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Butte County, Idaho Fire Risk Assessment and Mitigation Plan



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DISCLAIMER

North Wind, Inc. has prepared this Fire Risk Assessment and Mitigation Plan solely for Butte County, Idaho. The technical information contained herein should not be released without the written consent of the Authorized Officer. This document shall be used as a guide for County and local fire management agencies to mitigate the risk and hazard of wildfire in Butte County.

This is not a final decision document and Butte County should not implement fire management recommendations contained herein without appropriate planning, analysis, and funding. This management plan is intended solely as guidance by which fire risk and mitigation analyses have been provided to Butte County, Idaho by North Wind, Inc. North Wind, Inc. shall not be held liable for problems or issues associated with implementing the actions contained in this report.

1.0 INTRODUCTION

After the record-breaking wildfire season of 2000, Congress approved funds for federal and state agencies, and local communities, to develop and implement a national strategy for preventing the loss of life, natural resources, private property and livelihoods. The result of that planning and preparation is commonly known as the “National Fire Plan” (NFP) (U.S. Department of Agriculture [USDA] 2002). This plan was approved in September 2000 and is fully titled *Managing the Impacts of Wildfire on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000*. The NFP includes five key points: firefighting preparedness, rehabilitation and restoration of burned areas, reduction of hazardous fuels, community assistance, and accountability. In 2001, Congress released another directive requiring the Departments of Agriculture and the Interior to engage Governors in the development of a National ten-year comprehensive strategy that would implement the NFP. For this effort, *The Idaho Statewide Implementation Strategy for the National Fire Plan* (Kempthorne et al. 2002) was developed. It was approved in May 2002 and involved the cooperation and collaboration of the Secretary of Interior, the Secretary of Agriculture, the Governors of Montana, Wyoming, Idaho, and Oregon, and the Director of the Council on Environmental Quality. The primary goals of the Idaho Plan are to: improve prevention and suppression of wildfire, reduce hazardous fuels, restore fire-adapted ecosystems, and promote community assistance.

The purpose of this mitigation plan is to identify and mitigate wildfire risks and negative consequences in communities and Wildland Urban Interface (WUI) areas of Butte County, Idaho. A WUI is an area where improved property and wildland fuels meet at a well defined boundary. The mitigation plan addresses Federal Emergency Management Agency (FEMA) criteria contained in 44 CFR Part 201.6 and follows guidance from the *Idaho Statewide Implementation Strategy for the National Fire Plan* (Kempthorne et al. 2002) by: 1) identifying fire hazards that affect Fremont County and its residents, 2) providing sufficient information to make mitigation decisions, 3) discussing existing resources that are most current and best available and, 4) describing the process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved. The mitigation plan will be maintained, that is, monitored, evaluated, and updated annually within a five-year cycle, by a group of Butte County residents or Wildland Fire Interagency Group. The group will be represented by agencies countywide with wildland fire suppression experience and responsibilities. County Commissioners will take the lead for monitoring the plan while the other group members evaluate the risks and vulnerabilities to wildland fire within their area of concern. The maintenance process will allow local governments, when appropriate, to incorporate the requirements of the plan into other planning mechanisms such as comprehensive or capital improvement plans which will include public participation through scheduled hearings and meetings.

The purpose of this risk assessment and mitigation plan is to identify and mitigate wildfire risks and negative consequences in communities and Wildland Urban Interface areas of Butte County, Idaho in accordance with the Idaho Statewide Implementation Strategy for the National Fire Plan. The Wildland Urban Interface is defined as the residential and supporting commercial land uses intermingled with range commercial uses and wildlands (Hodgson 2001).

This Butte County Fire Risk Assessment and Mitigation Plan is comprised of four sections – Introduction, General Description, Existing Conditions, and Specific Mitigations. These sections summarize (1) the legal requirements and rationale for developing the plan, (2) the uniqueness of Butte County relative to the diverse land ownership, economics and social structure, (3) the fire hazards and risk assessments relative to different areas within Butte County, (4) the fire mitigation goals and their actions based on public involvement, and (5) mitigation costs, monitoring and evaluation.

2.0 GENERAL DESCRIPTION

The general description of Butte County is discussed in this section as follows: (1) land ownership, (2) topography and vegetation, (3) precipitation, (4) population, (5) land uses and economic development, and (6) roads. The Butte County Comprehensive Plan, the Butte County Assessor's office, North Wind's GIS database, and the County's website provided much of this information.

2.1 Land Ownership

Butte County, Idaho, is comprised of approximately 1.4 million acres divided among six landowners (Table 1). The Lemhi and Lost River Mountain ranges are located on the north and central portion of the County and are managed by the U.S. Forest Service (USFS) - Challis National Forest. Bureau of Land Management (BLM) lands, interspersed with State lands, adjoin the National Forest and extend to the south. The U.S. National Park Service manages Craters of the Moon National Monument (CMNM) in the southwest portion of the County, and the Department of Energy manages the Idaho National Engineering and Environmental Laboratory (INEEL) to the east. Private land lies mainly along the Big and Little Lost River Valleys (Figure 1).

Table 1. Land Status of Butte County, Idaho

Land Status	Acres
BLM	494,513
INEEL	336,617
USFS	271,484
Private	171,332
CMNM	136,694
State of Idaho	19,885
Open Water	467
Total	1,430,992

2.2 Topography and Vegetation

The topography of Butte County is primarily high mountain desert with elevations from 4,783 feet at the Big Lost River Sinks on the INEEL to 12,197 feet at the top of Diamond Peak in the Lemhi Range. The dominant shrub species are Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*), basin big sagebrush (*A. tridentata* spp. *tridentata*), and green rabbitbrush (*Chrysothamnus vicidiflorus*). This cover type is commonly known as the Upper Snake River Plain sagebrush-steppe and represents most of the wildland urban interface in Butte County. Much of this ecosystem throughout the west has been segmented and converted to development and agriculture. Basin big sagebrush may dominate or co-dominate with Wyoming big sage in areas with deep or sandy soils. These shrubs ignite readily and produce hot fires. Other common shrubs include winterfat (*Ceratoides arborescens*), spiny hopsage (*Greyia spinosa*), gray horsebrush (*Tetradymia canescens*), rubber rabbitbrush (*C. nauseosus*), and prickly phlox (*Leptodactylon caespitosum*). The shrub understory consists of a variety of grasses and forbs. The most common native grasses include thickspike wheatgrass (*Elymus macrourus*), Indian rice grass (*Achnatherum hymenoides*), bottlebrush squirreltail (*E. elymoides*), needle-and-thread grass

(*Stipa comata*), and bluebunch wheatgrass (*Pseudoroegneria spicata*). Some of the more common native forbs include tapertip hawkbeard (*Crepis acuminata*), Hood's phlox (*Phlox hoodii*), western yarrow (*Achilles millefolium*), lupines (*Lupinus* spp.), milkvetches (*Astragalus* spp.), and mustards (*Brassica* spp.). Willow (*Salix* spp.) occurs along the major watercourses and drainages. Rocky Mountain juniper (*Juniperus scopulorum*) has encroached into native sagebrush steppe communities in many locations. This species tends to burn rapidly and hot, further exacerbating the fire potential in many areas throughout the County. The most common non-native grasses are cheatgrass brome (*Bromus tectorum*) and crested wheatgrass (*Agropyron cristatum*).

2.3 Precipitation

Tables 2 and 3 summarize mean monthly climatic data for the Arco and Howe weather stations for years 1948 to 2003. These weather stations are located near Arco and Howe, which are within two separate valleys within the County. The data compare favorably and show the highest precipitation during the months of May and June and then tapering off through the summer and fall.

Table 2. Monthly Climate Summary for Arco, Idaho

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	28.9	34.6	43.9	57.1	67.7	76.8	85.8	83.9	74.1	61.4	43.0	31.1	57.3
Average Min. Temperature (F)	3.8	8.7	18.9	28.2	36.8	43.5	48.7	46.2	37.9	28.8	18.0	7.3	27.2
Average Total Precipitation (in.)	0.90	0.88	0.68	0.79	1.19	1.15	0.58	0.68	0.65	0.49	0.70	0.92	9.60
Average Total Snowfall (in.)	10.4	6.2	2.7	0.8	0.4	0.0	0.0	0.0	0.0	0.2	2.3	8.0	31.1
Average Snow Depth (in.)	4	2	1	0	0	0	0	0	0	0	0	1	1

Data for period August 1, 1948 to July 31, 2003 (Western Regional Climate Center – 2003).

Table 3. Monthly Climate Summary for Howe, Idaho

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	30.2	36.2	47.1	59.6	68.5	77.4	87.1	85.1	74.4	61.1	43.2	31.3	58.4
Average Min. Temperature (F)	6.5	12.0	21.8	30.1	38.5	45.5	50.4	48.2	38.9	28.9	18.7	8.2	29.0
Average Total Precipitation (in.)	0.56	0.55	0.47	0.69	1.04	1.21	0.59	0.79	0.54	0.46	0.60	0.69	8.20
Average Total SnowFall (in.)	3.3	2.5	1.5	0.7	2.4	0.0	0.0	0.0	0.0	0.4	1.5	4.4	16.6
Average Snow Depth (in.)	3	2	1	0	0	0	0	0	0	0	0	2	1

Data for period August 1, 1948 to July 31, 2003 (Western Regional Climate Center – 2003).

