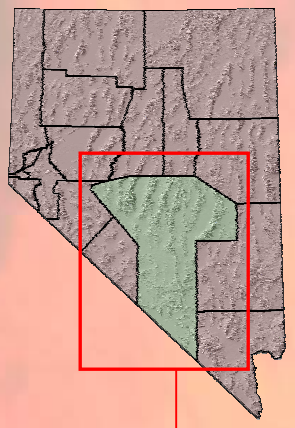
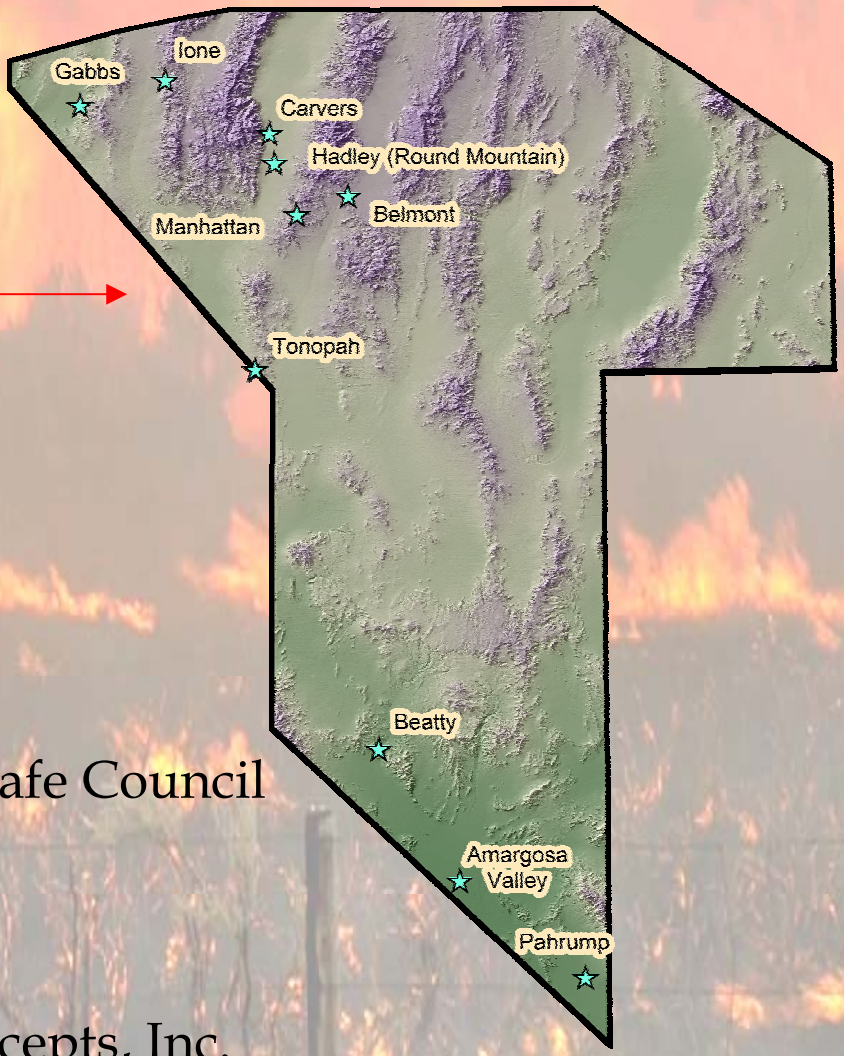
Nevada Community Wildfire Risk/Hazard Assessment Project

NYE COUNTY

January 2005





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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 wildlands meet.

This report was prepared specifically for the communities within Nye County identified in the 2001 Federal Register list of communities at risk within the vicinity of federal lands that are most vulnerable to the threat of wildfire. The communities assessed in Nye County are listed in Table 1-1.

The Nevada Fire Safe council contracted with 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 Nye County community listed in the Federal Register. The RCI Project Team spent several days inventorying conditions in Nye County and completing the verification portions of the risk/hazard assessment.

This report describes in detail the data and information collected, analyzed, and considered during the assessment of each community. The general results are summarized in Table 1-1. Five primary factors that affect potential fire hazard were assessed to arrive at the community hazard assessment score: community design, defensible space, construction materials, availability and capability of fire suppression resources, and physical conditions such as the vegetative fuel load and topography. Information on fire suppression capabilities and responsibilities for Nye County communities was obtained from local Fire Chiefs, local Fire Management Officers, and Nye County dispatch centers in Tonopah, Beatty, and Pahrump. The RCI Project Team Fire Specialist assigned an ignition risk rating for each community of low, moderate, or high. The rating was based upon historical ignition patterns, interviews with local fire personnel and other agency fire management officers, field visits to each community, and the professional judgments of the RCI Project Team Fire Specialist based on experience with wildland fire ignitions in central and southern Nevada.

Table 1-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CLASSIFICATION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Amargosa Valley	Intermix	Low	Low	Moderate
Beatty	Intermix	Low	Low	Moderate
Belmont	Intermix	High to Extreme	High	High
Carvers	Intermix	Low to High	High	Moderate
Gabbs	Classic Interface, Intermix	Low to Moderate	Low	Moderate
Hadley (Round Mountain)	Classic Interface	Low	Low	Low
Ione	Intermix	Moderate to Extreme	High	Extreme
Manhattan	Intermix	High to Extreme	High	Extreme
Pahrump	Intermix	Low	Moderate	Low
Tonopah	Classic Interface	Low to Moderate	Low	Low

Existing Situation

Nye County spans a broad range of elevations from the Mohave Desert areas in the south to the mountain ranges in the north. The communities in the southern part of the county generally have sparse fuels, low ignition risks, and low hazard ratings. Higher elevation communities in the northern part of the county have dense fuels, high ignition risks, and high to extreme hazard ratings.

Recommendations

A variety of measures are recommended for each community to reduce ignition risks, mitigate fire hazards, and promote fire safe communities. Recommendations typically include physical removal or reduction of flammable vegetation, increased community awareness of fire risks and strategies to reduce those risks, and coordination among fire suppression agencies to optimize efforts and resources.

Recommendations for creating defensible space were also applied uniformly in each community for landowners who have not yet reduced fuels on their private property. Defensible space is the homeowner's responsibility and is an essential first line of defense for saving lives and property during a catastrophic wildland fire.

Proper equipment and training are a common recommendation to each community. With the exception of Ione, each community in Nye County has a fire department. All of the departments rely on volunteers and are in need of additional wildfire personal protective equipment, tools, and wildfire training for all firefighters.

Recommendations were also formulated to mitigate the hazardous conditions for each problem area that was identified. The most hazardous areas are those within the heavy pinyon-juniper fuel types. Recommendations needed to reduce vegetative fuel load in the interface areas were directed to the Bureau of Land Management, US Forest

Service, and individual property owners. Implementation of the prescribed treatments will also reduce competition among the residual trees for sunlight and water, thus improving forest health. The reestablishment of native grasses in order to combat the invasion of cheatgrass, a highly flashy fuel, will also mitigate the fire hazard in some areas.

Excessive amounts of biomass (vegetative fuel) generated from fuel reduction treatments in the Nye County communities listed below will need to be chipped, burned, or removed from the treated areas to achieve the required fuel load reduction.

Belmont, Ione, and Manhattan have the highest hazard ratings in Nye County. Fuel reduction projects on land managed by the BLM and the US Forest Service surrounding each community are recommended. These communities also need improved radio communications in the event that additional resources need to be brought into the area.

Specific Recommendations for Fuel Reduction Treatments

Belmont:

- Implement a shaded fuelbreak around the community to provide a minimum of 500 feet of protection to structures from the surrounding wildland fuels. This distance increases up to 1,500 feet in areas where the fuel hazard is extreme. The fuelbreak should be seeded with perennial grasses and treated with an acceptable pre-emergent herbicide to prevent annuals from germinating in the first year.
- Within the shaded fuelbreak, trees should be thinned to a spacing equivalent to one and one-half (1½) times the height of the taller trees from crown to crown. Shrubs should be thinned to a spacing of two times their height and eliminated completely within ten feet of the tree crowns that remain.
- Fuel reduction on the private lands in the community should include thinning shrubs to a spacing of two times their height. Trees should be thinned to a spacing equivalent to one and one-half (1½) times the height of the taller trees from crown to crown. Additional guidelines for defensible space are included in Appendix E.

Ione:

The Bureau of Land Management (BLM) carried out a site assessment for the Ione community in May 2003, and the following treatment alternatives are proposed in the site assessment. Some treatments cross administrative boundaries between the BLM and the USFS. Figure 11-4 reproduces the proposed treatment areas as presented in the BLM site assessment.

- Continue implementation of the planned mowing, greenstrip, and shaded fuelbreak treatments on the BLM and USFS lands in the vicinity of Ione. The total planned treatment area is 476 acres.

Manhattan:

The Manhattan community was assessed by the Bureau of Land Management in October 2002 and an environmental assessment completed in November 2003. The assessment recommended fuel reductions on 487 acres of BLM and USFS lands (D. Walker, pers. comm. 2 Dec 2004). Implementation of this interagency effort was initiated during the summer of 2004.

Close and continued coordination between citizens, local fire departments, Nye County, the US Forest Service Austin and Tonopah Ranger Districts, and the Bureau of Land Management Battle Mountain Field Office is crucial for the implementation of fuel reduction projects and fire safety efforts in Nye County. To be most effective, fire safe practices need to be implemented on a community-wide basis. Proactive efforts to effectively reduce the risk of wildfire ignitions near communities, implementing defensible space and fuel reduction projects, general community clean-up programs, and public education programs will help to mitigate the hazards inherent in wildland interface areas.

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[May 18, 2005]

Resource Concepts, Inc.

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 the spring of 2002, in collaboration with county commissioners, state foresters, and tribal officials. The Plan calls for more active forest and rangeland management to reduce wildfire hazards in the wildland-urban interface.

The Healthy Forest Restoration Act (H.R. 1904) was signed into law in December of 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 in at risk communities across Nevada. The communities to be assessed are among those named in the 2001 Federal Register list of 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 wildfire threat in Nevada.

Resource Concepts, Inc. (RCI), a Carson City consulting firm, was selected to conduct the Community Risk/Hazard Assessments. During 2004, the RCI Project Team, consisting of fire behavior specialists, foresters, rangeland fuels specialists, and field technicians, visited over 250 communities in seventeen Nevada counties to assess both the risk of ignition and the potential fire behavior hazard within the wildland-urban interface, places where homes and wildland meet. Procedures accepted by Nevada's wildland fire agencies were used to reach consistent and objective evaluations in each community.

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

- Assess the wildfire hazards present in 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 high fuel hazard communities.
- 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 a format that will be easily updated and useful 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 completed 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 Belmont, Carvers, Ione, and Manhattan, where the fuel hazard in the interface area is high or extreme.

The results of the assessments are formatted to facilitate ease of reference and reproduction for individual communities. A glossary of wildland fire terms is included in Appendix A. Each community is mapped and ignition risks, hazards, and proposed mitigation projects are described for each community. The proposed mitigation projects are presented in a separate map if the recommendation 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 it is also crucial to the short and long-term viability of Nevada communities, natural resources, infrastructures, and watersheds.

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

- **Nevada Fire Safe Council (NFSC)**
- **Bureau of Land Management (BLM)**
- **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 communities listed below are within Nye County and identified in the Federal Register (66 FR 160) as communities at risk of wildfire within the vicinity of federal lands and are included in this assessment:

- Amargosa Valley
- Beatty
- Belmont
- Carvers
- Gabbs
- Hadley (Round Mountain)
- Ione
- Manhattan
- Pahrump
- Tonopah

In recent years the Round Mountain Gold Mine has expanded operations into the original Round Mountain townsite. To accommodate this expansion, the Hadley subdivision was created about ten miles (by road) to the west of historic Round Mountain and is where the majority of Round Mountain residents and all businesses can now be found. The assessment results presented in this report are exclusive to the Hadley community.

1.3 COMMUNITIES NOT ASSESSED

1.3.1 Yomba Reservation

The Yomba Reservation was not assessed. Tribal officials did not respond to repeated requests for their authorization to proceed with interviews and site assessments on tribal lands.

There may be additional rural areas or small subdivisions within Nye County that were not included on the Federal Register list, thus they were not included in the scope of this project. Conditions in and around some of these communities may warrant future individual hazard/risk assessments. However, many of the recommendations developed for similar communities in this report may apply to additional areas.

2.0 METHODOLOGY

2.1 PROJECT TEAM

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

The teams used standardized procedures developed from the *Draft Community Wildland Fire Assessment For Existing and Planned Wildland Residential Interface Developments in Nevada* during the assessment process (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.

2.2 BASE MAP DATA COLLECTION

The RCI Project Team Geographic Information Specialists compiled and reviewed existing statewide geospatial data to create field 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 Nye County Community Wildfire Risk/Hazard Assessment

SPATIAL DATASET	DATA SOURCE
LAND OWNERSHIP	BLM Nevada State Office Mapping Services
VEGETATION COMMUNITIES	Nevada Gap Analysis Program Data, Utah Cooperative Fish and Wildlife Research Unit, Utah State University
TOPOGRAPHY	US Geological Survey Digital Elevation Models and Topographic Maps
FIRE SUPPRESSION RESOURCES	Field and telephone interviews
ROADS	'TIGER' Census data (2000)
CURRENT AERIAL PHOTOGRAPHS	US Geological Survey Digital Orthophoto Quadrangles (1994, 1996, or 1998)
FUEL TYPES	BLM Nevada State Office Fire Hazard Potential Data
FIRE HISTORY	BLM Nevada State Office Mapping Services USFS Humboldt-Toiyabe Supervisor's Office National Interagency Fire Center

The existing data were reviewed and the pertinent information was compiled on maps in GIS format. The RCI Project Team verified the GIS data during the field assessments. The GIS Specialist provided data management for quality assurance and accuracy of the statewide geospatial data and map production.

2.2.1 Wildfire History

Wildfire history information was mapped using Bureau of Land Management and US Forest Service datasets and GIS databases that identify wildfire perimeters on federally managed lands covering the past 21 years. These databases were compiled by agency personnel using Global Positioning System (GPS) data and screen digitizing from source maps with a minimum detail level of 1:250,000. These datasets have been updated at the BLM Nevada State Office and the Humboldt-Toiyabe Supervisors Office at the end of each fire season from information provided by each Nevada BLM Field Office and Humboldt-Toiyabe Ranger District. The datasets are the central source of historical GIS fire data to support 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 were obtained through 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 within the section; in such cases, the point coordinate is located in the section center on maps.

The wildfire and ignition history data were used to formulate risk ratings and to develop recommendations specific to areas that have been repeatedly impacted by wildland fires. Observations made by the RCI Project Team and comments from local fire agencies were also used to develop recommendations for areas absent of recent wildfire activity where a significant buildup 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. The focus of this project was on identifying risks and hazards in the wildland-urban interface areas by assessing each community individually. Site-specific information for each community was collected during field visits conducted March 2, 2004 and between June 28 and June 29, 2004. The predominant conditions recorded during these site visits were used as the basis for the Community Risk and Hazard Assessment ratings.

2.3.1 Ignition Risk Assessment Criteria

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

2.3.2 Hazard Assessment Criteria

The Community Risk/Hazard Assessments were completed using 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. Hazard Rating Point System Used in the Nevada Community Wildfire Risk/Hazard Assessment Project

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

To arrive at a score for the community, five primary factors that affect potential fire hazard are 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 presenting the point values assigned to each element in the hazard assessment are provided at the end of each community assessment. Photographs of representative fuel types in the interface areas throughout Nye County are provided in Appendix C.

Community Design

Aspects of community design account for 26 percent of the total hazard 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 interface condition classes are used to categorize the wildland-urban interface: Classic Interface, Intermix, Occluded, and Rural. Definitions for each condition class are included in the glossary 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 or exploding transformers during windstorms or during periods of high electricity

demand. 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 back-up 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 account for sixteen percent of the total 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 address specific elements that strongly affect structure ignitability in the interface area. Factors considered in the assessment include:

- **Structure Building Materials.** The composition of building materials determines the length of time a structure could withstand high temperatures before ignition occurs. Houses composed of wood siding and wood shake roofing are usually the most susceptible to ignitions. Houses built with stucco exteriors and tile, metal, or composition roofing are able to withstand much higher temperatures and heat durations, thereby presenting a much lower ignition risk from firebrands or from the proximity of advancing flames when defensible space conditions are adequate.
- **Architectural Features.** Unenclosed or unscreened balconies, decks, porches, eaves, or attic vents on homes can create drafty areas where sparks and embers can accumulate, smolder, and ignite, rapidly spreading fire to the house. A high number of houses within the wildland-urban interface with these features implies a greater hazard to the community.

Defensible Space

Defensible space accounts for sixteen percent of the assessment score. The density and type of fuel around a home determines the potential fire exposure levels to the home and affects firefighter safety considerations for defending 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 losing the home. Defensible space is one of the factors that homeowners can most easily manipulate in order to improve the chances that a home or other property avoids damage or complete loss from a wildfire.

Suppression Capabilities

The availability and capability of fire suppression resources account for sixteen percent of the total assessment score. Knowledge of the capabilities or limitations of the fire suppression resources in a community can help the residents take action to maximize the effectiveness of the resources available. Factors considered in the assessment include:

- **Availability, Number, 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 firefighters 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 flow capabilities, or firefighters must rely on local ponds or other drafting sites influences the ability of the firefighters to adequately protect the community.

Physical Conditions

The physical conditions that influence fire behavior 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. Therefore, an understanding of how these physical conditions can influence the behavior of a fire 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 can burn downslope; however, it usually burns downhill at a slower rate and with shorter flame lengths than in upslope burns. 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 topographical features that are prone to higher wind speeds than adjacent areas. East facing slopes in the Great Basin routinely experience strong down slope winds in the afternoon that can rapidly push fires down slope. 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 thick, 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 steep slopes or high winds, can create a situation in which the worst-case fire severity scenario can occur. Under worst-case conditions, flame lengths in cheatgrass fuels could range between twelve and sixteen feet long.

2.3.3 Fuel 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 from the Nevada GAP Analysis Program satellite dataset at 30-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 BLM 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 of the project database.

2.3.4 Fire Behavior Worst-Case Scenario

The RCI Project Team Fire Specialists described the worst-case scenarios included in this evaluation based on their analyses of the severe fire behavior that could occur given a set of weather conditions, observed fuel load conditions, slope, aspect, and minimal fire suppression resources. The drought conditions and dry vegetation in combination with steep slopes or high winds can create situations in which the worst-case scenario can occur. The worst-case scenario does not describe the most likely outcome of a wildfire event at 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. Actual weather conditions including temperature, relative humidity, wind speed and direction, and time of day contribute to the actual fire behavior (Campbell 1991).

2.4 INTERVIEWS WITH FIRE PERSONNEL

The RCI Project Teams interviewed local fire department personnel and local Fire Management Officers to obtain information on wildfire training, emergency response time for initial and extended attack, personnel and equipment availability, evacuation plans, pre-attack plans, and estimates of possible worst-case scenarios. Local fire personnel reviewed maps showing the history of wildfires to ensure that local information on wildland fires was included. A list of fire agency personnel contacted for information in Nye County 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 community hazard score, and information from published references such as the "*Living with Fire"* and the FIREWISE resources (National Fire Plan website, FIREWISE website, and Nevada Cooperative Extension publications).

3.0 DESCRIPTION OF THE COUNTY

3.1 DEMOGRAPHICS, LOCATION, TOPOGRAPHY, AND CLIMATIC DATA

Nye County is located in south-central Nevada and is approximately 11.6 million acres in size. A summary of land management acreages is provided in Table 3-1 and presented in Figure 3-1.

Table 3-1. Land Management Acreage within Nye County

Land Administrator	Acres	Percent of total
Bureau of Land Management	6,553,000	56%
US Forest Service	1,962,000	17%
National Park Service	108,000	1%
State of Nevada	19,000	<1%
Private	247,000	2%
Bureau of Indian Affairs	8,000	<1%
Department of Defense	1,852,000	16%
Department of Energy	863,000	7%
Total	**11,612,000**	

Approximate values derived from BLM land ownership GIS database.

The Bureau of Land Management Battle Mountain Field Office and Humboldt-Toiyabe National Forest Austin and Tonopah Ranger Districts manage a combined 73 percent of the land in Nye County. As such, these agencies need to work closely with the communities and other agencies to ensure that the risk for loss of life and property from a wildfire in the wildland-urban interface areas is minimized.

Nye County spans from central to southern Nevada. Elevations within the county range from 11,773 feet at Arc Dome to 2,650 feet at Pahrump. The northern portion of the county has numerous mountain ranges including the Toiyabe Range, the Monitor Range, the Hot Creek Range, and the Grant Range. The largest valleys are Big Smoky Valley, Monitor Valley, and the Amargosa Valley Desert. The majority of the lands in the southern portion of the county are administered by the Department of Defense and the Department of Energy.

The current population estimate for Nye County is 36,600 persons (Nevada State Demographer 2003). The main employers in Nye County include the Nevada Test Site and mining. The Nevada Department of Employment, Training, and Rehabilitation also lists Bechtel Nevada Corp., and Round Mountain Gold Corp. as the largest employers in the County (Nevada Commission on Economic Development, 2004).

3.2 WILDFIRE HISTORY

The fire history of Nye County was researched through the Nevada BLM State Office and Humboldt-Toiyabe Supervisor's Office. There have been a moderate number of wildland fire occurrences in Nye County between 1980 and 2003; however, less than one percent of the land in the county has been affected by wildfire in the last 24 years. Many small fires that are caused by lightning in the mountains go unreported, and in the past, many large fires were not reported to or were not recorded by public land management agencies. Table 3-2 summarizes the fire histories and fire ignitions by year. Figure 3-2 illustrates the location and distribution of historic fires in Nye County. Amargosa Volunteer Fire Department Chief Roger Bright indicated that a 100-acre fire in 2003 and another 250-300-acre fire in 1999 were additional wildfires that were not included in the fire datasets.

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

YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE	YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE
1980	15	77	1992	25	6
1981	10	968	1993	15	2
1982	11	30	1994	7	1
1983	13	1,252	1995	5	5,041
1984	14	737	1996	7	21
1985	23	297	1997	17	20
1986	18	1,262	1998	29	1,391
1987	21	1,170	1999	24	23,598
1988	39	10,295	2000	19	18,762
1989	12	0	2001	23	182
1990	23	8	2002	16	4,380
1991	29	19	2003	12	52
			TOTAL	**427**	**69,571**

Fire ignition and base acreage data provided by the National Interagency Fire Center, Boise, Idaho. Additional fire history information provided by BLM Nevada State Office and USFS Humboldt-Toiyabe N.F. Supervisor's Office.

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 highways and county roads from burning material thrown out of vehicle windows or ignited during auto accidents, off-road vehicles, railroads, faulty power lines, agricultural fires, debris burning in piles or burn barrels, unattended camp fires, target shooting, and fireworks. Of the 427 wildfire incidents in Nye County, 267 were recorded by ignition source between 1980 and 2003; 177 of these were due to lightning and 90 were human caused. The cause for the remaining fires was not reported.

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 amount of dominant

vegetation replacement (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 that reoccupy burned areas in Nye County are cheatgrass and red brome.

Effect of Cheatgrass on Fire Ecology

Cheatgrass and red brome are commonly introduced annual grasses that aggressively invade disturbed areas, especially after a fire. Replacement of a native shrub community with a pure stand of cheatgrass or red brome increases the susceptibility of an area to repeated wildfire ignitions, especially in late summer when desiccating winds and lightning activity are more prevalent. The annual production or volume of cheatgrass or red brome fuel produced each year is highly variable and dependent on winter and spring precipitation. Plants can range from only a few inches tall in a dry year to over two feet tall on the very same site in wet years. In a normal or above normal precipitation year, cheatgrass and red brome can be considered high hazard fuel types. In dry years, these grasses are generally sparse and low in stature and pose a low fire behavior hazard because they tend to burn with relatively low intensities. Nevertheless, each year dried cheatgrass and red brome have the potential to create highly flammable fuel beds that are easily ignited with the propensity to rapidly burn into adjacent cover types that may be characterized by more severe and hazardous fire behavior. The ecologic risk of a fire spreading from a stand of cheatgrass or red brome 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 risks.

Eliminating cheatgrass and red brome presents a difficult challenge. Mowing defensible space and fuelbreak areas each year before seed maturity is effective in reducing 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[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, and private landowners should proceed with caution and consult with the label's instructions and their local extension agent. It may take years of intensive treatment efforts to control cheatgrass in a given area, but it is a desirable conservation objective in order to revert the landscape to the natural fire cycle and reduce the occurrence of large, catastrophic wildfires. Community-wide efforts in cooperation with county, state, and federal agencies are necessary for successful cheatgrass reduction treatments.

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

Fire Ecology in Pinyon-Juniper Woodlands

Singleleaf 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 dense 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 desirable for urban expansion in contrast to the surrounding deserts. In 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 be economic assets such as agricultural and industrial resources or cultural features, such as historic structures, archaeological sites, and recreation-based resources.

3.3.1 Historical Registers

There are fifty sites listed on the National Register of Historical Places for Nye County. Of these, 44 are located within Tonopah. The Nevada State Register of Historical Places lists eight of these sites on their registry for Nye County. The sites listed on both the Federal and the State Registers reflect this region's turn of the century mining history including sites such as: Board and Batten Miners Cabin, Brann Boarding house, Brokers Exchange, several row houses, and the Tonopah Mining Company House. Archeological sites and historic trails are not necessarily vulnerable to wildfire impacts. Historic districts, historic buildings, and cultural resources that lie in the wildland-urban interface that could be negatively impacted by wildfire are summarized in Table 3-3.

Table 3-3. At Risk Historical Places in Nye County

SITE NAME	LOCATION	SOURCE REGISTER
44 sites	Tonopah	National Register of Historic Places
William H. Berg House	Round Mountain	National Register of Historic Places
Belmont Historic District	46 miles NE of Tonopah	National Register of Historic Places; Nevada State Register of Historic Places
Berlin Historic District	Berlin	National Register of Historic Places; Nevada State Register of Historic Places
El Rancho Gardens	Pahrump	Nevada State Register of Historic Places
Gatecliff Rockshelter	Austin	National Register of Historic Places

3.3.2 Natural Resources and Recreation

The mountain ranges in Nye County provide particularly valuable recreation areas including the Toiyabe Range, the Monitor Range, the Hot Creek Range, and the Grant Range. These areas provide scenic, aesthetic, and wildlife resources. The 22,000-acre Ash Meadows National Wildlife Refuge is located approximately ten miles southeast of Amargosa Valley. The refuge provides habitat for 24 endemic species as well as four endangered fish and one endangered plant. If these areas burned, wildlife habitat would be substantially altered for a period of time and recreation/visitation rates would likely decrease for a period of time. Table 3-4 lists designated campground areas that are recreation resources at risk of loss or damage in the event of a wildfire. Figure 3-2 illustrates their locations.

Table 3-4. Recreation Areas in Nye County

NAME OF SITE	ELEVATION	USES	LOCATION
Barley Creek	7,700 ft.	camping, trailhead, wilderness access, scenic drive	Monitor Range
Columbine	9,000 ft.	camping, trailhead, wilderness access, scenic drive	Toiyabe Range
Peavine	6,700 ft.	camping, scenic drive	Toiyabe Range
Pine Creek	7,300 ft.	camping, trailhead, wilderness access, scenic drive	Toquima Range
San Juan Creek	7,600 ft.	camping, trailhead, wilderness access, scenic drive	Toiyabe Range
Washington Creek	7,200 ft.	camping, trailhead, scenic drive	Toiyabe Range
Berlin Ichthyosaur State Park	6,800 ft.	camping, ghost town, natural history display	Shoshone Range
Ash Meadows NWR	2,400 ft.	Wildlife habitat, wildlife observation, picnicking, hunting, swimming	Ash Springs

3.3.3 Flora and Fauna

The fifty species that are listed as threatened or endangered under the Endangered Species Act or are protected by state legislation with potential habitat in Nye County are listed in Table 3-5 (Nevada Natural Heritage Program database, 2004). The vast majority of the species are associated with springs or other water bodies. The Nevada Natural Heritage Program, the Nevada Division of Forestry, and/or the Nevada Department of Wildlife should be consulted regarding specific concerns and potential mitigation to minimize impacts to these species. Project recommendations for federally listed threatened or endangered species require consultation with the US Fish and Wildlife Service.

