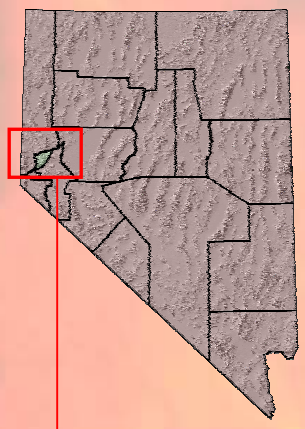
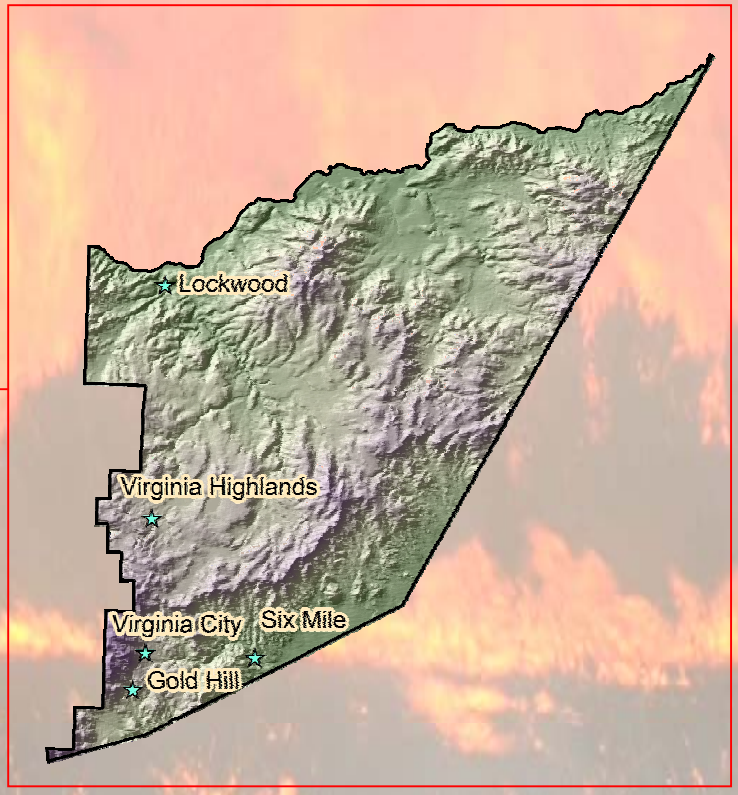
Nevada Community Wildfire

Risk/Hazard Assessment Project

STOREY 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 wildland meet.

This report was prepared specifically for the communities within Storey County, Nevada that were identified in the 2001 Federal Register list of communities that are located within the vicinity of federal lands that are most vulnerable to the threat of wildfire. The communities assessed in Storey 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) for completion of the wildfire risk assessment for each Storey County community listed in the Federal Register. The RCI Project Team spent four days inventorying conditions in Storey County and completing the primary data collection and verification portions of the risk 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. These factors included community design, construction materials, defensible space, availability and capability of fire suppression resources, and physical conditions such as the vegetative fuel load and topography. Information on fire suppression capabilities and responsibilities for Storey County communities was obtained from local Fire Chiefs and local Fire Management Officers. The RCI Project Team Fire Specialist assigned an ignition risk rating for each community of low, moderate, or high. The rating is based upon historical ignition patterns, the opinions of local, state, and federal fire agency personnel, community field visits, and the fire specialist's professional judgment based on experience with wildland fire ignitions in Nevada.

Table 1-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD CONDITION	IGNITION RISK RATING	COMMUNITY HAZARD RATING
Gold Hill	Intermix	Moderate to High	High	High
Lockwood	Classic Interface	Low	Low	Moderate
Six Mile	Intermix	Low	Low	Moderate
Virginia City	Intermix	Moderate to High	High	High
Virginia Highlands[1]	Intermix	Moderate to Extreme	High	Extreme

[1] *Ratings for the Virginia Highlands are adapted from the 2002 RCI Report and field visits in 2004.*

Existing Situation

There is high to extreme potential for a catastrophic wildfire in the wildland-urban interface areas of Virginia City, Gold Hill, and the Virginia Highlands. These elevated hazard ratings are primarily attributed to the moderate to extreme fuel loading that are often in volatile pinyon-juniper fuel types, inadequate defensible space, combustible building materials, and steep slopes. These circumstances also contribute to extremely dangerous conditions for firefighters. However, for Lockwood and Six Mile, the low vegetation density somewhat lowers the potential for a destructive wildfire.

Many homeowners in Storey County have been aggressive in establishing and maintaining appropriate defensible space around their residences. The Fire Safe Highlands Coalition and the Storey County Fire Department in the Virginia Highlands provide examples of collaborative efforts for safe and effective biomass removal.

Recommendations

Recommendations in this report focus primarily on efforts that homeowners can initiate and implement to enhance the fire safe nature of their communities. Recommendations for creating defensible space prescribed within this report are presented to homeowners in each community who have not yet reduced fuels on their private property. Defensible space is the homeowner's responsibility and it is an essential, priority defense mechanism for saving lives and property during a catastrophic wildland fire.