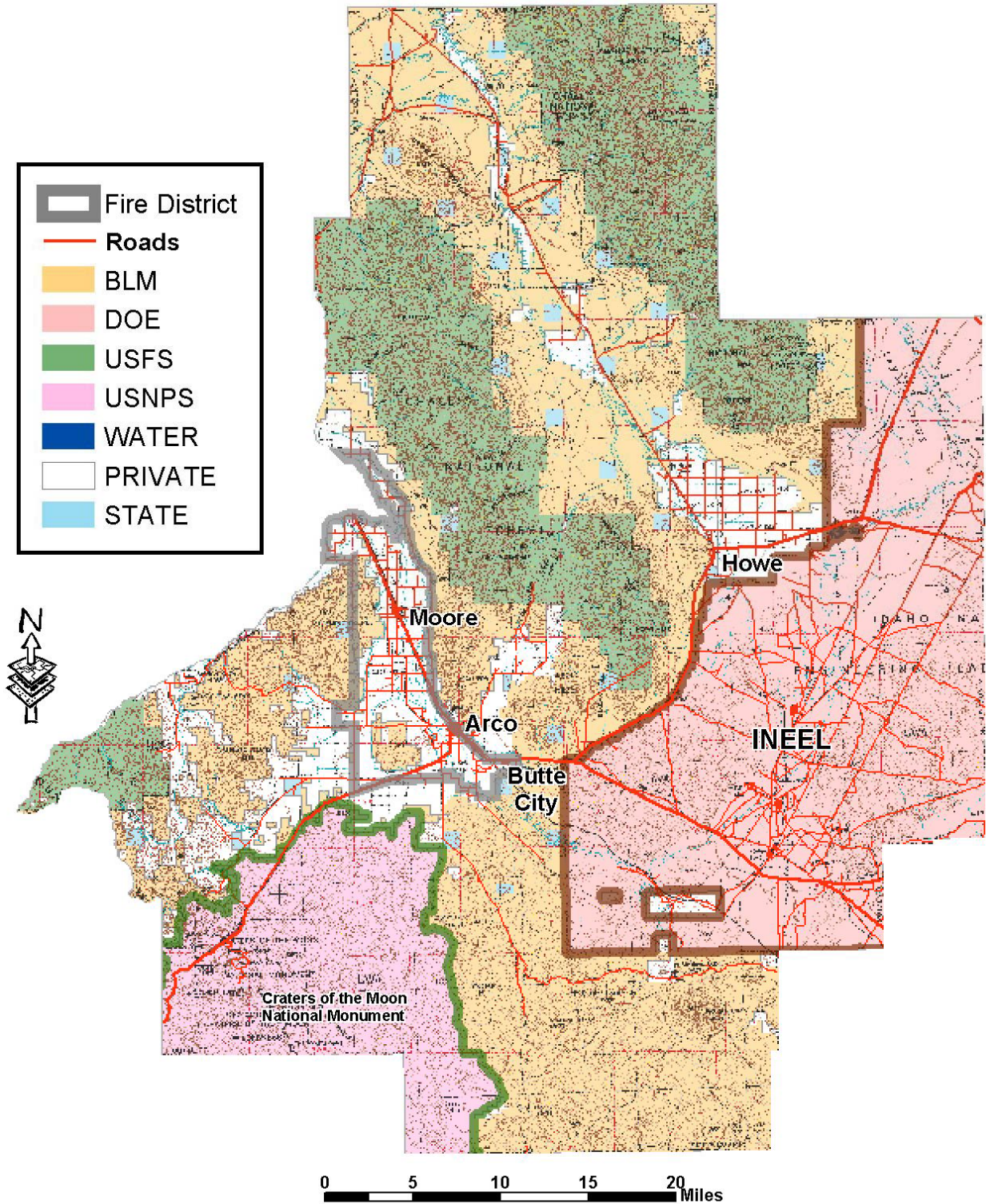


Figure 1. Butte County Land Ownership.

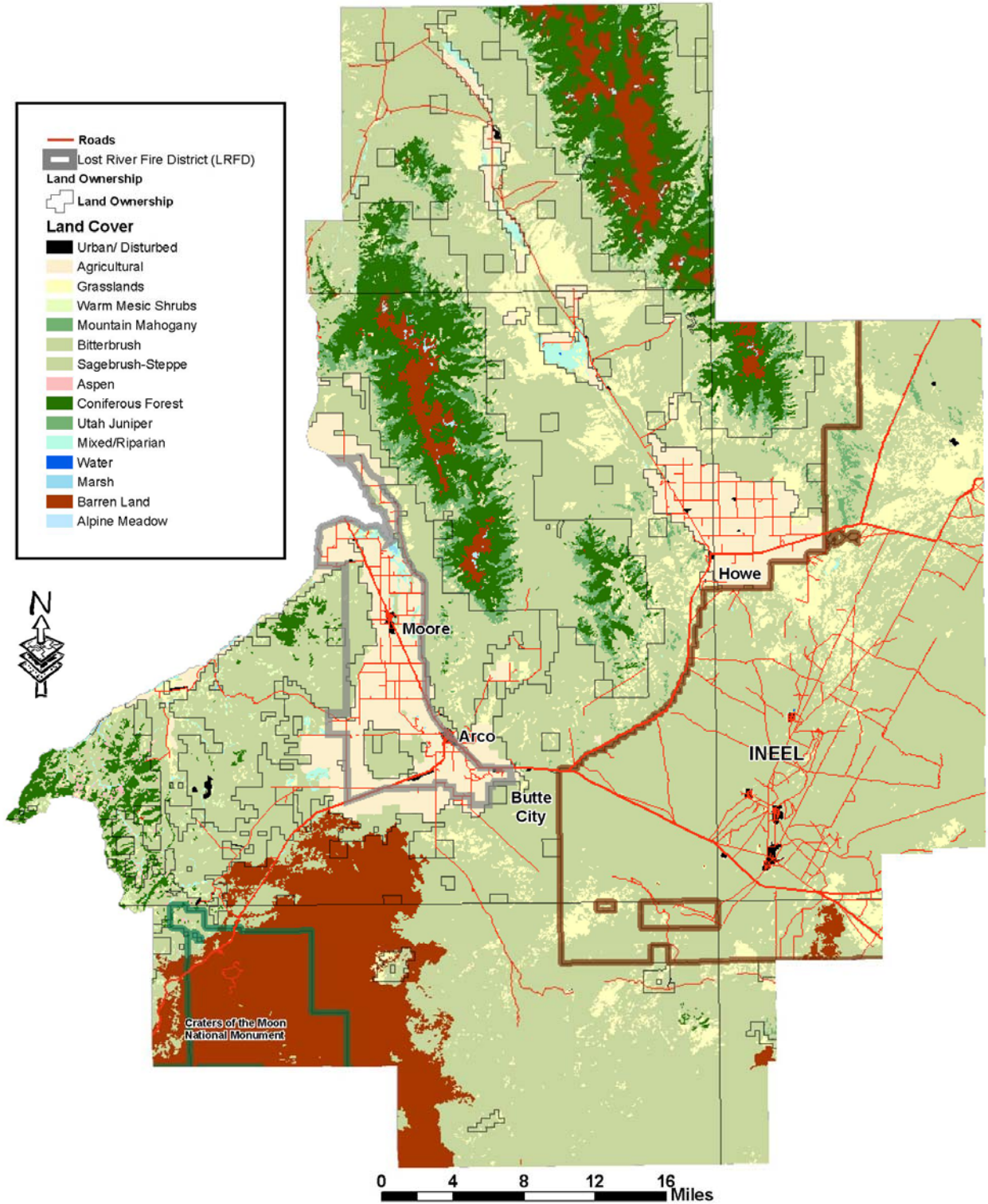


Figure 2. Butte County vegetation map.

2.4 Population

According to the Butte County Comprehensive Plan (Beal et al. 1998), the population of the county is considered 100% rural and approximately 1.30 persons per square mile. The National Association of Counties (2003) shows a decline in population for Butte County from 1980 (3,351) to 2000 (2,899). Table 4 shows the population of the major towns in Butte County – Arco, Butte City, and Moore – for years 1980, 1990, 1992, 1994 and 2000. For the Arco service area, the Eastern Idaho Fire Program (2003) shows no current rate of population growth per year, less than 5% anticipated growth per year, and greater than 10% population growth occurring in the wildland-urban interface.

Table 4. Arco, Butte City, and Moore Populations

Cities	Population				
	1980	1990	1992	1994	2000
Arco	1241	1016	1029	1106	1026
Butte City	93	59	65	59	76
Moore	210	190	196	198	196

2.5 Land Uses – Economic Development

Butte County's most important land use is agriculture and the majority of these land owners rely on public grazing lands to support their operation (Beal et al. 1998). The largest employment sectors are services, manufacturing, and the INEEL, with agriculture following as fourth. The Comprehensive Plan estimates the total employment within the county at 8,200 although only 15% (1,200) reside in Butte County and 18% (1,470) commute to other locations outside the county. Many persons reside outside the county and work at the INEEL.

2.6 Roads

The 2002 Butte County Subdivision Ordinance identifies roads and assigns a classification to each road (Table 5). In this report, these classifications were used to describe a road as it applies to fire department response time.

Table 5. Road Classifications for Butte County

Butte County Road Classifications
Minor road – provides access to abutting properties
Collector road – carries traffic from minor roads to the other collecting roads and/or arterial roads
Arterial road – designed to carry fast and/or heavy traffic between communities
Loop road – minor road with both terminal points on the same road of origin
Cul-de-sac – road connected to another street at one end only which is not more than 500 feet in length and terminates with an adequate temporary turnaround having a minimum radius of 50 feet for right-of-way
Frontage road – parallel to and adjacent to an arterial road, which has the primary purpose of providing access to abutting properties
Industrial road – designated for the purpose of providing traffic movement in an industrial area
Commercial road – designated for the purpose of providing traffic movement in a commercial area
Partial road – dedicated right-of-way providing only a portion of the required road width, usually along the edge of a subdivision or tract of land
Private road – provides vehicular and pedestrian access to one or more properties, however, not accepted for public dedication or maintenance

3.0 EXISTING CONDITIONS AND RESOURCES

This section identifies important wildland fire-related issues and their relationship to existing conditions in Butte County. Existing conditions in Butte County were determined by: (1) interviewing local, state, and federal employees and county residents; (2) driving the main roads within the Lost River Fire Protection District (LRFPD), Antelope Road to the Medicine Rock Equestrian Center, and the main Little Lost River Valley road to the Custer County line near Pass Creek Summit (Figure 3); (3) inspecting fuel loads adjacent to roads and, if flammable, calculating the distance this fuel occurred along the road; (4) evaluating roads for accessibility by large firefighting equipment such as tenders and pump trucks, surface conditions, bridge weight limits, and road classifications; (5) photographing representative structures and visually checking these structures for fire hazards and safety, including defensible space, location of propane tanks, proximity of fire hydrants and/or water sources, ingress and egress, and type of siding and/or roofing material; and (6) completing a Wildland Fire Hazard Assessment, Structural Assessment, and Community Assessment Form at representative locations within the LRFPD and near the towns of Arco, Moore, and Butte City (Figure 3). Structures were selected based on but not limited to: (1) proximity to a wildland-urban interface, and (2) exhibiting a fire hazard and safety concern such as proximity to highly flammable sources (i.e., large fields, vacant lots) or flammable material within 10 feet of the structure.