Table 3-5. Federal and State Listed Flora and Fauna At Risk in Nye County

SCIENTIFIC NAME	COMMON NAME	LEGISLATION
Plants		
Astragalus lentiginosus var. sesquimetralis	Sodaville milkvetch	NRS 527.260.300
Astragalus mohavensis var. heigyrus	Halfring milkvetch	NRS 527.260.300
Astragalus phoenix	Ash Meadows milkvetch	ESA–Listed Threatened NRS 527.260.300
Centaurium namophilum	Spring-loving centaury	ESA–Listed Threatened NRS 527.260.300
Enceliopsis nudicaulis var. corrugata	Ash Meadows sunray	ESA–Listed Threatened NRS 527.260.300
Frasera gypsicola	Sunnyside green gentian	NRS 527.260.300
Grindelia fraxinoptratensis	Ash Meadows gumplant	ESA–Listed Threatened NRS 527.260.300
Ivesia kingii var. eremica	Ash Meadows mousetail	ESA–Listed Threatened NRS 527.260.300
Mentzelia leucophylla	Ash Meadows bazingstar	ESA–Listed Threatened NRS 527.260.300
Nitrophila mohavensis	Amargosa Valley niterwort	ESA–Listed Endangered NRS 527.260.300
Opuntia pulchells	Sand cholla	NRS 527.060.120
Polyctenium williamsiae	Williams combleaf	NRS 527.260.300
Sclerocactus blainei	Blaine pincushion	NRS 527.060.120
Sclerocactus nyensis	Tonopah pincushion	NRS 527.060.120
Sclerocactus polyancistrus	Hermit cactus	NRS 527.060.120
Insects		
Ambrysus amargosus	Ash Meadows naucorid	ESA-Listed Threatened
Fish		
Catostomus clarki intermedius	White River desert sucker	NRS 501
Crenichthys baileyi thermophilus	Moorman White River springfish	NRS 501
Crenichthys nevadae	Railroad Valley springfish	ESA-Listed Threatened NRS 501
Cyprinodon diabolis	Devils Hole pupfish	ESA-Listed Endangered NRS 501
Cyprinodon nevadensis mionectes	Ash Meadows Amargosa Valley pupfish	ESA-Listed Endangered NRS 501

SCIENTIFIC NAME	COMMON NAME	LEGISLATION
Cyprinodon nevadensis pectoralis	Warm Springs Amargosa Valley pupfish	ESA-Listed Endangered
Gila bicolor ssp.	Big Smoky Valley tui chub	NRS 501
Gila bicolor ssp.	Hot Creek Valley tui chub	NRS 501
Gila bicolor ssp.	Little Fish Lake Valley tui chub	NRS 501
Gila bicolor ssp.	Railroad Valley tui chub	NRS 501
Lepidomeda albivallis	White River spinedace	ESA-Listed Endangered NRS 501
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	ESA-Listed Threatened NRS 501
Rhinichthys osculus lariversi	Big Smoky Valley speckled dace	NRS 501
Rhinichthys osculus nevadensis	Ash Meadows speckled dace	ESA-Listed Endangered NRS 501
Amphibians		
Bufo nelsoni	Amargosa Valley toad	NRS 501
Reptiles		
Gopherus agassizii	Desert tortoise (Mojave Desert pop.)	NRS 501
Heloderma suspectum cinctum	Banded gila monster	NRS 501
Mammals		
Brachylagus idahoensis	Pygmy rabbit	NRS 501
Euderma maculatum	Spotted bat	NRS 501
Birds		
Accipiter gentiles	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
Empidonax traillii extimus	Southwestern willow flycatcher	ESA-Listed Endangered NRS 501
Ixobrychus exilis hesperis	Western least bittern	NRS 501
Oreortyx pictus	Mountain quail	NRS 501
Otus flammeolus	Flammulated Owl	NRS 501
Phainopepla nitens	Phainopepla	NRS 501
Plegadis chihi	White-faced ibis	NRS 501
Rallus longirostris yumanensis	Yuma clapper rail	ESA-Listed Endangered NRS 501

3.4 PREVIOUS FIRE HAZARD REDUCTION PROJECTS

The Bureau of Land Management Battle Mountain Field Office conducted site assessments of fuel conditions surrounding the communities of Carvers, Hadley, Ione, Manhattan, and Tonopah between 2002 and 2003. The site assessments include narrative descriptions of fuels, expected fire behavior, treatment alternatives, reference photos, and maps of proposed project areas. Environmental Assessments were also completed for the proposed fuel reduction treatments in the communities of Carvers, Hadley, and Manhattan.

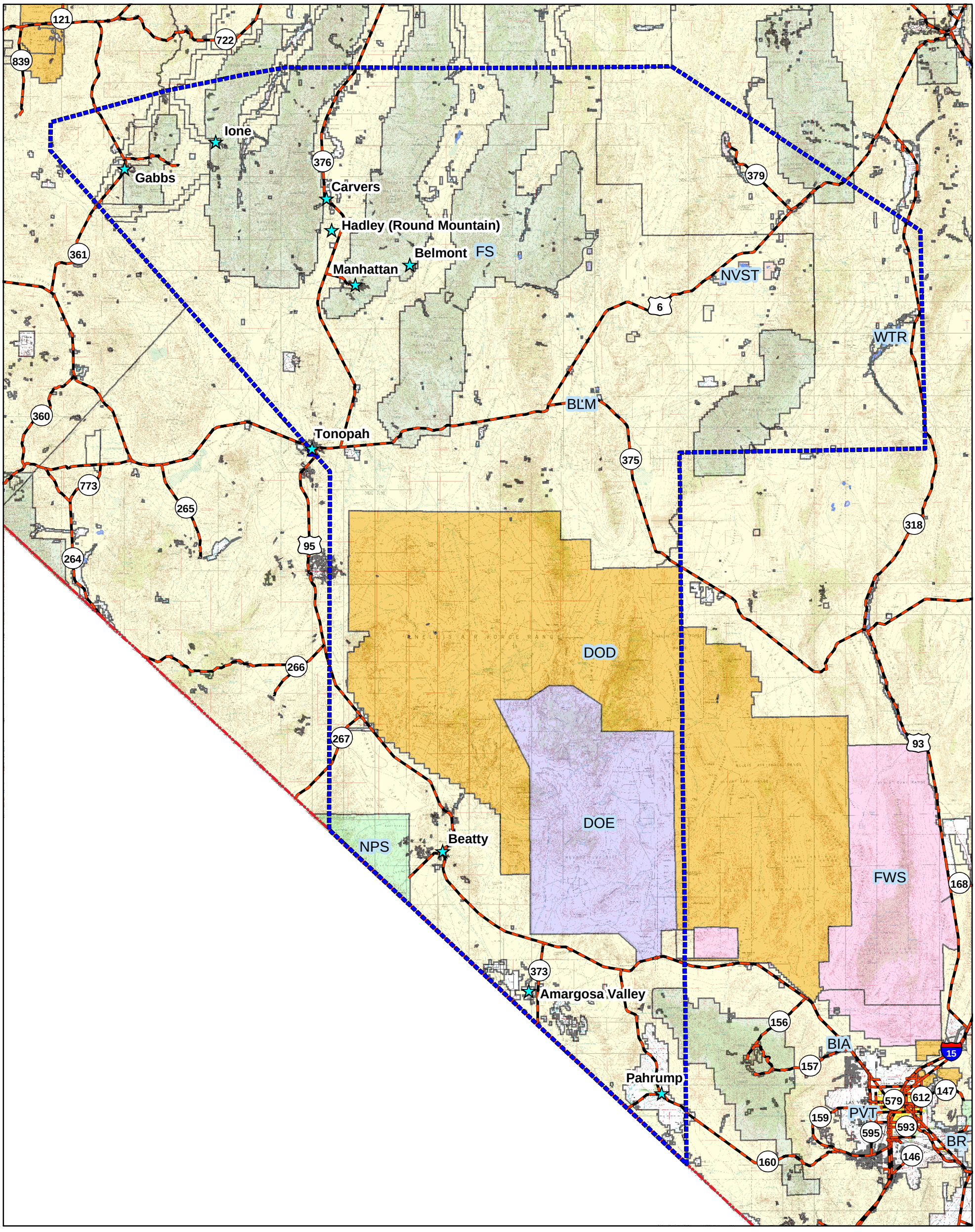
Treatment alternatives to reduce fuel hazards included mowing, greenstripping, imprint- and drill-seeding, prescribed fire, implementation of shaded fuelbreaks, and prescription thinning. Additional recommendations included the use of monitoring techniques for fine fuels, training, and the establishment of fire safe community programs in some locations.

Documentation and additional details on these projects are available at the Bureau of Land Management Battle Mountain Field Office. At the time of this report, the BLM fuel reduction treatments for Carvers were reported as being complete and an interagency fuel reduction project planned by the BLM and USFS in Manhattan was initiated in 2004, with additional work planned in 2005. The BLM also expects to begin work on fuel reduction treatments in Ione and Yomba in 2005.

The BLM Battle Mountain Field Office fuels management team was recognized in 2004 with a national award from the BLM for their work in the planning and implementation of fuels reduction projects in the communities within its district.

The Nevada Division of Forestry has initiated fuels reduction treatments along the access road and within the campground at the Berlin Ichthyosaur State Park. At the time of the interview, twelve acres had been treated with another 28 planned for late winter 2004-2005.

The Manhattan chapter of the Nevada Fire Safe Council completed a fuel reduction treatment of approximately twenty acres on private lands within the town.



Legend

- Nye Community
- Highways and State Routes

Land Ownership

- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Reclamation (BR)
- Department of Defense (DOD)
- Department of Energy (DOE)
- Fish and Wildlife Service (FWS)
- Forest Service (FS)
- National Park Service (NPS)
- Nevada State (NVST)
- Private (PVT)
- Water (WTR)

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

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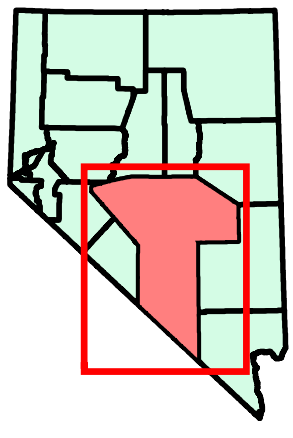

Resource Concepts, Inc.
340 N. Minnesota St.
Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

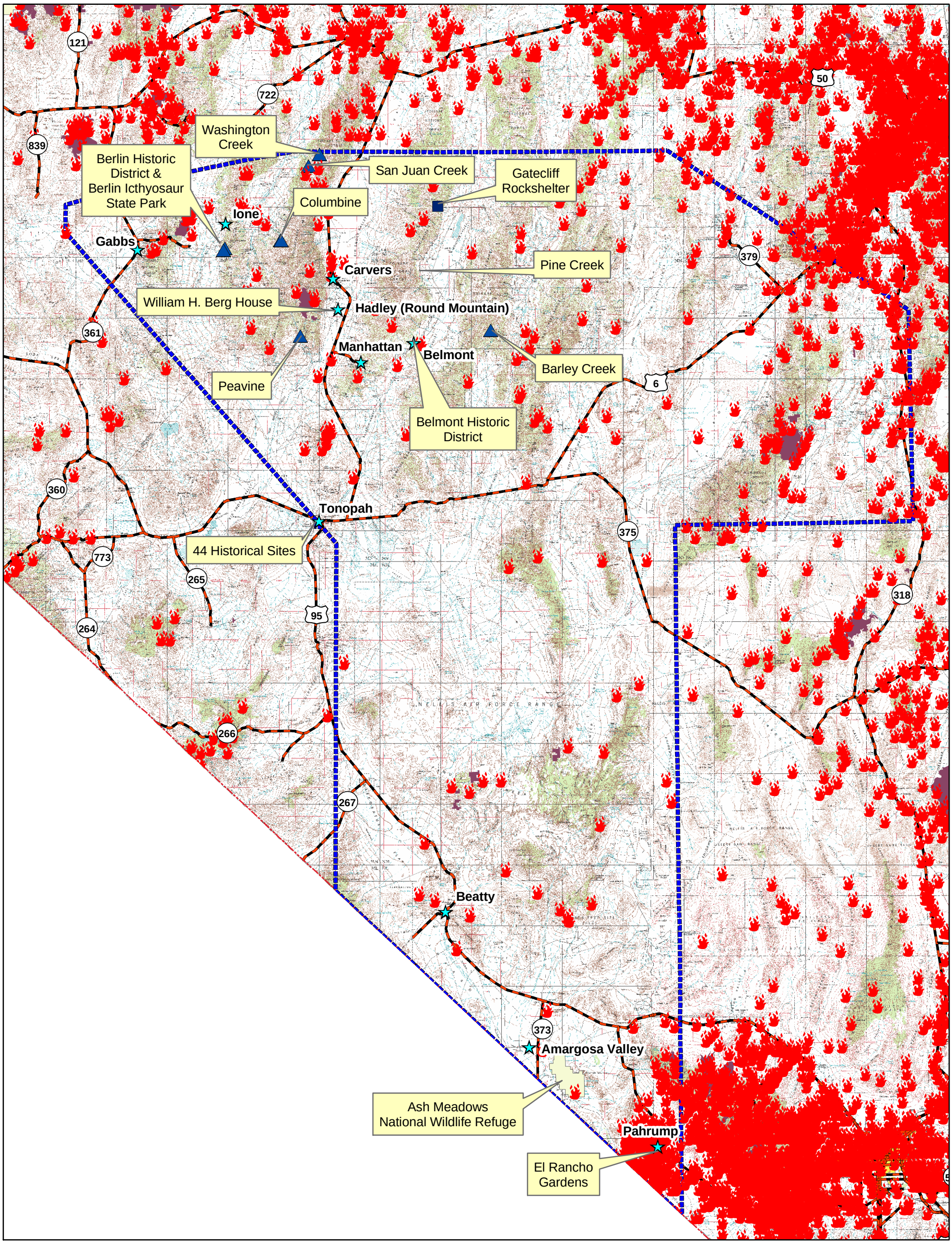

Figure 3-2 Ignition History, Fire History, and Potentially at Risk Resources, Nye County, Nevada

Legend
- Nye Community
- Fire Ignition
- Historic Site
- National Wildlife Refuge
- Nye County
- Past Fires (1980-2002)
- Highways and State Routes

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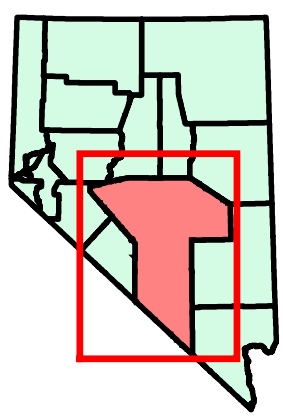


Nevada Community Wildfire Risk / Hazard Assessment Project

4.0 COUNTY-WIDE ASSESSMENT RESULTS

4.1 COUNTY-WIDE RISK AND HAZARD ASSESSMENT OVERVIEW

During June of 2004, the RCI Project Team evaluated ten communities in Nye County. Inventory and analyses of community design aspects (roads, signage, utility infrastructure), defensible space conditions, construction materials, architectural features, wildland-urban interface characteristics, fuel types, and fuel hazards resulted in an overall hazard rating for each community. The results of these assessments are summarized in Table 4-1.

Table 4-1. Nye County Risk/Hazard Assessment Results

COMMUNITY	FIRE PROTECTION AGENCY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Amargosa Valley	Amargosa VFD	Intermix	Low	Low	Moderate
Beatty	Beatty VFD	Intermix	Low	Low	Moderate
Belmont	Belmont VFD	Intermix	High to Extreme	High	High
Carvers	Smoky Valley VFD	Intermix	Low to High	High	Moderate
Gabbs	Gabbs VFD	Classic Interface / Intermix	Low to Moderate	Low	Moderate
Hadley (Round Mountain)	Round Mountain VFD	Classic Interface	Low	Low	Low
Ione	None	Intermix	Moderate to Extreme	High	Extreme
Manhattan	Manhattan VFD	Intermix	High to Extreme	High	Extreme
Pahrump	Pahrump FD	Intermix	Low	Moderate	Low
Tonopah	Tonopah VFD	Classic Interface	Low to Moderate	Low	Low

4.1.1 Wildfire Protection Resources

All of the Nye County communities, except Ione, have some type of fire department, either volunteer, career, or a combined department. Suppression resources for the individual fire departments in Amargosa Valley, Beatty, Belmont, Carvers, Gabbs, Manhattan, Pahrump, Hadley, and Tonopah are described in their respective community descriptions. In March 2004, the Nye County Commissioners accepted bids totaling $2.87 million for fire suppression equipment including eight water tenders, four rescue vehicles, and two fire engines. The equipment was expected to be delivered to the county in December 2004.

State and federal wildland fire suppression resources available to Nye County are requisitioned through interagency dispatch centers. In the north-county communities of Belmont, Carvers, Gabbs, Manhattan, Hadley, and Tonopah, along with the lands north of Beatty, federal resources are dispatched through the Central Nevada Interagency Dispatch

Center located in Winnemucca. State resources, such as fire crews from the Nevada Division of Forestry Tonopah Conservation Camp are dispatched through the Sierra Front Interagency Dispatch Center. Federal resources for the south-County, Pahrump, Amargosa Valley, and the lands south of Beatty, are dispatched through the Las Vegas Interagency Communication Center. In addition to local resources, state and federal wildland suppression resources are available for suppression on public lands in Nye County through three organizations: the Bureau of Land Management Field Offices in Battle Mountain, Ely, Winnemucca, and Carson City; the Humboldt-Toiyabe National Forest Austin and Tonopah Ranger Districts; and the US Fish and Wildlife Service at Ash Springs National Wildlife Refuge. Table 4-2 summarizes typical wildfire suppression resources, cooperating partners, and equipment available to respond to wildland fires to the communities in Nye County. The availability of the listed resources will vary depending on time of year and resource needs in other areas.

Table 4-2. Federal Agency Resources Available for Wildfire Suppression in Nye County

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender	1 1	BLM (Austin Interagency Station)
Type 6 Engine	1	USFS (Ely District)
Type 3 Engine	1	BLM (Carson City)
Type 4 Engine	1	BLM (Pahrump)
Type 4 Engine	1	USFS (Pahrump)
Additional Resources, including Helicopter Air Tanker		Multi-agency as requested. Nearest available resources are dispatched through the Central Nevada Interagency Dispatch Center or the Las Vegas Interagency Communication Center

Source: Personal Communication with Dave Davies, BLM Battle Mountain Fire Management Officer.

4.1.2 Detection and Communication

Fires are reported in Nye County by calling 911, which connects the caller with one of the Nye County Sheriff's Offices. The Nye County Sheriff's Office dispatch contacts the nearest resources, usually the volunteer fire department. The Nevada Division of Forestry, the Bureau of Land Management, and/or the US Forest Service are called and are dispatched from on of the following dispatch centers:

- The Central Nevada Interagency Dispatch Center,
- The Sierra Front Interagency Dispatch Center, and
- The Las Vegas Interagency Communication Center.

Fires may be communicated to fire response personnel through the Nye County Sheriff's Office in Tonopah, Beatty, or Pahrump and interagency dispatch centers by means of radios, pagers, and telephones. The Nye County Sheriff Offices have access to the state mutual aid frequencies. The radio system is also compatible with neighboring agencies.

5.0 AMARGOSA VALLEY

5.1 RISK AND HAZARD ASSESSMENT

Amargosa Valley is a farming/ranching community located in southern Nye County on State Route 373 adjacent to the California-Nevada state line. The community is situated at approximately 2,500 feet in elevation on relatively flat and open topography. Amargosa Valley has an estimated population of 1,169 (Nevada State Demographer 2003).

The assessment resulted in classifying Amargosa Valley in the **Moderate Community Hazard** category (54 points). This score was attributed to improvement needed in street and address signage in interface neighborhoods, several properties having inadequate defensible space, and somewhat limited water resources for fire suppression. Descriptions of the wildland fire assessment parameters as well as the predicted fire behavior and the worst-case fire scenario are provided below. Table 5-2 at the end of this section presents a summary of the fire hazard rating values.

5.1.1 Community Design

The wildland-urban interface surrounding Amargosa Valley is characterized as an intermix condition. The structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels and the buildings within the community. Most structures are spaced close together, though a few structures are surrounded by a sizeable expanse of vacant land. All of the lots assessed were on parcels less than one acre in size (Figure 5-1).

Roads: State Highway 373 and Valley View Boulevard are the major transportation routes into the community of Amargosa Valley. These primary access roads are at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment. No dead-end roads pose turn around hazards for fire suppression equipment. All roads in the community have less than a five percent gradient.

Signage: Street signs and residential addresses were observed as needing improvement to provide clear direction to an incident location in the wildland-urban interface areas. The presence of street signs and clearly visible building addresses are important for fire and emergency responders not familiar with the area.

Utilities: All of the utilities are above ground. Some of the power lines had been properly maintained to minimize the possibility of vegetation ignition due to sparking power lines during windstorms. Others had vegetation growing near the power lines.

5.1.2 Construction Materials

Almost all of the homes observed in the interface area were built with ignition resistant, treated, wood siding materials. Most homes had fire resistant roofing materials such as composition, metal, or tile. Less than fifteen percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where sparks and embers can accumulate, smolder, ignite, and rapidly spread fire to the home.

5.1.3 Defensible Space

Most of the homes observed (seventy percent) did not meet the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire. Many homeowners used salt cedar (tamarisk) for windbreaks. Unfortunately, the trees were often too close to the structures and the dead fuels along the bases of the trees were a significant hazard.

5.1.4 Suppression Capabilities

Wildfire Protection Resources

Amargosa Volunteer Fire Department has two fire stations in Amargosa Valley. At the time the interviews were conducted, the Amargosa VFD reported 26 volunteers in a 650 square mile service area. Table 5-1 lists the suppression resources currently available to Amargosa Valley for initial attack of a wildland fire. In addition to the current equipment, the Nye County Commissioners approved the purchase of a four-wheel drive emergency vehicle equipped with a 2,000-gallon water tank and a 1,000 gpm pump for the Amargosa Volunteer Fire Department.

Table 5-1. Amargosa Valley Initial Attack Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine	1	Amargosa Volunteer Fire Department Station #1 (Amargosa Valley)
Water Tender 3500 gal.	1	
Command Vehicle	1	
Type 4 Engine	1	
Type 3 Engine	3	Amargosa Volunteer Fire Department Station #2 (Amargosa Valley)

Source: Personal conversation with Roger Bright, Fire Chief, Amargosa FD (June 29, 2004).

Mutual aid is provided by the Pahrump and Mercury Fire Departments, the US Fish and Wildlife Service located on the Ash Meadows National Wildlife Refuge, the Bureau of Land Management, and the US Forest Service. The closest available resources are dispatched through the Las Vegas Interagency Communication Center.

Water Sources and Infrastructure

Water sources for fire suppression in Amargosa Valley are available from commercial, industrial, and agricultural sources. More than a dozen storage tanks may be available for use as drafting sources and range between 1,000 and 209,000 gallons in size for an overall storage capacity estimated at 269,000 gallons. Two existing drafting ponds were reported and another was reported as under construction at Desert Village.

Auto-start diesel powered emergency backup generators for well pumps were reported for two of the three fire pumps located in the area: at Longstreet Casino and Fort Amargosa. These locations would become the reliable sources for water in the case of an emergency with widespread electricity disruption. (E. Booss, comments to draft, 15 October 2004).

The majority of the water storage capacity for Amargosa Valley is located on private or commercial property. While storage capacity is adequate, sustained flow water supplies are limited to the three sites with fire pumps over a very large service area. In the event of an emergency, the Amargosa Volunteer Fire Department will play a key role in communicating the location and availability of water sources to suppression forces arriving from outside the area.

Detection and Communication

Fires are reported in the Amargosa Valley area through the use of 911, which connects the caller with Nye County Sheriff's Office located in Beatty. Fires are then communicated to fire response personnel through the use of radios and pagers. There are no known gaps in radio coverage.

The Amargosa Valley Fire Department radio system is compatible with most of its mutual aid departments (Beatty, Crystal, Pahrump, Nye County Sheriff, Southern Inyo). They also have state fire tac 3 in portable and mobile radios. Communications with federal agencies are facilitated by a "relay through dispatch." Compatible radio frequencies are important for communication between engines and strike teams during larger fires when more than one agency is fighting the fire.

Fire Protection Personnel Qualifications

All volunteer firefighters have received, at a minimum, training to the level of National Fire Protection Administration Firefighter 1 standards. Minimal wildland firefighter training has been provided annually.

Work Load

The Amargosa VFD responded to 128 calls in 2003. Three of these were wildland / brush fire calls.

Financial Support

Financial support for the Amargosa Volunteer Fire Department is primarily provided from the Nye County General Fund.

Community Preparedness

Amargosa Valley did not have any specific plans regarding community preparedness for a wildfire. The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan. The fire department did not have an active program for inspecting and enforcing defensible space or fuels management standards. The State Fire Marshal reviews development plans for commercial buildings.

5.1.5 Factors Affecting Fire Behavior

Fuels in the area were generally light, typically less than one ton per acre, on flat slopes. Ground fuels consisted of sparse and short red brome and Russian thistle. The shrub layer consisted of sparse creosote bush (two to three feet tall) and shadscale (one to two feet tall). The primary fuel hazards were concentrated near residences where yard debris and well-established salt cedar (tamarisk) windbreaks constitute a highly flammable, localized fuel hazard concern.

Amargosa Valley is in a hot and dry region with a mean annual rainfall of approximately two inches per year. Vegetation is very sparse. Aside from the salt cedar (tamarisk) windbreaks, the overall interface fuel hazard condition from wildland fuels was low.

5.1.6 Worst-case Fire Behavior

The worst-case wildfire scenario for Amargosa Valley would be a fire starting in the dead fuel along the base of a salt cedar (tamarisk) windbreak. With strong winds (greater than 25 mph), a fire could quickly spread through the trees and flammable debris and threaten adjacent structures.

5.1.7 Ignition Risk Assessment

Amargosa Valley has a low ignition risk rating. Two recent fires originated near Ash Meadows. In 1999, an escaped prescribed fire resulted in a 250 to 300 acre burn. In 2003, a fire started by fence welding burned 100 acres in the same area. In general, the brush in and around the community is low and sparse and insufficient to carry a large fire.

5.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Amargosa Valley risk and hazard reduction recommendations address the primary concern for the salt cedar (tamarisk) and other flammable debris close to structures in the defensible space area. Other recommendations pertain to community coordination, public education, and fire personnel training that could be initiated to enhance fire safety in Amargosa Valley.

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 recommended defensible space area). This defensible space reduces fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.

- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Clear around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials, woodpiles, lumber, and flammable debris within the defensible space area.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.
- Reduce (mow) vegetation and remove debris along irrigation channels and unlined ditches to reduce the fuel load.
- Maintain the area beneath unenclosed wood decks and porches free of weeds and flammable debris. Screen these areas when possible
- Remove litter, leaves, and debris from roofs and rain gutters. This is especially important for those areas near salt cedar (tamarisk) windbreaks.
- For deciduous and coniferous trees within the defensible space zone, limb branches to a height of four to six feet from the ground but not more than one-third the height of the tree to reduce ladder fuels. Remove all dead tree branches.
- Prune and maintain salt cedar (tamarisk) windbreaks such that no branches are within thirty feet of structures or within fifteen feet of power lines.
- Irrigate all trees and large shrubs near structures to increase their fire resiliency. This is especially important during droughty conditions.

5.2.2 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and other states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on an outside agencies in the event of a catastrophic wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set

priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

The Nevada Fire Safe Council
1187 Charles Drive
Reno, Nevada 89509
(775) 322-2413
www.nvfsc.org

- Assure that residential addresses are 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. Improving the visibility of addresses will facilitate rescue and suppression personnel in navigating neighborhoods unfamiliar during a wildfire.

Amargosa VFD Responsibilities

- Continue to maintain the street sign program and assure street sign visibility within the community.
- Establish and promote an ongoing program for cleaning weeds and debris from around structures and fences in the community.
- Update or develop agreements with private landowners to use water storage tanks as drafting sources in the event of a fire.
- Continue to coordinate and advise the Nye County Sheriff's Dispatch of burn activities.
- Meet annually with the BLM to discuss the pre-attack plan for the area surrounding Amargosa Valley.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.

Nye County Responsibilities

- Continue to coordinate debris and agricultural burning through the Nye County Sheriff's dispatch.
- Promote collaboration between the Assessor's Office and the County Roads Department to ensure that the roads in all existing and all new developments are named, mapped, signed, and identified with GPS coordinates.

5.2.3 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Amargosa VFD Responsibilities

- 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.
- Contact the Bureau of Land Management and the University of Nevada Cooperative Extension for assistance with public education programs.

5.2.4 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community.

Amargosa VFD Responsibilities

- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Continue to attend BLM Wildland Firefighter Training for volunteer firefighters or other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.
- Coordinate with BLM and US Forest Service to ensure that radio frequencies and radios are compatible in order to maintain communications on wildland fire incidents.