In the future, Storey County must take a proactive stance on residential development in heavy fuel, high-density vegetation areas. Local ordinances should be revised to provide Storey County Fire Department the authority to require defensible space treatment on all developed and undeveloped lots within the interface areas and to be able to assess property owners for defensible space treatment if the landowner fails to comply with the ordinance requirements. Ordinances should be adopted to ensure that all new development meets the National Fire Code and Standards and requires developers to implement and maintain adequate fuel reduction treatments as a condition of new subdivision approval.

Recommendations within this report were also formulated to mitigate the hazardous conditions for each problem area that was identified. The most hazardous areas are those within heavy pinyon-juniper fuels. The recommendations for a widely needed treatment to reduce the vegetative fuel load in the interface area are directed to the Storey County Fire Department, the Nevada Division of Forestry, Nevada Department of Transportation, and individual property owners. The recommended approach, known as "thinning from below," involves removal of smaller trees, brush, and dead and down materials to achieve the desired tree densities that will effectively minimize the hazardous ground fuels that contribute to crown fire ignitions. Implementation of the prescribed treatments will also reduce competition among the residual trees for sunlight, water, and space, thus improving forest health. The reestablishment of native grasses and fire-resistant adapted species in order to combat the invasion of cheatgrass, a highly ignitable and combustible fuel, will also mitigate the fire hazard in respective areas.

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

Specific Recommendations for Fuel Reductions Treatments

Gold Hill:

- Promote the establishment and maintenance of defensible space around homes and outbuildings in the community. Gold Hill is located near the head of Gold Canyon, an area conducive to upslope winds capable of rapidly carrying a fire through the existing high hazard fuels into residential areas while suppression resources from outside the community are in route.
- Implement fuels reduction treatment to protect residences and community infrastructure on approximately 8.5 acres in the vicinity of the water treatment facility, west of Highway 342, between Gold Hill and Virginia City. The specific location for the fuel reduction treatment is shown in Figure 5-1 of this report.

Virginia City:

- Implement fuels reduction treatment on approximately 63 acres to the west side of the city near Summit Street. The specific location for the fuel reduction treatment is shown in Figure 8-1 of this report.
- Create approximately 6,000 lineal feet of fuelbreak by extending the vegetation removal treatment along the existing power line road to Ophir Grade Road north to the junction of Stewart and Summit Streets on the west side of town. The specific location for this fuelbreak improvement is shown in Figure 8-1 of this report.

Virginia Highlands:

- A total of 116,550 lineal feet (approximately 250-500 acres) of fuelbreak is recommended for the Virginia Highlands area. The specific locations and priority breakdown for these fuelbreaks are shown in Figure 9-2 of this report. The local chapter of the Nevada Fire Safe Council must continue to emphasize the importance of internal fuelbreaks to property owners in the community as a necessary prerequisite to enhancing fire protection and they must continue to implement recommended fuel reduction treatments in the interior of the community.

To be most effective, fire safe practices need to be implemented on a community-wide basis. There is no guarantee that a wildfire will not occur in any of these communities, even if all of the recommendations in this report are implemented. Nonetheless, public awareness, neighbors helping neighbors, and concerned, proactive individuals setting examples for others to follow are among the most important initiatives involved in reducing the risk of wildfire ignition and managing the hazards inherent in wildland-urban interface areas.

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1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

A key element of the Healthy Forests Initiative announced by the White House in 2002 is the implementation of core components of the *National Fire Plan Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy.* Federal agencies and western state governors adopted the Plan in the spring of 2002, in collaboration with county commissioners, state foresters, and tribal officials. The Plan calls for more active forest and rangeland management to reduce the threat of wildland fire in the wildland-urban interface, the area where homes and wildland meet.

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 Bureau of Land Management to conduct Community Risk/Hazard Assessments in communities at risk across Nevada. The communities to be assessed are among those named in the 2001 Federal Register list of communities within the vicinity of Federal lands that are most vulnerable to wildfire threat in Nevada (66 FR 160).

Resource Concepts, Inc. (RCI), a Carson City consulting firm, was selected to conduct the Community Risk/Hazard Assessments. During 2004, the RCI Project Team inventoried 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 of 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 significantly influence the risk of wildfire ignition along the wildland-urban interface and inventoried 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 and capability of suppression resources and to identify opportunities for increased community preparedness. A description of the existing fuel hazard and potential fire behavior is discussed for each community. Photo points and fuel hazard maps are presented for Gold

Hill, Virginia City, and Virginia Highlands 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, fire hazards, and recommended mitigation projects are described for each community. The recommendations are summarized in table form, and presented in a separate map when the proposed mitigation project can be graphically represented. These tools will aid local, state, and federal agencies in strategic planning, raising public awareness, and securing funding to implement risk and hazard reduction projects. Mitigating the risks and hazards identified by these assessments is not only crucial to the long term goals of the National Fire Plan, but also to the short and long term viability of Nevada communities, natural resources, infrastructures, and watersheds.

