to allow ease of maneuverability for fire suppression equipment or the passage of two vehicles.

Signage: None of the streets in Montello have clearly posted signs. Residential addresses are only visible on ten homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

37.1.2 Construction Materials

Ninety-three percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard. Ninety percent of the homes have fire resistant roofing made of composition material, metal, or tile. Eleven percent of the homes had unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

37.1.3 Defensible Space

About three-quarters of the homes observed during the assessment meet the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

37.1.4 Suppression Capabilities

Wildfire Protection Resources

Montello is part of the Tecoma Township Fire Protection District (FPD), along with Pilot Valley and West Wendover, Nevada. The Montello VFD is staffed by 25 volunteer members. Table 37-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Montello in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 37-1. Wildfire Suppression Resources Available to Montello

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine	2 1	Tecoma Township FPD (Montello)
Type 4 Engine	1	Tecoma FPD (Pilot Valley)
Type 2 Engine	1	Wells VFD (Wells)
Type 4 Engine	1	Wendover FD (Wendover)
Type 6 Engine	1	Nevada Division of Forestry (Wells –seasonal)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bob Farrell, Tecoma Township VFD Fire Chief.

The Tecoma Township FPD has old, outdated equipment with the exception of a 1990's engine obtained through a fire assistance grant. It is important that fire suppression equipment be adequate and in proper working condition in order for fire protection personnel to be able to protect the community in the event of a wildfire.

Water Sources and Infrastructure

Water available for fire suppression resources in Montello includes:

- Hydrants within 300 feet of structures capable of 1,500 gpm.
- Springs located six miles west of town with a combined flow rate of 120 gpm.
- One 150,000 gallon storage tank located one mile west of town.
- One 20,000 gallon water storage tank in Pilot Valley.
- A pond available for use as a helicopter dip spot at the Crittendon/Gamble Ranch twenty miles northwest of Montello.

The water system operates on gravity and electrical pumps. There is a backup propane emergency generator to run the pumps in the event of an electrical power outage.

Fire Protection Personnel Qualifications

All Montello VFD firefighters have been trained in-house for structure protection and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Tecoma Township Fire Protection District and the volunteer fire departments within the FPD respond to the following annual calls together:

- Five to ten emergency medical calls.
- Five to ten wildland/brush fire calls.
- One to five other calls.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Montello is included in the County plans.

37.1.5 Factors Affecting Fire Behavior

The terrain within and around Montello is flat. The prevailing wind direction is south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area. The vegetative fuel density in the Montello interface area is generally light, estimated at one to three tons per acre, which was considered a low to moderate fuel hazard. Fuels in the community consist primarily of greasewood, shadscale, and rabbitbrush. Ground fuels consist of halogeton, cheatgrass, and perennials. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years of higher than average precipitation. Russian thistle has invaded disturbed areas in Montello. Russian thistle dries as tumbleweeds and tends to accumulate along fences and against structures, increasing the fuel loading and fuel hazard.

37.1.6 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the area surrounding Montello would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions with strong winds greater than twenty miles per hour could push fires into the community from any direction. The heaviest fuel loading is found in the interior of the community. A fire in the interior of the community poses the greatest threat.

37.1.7 Ignition Risk Assessment

Montello has a low to moderate ignition risk. There is moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Montello is lightning, although human caused ignitions are unpredictable and can occur at any time.

37.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents and local governments. The recommendations for Montello focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

37.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.

  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush or weeds accumulated against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[29] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted.

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

Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

37.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Tecoma Township FPD and Nevada Division of Forestry

- Remove accumulations of brush and Russian thistle within the community. Reseed areas as needed with fire resistant species such as recommended in Appendix E to minimize cheatgrass and weed invasion.
- Clear brush around fire hydrants.

Tecoma Township FPD, Nevada Division of Forestry, and Bureau of Land Management

- Construct a 50-foot wide fuelbreak along the north and west sides of the community from State Route 233 to Crittenden Reservoir Road.

Elko County and Nevada Department of Transportation

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

Union Pacific Railroad

- 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. Maintain low growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

37.2.3 Fire Suppression Resources

Tecoma Township Fire Protection District /Montello VFD and Nevada Division of Forestry

- Continue to meet annually with the cooperating agencies to review pre-attack plans.
- Upgrade fire suppression apparatus.
- Upgrade the VFD radio system to narrow band technology to ensure proper communication compatibility.

37.2.4 Community Coordination

Property Owners

- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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 of for more information contact the:

  Nevada Fire Safe Council
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

37.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Tecoma Township FPD/Montello VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

37.3 SUMMARY OF RECOMMENDATIONS

Table 37-2. Montello Risk and 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 area as needed.
	Community Coordination	Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety. Ensure residential addresses are easily visible from the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Elko County **Nevada Department of Transportation**	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.
Tecoma Township FPD **Nevada Division of Forestry** **Bureau of Land Management**	Fuels Reduction	Construct a 50-foot wide fuelbreak along the north and west sides of the community from State Route 233 to Crittenden Reservoir Road.
Tecoma Township Fire Protection District Montello VFD and Nevada Division of Forestry	Fuels Reduction	Remove accumulations of brush and Russian thistle within the community. Reseed areas as needed with fire resistant species to minimize cheatgrass and weed invasion. Clear brush around fire hydrants.
	Fire Suppression Resources	Continue to meet annually with the cooperating agencies to review pre-attack plans. Upgrade suppression equipment. Upgrade radio systems to narrow band technology to ensure proper communication compatibility
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 37-3. Montello Wildfire Hazard Rating Summary

A. Urban Interface Condition ***2***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	2	/10
2. Department	7	/10

TALLIES

82 Total Houses **15 Residential Streets**

B5. Street Signs

15 not visible | 0 visible | 0% visible

B6. Address Signs

72 not visible | 10 visible | 12% visible

C1. Roofs

8 combust | 74 not combust | 90% not combust

C2. Siding

6 combust | 76 not combust | 93% not combust

C3. Unenclosed Structures on Lot

9 not enclosed | 73 enclosed | 11% not enclosed

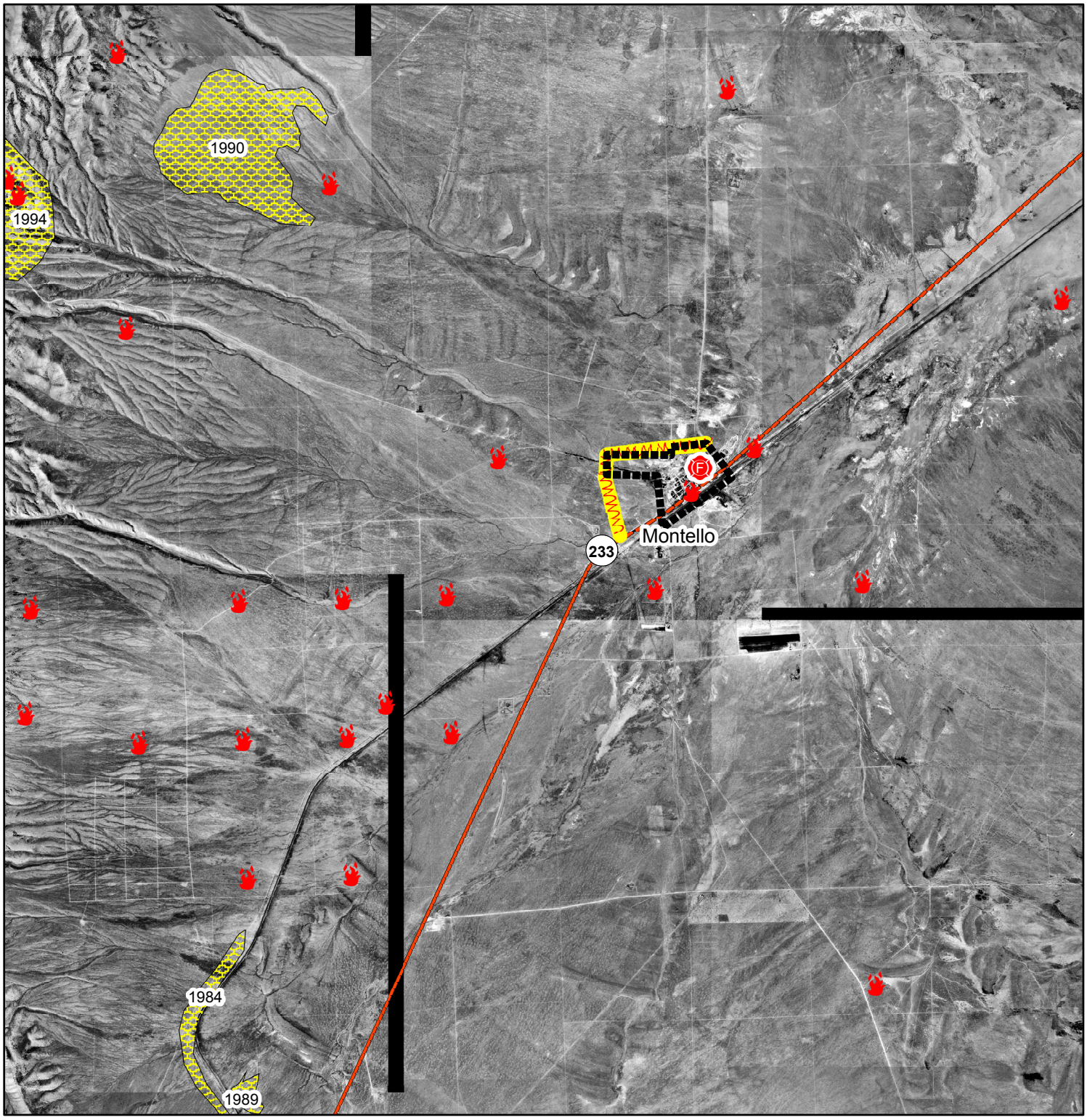
D1. Lot Sizes

51 <1ac | 12 >1ac <10ac | 19 >10ac

D2. Defensible Space

21 not adequat | 61 adequate | 74% adequate

Score **39** /128



Legend

- Community Boundary
- Proposed Fuelbreak
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes

Figure 37-1. Montello
Fire History, Suppression Resources,
and Proposed Mitigation Projects

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0 0.5 1 2
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

38.0 WELLS

38.1 RISK AND HAZARD ASSESSMENT

The city of Wells is located in central Elko County at the junction of Interstate 80 and State Route 93, approximately fifty miles east of the city of Elko. Wells is situated at an elevation of approximately 5,630 feet.

The results of the community hazard assessment classified Wells in the **Low Hazard** category (40 points). A summary of the factors that contribute to this hazard rating is provided in Table 38-3. Primary factors include good defensible space, reliable water sources, use of fire resistant construction materials, and grazing around the area that reduces the fuel hazard. The community boundary identified for this report is shown in Figure 38-1.

38.1.1 Community Design

The wildland-urban interface in Wells is a classic interface condition: a clear line of demarcation exists where developed areas abut wildland fuels. Roads and back fences characteristically mark this type of interface, and wildland fuels do not typically continue into residential areas. Of the 163 homes included in this assessment, 121 are on lots of one acre or less, and 42 are on lots of between one and ten acres.

Access: Interstate 80, Highway 93, and State Route 223, are the primary transportation routes through Wells. The roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment. Secondary roads in the community are adequate for two-way vehicle passage.

Signage: Street signs are posted on 83 percent of streets in Wells. Residential addresses are clearly visible on only 64 percent of homes. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities are above ground. Power line corridors need proper maintenance to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

38.1.2 Construction Materials

Ninety-eight percent of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard, and have fire resistant roofing made of composition material, metal, or tile. Fifteen percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can be trapped, smolder, ignite, and rapidly spread fire to the house.

38.1.3 Defensible Space

Ninety-two percent of the homes observed met the minimum defensible space requirement recommended to help protect the home from damage or loss during a wildfire.

38.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Wells is provided by the Wells Volunteer Fire Department, staffed by eighteen volunteers. Table 38-1 lists the types of local wildfire resources and equipment available to Wells in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 38-1. Wildfire Suppression Resources Available to Wells

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 2 Engine Type 3 Engine	2 1 1	Wells VFD (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 6 Engine	1	US Forest Service (Wells)
Type 4 Engine	1	Bureau of Land Management (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Randy Dedman, Wells VFD Chief.

Water Sources and Infrastructure

Water available for fire suppression in Wells includes fire hydrants within 500 feet of structures with 500 gpm flow capacities. The water system includes community wells and two water storage tanks: one 1,000,000 gallon, and one 500,000 gallon capacity. A pond on the golf course could be used as a helicopter dip spot if necessary. The water system operates on gravity and electrical pumps. There is no backup emergency generator to run the pumps in the event of an electrical power outage.

Fire Protection Personnel Qualifications

The Wells volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year the Wells VFD responds to the following annual calls:

- Twenty emergency medical calls.
- Fifty wildland/brush fire calls.
- Fifteen other calls.

Financial Support

Funding for the Jackpot Fire Department is provided through the Elko County General Fund and the Nevada Division of Forestry as authorized under NRS 473. The Nevada Division of Forestry pays the Wells Fire Department per run in the County where NDF has fire protection responsibility as outlined in the agreement.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Wells is included in the County plans.

38.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the Wells interface area is generally moderate, estimated at two to four tons per acre. The fuel hazard is low just outside of the residential areas of the community and moderate surrounding the community boundary. Fuels in the community consist of sagebrush, rabbitbrush, and greasewood shrubs two to three feet tall. Ground fuels consist of perennial grasses, basin wildrye, pepperweed, halogeton, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Russian thistle is prevalent in disturbed areas Russian thistle dries as tumbleweeds and tends to accumulate along fencelines and against structures creating fuel hazards. Numerous lots and areas within town are overgrown with dense vegetation. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southeast. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

38.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Wells would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions in the hills and mountains around the valley could be pushed toward the community with strong erratic winds from any direction. Fires ignited south or southeast of the community would also be influenced by predominant south to southeast winds.

There is an additional concern and possible worst case scenario regarding the fuel loading within the community. An ignition in heavy brush could feed a fire into structures if an ignition started within the community from a spot fire or a human caused ignition.

A third worst case condition could result of an ignition in the fuels around the propane storage area in the community. A severely hot fire wind-driven fire in this area could explode the tanks, spread fire toward residences, and push toxic fumes and smoke into the community.

38.1.7 Ignition Risk Assessment

Wells has a high ignition risk based on fire history in the area. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes

around the community. The primary risks of ignition in Wells are lightning, railroad sparks, and other human causes that are unpredictable and can occur at any time.

38.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendations for Wells focus primarily on the ongoing and additional efforts to create and maintain defensible space and on the community coordination and public education efforts that could be undertaken to enhance fire safety.

38.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Remove all dead vegetation and other flammable materials a minimum of five feet from the exterior of the structure.
- Mow or remove brush growing against fences in the community. The minimum distance for clearance should be ten feet in grass and 25 feet in brush.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks for a minimum distance of ten feet.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-emergent herbicide.[30] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted.

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

Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.

38.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.

Propane Company

- Clear vegetation and maintain a minimum clearance of 100 feet around all bulk fuel storage tanks.

Petroleum Fuel Company

- Clear vegetation and maintain a minimum clearance of 200 feet around all bulk fuel storage tanks.

Union Pacific Railroad

- 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. Maintain low growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

38.2.3 Fire Suppression Resources

Wells VFD

- Continue to provide structure firefighting training for all volunteers to bring them up to minimum State of Nevada Fire Marshal standards and wildfire training to meet the minimum National Wildfire Coordinating Group basic wildland standards.
- Upgrade the radio system to narrow band technology to ensure communication compatibility with cooperating agencies.

38.2.4 Community Coordination

Property Owners

- Ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.