3.1 Risk of Fires and Fire Frequency

The risk of wildfires within or adjacent to Butte County, Idaho is generally high due to a prolonged accumulation of flammable fuels. Cool wet springs have increased grass and shrub density within the sagebrush-steppe and persistent drought over the last decade has led to a high fire danger. Figure 4 shows fire frequency data from 1939 through 2002. The fire frequency is based on the number of times a geographic area has burned. The highest frequency is seen in the southern portion of the county, with most fires occurring after 1994, and all fires burned within the sagebrush-steppe cover type.

Flammable fuels that accumulate along most roads in the county (Figure 5) are related to 90% of the fires that occur in Butte County. Rocky Mountain juniper has encroached into native sagebrush steppe communities (Figure 6), further exacerbating the fire potential in many areas within the county. Since the 1980's the introduction of non-native annual plants, such as cheatgrass into native rangelands, has altered the natural frequency and recovery cycle. Cheatgrass sprouts in the late-winter, spring, or fall and dries quickly, increasing the chance of fire. Following fire, cheatgrass quickly germinates and outcompetes less flammable native plants for moisture and sunlight. The short growth period of cheatgrass relative to native plants also increases the likelihood of wildfire starts and spread through dry fuel accumulation (Pellant 1996).

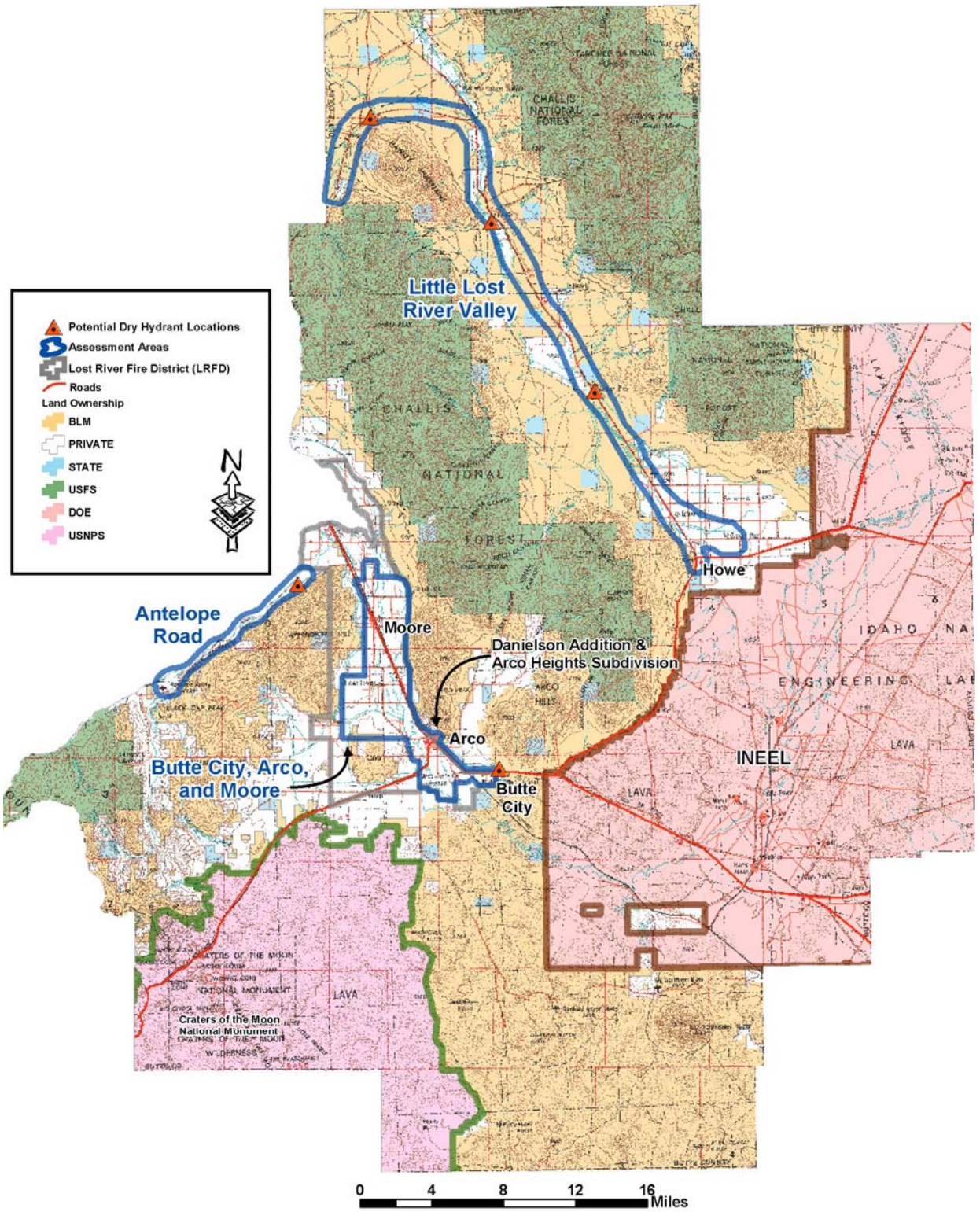


Figure 3. Assessment areas within Butte County

Butte County Fire Frequency

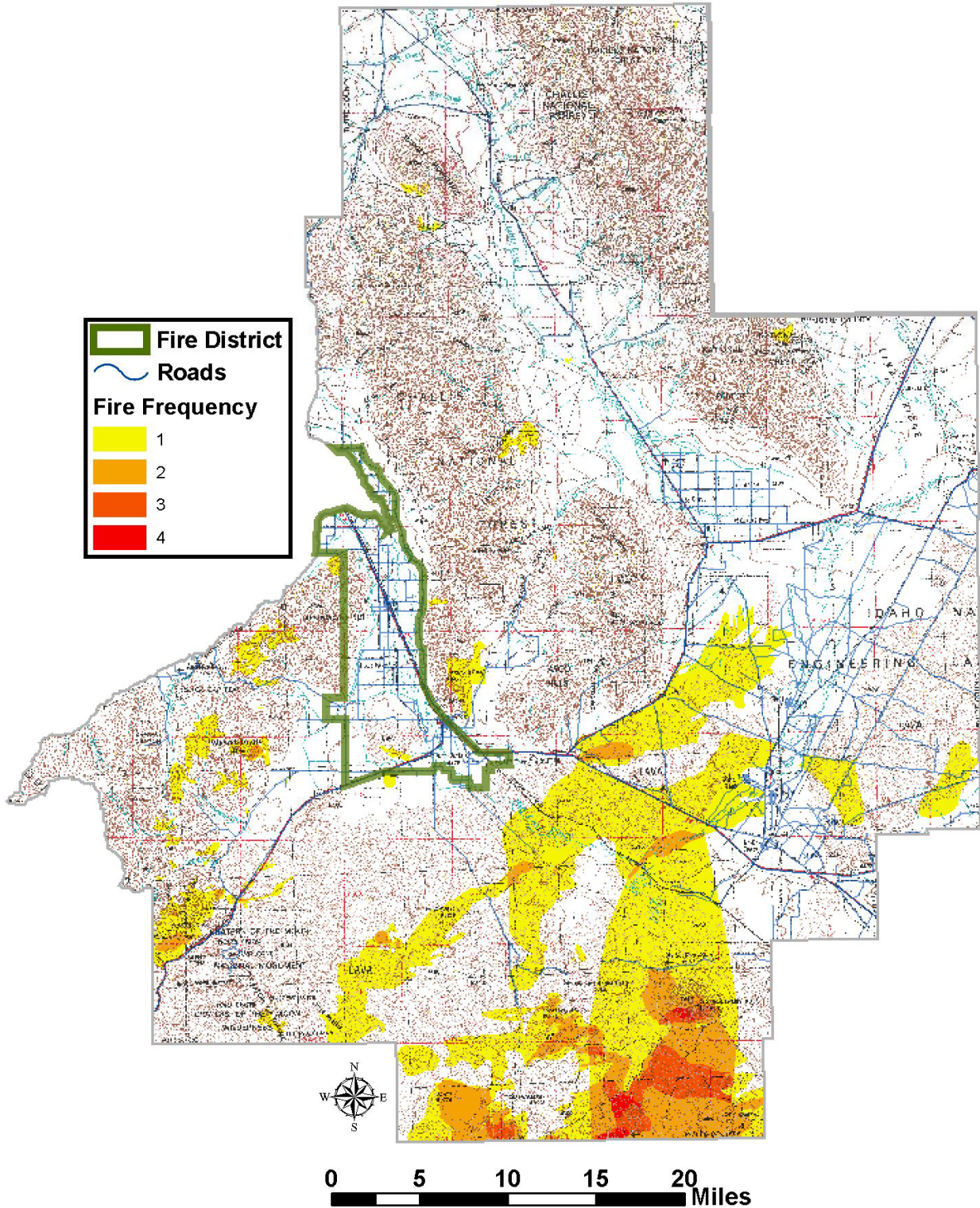


Figure 4. Butte County fire frequencies.



Figure 5. Fuels next to State Highway 20/26.
Photo shows crested wheatgrass, rabbitbrush and sagebrush alongside the highway (taken six miles inside Butte County, ID looking west toward Arco).



Figure 6. Juniper encroachment along State Highway 22.

3.2 Fuel Load Model

There is a need to assess wildfire fuel loads across the Intermountain West and large-scale models have already been developed for this purpose. However, the fuel load classes within these models may be too general to accurately predict differences in the sagebrush-steppe semi-arid deserts common to the west and specifically to Butte County.

Butler and Reynolds (1994) reported total fuel loading on the INEEL to be approximately 1-ton per acre in 1994. By 2000, the fuel load model (Figure 7) showed up to 4 tons per acre on the INEEL and surrounding areas within the same sagebrush-steppe cover type (Russell and Weber

2000). This increase could be attributed to the accumulation of standing dead grasses from year-to-year resulting from continuous low snow pack for those years (Butler and Reynolds 1994). Figure 7 also shows the wildland-urban/rural interfaces along the entire east boundary of the Lost River Fire Protection District. This interface is comprised of irrigated agriculture lands and sagebrush-steppe and contains fuels ranging from 4 to 6 tons per acre.

The 2000-fuel load model was developed using a remote sensing technique utilizing a combination of training sites within the sagebrush steppe communities of Southeast Idaho and 2000 Landsat 7 ETM+ satellite imagery. The model was specifically designed for use as a decision support tool for rangeland communities.