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

- Nevada Fire Safe Council (NFSC)
- Bureau of Land Management (BLM)
- Forest Service (FS)
- Natural Resource Conservation Service (NRCS)
- 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

Five communities identified as at risk within Storey County by the Federal Register (66 FR 160) are included in this assessment:

- Gold Hill
- Lockwood
- Six Mile
- Virginia City
- Virginia Highlands

There may be additional rural areas or residential developments in Storey County that were not included on the Federal Register list, and thus not included in the scope of this project. However, conditions in and around some of these communities may warrant future wildfire risk/hazard assessment and many of the recommendations given for communities with similar conditions 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, geographic information systems (GIS), natural resource ecology, and forest health who collaborated to complete a Community Risk/Hazard Assessment for each community. Each RCI Project Team included a Fire Specialist with extensive wildland fire prevention and suppression experience in Nevada and a Resources Specialist experienced in the natural resource environment of the Great Basin.

The RCI Project Team used standardized procedures developed from the *Draft Community Wildland Fire Assessment For Existing and Planned Wildland Residential Interface Developments in Nevada* 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. A glossary of wildfire management terms is included in Appendix A.

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 performing data verification. Data sources for the maps were the Nevada Fire Safe Council, the Nevada Department of Transportation, the Natural Resource Conservation Service, 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 Storey County Community Wildfire Risk/Hazard Assessment

SPATIAL DATA SET	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 Interviews
Roads	'TIGER' Census data (2000)
Current aerial photographs	US Geological Survey Digital Orthophoto Quadrangles (1994, 1996, or 1998)
Soil surveys	BLM Nevada State Office Mapping Services Natural Resource Conservation Service 'SSURGO' Website
Fuel types	BLM Nevada State Office Fire Hazard Potential Data
Fire history	BLM Nevada State Office Mapping Services National Interagency Fire Center—Boise, Idaho

Existing data was reviewed and the pertinent information was compiled on maps in GIS format. The RCI Project Teams verified the GIS data during field assessments. The GIS Specialists provided data management for quality assurance and accuracy of the statewide geospatial data as well as map production.

2.2.1 Wildfire History

Wildfire history was mapped using Bureau of Land Management datasets, US Forest Service datasets, and GIS databases that identify wildfire perimeters on federally managed lands, covering the past 21 years. This database was compiled by agency personnel using Global Positioning System (GPS) data and screen digitizing from source maps with a minimum detail of 1:250,000. This dataset has been updated at the BLM Nevada State Office and 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 used to support fire management and land use planning on federal lands.

In some cases the RCI Project Team Fire identified additional fire perimeters not present in the BLM and USFS datasets as a result of interviews with local fire experts. Fires that occur on private lands are generally recorded on paper maps and have not been consistently included in federal agency GIS datasets. Additional fire locations identified during the interviews with local fire personnel were recorded on the field maps where possible and added to the project wildfire perimeter dataset.

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

The wildfire and ignition history data was used to formulate risk ratings and to develop recommendations specific to areas that have been repeatedly impacted by wildland fires. Observations by the RCI Project Team and comments from the local fire agency personnel were also used to develop recommendations for each community 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. This project focuses on identifying risks and hazards in the wildland-urban interface areas countywide by assessing each community individually. Site-specific information for each community was collected during field visits conducted January 19-22, 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 an ignition risk rating 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 the National Interagency Fire Center, Bureau of Land Management, and 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 fire specialists based on their professional experience with wildland fire ignitions in Nevada.

2.3.2 Hazard Assessment Criteria

The Community Wildfire 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*. This system assigns hazard ratings of low through extreme based on the scoring system given in Table 2-2 and detailed in Appendix B.

Table 2-2. Hazard Rating Point System Utilized 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 were assessed: community design, construction materials, defensible space, availability and capability of fire suppression resources, and physical conditions such as fuel loading and topography. A description of each of these factors and their importance in developing the overall score for the community is provided below. Individual community score sheets presenting the point values assigned to each element in the hazard assessment score are provided at the end of each community assessment. Photographs of representative fuel types for each community are provided in Appendix C.

Community Design

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

- **Interface Condition.** Community safety is affected by the density and distribution of structures with respect to the surrounding wildland environment. Four condition classes were 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. Fires have been known to start from arcing power lines or exploding transformers during wind storms 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 backup energy source. Many communities rely on electric pumps to provide water to residents and firefighters for structure protection and fire suppression.

Construction Materials

Construction materials account for 16 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 can 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, they present a much lower ignition risk from firebrands or 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 be trapped, smolder, and ignite, rapidly spreading fire to the house. A high number of houses within a wildland-urban interface area with these features implies a greater hazard to the community.

Defensible Space

Defensible space accounts for 16 percent of the assessment score. The density and type of fuel around a home determines the potential fire exposure and the potential for damage to the home. A greater volume of trees and 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

Suppression capabilities account for 16 percent of the total assessment score. Knowledge of the capabilities or limitations of the fire suppression resources in a community can help county officials and residents take action to maximize 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 available to respond quickly is critical to saving structures and lives. Whether there is a local, paid fire department, volunteer department, or no local fire department impacts how long it 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. Wildland firefighting requires specialized equipment.
- **Water Resources**. The availability of water resources is critical to fighting a wildland fire. Whether there is a community water system with adequate water supply, or whether firefighters must rely on local ponds or other drafting sites affect how difficult it will be for firefighters to protect the community.