38.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Wells VFD

- Distribute copies of the publication *"Living With Fire"* to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

38.3 SUMMARY OF RECOMMENDATIONS

Table 38-2. Wells Risk and 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 the defensible space as needed.
	Community Coordination	Ensure residential addresses are easily visible from the road.
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Reduce and remove vegetation to maintain a minimum clearance of thirty feet from fences around power substations.
Propane Company	Fuels Reduction	Clear vegetation and maintain a minimum clearance of 100 feet around all bulk fuel storage tanks.
Petroleum Company	Fuels Reduction	Clear vegetation and maintain a minimum clearance of 200 feet around all bulk fuel storage tanks.
Union Pacific Railroad	Fuels Reduction	Mow or reduce vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.
Wells VFD	Fire Suppression Resources	Upgrade the radio system to narrow band technology to ensure communication compatibility with cooperating agencies. Obtain structure firefighting training for all volunteers to bring up to minimum State of Nevada Fire Marshal standards and wildfire training to meet the minimum National Wildfire Coordinating Group basic wildland standards.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.

Table 38-3. Wells Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	3	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	3	/5
6. Address Signs	5	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	3	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	7	/10

TALLIES

163 Total Houses **23 Residential Streets**

B5. Street Signs

4 not visible | 19 visible | 83% visible

B6. Address Signs

59 not visible | 104 visible | 64% visible

C1. Roofs

4 combust | 159 not combust | 98% not combust

C2. Siding

4 combust | 159 not combust | 98% not combust

C3. Unenclosed Structures on Lot

24 not enclosed | 139 enclosed | 15% not enclosed

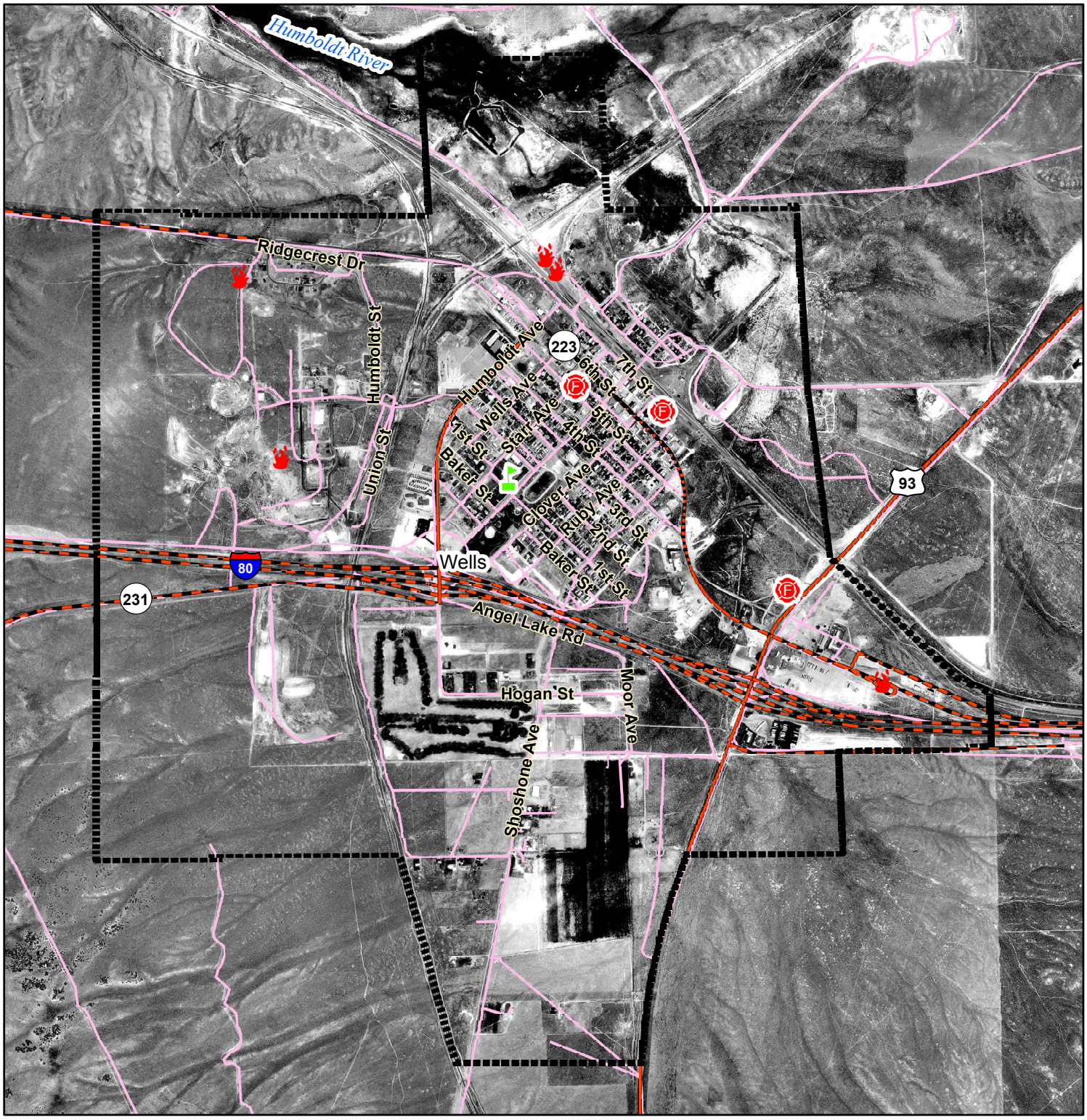
D1. Lot Sizes

121 <1ac | 42 >1ac <10ac | 0 >10ac

D2. Defensible Space

13 not adequat | 150 adequate | 92% adequate

Score **40** /128



Legend

- Community Boundary
- School
- Fire Station
- Fire Ignition
- Highways and State Routes
- Secondary Roads

Figure 38-1. Wells
Fire History, Suppression Resources, and Critical Features

N
W E
S

0 1,000 2,000 4,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

39.0 WEST WENDOVER

39.1 RISK AND HAZARD ASSESSMENT

West Wendover is a rapidly growing community located in eastern Elko County along Interstate 80 on the Nevada-Utah border. The town is contiguous to Wendover, Utah. West Wendover is situated at an elevation of approximately 4,450 feet.

The results of the community hazard assessment classified West Wendover in the **Low Hazard** category (26 points). A summary of the factors that contribute to the hazard rating is provided in Table 39-2. Primary factors that contribute to the rating are the sparse fuels; fire resistant construction materials, good defensible space and community design; and adequate fire suppression resources found in the community. The community boundary identified for this report is shown in Figure 39-1.

39.1.1 Community Design

The wildland-urban interface in West Wendover is a classic interface condition: a clear line of demarcation exists where developed areas abut wildland fuels. Roads and back fences characteristically mark this type of interface, and wildland fuels do not typically continue into residential areas. Each of the 159 homes included in this assessment are built on lots of one acre or less.

Access: Interstate 80 and Alt. 93 are the primary transportation routes through West Wendover. The roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment. Secondary roads are of adequate width and grade for fire apparatus to maneuver.

Signage: Street signs are clearly posted on all streets in the community. Residential addresses are clearly visible on 97 percent of the homes observed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

Utilities: All of the utilities were above ground. Power line corridors have been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks could start a fire in adjacent vegetation.

39.1.2 Construction Materials

All of the homes observed in the interface area are built with non-combustible or highly fire resistant siding materials such as medium density fiberboard, and fire resistant roofing made of composition material, metal, or tile. Fourteen percent of the homes have unenclosed porches, decks, or balconies that create drafts and provide areas where sparks and embers can lodge, smolder, ignite, and rapidly spread fire to the house.

39.1.3 Defensible Space

Ninety-nine percent of the homes meet the minimum recommended defensible space requirement to help protect the home from damage or loss during a wildfire.

39.1.4 Suppression Capabilities

Wildfire Protection Resources

Fire protection in West Wendover is provided by the Wendover Fire Department, a combination career/volunteer department with four career members and eighteen volunteers. Table 39-1 lists the types of local wildfire resources, cooperating partners and equipment available for initial response to West Wendover in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 39-1. Wildfire Suppression Resources Available to West Wendover

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 6 Engine Type 4 Engine	3 3 1	Wendover Fire Department (Wendover)
Type 3 Engine	1	Wells VFD (Wells)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Jeff Knudtsen, Wendover Fire Department Chief.

Water Sources and Infrastructure

Water available for fire suppression resources in West Wendover includes hydrants within 500 feet of structure with minimum flow capacities of 500 gallons per minute. The community water system includes wells and three storage tanks: one at 2.5-million gallons; one at 2-million gallons and one at 1-million gallons. The water system operates on gravity and electrical pumps. There is a backup emergency generator to run the pumps in the event of an electrical power outage.

Fire Protection Personnel Qualifications

All Wendover Fire Department firefighters have been trained in-house for structure protection and have received basic wildland fire training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Wendover Fire Department responds to the following annual calls:

- 350 emergency medical calls.
- 4-5 wildland/brush fire calls.
- 4-5 other type of fires.

Financial Support

Funding for the Wendover Fire Department comes from the City of Wendover General Fund and from some grant funding sources.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan. The Fire Department and mutual aid agencies have a pre-attack plan for the community. Elko County has an all-risk plan, and the City of Wendover has an emergency evacuation plan for disasters. All plans are updated annually. West Wendover is included in all plans.

39.1.5 Factors Affecting Fire Behavior

The vegetative fuel density in the West Wendover interface area is very light, estimated at less than one ton per acre, which was considered a low fuel hazard. Fuels in the community consist primarily of a shrub layer of shadscale, rabbitbrush, and ephedra. Ground fuels consist of halogeton and perennial grasses. The terrain within the community boundary is flat. The prevailing wind direction is unpredictable. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

39.1.6 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding West Wendover would come from dry lightning storms late on a summer afternoon. Strong erratic winds could push fires into the community from any direction. However, the low, sparse brush would not likely spread fire into any structures as there is no horizontal continuity in the fuel bed to carry a fire.

39.1.7 Ignition Risk Assessment

West Wendover has a very low risk of ignition based on fire history in the area. Increased fuel loading from annual invasive grasses in high precipitation years poses the greatest potential threat for increasing the ignition risk. There is no large wildfire history in the public lands surrounding the community, but there is a history of dry lightning strikes around the community. The primary risk of ignition in West Wendover is lightning, although human caused ignitions are unpredictable and can occur at any time.

39.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The responsibility to keep a community fire safe falls not only on the local fire protection district but also on the residents, businesses, and local governments. The recommendation for West Wendover focuses primarily on fire suppression training. The RCI Project Team made no recommendations for defensible space and fuels reduction because of the low fuel hazard and low community hazard ratings in West Wendover. Continued maintenance of defensible space as outlined in Appendix E is an important measure for all residents.

39.2.1 Fire Suppression Resources

Wendover Fire Department

- Obtain structure firefighting training for all volunteers to bring them up to minimum State of Nevada Fire Marshal standards.
- Upgrade the radio system to narrow band technology to ensure communication compatibility with cooperating agencies

Table 39-2. West Wendover Wildfire Hazard Rating Summary

A. Urban Interface Condition ***1***

B. Community Design

1. Ingress / Egress	1	/5
2. Width of Road	1	/5
3. Accessibility	1	/3
4. Secondary Road	1	/5
5. Street Signs	1	/5
6. Address Signs	1	/5
7. Utilities	1	/5

C. Construction Materials

1. Roofs	1	/10
2. Siding	1	/5
3. Unenclosed Structures	1	/5

D. Defensible Space

1. Lot Size	5	/5
2. Defensible Space	1	/15

F. Fire Behavior

1. Fuels	1	/5
2. Fire Behavior	3	/10
3. Slope	1	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	3	/10

TALLIES

159 Total Houses **17 Residential Streets**

B5. Street Signs

0	not visible	17	visible	100%	visible

B6. Address Signs

4	not visible	155	visible	97%	visible

C1. Roofs

0	combust	159	not combust	100%	not combust

C2. Siding

0	combust	159	not combust	100%	not combust

C3. Unenclosed Structures on Lot

23	not enclosed	136	enclosed	14%	not enclosed

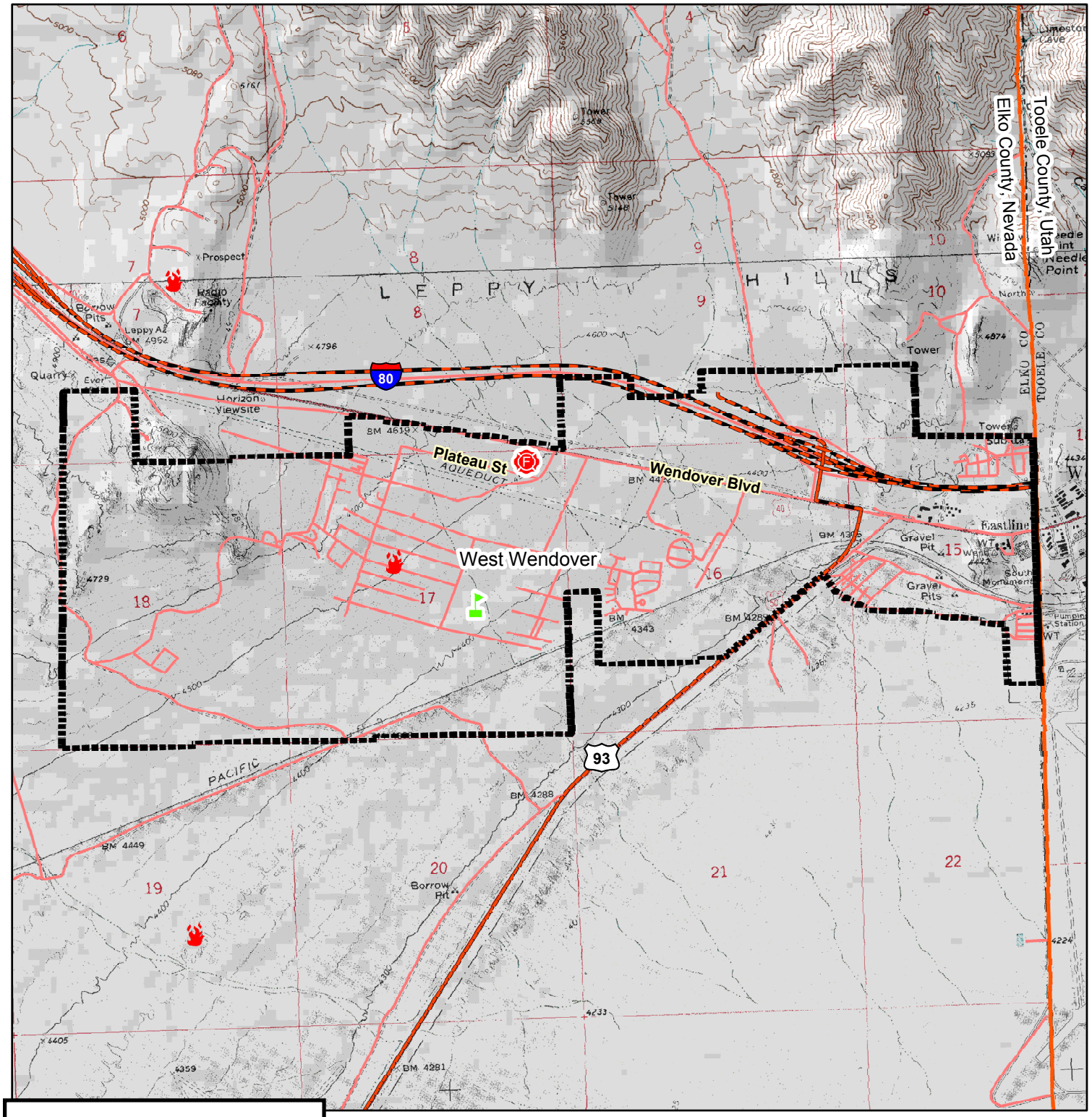
D1. Lot Sizes

159	<1ac	0	>1ac <10ac	0	>10ac

D2. Defensible Space

2	not adequat	157	adequate	99%	adequate

Score **26** /128



Legend

- Community Boundary
- School
- Fire Station
- Fire Ignition
- County Boundary
- Highways and State Routes
- Secondary Roads

Figure 39-1. West Wendover
Fire History, Suppression Resources,
and Critical Features

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Feet

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RURAL RANCH COMMUNITIES

40.0 CHARLESTON

40.1 RISK AND HAZARD ASSESSMENT

Charleston is a rural ranch community that was once situated in a canyon along County Road 7461. The E. Prunty Ranch is currently the only residence in the area. Charleston is situated at an elevation of approximately 5,900 feet. The Bruneau River flows through the area. The community boundary identified for this report is shown in Figure 40-1.