3.3 Slope Risk Model

Figure 8 shows the Slope Risk Model for Butte County. Steep slopes cause rapid fire spread because of convection and radiant heat and the fact that the flames are closer to the fuels. The model was developed using 30-meter spatial resolution digital elevation model (DEM). Slope was calculated from the DEM by ArcInfo processing.

3.4 Interagency Fire Agreements

Memoranda of Understanding (MOUs) and Cooperative Fire Protection Agreements currently exist between Butte County and Challis National Forest, BLM, CMNM, and the INEEL. These agreements are discussed in detail later in this report.

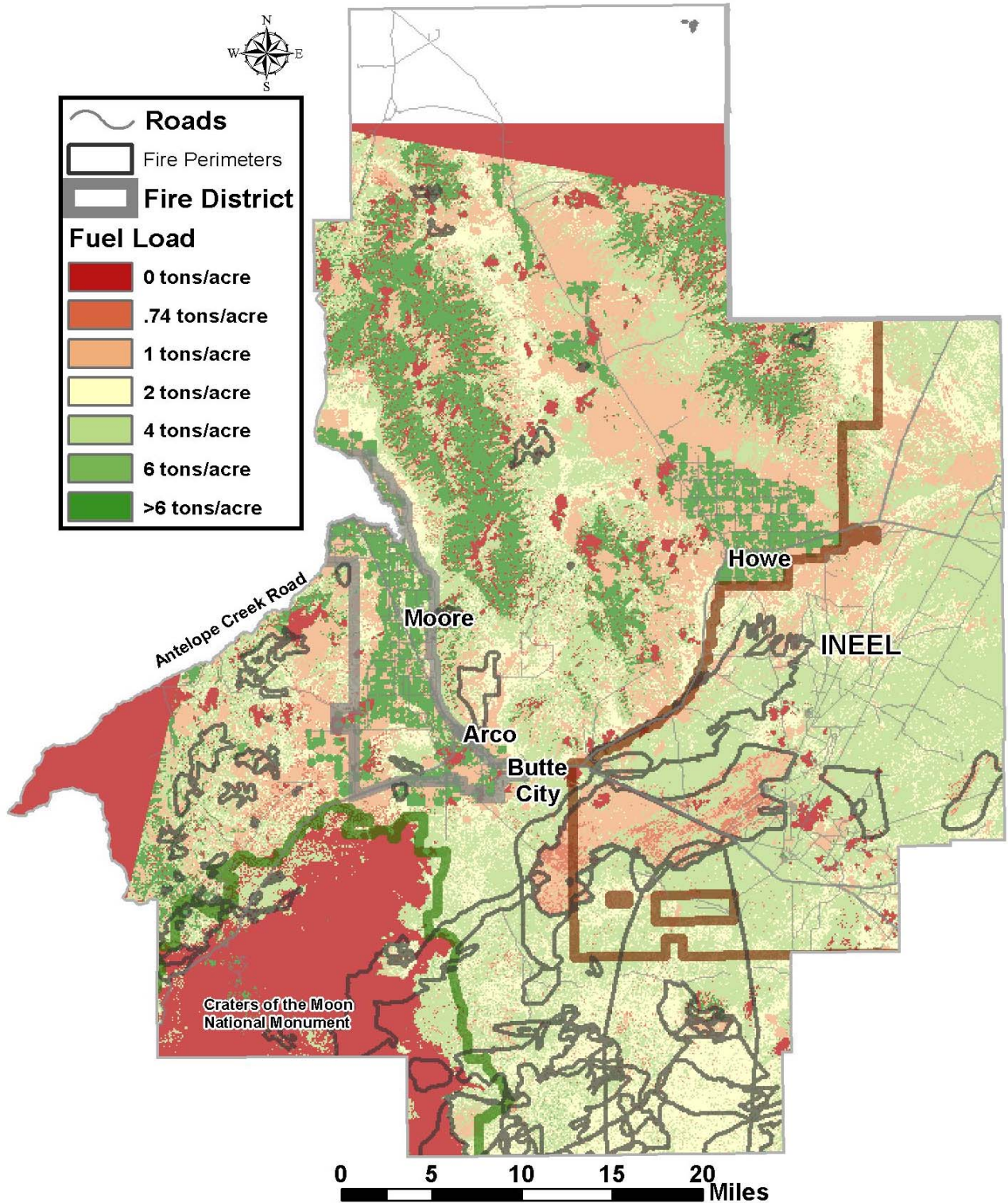


Figure 7. Butte County Fuel Load Model.
The model shows tons/acre values for each vegetation class.

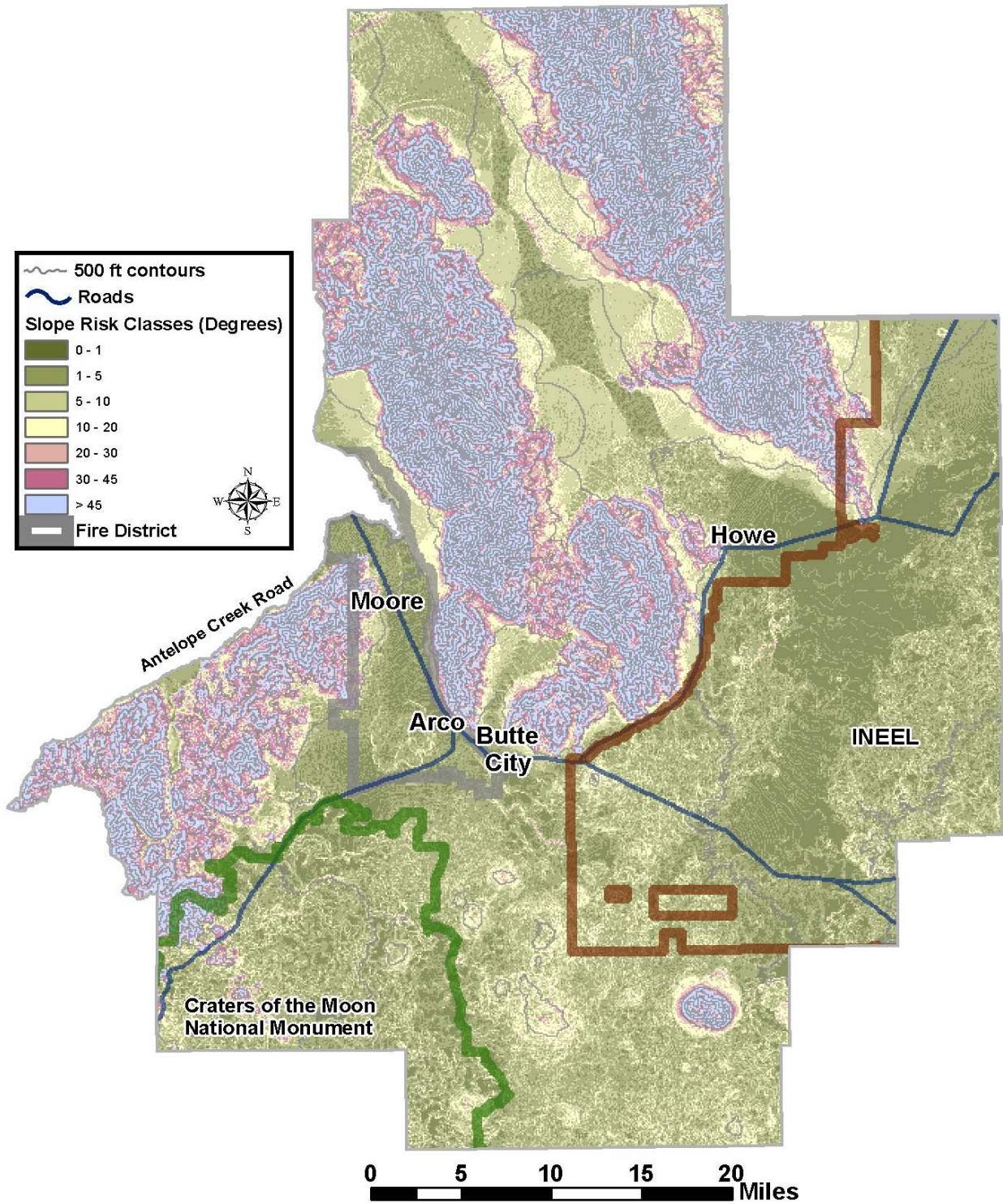


Figure 8. Butte County Slope Risk Model.

3.5 Lost River Fire Protection District

The Lost River Fire Protection District (LRFPD) (Figure 9) boundary is approximately 83 square miles or 3.7% of Butte County. The LRFPD has one fire department at Moore that serves Butte City, Moore, Darlington, and homes just off the pavement on the Antelope Creek Road. The remainder of the private land in the county is considered “unprotected.” According to the Mutual Aid Agreement between the BLM and LRFPD, the LRFPD is the first responder to BLM land located within the boundary and BLM lands adjacent to the boundary for the first mile. This effectively increases the LRFPD’s responsibilities to an area approximately 150 square miles. In addition to the MOU with the BLM, the LRFPD has agreements with Arco Fire Department, South Custer Fire District (Mackay), U.S. Forest Service, Craters of the Moon National Monument, and the INEEL.

The LRFPD currently is comprised of fourteen volunteer personnel (Table 6). Table 7 lists the equipment located at the fire station in Moore and the single structural pumper housed at the Arco fire station. In addition to this equipment, there are twelve water hydrants within the city of Moore.

The District responds to approximately 20 fire-related incidents annually. During the past five years the average yearly cost of \$75,000.00 for structural suppression, \$10,000.00 for wildland fire suppression, and \$20,000.00 for vehicles and agricultural-related incidents. The LRFPD has the capability of a 10-20 minute response time including scene size-up, search and rescue, and initial attack and, as needed, will combine efforts with the Arco Fire Department. The LRFPD’s fire response includes protection for structures, wildfires, and vehicle fires. All firefighters are trained in wildland fire suppression and have developed initial response cards for personnel and apparatus assignments.