5.2.5 Fuel Reduction Treatments

Utility Company Responsibilities

- Trim tree branches within fifteen feet of all power lines. This is particularly important for the salt cedar (tamarisk) trees. The clearance is needed to minimize the possibility of vegetation ignition due to sparking power lines during windstorms.

Table 5-2 Amargosa 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	3	/5
6. Address Signs	3	/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	15	/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	7	/10

TALLIES

126 Total Houses **31 Residential Streets**

B5. Street Signs

7 not visible | 24 visible | 77% visible

B6. Address Signs

30 not visible | 96 visible | 76% visible

C1. Roofs

2 combust | 124 not combust | 98% not combust

C2. Siding

6 combust | 120 not combust | 95% not combust

C3. Unenclosed Structures on Lot

17 not enclosed | 109 enclosed | 13% not enclosed

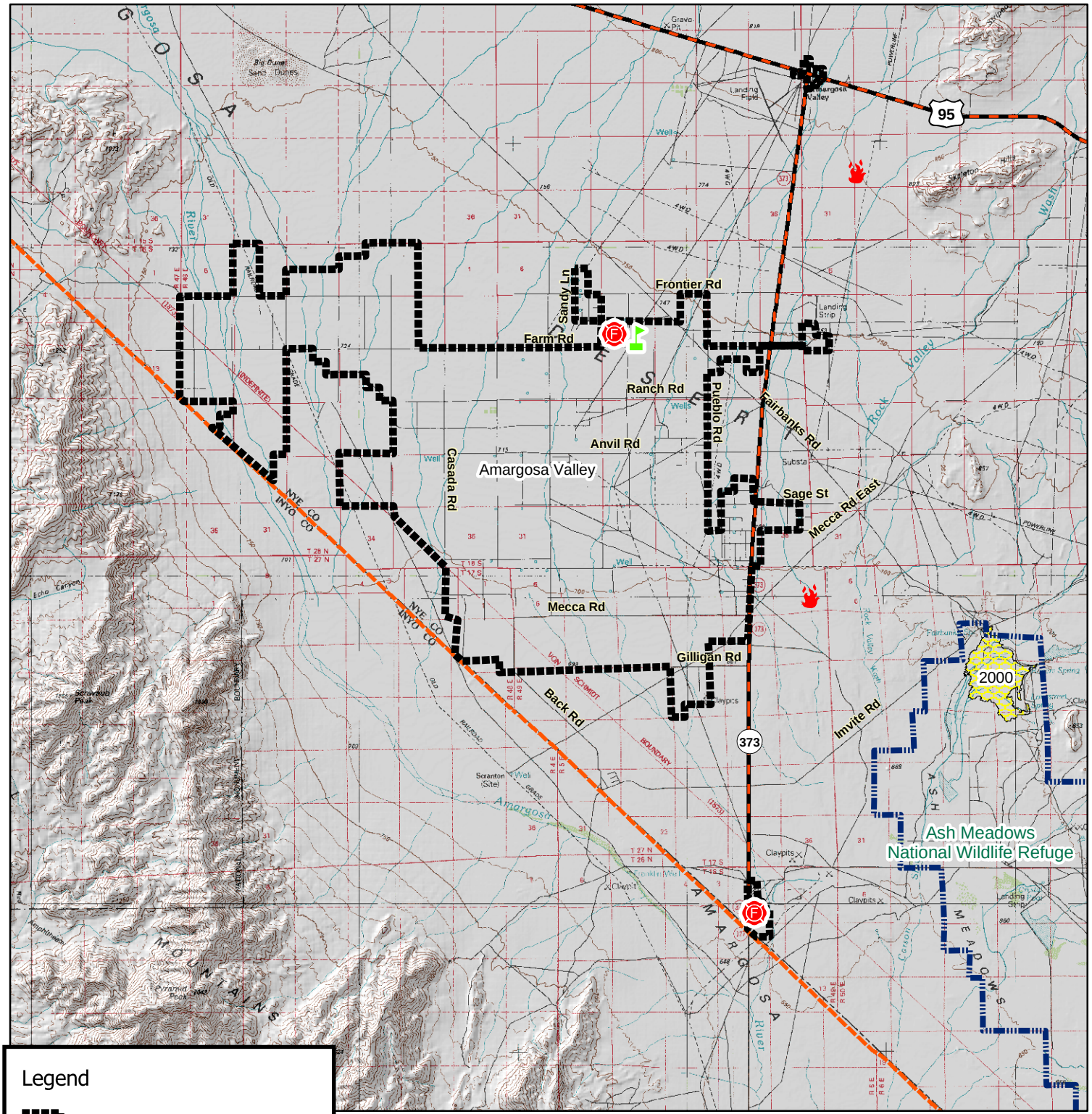
D1. Lot Sizes

126 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

92 not adequat | 34 adequate | 27% adequate

Score **54** /128



Legend

- Community Boundary
- School
- Critical Feature
- Fire Station
- Fire Ignition
- Fire Boundary
- County Boundary
- Highways and State Routes

Figure 5-1. Amargosa
Fire History, Suppression Resources,
and Critical Features

N
W E
S

0 1 2 4
Miles

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

Nevada Community Wildfire Risk / Hazard Assessment Project

6.0 BEATTY

6.1 RISK AND HAZARD ASSESSMENT

Beatty is located at nearly 3,300 feet in elevation in southern Nye County on US Highway 95. The town is situated on gently rolling terrain at the headwaters of the Amargosa River. The population of Beatty is approximately 1,000 (Nevada State Demographer 2003).

The assessment resulted in classifying Beatty in the **Moderate Community Hazard** category (59 points). This rating was attributed to needed improvement in address signs, inadequate defensible space, and combustible roofing materials. Erratic winds that are common during summertime, lightning activity, and the local topography contribute to a high fire behavior score. A summary of factors that contributes to the hazard score is included in Table 6-2.

6.1.1 Community Design

The wildland-urban interface surrounding Beatty is characterized as an intermix condition. Structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, buildings, and open space throughout the community. Most structures are spaced close together, though a few are surrounded by a sizeable expanse of vacant land. The majority of the 257 structures assessed were on parcels less than one acre in size. Approximately five percent of the lots were between one and ten acres in size (Figure 6-1).

Roads: US Highway 95 and State Highway 374 are the major transportation routes into Beatty. These primary access roads are all at least 24 feet wide, paved, and have adequate turnaround space for fire suppression equipment. All roads in the community have less than a five percent gradient.

Signage: Street signs are present and visible along all streets at the time of the assessment. Residential addresses were only visible on approximately one-third of the homes. Clear and visible address identification is important to assist fire suppression personnel during poor visibility conditions that occur during a wildland fire.

Utilities: All of the utilities were above ground. Power lines had been properly maintained to minimize the possibility of vegetation ignition due to sparking power lines.

6.1.2 Construction Materials

Nearly twenty percent of the homes observed in the interface area were built with combustible roofing and siding materials. Sixty-eight percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where sparks and embers can accumulate, smolder, ignite, and rapidly spread fire to the home.

6.1.3 Defensible Space

Only 37 percent of the homes observed met the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire.

6.1.4 Suppression Capabilities

Wildfire Protection Resources

At the time of the interview, the Beatty Volunteer Fire Department reported having one fire station, a force of eighteen volunteers and one paid firefighter. Table 6-1 lists the types of wildfire resources, cooperating partners, and equipment available to Beatty for initial attack of a reported wildland fire. In addition to the current equipment, in 2004 the Nye County Commissioners approved the purchase of an emergency vehicle equipped with a 2,000-gallon water tank and a 1,000 gpm pump for the Beatty Volunteer Fire Department.

Table 6-1. Resources Available to Beatty for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 1 Engine Water Tender (4,000 gal.)	2 1	Beatty Volunteer Fire Department (Beatty)
Type 3 Engine	1	Amargosa Volunteer Fire Department– upon request of the Beatty VFD (Amargosa Valley)
Type 4 Engine Type 3 Engine Type 1 Engine Water Tender Command Vehicle	2 1 1 3 1	Pahrump Fire Department – upon request from by the Beatty VFD (Pahrump)

Source: Personal conversation with Jim Benshoof, Beatty VFD (June 28, 2004)

Additional resources include the US Fish and Wildlife Service located on the Ash Meadows National Wildlife Refuge. Bureau of Land Management and US Forest Service resources are dispatched through the Las Vegas Interagency Communication Center for fires south of Beatty and the Central Nevada Interagency Dispatch Center for fires north of Beatty. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

Water availability for fire suppression in Beatty varies within the community. The central portion of the community has 500 gpm hydrants within 1,000 feet of structures. The perimeter of the community is not served by hydrants. There were three water storage tanks, each 250,000-gallons plus a 20,000-gallon booster tank in the community. There is a proposal for a two million gallon tank in the near future. The water system operates on gravity and electrical pumps. There is a backup

emergency generator to run the pumps. In addition to the water tanks, several ranch ponds were identified north of town that could be used as helicopter dip sites.

Detection and Communication

Fires are reported in the Beatty area by calling 911, which connects the caller with the Nye County Sheriff Dispatch in Beatty. Beatty also has a community siren. Fires are communicated to fire response personnel through the use of radios and pagers. The fire department has access to the state mutual aid frequencies and the frequencies compatible with neighboring agencies. Gaps in radio coverage were reported for some areas south of town toward Death Valley.

Fire Protection Personnel Qualifications

All Beatty Volunteer Fire Department firefighters have been trained to National Fire Protection Administration Firefighter 1 standards. Firefighters are not formally or regularly trained in wildland firefighting techniques. However basic personal protective equipment (boots, brush jackets) were reported to be on hand. No specialized tools for wildland firefighting (e.g. Pulaskis, McLeods) were reported (Jim Benshoof, pers. comm. 28 June 2004, M. Lasorsa, pers. comm., 9 Dec 2004).

Work Load

The Beatty Volunteer Fire Department responded to thirty calls in 2003. Only one was a wildland/brush call.

Financial Support

Financial support for the Beatty Volunteer Fire Department comes primarily from the Nye County General Fund.

Community Preparedness

Beatty does not have any specific plans regarding community preparedness for a wildfire. The Nye County Local Emergency Planning Committee maintains an All Risk County Plan and an Emergency Plan for hazardous materials. The fire department has no active program for inspecting and enforcing defensible space or fuels management standards.

6.1.5 Factors Affecting Fire Behavior

Beatty is located along a narrow canyon and is bordered on three sides by steep mountain slopes. There is a narrow canyon on the north and south end of the community where strong south winds often blow. Winds may be erratic due to the terrain and during thunderstorms.

The vegetative fuels in the areas around Beatty mostly consist of sparse fuels, with moderate fuel loads along the river bottom. The shrub layer along the river bottom was dominated by greasewood typically ranging from three to five feet high with an estimated fuel load of five tons per acre. The tree layer consisted of cottonwood, willow, and salt cedar (tamarisk). The ground fuel was dominated by red brome. The slopes in the canyon bottom were less than eight percent with a slight west-facing aspect. Overall interface fuel hazard condition was considered low.

6.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario for Beatty would be a fire starting along Highway 95 south of the community. Strong winds blowing from the south could push a fire north along the low to moderately dense vegetation in and around the river bottom and threaten structures along the east side of town. Due to the remote location and limited suppression resources, the fire could burn through parts of the community before additional fire suppression resources could arrive. Spotting could occur from firebrands and start multiple additional fires within the community due to lack of defensible space around structures.

6.1.7 Ignition Risk Assessment

Beatty was determined to have a low ignition risk. No large wildfire occurrences have been reported around Beatty. The low ignition rates were attributed to the low, sparse brush in and around the community. The primary risks of ignition in Beatty include highway traffic, campfires, off-highway vehicles, and fireworks.

6.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Beatty risk and hazard reduction recommendations address the primary concern of reducing accumulations of flammable vegetation along roadways and fence lines. Other recommendations pertain to defensible space, community coordination, public education, and firefighter personnel training that could be initiated to enhance fire safety in Beatty.

6.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space depend upon fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Clear around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.

- Maintain grass within the defensible space area to a maximum of four inches in height.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.
- Maintain the area beneath unenclosed wood decks and porches free of weeds and flammable debris. Screen these areas if possible.
- Remove leaves and debris from roofs and rain gutters.
- Prune tree branches to at least fifteen feet from chimneys, walls, and roofs of structures.
- Irrigate all trees and large shrubs near structures to increase their fire resiliency. This is especially important during droughty conditions.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.
- Reduce (mow) vegetation and remove debris along irrigation channels and unlined ditches to reduce the fuel load.

6.2.2 Community Coordination:

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on outside agencies in the event of a wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

  The Nevada Fire Safe Council
  1187 Charles Drive
  Reno, Nevada 89509
  (775) 322-2413
  www.nvfsc.org

- Ensure that residential addresses are 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. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

Beatty VFD Responsibilities

- Provide courtesy inspections of residential defensible space measures.
- Participate annually with the BLM to update the pre-attack plan for the wildland-urban interface around Beatty.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to responding outside agencies in the event of a wildland fire.

6.2.3 Fuels Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Beatty VFD Responsibilities

- Establish and promote an ongoing program for cleaning weeds and debris from around structures and fences in the community.
- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for fire personnel.

6.2.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Beatty VFD Responsibilities

- Contact the Bureau of Land Management and the University of Nevada Cooperative Extension for assistance with programs for 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.

Nye County Responsibilities

- Continue to coordinate debris and agricultural burning through the Nye County Sheriff Dispatch.
- Promote collaboration between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS coordinates.
- County Commissions and Rural Planning Commissions should require that all future development in Beatty meet the National Fire Codes with regard to community design aspects: building construction and spacing, road

construction and design, water supply, and emergency access. Refer to Appendix F for fire safe recommendations for planning in new developments.

6.2.5 Equipment and Training

Resources and training for wildfire suppression is a safety issue for the firefighters as well as the community. The volunteer fire department needs brush training and equipment to safely do their job because additional help is one to two hours away.

Beatty VFD Responsibilities

- Obtain basic wildland firefighting training and attend annual refresher courses. Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.
- Obtain wildland firefighting equipment such as Pulaskis, McLeods, shovels, and fire shelters.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.
- Coordinate with the Bureau of Land Management and US Forest Service to ensure that radio frequencies and radios are compatible in order to maintain communications during wildland fire incidents.

Table 6-2 Beatty 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	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	5	/5
2. Defensible Space	7	/15

F. Fire Behavior

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

E. Suppression Capabilities

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

TALLIES

257 Total Houses **31 Residential Streets**

B5. Street Signs

0	not visible	31	visible	100%	visible

B6. Address Signs

172	not visible	85	visible	33%	visible

C1. Roofs

44	combust	213	not combust	83%	not combust

C2. Siding

46	combust	211	not combust	82%	not combust

C3. Unenclosed Structures on Lot

174	not enclosed	83	enclosed	68%	not enclosed

D1. Lot Sizes

245	<1ac	12	>1ac <10ac	0	>10ac

D2. Defensible Space

162	not adequat	95	adequate	37%	adequate

Score **59** /128

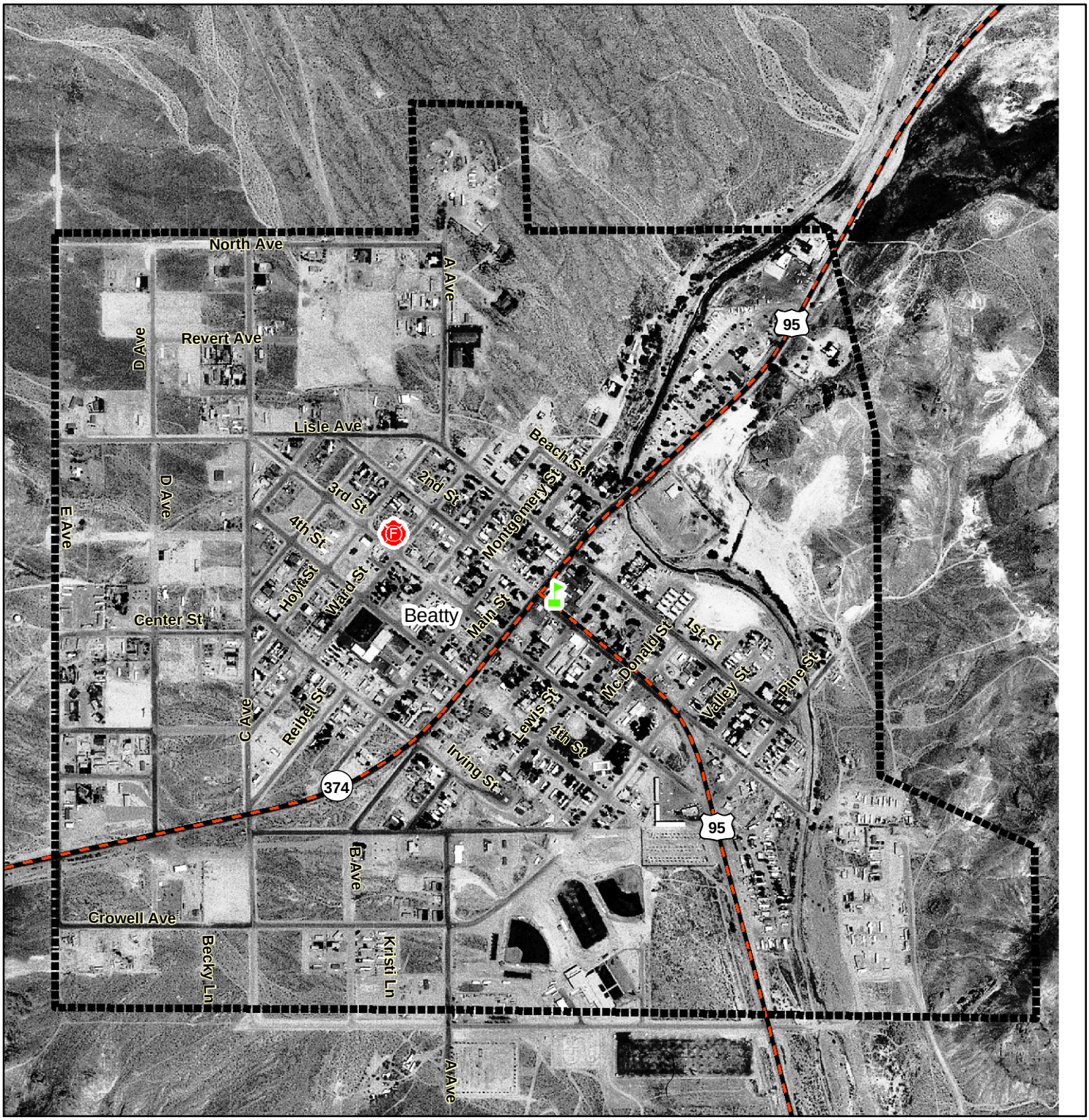


Figure 6-1. Beatty
Suppression Resources and
Critical Features

Legend

- Community Boundary
- School
- Fire Station
- Highways and State Routes

0 500 1,000 2,000
Feet

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W E
S

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Nevada Community Wildfire Risk / Hazard Assessment Project

7.0 BELMONT

7.1 RISK AND HAZARD ASSESSMENT

Belmont is located at nearly 7,400 feet in elevation in northern Nye County on the east side of the Toquima Range, at the southern end of Monitor Valley, adjacent to the Humboldt-Toiyabe National Forest. The community is situated adjacent to south-facing and moderately steep slopes. The population of Belmont is small and not tracked by the Nevada State Demographer (Nevada State Demographer, 2003). The assessment resulted in classifying Belmont in **High Community Hazard** category (73 points). This rating was primarily attributed to limited access, inadequate defensible space, relatively steep slopes, and heavy fuels. The specific findings for each of the wildland fire assessment parameters are reported below, and shown in Table 7-2.

7.1.1 Community Design

The wildland-urban interface around Belmont is described as an intermix condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, the buildings, and open space throughout the community. All of the 29 residences assessed were on parcels between one and ten acres in size. As such, most structures were surrounded by vegetation.

Roads: Belmont is a relatively remote community accessed by State Route 82. This primary access road is paved and is between twenty and 24 feet in width. Many roads within the community have a grade steeper than five percent. The majority of the roads have adequate turnaround space for fire suppression equipment.

Signage: Secondary streets in the community are all unpaved and do not have clearly visible street signs. No house numbers were observed on any of the homes. The presence of street signs and clearly visible building addresses are an important aid for fire and emergency responders unfamiliar with the area.

Utilities: All of the utilities were above ground. Power lines had been properly maintained to minimize the possibility of vegetation ignition due to sparking power lines during windstorms.

7.1.2 Construction Materials

All but one of the homes observed in the interface area were built with ignition resistant roofing materials and all but five of the homes were built with ignition resistant siding materials. Forty-one percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that could create drafty areas where sparks and embers can accumulate, smolder, and ignite, and rapidly spread fire to the home.

7.1.3 Defensible Space

Only 38 percent of the homes met the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire.

7.1.4 Suppression Capabilities

Wildfire Protection Resources

At the time of the interview for this assessment, Belmont reported a seventeen member Volunteer Fire Department at one fire station. Table 7-1 lists the types of wildfire resources, cooperating partners, and equipment available to Belmont in the event of a reported wildland fire. In addition to the current equipment, in 2004 the Nye County Commissioners approved the purchase of a four-wheel drive emergency vehicle equipped with a 2,000-gallon water tank and a 1,000 gpm pump for the Belmont Volunteer Fire Department.

Table 7-1. Resources Available to Belmont for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 3 Engine Water Tender (4,000 gal.)	1 1	Belmont Volunteer Fire Department (Belmont)
Type 6 Engine	1	Manhattan Volunteer Fire Department (Manhattan)
Type 3 Engine	1	Tonopah Volunteer Fire Department (Tonopah)

Source: Personal conversation with Chief Rich Sauer, Belmont VFD (June 28, 2004)

Additional mutual aid resources were reported to be available through the fire departments in Hadley, Manhattan, and Tonopah, dispatched through the Nye County Sheriff Dispatch Center in Tonopah. Resources are also available from the Nevada Division of Forestry Tonopah Conservation Camp as dispatched through the Sierra Front Interagency Dispatch in Minden. Bureau of Land Management and the US Forest Service resources are dispatched through the Central Nevada Interagency Dispatch Center. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

Water available for fire suppression in Belmont includes:

- 500 gpm hydrants within 500 feet of structures,
- One 12,000 gallon tank, and
- Two ponds on private property.

The water system is operated by gravity and electric pumps. There is no emergency back-up generator.

Detection and Communication

Belmont is a small, remote community. Where there is cell phone reception, fires can be reported by calling 911. Fires are reported to the Nye County Sheriff's Office in Tonopah, which serves as fire dispatch.

The radio frequency used by the Belmont Volunteer Fire Department was reported to be compatible with neighboring agencies but the fire department reported no access to state mutual aid frequencies. Many gaps in radio coverage due to the terrain were reported. A better repeater system is needed to alleviate the problem.

Fire Protection Personnel Qualifications

All volunteer firefighters have been trained to National Fire Protection Administration Firefighter I and II standards.

Work Load

The Belmont Volunteer Fire Department responded to three calls in 2003. Only one of the calls was for a wildland / brush fire.

Financial Support

Financial support for the Belmont Volunteer Fire Department comes primarily from the Nye County General Fund.

Community Preparedness

The Belmont Volunteer Fire Department has a voluntary brush clearance program on private property and maintains a pre-attack plan. The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan.

7.1.5 Factors Affecting Fire Behavior

Vegetation, as well as dead and down fuels, and topographical features contributes to the potential fire hazard in the wildland-urban interface. Belmont lies in a north-south oriented canyon with twenty to thirty percent slopes. During the summer months, there can be strong southwest and west upslope winds. Winds can be erratic during summer thunderstorms. Fuels in the community were dominated by moderately dense pinyon pine and juniper on the east facing slopes and sagebrush and rabbitbrush on the west facing slopes. The sagebrush was from two to five feet tall and the rabbitbrush was from one to three feet tall. A low drainage in the center of town was occupied with basin big sagebrush up to six feet tall. The interface fuel hazard ranged from high to extreme. The fuel hazard condition was mapped for Belmont and photo points were established to monitor the fuel hazard condition over time (Figures 7-2 and 7-3).

7.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario for Belmont would occur in a year with above normal precipitation and above normal grass production, with a fire starting in the late afternoon southwest of community at the bottom of the canyon. Winds would push a fire through the brush ladder fuels allowing flames to extend into pinyon pine and juniper crowns. Spotting could occur up to one-quarter mile ahead of the main fire front with flames six to more than twenty feet in length. A fire spread rate between thirty and 75 feet per minute would

be expected. Belmont currently has only one Type 3 engine with additional resources more than thirty minutes away. A fire under these conditions could easily escape initial attack. The canyon topography and winds could act as a chimney and pull the fire rapidly through the community.

7.1.7 Ignition Risk Assessment

There is a high potential for fire ignition and a high potential for structure loss in Belmont due to the continuous fuel loads and lack of defensible space throughout the community. The primary ignition risks in Belmont are from lightning, campfires, and off-highway vehicles. One fire ignition was recorded within 1.5 miles east of the community.

7.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Belmont risk and hazard reduction recommendations address the primary concern regarding defensible space and the need for fuel reduction treatments surrounding the community. Other recommendations pertain to community coordination, improving radio communications, and public education efforts that could be initiated to enhance fire safety in Belmont.

7.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Clear around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.
- Store lumber and firewood a minimum distance of thirty feet from structures.
- Install spark arrestors on chimneys.
- Maintain the area beneath unenclosed wood decks and porches free of weeds and flammable debris.

- Prune pinyon and juniper branches a minimum of four feet from the ground (but no more than one-third of the tree canopy) to reduce ladder fuels. Remove all dead and diseased branches and duff from beneath the remaining trees. Remove leaves and debris from roofs and rain gutters.
- If a resident decides to keep some pinyon or juniper trees near the home for aesthetic reasons, no other native trees or ladder fuels should be within a minimum of thirty feet of the crown of the tree.
- Prune tree branches back at least fifteen feet from chimneys, walls, and roofs of structures.
- Where possible wood shake roofs should be replaced with non-combustible shingles.

7.2.2 Fuel Reduction Treatments:

Fuel reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Property Owner Responsibilities

A substantial fuel reduction treatment is needed on private lands within the community to remove or reduce the amount of sagebrush, rabbitbrush, and wood debris from collapsed buildings. The approximate location of the area in need of fuel reduction treatment is shown in Figure 7-1.

- Within the community, shrubs should be thinned to a spacing of two times their height. Trees should be thinned to a spacing equivalent to one and one-half (1½) times the height of the taller trees from crown to crown.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.

Belmont VFD Responsibilities

- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for firefighters.

7.2.3 Community Coordination:

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on outside agencies in the event of a catastrophic wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the

establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

The Nevada Fire Safe Council
1187 Charles Drive
Reno, Nevada 89509
(775) 322-2413
www.nvfsc.org

- As an evacuation plan becomes available, citizens should read and become fully knowledgeable of evacuation procedures, fire safety zones, and safety procedures for sheltering in place in the event that evacuation is not possible.
- Assure that residential addresses are 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. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

Belmont VFD Responsibilities

- Participate annually with the US Forest Service and Bureau of Land Management to discuss pre-attack plans for the public lands surrounding Belmont.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.
- Initiate a program for posting street names with at least four-inch high reflective lettering.

Nye County and Belmont VFD Responsibilities

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

7.2.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Belmont VFD Responsibilities

- Contact the BLM Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with programs for 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.

7.2.5 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community. The volunteer fire department needs brush training and equipment to safely do their job because additional fire suppression resources are at least thirty minutes and more likely, one to two hours away.

Belmont VFD Responsibilities

- Obtain access to the state mutual aid frequencies and the frequencies that are compatible with neighboring agencies. Compatible radio frequencies are important for communication between engines during larger fires and are critical to firefighter safety.
- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Obtain basic wildland firefighting training and attend annual refresher courses. Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.

Nye County Responsibilities

- Assist the Belmont Volunteer Fire Department in obtaining grants to improve radio system and communications for Belmont.
- Coordinate with the Belmont Volunteer Fire Department to acquire basic wildland safety gear.

BLM and USFS Responsibilities

- Meet annually with Belmont Volunteer Fire Department to discuss pre-attack plans for the area around Belmont.
- Provide basic wildland fire training to all Belmont VFD Volunteers.

7.2.6 Shaded Fuelbreak

The topography and fuel hazard surrounding Belmont are favorable to the rapid spread of a wildfire. These conditions, coupled with limited local fire suppression resources and the distance of the town from additional firefighting resources warrant the establishment of a shaded fuelbreak around the entire community. Where possible, the treatment area should extend from the ridgelines down to the structures to be protected. Figure 7-1 shows a schematic of the proposed alignment, which will vary in width from 500 and 1,300 feet. The

exact location of the shaded fuelbreak should be field surveyed in order to incorporate existing topographic features, natural barriers, and property line constraints.