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

40.1.1 Community Design, Construction Materials, and Defensible Space

The topography in Charleston is generally flat. There are seven ranch buildings on the E. Prunty Ranch. All of the buildings have metal roofing. Defensible space improvements are needed around some of the structures. However, all of the structures are surrounded by irrigated fields or pastures.

40.1.2 Suppression Capabilities

Wildfire Protection Resources

Charleston has no organized fire department or suppression resources Table 40-1 lists the types of wildfire resources and equipment available for initial response to Charleston in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 40-1. Wildfire Suppression Resources Available to Charleston

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine Type 2 Engine	1 1	Jarbidge VFD (Jarbidge)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 2 Engine Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 6 Engine	1	US Forest Service (Mountain City)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Kenny Heil, Jarbidge VFD Chief; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Joe Freeland, Bureau of Land Management Elko Field Office FMO; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

There is no local water system in the area. Water for fire suppression in the Charleston area includes ranch ponds and small creeks or rivers.

40.1.3 Factors Affecting Fire Behavior

The vegetative fuel density on the west side of the Charleston interface area is generally low, estimated at less than one ton per acre, which was considered a low fuel hazard. Fuels consist primarily of meadow grass, rabbitbrush, and sagebrush. On the north and east side fuels are estimated at four to six tons per acre and consists of cheatgrass, basin wildrye, sagebrush, bitterbrush, and rabbitbrush. These were considered a high fuel hazard. The terrain is generally flat and winds blow from the south and southwest.

40.1.4 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in the Charleston area would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions and strong erratic winds could push fires from any direction toward residences or hay and equipment storage areas with inadequate defensible space.

40.1.5 Ignition Risk Assessment

There is a high potential for fire ignition but it is somewhat mitigated by surrounding agricultural fields. The primary risk of ignition in Charleston is lightning, although human caused ignitions are unpredictable and can occur at any time. Hay storage areas, without defensible space, in close proximity to wildland fuels pose an additional ignition risk.

40.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Charleston address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

40.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Charleston has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.
- Clear all vegetation and combustible materials around propane tanks or other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

40.2.2 Fire Suppression Resources

Property Owners

- Develop a system for backup power in the case of a large wildland fire.
- Develop water sources for fire protection and coordinate with Nevada Division of Forestry for developing or adapting water sources to fill fire apparatus.

40.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

40.3 SUMMARY OF RECOMMENDATIONS

Table 40-2. Charleston Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Seed a mixture of fire resistant species around residential structures and ranch outbuildings.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire. Develop water sources for fire protection and coordinate with Nevada Division of Forestry to develop or adapt sources to fill fire apparatus.
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.

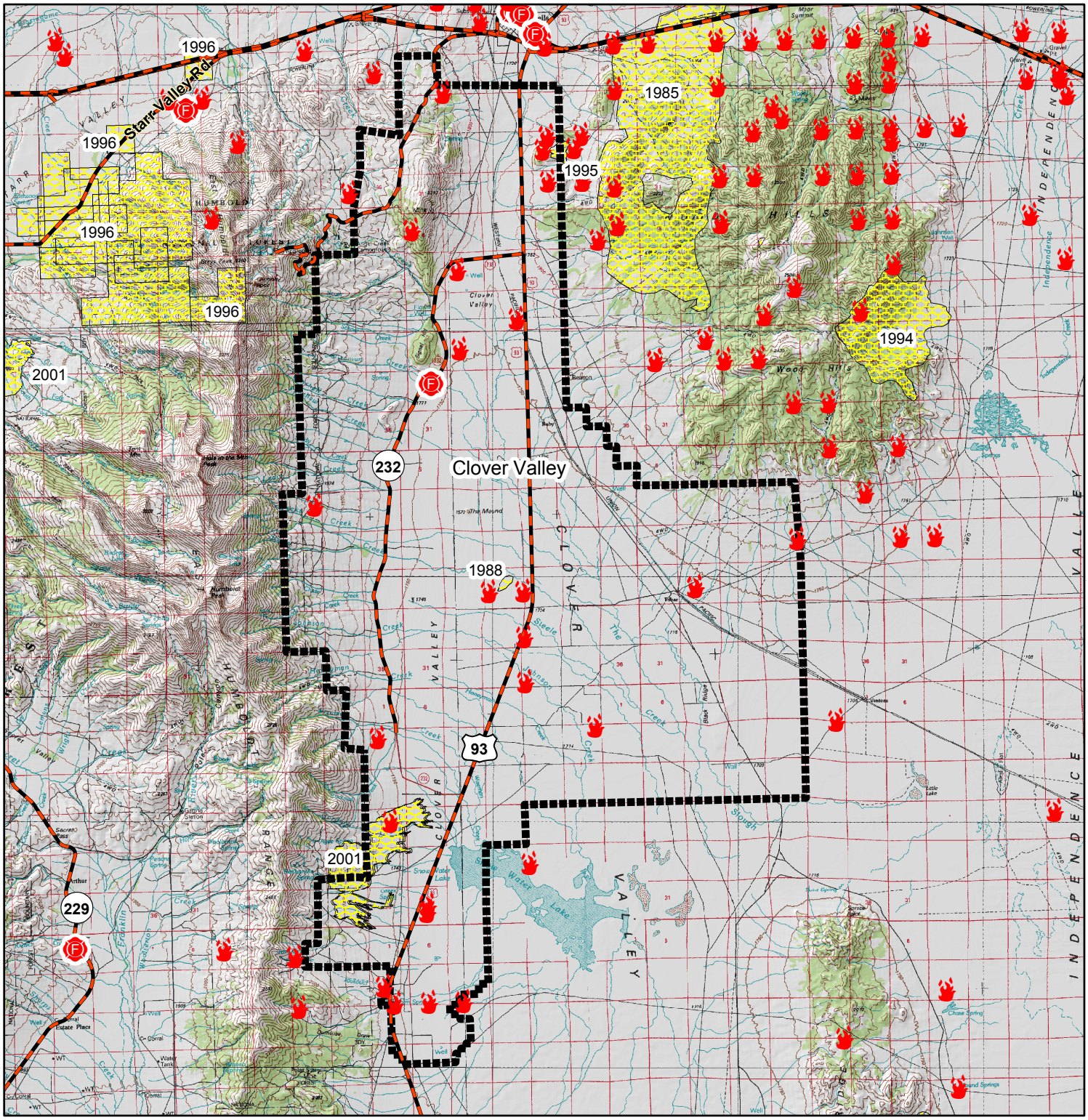


Figure 41-1. Clover Valley
Fire History and Suppression Resources

Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Highways and State Routes
- Fire Boundary and Date

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41.0 CLOVER VALLEY

41.1 RISK AND HAZARD ASSESSMENT

Clover Valley is a rural community with several ranches scattered throughout the valley. Clover Valley is located in central Elko County on Highway 93 south of Wells between the East Humboldt Range and the Pequop Mountains at an elevation of approximately 5,600 feet. The community boundary identified for this report is shown in Figure 41-1.

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers

41.1.1 Community Design and Defensible Space

Clover Valley is considered a rural ranch community. All of the ranch residences are surrounded by irrigated agricultural fields and pastures. Defensible space is not a primary risk factor because the agricultural fields provide a buffer zone between residences and any wildland fuels.

41.1.2 Suppression Capabilities

Wildfire Protection Resources

Clover Valley has a twenty member volunteer fire department. Table 41-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to Clover Valley in the event of a reported wildfire. Additional resources are available through the Deeth-Starr Valley VFD, the Wells VFD, the Bureau of Land Management Elko Field Office, the Nevada Division of Forestry, and the US Forest Service as described in Section 4.1.1.

Table 41-1. Clover Valley Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine Water Tender	1 1 1	Clover Valley VFD (Clover Valley)
Type 1 Engine Type 2 Water Tender	2 1	Deeth/Starr Valley VFD (Deeth)
Type 1 Engine Type 3 Engine	2 1	Wells VFD (Wells)
Type 6 Engine	1	Nevada Division of Forestry (Wells - seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Bobby Lee, Clover Valley VFD Chief (seasonal for Nevada Division of Forestry)

Water Sources and Infrastructure

Water available for fire suppression resources in Clover Valley varies. Water sources including individual wells, storage tanks, and large ponds that could be used for drafting or dip spots for fire suppression are twenty minutes or less away round trip. Volunteers have access to irrigation wheel lines for filling fire apparatus.

Fire Protection Personnel Qualifications

All Clover Valley VFD firefighters have received State Fire Marshal Firefighter I and II training for structure protection, and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Clover Valley VFD responded to 55 calls in 2003:

- 10 emergency medical calls.
- 30 wildland/brush fire calls.
- 15 other calls.

Financial Support

Funding for the Clover Valley VFD is provided through the Elko County General Fund and the Nevada Division of Forestry as authorized under NRS 473. Through an agreement with Nevada Division of Forestry, each volunteer fire department is paid per incident and per vehicle used in a wildfire. In Elko County, volunteer fire departments within the Northeastern Area Fire Protection district are not funded by property taxes as is typically the case elsewhere in Nevada.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually. Clover Valley is included in the County plan.

41.1.3 Factors Affecting Fire Behavior

The vegetative fuel hazard in the Clover Valley interface area varies from moderate in the lower elevation areas to high in the upper elevation area. Fuels in the valley bottom at the south end of the valley was estimated at two to three tons per acre consisting of cheatgrass, basin wildrye, rabbitbrush, sagebrush, and greasewood. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. The fuels at the northern end of the valley include pinyon and juniper trees, with fuel loading estimated at two and eight tons per acre. The terrain within Clover Valley is generally flat; however, there are steep slopes surrounding the valley. The prevailing wind direction is from the south and southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

41.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Clover Valley would be a fire starting at the south end of the valley in two to three foot tall shrubs, with a strong wind from the south/southwest. Risks to residents in the area are somewhat mitigated by agricultural fields that provide a buffer zone between structures and wildland fuels. A wind-driven fire could result in a large acreage incident. There are very limited fire resources in the area and additional fire suppression resources are over an hour away.

41.1.5 Ignition Risk Assessment

Clover Valley has a moderate to high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. There is a moderate wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Clover Valley is lightning, although ignitions from the railroad also pose potential ignition risks.

41.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Clover Valley address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

41.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Clover Valley has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Install spark arrestors on chimneys.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, which is especially important in these rural areas where water sources are limited or distant.

41.2.2 Fire Suppression Resources

Clover Valley VFD and Nevada Division of Forestry

- Upgrade communication system to narrow band technology for compatibility with cooperating agencies.

Property Owners

- Develop a system for backup power in the case of a large wildland fire.

41.2.3 Fuels Reduction

Union Pacific Railroad

- 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. Maintain low

growing, low-density fuel volumes within the railroad corridors to reduce the wildfire ignition risk and hazard.

41.2.4 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

University of Nevada Cooperative Extension

- 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.

41.3 SUMMARY OF RECOMMENDATIONS

Table 41-2. Clover Valley Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, which is especially important in these rural areas where water sources are limited or distant.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire.
Union Pacific Railroad	Fuel Reduction	Mow and maintain low vegetation within a minimum distance of twenty feet on both sides of the railroad tracks.
Clover Valley VFD and Nevada Division of Forestry	Fire Suppression Resources	Upgrade communication system to narrow band technology for compatibility with the new 2005 system, to include repeaters for adequate communication.
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.

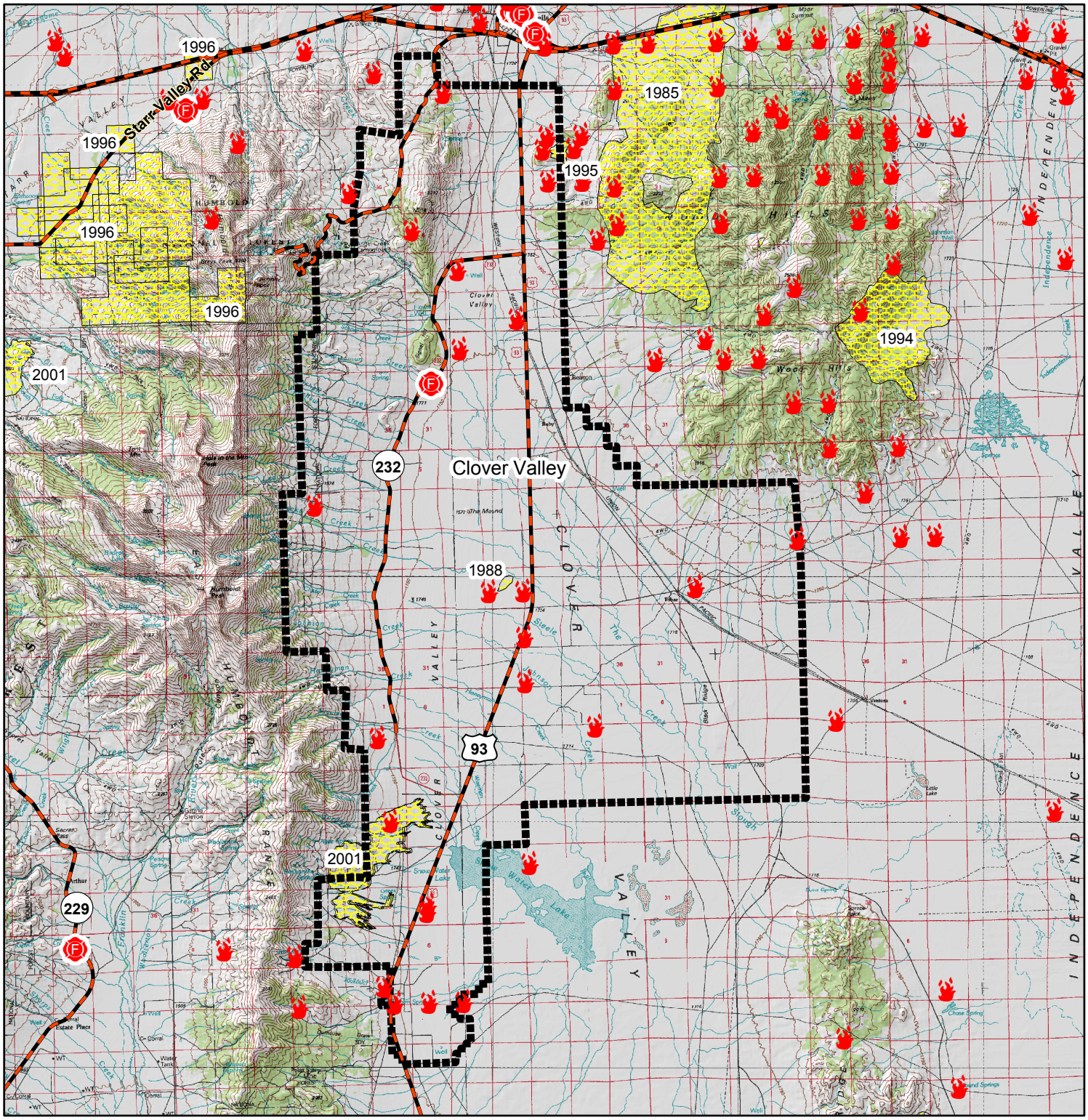


Figure 41-1. Clover Valley
Fire History and Suppression Resources

Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Highways and State Routes
- Fire Boundary and Date

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42.0 GOOSE CREEK

42.1 RISK AND HAZARD ASSESSMENT

Goose Creek is a small rural ranch community located in northeastern Elko County. The community boundary identified for this report is shown in Figure 42-1.

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

42.1.1 Community Design and Defensible Space

There are three ranches in the area that are situated at the bottom of creek drainages. All of the ranch structures are surrounded by irrigated agricultural fields and pastures. Defensible space is not a primary risk factor because the agricultural fields provide a buffer zone between residences and wildland fuels.