Table 6. LRFPD Personnel

Moore Fire Department Personnel	
Name	Title
Kenneth W. Babcock	Chairman – Fire District Commissioners
Clyde Hymas	Commissioner
Rick Reynolds	Commissioner
Lin Pearson	District clerk
David Mull	Chief
Jim Huelsman	Assistant Chief
Duane Haney	Captain
Dennis Maynard	Captain
Phil Scott	Firefighter
Beau Maynard	Firefighter
Kevin Hays	Firefighter
Ron Mort	Firefighter
James Matt	Firefighter
Dean Moncur	Firefighter

Table 7. LRFPD Equipment

Moore Fire Department Equipment				
Unit	Type	Pump	Tank	Location
201**	Structural pumper	500 gpm	1000 gallon	Arco
205**	Wildland engine	350 gpm	300 gallon	Moore
212***	Structural pumper	1000 gpm	750 gallon	Moore
223***	Heavy brush 6X6	120 gpm	900 gallon	Moore
224***	Light brush 4X4	20 gpm	250 gallon	Moore
236	Water Tender	300 gpm	4000 gallon	Moore

**Capable of drawing water from ponds, etc

***Capable of drawing water from ponds and using foam

3.6 Lost River Fire Protection District Overview

In 2003, the Eastern Idaho Fire Program - Three Rivers RC&D Council received a grant to conduct an independent assessment of the needs and capabilities of the fire departments in southeast Idaho. These results were provided to BLM and the fire departments. A summary of this assessment for the Lost River Fire Protection District is shown in Table 8.

Table 8. Lost River Fire Protection District Resources and Assets

Facilities	The District has one station with six bays. The District also houses one Class "A" pumper in the Arco Fire Station, allowing better coverage on that end of the District.
Response Area	The fire protection area includes agricultural, rangelands, forest, wildland urban interface, and residential, business, and high risk with mutual aid to the Idaho National Engineering and Environmental Laboratory. The District responds to an area approximately 150 square miles in size.
Budget and Funding	The budget has remained steady over the past few years with 100% of District funds coming from taxes.
Grants	The Fire District has received grant funds from the State IDS, FEMA and other private foundations. They are knowledgeable about the National Fire Plan and hope to increase their use of grants for purchases in the future.
Records Management	A manual records management system is in place. The District tracks personnel, training records, agreements, building and apparatus maintenance records.
Hazardous Materials Program	The Fire District does not have a HazMat response team. Mutual aid agreements are in place with the U.S. Forest Service, BLM, INEEL, the Idaho Department of Lands and the Arco and South Custer Fire Programs.
EMS Program	The District does not provide EMS services.
Training and Certification	The District's training program includes structural protection [Self-Contained Breathing Apparatus (SCBA), emergency vehicle driving apparatus], and wildland fire suppression (standards for survival, shelters and firefighter 1).
Communications	Communication is dispatched through the Butte County Sheriff's Department. Radio communication capacity is sufficient. All of the vehicles are equipped with radios and the District does have a sufficient number of hand-held radios.
Prevention and Inspection	The District does not have Fire Code regulation enforcement capacity, and does not conduct fire cause and origin investigations. If there is a cause or origin question, the State Fire Marshal's Office is called in for advice and investigation.
Public Education	The District does conduct public education programs for structural fires, wildland fires and home safety. It also regularly participates in public outreach through fire station open houses.

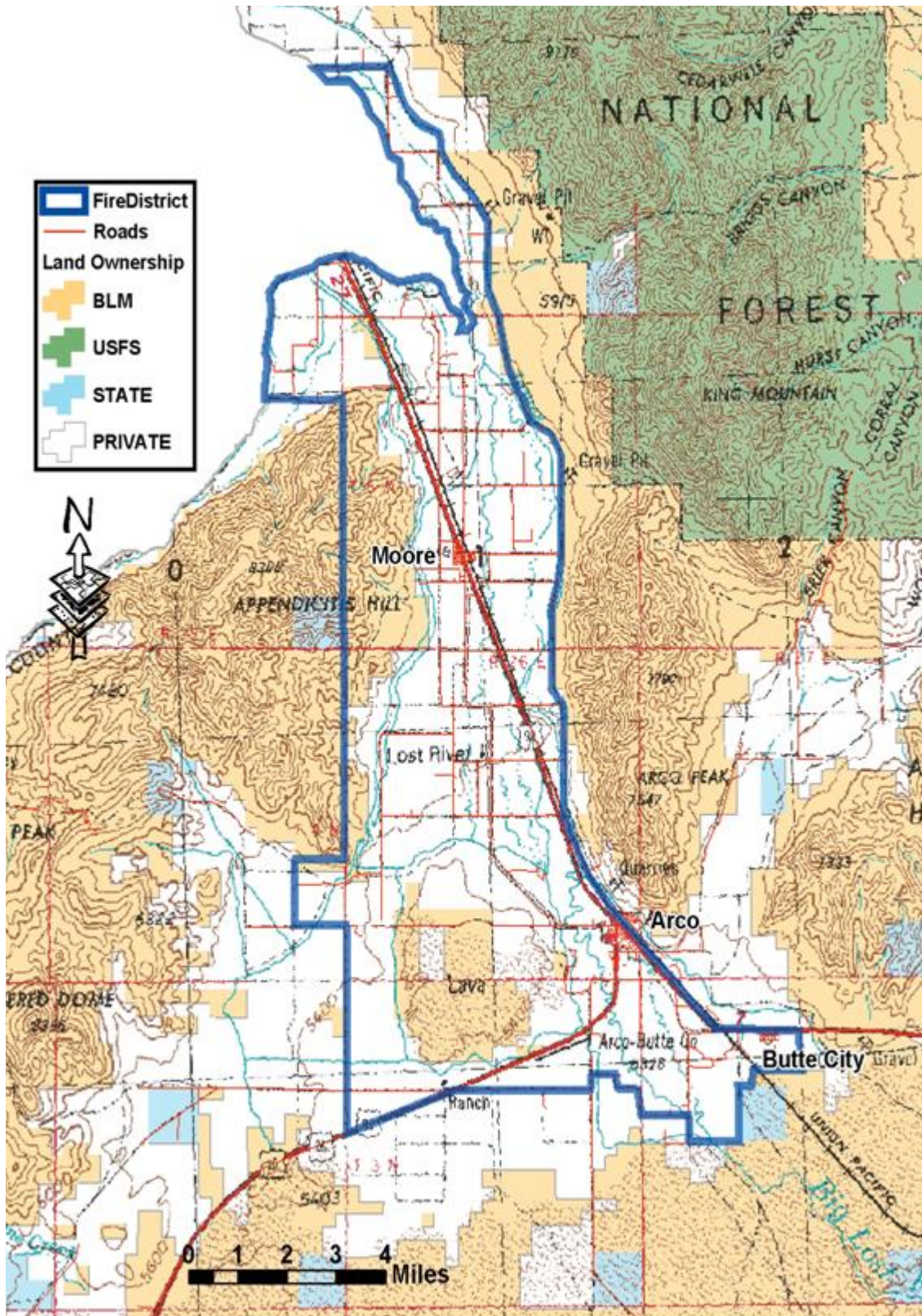


Figure 9. Lost River Fire Protection District.

3.7 Arco Fire Department

The Arco Fire Department is located in the town of Arco and currently is comprised of ten volunteer personnel Table 9. The Department serves 10 square miles of city property and the 83 square miles of the LRFPD (Figure 9). Table 10 lists the Department's equipment located at the fire station and Table 11 lists the Department's radio frequencies.

The Department responds to approximately 48 fire-related incidents annually. In 2001, there were 41 incidents that the department responded to, with an estimated cost of \$170,075. In 2002 there were 27 incidents with an estimated cost of \$80,000. The Department's average response time is <5 miles = 7-10 minutes; 5-10 miles = 15-20 minutes; >10 miles =20 plus minutes and, as needed, will combine efforts with LRFPD. The response time includes scene size-up, search and rescue, and initial attack. The Department's fire response includes protection for structures, wildfires, and vehicle fires. All firefighters are trained in wildland fire suppression and initial response cards have been developed for personnel and apparatus assignments. There are some adequate and reliable sources of water in Arco through water mains, hydrants, city wells, and bodies of water. The Department has mutual aid/MOUs with the LRFPD, CMNM, USFS, BLM, INEEL and a signatory with the East Idaho Reciprocal Firefighting Assistance Agreement.

Table 9. Arco Fire Department Personnel

Arco Fire Department Personnel	
Name	Title
Daniel Koste	Fire Chief
Tim Williams	Assistant Fire Chief
Bill Moncur	Captain
Kevin Brewer	Captain
Tammi Hughes	Firefighter
Ernie Lenge	Firefighter
Jeff Lenge	Firefighter
Kody Lindsay	Firefighter
LaJunta Rinkle	Firefighter
George Warner	Firefighter

Table 10. Arco Fire Department Equipment

Arco Fire Department Equipment			
Vehicle Identification	Vehicle Capacity	Primary Function	NWCG Type
AFD Unit 113	1250 GPM/500 Gallon Tank	Structural Engine	1
AFD Unit 121*	6X6 200 GPM/600 Gallon Tank	Wildland Engine	3
AFD Unit 125*	4X4 35 GPM/250 Gallon Tank	Wildland Engine	6
AFD Unit 144*	100 GPM/250 Gallon Tank	Rescue Squad	NA

*Capable of drawing water from pumps and using foam.

Table 11. Arco Fire Department Radio Frequencies

Arco Fire Department Radio Frequencies			
Transmit	Receive	Channel Number	Use Identification
154.385	154.385	5	AFD Point to Point
153.755	154.385	1	AFD Repeater
156.045	159.165	3	BSO Repeater
158.925	158.925	6	LRFD Point to Point
153.815	158.925	2	LRFD Repeater
155.340	155.340	4	EMS-1

Arco Fire Department Overview

In 2003, the Eastern Idaho Fire Program - Three Rivers RC&D Council received a grant to conduct an independent assessment of the needs and capabilities of the fire departments in southeast Idaho. These results were provided to BLM and the fire departments. A summary of this assessment for the Arco Fire Department is shown in Table 12.