USFS Responsibilities

- Construct the shaded fuelbreak by thinning trees to a spacing equivalent to one and one-half (1½) times the height of the taller trees from crown to crown. Thin shrubs to a spacing of two times their height. Clear all shrubs within ten feet of the tree crowns that remain.
- Seed the fuelbreak treatment area with perennial grasses and treat it with an acceptable pre-emergent herbicide to prevent annuals from germinating in the first year. Any herbicide application on public lands must be done in accordance with federal guidelines.

Table 7-2 Belmont 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	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	7	/15

F. Fire Behavior

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

E. Suppression Capabilities

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

TALLIES

29 Total Houses **6 Residential Streets**

B5. Street Signs

6 not visible | 0 visible | 0% visible

B6. Address Signs

29 not visible | 0 visible | 0% visible

C1. Roofs

1 combust | 28 not combust | 97% not combust

C2. Siding

5 combust | 24 not combust | 83% not combust

C3. Unenclosed Structures on Lot

12 not enclosed | 17 enclosed | 41% not enclosed

D1. Lot Sizes

0 <1ac | 29 >1ac <10ac | 0 >10ac

D2. Defensible Space

18 not adequat | 11 adequate | 38% adequate

Score **73** /128

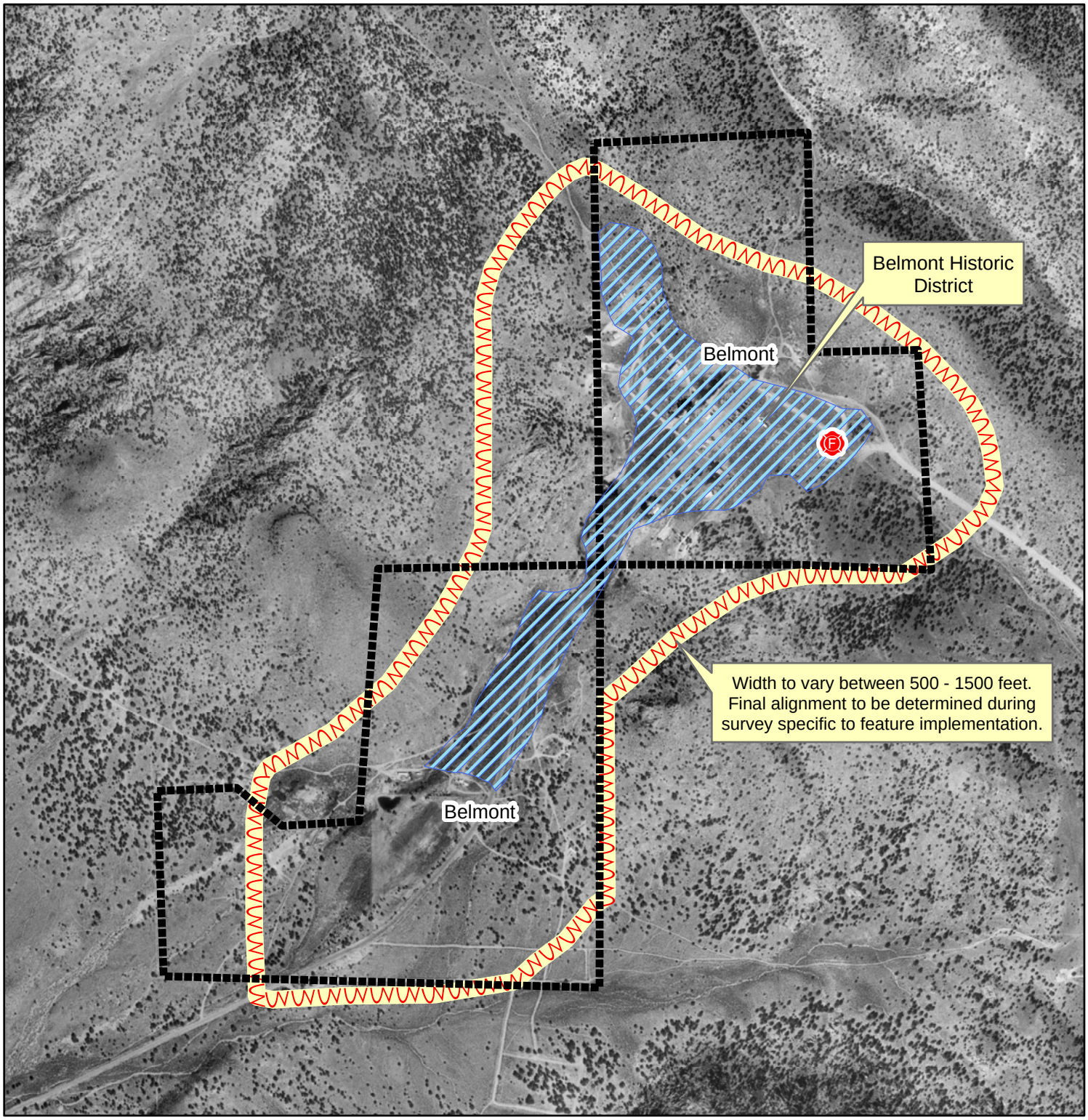

Figure 7-1. Belmont
Suppression Resources, Critical Features, and
Proposed Mitigation Projects

Legend

- Proposed Alignment of Shaded Fuelbreak
- Proposed Fuel Reduction
- Community Boundary
- Fire Station

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Feet

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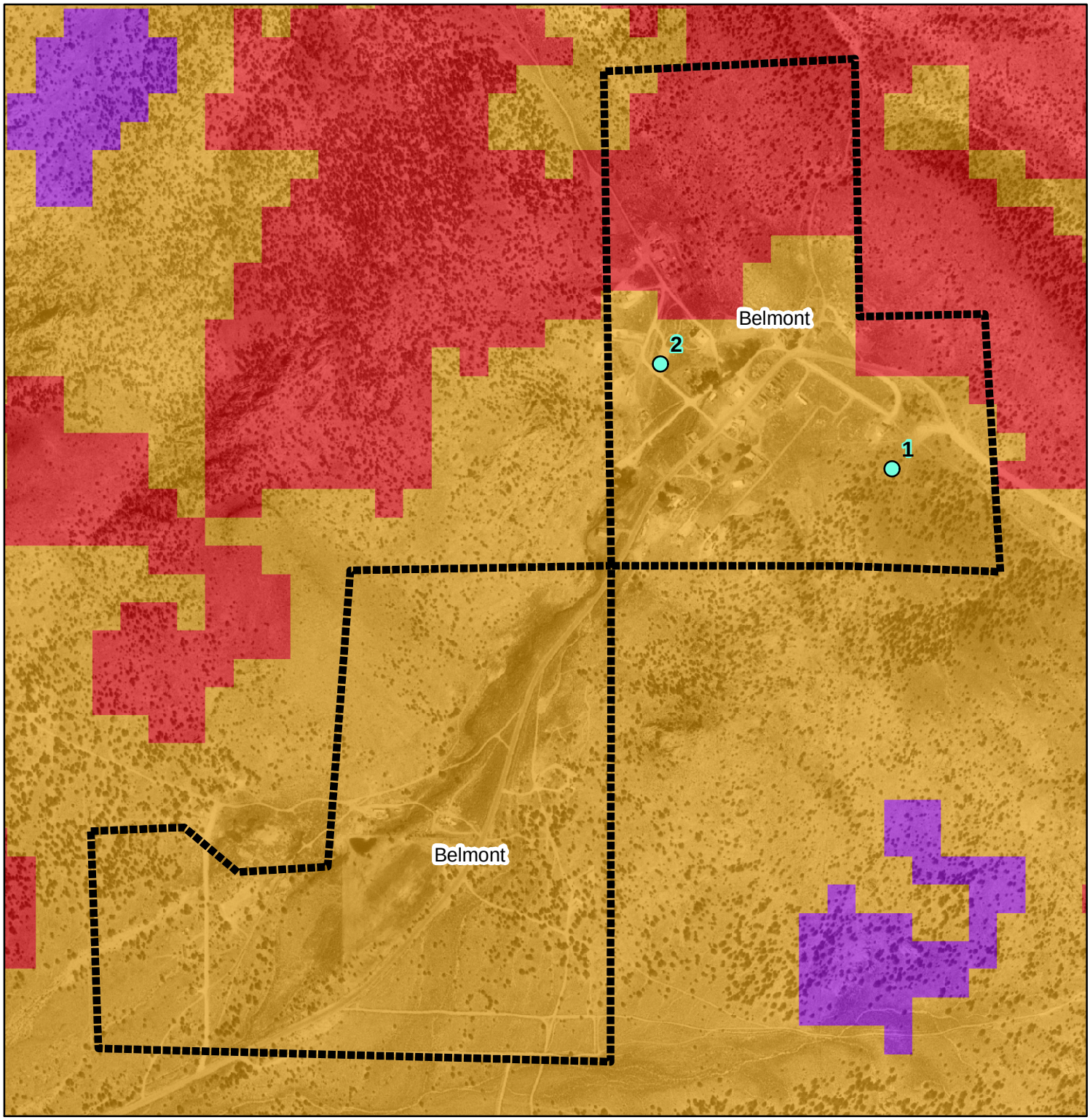

Legend

- Community Boundary

Fuel Hazard

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

Figure 7-2. Belmont
Fuel Hazard Classification

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Feet

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Figure 7-3. Belmont Fuel Hazard Photo Points

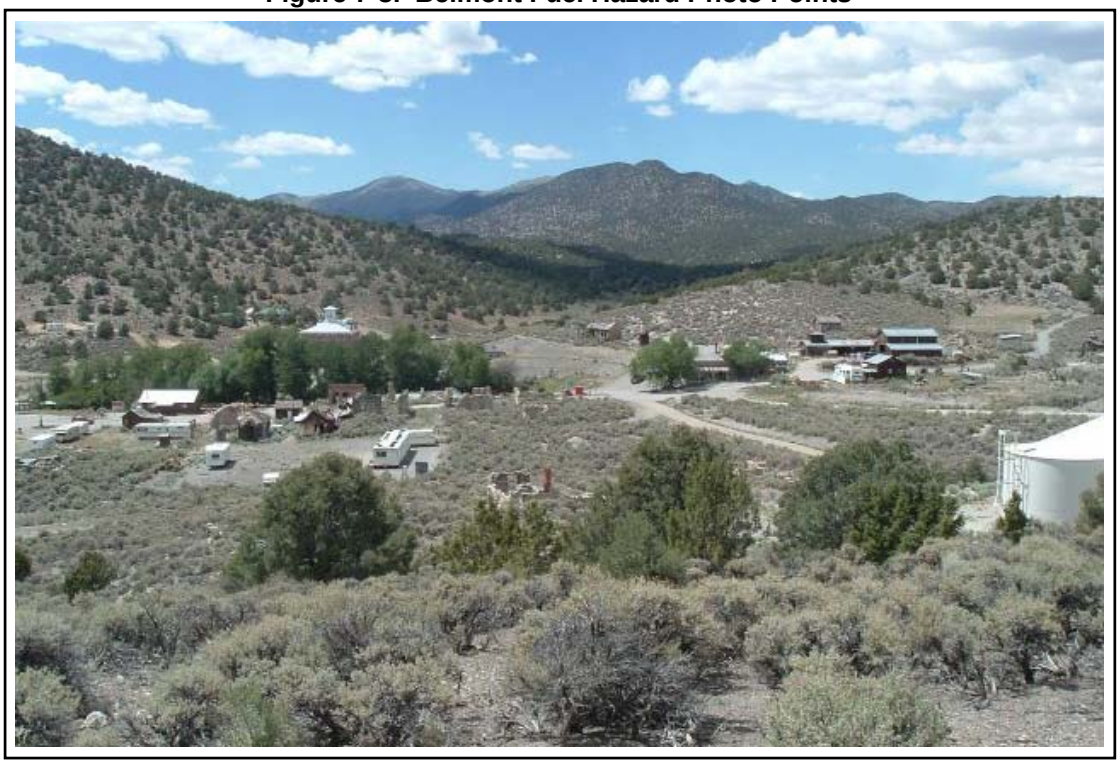

Photo Point 1 – 4271793 N. 511110 E 328˚NNW. The fuel load was estimated to range between five and twelve tons per acre. The sagebrush vegetation type was considered a high fuel hazard. The pinyon and juniper vegetation type was generally steeper and considered an extreme fuel hazard adjacent to Belmont.

Photo Point 2 – 4271958 N. 510745 E 37˚NNE. The sagebrush in this photo was six feet tall and needs to be thinned throughout the community, especially within 100 feet of structures.

8.0 CARVERS

8.1 RISK AND HAZARD ASSESSMENT

Carvers is located on relatively flat topography near 5,000 feet in elevation in northern Nye County on the west side of Big Smokey Valley. The hazard assessment resulted in placing Carvers in the **Moderate Community Hazard** category (45 points). The hazard rating was primarily attributed to heavy fuels and poor signage. The results for each of the wildland fire assessment factors are summarized in Table 8-2.

8.1.1 Community Design

Carvers is characterized as an intermix wildland-urban interface condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, the buildings, and the open space throughout the community. Approximately one-half of the 161 residences assessed were on lots between one and ten acres in size and the remainder were on lots less than one acre in size. Two homes were on lots greater than ten acres in size.

Roads: The primary access into the community is State Route 376. This road is at least 24 feet wide. The secondary roads are on grades less than five percent and have adequate turnaround space for fire suppression equipment.

Signage: Street signs were present and visible along 79 percent of the nineteen streets assessed. Residential addresses were visible on only 37 percent of the 161 homes assessed.

Utilities: All of the utilities were above ground and power line corridors had been properly maintained.

8.1.2 Construction Materials

All of the homes observed in the interface area were built with ignition resistant, treated, wood siding materials. All but two of the homes had fire resistant roofing materials such as composition roofing, metal, or tile. Twenty-nine percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where sparks and embers can accumulate, smolder, and ignite, rapidly spreading fire to the home.

8.1.3 Defensible Space

The majority of the homes (87 percent) met the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire.

8.1.4 Suppression Capabilities

Wildfire Protection Resources

The Smoky Valley Volunteer Fire Department in Carvers operates one fire station staffed by nine volunteers. Table 8-1 lists the types of wildfire resources, cooperating partners, and equipment available to Carvers in the event of a reported wildland fire.

Table 8-1. Resources Available to Carvers for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Brush Engine Water Tender (3,000 gal.)	2 1	Smoky Valley Volunteer Fire Department (Carvers)
Type 6 Brush Engine Type I Engine	1 1	Round Mountain Volunteer Fire Department (Hadley)
Type 6 Engine Type I Engine	1 1	Tonopah Fire Department (Tonopah)

Source: Personal conversation with Chief Holley Allison, Smoky Valley VFD (June 29, 2004)

Additional resources are available through fire departments in Hadley, Manhattan, and Tonopah, dispatched through the Nye County Sheriff Department. Resources are also available through the Nevada Division of Forestry Tonopah Conservation Camp, dispatched through the Sierra Front Interagency Dispatch. Bureau of Land Management and US Forest Service resources are dispatched through the Central Nevada Interagency Dispatch Center. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

Water availability for fire suppression in Carvers includes:

- 500 gpm hydrants within 1,000 feet of structures,
- Two above-ground water storage tanks, and
- One pond.

The water system operates on gravity and electrical pumps. No backup emergency generators for running the pumps in case of energy failure were reported.

Detection and Communication

Fires can be reported in the Carvers area by calling 911, which connects the caller with the Nye County Sheriff's Office in Tonopah. Fires are communicated to the fire department through the use of pagers and radios.

The radio frequency is compatible with neighboring agencies and the fire department has access to state mutual aid frequencies. Some gaps in radio coverage in the Carvers area are due to the terrain.

Fire Protection Personnel Qualifications

All of the volunteer firefighters have been trained to National Fire Protection Administration Firefighter I and II standards. Volunteer firefighters also received wildland firefighter training provided by the BLM.

Work Load

The Smoky Valley Volunteer Fire Department responded to twenty calls in 2003. Ten of these were wildand / brush fire calls.

Financial Support

Financial support for the Smoky Valley Volunteer Fire Department comes from the Nye County General Fund.

Community Preparedness

The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan. The Carvers Volunteer Fire Department maintains a Pre-Attack Plan for response to fires. The Nye County Sheriff's Office maintains an evacuation plan for disasters.

8.1.5 Factors Affecting Fire Behavior

Vegetation, dead and down fuels, and topographical features contribute to the potential fire hazard in the wildland-urban interface. Fuels in the Carvers area were heavy, typically ranging from ten to fifteen tons per acre. The shrub layer included big sagebrush, rabbitbrush, fourwing saltbush, and isolate stands of willow, and silver buffaloberry. Ground fuels included salt grass, perennial grasses, and Russian thistle along the highway. The slopes were generally less than eight percent. The interface fuel hazard condition was considered to range from low to high. The fuel hazards were mapped for Carvers and fuel hazard photos were taken to illustrate the relationship between vegetation types, slope, aspect, and overall fuel hazard (see Figures 8-2 and 8-3).

8.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would begin with an above normal precipitation year with above normal grass production. A fire starting in the late afternoon at the south end of the community, with south winds greater than twenty miles per hour, could push the fire northward through the community. Flame lengths of six to twenty feet with rates of spread from thirty to 75 feet per minute could be expected. This would easily cause fire to escape initial attack due to limited capabilities of local initial attack resources and a response time of more than thirty minutes for additional resources.

8.1.7 Ignition Risk Assessment

A high potential for fire ignition was observed. The primary ignition risk is lightning.

8.2 PREVIOUS SITE ASSESSMENT SUMMARY

The BLM Battle Mountain Field Office completed a site assessment in October 2002 for approximately 1,600 acres adjacent to and south of the community of Carvers. An environmental assessment was completed in December 2003. Fuel loadings up to 15.2 tons per acre were reported in this assessment. The treatment alternatives presented in the Environmental Assessment for reducing the fuel loading included mowing (either entire areas or in strips), seeding with drill seeders and imprint seeders as appropriate, and prescribed fires in the treatment areas shown in Figure 8-4.

By the end of 2004, the BLM had completed mechanical shrub mastication on over 400 acres of land surrounding the south end of Carvers. In addition, 257 acres of treated area were drill seeded. Complete documentation for this project is available at the BLM Battle Mountain Field Office.

8.3 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Carvers risk and hazard reduction recommendations address concerns regarding radio communications, defensible space, maintenance of fuel reduction treatment areas, community coordination, and public education efforts that could be initiated to enhance fire safety.

8.3.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed set, or treated with an application of a pre-emergent herbicide. Prescribed treatments may need to be repeated for several years to ensure that the bank of unwanted annual plants 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 around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.
- Store lumber, firewood, and other flammable materials a minimum distance of thirty feet away from structures.
- Install spark arrestors on chimneys.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.

8.3.2 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on an outside agency in the event of a catastrophic wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

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  1187 Charles Drive
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  (775) 322-2413
  www.nvfsc.org

- Assure that residential addresses are 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. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

Smoky Valley VFD Responsibilities

- Participate annually with the BLM and the USFS to discuss the pre-attack plans for the public lands surrounding Carvers.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.

8.3.3 Fuel Reduction Treatments

Fuel reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of a lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Bureau of Land Management Responsibilities

- Maintain the fuel reduction treatments completed in 2004 to prevent future heavy accumulations of brush or annual grasses. This maintenance will be essential in achieving the hazard reduction objective.

Smoky Valley VFD Responsibilities

- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for fire personnel.

8.3.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Smoky Valley VFD Responsibilities

- Contact the BLM Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with programs for 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.

8.3.5 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community.

Smoky Valley VFD Responsibilities

- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Continue to require basic wildland firefighter training. Assure that all volunteers meet this requirement by attending the annual BLM Wildland Firefighter Training and other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.

- Coordinate with the County to upgrade the repeater system and improve radio communications with Nye County Sheriff's dispatch.
- Coordinate with the Bureau of Land Management and US Forest Service to ensure that radio frequencies and radios are compatible in order to maintain communications during wildland fire incidents.

Nye County Responsibilities

- Upgrade repeater system to improve radio communications between Sheriff's Dispatch and the Smoky Valley VFD.

Table 8-2 Carvers 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	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	3	/5
2. Defensible Space	1	/15

F. Fire Behavior

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

E. Suppression Capabilities

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

TALLIES

161 Total Houses **19 Residential Streets**

B5. Street Signs

4 not visible | 15 visible | 79% visible

B6. Address Signs

102 not visible | 59 visible | 37% visible

C1. Roofs

2 combust | 159 not combust | 99% not combust

C2. Siding

0 combust | 161 not combust | 100% not combust

C3. Unenclosed Structures on Lot

47 not enclosed | 114 enclosed | 29% not enclosed

D1. Lot Sizes

72 <1ac | 87 >1ac <10ac | 2 >10ac

D2. Defensible Space

21 not adequat | 140 adequate | 87% adequate

Score **45** /128

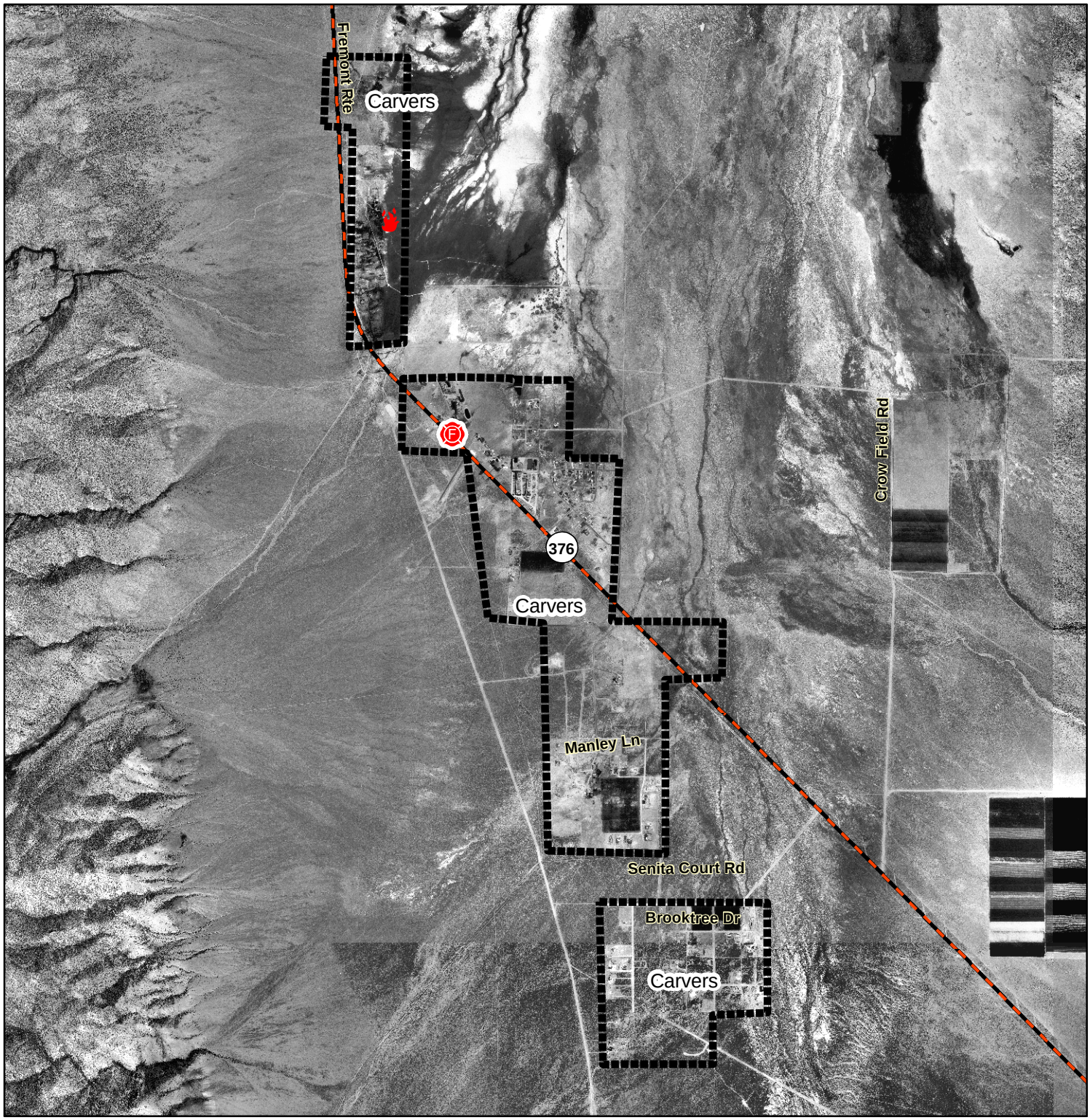


Figure 8-1. Carvers
Fire History and Suppression Resources

N
W E
S

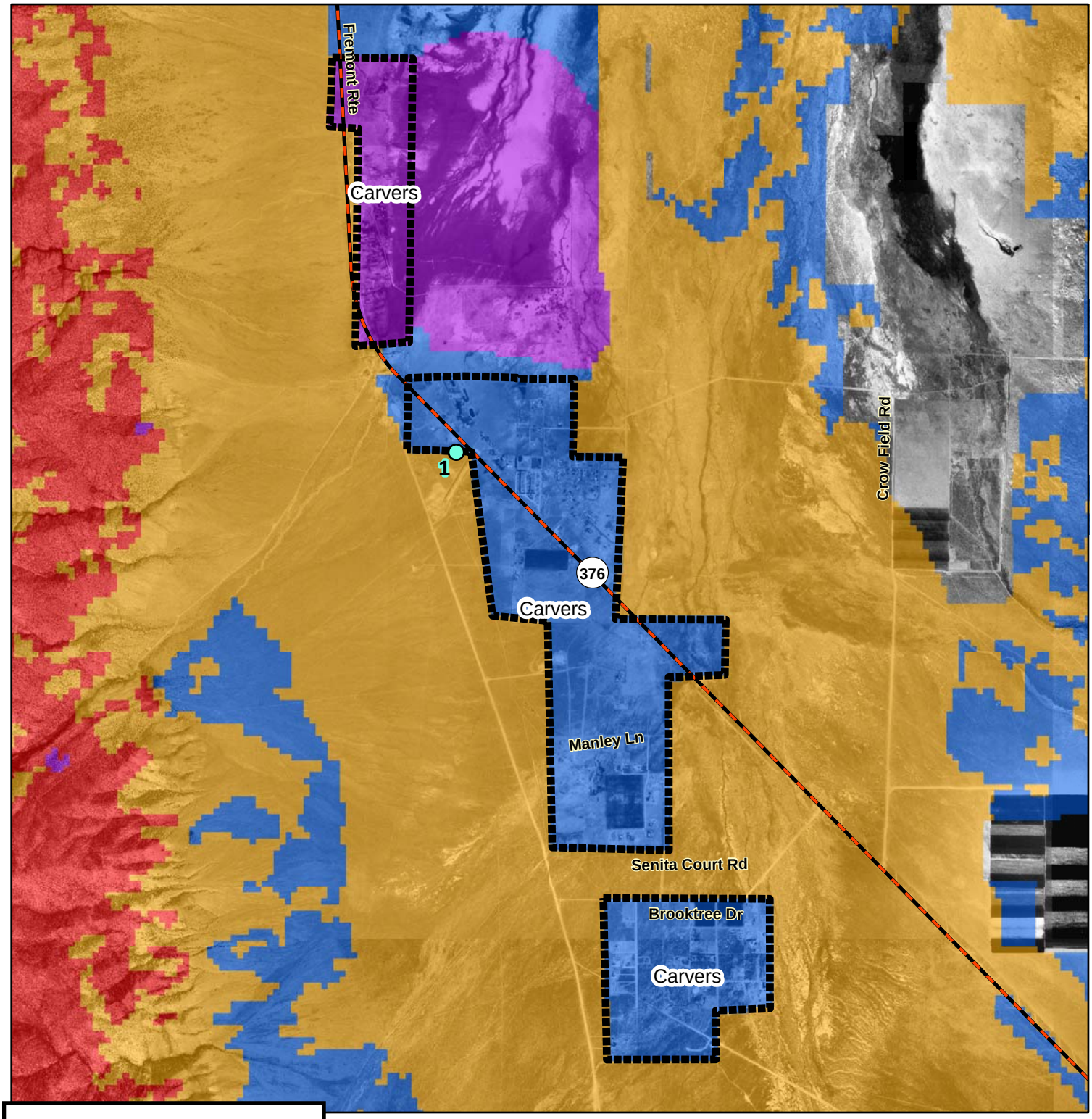
Legend

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

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



Legend

- Community Boundary
- Highways and State Routes

Fuel Hazard

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

Figure 8-2. Carvers
Fuel Hazard Classification

N
W E
S

0 0.25 0.5 1
Miles

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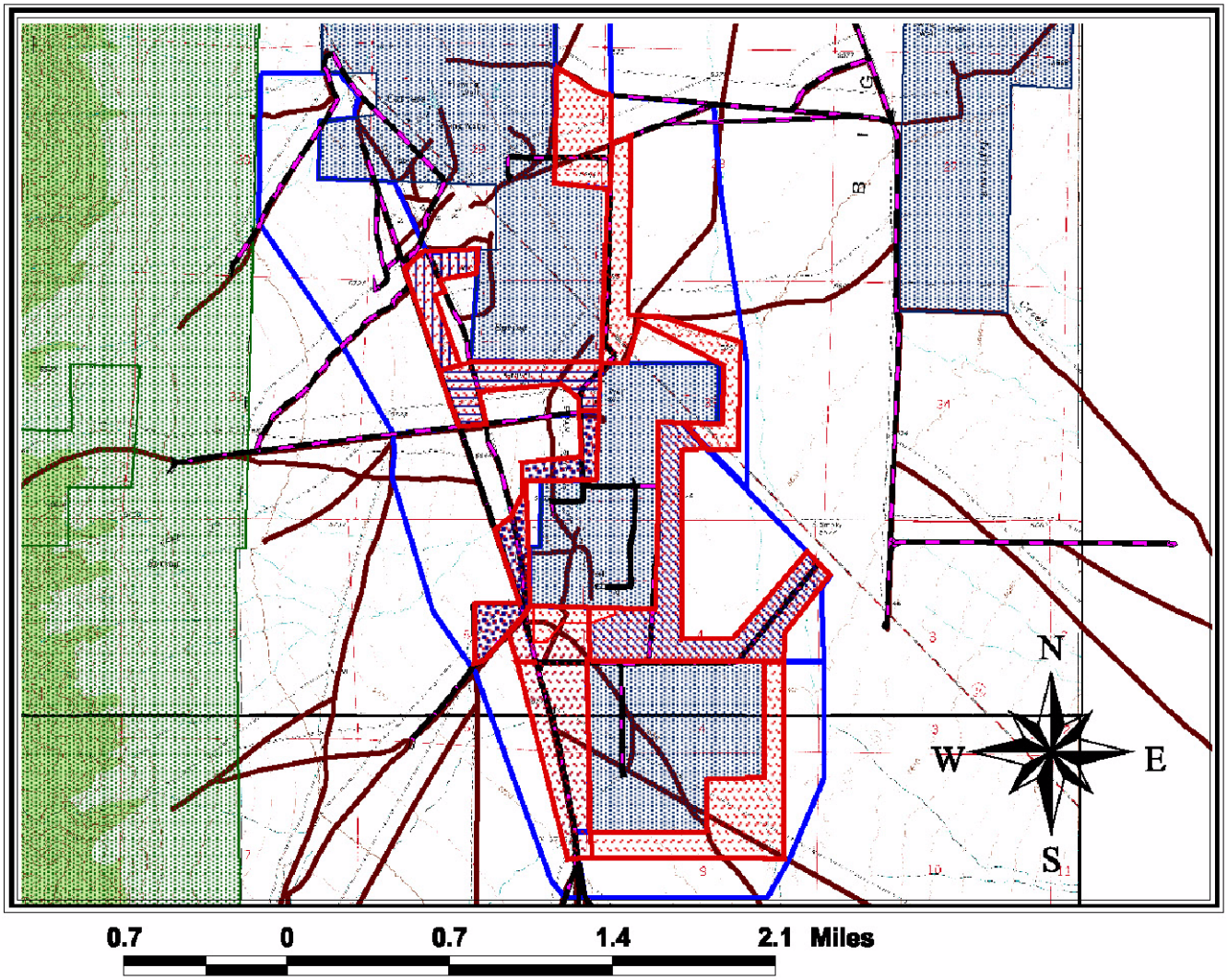
340 N. Minnesota St.
Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Figure 8-3. Carvers Fuel Hazard Photo Points

Photo Point 1 – 4292878 N 484523 E 12˚NNE. The sagebrush, fourwing saltbush, and rabbitbrush fuel load around Carvers was estimated between five and six tons per acre. In Carvers the heaviest vegetation was observed near buildings.