42.1.2 Suppression Capabilities

Wildfire Protection Resources

The closest wildfire protection resource available to Goose Creek is the Jackpot Volunteer Fire Department. Table 42-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Goose Creek in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 42-1. Goose Creek Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine	2	Jackpot VFD
Type 2 Engine	1	
Type 1 Engine	1	
Type 6 Engine	1	
Type 4 Engine	1	Bureau of Land Management (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Verl Jarvie, Jackpot VFD Chief

Water Sources and Infrastructure

Water available for fire suppression resources in Goose Creek is limited to ponds at the ranches.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually.

42.1.3 Factors Affecting Fire Behavior

The vegetative fuel hazard in the Goose Creek interface area varies from low to high. Irrigated agricultural lands were considered low fuel hazards. The highest fuel hazard in the interface area was identified near Trout Creek, estimated at five to six tons per acre. Fuels in the community consist of juniper, ten to twelve feet tall, and big sagebrush and rabbitbrush, three to six feet tall. Ground fuels include cheatgrass, and perennial grasses. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation.

42.1.4 Fire Behavior Worst Case Scenario

The worst-case scenario for a wildfire in Goose Creek would start from a dry lightning storm on a summer day in a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions, and strong erratic winds could push fires in any direction. A wildfire could exceed initial attack resources and spread rapidly before suppression resources could arrive Risks to residents in the area are somewhat mitigated by agricultural fields that provide a buffer zone between structures and wildland fuels.

42.1.5 Ignition Risk Assessment

Goose Creek has a high risk of ignition based on fire history in the area and a history of dry lightning from thunderstorms. However, hay storage areas without defensible space and in close proximity to wildland fuels pose a potential ignition risk.

42.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Goose Creek address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

42.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Goose Creek has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

42.2.2 Fire Suppression Resources

Property Owners

- Coordinate with the Nevada Division of Forestry to develop and adapt water sources to refill fire apparatus.
- Develop a system for backup power in the case of a large wildland fire.

42.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

42.3 SUMMARY OF RECOMMENDATIONS

Table 42-2. Goose Creek Risk and Hazard Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Seed a mixture of fire resistant species around residential structures and ranch outbuildings.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire. Coordinate with the Nevada Division of Forestry to develop and adapt water sources for refilling fire apparatus.
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.

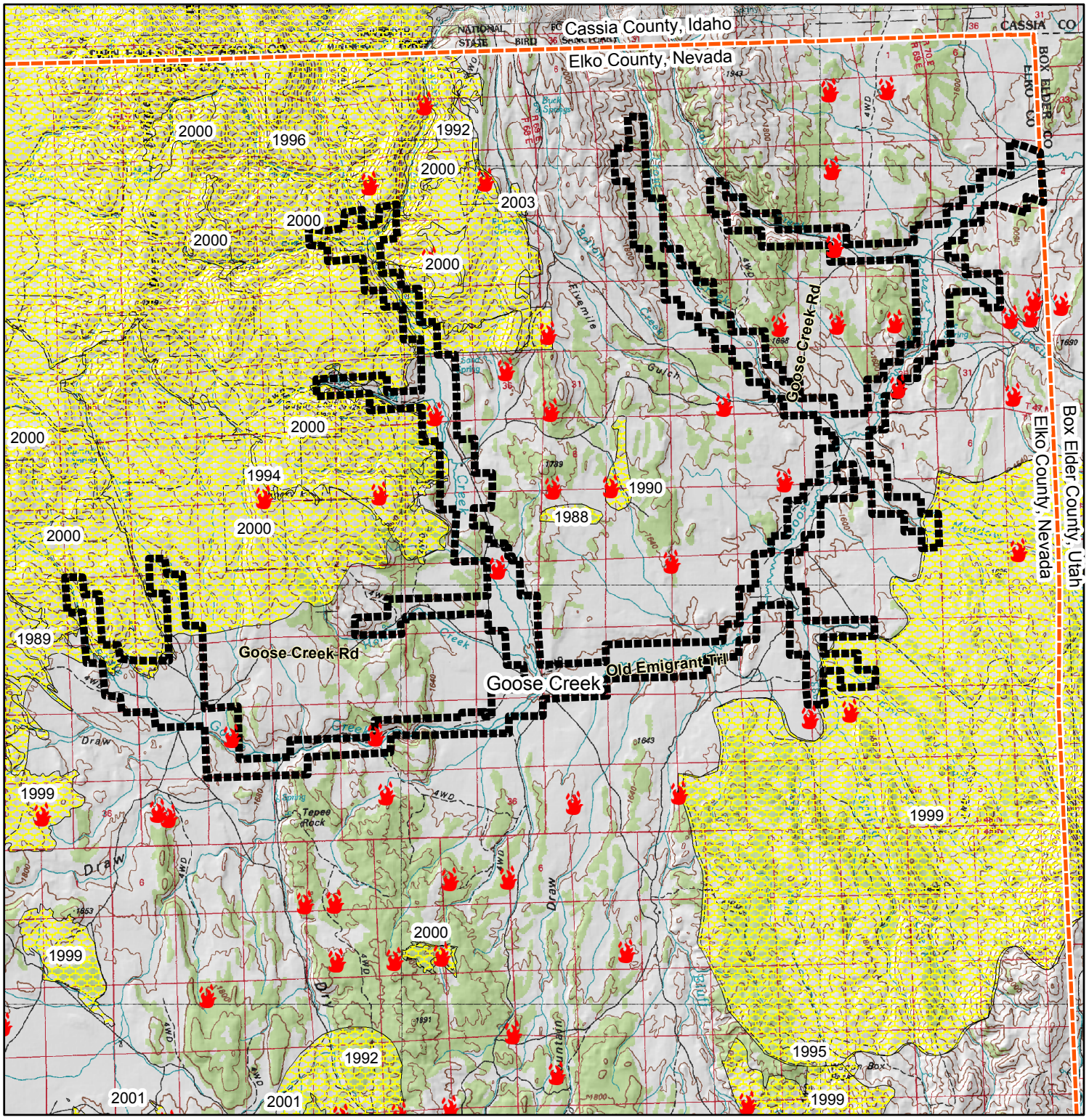


Figure 42-1. Goose Creek
Fire History

Legend

- Community Boundary
- Fire Boundary and Date
- County Boundary
- Fire Ignition

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43.0 INDEPENDENCE VALLEY

43.1 RISK AND HAZARD ASSESSMENT

Independence Valley is a rural ranch community located along SR 226 in northwestern Elko County. The South Fork of the Owyhee River flows through the valley, along with several other small creeks that drain into the Owyhee River. The community boundary identified for this report is shown in Figure 43-1.

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

43.1.1 Community Design and Defensible Space

Independence Valley contains approximately twelve ranches and a few other scattered residences.

43.1.2 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Independence Valley is provided by the Independence Valley Volunteer Fire Department, staffed by ten volunteers. Table 43-1 lists the types of wildfire resources, cooperating partners, and equipment available for initial response to Independence Valley in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 43-1. Wildfire Suppression Resources Available to Independence Valley

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Type 6 Engine	1 1	Independence Valley VFD
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)
Type 6 Engine	1	US Forest Service (Mountain City)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Jay Wright, Independence Valley VFD Fire Chief.

The Independence Valley VFD has some old, outdated equipment including a 1977 Dodge 4x4 and a 1974 6x6. It is important that fire suppression equipment be adequate and in proper working condition in order for fire protection personnel to be able to protect the community in the event of a wildfire.

Water Sources and Infrastructure

Water available for fire suppression resources for Independence Valley is limited to private wells and ponds.

Fire Protection Personnel Qualifications

All Independence Valley VFD firefighters have been trained in-house for structure protection and have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

The Independence Valley VFD annually responds to two-three average wildland/ brush fire calls.

Financial Support

Funding for the Independence Valley VFD is provided through the Elko County General Fund and the Nevada Division of Forestry as authorized under NRS 473. Through an agreement with Nevada Division of Forestry, each volunteer fire department is paid per incident and per vehicle used in a wildfire. In Elko County, volunteer fire departments within the Elko County Fire Protection district are not funded by property taxes as is typically the case elsewhere in Nevada.

Community Preparedness

Elko County has an active Local Emergency Planning Committee and has adopted an emergency plan that includes a hazardous materials response plan and an all-risk disaster response plan, which is updated annually.

43.1.3 Factors Affecting Fire Behavior

The valley bottom, meadows, and agricultural fields in Independence Valley consist primarily of meadow grasses including basin wildrye, willows, and wild rose. There are several agricultural fields that have been abandoned and are now dominated by sagebrush. Uplands on both sides of the community are dominated sagebrush, rabbitbrush, basin wildrye, perennial grasses, cheatgrass and annuals. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazard conditions in years of higher than average precipitation. Fuel loading in the uplands was estimated at two to five tons per acre and was considered a moderate fuel hazard. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southwest.

43.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in Independence Valley would come from a dry lightning storm late on a summer afternoon during a year with normal to above normal precipitation and high annual grass and forb production. Multiple fire ignitions and strong erratic winds could push fires into the valley from any direction. Most of the structures are protected by agricultural buffer zones.

43.1.5 Ignition Risk Assessment

Independence Valley has a high risk of ignition based on a history of large wildfires and moderate fuel loading. The primary risk of ignition in Independence Valley is lightning, although human caused ignitions are unpredictable and can occur at any time.

43.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Independence Valley address the primary concern for maintaining defensible space, fuel reduction, and upgrading radios and fire suppression equipment.

43.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Independence Valley has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes 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 debris.
  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Maintain areas under wood decks and porches free of weeds and other flammable debris. Enclose these areas when possible. Box in eves and cover attic and other ventilation openings with very fine metal wire mesh to prevent embers from entering the attic or crawl space.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed maturity or treated with an application of a pre-

emergent herbicide.[31] Treatments may need to be repeated for several years to ensure that the seed bank of unwanted annual grass seeds has been depleted. Refer to Appendix E for a recommended seed mixture and planting guidelines that can be used in conjunction with cheatgrass removal.

- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

43.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Elko County

- Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road. Remove and dispose of biomass at an appropriate site. Reseed treated areas with fire resistant species such as recommended in Appendix E to minimize cheatgrass and noxious weed invasion.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

43.2.3 Fire Suppression Resources

Independence Valley VFD and Nevada Division of forestry

- Upgrade firefighting apparatus.
- Upgrade radios to narrow band technology to ensure communication compatibility.
- Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.

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

43.2.4 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

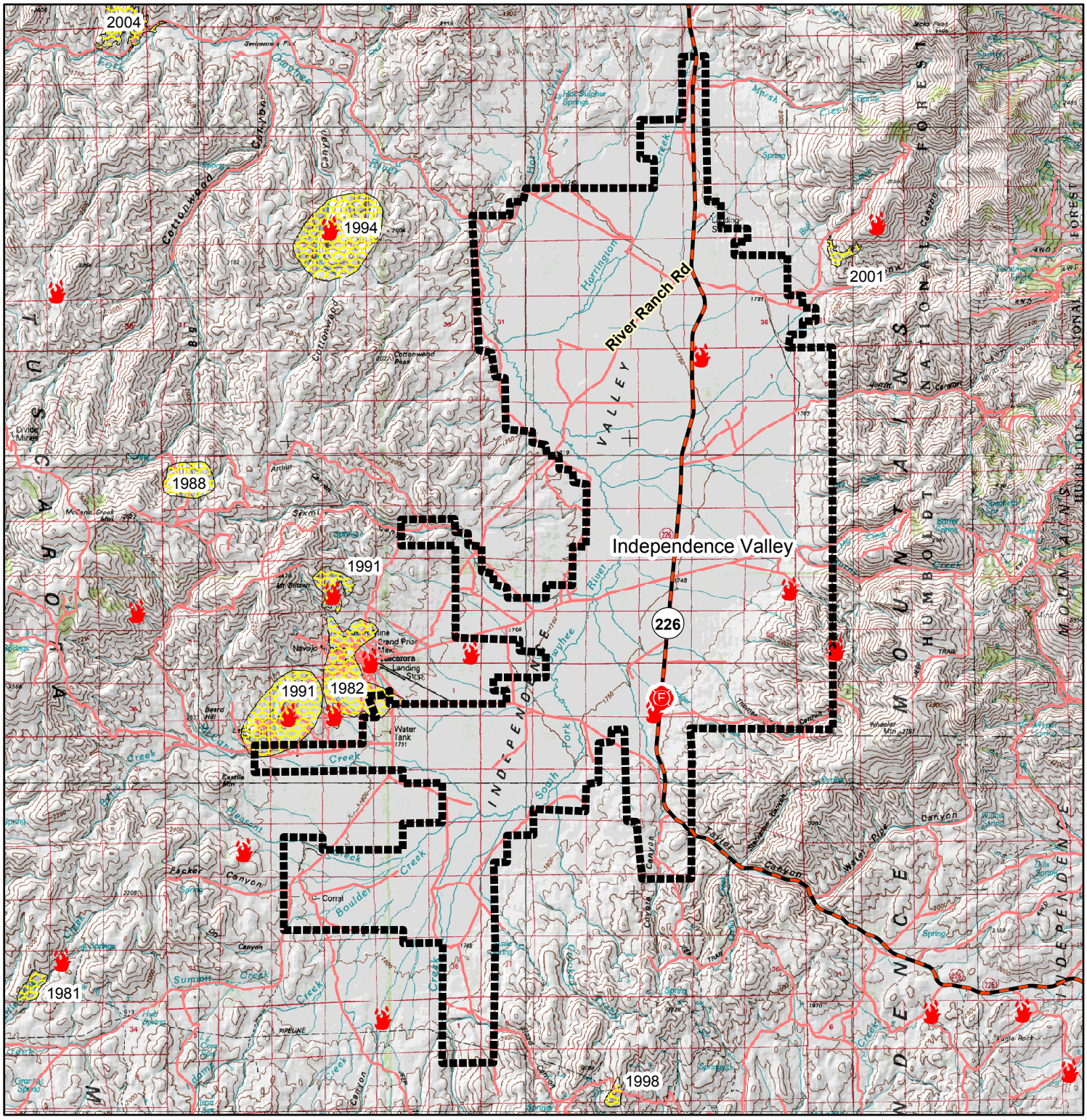
University of Nevada Cooperative Extension

- 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.

43.3 SUMMARY OF RECOMMENDATIONS

Table 43-2. Independence Valley Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes according to the guidelines in Appendix E. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. Maintain the defensible space as needed.
Elko County	Fuels Reduction	Reduce vegetation and maintain roads by mowing all vegetation to a height of no more than four inches for a distance of twenty feet from the edge of the road on both sides of the road.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.
Independence Valley VFD **and** **Nevada Division of Forestry**	Fire Suppression Resources	Upgrade firefighting apparatus. Upgrade radios with narrow band technology to ensure communication compatibility. Continue to meet annually with the cooperating agencies to review pre-attack plans for the area.
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.



Legend

- Community Boundary
- Fire Station
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads

Figure 43-1. Independence Valley
Fire History and Suppression Resources

N
W E
S

0 1 2 4
Miles

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Nevada Community Wildfire Risk / Hazard Assessment Project

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44.0 MAGGIE SUMMIT ROAD

44.1 RISK AND HAZARD ASSESSMENT

Maggie Summit Road is a rural ranch community on the east slope of the Bull Run Mountains and west of State Route 225, approximately six mile south of Mountain City. Several creeks and streams are used to irrigate meadows and pasture within the community. The community boundary identified for this report is shown in Figure 44-1

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

44.1.1 Community Design and Defensible Space

The Independence Valley community is comprised of ranches situated approximately one to three miles apart. Seven ranches were observed during the assessment of the Maggie Summit Road community. All of the ranch structures have non-combustible roofing. All of the residences are surrounded by irrigated agricultural fields or pastures that provide a buffer zone between homes and wildland fuels.