Table 12. Arco Fire Department Assessment

Arco Fire Department Assessment Overview – Resources and Assets	
Facilities	The Department has one fire station with three bays. The City would like to build a new fire station with devoted classroom and hands-on training space.
Response Area	The Department provides fire protection for agricultural, rangelands, forest, Wildland-Urban Interface, residential and business properties. It serves 10 square miles of city property.
Budget and Funding	The Department has experienced no budget increases over the last five years. Approximately 80% of the budget comes from taxes and 20% from grants.
Grants	Grant funds have been received from BLM and U.S. Forest Service. The Department is not yet familiar with the National Fire Plan but intends to research it in the near future. The Department hopes to seek more grant funding in the future.
Records Management	A computerized records management system is in place. The Department uses National Fire Incident Reporting System (NIFIRS) reporting software and crossfire software.
Hazardous Materials Program	The Department does not have a Hazardous Materials (HazMat) response team. The Department is adjacent to the INEEL, which has a full-time HazMat response team. The District does participate in a reciprocal mutual aid agreement with the INEEL. The Department also cooperatively responds to fires with the Lost Rivers Fire Protection District as needed.
EMS Program	The Department does not provide Emergency Medical Services (EMS). It will respond to motor vehicle accidents for extrication, when called to do so.
Training and Certification	The Department meets training and certification standards in the areas of structural protection (firefighter safety, Personal Protective Equipment (PPE)/Self-Contained Breathing Apparatus (SCBA), hose, nozzle and ladders), wildland fire suppression (basic and standards for survival), and HazMat awareness training. The Department utilizes the International Fire Service Training Association (IFSTA) training program.
Communications	All fire fighting equipment is equipped with radios; there are sufficient hand-held units for communication within Arco and among firefighters. Radio communications are not adequate with other entities because of the “dead

Arco Fire Department Assessment Overview – Resources and Assets	
	space” around the CMNM and the strict air space requirements around INEEL.
Prevention and Inspection	The Department does administer and enforce Fire Code regulations and conducts fire cause and origin investigations. The State Fire Marshal’s Office is utilized as needed.
Public Education	The Department conducts public education programs for structural fires, wildlands and home safety. It also regularly participates in public outreach at schools, public events, the fire station open house, and fire station tours.

3.8 Idaho National Engineering and Environmental Laboratory (INEEL)

A large portion of the INEEL is located within Butte County. The facility is owned and administered by the U.S. Department of Energy. Day-to-day operations are managed under various contracts with private industry, the U.S. Navy, the U.S. Army, and other agencies. The INEEL has experienced 48 wildland fires over the past ten years that involved a total of approximately 137,500 acres.

The INEEL uses a Wildland Fire Management Guide (GDE-7063) as its primary planning tool for preventing and managing wildland fires. The INEEL Emergency Response Organization (ERO) is the site-wide organization that manages all significant emergency response activities, including wildland fires. The INEEL Fire Department is the primary tactical entity used by the ERO to provide fire suppression. Heavy equipment resources from other operational activities at the INEEL augment suppression activities. The INEEL utilizes an Incident Command System (ICS) for operational activities, and supports field ICS elements with ERO elements that operate from Command Posts, Emergency Control Centers, and the EOC.

The INEEL has taken the following additional actions, as conditions warrant, to lessen the dangers of wildland fire in and around the INEEL:

- Aggressive vegetation control along facility perimeters and interconnecting roadways
- Fire danger advisories to all INEEL employees about the high fire potential and precautions
- Administrative controls restricting the use of off-road vehicles during severity
- Installation of "real-time" weather monitoring stations
- Heavy equipment (bulldozers, scrapers, water tenders, etc.) maintained in readiness for wildland fire response
- Heavy-equipment operators trained for wildland fire response
- Restrictions on hot work activities (welding, etc.) outside facility perimeters during high fire potential
- A minimum 30-foot defensible space established around important structures and equipment
- Redirection of power supplies during a wildland fire before a line fault occurs
- Emergency back-up power supplies for major sites

Memorandum of Understanding (MOU)

The INEEL maintains a series of MOUs, Cooperative Fire Protection Agreements (CFPAs), and Annual Operating Plans (AOPs) with surrounding fire departments, fire districts, and federal agencies responsible for managing adjacent federal land. The INEEL has MOUs with Butte, Bingham, Bonneville, Clark, and Jefferson counties for general emergency management. The INEEL utilizes the Reciprocal Fire Fighting Assistance (RFFA) Agreement and its supporting AOP for mutual aid assistance between a number of fire departments and districts, including Arco and Lost Rivers Fire Departments, BLM, the cities of Blackfoot, Pocatello, Arco, Rexburg, American Falls, Chubbuck and Rigby, and fire protection districts in Shelley/Firth, Jefferson Central, and Fort Hall. In addition, CFPAs and AOPs have been developed between the INEEL, USFS Salmon-Challis National Forest, and the BLM Upper Snake River District. These are the two primary federal organizations which have land management responsibilities for the geographical area encompassed with Butte County.

The INEEL has communications interface capability with all of the MOU organizations utilizing common radio channels. A broad range of radio channels has been pre-programmed into radios in the Central Facility Area (CFA) Emergency Operations Center (ECC) and the INEEL Mobile Command Center. Mobile and portable radios have a robust communications capability.

INEEL Fire Department Equipment Inventory

Three fire stations are located at the INEEL, each equipped with variety firefighting equipment. The fire department maintains four heavy wildland firefighting trucks (Table 13) and a 2,000-gallon all-wheel-drive water tender. Heavy wildland fire fighting units are outfitted with high-tech on-board compressed-air foam systems capable of making heavy, clinging, or water-saturated foam that suppresses and blankets flames. The INEEL keeps at least 22 firefighters on duty. If additional workers are needed, the fire department will recall off-duty employees to supplement its force.

Table 13. Brush Unit Specifications for the INEEL

1997 Pierce/International Model 4800 INEEL Fire Department Brush Unit
<ul style="list-style-type: none"> • 250 HP/2300 RPM turbo charged diesel • 200 inch wheel base • Six passenger, four door cab • 33,000 GVW • All wheel drive with locking front differential and high/low transfer • Booster tank capacity of 830 gallons (25 gallon Class A foam tank) • Pump/Waterous 250 gpm/150 psi self priming • Compressed Air Foam System operated by a Volkswagen four cylinder diesel operating at 150 psi

3.9 Craters of Moon National Monument

President Coolidge established the Craters of the Moon National Monument (CMNM) on May 2, 1924. Since 1924, the monument has been expanded through five presidential proclamations issued in accordance with the Antiquities Act. The most recent and largest expansion of the monument occurred 9 November 2000 when President Clinton signed a Proclamation enlarging the monument 13-fold. The monument now encompasses 715,000 acres of federal land.

The monument is mostly surrounded by public land administered by the BLM Upper Snake River District [District], with field offices in Shoshone and Idaho Falls. Most BLM land adjacent to the monument boundary includes barren lava flows that prevent the spread of fire into or out of the monument. The majority of these lands, south of Highway 93 and 20/26, are part of the Great Rift Wilderness Study Area. A four-mile long corridor (~94 acres) surrounding Highway 93 and 20/26 and extending across the north end of the monument was excluded from the monument in 1941 and is owned by the Idaho Highway Department. The INEEL lies 12 mile east of the monument. The nearest private land is less than one-half mile from the monument boundary on the north side.



Figure 10. Entrance to Craters of the Moon National Monument. Photo shows heavy fuels comprised of mountain big sagebrush/perennial grass habitat (photo courtesy of John Apel, Chief of Resources Management, CMNM).

The National Park Service has suppressed wildland fires within CMNM since its establishment in 1924. Decades of fire suppression activities have altered normal ecological processes and, as a result, fire adapted plant communities have been altered (Figure 10). In turn, this has created a decline in the overall biological diversity of the area.

The National Park Service (NPS) and the BLM manage the monument cooperatively. The NPS has primary management authority over the portion of the monument that includes the exposed lava flows. The BLM has primary management authority over the remaining portion of the monument. Under the laws and regulations pertaining to federal public lands, specific resource uses and activities such as livestock grazing and hunting are allowed.

Craters of Moon National Monument Memorandum of Understanding (MOU)

In 1998, the NPS, Arco Fire Department, and the LRFDP entered into MOUs. The purpose of the MOUs was to provide the personal services and equipment required for structural fire

suppression and the protection of life and property from structural fire on lands administered by CMNM and property under the protection of the District.

There are several agreements under this MOU:

If a fire occurs on CMNM administered lands, then 1) the District and Arco Fire Department agree to: a) respond with adequate apparatus and equipment in accordance with the District and Arco Fire Department policy, and 2) supervise all aspects of the fire activities; and CMNM agrees to 1) assist the District and Arco Fire Department upon request, 2) cooperate and coordinate with the District and Arco Fire Department personnel in suppression and rescue activities from a support mode, and 3) solicit and accept recommendations from the District and Arco Fire Department command personnel in pre-suppression, suppression, and rescue procedures, insofar as they do not conflict with CMNM policies.

Suppression personnel/equipment will be activated as follows: 1) CMNM will request assistance by contacting the Butte County Sheriff Dispatcher at 911; and 2) the District or Arco Fire Department may request assistance by contacting CMNM personnel through the CMNM office at 527-3257, by contacting park personnel after hours, or by calling the Butte County Sheriff Dispatch at 911.

The CMNM, Arco Fire Department, and the District mutually agree to the following:

- The CMNM Chief Ranger serves as the principle liaison/contact with the District and Arco Fire Department, and will coordinate all dual agency training and District inspections of park facilities.
- Employees or agents of the District are not considered employees of the CMNM or NPS.
- The CMNM shall not make any expenditures under this MOU, except as may be appropriate.
- The CMNM, the District and Arco Fire Department waive all claims against each other for compensation for any loss, damage, personal injury or death occurring in consequence of activities.
- All suppression-qualified personnel will meet the District and Arco Fire Department standards for physical fitness and personal protection equipment.
- It is understood by the CMNM, the District and the Arco Fire Department that because of the limited number of firefighters and/or equipment, there may be instances when response may be limited or impossible. Neither party will hold the other liable under those circumstances.
- The Federal Government, in the manner and to the extent provided by the Federal Tort Claims Act, as amended (28 USC 1346.2671-2680), shall be liable for, and shall hold the District harmless from, claims for damage or loss of property, personal injury or death caused by the negligent or wrongful acts or omissions of any employee of the Federal government while acting within the scope of his/her office or employment in the performance of this agreement.
- Four CMNM personnel are red-card qualified as fire fighters for wildland fire suppression only. CMNM structural fires will be controlled under a cooperative agreement with Lost River Fire Protection District. This agreement is updated annually.

A 1-ton light engine fire truck and 3-pressurized fire hydrants reside within the CMNM compound. CMNM has a mutual aid agreement with the BLM Shoshone Office.