Carvers Wildland-Urban Interface Fire Defense System



Legend:

- Carvers WUI MOW 2004: 796 acres
- Carvers WUI Seeding Areas: 250 seeding Acres
  - 46 acres
  - 67 acres
  - 79 acres
  - 141 acres
  - 180 acres
- Carvers Roads

Landowner

- PVT
- USFS
- Carvers-Hadley Project Area
- Roads

United States Department of the Interior
Bureau of Land Management
Battle Mountain Field Office
50 Bastian Road
Battle Mountain, NV 89820

Figure 8-4. Carvers
BLM Planned Mitigation Projects

Source: Wildland Urban Interface Fire Defence System for Manhattan, Nevada
Environmental Assessment NV-064-EA-03-50
BLM Battle Mountain Field Office

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

Nevada Community Wildfire Risk / Hazard Assessment Project

9.0 GABBS

9.1 RISK AND HAZARD ASSESSMENT

Gabbs is located at nearly 4,800 feet in elevation in northwest Nye County on State Route 361. The town of 300 people is situated on west-facing, gently sloping topography on the east side of Gabbs Valley. The hazard assessment resulted in classifying Gabbs in the **Moderate Community Hazard** category (46 points). The hazard score was primarily affected by poor signage, and inadequate defensible space around buildings. A summary of the values that contribute to the hazard score is included in Table 9-2.

9.1.1 Community Design

There are two separate developed areas in Gabbs. South Gabbs is characteristic of a classic wildland-urban interface condition with a clear line of demarcation between building structures and wildland fuels. Wildland vegetation typically does not continue into the development areas. North Gabbs is characteristic of an intermix wildland-urban interface condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, buildings, and open space throughout the community. All of the 61 houses observed were on parcels less than one acre in size (Figure 9-1).

Roads: The only access into the community is State Route 361. This dirt road is at least 24 feet wide. The secondary roads are on grades less than five percent and have adequate turnaround space for fire suppression equipment.

Signage: Street signs and addresses were not clearly visible for two-thirds of the thirteen streets and 61 houses observed. Clear and visible signage is important to help firefighters locate residences during poor visibility conditions that may occur during a wildland fire.

Utilities: All of the utilities were above ground. There were no tree branches in the power lines, but there were weeds and debris under the lines. The corridors need to be properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks created by electric utilities will start a fire in adjacent vegetation.

9.1.2 Construction Materials

Ninety percent of the homes observed in the interface area were built with ignition resistant, wood siding materials. Ninety percent of the homes had fire resistant roofing materials such as composition roofing, metal, or tile. Eleven percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where sparks and embers can accumulate, smolder, and ignite, rapidly spreading fire to the home.

9.1.3 Defensible Space

The majority of the homes observed (64 percent) met the minimum recommended defensible space guidelines to help protect the home from damage or loss during a wildfire. While the threat of a wildfire reaching the community through the surrounding native

vegetation was low, the accumulation of weeds, abandoned buildings, and debris in many areas immediately adjacent to homes, outbuildings, and corrals presents a hazard.

9.1.4 Suppression Capabilities

Wildfire Protection Resources

Gabbs has a Volunteer Fire Department with one fire station. At the time that interviews were conducted for this assessment (and as of January 7, 2005) both of the Gabbs VFD fire engines were inoperable and in need of repairs. In 2004, the Nye County Commissioners approved the purchase of an emergency vehicle equipped with a 2,000-gallon water tank and a 1,000 gpm pump for the Gabbs VFD. The new apparatus is expected to arrive prior to the start of the 2005 fire season. Table 9-1 lists the types of wildfire resources and equipment currently available to Gabbs in the event of a reported wildland fire.

Table 9-1. Resources Available to Gabbs for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Brush Truck	1 – Out of Service	Gabbs Volunteer Fire Department (Gabbs)
Type I Engine	1 – Out of Service	

Source: Personal conversation with Assistant Chief Connie Stinson, Gabbs VFD (March 2, 2004)

Additional resources for initial attack are over an hour away. Formal mutual aid agreements were not reported. The nearest fire departments are in Hadley, Manhattan, and Tonopah. Resources from the Nevada Division of Forestry Tonopah Conservation Camp are dispatched through the Sierra Front Interagency Dispatch Center. Bureau of Land Management and US Forest Service resources are dispatched through the Central Nevada Interagency Dispatch Center.

Water Sources and Infrastructure

Water availability for fire suppression in Gabbs included:

- 500 gpm hydrants within 1,000 feet of structures, and
- Several water storage tanks.

The water system operates on gravity and electrical pumps. No backup emergency generator to run the pumps was reported.

Detection and Communication

Fires are reported in the Gabbs area by calling 911, which connects the caller with Nye County Sheriff Dispatch. Gabbs also has a community siren. Fires are communicated to fire departments and agencies through the use of radios and pagers dispatched through the Fire Dispatch in the Nye County Sheriff's Office in Tonopah.

The radio frequency was reported as being incompatible with neighboring agencies and the fire department did not have access to state mutual aid frequencies. Gaps in the radio coverage outside of town were also reported.

Fire Protection Personnel Qualifications

All of the volunteer firefighters had been trained to National Fire Protection Administration Firefighter I and II standards. Four members were reported to have acquired wildland firefighter training through the BLM.

Work Load

The Gabbs Volunteer Fire Department responded to over fifty calls in 2003. Three or four of these were wildland / brush fire calls. The Gabbs Volunteer Fire Department is currently unable to respond to wildland calls. Their equipment is in need of repair.

Financial Support

Financial support for the Gabbs Volunteer Fire Department comes from the Nye County General Fund.

Community Preparedness

The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan.

9.1.5 Factors Affecting Fire Behavior

The terrain east of the Gabbs community is slightly sloping, five to ten percent, with a slight west-facing aspect. Brush types in the area include ephedra, desert peach, and rabbitbrush with ground fuels of cheatgrass, squirreltail, Indian ricegrass, and Russian thistle. Shrubs were moderately dense with two to five foot spacing between plants. In addition to native vegetation, fuels within the community include general debris, weed piles, and abandoned mobile homes and wood structures. Some of the areas immediately adjacent to homes, outbuildings, and corrals present a more acute fuel hazard than the surrounding native vegetation. The interface fuel hazard condition was observed to be low to moderate.

9.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would begin on a high hazard day with dry lightning striking west of town, downslope from the corrals. With a 25 to 35 mph wind out of the west, the fire could quickly consume the corral area and continue east into north Gabbs. This scenario could result in the loss of livestock, corrals, barns, and possibly homes.

9.1.7 Ignition Risk Assessment

There was a low potential for fire ignition in the sparse fuels that surround the community. However within the community there are several areas where debris is of concern. Lightning and human causes such as off-road vehicles are the primary ignition risks. The very few ignitions that have been recorded occurred east of Gabbs in the Paradise Range.

9.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Gabbs risk and hazard reduction recommendations address the primary concern regarding defensible space and equipment needs. Other recommendations pertain to community coordination and public education efforts that could be initiated to enhance fire safety in Gabbs.

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 vegetation within a prescribed distance from structures (typically thirty feet). This defensible space reduces fire intensity and improves firefighter and homeowner chances for successfully defending a structure against oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Clear around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.
- Install spark arrestors on chimneys.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.

9.2.2 Fuel Reduction

Fuel reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of lower volume or reduced flammability, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Gabbs VFD Responsibilities

- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for firefighters.

Nye County and Nevada Department of Transportation Responsibilities

- Clear vegetation within a minimum space of ten feet from the edge of both sides of community roads including State Route 361 for the length of the community. Maintain these areas clear of vegetation.

Utility Company Responsibilities

- Clear a space no less than fifteen feet around electric utility poles within power line corridors and maintain this area free of accumulated vegetation.

9.2.3 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on outside agencies in the event of a wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

  The Nevada Fire Safe Council
  1187 Charles Drive
  Reno, Nevada 89509
  (775) 322-2413
  www.nvfsc.org

- Ensure that residential addresses are 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. Improving the visibility of addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire event.

Gabbs Volunteer Fire Department Responsibilities

- Participate annually with the BLM and the USFS to discuss their pre-attack plans for the community.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.

- Obtain access to the state mutual aid frequencies and frequencies compatible with neighboring agencies. Compatible radio frequencies are important for communication between engines and firefighter safety during larger fires.
- Develop a program for improving street sign visibility throughout the community.

Nye County Responsibilities

- Assist the Gabbs VFD in improving the radio coverage and emergency communicators.
- Assure the delivery of the new suppression apparatus for the Gabbs Volunteer Fire Department prior to the start of the 2005 fire season.

9.2.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Gabbs VFD Responsibilities

- Contact the BLM Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with programs for 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.

9.2.5 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community.

Gabbs VFD Responsibilities

- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Continue to provide basic wildland firefighter training through annual attendance at a BLM Wildland Firefighter Training for volunteer firefighters or other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.

Nye County Responsibilities

- Provide funding to repair and maintain firefighting equipment.
- Assist the Gabbs VFD in pursuing grants and other funding sources for equipment.

Table 9-2 Gabbs 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	1	/5

D. Defensible Space

1. Lot Size	5	/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	1	/10
2. Department	7	/10

TALLIES

61 Total Houses **13 Residential Streets**

B5. Street Signs

9 not visible | 4 visible | 31% visible

B6. Address Signs

41 not visible | 20 visible | 33% visible

C1. Roofs

6 combust | 55 not combust | 90% not combust

C2. Siding

6 combust | 55 not combust | 90% not combust

C3. Unenclosed Structures on Lot

7 not enclosed | 54 enclosed | 11% not enclosed

D1. Lot Sizes

61 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

22 not adequat | 39 adequate | 64% adequate

Score **46** /128

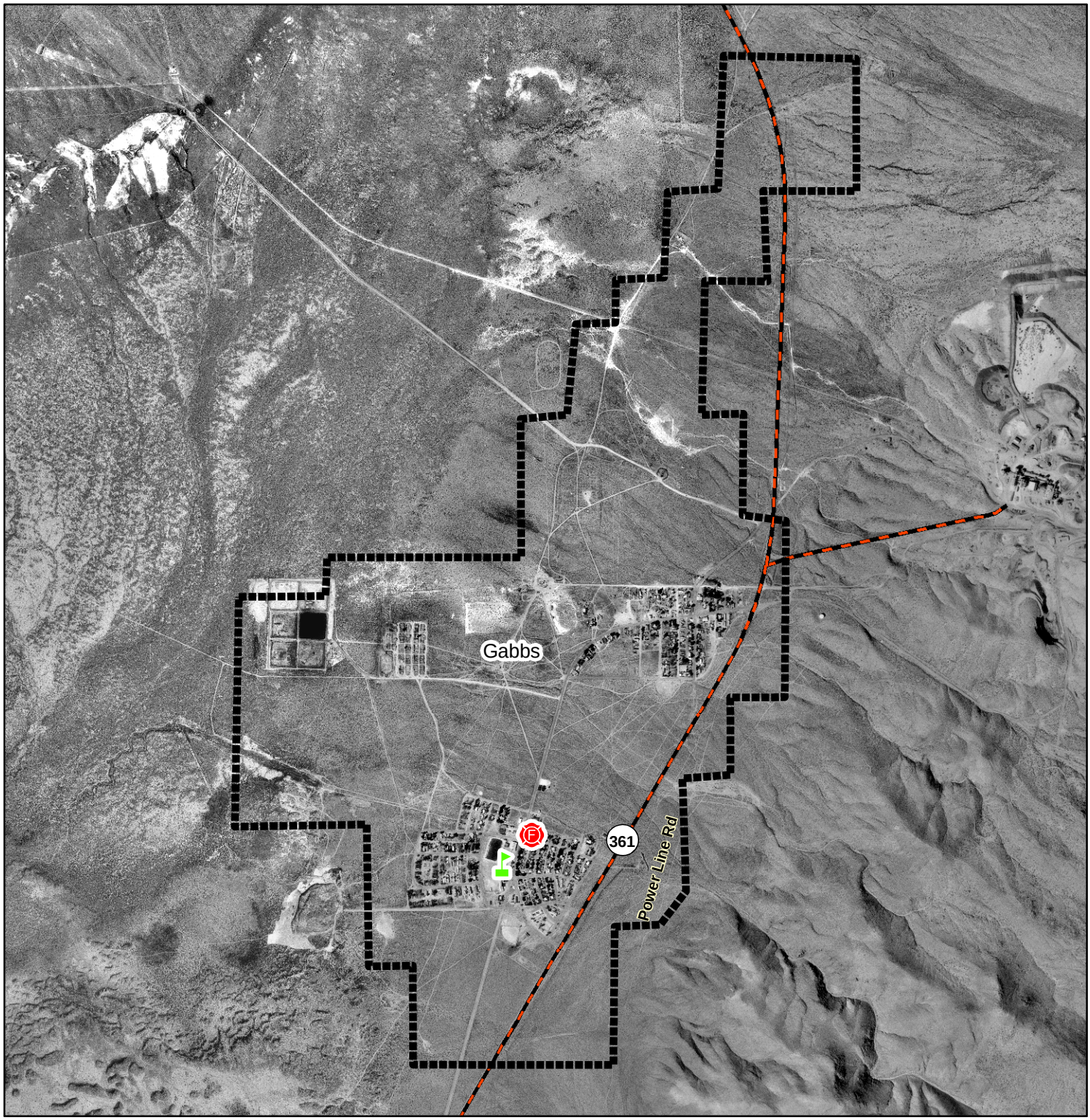


Figure 9-1. Gabbs
Suppression Resources
and Critical Features

Legend

- Community Boundary
- School
- Fire Station
- Highways and State Routes

0 0.25 0.5 1
Miles

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

10.0 HADLEY (ROUND MOUNTAIN)

10.1 RISK AND HAZARD ASSESSMENT

The community of Hadley is the relocation site for the mining town of Round Mountain. The relocation of the town's population and services from Round Mountain to Hadley is well underway. As such, the data and conditions reported in this chapter refer only to Hadley. Hadley is located in northern Nye County in Big Smoky Valley. The community is situated on relatively flat terrain at 5,700 feet in elevation. The community hazard assessment resulted in classifying Hadley in the **Low Community Hazard** category (32 points). The low hazard score was primarily attributed to good access and sparse fuels. A summary of the values that affected the hazard rating is included in Table 10-2.

10.1.1 Community Design

Hadley is characterized as a classic interface condition. There is a clear line of demarcation between the structures and the wildland fuels. Fuels do not continue in the development area. All of the 25 houses observed in the interface area were on parcels less than one acre in size (Figure 10-1).

Roads: The primary access route into Hadley is provided by Pablo Canyon Road, which intersects with State Route 376. Both roads are at least 24 feet wide. The secondary roads are paved, with grades less than five percent and have adequate turnaround space for fire suppression equipment.

Signage: Street signs and addresses were clearly visible. Clear and visible signage is important to assist firefighters in locating residences during poor visibility conditions that occur during a wildland fire.

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

10.1.2 Construction Materials

All of the homes observed in the interface area were built with ignition resistant wood siding materials and have fire resistant roofing materials such as composition roofing, metal, or tile. None of the 25 homes observed have unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where sparks and embers can accumulate, smolder, ignite, and rapidly spread fire to the home.

10.1.3 Defensible Space

All of the homes met the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire.

10.1.4 Suppression Capabilities

Wildfire Protection Resources

The Round Mountain Volunteer Fire Department has one fire station located in Hadley, with one paid position and 23 volunteer firefighters, at the time the interviews were conducted for this report. Table 10-1 lists the types of wildfire resources, cooperating partners, and equipment available to Hadley for initial attack of a reported wildland fire.

Table 10-1. Resources Available to Hadley for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Brush Engine Type I Brush Engine	1 1	Round Mountain Volunteer Fire Department (Hadley)
Water Tender (3,000 gal.) Type 6 Brush Engine	1 1	Smoky Valley Volunteer Fire Department (Carvers)
Water Truck 30,000 gal Water Truck 10,000 gal	2 3	Round Mountain Gold Company (Round Mountain)
Type 6 Brush Engine	1	Tonopah Volunteer Fire Department (Tonopah)

Source: Personal conversation with Assistant Chief Dan Sweeny, Round Mountain VFD (June 29, 2004)

Additional resources are available through the fire departments in Carvers, Manhattan, and Tonopah, dispatched through the Nye County Sheriff. Resources are also available from the Nevada Division of Forestry Tonopah Conservation Camp, dispatched through the Sierra Front Interagency Dispatch Center. The Bureau of Land Management and US Forest Service suppression resources are dispatched through the Central Nevada Interagency Dispatch Center. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

Water availability for fire suppression in Hadley includes:

- 500 gpm hydrants within 500 feet of structures and
- Water storage tanks totaling one million gallons.

The water system operates on gravity and electrical pumps. There is no backup emergency generator to run the pumps. Also there were two fishing ponds in Hadley and ponds on the golf course that may be used as drafting sources with landowner permission.

Detection and Communication

Fires are reported in the Hadley area by calling 911, which connects the caller with the Nye County Sheriff. The Nye County Sheriff Dispatch in Tonopah contacts local

fire department through radios and pagers. All Hadley Volunteer Fire Department radios are compatible with neighboring fire departments and state mutual aid frequencies.

Fire Protection Personnel Qualifications

All of the Hadley volunteer firefighters have been trained to State Fire Marshall's Firefighter I standards. Firefighters also receive annual wildland-urban interface training by video conferencing.

Work Load

The Round Mountain Volunteer Fire Department responded to over fifty calls in 2003. Three to four of these call were wildland / brush fire calls

Financial Support

Financial support comes primarily from the Nye County General Fund and the Town of Hadley General Fund.

Community Preparedness

Nye County has an active Local Emergency Planning Committee and has adopted an emergency plan, a disaster plan, and an emergency evacuation plan. The Round Mountain volunteer fire department maintains a Fire Department Response Plan.

10.1.5 Factors Affecting Fire Behavior

The interface fuel hazard condition for Hadley is low. Light fuels in the area consist of sparse salt grass, rabbitbrush, and shadscale. The community is bound on two sides by a golf course, and the area is relatively flat with no topographic features that would increase the community's fire hazard rating.

10.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would occur during a year of above-normal precipitation and annual grass production without livestock grazing to reduce ground fuels. A wind-driven fire would be carried through grass since most brush is widely spaced and less than one foot high. Flame lengths of four to six feet with rates of spread of approximately 2,000 to 4,000 feet per hour would be expected.

10.1.7 Ignition Risk Assessment

There is a low potential for fire ignition due to sparse fuels within and around the community. The primary risk is from off-road vehicle usage.

10.2 PREVIOUS SITE ASSESSMENT SUMMARY

The site assessment carried out by the BLM Battle Mountain Field Office in October of 2002 reports that Hadley is a fire safe community requiring no special fuel reduction treatments. The report cites flat topography and insufficient fuels to carry fire into the community. A golf course in the northeast section of the community and roads on all sides of community are also reported to constitute effective fire barriers.

10.3 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Hadley risk and hazard reduction recommendations address the primary concern regarding training, communication, and public education.

10.3.1 Defensible Space Treatments

Maintain the already good defensible space conditions established around Hadley.

10.3.2 Community Coordination

Round Mountain Volunteer Fire Department Responsibilities

- Participate annually with the Bureau of Land Management and the US Forest Service to discuss their pre-attack plan for the public lands surrounding the community.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.

10.3.3 Public Education

Round Mountain Volunteer Fire Department Responsibilities

- 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.

10.3.4 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community.

Round Mountain Volunteer Fire Department Responsibilities

- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Continue to provide basic wildland firefighter training by requiring all volunteers to attend BLM Wildland Firefighter Training for volunteer firefighters or other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.
- Coordinate with the Bureau of Land Management and US Forest Service to ensure that radio frequencies and radios are compatible in order to maintain communications during wildland fire incidents.

Table 10-2 Hadley (Round Mountain) 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	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	1	/10
2. Department	3	/10

TALLIES

22 Total Houses **10 Residential Streets**

B5. Street Signs

0 not visible | 10 visible | 100% visible

B6. Address Signs

2 not visible | 20 visible | 91% visible

C1. Roofs

0 combust | 22 not combust | 100% not combust

C2. Siding

0 combust | 22 not combust | 100% not combust

C3. Unenclosed Structures on Lot

2 not enclosed | 20 enclosed | 9% not enclosed

D1. Lot Sizes

22 <1ac | 0 >1ac <10ac | 0 >10ac

D2. Defensible Space

8 not adequat | 14 adequate | 64% adequate

Score **32** /128

Legend

- Community Boundary
- Fire Station
- Highways and State Routes

N
W E
S

0 0.25 0.5 1
Miles

Figure 10-1. Hadley (Round Mountain) Suppression Resources

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

Nevada Community Wildfire Risk / Hazard Assessment Project

11.0 IONE

11.1 RISK AND HAZARD ASSESSMENT

Ione is located in northwestern Nye County north of the Berlin-Ichthyosaur State Park. The small remote community is situated at approximately 7,000 feet in elevation on south-facing, gently sloping topography on the west side of the Shoshone Mountains. There is no private land in Ione; it is a historic mining community built on public land. The community hazard assessment resulted in classifying Ione in the **Extreme Community Hazard** category (97 points). The hazard rating was primarily attributed to limited access to water, steep terrain, heavy fuels, and the distance (greater than one hour) from an organized fire department. A summary of the factors that affected the hazard score is provided in Table 11-2.

11.1.1 Community Design

The wildland-urban interface area around Ione is characterized as an intermix condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, structures, and the open space throughout the community. Fourteen of the eighteen houses observed in Ione were on parcels less than one acre in size, the remaining four were on parcels between one and ten acres indicating an overall high density of houses (Figure 11-1).

Roads: Ione is accessed via a graded dirt road between twenty and 24 feet wide. A majority of secondary roads in the community have grades steeper than five percent.

Signage: Due to the small size of this particular community, nearly all streets and residences are clearly visible upon approach. However, no signs were posted on the main road and no addresses were posted on the long driveways leading up to residences. Clear and visible signage is important to assist firefighters in locating residences during poor visibility conditions that occur during a wildland fire.

Utilities: All of the utilities were above ground. Power for the community is supplied by local generators.

11.1.2 Construction Materials

Ione began as a mining town in the 1860s and the building construction materials reflect that era. The majority of the homes observed in the interface area were built with wood siding materials. Some of the structures had corrugated metal roofing, but 56 percent had combustible materials such as wood shingles. One of the homes observed had an unenclosed porch that could create drafty areas where firebrands can accumulate, smolder, ignite, and rapidly spread fire to the home.

11.1.3 Defensible Space

The majority of the homes observed (72 percent) met the minimum recommended defensible space guidelines to help protect the home and minimize damage or loss during a wildfire.

11.1.4 Suppression Capabilities

Wildfire Protection Resources

There is no organized fire department in Ione. The closest fire station is in Gabbs, which is more than an hour away (24 miles on dirt roads). Gabbs currently has no response capability to assist with a wildland fire near Ione since all of their suppression apparatus is in need of repair. Table 11-1 lists the types of wildfire resources, cooperating partners, and equipment available to Ione in the event of a reported wildland fire.

Table 11-1. Resources Available to Ione for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
None		
Brush Truck Type I Engine	1 – Out of Service 1 – Out of Service	Gabbs Volunteer Fire Department (Gabbs)
Type 6 Engine	1	Berlin-Ichthyosaur State Park (Berlin)

Source: Personal conversation with Gary Fly, bar owner in Ione, March 2, 2004

Additional resources are available through the fire departments in Hadley, Manhattan, and Tonopah, dispatched through the Nye County Sheriff Department. Resources can also be obtained from the Nevada Division of Forestry Tonopah Conservation Camp, as dispatched through the Sierra Front Interagency Dispatch. Bureau of Land Management and US Forest Service suppression resources are dispatched through the Central Nevada Interagency Dispatch Center. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

There is one fire hydrant in the community. The water source for the hydrant was reported to be gravity-fed from a well. There were several private wells in the community operated by generators. No water storage tanks or ponds were identified during field reconnaissance.

Detection and Communication

There is no landline phone service in Ione. Cell phones and satellite phones operate, although inconsistently. When service is available, fires can be reported through 911 calls to the Nye County Sheriff and fire suppression resources are dispatched through the Nye County Sheriff's Office in Tonopah.

Community Preparedness

The community is located 61 miles south of Austin and 96 miles northwest of Tonopah on public land. There has been no formal coordination between the Bureau of Land Management or the US Forest Service and the community regarding community preparedness for a wildfire (G. Fly 2004 pers comm.). The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan.