44.1.2 Suppression Capabilities

Wildfire Protection Resources

Fire protection in the Maggie Summit Road community is provided by the Mountain City Volunteer Fire Department, which has four volunteer members. Table 44-1 lists the types of local wildfire resources and equipment available for initial response to Maggie Summit Road in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 44-1. Wildfire Suppression Resources Available to Maggie Summit Road

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 2 Engine	1	Mountain City VFD (Mountain City)
Type 6 Engine	1	US Forest Service (Mountain City)
Type 2 Engine Type 1 Water Tender	1 1	Nevada Division of Forestry (Elko)
Type 4 Engine	1	Bureau of Land Management (Elko)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

There is no local water system in the area. Water for fire suppression in Maggie Summit Road includes ranch ponds, small creeks, and the Owyhee River.

44.1.3 Factors Affecting Fire Behavior

The vegetative fuel density around Maggie Summit Road varies from light to moderate, estimated at one to four tons per acre. The upland vegetation adjacent to agricultural fields is considered a high fuel hazard. Wildland fuels in the community consist primarily of sagebrush, rabbitbrush, serviceberry, wild rose, and bitterbrush. Fuel hazards increase on slopes on either side of the valley where fuel loading is higher. Some cheatgrass is present, which will produce at higher rates in years of increased moisture. The terrain within the valley is flat to gently sloping. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area and some history of large fires.

44.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Maggie Summit Road would come from dry lightning storms late on a summer afternoon during a year with normal to above normal precipitation and high annual grass and forb production. Strong erratic winds could push fires into the valley from any direction. Multiple ignitions could easily exceed the capabilities of the volunteer fire department located forty minutes to an hour away.

44.1.5 Ignition Risk Assessment

Maggie Summit Road was determined to have a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in years with higher moisture. There is a history of lightning strikes around the community. The primary risk of ignition in Maggie Summit Road is lightning, although human caused ignitions are unpredictable and can occur at any time.

44.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for the Maggie Summit Road community address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

44.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, the Maggie Summit road community has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Prune all tree branches to a minimum distance of fifteen feet from buildings, paying special attention around chimneys.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Install spark arrestors on chimneys.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species such as the one recommended in Appendix E around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

44.2.2 Fire Suppression Resources

Property Owners

- Develop a system for backup power in the case of a large wildland fire causing power failure.

- Coordinate with the Nevada Division of Forestry to develop or adapt water sources for fire protection and install fire hose threads on agricultural wells for filling suppression apparatus

44.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

44.3 SUMMARY OF RECOMMENDATIONS

Table 44-2. Maggie Summit Road Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire causing power failure. Coordinate with the Nevada Division of Forestry to develop or adapt water sources for fire protection and install fire hose threads on agricultural wells for filling fire apparatus.
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.

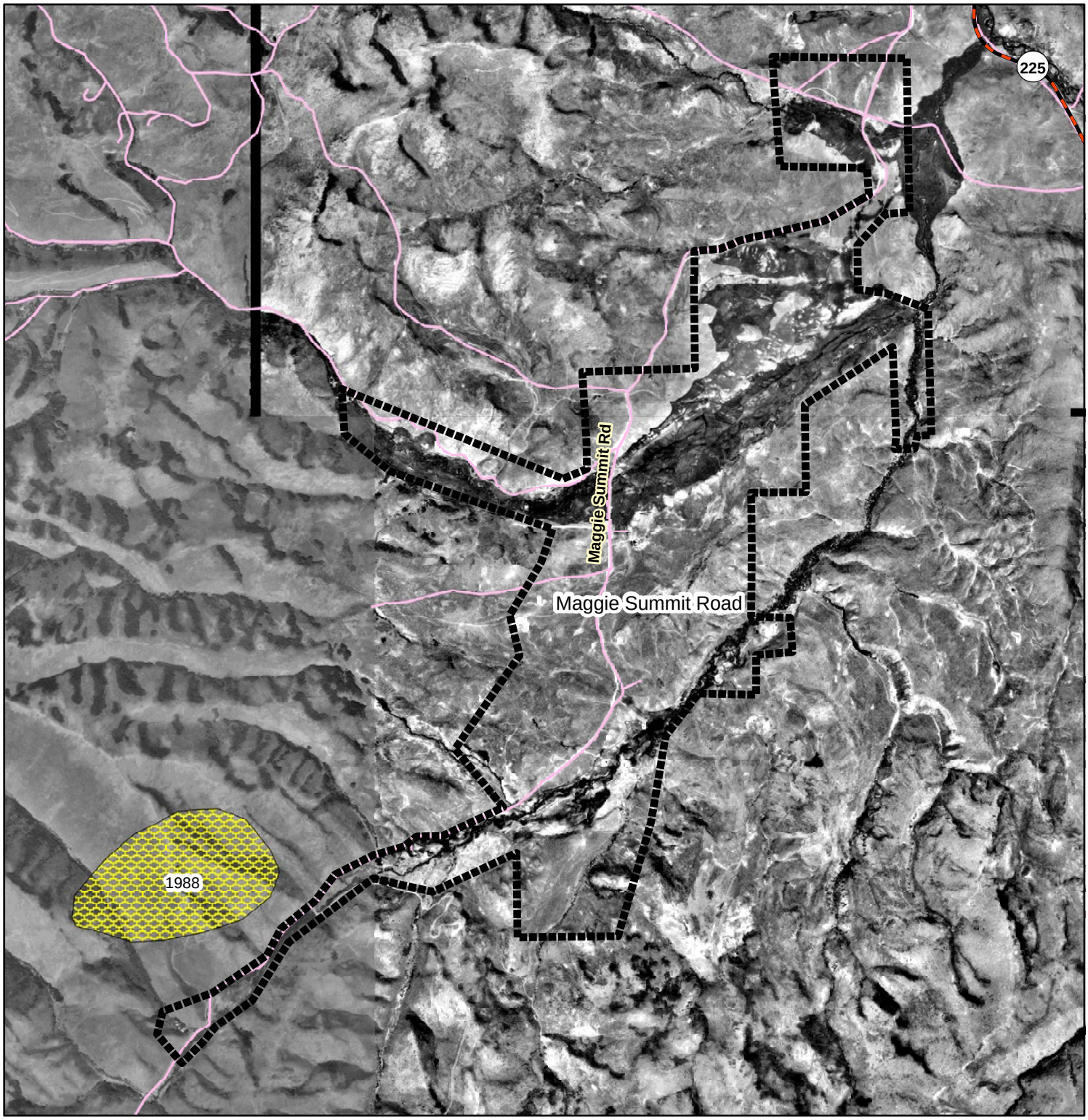


Figure 44-1. Maggie Summit Road
Fire History

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W E
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Legend

- Community Boundary
- Highways and State Routes
- Fire Boundary and Date
- Secondary Roads

0 1,000 2,000 4,000
Feet

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45.0 ODGER'S RANCH INDIAN RESERVATION

45.1 RISK AND HAZARD ASSESSMENT

Odger's Ranch Indian Reservation is located in southeast Elko County, southeast of the Ruby Marshes, west of Currie, between the Cherry Creek and Medicine Ranges in Butte Valley. The community boundary identified for this report is shown in Figure 45-1.

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

45.1.1 Community Design and Defensible Space

The community consists of two ranches on tribal land, in a valley with steep mountains to the west. The ranches are part of the South Fork Indian Reservation. The ranches are remote from any other communities. Irrigated agricultural fields provide a buffer zone between structures and wildland fuels.

45.1.2 Suppression Capabilities

Wildfire Protection Resources

Odger's Ranch has no local fire suppression resources. Table 45-1 details Bureau of Land Management and Nevada Division of Forestry fire suppression resources available to Odger's Ranch. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 45-1. Wildfire Suppression Resources Available to Odger's Ranch

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engines	1	Bureau of Land Management (Wells)
Type 4 Engines	1	Bureau of Land Management (Elko)
Type 4 Engines SEAT	4 1	Bureau of Land Management (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Sam Hicks, Nevada Division of Forestry Elko County Prevention Captain; Joe Freeland, Bureau of Land Management Elko Fire Management Officer; Kevin Hall, Nevada Division of Forestry Northern Region FMO; Tom Turk, Nevada Division of Forestry Northern Region Battalion Chief; Melody Asher, US Forest Service Zone FMO.

Water Sources and Infrastructure

Water sources for fire protection in the Odger's Ranch area are limited to agricultural wells and ponds.

45.1.3 Factors Affecting Fire Behavior

The vegetative fuel density in the Odger's Ranch interface area is generally light, estimated at one to three tons per acre and considered a moderate fuel hazard. Fuels in the community consist primarily of big sagebrush, black sagebrush, and green rabbitbrush, with bluegrass, squirreltail, and cheatgrass in the understory. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevated fuel hazards in years of higher than average precipitation. The terrain within the community boundary is mostly flat. The prevailing wind direction is from the south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area, and one large fire southeast of the area.

45.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding Odger's Ranch would come from a fire starting in the southwest part of the community with a strong wind pushing the fire northeast. There are very few structures in the area, but the fire could burn several thousand acres of wildland vegetation before fire suppression resources could reach the area.

45.1.5 Ignition Risk Assessment

Odger's Ranch was determined to have a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annuals in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community and a history of lightning strikes around the community. The primary risk of ignition in Odger's Ranch is lightning, although human caused ignitions are unpredictable and can occur at any time.

45.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Odger's Ranch address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

45.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Charleston has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Resident Recommendations

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions, as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

45.2.2 Fire Suppression Resources

Residents and Bureau of Indian Affairs

- Develop a system for backup power in the case of a large wildland fire causing power failure.
- Coordinate with the Nevada Division of Forestry and the Bureau of Land Management to develop or adapt water sources for fire protection and install filler hoses for fire apparatus.

45.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

45.3 SUMMARY OF RECOMMENDATIONS

Table 45-2. Odger's Ranch Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Residents	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space as needed. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.
	Public Education	Obtain copies of the current publication "*Living With Fire*". This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.
Residents and Bureau of Indian Affairs	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire. Coordinate with the Nevada Division of Forestry and the Bureau of Land Management to develop or adapt water sources for fire protection and install filler hoses for water tenders.
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.

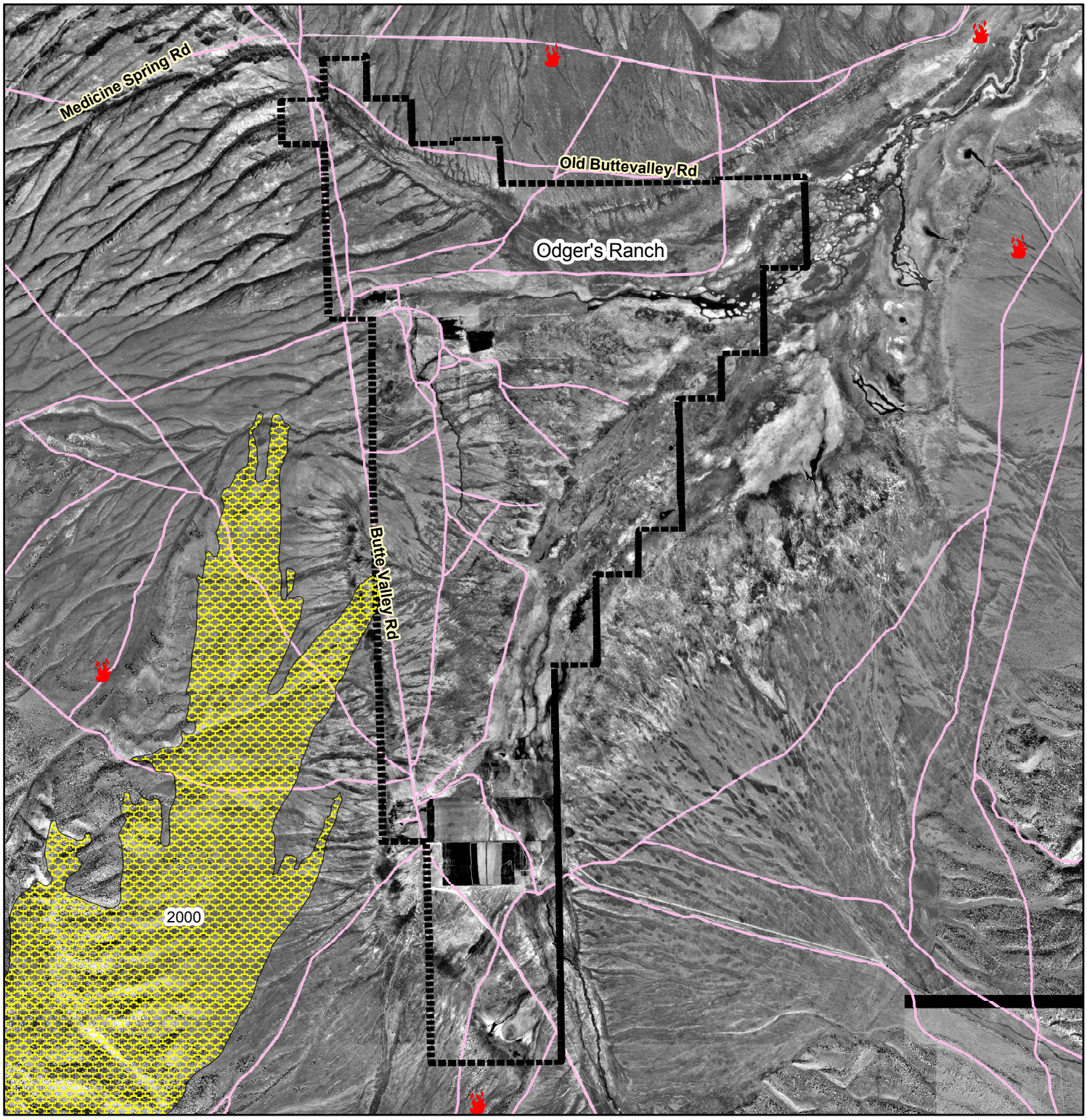


Figure 45-1. Odger's Ranch
Fire History

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Legend

- Community Boundary
- Fire Ignition
- Fire Boundary and Date
- Secondary Roads

0 0.5 1 2
Miles

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46.0 O'NEIL BASIN

46.1 RISK AND HAZARD ASSESSMENT

O'Neil Basin is located in northern Elko County west of Highway 93. Elevations range from 6,100 feet to over 6,300 feet. Several streams traverse the basin, including the South Fork of the Salmon River, Camp Creek, Cottonwood Creek, and Canyon Creek. The community boundary identified for this report is shown in Figure 46-1.

Because of the differences in residential layout and vegetation type and density, rural ranch communities have been assessed independently of the standard definitions for classic, intermix, or occluded wildland-urban interface areas. Rural ranch communities typically are located in valleys, usually with miles between ranch units or ranch worker residential clusters, resulting in structure spacing that precludes calling the valley and the residences a community in the sense commonly used in this document. In areas such as these, the topography is generally flat and homes are surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of property due to wildfires.

46.1.1 Community Design and Defensible Space

Eight working ranches and some unoccupied ranches were observed in O'Neil Basin during this assessment. Ranches are accessed by dirt roads from Deeth or from Highway 93. Most of the structures in the O'Neil Basin are buffered by irrigated agricultural fields. The RCI Project Team noted five structures with combustible wood shake roofs and two ranches where defensible space around structures and hay/equipment storage areas needs improvement.

46.1.2 Suppression Capabilities

Wildfire Protection Resources

O'Neil Basin has no local fire suppression resources. Some resources are available from the Jackpot VFD. Table 46-1 lists the types of local wildfire resources and equipment available for initial response to O'Neil Basin in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 46-1. Wildfire Suppression Resources Available to O'Neil Basin

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Type 2 Engine Type 3 Engine Type 6 Engine	1 1 2 1	Jackpot VFD (Jackpot)
Type 6 Engine	1	Nevada Division of Forestry (Wells-seasonal)
Type 4 Engine	1	Bureau of Land Management (Wells)
Type 6 Engine	1	US Forest Service (Wells)

Source: Verl Jarvie, Jackpot VFD.