CMNM has developed the following Minimum Impact Suppression Tactics (MIST) guidelines to reduce the degree of long-term impacts associated with wildland fire suppression:

- 1) Fire line Construction
 - Minimize construction using natural barriers, rock outcrops, trails, roads, streams, and other existing fuel breaks.
 - Minimize width necessary to halt the spread of the fire and to avoid impacts to natural and cultural resources.
 - Obtain archeological clearance where possible.
 - Minimize clearing and scraping of vegetation and cutting and/or limbing of trees except when essential.
- 2) Fire Fighting
 - Flag route to fire from nearest trail.
 - Vary travel routes to the fire to reduce impacts.
 - Use natural openings for helicopter landings.
 - Retardant drops require Superintendent's approval.
 - Use water drops where practical.
 - Minimize number of drops to what is essential for control of the fire.
- 3) Mop-up – Rehabilitation
 - The last person to leave the area will remove flagging.
 - All equipment and debris will be removed from the area for proper disposal.
 - Before leaving the fire, rehabilitation will be completed to eliminate impacts from the suppression effort.
 - Construct waterbars to prevent erosion.

MIST emphasizes suppressing a wildland fire with the least impact to the landscape and is consistent with the National Fire Plan and the Idaho Statewide Implementation Plan – both which state that burned areas and fire-adapted ecosystems will be rehabilitated and restored.

3.10 Arco Fire and Structure Hazard Assessment and Community Assessment

The Wildland Fire Hazard Assessment, Structural Assessment, and Community Assessment forms are presented based on structures within the city limits of Arco and Arco Fire Department response area. Structures were selected based on but not limited to: (1) proximity to a wildland-urban interface and, (2) exhibiting a fire hazard and safety concern such as adjacent to highly flammable sources (i.e., large fields, vacant lots) or flammable material within 10 feet of the structure.

Within and near the city of Arco most single-family dwellings and commercial and industrial buildings are buffered by irrigated agricultural lands. During late summer through fall and early winter these fields become the primary hazardous fuel. There are only two wells in Arco that are

adequate to supply water for a wildland fire. The Butte County Assessors office identifies 28 platted subdivisions within the city limits of Arco. With the exception of two, agriculture lands, city streets, or secondary highways buffer these subdivisions. Danielson Addition and Arco Heights (Figure 3) are northeast of Arco and located adjacent to a wildland-urban interface (see Figures 11, 12, and 13). Therefore, these two subdivisions were assessed in greater detail, as described below.

The following is a summary of the Fire Hazard Assessment for Arco. Table 14 shows the complete results. Overall, the two subdivisions received a Class B (medium) fire hazard assessment rating for 10 out of 12 elements (83%) and a Class C (high) rating for 2 out of 12 elements (17%).

Vegetation Type – Native and introduced grasses will be the primary carrier of any ignition to the heavier sagebrush-grassland-rabbit brush. These fuels will carry fire to the wildland-urban interface.

Slope – Most slopes within the assessment area are 10-30%.

Aspect – The majority of the assessment area faces west to southwest.

Elevation – The elevation within the assessment area averages 5,300 feet.

Fuel Type – Fuel types are generally medium (brush, medium shrubs, and small trees).

Fuel Density – Fuel density within the assessment area is broken moderate fuels adjacent to federal land 31 to 60% cover.

Fuel Bed Depth – Fuel bed depth with the assessment area is moderate.

Table 14. Fire Hazard Assessment for Arco

Subdivision/Parcels	Vegetation Type	Rating Elements					
		Slope	Aspect	Elevation	Fuel Type	Fuel Density	Fuel Bed Depth
Danielson Addition	Sagebrush-grassland	B	C	B	B	B	B
Arco Heights	Sagebrush-grassland	B	C	B	B	B	B

A=Class A low fire hazard assessment rating

B=Class B medium fire hazard assessment rating

C=Class C high fire hazard assessment rating

The following is a summary of the Structural Hazard Assessment for Arco. Table 15 shows the complete results. Overall, the two subdivisions received a Class A (low) structure hazard assessment for 4 out of 14 elements (29%), a Class B (medium) for 6 out of 14 elements (43%), and a Class C (high) for 5 out of 14 elements (36%).

Structure Density – The structure density within the assessment area is at least one structure per 0-5 acres.

Proximity to Fuels – Structures within the assessment area and adjacent to the wildland-urban interface are within 40-100 feet of flammable fuels.

Building Materials – Structures within the assessment area were constructed as early as 1949 to within the last 10 years resulting in less than 10% having fire resistant roofs and/or siding.

Survivable Space – Less than 10% of the structures within the assessment area and adjacent to the wildland-urban interface have improved survivable space around the property.

Roads – Roads within the assessment area are classified (see road classifications) minor to private.

Response Time – Response time to the assessment area is 20 minutes or less. However, during winter months the roads to the upper end of Arco Heights Subdivision can be icy resulting in a longer response time.

Access – Access is limited to two roads and some roads that dead-end. Moderate to steep grades exist in the Arco Heights Subdivision.

Table 15. Structural Hazard Assessment for Arco

Subdivision/Parcels	Rating Elements						
	Structure Density	Proximity of Fuels	Building Materials	Survivable Space	Roads	Response Time	Access
Danielson Addition	A	B	C	C	B	A	B
Arco Heights	A	B	C	C	B	A	B/C

A=Class A low fire hazard assessment rating
 B=Class B medium fire hazard assessment rating
 C=Class C high fire hazard assessment rating

Table 16 summarizes the Community Assessment for Arco based on visual observations and information compiled from interviews with Arco Fire Department personnel.

Table 16. Community Assessment for Arco

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Community Description	There is a clear line where residential business, and public structures meet wildland fuels. Wildland fuels do not generally continue into the developed area.	There is no clear line of demarcation wildland fuels is continuous outside of and within the developed area.	The community generally exists where homes, ranches, and other structures are scattered by adjacent to wildland vegetation.	A
Response Time	Prompt response time to interface areas (20 min or less).	Moderate response time to interface area (20-40 minutes).	Lengthy response time to interface area (40+ minutes).	A
Firefighting Capability	Adequate structural fire department. Sufficient personnel, equipment, and wildland firefighting capability and experience.	Inadequate fire department. Limited personnel, and or equipment but with some wildland firefighting experience and training.	Fire department non-existent or untrained and/or equipped to fight wildland fire.	A/B
Water Supply	Adequate supply of fire hydrants and pressure, and/or open water sources (pools, lakes, reservoirs, rivers, etc.).	Inadequate supply of fire hydrants, or limited pressure. Limited water supply.	No pressure water system available near interface. No surface water available.	B
Local Emergency Operations	Active EOG. Evacuation plan in place.	Limited participation in EOG. Have some form of evacuation process.	No EOG. No evacuation plan in place.	B

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Group (EOG)				
Structure Density	At least one structure per 0-5 acres.	On structure per 5-10 acres.	Less than one structure per 10 acres.	A
Community Planning Practices	County/local laws and zoning ordinances require use of fire safe residential design and adequate ingress/egress of fire suppression resources. Fire Department actively participates in planning process.	Local officials have an understanding of appropriate community planning practices for wildfire loss mitigation. Fire department has limited input to fire safe development and planning efforts.	Community standards for fire safe development and protection are marginal or non-existent. Little or no effort has been made in assessing and applying measures to reduce wildfire impact.	A/B
Fire Mitigation Ordinances, Laws, or Regulations in Place	Have adopted local ordinances or codes requiring fire safe landscaping, building and planning. Fire Department actively participates in planning process.	Have voluntary ordinances or codes requiring fire safe landscaping and building practices. Fire Department practices in planning process.	No local codes, laws or ordinances requiring fire safe building landscaping or planning processes.	A/B
Fire Department Equipment	Good supply of structure and wildland fire apparatus and miscellaneous specialty equipment.	Smaller supply of fire apparatus in fairly good repair with some specialty equipment.	Minimum amount of fire apparatus, which is old and in need of repair. None or little specialty equipment	B/C
Fire Department Training and Experience	Large, fully paid fire department with personnel that meet NFPA or NWCG training requirements, are experienced in wildland fire, and have adequate equipment.	Mixed fire department. Some paid and some volunteer personnel. Limited experience, training and equipment to fight wildland fire.	Small, all volunteer fire department. Limited training, experience and budget with regular turnover of personnel. Do not meet NFPA or NWCG standards.	B/C
Community Fire Safe Efforts and programs already in place	Organized and active groups (Fire Dept.) providing educational materials and programs for their community.	Limited interest and participation in educational programs. Fire Department does some prevention and public education.	No interest of participation in educational programs. No prevention/education efforts by fire department.	B/C
Community support and attitudes	Actively supports urban interface plans and actions.	Some participation in urban interface plans and actions.	Opposes urban interface plans and efforts.	B



Figure 11. Lost Rivers Dental Center (in photo). The Dental Center and Medical Center (out of photo) are both located in the Hilltop Subdivision and is immediately adjacent to sagebrush-grassland fuels.



Figure 12. Interface between Danielson Addition and Hilltop Subdivision. Photo shows the close proximity of sagebrush-grassland fuels to structures.



Figure 13. Interface directly east of Danielson Addition and Hilltop Subdivision. Continuous sagebrush-grassland fuels exist in the interface.

3.11 LRFPD (Moore) Fire and Structural Hazard Assessment and Community Assessment

The LRFPD assessment extended north to road 4050 North, east to King Mountain Road, and south to Moore. Most structures west of State Highway 93 and westerly to the LRFPD boundary are buffered by irrigated agriculture lands, stubble and fallow fields, and some livestock confinement operations or feed lots.

The following is a summary of the Fire Hazard Assessment for the LRFPD. Figures 14 through 18 are photos of the individual structures assessed. Table 17 summarizes the results and also includes these figures. Figure 19 shows a field of combustible fuels immediately adjacent to single-family dwellings. Overall, Moore received a Class A (low) fire hazard assessment rating for 14 out of 36 elements (39%), a Class B (medium) rating for 16 out of 36 elements (44%), and a Class C (high) rating for 7 out of 36 elements (19%).

Vegetation Type – The primary native fuels within the assessment area are native and introduced perennial grasses (crested wheatgrass) and exotic annual grasses (cheatgrass brome) interspersed with heavier fuels such as sagebrush and rabbitbrush.

Slope – The assessment area is flat.

Aspect – The majority of the homes assessed have south and west aspects.

Elevation – Single-family dwellings are at approximately 5,300 feet in elevation.

Fuel Type – Fuels within the assessment area range between light fuels of perennial, introduced, and exotic grasses to heavy fuels of deciduous trees (cottonwood, Russian olive, and ornamental trees).

Fuel Density – Two-thirds of the fuels assessed are broken moderate fuels adjacent to federal lands (31 to 60 percent cover) and one third are non-continuous fuels (grasses) with less than 30 percent cover.