11.1.5 Factors Affecting Fire Behavior

Vegetation, dead and down fuels, and topographical features contribute to the potential fire hazard within the wildland-urban interface. Ione is situated in a narrow canyon that runs southwest to northeast. Erratic winds are common due to the terrain. Predominant winds blow from the south and southwest upslope and into the canyon. Heavy fuels in the canyon surround the town (see Figures 11-2 and 11-3). The fuels are composed of sparse to dense pinyon and juniper with a shrub understory of sage up to five feet in height. Ground fuels are abundant consisting of cheatgrass and perennial grasses. The interface fuel hazard condition ranges between moderate and extreme.

11.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would occur on a high hazard day on the 4th of July when several hundred tourists visit this old mining town. An ignition southwest of town caused by a dry lightning strike or a careless tourist could spread rapidly, driven by winds through the dry fuels. A fire could quickly burn upslope through the canyon directly into and all around Ione, trapping several hundred tourists. Fire resources several hours away would be of little help. Spot fires could ignite several additional fires and the old wood structures could be quickly consumed. The vegetation in this area with the steep canyon slopes could create flame lengths of over 100 feet.

11.1.7 Ignition Risk Assessment

Large gatherings of tourists and visitors occur during special occasions and holidays that intermittently influence the ignition risk and evacuation safety. There is a high potential for fire ignition due to heavy, continuous fuels within and around the community. The primary ignition risks are lightning in the surrounding mountains and human causes such as unextinguished cigarettes, campfires, or other careless human behavior. Five fires, all less than forty acres, have been recorded within seven miles of Ione since 1992.

11.2 PREVIOUS SITE ASSESSMENT SUMMARY

The Bureau of Land Management Battle Mountain Field Office completed a site assessment for the Ione community in May 2003 and reported heavy fuel loadings within Ione Canyon, Shamrock Canyon, and the wooded areas north and west of town.

The BLM proposed the following treatment alternatives in the site assessment. Some treatment areas cross administrative boundaries between the BLM and the US Forest Service. Figure 11-4 shows the proposed treatment areas.

- Mow sagebrush and shrubs, re-seed (greenstrip), and thin pinyon and juniper over 234 acres to the west and south of Ione,
- Create a 73 acre shaded fuelbreak in Shamrock Canyon,
- Create a 32 acre shaded fuelbreak in Ione Canyon, and
- Thin and mow vegetation within 137 acres northeast of Ione.

The BLM expects to begin a phased implementation of these treatment alternatives beginning in 2005.

11.3 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Ione risk and hazard reduction recommendations address the primary concern regarding lack of fire suppression resources and limited water resources. Other recommendations pertain to community coordination and public education efforts that could be initiated to enhance fire safety in Ione.

11.3.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed set, or treated with an application of a pre-emergent herbicide. Prescribed treatments may need to be repeated for several years to ensure that the bank of unwanted annual plants 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 around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space area.

- Store lumber, firewood, and other potentially flammable materials a minimum distance of thirty feet from structures.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.
- Install spark arrestors on chimneys.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.
- Leaves, and debris should be removed from roofs and rain gutters.
- Prune pinyon and juniper branches four feet from the ground (but not more than 1/3 of the tree crown) to reduce ladder fuels. All dead and diseased branches and duff should be removed from beneath remaining trees.
- If residents elect to keep some pinyon or juniper trees close to the home for aesthetic reasons, there must not be any other native trees or ladder fuels within a minimum of thirty feet of the crown of the tree.
- Prune trees so that the branches are at least fifteen feet away from chimneys and or structures.

11.3.2 Fuel Reduction

Fuels reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Homeowner Responsibilities

- Mow cheatgrass, reduce brush, and thin trees along driveways for a minimum width of twenty feet on both sides. Brush should be thinned to a spacing of two times the height of the shrub.
- Mow or otherwise remove all vegetation within ten feet of the fire hydrant to improve visibility and access. Ensure residents are trained in the use of the hydrant.

Bureau of Land Management and Homeowner Responsibilities

- Remove all trees within 25 feet of each edge of the main road through the community. Thin an additional area of 25 feet wide to approximately ten trees per acre. Thin shrubs to a distance two times their height for the entire fifty-foot wide treatment area.

Bureau of Land Management and US Forest Service Responsibilities

Continue to coordinate implementation of the fuel reduction treatments around Ione, especially Shamrock Canyon, on the Humboldt-Toiyabe Austin Ranger District as proposed in the BLM site assessment.

11.3.3 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will be dependent on an outside agency in the event of a catastrophic wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

  The Nevada Fire Safe Council
  1187 Charles Drive
  Reno, Nevada 89509
  (775) 322-2413
  www.nvfsc.org

- Participate annually with the Bureau of Land Management to discuss their pre-attack plans for the public lands surrounding the community.
- As an evacuation plan becomes available, read and become fully knowledgeable of evacuation procedures, fire safety zones, and safety procedures for sheltering in place in the event that evacuation is not possible.

Nye County Responsibilities

- Work with local residents to prepare an evacuation plan for special events and holidays. Post the plan in the community for visitor awareness and distribute the plan to all residents. This plan should include information regarding evacuation routes, evacuation procedures, designated fire safe zones, and procedures for sheltering in place in case evacuation becomes infeasible during a fast moving firestorm.

BLM and USFS Responsibilities

- Station a brush engine in or near town during special events and holidays such as the 4th of July when large numbers of visitors converge in Ione.

11.3.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Property Owner Responsibilities

- Contact the BLM Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with programs for public education.
- Obtain copies of the publication *"Living with Fire"* for all property owners. This publication is free of charge. Copies can be requested from the University of Nevada Cooperative Extension.

11.3.5 Equipment and Training

BLM Responsibilities

- Coordinate with Nye County to purchase and install a 15,000-gallon water tank to provide the Bureau of Land Management and the US Forest Service with a nearby drafting site for their engines in the case of a nearby wildfire. This additional water storage capacity will also provide local residents an additional resource for use on small fires.

Nye County Responsibilities

- Identify and train a minimum of four residents from the community of Ione with the Basic Wildland Firefighter Training course.
- Station a pick-up truck and a one-piece, slip-on, 100 to 200-gallon pump and tank unit with hose and hose reel in Ione. This equipment, fitted properly for the size and weight of the truck, can be used by the trained residents to provide initial attack on wildfires threatening the community.

Table 11-2 Ione 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	1	/5
5. Street Signs	5	/5
6. Address Signs	5	/5
7. Utilities	3	/5

C. Construction Materials

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

E. Suppression Capabilities

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

TALLIES

18 Total Houses **3 Residential Streets**

B5. Street Signs

3 not visible | 0 visible | 0% visible

B6. Address Signs

18 not visible | 0 visible | 0% visible

C1. Roofs

10 combust | 8 not combust | 44% not combust

C2. Siding

10 combust | 8 not combust | 44% not combust

C3. Unenclosed Structures on Lot

1 not enclosed | 17 enclosed | 6% not enclosed

D1. Lot Sizes

14 <1ac | 4 >1ac <10ac | 0 >10ac

D2. Defensible Space

5 not adequat | 13 adequate | 72% adequate

Score **97** /128

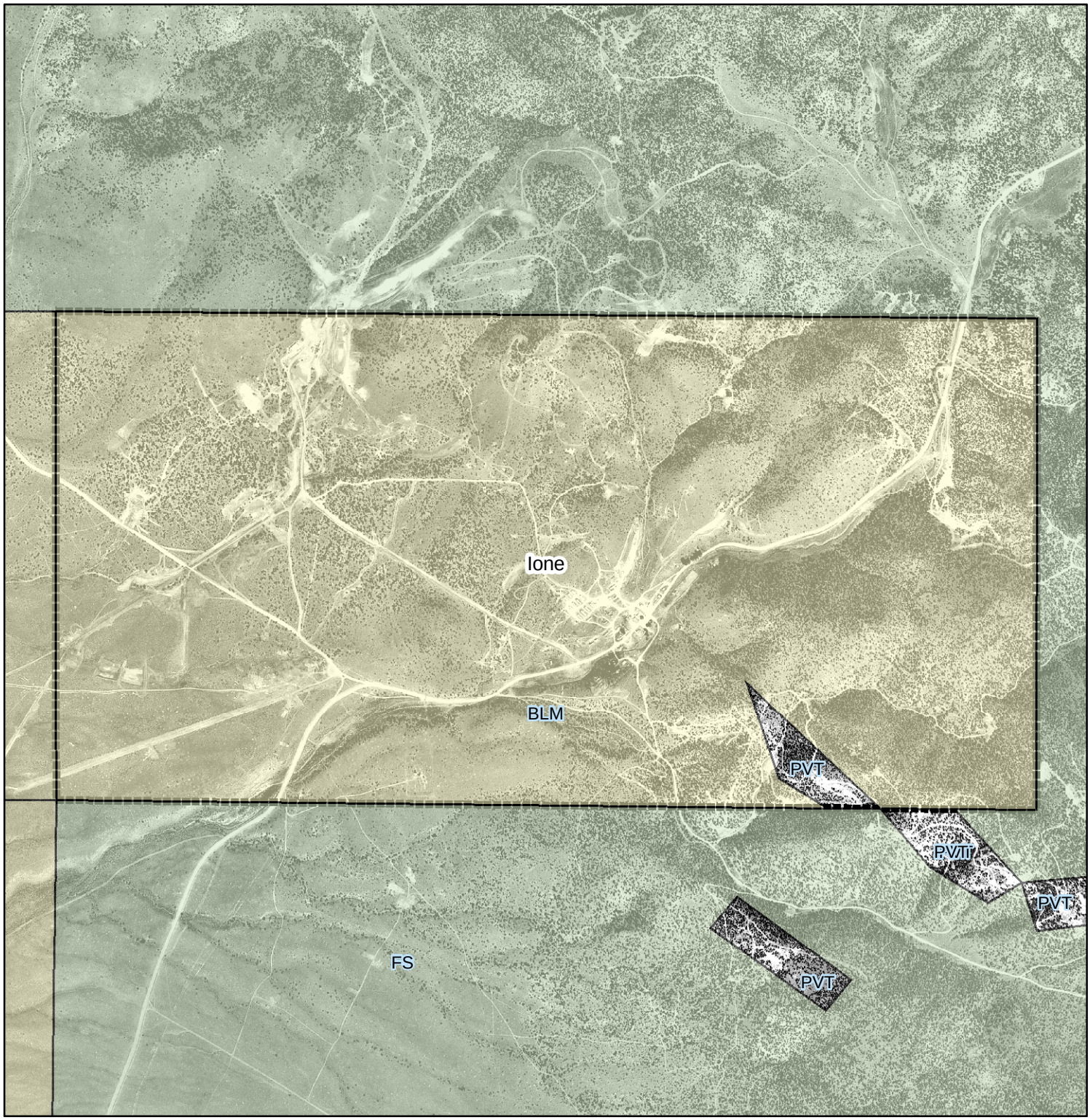


Figure 11-1. Ione
Land Ownership

N
W E
S

Legend

Community Boundary

Land Ownership

Bureau of Land Management (BLM)

Forest Service (FS)

Private (PVT)

0 1,000 2,000 4,000
Feet

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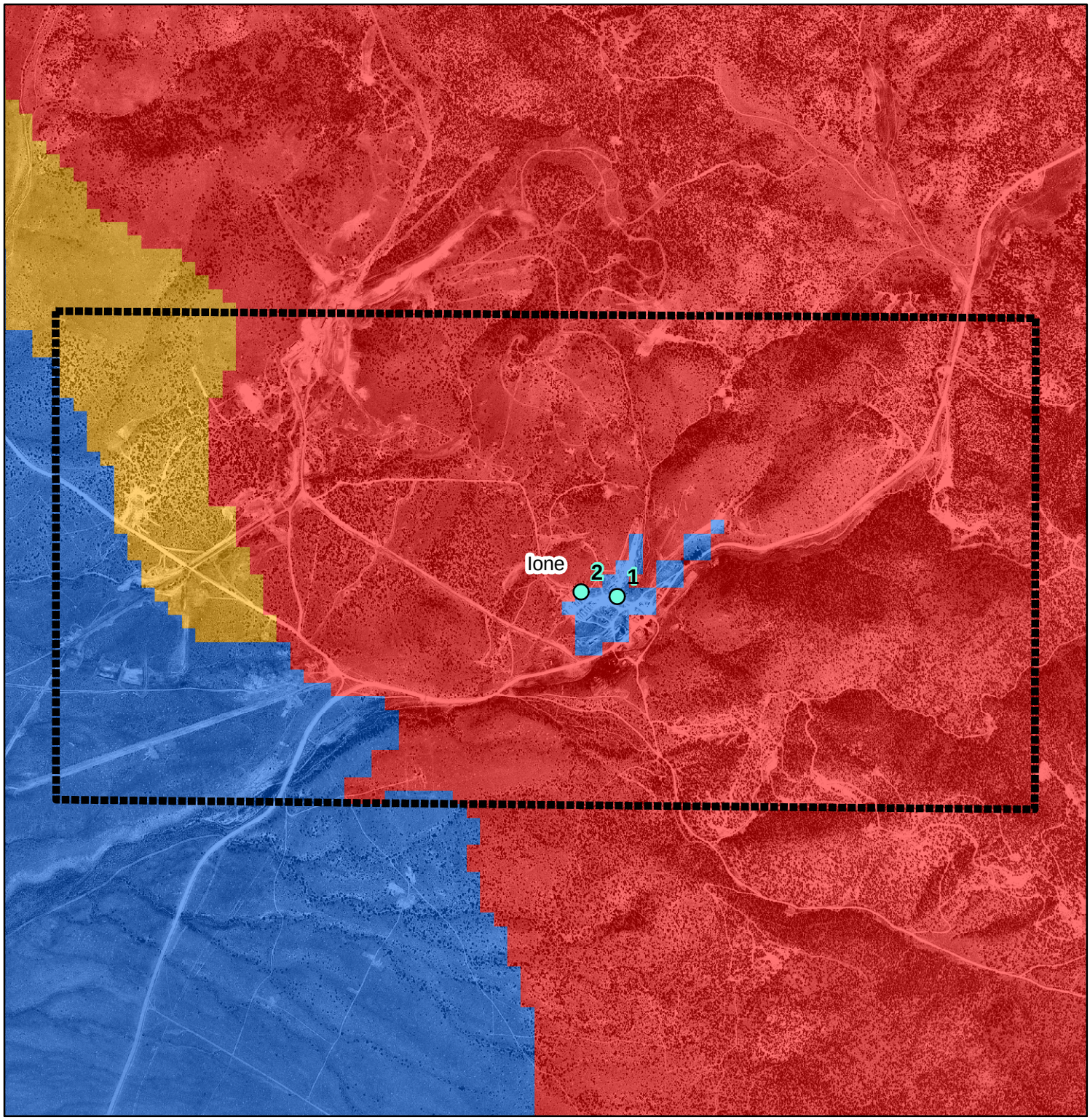
340 N. Minnesota St.
Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project



Legend

Community Boundary

Fuel Hazard

Extreme

High

Moderate

Low

Fuel Photo Point

Figure 11-2. Ione
Fuel Hazard Classification

N
W E
S

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

Figure 11-3. Ione Fuel Hazard Photo Points

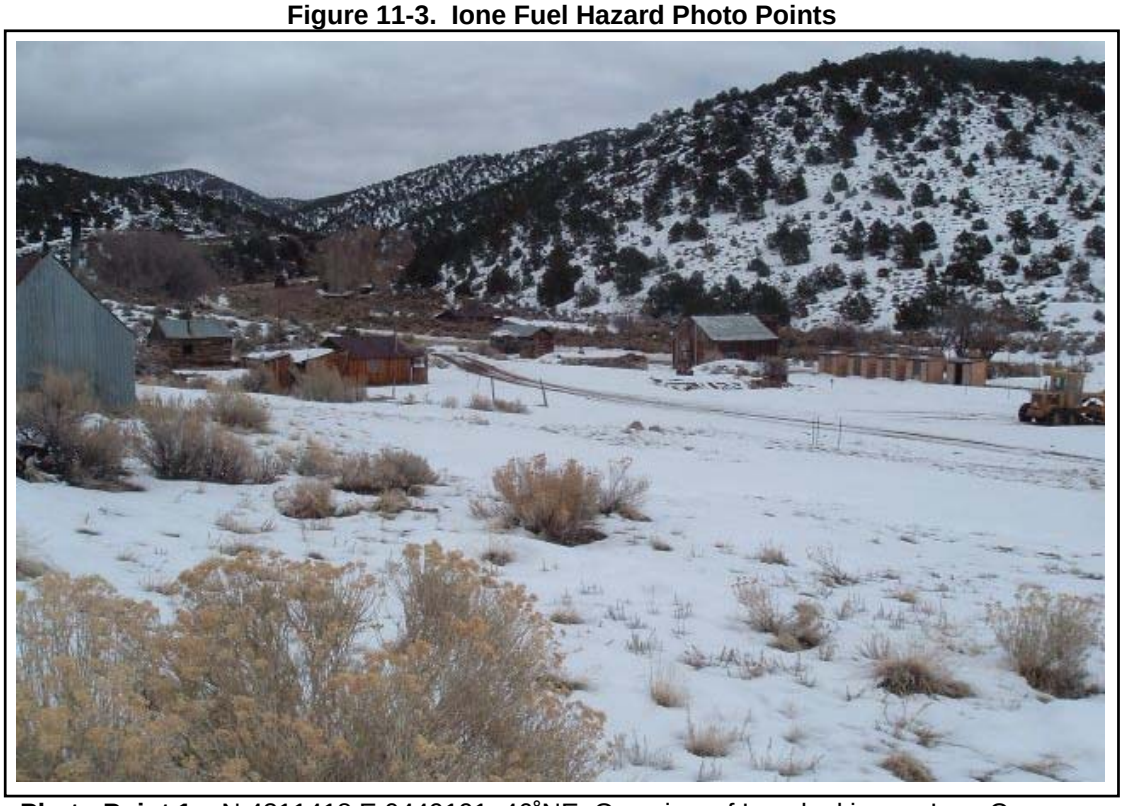


Photo Point 1 – N 4311418 E 0449191 46˚NE. Overview of Ione looking up Ione Canyon. Aggressive establishment of defensible space is needed to protect buildings from the moderate fuels in the immediate vicinity and the extreme fuels present on the surrounding hillsides.

Photo Point 2 –N 4311433 E 0449072 319˚NW. Ione is characterized with heavy fuels surrounding the community. The vegetative fuel load associated with the sagebrush dominant vegetation was estimated at two to five tons per acre and was considered a moderate to high fuel hazard. The pinyon and juniper dominated sites were considered an extreme fuel hazard.

Ione Wildland-Urban Interface Project
FIRE DEFENSE SYSTEM

"Draft"
04/25/03

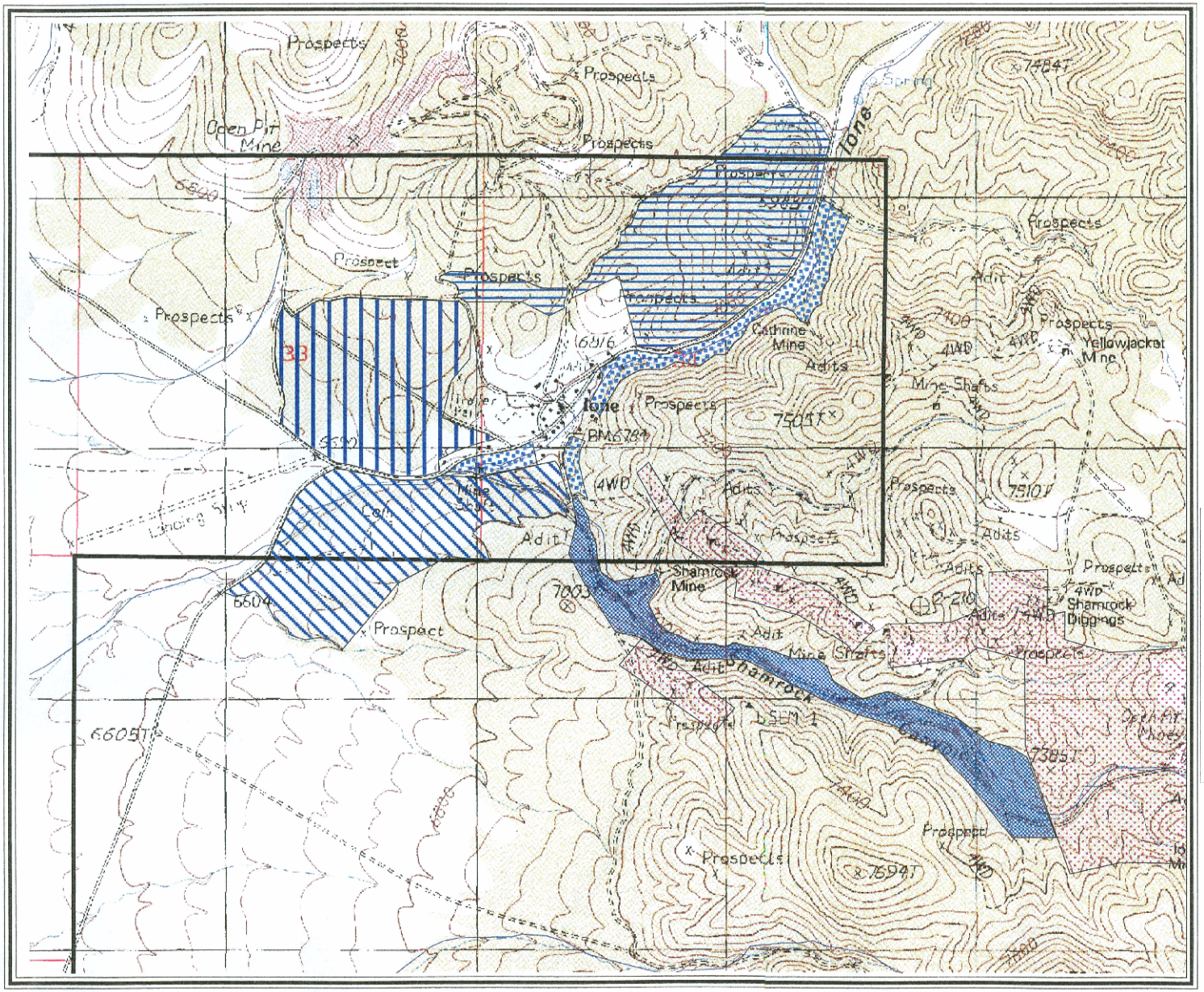


Figure 11-4. Ione
BLM and USFS
Planned Mitigation Projects

source: Battle Mountain Field Office
Site Assessment 2824-DDJF21

LEGEND

- West_Ione_Unit: 114.6 acres
- South_Ione_Unit: 119.3 acres
- Shamrock_Cyn_Unit: 73.2
- North_Ione_Unit: 136.7 ac
- Fsbndry24k
- 60distIndownr.shp
- Bmdohydro100bf.shp
- Tall_Sage_Unit: 38.3 acres
- 1202_points_by_comp.shp

N
W E
S

12.0 MANHATTAN

12.1 RISK AND HAZARD ASSESSMENT

Manhattan is an old mining community situated at 7,000 feet in elevation at the south end and west side of the Toquima Range in northern Nye County. The town population is estimated at 135 people. The assessment resulted in classifying Manhattan in the **Extreme Community Hazard** category (80 points). The fire hazard rating was primarily attributed to limited access, inadequate defensible space, and potential for extreme fire behavior based on heavy fuels, steep topography, and west facing slopes. A summary of the values that contribute to this hazard rating is included in Table 12-2.

12.1.1 Community Design

Manhattan is characterized as an intermix wildland-urban interface condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, buildings, and open space throughout the community. All but five of the 58 houses observed were on parcels between one and ten acres in size; five parcels were less than one acre in size (Figure 12-1).

Roads: The only access into the community is State Route 377, which becomes Main Street. This dirt road is between twenty and 24 feet wide. Many of the roads in the community are steeper than a five percent grade, although the majority of the roads have adequate turnaround space for fire suppression equipment.

Signage: The one primary street in town had a clearly visible sign. All but one of the 58 homes had clear address signs. Clear and visible signage is important to assist fire suppression personnel locate residences during poor visibility conditions that may occur during a wildland fire.

Utilities: All of the utilities were above ground. The majority of the power line corridors had been properly maintained to minimize wildfire damage to electric utilities and reduce the possibility that sparks created by electric utilities would start a fire in adjacent vegetation.

12.1.2 Construction Materials

Eighty-four percent of the currently inhabited homes observed in the interface area were built with ignition resistant, treated, wood siding materials. All but two of the homes had fire resistant roofing materials such as composition roofing, metal, or tile. Many old, abandoned buildings with tarpaper roofs are scattered throughout the community. Thirty eight percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where firebrands can accumulate, smolder, and ignite, rapidly spreading fire to the home.

12.1.3 Defensible Space

Few of the homes observed (28 percent) met the minimum recommended defensible space guidelines for landscaping to help protect the home from damage or loss during a wildfire.

12.1.4 Suppression Capabilities

Wildfire Protection Resources

The Manhattan Volunteer Fire Department reported one fire station staffed by 25 volunteers. Table 12-1 lists the types of wildfire resources, cooperating partners, and equipment available to Manhattan in the event of a reported wildland fire. In addition to the current equipment, in 2004 the Nye County Commissioners approved the purchase of a four-wheel drive emergency vehicle equipped with a 2,000-gallon water tank and a 1,000 gpm pump for the Manhattan Volunteer Fire Department.

Table 12-1. Resources Available to Manhattan for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Brush Truck Type 2 Engine Type 3 Engine	1 1 1	Manhattan Volunteer Fire Department (Manhattan)
Type 1 Engine Type 6 Brush Truck	1 1	Round Mountain Volunteer Fire Department (Hadley)
Water Tender	1	Smoky Valley Volunteer Fire Department (Carvers)

Source: Personal conversation with Chief Dennis Floto, Manhattan VFD, (June, 29 2004)

Additional resources are available through fire departments in Hadley and Tonopah, dispatched through the Nye County Sheriff Department, and the Nevada Division of Forestry Tonopah Conservation Camp, as dispatched through the Sierra Front Interagency Dispatch Center. The Bureau of Land Management and US Forest Service resources are dispatched through the Central Nevada Interagency Dispatch Center. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

There are fire hydrants scattered throughout the community but not all structures were protected. The hydrants are fed by a 36,000-gallon water storage tank. Gravity and electric pumps power the water system but do not meet the 500-gallon per minute flow rate described in the Uniform Fire Code. No backup generator was available for the well pumps at the time of the interview.

Detection and Communication

Fires are reported by calling 911. Fires are communicated to fire response personnel through the use of radios and pagers by the Nye County Sheriff Department in Tonopah. Manhattan also has a community siren.

The radio frequency is compatible with neighboring agencies and the fire department has access to state mutual aid frequencies. Many gaps in radio coverage were reported throughout the area due to the steep terrain.

Fire Protection Personnel Qualifications

Nye County Emergency Services provided training to the volunteer firefighters. The training focused on structure protection and touched on wildland fire suppression.

Work Load

The Manhattan Volunteer Fire Department responded to one wildland/brush fire in 2003.

Financial Support

Financial support for the Manhattan Volunteer Fire Department comes from the Nye County General Fund and the Manhattan Volunteer Fire Department annual fundraiser.

Community Preparedness

The Nye County Local Emergency Planning Committee maintains an Emergency Plan for hazardous materials and an All Risk County Plan. The Nye County Sheriff Department has an evacuation plan for disasters.

Manhattan formed a chapter of the Nevada Fire Safe Council in April 2003. Through the establishment of a local chapter, Manhattan obtained access to information and funding to implement a fuelbreak on approximately twenty acres of private land to the south of the community. The successful completion of this project has provided a model for cooperative projects involving private and federal lands (B. Bottom, pers. comm., December 1, 2004).

12.1.5 Factors Affecting Fire Behavior

Vegetation, dead and down fuels, and topographic features contribute to the potential fire hazard in the wildland-urban interface. Manhattan lies in a narrow canyon with steep slopes on each side, ranging between twenty and thirty percent. The predominant aspect is to the south. North winds associated with passing cold fronts or thunderstorm activity are common, particularly in the summer afternoons. Prevailing wind exposure and ladder fuels may inhibit effective suppression efforts.

Moderate to heavy fuels ranging from six to thirty tons per acre surround the town. The overall interface fuel hazard condition was rated as high to extreme. (See Figures 12-2 and 12-3). The fuels are composed of pinyon and juniper with a shrub understory of rabbitbrush, bitterbrush, and sagebrush. Shrubs are typically two to four feet tall. Ground fuels include cheatgrass and perennial grasses. Continuous dense fuels in close proximity to structures, numerous old wooden structures (many of which are abandoned) and inadequate defensible space constitute a serious fuel hazard in Manhattan.