Physical Conditions

The physical conditions that influence fire behavior account for 26 percent of the total assessment score. Physical conditions include slope, aspect, topography, typical local weather patterns, fuel type, and fuels density. With the exception of changes to the fuels 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 influence the fire behavior is essential to planning effective preparedness activities such as fuel reduction treatments. Physical conditions considered in the assessment include:

- **Slope, Aspect, and Topography.** In addition to local weather conditions, slope, aspect, and topographic features are also used to predict fire behavior. Steep slopes greatly influence fire behavior. Fire usually burns upslope with greater speed and longer flame lengths than on flat areas. Fire can burn downslope; however it usually burns downhill at a slower rate and with shorter flame lengths than in upslope burns. East aspect slopes in the Great Basin frequently have afternoon downslope winds that may rapidly increase downhill burn rates. West and south facing aspects are subject to more intense solar exposure, which preheats vegetation and lowers the moisture content of fuels. Canyons, ravines, and saddles are topographic features that are prone to higher wind speeds than adjacent areas. Fires pushed by winds grow at an accelerated rate compared to fires burning in non-windy conditions. Homes built mid-slope, at the crest of slopes, or in saddles are most at risk due to wind-prone topography in the event of a wildfire.
- **Fuel Type and Density.** Vegetation type, fuel moisture values, and fuel density around a community affect the potential fire behavior. Areas with thick, continuous, vegetative fuels carry a higher hazard rating than communities situated in areas of irrigated, sparse, or non-continuous fuels.

2.3.3 Fuel Hazard Mapping

The BLM Nevada and Utah State Offices, using the Nevada GAP Analysis Program satellite vegetation dataset, initially generated fuel hazard maps 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 an extreme fuel hazard, while sparse shadscale cover types were rated as low fuel hazards.

The RCI Project Teams evaluated the interface areas around high and extreme hazard communities to verify 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. Hazard mapping in Storey County was completed for the communities of Gold Hill, Virginia City, and the Virginia Highlands where high and extreme fuel hazard conditions exist.

2.3.4 Fire Behavior Worst-case Scenario

The RCI Project Team Wildfire Specialists described the worst-case wildfire scenarios 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 wildfire scenario can occur. The worst-case wildfire scenario does not describe the most likely outcome of a wildfire event in the interface but it illustrates the potential for damage if a given set of conditions were to occur simultaneously. The worst-case wildfire scenarios are described in this document for public education purposes and are part of the basis for the fuel reduction recommendations. Typical weather conditions including temperature, relative humidity, wind speed and direction, and time of day also contribute to actual fire behavior (Campbell, 1991).

2.4 INTERVIEWS WITH FIRE PERSONNEL

The RCI Project Team interviewed local fire department personnel and local area Fire Management Officers to obtain information on wildfire training, emergency response time, personnel and equipment availability and capability, evacuation plans, pre-attack plans, and estimates of possible worst-case wildfires 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 used in the assessments is included in Appendix D.

2.5 RECOMMENDATION DEVELOPMENT

A wide variety of treatments and alternative measures can be used to reduce ignition risks, mitigate fire hazards, and promote fire safe communities. Proposed recommendations typically include physical removal or reduction of flammable vegetation, increased community awareness of the risk of fires and how to reduce those risks, and coordination among fire suppression agencies to optimize efforts and use of 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 developed in conjunction with the *Living With Fire* publications, National Fire Plan, and 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

Storey County, located in western Nevada, is the second smallest county in Nevada at approximately 167,620 acres in size. Only about nine percent of Storey County is administered by the federal government, the smallest percentage of any Nevada County. The Bureau of Indian Affairs administers a trace amount and the remainder (about 91 percent) is private land. A summary of land status acreages is provided in Table 3-1.

Table 3-1. Land Status Within Storey County

LAND ADMINISTRATOR	BLM	Private	BIA
APPROXIMATE ACREAGE	14, 980	152,200	440

Source: BLM land ownership GIS database.

The discovery of gold at the head of Gold Canyon in 1859 prompted an influx of people to this area, a development that led to statehood for Nevada five years later. Today the county holds a population estimated at around 3,700 people. Of those, about 1,200 people live in the towns of Virginia City and Gold Hill (Nevada State Demographer's Office, 2003). The other two thirds of the population resides in the communities of Lockwood, Virginia Highlands, and Six Mile. Mining has given way to tourism as the leading element of the County's economy. Virginia City has been the County Seat since territorial times.

Elevations within the county range from 7,836 feet in the Virginia Range to 4,057 feet in Long Valley. Primary mountain ranges include the Virginia Range and the Flowery Range. The major valley in the county is Long Valley, which drains the western part of the county and flows into the Truckee River at Lockwood. General information for Storey County is shown in Figure 3-1.