Water Sources and Infrastructure

There are no local water sources such as hydrants or water storage tanks in O'Neil Basin designated for fire suppression. There are several creeks that could be used as draft sites depending on the location of the fire and water levels. Irrigation wells and ranch ponds are the only water sources near residences.

46.1.3 Factors Affecting Fire Behavior

The vegetative fuel density in the O'Neil Basin interface area is generally moderate, estimated at two to three tons per acre. Agricultural fields have a low fuel hazard. Upland areas and steeper slopes were considered a high fuel hazard. These fuels consist primarily of sagebrush and rabbitbrush, with ground fuels of perennial grasses and some cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazard conditions in years of higher than average precipitation. Burned areas to the west of the community boundary pose a moderate fuel hazard with the potential to increase to a high hazard in years of increased annual grass production. Riparian areas are dominated by grasses and willows.

The terrain within the community boundary is flat to gently sloping, with slopes ranging from eight to twenty percent. The prevailing wind direction is south/southwest. There is a history of afternoon thunderstorms and dry lightning strikes in the area. Between 1994 and 1997, the Bureau of Land Management Elko Field Office completed several prescribed burns at the very south end of the O'Neil Basin. These prescribed burns were completed to change sagebrush structure and improve wildlife habitat.

The Bureau of Land Management Elko Field Office is actively planning and implementing fuels reduction treatments in the O'Neil Basin area. A mowing treatment was completed along Starr Ridge from the Idaho border to 26 miles southeast along the ridgeline. The mowing treatment ranges between 200 and 325 feet in width. The Elko Field Office is also planning a mowing treatment on 887 acres to be completed in late summer or fall of 2005. The planned treatment area is located north of the schoolhouse and adjacent ranches.

46.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in the area surrounding O'Neil Basin would come from dry lightning storms late on a summer afternoon during a year with normal to above normal precipitation and high annual grass and forb production. Multiple ignitions with strong erratic winds could push fires from any direction toward scattered ranch structures and hay and equipment storage areas. Resources for initial ground attack are one to two hours away. Air resources are dependent on local availability. Long response times from fire protection resources would allow fires to spread rapidly. Agricultural fields provide buffer zones between residences and wildland fuels.

46.1.5 Ignition Risk Assessment

O'Neil Basin was determined to have a high risk of ignition based on fire history in the area, and the potential for increased fuel loading from annual grasses in high precipitation years. There is an extensive wildfire history in the public lands surrounding the community, and a history of lightning strikes around the community. The primary risk of ignition in the O'Neil Basin is lightning, although human caused ignitions are unpredictable and can occur at any time.

46.1.6 Completed Fuels Reduction Treatments

The Bureau of Land Management Elko Field Office is actively planning and implementing fuels reduction treatments in the O'Neil Basin area. A mowing treatment was completed along Starr Ridge from the Idaho border to 26 miles southeast along the ridgeline. The mowing treatment ranges between 200 and 325 feet in width. The Elko Field Office is also planning a mowing treatment on 887 acres to be completed in late summer or fall of 2005. The planned treatment area is located north of the schoolhouse and adjacent.

46.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for the O'Neil Basin address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

46.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, the O'Neil Basin community has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

46.2.2 Fire Suppression Resources

Property Owners

- Develop a system for backup power in the case of a large wildland fire causing power failure.
- Coordinate with the Nevada Division of Forestry to pursue funding to develop or adapt water sources for fire protection and install filler hoses for fire apparatus.

46.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

46.3 SUMMARY OF RECOMMENDATIONS

Table 46-2. O'Neil Basin Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This is especially important in these rural areas where water sources are limited or distant.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire causing power failure. Coordinate with NDF to pursue funding to develop or adapt water sources for fire protection and install filler hoses for fire apparatus.
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.

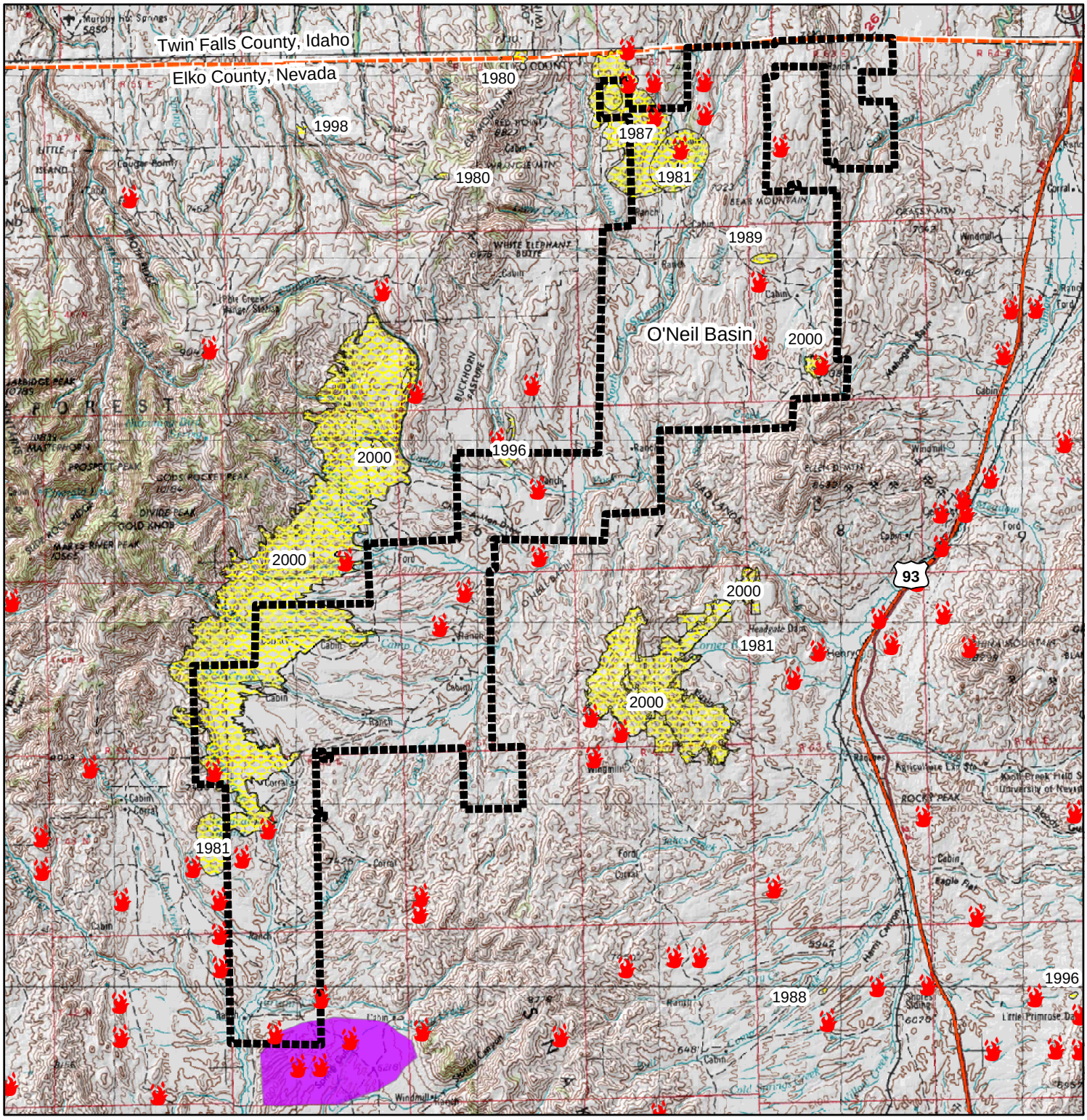


Figure 46-1. O'Neil Basin
Fire History and Prescribed Burns

Legend

- Community Boundary
- Fire Ignition
- Fire Boundary and Date
- Prescribed Burn
- County Boundary
- Highways and State Routes

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Miles

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Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

47.0 RUBY VALLEY

47.1 RISK AND HAZARD ASSESSMENT

Ruby Valley is seventy miles long and averages ten miles wide, running north/south along the eastern flank of the Ruby Mountains. The area is situated at an elevation of approximately 6,000 feet. Several ranches are scattered north of the Ruby Valley National Wildlife Refuge. The community boundary identified for this report is shown in Figure 47-1

The rural ranch community type does not lend itself to the standard community assessment procedures. Community design, suppression resources, and fuel hazard conditions are described qualitatively for the rural ranch communities. Within this community type, the homes are often surrounded by landscaped yards, corrals, or agricultural pastures with no wildland vegetation in close proximity to structures. These common characteristics usually contribute to a low risk of damage or direct loss of homes due to wildfires. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection during a wildfire because of their considerable value to ranchers and farmers.

47.1.1 Community Design and Defensible Space

Eight working ranches and some abandoned ranches were observed during this assessment in Ruby Valley. Most of the structures are buffered by irrigated agricultural fields. The RCI Project Team noted five structures with combustible wood shake roofs, and two ranches where defensible space around structures and hay/equipment storage areas needs improvement.

47.1.2 Suppression Capabilities

Wildfire Protection Resources

Fire protection in Ruby Valley is provided by the Ruby Valley Volunteer Fire Department. The department has several stations situated throughout the valley, with a total of seventeen volunteers and one chief. Table 47-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Ruby Valley in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 47-1. Wildfire Suppression Resources Available to Ruby Valley

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 engine	2	Ruby Valley VFD Secret Pass Station
Type 3 Engine Water Tender	1 1	Ruby Valley VFD School Station
Type 6 Engine Type 3 Engine	1 1	NDOW Gallagher Fish Hatchery (Ruby Valley)
Type 4 Engine Water Tender	1 1	Ruby Valley NWR (Ruby Valley)
Type 2 Engine	1	Spring Creek Station 1 (Spring Creek)
Type 6 Engine	1	Nevada Division of Forestry (Wells – seasonal)
Type 6 Engine	1	US Forest Service (Wells)
Type 4 Engine	1	Bureau of Land Management (Wells)

Source: Larry Burton, Ruby Valley VFD Fire Chief.

Water Sources and Infrastructure

Water available for fire suppression in Ruby Valley includes ranch ponds, individual residence and irrigation wells, and numerous creeks that could be used for drafting sites in the event of a wildfire.

Fire Protection Personnel Qualifications

The Ruby Valley volunteers have received training from the Nevada Division of Forestry and cooperating agencies to meet the minimum National Wildfire Coordinating Group basic wildland standards.

Work Load

In a typical year, the Ruby Valley VFD responds to the following annual calls:

- Three to four emergency medical calls.
- Six to twelve wildland/brush fire calls.
- Six other calls.

47.1.3 Factors Affecting Fire Behavior

The vegetative fuel Hazard in the Ruby Valley interface area varies from Moderate to High. The lower elevation areas of the valley consist of sagebrush and rabbitbrush, with an understory of perennial grasses, crested wheatgrass, and cheatgrass. Cheatgrass growth is dependent on annual moisture and will produce increased fuel volumes and elevate fuel hazards in years of higher than average precipitation. Fuel loads along the valley bottom are estimated at two to four tons per acre. On slopes to the west of the community the fuels are of a greater density, with some pinyon-juniper stands, and fuel loading is estimated at four to eight tons per acre. The prevailing wind direction is from the south/southwest; however

downslope winds from the mountains are erratic and unpredictable. There is a history of afternoon thunderstorms and dry lightning strikes in the area.

47.1.4 Fire Behavior Worst Case Scenario

The worst case scenario for a wildfire in Ruby Valley would be a dry lightning storm on the west side of the valley in pinyon-juniper and annual grass ground fuels. Erratic downslope winds would drive the fire toward ranch residences, especially those located on the west side of Ruby Valley Road. Initial response from fire suppression resources could be an hour or more away dependent on availability during normal working hours.

47.1.5 Ignition Risk Assessment

Ruby Valley has a high risk of ignition based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. There is a moderate wildfire history in the public lands surrounding the community, and a history of lightning strikes around the community. The primary risk of ignition in Ruby Valley is lightning, although human caused ignitions are unpredictable and can occur at any time.

47.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The risk and hazard reduction recommendations for Ruby Valley address the primary concern for maintaining defensible space and assuring water availability for fire suppression.

47.2.1 Defensible Space Treatments

Despite the reduced risk of damage or loss to structural properties, Ruby Valley has other unique conditions due to the remote location and relative isolation. Hay and alfalfa fields, stockpiled bales, livestock, ranching and farming equipment, and fuel tanks are assets that require special planning for protection against wildfire because of their considerable value to ranchers and farmers.

Property Owners Recommendations

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.
- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or

baled hay is vulnerable to ignitions as much from internal combustion as from outside sources.

- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

47.2.2 Fire Suppression Resources

Property Owners

- Develop a system for backup power in the case of a large wildland fire causing power failure.
- Coordinate with the Nevada Division of Forestry to pursue funding to develop or adapt water sources for fire protection and install filler hoses for water tenders.

47.2.3 Public Education

University of Nevada Cooperative Extension

- 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.

47.3 SUMMARY OF RECOMMENDATIONS

Table 47-2. Ruby Valley Risk and Hazard Reduction Priority Recommendations

INVOLVED PARTY	RECOMMENDED TREATMENTS	RECOMMENDATION DESCRIPTION
Property Owners	Defensible Space	Remove, reduce, and replace vegetation around homes, equipment, and hay storage areas according to the guidelines in Appendix E. Maintain the defensible space annually. Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources. Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.
	Fire Suppression Resources	Develop a system for backup power in the case of a large wildland fire causing power failure. Coordinate with the Nevada Division of Forestry to pursue funding to develop or adapt water sources for fire protection and install filler hoses for water tenders.
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.

Ruby Valley North

Ruby Valley South

Ruby Valley Indian Allotments

Ruby Lake Estates

Ruby Lake NWR and Hatchery

Shanty Town

1999

1999

1999

1996

1999

229

767

Figure 47-1. Ruby Valley
Fire History, Suppression Resources, and
Critical Features

Legend

- Community Boundary
- Elko Community
- School
- Fire Station
- Ruby Lake National Wildlife Refuge
- Fire Ignition
- Fire Boundary and Date
- Highways and State Routes
- Secondary Roads
- Community Boundary

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Nevada Community Wildfire Risk / Hazard Assessment Project

Resources 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.

PREVIOUSLY ASSESSED COMMUNITIES

48.0 SHANTY TOWN

48.1 RISK AND HAZARD ASSESSMENT

SRK Consulting of Reno, Nevada conducted a wildfire risk/hazard assessment in Shanty Town in October 2002. They assessed community design, vegetation, fire suppression, and fire history, and they made recommendations for mitigation projects to reduce the threat of wildfire in the community. Shanty Town is located in southern Ruby Valley, along the eastern flank of the Ruby Mountains and adjacent to the marshes of the Ruby Lake National Wildlife Refuge (RLNWR).

48.1.1 Community Design

The 53 homes observed in the community are primarily vacation homes occupied in the summer, however there are some homes occupied year-round.

Access: Ruby Valley Road is the primary transportation route to Shanty Town and there are numerous secondary roads. Ruby Valley Road is between twenty to 24 feet wide, dirt and gravel base, and has adequate turnaround space for fire suppression equipment. Secondary roads in the community have not been maintained. Some roads are too narrow for fire suppression and emergency vehicle equipment passage and do not have adequate turn-around space.

Signage: Secondary roads in Shanty Town are not adequately signed. Clear and visible street signs and residential addresses are important in locating homes during low visibility conditions that occur during a wildfire.

48.1.2 Suppression Capabilities

Wildfire Protection Resources

Shanty Town receives fire protection from the Ruby Valley Volunteer Fire Department. The department has several stations situated throughout the valley, with a total of seventeen volunteers and one chief. The Ruby Valley NWR has three full time staff and three seasonal paid staff members. The Nevada Division of Wildlife Gallagher Fish Hatchery has equipment and trained personnel as well. Table 48-1 lists the types of local wildfire resources, cooperating partners, and equipment available for initial response to Shanty Town in the event of a reported wildfire. Additional resources are available from local, state, and federal agencies through mutual aid agreements as described in Section 4.1.1.