12.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would begin during an above normal precipitation year with above normal grass production. A fire started in the late afternoon located west to southwest of the community could be pushed by strong winds up the canyon through heavy fuels. There is a high potential for extreme fire behavior due to steep slopes, poor defensible space, and many old wooden structures. Long range spotting of up to one-quarter mile could occur creating multiple fire fronts. Flame lengths of six to twenty feet with rates of spread of thirty to 75 feet per minute could be expected. There are limited suppression resources within the community and additional suppression resources are a minimum of thirty minutes away. Fire could easily escape initial attack.

12.1.7 Ignition Risk Assessment

Manhattan has a high risk of ignition due to heavy fuels within the community. The primary ignition sources are lightning and off-road vehicles. Two fire ignitions were recorded within six miles of Manhattan, the five-acre Peavine fire in 1985 and another small fire in 1992.

12.2 PREVIOUS SITE ASSESSMENT SUMMARY

The Bureau of Land Management conducted a community assessment of Manhattan in October 2002 and completed an environmental assessment in November 2003. The BLM recommended shaded fuelbreaks on 487 acres of public and national forest and lands (D. Walker, pers. comm. 2 December 2004). Implementation of this interagency effort was initiated during the summer of 2004.

Treatments focused on removing dead and diseased trees in the project areas, with final tree spacing projected to be approximately thirty feet between crowns. Additionally, trees were being limbed to three feet above the ground. These treatments were reported to be underway in a 200-foot wide corridor along Pipe Spring Road and on approximately 83 acres in the Pipe Springs Unit (B. Bottom, pers. comm. 01 Dec 2004). During phase II, which is projected to follow the tree thinning and pruning, shrubs greater than one foot in height within ten feet of the tree canopies will be reduced to one foot in height or less. Treatment areas are shown in Figure 12-4.

In addition to these interagency efforts, in 2001 a fuelbreak was constructed on approximately twenty acres of private land to the south of the community using matching funds from the landowner and the Nevada Fire Safe Council.

12.3 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The following risk and hazard reduction recommendations for Manhattan address the primary concern regarding defensible space. Other recommendations pertain to community coordination and public education efforts that could be initiated to improve fire safety in Manhattan.

12.3.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel

type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed set, or treated with an application of a pre-emergent herbicide. Prescribed treatments may need to be repeated for several years to ensure that the bank of unwanted annual plants 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 around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space area.
- Store lumber, firewood, and other flammable materials a minimum distance of thirty feet from structures.
- Install spark arrestors on chimneys.
- Maintain the area beneath wood decks and porches free of weeds and flammable debris. Enclose these areas where possible.
- If a resident decides to keep some pinyon or juniper trees near the home for aesthetic reasons, no other native trees or ladder fuels should be within a minimum of thirty feet of the crown of the tree.
- Trim tree limbs to a height of four feet above the ground (but not more than one-third of the tree canopy). Pinyon pines should be thinned to a spacing of one and one-half times the height of the trees from the edge of the tree crowns.
- Prune tree branches to at least fifteen feet from chimneys, walls, and roofs of structures.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.
- Mow or remove brush, weeds, and other flammable vegetation growing against wood fences in the community.
- Replace wood roofs with non-combustible roofing materials such as composite shingles or metal.

12.3.2 Fuel Reduction

Fuel reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of a land to one of lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Property Owner Responsibilities

- Remove brush and trees within twenty feet of each sides of private driveways longer than 200 feet. Replace flammable fuels with fire-resistant species such as crested wheatgrass or an approved pre-suppression seed mix. Refer to Appendix E for approved seed mixes, planning guidelines, and seed sources.

Manhattan Volunteer Fire Department Responsibilities

- Mow or otherwise remove all vegetation within ten feet of all fire hydrants to improve visibility and access for fire personnel.

Utility Company Responsibilities

- Remove rather than prune trees in the power line right-of-ways.
- Clear vegetation and maintain a space of no less than fifteen feet around utility poles.

BLM and USFS Responsibilities

- Continue implementation of fuel reduction treatments as described in the BLM site assessment and environmental assessment.

12.3.3 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire.

Manhattan VFD Responsibilities

- Participate annually with the Bureau of Land Management and the US Forest Service to discuss pre-attack plans for the community.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.
- Work with the County to upgrade the repeater system and improve radio communications with Nye County Sheriff's dispatch.

Nye County and Manhattan VFD Responsibilities

- Prepare an evacuation plan and post, or otherwise distribute this plan to residents. This plan should include information regarding evacuation routes, evacuation procedures, designated fire safe zones, and procedures for

sheltering in place in case evacuation becomes infeasible during a fast moving firestorm.

Property Owner Responsibilities

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

12.3.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Manhattan VFD Responsibilities

- Contact the BLM Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with programs for 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.

12.3.5 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community. The volunteer fire department needs brush training and equipment to safely do their job.

Manhattan VFD Responsibilities

- Seek funding to provide personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Coordinate with the Bureau of Land Management and US Forest Service to ensure that radio frequencies and radios are compatible in order to maintain communications during wildland fire incidents.
- Continue to provide basic wildland firefighter training through annual attendance at a BLM Wildland Firefighter Training for volunteer firefighters or other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.

Nye County Responsibilities

- Upgrade the repeater system to improve radio communications between Nye County Sheriff's Dispatch and the Manhattan Volunteer Fire Department.
- Assist the Volunteer Fire Department in securing grants to obtain wildland firefighting equipment.

Table 12-2 Manhattan 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	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	3	/5
2. Defensible Space	15	/15

F. Fire Behavior

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

E. Suppression Capabilities

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

TALLIES

58 Total Houses **1 Residential Streets**

B5. Street Signs

0 not visible | 1 visible | 100% visible

B6. Address Signs

1 not visible | 57 visible | 98% visible

C1. Roofs

2 combust | 56 not combust | 97% not combust

C2. Siding

9 combust | 49 not combust | 84% not combust

C3. Unenclosed Structures on Lot

22 not enclosed | 36 enclosed | 38% not enclosed

D1. Lot Sizes

5 <1ac | 53 >1ac <10ac | 0 >10ac

D2. Defensible Space

42 not adequat | 16 adequate | 28% adequate

Score **80** /128

Figure 12-1. Manhattan
Suppression Resources

N
W E
S

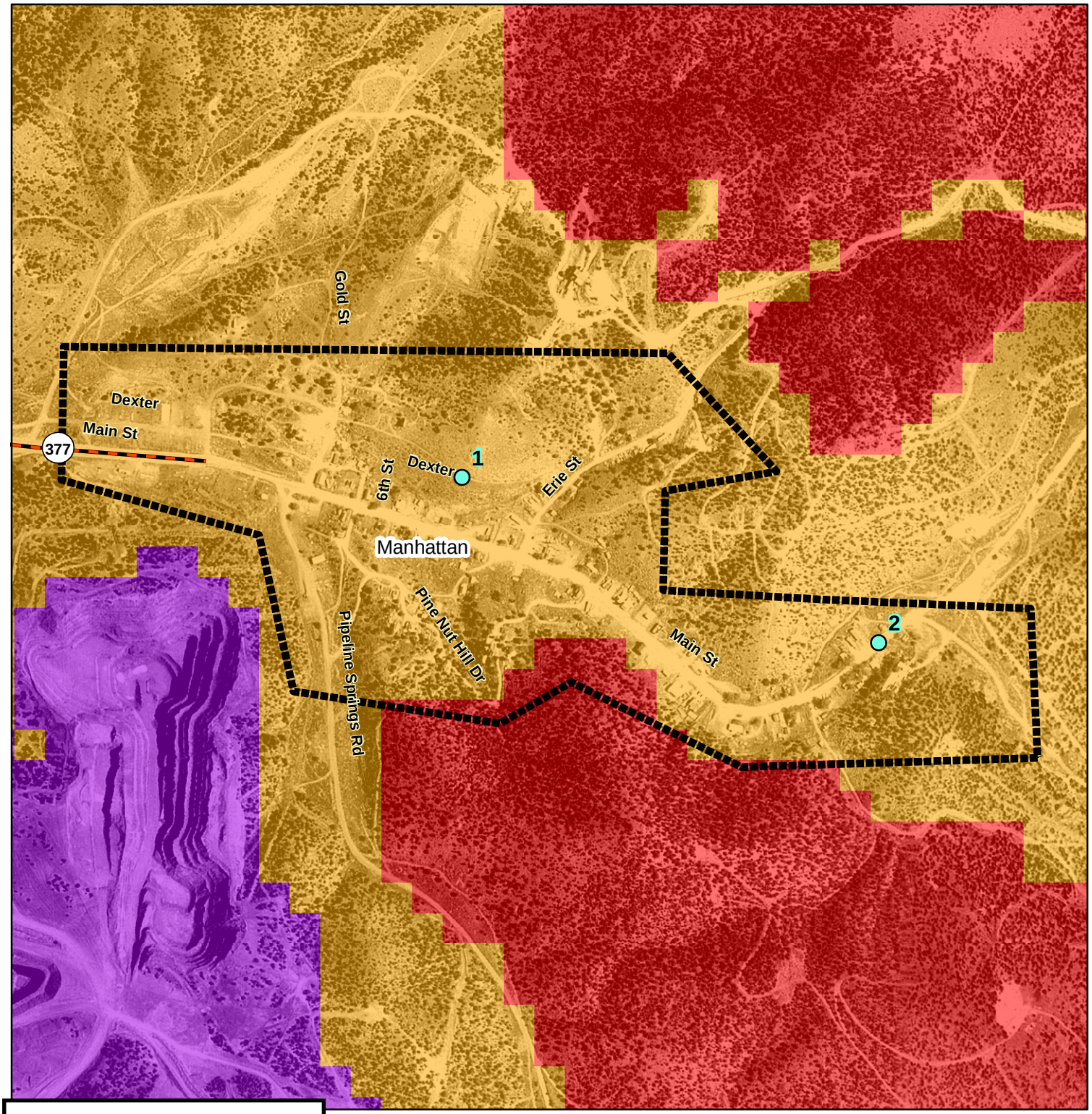
Legend

- Community Boundary
- Fire Station
- Highways and State Routes

0 250 500 1,000
Feet

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

Nevada Community Wildfire Risk / Hazard Assessment Project



Legend

- Community Boundary
- Highways and State Routes

Fuel Hazard

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

Figure 12-2. Manhattan
Fuel Hazard Classification

N
W E
S

0 250 500 1,000
Feet

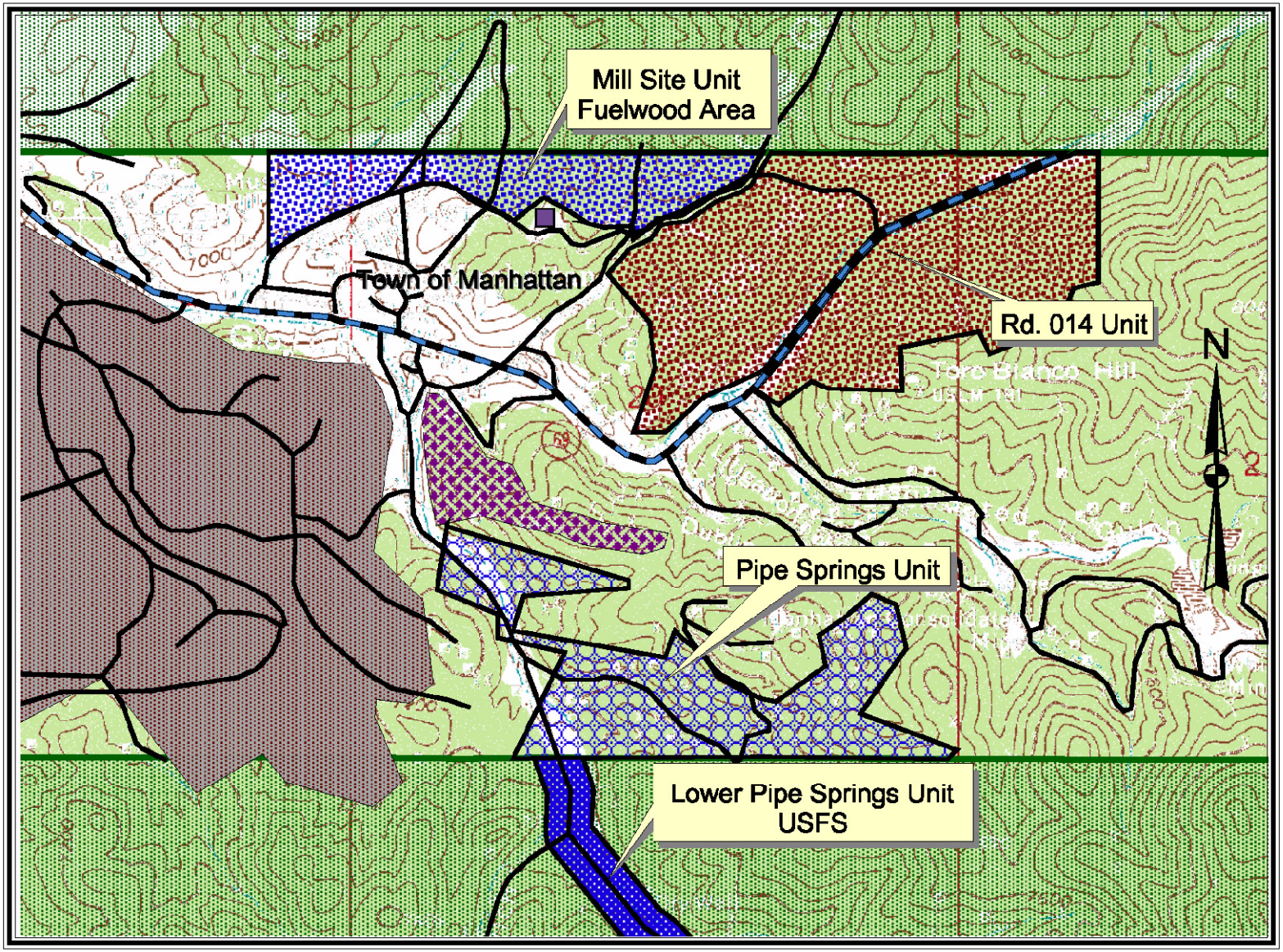
Resource Concepts, Inc.
340 N. Minnesota St.
Carson City, NV 89703
(775)-883-1600

Nevada Community Wildfire Risk / Hazard Assessment Project

Figure 12-3. Manhattan Fuel Hazard Photo Points

Photo Point 1 –N 4265626 E 493710 130˚SE. Pinyon and juniper vegetation dominates the hillsides around the community. Vegetative fuel loads were estimated at eight tons per acre for high hazard sagebrush and rabbitbrush fuel types and approximately thirty tons per acre in the extreme hazard pinyon and juniper fuel type.

Photo Point 2 – N 4265385 E 494317 170˚SSE. In many cases, a minimum of 100 to 200-feet of vegetation clearance is needed to create the defensible space appropriate for protecting structures in Manhattan.



Created (07/20/04) by (BMFO)

NV Fire Safe Council
Manhattan Chapter

Figure 12-4. Manhattan BLM and USFS Planned Mitigation Projects

source: Wildland Urban Interface Fire Defense System for Manhattan, Nevada

Environmental Assessment NV-064-EA-03-50

BLM Battle Mountain Field Office

United States Department of the Interior
Bureau of Land Management
Battle Mountain Field Office
50 Bastian Road
Battle Mountain, NV 89820

0.5 0 0.5 1 Miles

Legend:
- Manhattan Mill-Site
- 377/ F.S. Rd. 014
- Road
- Lower Pipe Springs Unit: 203 acres
- Pipe Springs Unit: 82.8 acres
- Rd. 14 Unit: 155.7 acres
- Mill Site Unit: 48.4 acres
- Fire Safe Project: 20 acres
- Natural Barrier
- Forest/BLM Boundary

Manhattan Wildland-Urban Interface Project
FIRE DEFENSE SYSTEM

13.0 PAHRUMP

13.1 RISK AND HAZARD ASSESSMENT

Pahrump is located at 2,650 feet in elevation in a flat valley at the extreme south end of Nye County. The community of 29,000 people is adjacent to Clark County at the junction of State Route 160 and 372. The Pahrump risk/hazard assessment resulted in placing Pahrump in the **Low Community Hazard** category (34 points). The low hazard rating was primarily attributed to good access, low fuel density, flat topography, and ignition resistant construction materials. A summary of the values that contribute to the community hazard rating is included in Table 13-2.

13.1.1 Community Design

Pahrump is characterized as an intermix wildland-urban interface condition: structures are scattered throughout the wildland area with no clear line of demarcation between wildland fuels, the buildings, and open space throughout the community. Ninety percent of the 1,674 homes observed in the interface area were on lots between one and ten acres in size. The remainder of the homes were on lots less than one acre in size (Figure 13-1).

Roads: State Route 160 and 372 are the primary access roads into the community. These roads are paved and are at least 24 feet wide. The secondary road grades are less than five percent and have adequate turnaround space for fire suppression equipment.

Signage: Street signs were visible on 89 percent of the 74 residential streets assessed and addresses were visible on 74 percent of the homes. Clear and visible signage is important to assist fire suppression personnel locate residences during poor visibility conditions that may occur during a wildland fire.

Utilities: Utilities were both above and below ground. Powerline transformers posed a ignition risk because some of the power line corridors had not been properly maintained.

13.1.2 Construction Materials

Ninety-nine percent of the homes observed in the interface area were built with ignition resistant siding and roofing materials. Most homes were built with stucco, block, or ignition-resistant wood siding materials. Fire resistant roofing materials such as composition roofing, metal, or tile were prevalent. Ten percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that can create drafty areas where firebrands could accumulate, smolder, and ignite, rapidly spreading fire to the home.

13.1.3 Defensible Space

The majority of the homes (86 percent) met the minimum recommended defensible space guidelines to help protect the home from damage and minimize the potential for loss during a wildfire. However, there are the homes located near several large patches of heavy vegetation within the community that lacked the required defensible space.

13.1.4 Suppression Capabilities

Wildfire Protection Resources

The Pahrump Valley Fire Department is a combination career and volunteer department with 22 career positions. A total of 22 volunteers were reported at the time of the assessment. Seven career firefighters are on duty each day. Four fire stations were reported, one of which is regularly staffed; the other three fire stations house equipment.

Table 13-1 lists the types of wildfire resources, cooperating partners, and equipment available to Pahrump in the event of a reported wildland fire.

Table 13-1. Resources Available to Pahrump for Initial Attack of Wildland Fires

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 4 Engine	2	Pahrump Fire Department (Pahrump)
Type 3 Engine	1	
Type 1 Engine	1	
Water Tender (3,500 gallon)	3	
Command Vehicle	1	
Type 3 Engine	1	US Forest Service (Pahrump Fire Dept. Station #3)
Type 6 Engine	1	

Source: Personal conversation with Fire Chief Scott Lewis, Pahrump FD (June, 29 2004; January 7, 2005).

Additional resources are available through the Clark County Fire Department, the Amargosa Volunteer Fire Department, as well as the Bureau of Land Management and the US Fish and Wildlife Service in Ash Meadows dispatched from the Las Vegas Interagency Communication Center. Fire crews from the Nevada Division of Forestry Tonopah Conservation Camp are dispatched from the Sierra Front Interagency Dispatch Center in Minden. It is important to note that the actual number and type of suppression resources available to respond from neighboring fire departments and agencies is dependent upon the resources on hand at the time of the wildland fire call.

Water Sources and Infrastructure

Water availability for fire suppression in Pahrump includes:

- Community wells.
- 500 gpm hydrants within 1,000 feet of structures in the main section of the community.
- Water storage tanks totaling one million gallons.
- Commercial buildings are required to have 10,000 gallon tanks on-site.
- Fire Department had a total of three water tenders 3,500 gallon each.
- There are several ponds in the area that may be available as draft sources with landowner permission.

Water sources were within a twenty minute or less round trip turn-around for most of the community. The community water system operates on gravity and electrical pumps. There is no backup emergency generator to run the pumps.

Detection and Communication

Fires are reported in the Pahrump area by calling 911 and are communicated to fire response personnel through the Nye County Sheriff Dispatch in Pahrump by using radios and pagers. Not all Pahrump fire radios are compatible with neighboring agencies but can be contacted through state mutual aid frequencies.

Fire Protection Personnel Qualifications

At the time of this report, approximately 75 percent of the volunteer firefighters had been trained to National Fire Protection Administration Firefighter 1 standards. Wildland firefighter training was scheduled for July of 2004 and is conducted annually.

Work Load

The Pahrump Fire Department responded to 6,663 calls in 2003; fifty were wildland / brush fire calls.

Financial Support

Financial support for the Pahrump Fire Department comes primarily from the Pahrump General Fund.

Community Preparedness

Nye County has an active Local Emergency Planning Committee and has adopted an emergency plan, a disaster plan, and an emergency evacuation plan. Pahrump maintains an emergency plan specifically for Pahrump Valley. The Pahrump Fire Department is currently working on formal mutual aid agreements with other local fire agencies.

13.1.5 Factors Affecting Fire Behavior

Rapid growth in Pahrump has resulted in dispersed development in town. The predominant vegetation types around Pahrump include creosote-bursage-shadscale associations and Spinescale, saltbush-fourwing, saltbush-shadscale associations with fuel loads ranging between one and three tons per acre. Inclusions of mesquite, up to twenty feet tall, were also observed near the community. Salt cedar (tamarisk) occurred in large thick patches within the community ranging between twenty and thirty feet in height. Ground fuels consisted of sparse red brome and Russian thistle. The overall interface fuel hazard condition was recorded as a low hazard.

High winds are typically from the south/southwest but can blow from any direction across the flat valley, particularly on summer afternoons. The terrain around Pahrump is generally flat with no topographic features that increase the community's fire hazard rating.

13.1.6 Fire Behavior Worst-case Scenario

Fuels surrounding the community were generally sparse and would not likely pose a threat to the community. However, a fire started in the heavy mesquite and salt cedar fuels within the community could threaten homes. A fire ignition in the community would be most critical on a high hazard day with the wind blowing over 25 mph in any direction, most likely from the south.

13.1.7 Ignition Risk

The fire history around Pahrump indicates a moderate potential for fire ignition within the community, primarily from human risks. Possible ignition sources include campfires, and arson. Fireworks have been identified as a particular concern in spite of county ordinances prohibiting them, because of their availability in Pahrump at the height of fire season.

13.2 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Pahrump risk and hazard reduction recommendations address the primary concern regarding heavy fuels within the community. Other recommendations pertain to community coordination and public education efforts that could be initiated to enhance fire safety in Pahrump.

13.2.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Where cheatgrass has become dominant within the defensible space zone, areas should be mowed prior to seed set, or treated with an application of a pre-emergent herbicide. Prescribed treatments may need to be repeated for several years to ensure that the bank of unwanted annual plants 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 around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.
- Store lumber, firewood, and other flammable materials a minimum distance of thirty feet from structures.
- Remove or properly enclose trailers and buildings that have been abandoned to prevent unwanted ignition from sparks or firebrands.
- Mow or remove brush, weeds, and other flammable vegetation growing against fences that adjoin structures in the community.
- Maintain the area beneath unenclosed wood decks and porches free of weeds and flammable debris.
- Where homes are located adjacent to dense stands of mesquite and salt cedar, thin the tall brush and trees to a spacing equivalent to one and one-half times the height of the taller trees from crown to crown within a distance of 100 feet from the home and other structures.
- Prune tree branches to at least fifteen feet from chimneys, walls, and roofs of structures.

13.2.2 Community Coordination

Coordination among local, state, and federal fire suppression agencies is important in the day-to-day fire prevention activities and becomes critical in the event of a wildland fire. During a fire event, firefighters from other communities and states may be dispatched to areas they have never been before. This is particularly true in areas that have limited fire suppression resources and will most likely be dependent on an outside agency in the event of a catastrophic wildland fire.

Property Owner Responsibilities

- Form a local chapter of the Nevada Fire Safe Council. The Nevada Fire Safe Council proposes to work on solutions that reduce the risk of loss of lives and property from wildfires in Nevada's communities. Through the establishment of a local Chapter, communities become part of a large information-sharing network that receives notifications 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 provides assistance and support to communities to complete fire safe plans, set priorities, educate and train community members, and promote success stories of its members. For more information on forming a chapter, contact;

  The Nevada Fire Safe Council
  1187 Charles Drive
  Reno, Nevada 89509
  (775) 322-2413
  www.nvfsc.org

- Ensure that residential addresses are 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. Improving the visibility of

addresses will facilitate the navigation of unfamiliar neighborhoods for rescue and suppression personnel during a wildfire.

Pahrump Fire Department Responsibilities

- Provide courtesy inspections of residential defensible space measures.
- Participate annually with the Bureau of Land Management and US Forest Service to discuss pre-attack plans for the community.
- Provide pre-attack plans, including maps of water sources, staging areas, safety zones, etc. to outside agencies that respond to a wildfire event.

Nye County Responsibilities

- Continue to coordinate debris and agricultural burning through the Nye County Sheriff's dispatch.
- Promote collaboration between the Assessor's Office and the Roads Department to ensure that all new development roads are named, mapped, signed, and identified with GPS coordinates.
- County Commissions and Rural Planning Commissions should require that all future development in Pahrump meet the National Fire Codes with regards to community design aspects: building construction and spacing, road construction and design, water supply, and emergency access. Refer to Appendix F an example of fire safe recommendations for planning in new developments.

13.2.3 Fuel Reduction

Fuels reduction treatments are applied on a larger scale than defensible space treatments. By permanently changing the fuel structure over large blocks of land to one of a lower volume or reduced flammability with a fuel reduction treatment, the expected result in the event of a catastrophic wildfire would be one of reduced capacity for uncontrolled spread through the treated area.

Pahrump Fire Department Responsibilities

- Remove or mow vegetation within ten feet of all fire hydrants to improve visibility and access to fire personnel.
- Promote an ongoing program for cleaning weeds and debris from around structures and fences in the community.

Nye County Responsibilities

- Where community roads intersect areas of heavy brush or thick salt cedar (tamarisk), clear and maintain the area within twenty feet of the road edges of vegetation by mowing to a height of four inches to reduce fuel hazards and improve access safety.

Utility Company Responsibilities

- Maintain a defensible space that is clear of all vegetation a minimum of thirty feet from the fence lines of all electrical transfer stations. Maintenance is

important to minimize wildfire damage to electric utilities and reduce the possibility that sparks created by electric utilities will start a fire in adjacent vegetation.

- Clear a space of no less than fifteen feet from transformers within power line corridors and maintain it free of accumulated vegetation.
- Clear salt cedar (tamarisk) branches within fifteen feet of power lines and transformers.

13.2.4 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Pahrump Fire Department Responsibilities

- Contact the Bureau of Land Management Las Vegas Field Office and the University of Nevada Cooperative Extension for assistance with programs for 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.

13.2.5 Equipment and Training

Pahrump Fire Department Responsibilities

- Continue to provide basic firefighter training through annual attendance at a BLM of USFS wild Firefighter Training for Volunteer Firefighters or other training opportunities.
- Ensure that wildland fire training and equipment conforms to the national Wildfire coordinating Group 310-1 standards.

Table 13-2 Pahrump 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	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	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	3	/10

TALLIES

1674 Total Houses **132 Residential Streets**

B5. Street Signs

8 not visible | 124 visible | 94% visible

B6. Address Signs

441 not visible | 1233 visible | 74% visible

C1. Roofs

17 combust | 1657 not combust | 99% not combust

C2. Siding

17 combust | 1657 not combust | 99% not combust

C3. Unenclosed Structures on Lot

172 not enclosed | 1502 enclosed | 10% not enclosed

D1. Lot Sizes

171 <1ac | 1413 >1ac <10ac | 0 >10ac

D2. Defensible Space

237 not adequat | 1437 adequate | 86% adequate

Score **34** /128

Gann Dr
Linda St
Isola Ln
Parque Rd
Elkhorn Ave
Eva St
Brents St
Harris Farm Rd
Nve Rd
Spencer Rd
Panorama Rd
Simkins Rd
Jarvis Rd
Monument Junipr
Linda St
Stephanie
Gally Rd
Bell Vista Rd
Bunarch Rd
Blagg Rd
Bell Vista Ave
Bonita Rd
Blosser Rd
Mesquite Ave
Tough Girl Rd
David St
Pinto Ln
Royal Ave
Hays St
Mesquite Ave
Nye
Clark
160
Our Rd
Irene St
Kismet St
Black Rd
Grieco Way
Kyle Way
Basin Ave
Wheeler Pass Rd
Warren St
Woodchips Rd
Lola Ln
Mark St
Morgan Rd
Windsong Ln
Horn Rd
Linda St
Lafayette
Frontage
Retread Rd
Barney St
Happy Ln
Buol Ln
Hardy Ln
Murphy St
Red Rock Dr
Pahrump
372
Galaxy St
Ambush St
Winery Rd
Wheeler Pass Rd
China St
Idlewild St
Indole St
Jaybird St
Lexis Ln
Pahrump Valley Blvd
Dandelion St
Oakleaf Ave
Malibou Ave
Rebel Ave
Deerskin St
Rainbow Ave
Gamebird Rd
Gregory St
Yucca Springs Rd
Jeane Ave
Manse Rd
Money St
Clark St
Vicki Ann Rd
Oakridge Ave
Mickey St
Thousandaire Blvd
Fox Ave
Lewis St
Homestead Rd
Mary Lou St
Bridger St
Kellogg Rd
Nye County, Nevada
Inyo County, California
Thorne Dr
Bond St
Bond St
Fuchsia St
Silver St

Legend

- School
- Hospital
- Community Boundary
- Fire Ignition
- Fire Station
- County Boundary
- Highways and State Routes

Figure 13-1. Pahrump
Fire History, Suppression Resources,
and Critical Features

0 1 2 4
Miles

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

14.0 TONOPAH

14.1 RISK AND HAZARD ASSESSMENT

Tonopah is located on the border of Nye and Esmeralda Counties on US Highway 95. The town of 2,400 people is situated at 6,000 feet in elevation in the San Antonio Mountains. The risk/hazard assessment resulted in classifying Tonopah **Low Community Hazard** category (37 points). The hazard rating was primarily attributed to good access, sparse fuels, and ignition resistant building materials. A summary of the values that contribute to this hazard rating is included in Table 14-2.