The Truckee River separates Storey County from Washoe County to the north. State Routes 341 and 342 are the primary transportation corridors. US Highway 50 and the Carson River to the south lie just beyond the county line in Lyon County.

3.2 WILDFIRE HISTORY

Few wildfire ignitions have been recorded for Storey County over the last 24 years. However some large wildfires have occurred. The Gooseberry Mine II fire in 1985 started in Storey County and burned over 20,000 acres as it crossed into Lyon County (Reinhardt, pers. comm.). Fires that occur on private lands are predominantly recorded on paper maps and are often not included in the GIS datasets. Wherever possible, anecdotal information from fire professionals and local residents was added to the database information. Available fire datasets suggest that 34 percent of the county has burned during the last 24 years. Table 3-2 summarizes the fire histories and fire ignitions that have been recorded in the database since 1980. Figure 3-2 illustrates the fire history on a map of Storey County.

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

YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE	YEAR	NUMBER OF FIRE IGNITIONS	TOTAL FIRE ACREAGE
1980	0	0	1992	2	0
1981	0	0	1993	0	0
1982	2	370*	1994	0	0
1983	1	3,285	1995	1	0
1984	1	NA	1996	2	472*
1985	1	27,194*	1997	0	0
1986	1	NA	1998	0	0
1987	3	265*	1999	2	17,880
1988	1	NA	2000	0	7,620
1989	4	15	2001	5	64
1990	1	342*	2002	1	0
1991	3	NA	2003	3	97
			TOTAL	**38**	**57,604**

NA = Information Not Available

Source: Fire history data provided by the National Interagency Fire Center, Boise, Idaho, BLM Nevada State Office, and USFS Humboldt-Toiyabe Supervisor's Office. Additional fire history information provided by Jim Reinhardt, personal communication.

3.2.1 Ignition Risk Factors

Wildfire ignition risks fall into two categories: lightning and human caused. Human caused ignitions can come from a variety of sources such as burning material thrown out of vehicle windows or ignited during auto accidents, off-road vehicles, railroads, arcing power lines, agricultural fires, campfires, debris burning in piles or burn barrels, matches, and fireworks. In Storey County, database records indicate that eight of the 38 wildland fire incidents recorded were due to lightning. Of the remaining thirty fires, ten were human caused and twenty had unreported causes of ignition.

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 to reoccupy burned areas in northern Nevada is cheatgrass.

Effect of Cheatgrass on Fire Ecology

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

Eliminating cheatgrass is an arduous task. Mowing defensible space and fuelbreak areas annually 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 and reduce the annual fuel load (BLM 2003, Davison and Smith 2000, Montana State University (2004)[1]. 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.

Fire Ecology in Pinyon-Juniper Woodlands

Singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) 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, which often results in crown fires. A crown fire is the most perilous of

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

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 twelve sites listed on the National Register of Historical Places for Storey County. The Nevada State Register of Historical Places lists one site. The effects of fire on cultural and historical resources depend upon factors that vary on a site-specific basis such as fuels, terrain, site type, and cultural or historical materials present. Archeological sites such as the Largomarsino Petroglyph site, rock art, ceramics, and rock artifacts can be damaged or destroyed by extremely hot fires.

Tourism is a significant economic base for Storey County. Virginia City is a primary tourist attraction in northwestern Nevada. The tourism industry in Virginia City and Gold Hill is centered around the historic features and mining heritage of that area. The Virginia City Historic District is registered as a National Historic Landmark and includes seven buildings listed on the National Register of Historic Places. Many of these Comstock era buildings and cotemporaneous neighbors lie in the wildland-urban interface and are at risk of permanent loss and destruction in the event of a wildfire in the Virginia City area. The Silver Terrace Cemeteries (also known as the Virginia City Cemeteries) to the north of town contain historical artifacts from the 19th and 20th centuries that would be better protected from the threat of wildfire with implementation of mitigation treatments.

3.3.2 Flora and Fauna

Eleven species from the Sensitive Taxa list are protected by Nevada state legislation and are identified in Table 3-3 (Nevada Natural Heritage Program database; last updated for Storey County 18 March 2004). The Nevada Natural Heritage Program, the Nevada Division of Forestry, and the Nevada Department of Wildlife should be consulted regarding specific concerns and potential mitigation to minimize impacts to these species and their habitat prior to the event of a catastrophic wildfire or in the implementation of projects intended to reduce the threat of wildfires to a community.

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

COMMON NAME	SCIENTIFIC NAME	LEGISLATION
Plants		
Sand cholla	*Opuntia pulchella*	NRS 527.260.120
Mammals		
Spotted bat	*Euderma maculatum*	NRS 501
River otter	*Lontra canadensis*	NRS 501
Birds		
Northern goshawk	*Accipiter gentilis*	NRS 501
Western burrowing owl	*Athene cunicularia hypugaea*	NRS 501
Ferruginous hawk	*Buteo regalis*	NRS 501
Swainson's hawk	*Buteo swainsoni*	NRS 501
Greater sage-grouse	*Centrocercus urophasianus*	NRS 501
Black tern	*Choldonias niger*	NRS 501
Flammulated owl	*Otus flammeolus*	NRS 501
White-faced ibis	*Plegadis chichi*	NRS 501

Fishing is an important recreational resource for the area. The Truckee River traverses roughly 25 miles of the Storey County line. The Truckee River is home to two federally listed fish: the Lahontan Cutthroat Trout (federally listed as threatened) and the Cui-ui (federally listed as endangered). The ability of the Truckee River watershed to receive, store, and transmit water is related to the geology, vegetation, and soil within the associated watersheds. While Storey County contributes to only a small portion of the Truckee River watershed, excessive erosion from burned areas within the associated watersheds could significantly increase sedimentation of spawning beds and impact water quality for fisheries in the lower Truckee River.