Table 48-1. Wildfire Suppression Resources Available to Shanty Town

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 engine	2	Ruby Valley VFD Secret Pass Station
Type 3 Engine Water Tender	1 1	Ruby Valley VFD School Station
Type 6 Engine Type 3 Engine	1 1	NDOW Gallagher Fish Hatchery
Type 4 Engine Water Tender	1 1	Ruby Valley NWR

Source: Larry Burton, Ruby Valley VFD Fire Chief.

Water Sources and Infrastructure

Water is provided by a gravity fed system to some of the residences. There are no water storage facilities and water for fire. Two 12,000-gallon water storage tanks have been purchased for the community and tank installation is planned for June or July of 2005.

48.1.3 Factors Affecting Fire Behavior

Vegetation around the community consists of big sagebrush, perennial grasses, and pinyon-juniper. Tree density increases toward the base of the mountains on the western side of the community and fuel loading is highest there. The fuel hazard condition was considered moderate to high. A landfill in the community is closed now and residents have been piling green waste in Deadman's Canyon, increasing fuel loading and fire ignition risk.

48.1.4 Ignition Risk Assessment

Shanty Town has a high ignition risk based on fire history in the area and the potential for increased fuel loading from annual grasses in high precipitation years. The primary ignition risks in Shanty Town are lightning, uncontrolled burns, and human caused ignitions that are unpredictable and can occur at any time.

48.1.5 Existing Mitigation Projects

SRK developed the following set of recommendations to reduce the hazards and threat of wildfire in Shanty Town. The SRK proposed fuels reduction projects and dry hydrant system (water tanks) have been completed, with the exception of seeding which will occur during the fall of 2005.

- Surface maintenance of community roads, widening of some roads for emergency vehicle passage, and development of turn-arounds.
- Construct the proposed road providing access to the west side of the community and fuel storage facilities there.
- Form a committee to propose street names and obtain approval from Elko County.
- Continue to train volunteers in State Fire Marshal structure firefighting and Nevada Division of Forestry wildland firefighting and work to recruit more volunteers and increase attendance at training.

- Develop a water storage facility for fire suppression.
- Develop a water storage system near Flynn Spring with a hydrant delivery system.
- Coordinate with the Ruby Lake National Wildlife Refuge for use of the gravel pit pond for fire suppression.
- Develop agreement with Elko County and the Ruby Lake National Wildlife Refuge to identify a suitable location for prescribed burning of biomass.

Fuel Reduction Treatments

The locations of the proposed fuel reduction treatments listed below are shown in Figure 48-1.

- Construct a greenstrip 300 feet wide, 1,600 feet long south of Largemouth Lane on US Forest Service administered land on the south end of the community.
- Construct a greenstrip 300 feet wide, 2,100 feet long approximately 0.5 miles south of the community on the south side of the existing dirt road, extending west-northwest to the US Forest Service property.
- Construct a greenstrip 100 feet wide, 0.8-mile long on the east side of the County Road right-of-way, extending from Gravel Pit Road to 0.2 miles north of Shanty Town.
- Implement brush removal treatments to reduce the fuel loading in the sagebrush block between greenstrips 1 and 2. The area should be grazed annually before fire season to remove herbaceous fuels.
- Implement tree thinning for a width of 100 to 150 feet on the west side of the community between the proposed greenstrip on the south side to the existing power line on the north side of the community.
- Construct a fuelbreak 25 to 50 feet wide along the power line corridor from County Road south to the residential area.
- Thin trees and shrubs within the thirteen-acre US Forest Service parcel on the north side of the community.
- Clear fuels along fence lines in the community.

48.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS

The RCI Project Team visited Shanty Town during the Elko County risk assessment and proposed the following recommendations.

48.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatments is to significantly reduce or remove flammable vegetation within a prescribed distance from structures. (Refer to Appendix E for the minimum recommended defensible space area). Defensible space reduces the fire intensity and improves firefighter and homeowner chances for successfully defending a structure against an oncoming wildfire.

Property Owners

- Remove, reduce, and replace vegetation around homes, equipment, and hay 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 debris.

  Green: Existing plants are healthy and green during the fire season.

- Store firewood a minimum distance of thirty feet from structures.
- Clear all vegetation and combustible materials around propane tanks and other fuel storage tanks for a minimum distance of ten feet.
- Immediately dispose of cleared vegetation when implementing defensible space treatments. This material dries quickly and poses a fire hazard if left on site.
- Maintain the defensible space as needed.
- Create a fuelbreak of bare ground or gravel for 100 feet around stockpiled commodities such as hay or alfalfa. Because it is dried plant material, stacked or baled hay is vulnerable to ignitions as much from internal combustion as from outside sources.
- Seed a mixture of fire resistant species around residential structures and ranch outbuildings. This will enhance fire safety, especially important in these rural areas where water sources are limited or distant.

48.2.2 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. Permanently changing the fuel characteristics over large blocks of land to one of a lower volume and one of altered distribution reduces the risk of a catastrophic wildfire in the treated area. Reducing vegetation along roadways and driveways could reduce the likelihood of blocking access and escape routes, help contain the fire perimeter, and improve firefighter access and safety for protecting homes.

Ruby Valley VFD and Nevada Division of Forestry

- Increase the width of the serpentine shaped tree thinning area on the west side of the community from 100 to 150 feet wide to 300 feet wide.
- Continue to coordinate and enforce a brush clearance program for the community.

Utility Company

- Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community.

48.2.3 Fire Suppression Resources

Ruby Valley VFD and Nevada Division of Forestry

- Continue to work with residents and cooperating agencies to enforce the existing burn permit process.

48.2.4 Community Coordination

Property Owners

- Once street names are recorded with the County, ensure residential addresses are easily visible from the road. Address characters should be at least four inches high, reflective on a dark background, and made of non-flammable material. Improving visibility of addresses will make it easier for those unfamiliar with the area to navigate under smoky conditions during a wildfire.
- Form a local community-based organization to take responsibility and provide leadership for community-wide fuels reduction and community fire safety. The Nevada Fire Safe Council is one option for community organization. Through the establishment of a local Nevada Fire Safe Council 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 of for more information contact the:

  Nevada Fire Safe Council
  210 South Roop Street Suite 101
  Carson City, NV 89701
  www.nvfsc.org

Ruby Valley VFD and Nevada Division of Forestry

- Coordinate with the community-based fire safe organization to develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.
- Coordinate with the community-based fire safe organization to enforce protection of street signs by law enforcement agencies.

Elko County

- Continue to require all future development in the County to meet the National Fire Codes, NRS 477, the National Environmental Policy Act, and local ordinances regarding community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

48.2.5 Public Education

A public education program that explains fire safe measures in clear and emphatic terms will have an impact on residents of the wildland-urban interface. Informed community members will be more inclined to make efforts to effectively reduce wildfire hazards around their homes and neighborhoods.

Ruby Valley VFD and Nevada Division of Forestry

- Distribute copies of the publication "Living With Fire" to all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

48.3 SUMMARY OF RECOMMENDATIONS

Table 48-2. Shanty Town Risk and 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 the defensible space annually.
	Community Coordination	Ensure addresses are easily visible from the road. Form a local community-based organization to provide leadership and be responsible for community-wide fuels reduction and community fire safety.
Ruby Valley VFD **Nevada Division of Forestry**	Fuels Reduction	Increase the width of the tree thinning serpentine shaped fuel reduction area on the west side of the community from 100 to 150 feet wide to 300 feet wide. Develop and enforce a brush clearance program for the community with a designated biomass disposal site other than Deadman's Canyon.
Utility Company	Fuels Reduction	Reduce and remove vegetation to maintain clearance around power lines. Clear vegetation within fifteen feet of utility poles near the community. Remove all trees from beneath power lines.
Ruby Valley VFD and Nevada Division of Forestry	Fire Suppression Resources	Develop an evacuation plan that identifies routes of travel, shelter in place areas, and individuals with needs for special assistance such as non-ambulatory residents.
	Public Education	Distribute copies of the publication *"Living With Fire"* to all property owners.
Elko County	Community Coordination	Promote cooperation between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS locations. Continue to require all future development in the County to meet the National Fire Codes with regard to community design, building construction and spacing, road construction and design, water supply and emergency access. Refer to Appendix F for an example of fire safe recommendations for planning new developments.

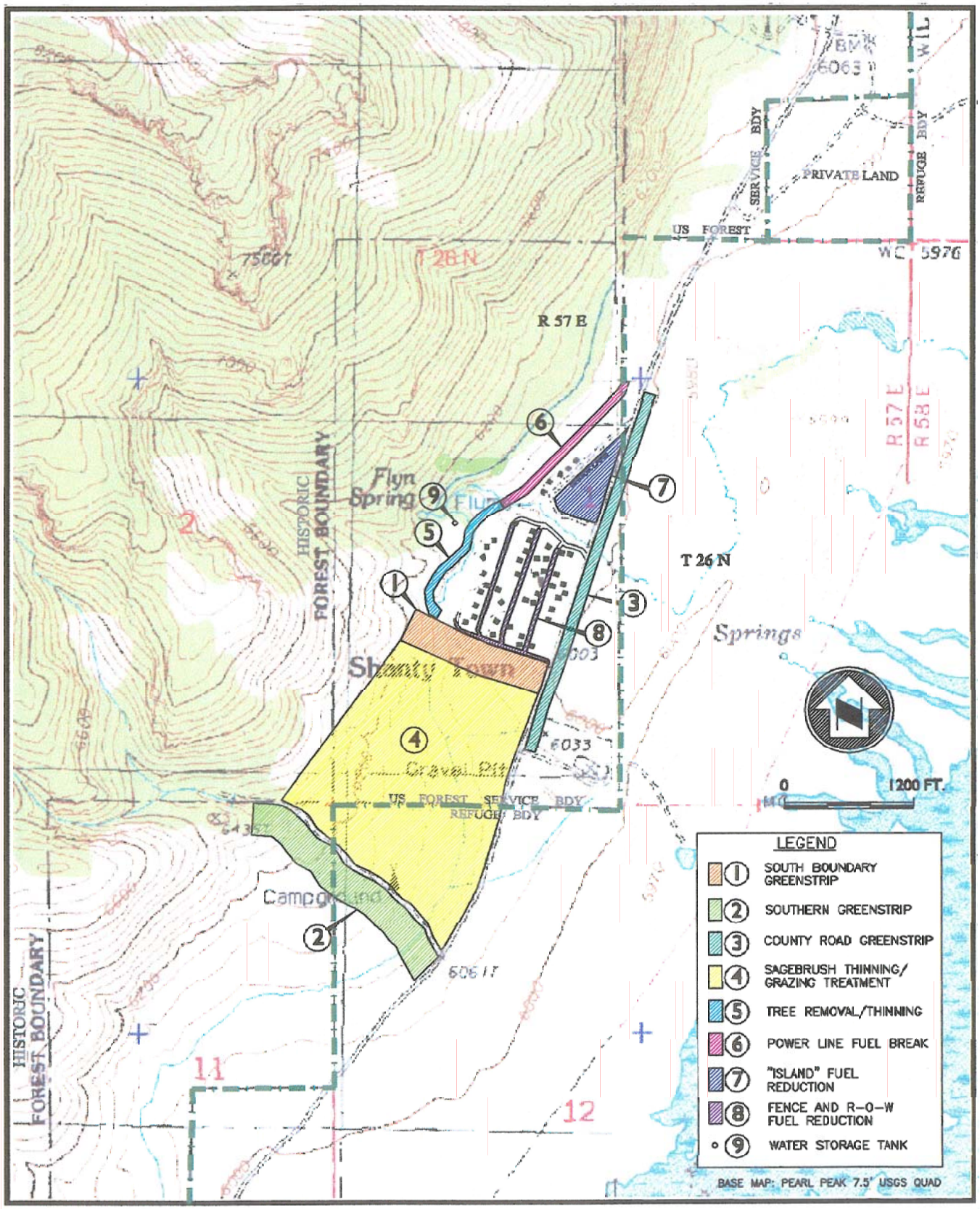


Figure 48-1. Shanty Town
Proposed Mitigation Projects

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(775)-883-1600

Source: Fire Safe Plan for Shanty Town; Elko County, Nevada
SRK Consulting, October 2002.

49.0 CONCLUSIONS

The recommendations in this report have been developed based on site-specific conditions observed during the wildfire risk and hazard assessments performed by RCI and with input from Elko County fire agencies. General and specific recommendations provide a starting point so that each community described in this report can take a proactive approach in formulating projects to reduce the risks of loss of life, property, and natural resources from a wildland fire.

Thousands of acres in the wildland-urban interface in Elko County are exposed to the threat of wildfire each year. Most Elko County communities are prone to fire ignitions from dry lightning storms, railroad ignitions, or other human causes. The wildland-urban interface around many Elko County communities has burned or repeatedly burned in the recent past.

The Volunteer Fire Department firefighters are critical component of the wildfire suppression resources in Elko County. The State of Nevada, Elko County, and the Nevada Division of Forestry need to cooperatively develop and offer incentives to recruit and maintain volunteer firefighters. Nevada Division of Forestry and the cooperating fire agencies should continue to provide training to meet the minimum National Wildfire Coordinating Group basic wildland standards. Volunteers need to make extended efforts to attend these trainings and become qualified to fight wildland fire.

Public land agencies and private land owners must continue to cooperatively implement and maintain fuel reduction treatments on lands adjacent to communities. As communities continue to grow, there will be a corresponding need for expanded fuel reduction treatments. Cheatgrass abatement must be given special consideration, especially during years with normal or above normal winter and spring precipitation. Early season livestock grazing is an effective treatment to reduce cheatgrass fuels on an annual basis that should be given high priority.

To be most effective, fire safe practices need to be implemented on a community-wide basis. There is no way to completely eliminate the threat that wildfires present to communities at the wildland interface. However, the recommendations in this report are intended to increase public awareness and encourage concerned community members to make proactive efforts to effectively reduce the risk of wildfire ignitions near their communities. Creating and implementing defensible space on private property, fuel reduction projects, and increasing public awareness of the potential for damage of property or loss of lives associated with living in a fire prone environment is 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 the 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 on the wildland-urban interface.

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Spatial database information used in this report is listed by source in Section 2.2.

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. It 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, such as 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 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, and/or 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:

FIREWISE. Glossary of Terms.

National Fire Plan. Glossary of Terms.

Utah Department of Natural Resources Division of Forestry, Fire and State Lands. 2001. Fuel load reduction treatments along the wildland-urban interface: Community level protection support document for National Fire Plan projects in Utah and Nevada.

SCIENTIFIC PLANT NAMES

Common Name	Scientific Name
Trees	
Black cottonwood	*Populus trichocarpa*
Curl-leaf mountain mahogany	*Cercocarpus ledifolius*
Quaking aspen	*Populus tremuloides*
Rocky Mountain juniper	*Juniperus scopulorum*
Russian olive	*Elaeagnus angulstifolius*
Singleleaf pinyon	*Pinus monophylla*
Subalpine fir	*Abies lasiocarpa*
Utah juniper	*Juniperus osteosperma*
Willow	*Salix* sp.
Shrubs	
Big sagebrush	*Artemisia tridentata*
Bitterbrush	*Purshia tridentata*
Black greasewood	*Sarcobatus vermiculatus*
Black sagebrush	*Artemisia nova*
Broom snakeweed	*Gutierrezia sarothrae*
Low sagebrush	*Artemisia arbuscula*
Mountain big sagebrush	*Artemisia tridentata* ssp. *vaseyana*
Mormon tea	*Ephedra viridis*
Rabbitbrush	*Chrysothamnus* sp.
Serviceberry	*Amelanchier* sp.
Shadscale	*Atriplex confertifolia*
Spiny hopsage	*Grayia spinosa*
Wild rose	*Rosa woodsii*
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*
Grasses / Forbs	
Annual kochia	*Kochia scoparia*
Basin wildrye	*Leymus cinereus*
Bottlebrush squirreltail	*Elymus elymoides*
Cheatgrass	*Bromus tectorum*
Crested wheatgrass	*Agropyron cristatum*
Halogeton	*Halogeton glomeratus*
Hoary cress	*Cardaria draba*
Indian ricegrass	*Achnatherum hymenoides*
Annual mustard	*Brassicaceae* family
Annual pepperweed	*Lepidium* sp.
Russian thistle	*Salsola tragus*
Sandberg bluegrass	*Poa secunda*

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 70-89%	5
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

Photos of Representative Fuel Types



Photo 1. High hazard juniper and sagebrush fuel types exist in many communities in Elko County including Spring Creek. Ground fuels include cheatgrass, basin wildrye, bluegrass, and squirreltail one to three feet tall. The shrub layer is composed of sagebrush, rabbitbrush, and broom snakeweed standing one to three feet high.