14.1.1 Community Design

Tonopah is characterized as a wildland-urban interface condition, with a clear line of demarcation between building structures and wildland fuels. Wildland vegetation typically does not continue into the developed areas. Most of the 848 houses observed were on parcels less than one acre in size. Fifty two houses were on parcels between one and ten acres in size (Figure 14-1).

Roads: US Highway 95 is the primary access through the community. This road is at least 24-feet wide. Some of the secondary roads are on grades steeper than five percent but have adequate turnaround space for fire suppression equipment.

Signage: Street signs were visible on approximately 75 percent of the 74 residential streets observed. Addresses were visible on 82 percent of the houses observed. The presence of street signs and clearly visible building addresses are an important aid for fire and emergency responders not familiar with the area.

Utilities: The 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 created by electric utilities will start a fire in adjacent vegetation.

14.1.2 Construction Materials

Ninety four percent of the homes observed in the interface area were built with ignition resistant siding materials. Ninety eight percent of the homes had fire resistant roofing materials such as composition roofing, metal, or tile. Fourteen percent of the homes observed had unenclosed balconies, porches, decks, or other architectural features that could create drafty areas where firebrands can accumulate, smolder, and ignite, rapidly spreading fire to the home.

14.1.3 Defensible Space

Almost all of the homes (99 percent) met the minimum recommended defensible space guidelines to help protect the home from damage or loss during a wildfire.

14.1.4 Suppression Capabilities

Wildfire Protection Resources

At the time of the interview, the Tonopah Volunteer Fire Department was staffed by one paid firefighter and 27 volunteer firefighters of one fire station in Tonopah. Upon retirement of the fire chief, the Tonopah Town Board designated the volunteer fire organization to absorb the chief's duties into the current volunteer staff (R. Elliott, Chief TVFD, October 2004).

Table 14-1 lists the types of wildfire resources, cooperating partners, and equipment available to Tonopah in the event of a reported wildland fire.

Table 14-1. Tonopah Initial Attack Wildfire Suppression Resources

TYPE OF EQUIPMENT	AMOUNT OF EQUIPMENT	COOPERATING PARTNER (RESOURCE LOCATION)
Type 6 Engine	1	Tonopah Volunteer Fire Department
Type I Engine	1	(Tonopah)

Source: Personal conversation with Chief Bruce Woodworth, Tonopah FD (June, 29 2004)

Additional resources are available from Hadley, Mina, Goldfield, or Hawthorne dispatched from the Central Nevada Interagency Dispatch Center. Fire crews from the Nevada Division of Forestry Tonopah Conservation Camp are dispatched from the Sierra Front Interagency Dispatch Center.

Water Sources and Infrastructure

Water availability for fire suppression in Tonopah includes.

- 500 gpm hydrants within 500 feet of structures,
- One million-gallon tank, and
- Three 500,000-gallon tanks.

The water system operates on gravity and electrical pumps. There are backup emergency generators available to run the pumps.

Detection and Communication

Fires are reported in the Tonopah area through.

- Calling 911 to the Nye County Sheriff's Office in Tonopah, and
- A community siren.

Fires are communicated to fire response personnel through the use of radios and pagers through the Nye County Sheriff Dispatch in Tonopah.

The radio frequency is compatible with neighboring agencies and the fire department has access to state mutual aid frequencies. There are some gaps in radio coverage east of the community.

Fire Protection Personnel Qualifications

All of the volunteer firefighters had been trained to State Fire Marshall Firefighter I and II standards and have received basic wildland fire behavior training (S-190).

Work Load

The Tonopah Volunteer Fire Department responded to two wildland/brushfire calls in 2003.

Financial Support

Financial support for the Tonopah Volunteer Fire Department comes from the Tonopah General Fund.

Community Preparedness

Nye County has an active Local Emergency Planning Committee and has adopted an emergency plan, a disaster plan, and an emergency evacuation plan. The Tonopah Volunteer Fire Department maintains a pre-attack plan to respond to fire incidents.

The fire department reviews development plans and sends out annual reminders to residents on fire regulations and suggestions for reducing fire risk.

14.1.5 Factors Affecting Fire Behavior

The south end of the community is situated between Brougher Mountain, Mt. Oddie, Rushton Hill, Golden Mountain, and Heller Butte where the slopes are between eight and twenty percent with varied aspects. The north portion of the community is situated on relatively flat topography with a west aspect. There is no predictable wind direction, winds blow from any direction, anytime of day or season.

Fuels in the area are light to medium, typically less than one ton per acre consisting of greasewood, rabbitbrush, and ephedra. The shrubs are typically one to two feet tall spaced three to five feet apart. Ground fuels consist of cheatgrass, Indian rice grass, halogeton, and salt grass. The overall interface fuel hazard condition was recorded as a low.

14.1.6 Fire Behavior Worst-case Scenario

The worst-case scenario would occur during a year with above normal precipitation and above normal annual grass production. A fire starting northwest of the community could be driven by strong afternoon winds through annual grasses and southward up the wide canyon in which the town lies. The fire would not easily move through the community due to numerous paved streets and dirt roads.

14.1.7 Ignition Risk

Tonopah has a low potential for fire ignition. The primary risks would be lightning, off-road vehicles, and human carelessness. There have been no recorded fire ignitions on public lands within ten miles of Tonopah.

14.2 PREVIOUS SITE ASSESSMENT SUMMARY

The Bureau of Land Management March 2003 assessment describes a low threat of catastrophic wildfire in Tonopah. The BLM recommended the following activities:

- Monitor annual fuel production and move additional resources into the area during years with above normal grass production.
- Train and equip the Tonopah Volunteer Fire Department for wildland suppression.
- Establish an evacuation and contingency plan with the Tonopah Volunteer Fire Department and Nye County Sheriff Department.
- Establish a fire safe community program focusing on defensible space and home protection.

14.3 RISK AND HAZARD REDUCTION RECOMMENDATIONS, ROLES, AND RESPONSIBILITIES

The Tonopah risk and hazard reduction recommendations address the primary concern regarding community coordination and training efforts that could be initiated to enhance fire safety in Tonopah.

14.3.1 Defensible Space Treatments

Defensible space treatments are an essential first line of defense for residential structures. The goal of the treatment is to significantly reduce or remove vegetation within a prescribed distance from structures. (Specific guidelines for defensible space are dependent on fuel type and topography and are given in Appendix E.) Defensible space reduces fire intensity and decreases the potential for loss or damage to structures in the event of an oncoming wildfire.

Property Owner 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, and
  - Green: Existing plants are healthy and green during the fire season.
- Maintain the defensible space condition as needed.
- Immediately remove cleared vegetation to an approved disposal site when implementing defensible space treatments. This material dries quickly and presents a fire hazard if left on site.
- Clear around propane tanks for a minimum distance of ten feet and maintain this area free of accumulated vegetation and combustible materials.
- Remove flammable materials and other debris from the defensible space.
- Store lumber, firewood, and other flammable materials a minimum distance of thirty feet from structures.
- Mow or remove brush, weeds, and other flammable vegetation growing against wood fences in the community.

- Maintain the area beneath unenclosed wood decks and porches free of weeds and flammable debris.

14.3.2 Public Education

Public education focused on increasing community fire safety is critical. A program that explains fire safe measures in clear and emphatic terms will have an impact on residents in the wildland-urban interface. Informed community members will be more inclined to take actions to effectively reduce fuels and other wildfire hazards around their homes and in their neighborhoods.

Tonopah Volunteer Fire Department Responsibilities

- Contact the Bureau of Land Management Battle Mountain Field Office and the University of Nevada Cooperative Extension for assistance with public education programs.
- 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.

14.3.3 Equipment and Training

Resources and training for wildfire is a safety issue for firefighters as well as the community. The volunteer fire department needs brush training and equipment to safely do their job.

Tonopah Volunteer Fire Department Responsibilities/Nye County

- Upgrade personal protection equipment for wildland firefighting. Personal protection equipment includes hard hats, goggles, gloves, fire shelters with cases, and Nomex clothing.
- Obtain wildland firefighting equipment such as Pulaskis, shovels, and McLeods.
- Continue to provide basic wildland firefighter training through annual attendance at a Bureau of Land Management Wildland Firefighter Training for volunteer firefighters or other training opportunities.
- Ensure that wildfire training and equipment conforms to the National Wildfire Coordinating Group 310-1 standards.

Nye County Responsibilities

- Assist the Tonopah VFD and Nye County in acquiring wildfire training and equipment.

Table 14-2 Tonopah 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	3	/3
4. Secondary Road	1	/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	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	4	/10
4. Aspect	1	/10

E. Suppression Capabilities

1. Water Source	1	/10
2. Department	3	/10

TALLIES

848 Total Houses **74 Residential Streets**

B5. Street Signs

21 not visible | 53 visible | 72% visible

B6. Address Signs

149 not visible | 699 visible | 82% visible

C1. Roofs

48 combust | 800 not combust | 94% not combust

C2. Siding

14 combust | 834 not combust | 98% not combust

C3. Unenclosed Structures on Lot

119 not enclosed | 729 enclosed | 14% not enclosed

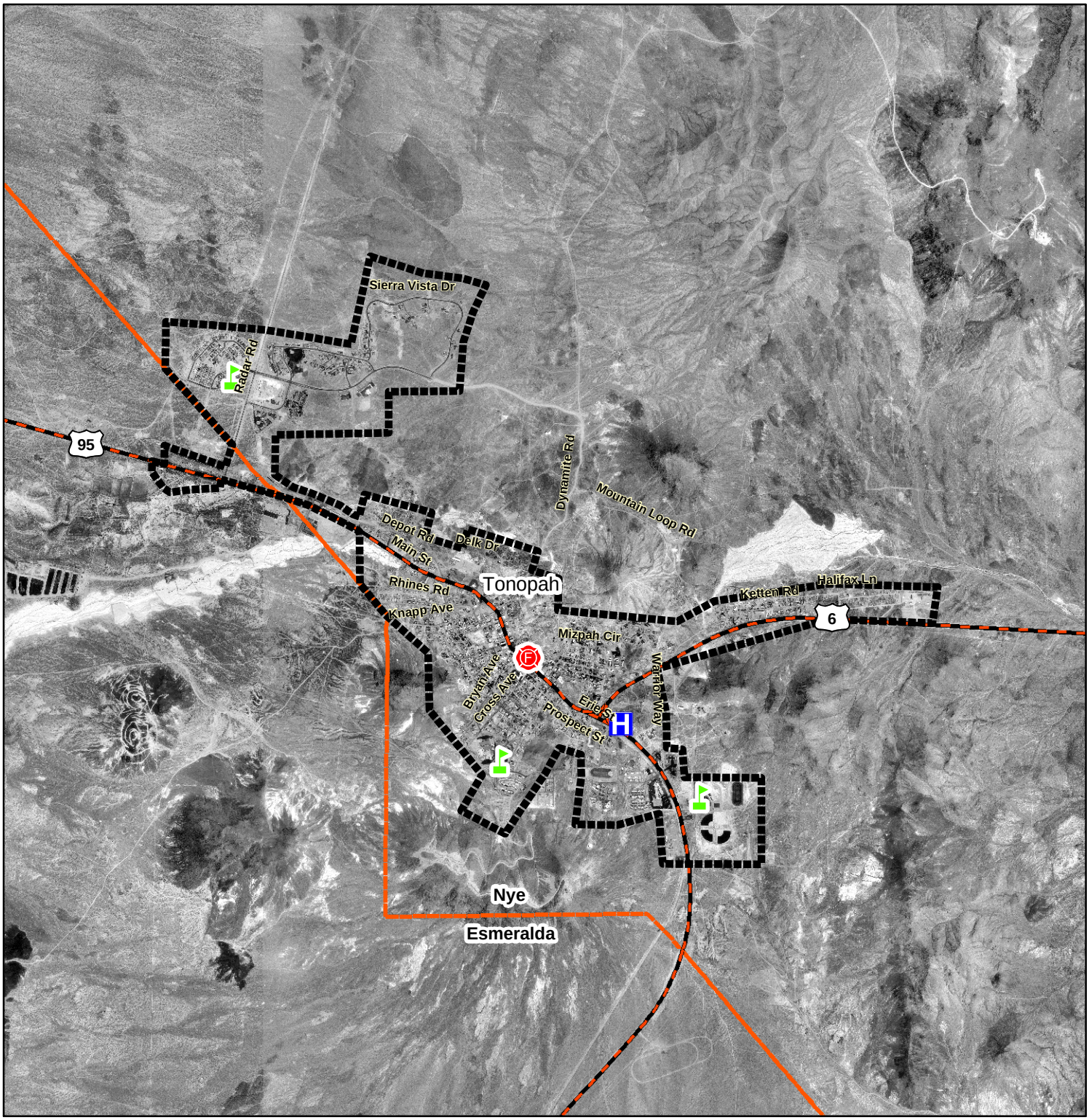
D1. Lot Sizes

796 <1ac | 52 >1ac <10ac | 0 >10ac

D2. Defensible Space

12 not adequat | 836 adequate | 99% adequate

Score **37** /128



Legend

- Community Boundary
- School
- Hospital
- Fire Station
- County Boundary
- Highways and State Routes

Figure 14-1. Tonopah Suppression Resources and Critical Features

0 0.25 0.5 1
Miles

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

15.0 NYE COUNTY RISK/HAZARD ASSESSMENT CONCLUSIONS

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

Nye County spans a broad range of elevations from the Mohave Desert areas in the south to the Toquima and Toiyabe mountain ranges in the north. The communities to the south generally have lower ignition risks, lower hazard ratings, and a lower incidence of wildfire. The communities in northern Nye County tend to have more vegetation, higher ignition risk ratings, and high to extreme community hazard ratings.

The communities of Amargosa Valley, Beatty, Belmont, Gabbs, Ione, and Manhattan, need to improve and maintained defensible space around structures according to the defensible space recommendations provided to each community and specified in the guidelines in Appendix E. To be most effective, defensible space treatments need to be implemented on community-wide basis. Community coordination and participation with the Nevada Fire Safe Council, will facilitate homeowners in taking proactive measures to protect their private property.

The communities of Manhattan, Ione, and Belmont have the highest hazard ratings in Nye County and require extensive fuel reduction treatments in addition to defensible space treatments in order to effectively reduce the community hazard. These small communities are surrounded by public land and/or National Forest and are dependent upon the federal land management agencies to address fuel hazards and reduce the risk of a catastrophic wildfire in the wildland-urban interface. The Bureau of Land Management and US Forest Service have planned fuel reduction treatments for the communities of Ione and Manhattan and have either already started implementing treatments or plan to during the 2005 fiscal year. Limited fire suppression resources in these communities will be much more effective in protecting lives and property when the fuel reduction recommendations are fully implemented and maintained. Limited suppression resources in these communities also warrants the development and distribution of community evacuation plans.

All of the communities in Nye County, except Pahrump, rely heavily on volunteer firefighters. Volunteer fire departments need to be equipped with wildland personal protective equipment, wildfire suppression equipment, and be properly trained in accordance with National Wildfire Coordinating Group 310-1 requirements, such as the BLM Wildland Firefighter Training. Membership in volunteer fire departments is subject to change and Fire Chiefs need to assure that their members are trained annually.

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. Implementing defensible space treatments, fuel reduction projects, and public education programs will help to mitigate the hazards inherent in wildland interface areas.

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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. Can also refer to the person functioning as air attack officer and directing aerial operations.

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

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

Aspect: Direction toward which a slope faces.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Fuelbreaks: A 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.

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Dominant Vegetation of the Wildland-Urban Interface, Nye County

COMMON NAME	SCIENTIFIC NAME*
Trees	
Cottonwood	*Populus fremontii*
Willow	*Salix sp.*
Single-leaf pinyon pine	*Pinus monophylla*
Utah juniper	*Juniperus osteosperma*
Shrubs	
Bitterbrush	*Purshia tridentata*
Creosote bush	*Larrea tridentata*
Desert peach	*Prunus andersonii*
Four-wing saltbrush	*Atriplex canescens*
Greasewood	*Sarcobatus vermiculatus or Sarcobatus baleyi*
Low sagebrush	*Artemisia arbuscula or Artemisia arbuscula ssp. longicaulis*
Morman tea	*Ephedra viridis*
Ephedra or Mormon tea	*Ephedra nevadensis*
Rabbitbrush	*Chrysothamnus sp.*
Sagebrush	*Artemisia tridentata*
Shadscale	*Atriplex confertifolia*
Salt cedar (Tamarisk)	*Tamarix ramosissima*
Silver buffaloberry	*Shepherdia argentea*
Spinescale saltbush	*Atriplex spinifera*
White bursage	*Ambrosia dumosa*
Willow	*Salix sp.*
Grasses / Forbs	
Cheatgrass	*Bromus tectorum*
Halogeton	*Halogeton glomeratus*
Indian ricegrass	*Achnatherum hymenoides*
Red brome	*Bromus rubens*
Russian thistle	*Salsola kali*
Saltgrass	*Distichilis spicata*
Bottlebrush squirreltail	*Elymus elymoides*

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

Appendix B

Community Wildfire Assessment
Rating System

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

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

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

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

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

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

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

Appendix C

Photographs of Representative Fuel Types

The vegetative fuels around Carvers consist primarily of big sagebrush, rabbitbrush, and fourwing saltbush. The fuel load in the interface area around Carvers range from two to six tons per acre and was considered a moderate to high fuel hazard.

The vegetative fuels in the interface around Belmont, Ione, and Manhattan consists of big sagebrush, rabbitbrush, and in some areas bitterbrush intermixed with singleleaf pinyon and Utah juniper. The fuel loads in these areas range from five to twenty tons per acre and were considered moderate to extreme fuel hazards.

The vegetative fuels on the interface slopes around Tonopah consist of low sagebrush, Nevada ephedra, and rabbitbrush. The flat terrain around Tonopah, Gabbs, and Hadley (Round Mountain) are dominated by greasewood and shadscale. The fuel load in these interface areas was estimated to be less than one ton per acre and generally considered a low fuel hazard.

Creosote bush, white bursage, and shadscale dominate the interface areas near the communities of Amargosa Valley, Beatty, and the east side of Pahrump. Shrubs are generally four to five feet apart, and are considered a low fuel hazard. In wet years with high cheatgrass and red brome production, horizontal continuity in the ground fuels increases the fuel hazard.

Appendix D

List of Persons Contacted

Appendix D – List of Persons Contacted

CONTACT NAME	POSITION	DATE CONTACTED	TELEPHONE
Roger Bright	Amargosa Valley FD Fire Chief	June 29, 2004	775-372-1111
Jim Benshoof	Beatty VFD Fire Chief	June 28, 2004	775-553-2958
Mike Lasorsa	Beatty VFD Firefighter	December 9, 2004	775-553-2958
Rich Sauer	Belmont VFD Fire Chief	June 28, 2004	775-240-4179
Connie Stinson	Gabbs VFD Assistant Fire Chief	March 2, 2004	775-285-2692
Gary Fly	Ione bar owner	March 2, 2004	775-761-7376
Dennis Floto	Manhattan VFD Fire Chief	June 29, 2004	775-487-2438
Scott Lewis	Pahrump Fire Rescue Fire Chief	June 29, 2004	775-727-5658
Dan Sweeney	Round Mountain VFD Fire Chief	June 29, 2004	775-377-2508
Holley Allison	Smoky Valley Fire Fire Chief	June 29, 2004	775-377-1002
Bruce Woodworth	Tonopah VFD Fire Chief	June 28, 2004	775-482-3778
Robert W. Elliott	Tonopah VFD Fire Chief	October 25, 2004 (email)	775-482-8672
David C. Davis	BLM Battle Mountain Field Office, Fire Management Officer	December 1, 2004	775-635-4000
Donovan Walker	BLM Battle Mountain Field Officer, Fire Ecologist	December 2, 2004	775-635-4000
Bob Bottom	NDF Conservation Camp, Tonopah Acting Camp Supervisor	December 1, 2004	775-482-3250
Chris Faehling	NDF Southern Region Fire Protection Officer	December 2, 2004	775-962-5543
Lindsay Forger	USFS Ely Ranger District Engine Captain	December 1, 2004	775-289-3031

Appendix E

Defensible Space Guidelines,
Homeowner's Annual Checklist and Seed Mixes

DEFENSIBLE SPACE GUIDELINES

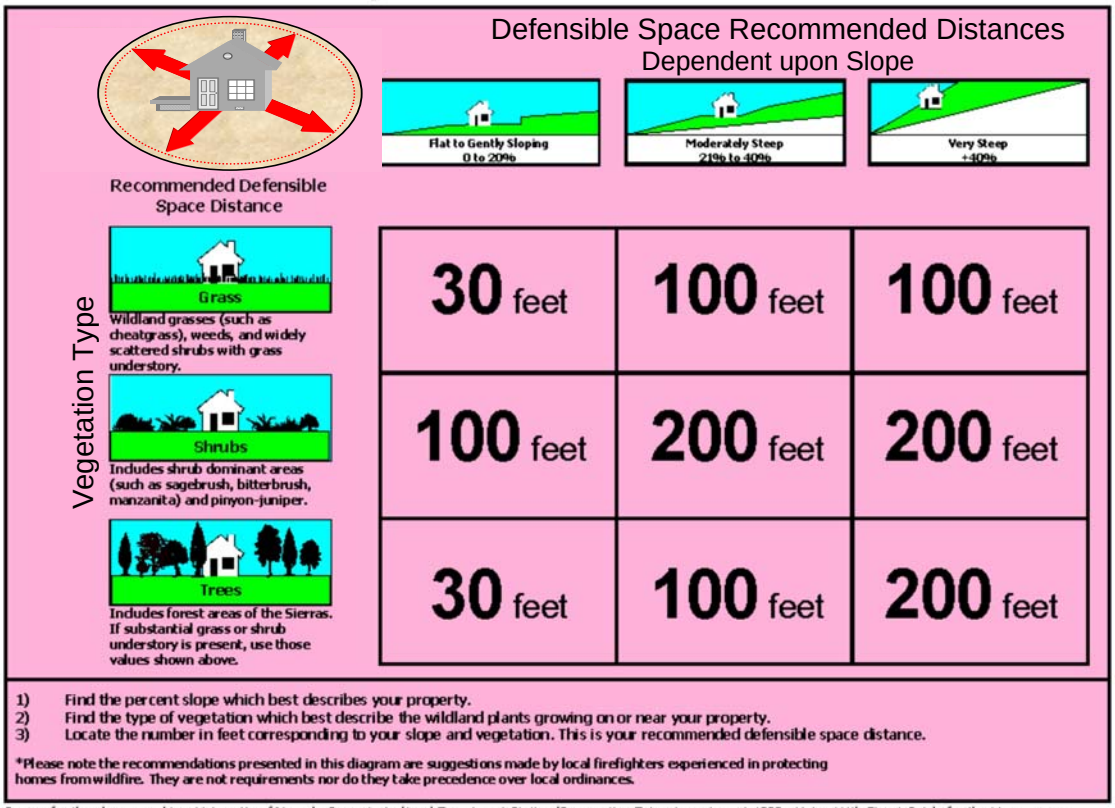
A FACT SHEET FOR NYE COUNTY HOMEOWNERS

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 four 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 NYE 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 NYE 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 the use of prescribed fires.

GENERAL RULES FOR FUEL MODIFICATION:

- Thin trees to a distance 1 ½ times their height and shrubs to a distance 2 times their height to create space between each canopy. Remove dead and diseased trees first.
- Evenly space thinned trees or thin in small clumps to create the desired appearance.
- If possible, prune/limb trees in the winter to avoid insect infestations. If pruning in other seasons, pruning scars should be sealed and trees should be sprayed with approved products to protect tree from insects and disease.
- For mature trees, prune limbs from the bottom of the tree to 4-feet above ground. Avoid removing more than 25 percent of the trees' live branches.
- Contact your local Nevada Division of Forestry (NDF) forester for additional recommendations regarding tree health.

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

Revegetation Specifications for Fuels Reduction Areas –
Carvers, Ione, Manhattan, Belmont, and Gabbs

Common Name	Scientific Name	Seeding Rate (PLS lbs./acre)	
		Drill	Broadcast
'Ephraim' Crested Wheatgrass*	*Agropyron cristatum*	3.00	6.00
Bottlebrush squirreltail	*Elymus elymoides*	0.75	1.50
'Sodar' streambank wheatgrass	*Elymus lanceolatus ssp. psammophilus*	2.50	4.00
'Immigrant' Forage Kochia	*Kochia prostrata*	2.00*	2.00
	Total PLS Pounds per acre	**8.25**	**13.50**

Revegetation Specifications for Fuels Reduction Areas –
Pahrump, Amargosa, and Beatty

Common Name	Scientific Name	Seeding Rate (PLS lbs./acre)	
		Drill	Broadcast
'Nezpar' Indian ricegrass	*Achnatherum hymenoides*	2.00	4.00
'Viva florets' galleta grass	*Hilaria jamesii*	2.00	4.00
'Salado' Alkali sacaton	*Sporobolus airoides*	1.50	3.00
Scarlet globemallow	*Spharalcea coccinea*	0.25	0.25
'Immigrant' Forage Kochia	*Kochia prostrata*	2.00*	2.00
	Total PLS Pounds per acre	**7.75**	**13.25**

Revegetation Specifications for Fuels Reduction Areas –
Round Mountain and Tonapah

Common Name	Scientific Name	Seeding Rate (PLS lbs./acre)	
		Drill	Broadcast
Siberian wheatgrass	*Agropyron fragile ssp. sibericum*	2.00	3.00
'Nezpar' Indian ricegrass	*Achnatherum hymenoides*	0.75	2.50
'Sodar' streambank wheatgrass	*Elymus lanceolatus ssp. psammophilus*	2.00	4.00
'Viva florets' Galleta grass	*Hilaria jamesii*	1.00	1.50
Bottlebrush squirreltail	*Elymus elymoides*	0.75	1.50
Scarlet globemallow	*Spharalcea coccinea*	0.25	0.25
'Immigrant' Forage Kochia	*Kochia prostrata*	2.00*	2.00
	Total PLS Pounds per acre	**8.75**	**14.75**

*** Kochia prostrata is always broadcast seeded on the soil surface, never drill seeded.**

The seed mixtures above are for treating all disturbed areas and areas cleared for fuel reduction purposes. The above species are to be mixed and seeded together at the same time. Drill seeding is recommended where feasible, except in the case of *Kochia prostrata*, which is always broadcast seeded. Drill rows should be spaced 12 inches and seed should be planted at a depth of ½ inch. Broadcast seeding is recommended for rocky, steep, or small treatment areas. The seed can be broadcast using hand held seeders such as "Whirlybird" or a seeder mounted on an ATV. Continually mix the seed while broadcasting to equally distribute the small seeds throughout the mix. Following broadcast seed application the seeds should be raked to an average depth of ½ inch. This can be done with hand held rakes or by pulling a drag, such as a 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, of 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

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 fire hydrant locations shall be reviewed and approved by the county building department and shall be in proximity to streets so that snow accumulation at the hydrants may be removed during routing snow plowing operations.
3. 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.
4. 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.
5. 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.
6. Clearance of vegetative growth from roadways must be performed in accordance with Uniform Fire Code Appendix II-A-17.
7. 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.
8. 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.