3.4 PREVIOUS FIRE HAZARD REDUCTION PROJECTS

In March 2002, the Fire Safe Highlands Coalition became the first self-directed citizens group to become a formally affiliated chapter of the Nevada Fire Safe Council. This group has been influential in spearheading fire safety activities in collaboration with the Storey County Fire Department and the Nevada Division of Forestry. In June of 2002, the coalition, in collaboration with the University of Nevada, Reno – Cooperative Extension, contracted with Resource Concepts, Inc. to produce the *Community Wildfire Risk Assessment and Fuel Reduction Plan for the Virginia Highlands Community*. The parties involved include the Storey County Fire Department, Storey County Emergency Management Department, Local Emergency Planning Committee, the Virginia Highlands Volunteer Fire Department, and the Fire Safe Highlands Coalition. Recommendations from the plan and previous projects initiated by the Storey County Fire Department have led to the installation of a warning siren, the development and distribution of a fire evacuation plan, and improved marking of residential addresses and escape routes. Fire suppression capacity has been improved through the installation of eleven additional underground storage tanks, increasing fire-grade water storage capacity by 240,000 gallons. Approximately one hundred houses have benefited from defensible space activities through a grant from the Nevada Fire Safe Council. The Nevada Division of Forestry is completing fire hazard assessments on individual private parcels and promoting defensible space implementation. The SCA Fire Education Corps evaluated individual homes in Virginia Highlands in 2003.

Grant money obtained through the assistance of the Nevada Fire Safe Council has been used by the local Highlands Chapter of the Fire Safe Council to complete substantial portions of the fire hazard reduction projects in the community. Limited grant funding for the implementation of fuels reduction treatments was allocated by a lottery and defensible space activities were limited to individual homeowner initiative and seasonal NDF crews who were clearing dead trees from the area. The chapter is expecting to administer a new grant disbursement in fall 2004 and spring 2005, with plans to implement a fuelbreak along Cartwright Road. Fuelbreaks are also proposed along Yellowjacket Road and Highway 341, which are well situated to protect the western flank of the community with fuel reduction enhancements (J. Copeland, pers. comm.).

In addition to individual homeowners implementing defensible space treatments around their residences, other fuels reduction projects have removed over 700 tons of combustible material from the Virginia Highlands area (P. Murphy, pers. comm). Projects have included the preparation of a demonstration parcel on Lousetown Road and a dead tree hunt, where community members identified over 400 dead or dying trees for removal from sixteen parcels on Geiger Grade.

The coalition has also purchased a trailer that is available to Virginia Highland residents to facilitate the timely removal of cleared brush to a designated burn pile next to the fire station. Public education events such as workshops on defensible space sponsored by the BLM Carson City Field Office, as well as pine beetle activity, evacuation protocol, and a demonstration by NDF of fireproofing gel for homeowners, have contributed to an improved understanding of the interaction between this landscape and its residents.

The Chapter's web page (www.firesafehighlands.org) is an example of active engagement in fire safe education by and for homeowners.

Lockwood
Virginia Highlands
Virginia City
Six Mile
Gold Hill
BLM
BIA
PVT
PK
NVST
BR
Fernley
SPARKS
445
447
427
650
646
655
80
341
342
50
95

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

Legend

- Storey County Community
- Storey County
- Highways and State Routes

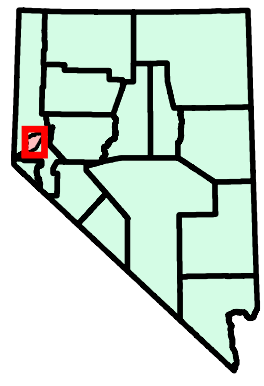
Land Ownership

- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Reclamation (BR)
- Nevada State (NVST)
- Regional Park (PK)
- Private (PVT)

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

Lockwood School
Lockwood
Virginia Highlands
Virginia City Cemetery
Virginia City
Virginia City Historic District
Six Mile
Gold Hill
Hugh J. Gallagher Elementary School
Virginia City High School
Virginia City Middle School
445
447
427
650
646
655
80
341
342
50
95

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

Legend
- Storey County Community
- Critical Feature
- Storey County
- Fire Ignition
- Past Fires (1981-2003)
- Highways and State Routes

0 1 2 4
Miles

N W E S

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Carson City, NV 89703
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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 January and February of 2004, RCI Project Teams evaluated five Storey County communities. 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 densities resulted in an overall hazard rating for each community. The key components of these assessments are summarized in Table 4-1.