Photo 2. Big sagebrush intermixed with crested wheatgrass is a common wildland-urban interface fuel type in Elko County. Fuel loads were estimated at two to four tons per acre and considered a moderate fuel hazard.



Photo 3. Low sagebrush and black sagebrush are generally less than one foot tall and were often considered either a low or moderate fuel hazard depending upon plant density, grass cover, and slope.



Photo 4. Salt desert shrub vegetation surrounds several communities in Elko County including West Wendover and Pilot Valley. Fuel loads were estimated between one and three tons per acre and were considered a moderate fuel hazard.



Photo 5. Big sagebrush and rabbitbrush are the dominant species in the sagebrush vegetation type. This fuel type is generally found along lower elevation valley bottoms and fans below pinyon and juniper or mountain shrub types. Fuel loads ranged between two and six tons per acre and were considered a moderate to high fuel hazard depending upon plant density and slope.

Appendix D

List of Persons Contacted

Appendix D – List of Persons Contacted

CONTACT NAME	POSITION	DATE CONTACTED	TELEPHONE
Verl Jarvie	Fire Chief Jackpot VFD	Aug. 24, 2004	(775) 755-2449
Kenny Heil	Fire Chief Jarbidge VFD	Aug. 25, 2004	(775) 488-2325
Tom Turk	Battalion Chief NDF Northern Region	Aug. 24, 2004	(775) 738-3454
Joe Freeland	Fire Management Officer Bureau of Land Management, Elko Field Office	Aug. 24, 2004	(775) 753-0308
Frank Zaga	Fire Chief Jiggs VFD	Aug. 25, 2004	(775) 744-4359
Alan Kightlinger	Chief Elko Fire Department	Aug. 25, 2004	(775) 777-7350
Walt Howell	Fire Chief Deeth/Starr Valley VFD	Aug. 24, 2004	(775) 752-3047
Jess Sustacha Jr.	Fire Chief Lamoille VFD	Aug. 24, 2004	(775) 753-6465
Lorayne London	Environmental Coordinator South Fork Indian Reservation	Aug. 26, 2004	(775) 744-4973
Melody Asher	Fire Management Officer Humboldt-Toiyabe, Mountain City Ranger District	Aug. 24, 2004	(775) 778-6106
Bill Krohn	Fire Chief Ryndon VFD	Aug. 24, 2004	(775) 738-5882
Larry Burton	Fire Chief Ruby Valley VFD	Aug. 31, 2004	(775) 779-2231
Jay Wright	Fire Chief Independence Valley VFD	Aug. 24, 2004	(775) 756-6562
William Johnston	Fire Chief Carlin VFD	Aug. 24, 2004	(775) 754-6969
Kevin Hall	Fire Management Officer NDF Northern Region	Oct. 19, 2004	(775) 738-3454
John Evans	Fire Chief Steptoe/Cherry Creek VFD	Aug. 10, 2004	(775) 591-0405
Blake O'Donnell	Fire Chief Ten Mile VFD	Aug. 24, 2004	(775) 744-2778
Randy Dedman	Fire Chief Wells VFD	Aug. 24, 2004	(775) 752-3333
Bob Farrell	Fire Chief Tecoma Township FPD	Sept. 1, 2004	(775) 776-2466
Rod Mothershead	Fire Chief Spring Creek VFD	Aug. 24, 2004	(775) 753-6374
Jeff Knudtsen	Fire Chief Wendover Fire Department	Aug. 31, 2004	(775) 664-2274
Bobby Lee	Fire Chief Clover Valley VFD	Aug. 24, 2004	(775) 934-1253
Brian Pete	Engine Boss Sho-Pai Fire	Aug. 24, 2004	
Tom Reid	Hazardous Fuels Management Specialist Bureau of Land Management, Elko Field Office	May 31, 2005	(775) 753-0200
Dennis Walker	Resource Management Officer Nevada Division of Forestry, Northern Region	May 27, 2005	(775) 738-3454

Appendix E

Homeowner Guidelines

Defensible Space Guidelines
Homeowner's Annual Checklist
Fuelbreaks and Fuel Reduction Treatments
Seed Mix and Planting Specifications for Elko County

DEFENSIBLE SPACE GUIDELINES

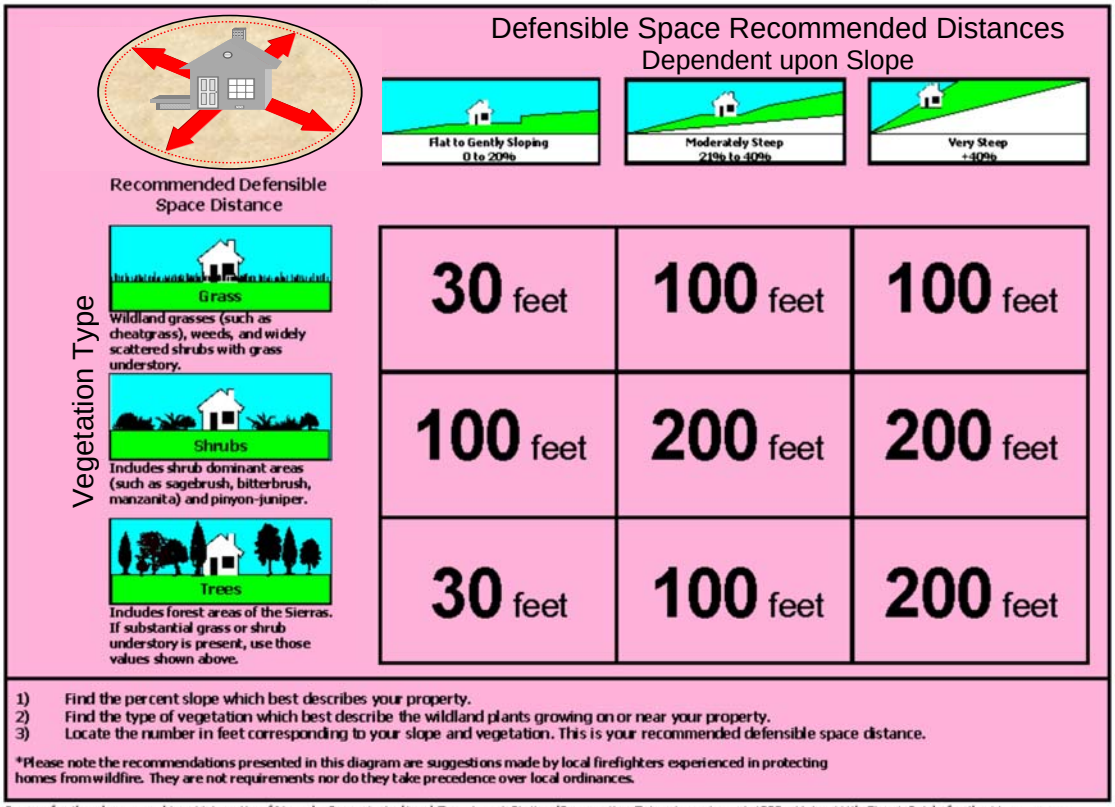
A FACT SHEET FOR ELKO COUNTY HOMEOWNERS

Defensible space refers to a **minimum** 30-foot area around houses and other buildings where vegetation has been significantly reduced or removed. The purpose of creating defensible space is to reduce the risk of losing homes and other property improvements to a wildfire.

HOW TO CREATE DEFENSIBLE SPACE

STEP 1 **DETERMINE DEFENSIBLE SPACE DISTANCE.** Use the table below to determine the minimum distance for defensible space, dependent upon slope and native vegetation type surrounding homes.

Standard Defensible Space Guidelines



Source for the above graphics: University of Nevada, Reno Agricultural Experiment Station/Cooperative Extension. August 1998. Living With Fire-A Guide for the Homeowner.

STEP 2 **REMOVE.** Cut and remove all dead, diseased or dying trees and shrubs from within the defensible space area. Remove selected trees and shrubs to eliminate continuous fuels extending up to the house. Also remove any flammable debris and firewood piles from within the minimum defensible space distance. Weeds or other dry vegetation should be removed from underneath porches and decks. Eliminate any flammable vegetation or debris within 10 feet of propane tanks. Remove leaves and debris from rain gutters.

STEP 3 **REDUCE.** Reduce vegetation height of shrubs under mature trees to decrease "ladder" fuels. Prune low tree branches to a minimum height of 4 feet and prune branches within 15 feet of structures and chimneys. Reduce accumulations of annual grasses (cheatgrass) through mowing or pre-emergent selective herbicide treatments in the fall. Reduce the accumulation of vegetation around wood fences through mowing or plant removal.

STEP 4 **REPLACE.** Substitute flammable vegetation such as juniper, sagebrush, and rabbitbrush with fire resistant plants. Replacement plantings may include low stature shrubs, decorative rock, lawn, flowerbeds, and succulent vegetation. Irrigation of vegetation throughout the fire season will decrease plant flammability.

STEP 5 **DISPOSE.** It is essential that all tree branches, shrubs, and other plant biomass be removed from the site immediately to a safe disposal area. This material dries rapidly and can contribute to the fire hazard problem if allowed to remain on the premises.

STEP 6 **MAINTAIN.** Maintenance of the defensible space area requires an annual review of fuel reduction guidelines around the home. Action should be taken to maintain an effective defensible space area.

Remember, good defensible space is –

Lean – There are only small amounts of flammable vegetation
Clean – There is no accumulation of dead vegetation or flammable debris
Green – Existing plants are healthy, green, and irrigated during fire season

(Source: Living With Fire…In the Big Sagebrush/Bitterbrush Environment. Nevada State Bureau of Land Management. Produced by Ed Smith and JoAnne Skelly.)

HOMEOWNERS' ANNUAL CHECKLIST

A FACT SHEET FOR ELKO COUNTY HOMEOWNERS

This checklist includes actions homeowners can perform annually to help create a fire safe home and community.

- ❑ Check all address signs for ease of visibility. Metal signs with four-inch high reflective numbers are recommended for visibility by emergency responders.

- ❑ Continue clearing of all trees underneath and adjacent to overhead power lines and poles. This includes the poles and lines to individual parcels. Trees that can touch or blow into the power lines can easily be trimmed or removed, and maintained to reduce fire hazard.

- ❑ Remove shrubs and trees for a distance of 10 feet from propane tanks.

- ❑ Remove all tree limbs within at least 15 feet of chimneys, decks, and open overhangs.

- ❑ Remove woodpiles, obvious accumulations of trash, pine needles or other debris from defensible space areas.

- ❑ Remove all dead and diseased branches. After initial emergency treatments, it is recommended that tree limbing occur during late fall and winter to prevent disease and attacks by pests.

- ❑ Harvested vegetation and trimmings must be immediately removed from the premises to assure that fuel reduction treatments are effective. All harvested biomass should be moved to a predetermined disposal area or safe zone approved by the Fire Department.

- ❑ All soil disturbances including those during biomass removal should be broadcast seeded according to the recommended species and rates provided in the "pre-suppression seeding" section.

- ❑ Where possible, improve driveway access to assure an adequate turning radius for firefighting apparatus.

- ❑ Clear rain gutters of leaves, needles and other debris. Screen vents to prevent any embers from entering attics in the event of a wildfire.

- ❑ Check hoses, valves, and other water equipment to assure operability should a fire occur.

- ❑ During high precipitation years, when growing conditions produce exceptional amounts of weeds, care should be taken to reduce the height of fire-prone vegetation, particularly weeds and grasses that carry fire to the adjacent shrubs. Implements such as weed-eaters work well for this job.

FUELBREAKS and FUEL REDUCTION TREATMENTS

A FACT SHEET FOR ELKO COUNTY HOMEOWNERS

DEFINITIONS:

A **fuelbreak** is a strategically located strip of land, on which a cover of dense, heavy, or flammable vegetation has been drastically changed to one of lower fuel volume or reduced flammability. Fuelbreak construction may include removing, controlling, and possibly replacing highly flammable vegetation with more fire resistant species. Ridgetop fuelbreaks generally have continuous length and width, which requires long-range planning. Fuel density is reduced, ladder fuels removed, and canopy closure reduced in fuelbreak treatments.

Shaded fuelbreaks are created by altering surface fuels and increasing the height of the base of the live crown and opening the canopy by removing trees. This type of fuelbreak spans a wide range of understory and overstory prescriptions and methods of creation through manual, mechanical, and prescribed fire treatments.



GENERAL RULES FOR FUEL MODIFICATION:

- Thin pinyon and juniper trees to a canopy spacing two times the height of the trees. Remove all shrubs from beneath tree crowns (ladder fuels).
- Thin shrubs so that canopies are spaced at least two times the height of the adjacent shrubs.
- Prune limbs up a minimum of four feet and up to one-third the height of the tree.
- If possible, prune/limb trees in the winter to avoid insect infestations. If pruning in other seasons, the tree should be sprayed with approved products to protect tree from insects and disease.
- Contact your local Nevada Division of Forestry (NDF) forester for additional recommendations regarding tree health and extensive tree removal projects.

When applying thinning and pruning treatments it is essential that all tree branches, shrubs, pine needle litter, and other plant biomass be removed from the site immediately to a safe disposal area. This material dries rapidly and can contribute to the fire hazard problem if allowed to remain on the premises.

SEED MIX AND PLANTING SPECIFICATIONS FOR ELKO COUNTY

COMMON NAME	SCIENTIFIC NAME	SEEDING RATE (PLS LBS/ACRE)	
		Broadcast Application	Drill Application
'Hycrest' wheatgrass	*Agropyron fragile spp. sibericum*	8.0	4.0
'Anatone" Bluebunch wheatgrass	*Agropyron spicatum*	4.0	2.0
'Immigrant' Forage Kochia	*Kochia prostrata*	2.0**	
Sandberg bluegrass	*Poa sandbergii*	1.5	.75
TOTAL PLS POUNDS PER ACRE		***15.5***	***8.75***

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

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 12 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 harrow implement 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.

Appendix F

Fire Safe Community Guidelines

FIRE SAFE COMMUNITY PLANNING RECOMMENDATIONS FOR NEW DEVELOPMENTS

Sample Building Department Requirements

1. A complete fire flow water system capable of meeting the residential calculated fire flow requirements as prescribed by the Uniform Fire Code Appendix III-A shall be installed.
2. All roadways within the project shall meet requirements of paved all-weather surface, Uniform Fire Code Article 9, Section 901 and 902 conditions, and shall be designated no parking zones where roads are less than 24 feet wide. If steep roads prevent constructing 24-foot wide roads, then turnouts must be installed every ¼ mile. Homes with long private drives must have a turn around (50-foot radius), or a horseshoe drive or a hammerhead drive that allows large engines to turn around. Cul-de-sacs shall have a minimum 50-foot radius.
3. There shall be a minimum of two ways in and two ways out of the development. These shall be completed prior to the delivery of any combustible materials to the project site.
4. A fuels management/reduction program around all structures shall be maintained a minimum thirty feet in accordance with Uniform Fire Code Appendix 11-A-16.
5. Clearance of vegetative growth from roadways must be performed in accordance with Uniform Fire Code Appendix II-A-17.
6. Developers should submit a fuels modification plan for the entire acreage. A property line twenty-foot minimum fuelbreak shall be completed prior to approval of any final map.
7. All new structures shall be constructed with fire retardant roofing materials in compliance with Nevada Revised Statute 472.100.

These recommendations are provided as a guideline to fire safe community development and are not intended to supercede existing fire codes. Check with your county building department for actual county building codes.