Table 4-1. Community Risk and Hazard Assessment Results

COMMUNITY	INTERFACE CONDITION	INTERFACE FUEL HAZARD	IGNITION RISK	FIRE HAZARD RATING
Gold Hill	Intermix	Moderate to High	High	High
Lockwood	Classic Interface	Low	Low	Moderate
Six Mile	Intermix	Low	Low	Moderate
Virginia City	Intermix	Moderate to High	High	High
Virginia Highlands[1]	Intermix	Moderate to Extreme	High	Extreme

[1] *Ratings for the Virginia Highlands are adapted from RCI 2002 and field visits in 2004.*

4.1.1 Suppression Capabilities

Wildfire Protection Resources

The Storey County Fire Protection District was established under NRS 474 assigning the responsibility for all-risk response services in the towns of Virginia City and Gold Hill to the Storey County Fire Department. An NDF Fire Protection District was established in 1974 under the terms of NRS Chapter 473, assigning responsibility for all-risk response services throughout the remaining private lands in Storey County and the lead role in wildland fire management to the Nevada Division of Forestry. The NDF Comprehensive Wildfire Management Program includes wildfire prevention and suppression, hazardous fuels reduction, post-wildfire rehabilitation, and public education. Currently, the Storey County Fire Department is in the process of extending their all-risk responsibility in the 474 Fire Protection District to all communities in Storey County, with NDF operating a seasonal wildland fire program throughout the county.

Fire suppression apparatus and personnel stationed in Storey County are summarized in Table 4-2. The resources shown are based on data available at the time of interviews with local and regional fire authorities and are subject to change. They are reported here to represent the relative strength of fire suppression

resources on site. The resources that will be dispatched in response to a first-alarm wildland fire call are determined by a run card system that is based on National Fire Protection Association standards and adapted to local needs and conditions.

Table 4-2. Storey County On-Site Fire Suppression Resources

LOCATION	RESOURCE	AMOUNT
Virginia City Fire Station #1	Type I Engine	2
	Type III Engine	2
	Type IV Engine	1
	Type VIII Water Tender	1
	Fire Chief	1
	Career Firefighters	6
	Volunteer Firefighters	17
Virginia Highlands Fire Station #2	Type I Engine	1
	Type II Engine	1
	Type III Engine	2
	Type III Engine -NDF	1
	Type IV Engine	2
	Type VIII Water Tender	1
	Career Firefighters	3
	Volunteer Firefighters	13
	Seasonal Firefighters -NDF	5
Six Mile Fire Station #3	Type I Engine	1
	Type II Engine	1
	Type III Engine	1
	Type IV Engine	1
	Type VIII Water Tender	1
	Volunteer Firefighters	17
Lockwood Fire Station #4	Type I Engine	1
	Type II Engine	1
	Type IV Engine	1
	Type VIII Water Tender	1
	Career Firefighters	6
	Volunteer Firefighters	12

Mutual Aid Agreements

Current mutual aid agreements with Storey County provide additional resources for wildfire suppression as shown in Table 4-3 and summarized below.

Nevada Division of Forestry. In the event that a Second Alarm assignment is declared on an incident that originates within the Storey County Fire Department area of responsibility, the SCFD and NDF will assume a unified command. The Sierra Front Interagency Dispatch Center in Minden, Nevada houses dispatch facilities for multiple state and federal agencies, including NDF. The Center coordinates resources for these agencies, including air support, overhead management, and extended ground attack.

Central Lyon County Fire Protection District. Storey County Fire Department is allowed to request first-alarm fire suppression resources from the Central Lyon County Fire Protection District based upon their mutual aid agreement.

Lake Tahoe Regional Fire Chiefs' Association Mutual Aid Agreement. Storey County Fire Department is a signatory to this regional mutual aid agreement. The agreement provides for the activation of pre-assigned task forces and strike teams with multiple suppression apparatuses to participating fire departments and fire protection districts under a "good neighbor" policy of free assistance for a predetermined period of time. This agreement is guided by an operating plan with mobilization guides updated annually by each participating force. These guides set forth the commitments made in local agreements, the regional plan, and the assistance for hire predicated on closest resource and the dispatch level of the request: initial attack (nearest on-duty crews respond), immediate need (crews respond within thirty minutes), or planned need beyond initial attack.

Sierra Front Wildfire Cooperators. Membership in the Sierra Front Wildfire Cooperators (Sierra Front) is composed of more than 25 federal, state, and local entities including fire suppression agencies, state and local law enforcement agencies, and special organizations such as the Natural Resources Conservation Service and the U.S. Weather Service. By pooling their resources, these agencies take a more efficient approach to the common goal of fire protection and a quicker response to wildland fires and other emergencies. The Sierra Front area extends its responsibility north to Susanville, California, south to Bishop, California, including the Tahoe Basin, and east to Fallon, Nevada.

Table 4-3. Typical Initial Attack Response in Storey County from Mutual Aid Agencies

TYPE OF RESOURCE	AMOUNT OF EQUIPMENT	AGENCY OR DISTRICT
Type I Engine Type II Tender Type III Engine Medic Unit	2 2 2 1	Central Lyon County Fire Protection District. Response will vary according to resource request.
Hand Crew Engine Type III Water Tender Bulldozer Helicopter Type III	1 4 1 1 1	Nevada Division of Forestry dispatched through the Sierra Front Interagency Center in Minden. Nearest available resources will respond based on the current fire hazard level.
Typical Strike Team/Task Force: Strike Team Leader Engine Type III	 1 5	Lake Tahoe Regional Fire Chiefs Association Nearest available resource, will respond based on the current fire hazard level.
Air Attack Type II Incident Management Team	1 1	Requests for resources beyond initial attack are dispatched through the Sierra Front Interagency Center in Minden.

Source: Personal communication with Chief Gary Hames, Storey County Fire Department, Chief John Gillenwater, Central Lyon County Fire Protection District; John Copeland, Fire Protection Officer NDF Western Region, Chief Duane Whitelaw, Operational Coordinator Tahoe Regional Fire Chiefs' Association, and Janice Meyer, Sierra Front Interagency Dispatch.

Detection Communication

Wildfire ignitions detected by the public are generally reported through the 911 system. Following dry lightning storm events, the Storey County Fire Department and Nevada Division of Forestry are on heightened alert to respond to these calls and dispatch patrols to directly detect ignitions. NDF also works with the Sierra Front Wildfire Interagency Dispatch Center to coordinate reconnaissance flights of areas that have experienced a lightning storm event.

Agencies use the following tools to communicate with fire response personnel:

- **Community sirens** operated in Virginia City, Virginia Highlands, Lockwood, and Six Mile.
- **Radio** access to a primary (155.865) and secondary (155.070) radio frequency and State Mutual Aid frequencies. All frequencies are compatible with neighboring agencies. For the most part, there are no known gaps in the radio coverage.
- **Fire Dispatch**. County fire resources are dispatched through the Storey County Sheriff Office located in Virginia City. Emergency personnel are notified by both radio and pager. Requests to activate interlocal and interagency aid agreements are made by the Storey County Fire Chief through unified county dispatch services at the Storey County Sheriff's Office. Requests to the Lake Tahoe Regional Fire Chief's Association are made though the Placer County Dispatch center. NDF, BLM, and USFS resources in this region are dispatched through the Sierra Front Interagency Dispatch Center in Minden, Nevada, which also coordinates with the dispatch offices of the remaining Sierra Front Wildfire Cooperators.

Fire Protection Personnel Qualifications

All Storey County volunteer and professional firefighters carry a minimum Wildland Firefighter II certification. Each has successfully completed the National Wildfire Coordinating Group (NWCG) courses S110, 120, 130, and 190 at a minimum. They are listed in the NWCG Red Card system with individual qualifications, which authorizes a person to fight wildland fires on public lands. The Storey County Fire Department also has certified Division Group Supervisors, Strike Team Leaders, and a Type II Incident Commander on their staff.

All volunteer and professional fire prevention employees, firefighters, fire officers, and fire instructors receive training to meet National Fire Protection Association (NFPA) standards.

Work Load

The Storey County Fire Department tracks calls on an annual, countywide basis using the Firehouse Software database. The calls from 2003 are summarized below.

- Emergency Medical Calls: 500
- Wildland / Brush fire calls: 150
- Other calls: 150

Financial Support

Financial support for fire protection in Storey County is described in Nevada Revised Statutes 473 and 474. The Storey County Fire Department funding for day-to-day activities is derived almost equally from two main sources: the assessment of an *ad valorem* property tax within Storey County and the Supplemental City-County Relief Tax (SSCRT) as described in the 474 Fire Protection District language. The Nevada Division of Forestry, through the fire protection district, is responsible for incident command after initial attack on wildfires that ignite on undeveloped private land in the county under the terms of the 473 Fire Protection District. The Fire Department also pursues grant funding when available.

Community Preparedness

The Storey County Fire Department works with the Storey County Sheriff's' Department and the local emergency planning committee to develop emergency plans, disaster plans, and an emergency evacuation plan. The Emergency Evacuation Plan (EEP) is currently in the final draft process and was expected to be issued during the last quarter of 2004. These plans are reviewed annually. Activation of the EEP is a "three deep" process, which means that a consensus of all three officials in charge of the entities mentioned must be reached for activation. Aspects of these plans were tested with success during the Andrew Fire in August 2004.

The Storey County Fire Department has an informational web page under development (www.storeyfire.com) and offers periodic programs for the public to increase community fire awareness and fire safety.

The Sierra Front Wildfire Cooperators have a pre-attack plan (dispatch run cards for initial attack) that is updated annually prior to the start of each fire season and the Storey County Fire Protection District participates in the pre-attack plan meetings. The Storey County Fire Department enforces a county ordinance prohibiting debris burning in the Virginia City and Gold Hill communities; it issues burn permits for those areas where burning is permitted. The Storey County Fire Department reviews new development plans for the communities to ensure that they conform to current fire code standards.