Fuel Bed Depth – Fuels range from low to moderate in height within the assessment area.

Table 17. Fire Hazard Assessment for LRFPD (Moore)

Structures	Vegetation Type	Rating Elements					
		Slope	Aspect	Elevation	Fuel Type	Fuel Density	Fuel Bed Depth
Single Family dwelling along King Mtn Road (3600 North – Fig. 14)	Sagebrush-grassland	A	C	B	A	A	A
Single Family dwelling along King Mtn Road (3600 North – Fig. 15)	Sagebrush-grassland	A	A	B	A	A	A
SFD at 3350 West – 3400 North and 1.8 miles north of Moore (Fig. 16)	Crested wheatgrass-Cheatgrass brome	A	C	B	A	B	B
SFD one block east of Moore along 3350 West	Sagebrush-grassland	A	C	B	B	B	B
Vacant lot at 3350 West and one block east of Moore (Fig. 17)	Sagebrush-grassland	A	C	B	B	B	B
SFD south of vacant lot at 3350 West and one block east of Moore (Fig. 18)	Conifer/cottonwood/grass	A	C	B	C	B	B/C

A=Class A low fire hazard assessment rating

B=Class B medium fire hazard assessment rating

C=Class C high fire hazard assessment rating

The following is a summary of the Structure Hazard Assessment for LRFPD. Table 18 shows the complete results. Overall, LRFPD received a Class A (low) rating for 23 out of 42 elements (55%), a Class B (medium) rating for 15 out of 42 times (36%), and a Class C (high) rating for 11 out of 42 elements (26%).

Structure Density – One half of the dwellings assessed occupy 0-5 acres and one half occupies at least 10 acres.

Proximity to Fuels – Proximity to fuels of the dwellings assessed range from less than 40 feet to greater than 100 feet.

Building Materials – Sixty-seven percent (67%) of the dwellings assessed do not have fire resistant roofs and/or siding.

Survivable Space – Fifty percent (50%) of the dwellings assessed do not have improved survivable space around the structure(s).

Roads – Roads near Moore (within a couple of blocks) are well maintained and paved in some cases. East of Moore the roads are maintained, two lane roads with no shoulders.

Response Time – Response time to assessed areas would be 20 minutes or less.

Access – Eighty-three percent (83%) of the assessed area can be accessed via multiple entrances/exits well equipped for fire trucks. The remaining areas are accessed via one or two minor roads.

Table 18. Structural Hazard Assessment for LRFPD (Moore)

Structures	Rating Elements						
	Structure Density	Proximity of Fuels	Building Materials	Survivable Space	Roads	Response Time	Access
Single Family dwelling along King Mtn Road (3600 North)	C	A	A	A	B	A	A/B
Single Family dwelling along King Mtn Road (3600 North)	C	A	A	A	B	A	A/B
SFD at 3350 West – 3400 North and 1.8 miles north of Moore	C	B	B	B	B	A	B
SFD one block east of Moore along 3350 West	A	C	B/C	C	A	A	A/B
Vacant lot at 3350 West and one block east of Moore	A	C	C	C	A	A	A/B
SFD south of vacant lot at 3350 West and one block east of Moore	A	B	B/C	C	A	A	A/B

A=Class A low fire hazard assessment rating

B=Class B medium fire hazard assessment rating

C=Class C high fire hazard assessment rating

Table 19 summarizes the Community Assessment based on visual observations and information compiled from interviews with LRFPD Fire Department Fire Chief.

Table 19. Community Assessment for LRFPD (Moore)

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Community Description	There is a clear line where residential business, and public structures meet wildland fuels. Wildland fuels do not generally continue into the developed area.	There is no clear line of demarcation wildland fuels is continuous outside of and within the developed area.	The community generally exists where homes, ranches, and other structures are scattered by adjacent to wildland vegetation.	A
Response Time	Prompt response time to interface areas (20 min or less).	Moderate response time to interface area (20-40 minutes).	Lengthy response time to interface area (40+ minutes).	A
Firefighting Capability	Adequate structural fire department. Sufficient personnel, equipment, and wildland firefighting capability and experience.	Inadequate fire department. Limited personnel, and or equipment but with some wildland firefighting experience and training.	Fire department non-existent or untrained and/or equipped to fight wildland fire.	B/C

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Water Supply	Adequate supply of fire hydrants and pressure, and/or open water sources (pools, lakes, reservoirs, rivers, etc.).	Inadequate supply of fire hydrants, or limited pressure. Limited water supply.	No pressure water system available near interface. No surface water available.	B/C
Local Emergency Operations Group (EOG)	Active EOG. Evacuation plan in place.	Limited participation in EOG. Have some form of evacuation process.	No EOG. No evacuation plan in place.	A/B
Structure Density	At least one structure per 0-5 acres.	On structure per 5-10 acres.	Less than one structure per 10 acres.	A/B
Community Planning Practices	County/local laws and zoning ordinances require use of fire safe residential design and adequate ingress/egress of fire suppression resources. Fire Department actively participates in planning process.	Local officials have an understanding of appropriate community planning practices for wildfire loss mitigation. Fire department has limited input to fire safe development and planning efforts.	Community standards for fire safe development and protection are marginal or non-existent. Little or no effort has been made in assessing and applying measures to reduce wildfire impact.	B/C
Fire Mitigation Ordinances, Laws, or Regulations in Place	Have adopted local ordinances or codes requiring fire safe landscaping, building and planning. Fire Department actively participates in planning process.	Have voluntary ordinances or codes requiring fire safe landscaping and building practices. Fire Department practices in planning process.	No local codes, laws or ordinances requiring fire safe building landscaping or planning processes.	B/C
Fire Department Equipment	Good supply of structure and wildland fire apparatus and miscellaneous specialty equipment.	Smaller supply of fire apparatus in fairly good repair with some specialty equipment.	Minimum amount of fire apparatus, which is old and in need of repair. None or little specialty equipment	A/B
Fire Department Training and Experience	Large, fully paid fire department with personnel that meet NFPA or NWCG training requirements, are experienced in wildland fire, and have adequate equipment.	Mixed fire department. Some paid and some volunteer personnel. Limited experience, training and equipment to fight wildland fire.	Small, all volunteer fire department. Limited training, experience and budget with regular turnover of personnel. Do not meet NFPA or NWCG standards.	C
Community Fire Safe Efforts and programs already in place	Organized and active groups (Fire Dept.) providing educational materials and programs for their community.	Limited interest and participation in educational programs. Fire Department does some prevention and public education.	No interest of participation in educational programs. No prevention/education efforts by fire department.	B/C
Community support and attitudes	Actively supports urban interface plans and actions.	Some participation in urban interface plans and actions.	Opposes urban interface plans and efforts.	B



Figure 14. Single-family dwelling at 3556 US Highway 93. This home exhibits good fire prevention measures including a metal roof and 50 feet of landscaping between the home and the wildland-urban interface.



Figure 15. Single-family dwelling 3.5 miles north of Moore at 3592 W 3690 N. This home exhibits good fire prevention measures including a metal roof and 50 feet of landscaping between the home and the wildland-urban interface.



Figure 16. Single-family dwelling showing good fire prevention measures.



Figure 17. Single-family dwelling one block east of Moore
This home is along 3350 West and shows poor fire prevention measures including a vacant lot with substantial sagebrush, crested wheatgrass, and cheatgrass fuels growing immediately adjacent to structure.



Figure 18. Single-family dwelling east of Moore

This home at 3350 West could reduce its susceptibility to fire by replacing the wood roof with a more fire resistant covering and trimming the overhanging vegetation.



Figure 19. Flammable cheatgrass field two miles north of Moore on 3350W and 3400N.

3.12 LRFPD (Butte City) Fire and Structural Hazard Assessment and Community Assessment

Within this area agricultural lands and some livestock confinement operations buffer most single-family dwellings. Sagebrush-grassland fuels, stubble, and fallow or weed infested fields present the most hazardous fuel conditions at the wildland-urban interface. There is no water in the winter at Butte City and only one well with a 500 gallon capacity. Several roads are infested with annual weeds and some bridges will not support fire-fighting equipment, especially the heavy tenders. This is further discussed in Section 4.0 - Specific Mitigation.

The Butte City assessment included the entire southern portion of the Lost River Fire Protection District south to 2100N and 3100W (see Figure 3). The following is a summary of the Fire Hazard Assessment for Butte City. Figures 20 through 27 are photos of the individual structures assessed. Table 20 summarizes the results and also includes these figures. Overall, Butte City received a Class A (low) rating for 21 out of 48 elements (44%), Class B (medium) rating for 21 out of 48 (44%) elements, and a Class C (high) rating for 7 out of 48 elements (15%).

Vegetation Type – The primary fine fuels within the assessment area are native and introduced grasses interspersed with heavier fuels such as sagebrush and rabbitbrush.

Slope – The assessment area is flat.

Aspect – The majority of the single-family dwellings assessed have a south and west aspect.

Elevation – All single-family dwellings within the assessment area are approximately 5300 feet in elevation.

Fuel Type – Fuels within the assessment area range between small, light fuels (e.g., grasses) to medium fuels (e.g., sagebrush, rabbitbrush and ornamental shrubs).

Fuel Density – One half of the fuels assessed are non-continuous with less than 30% cover. The other half of fuels assessed are broken moderate fuels adjacent to agriculture land.

Fuel Bed Depth – The fuels range from low to moderate in height within the assessment area.

Table 20. Fire Hazard Assessment for LRFPD (Butte City)

Subdivision/Parcels	Vegetation Type	Rating Elements					
		Slope	Aspect	Elevation	Fuel Type	Fuel Density	Fuel Bed Depth
Dwelling along 2900 West (Fig. 20)	Sagebrush-rabbitbrush-grassland	B	C	B	B	A	A/B
Dwelling along 2900 West (Fig. 21)	Sagebrush-rabbitbrush-grassland	A	C	B	B	B	B
Dwelling along 2900 West (Fig. 22)	Sagebrush-rabbitbrush-grassland/Russian Olive	A	C	B	B	A	B
Dwelling along 2150 North (Fig. 23)	Sagebrush-grassland	A	A	B	A	B	B
Dwelling along 2150 North (Fig. 24)	Agriculture	A	C	B	A	C	A
Dwelling along 2900 West (Fig. 25)	Along Big Lost River (Willows, Cottonwoods)	A	C	B	A	A	A
Trailer along 3100 West (Fig. 26)	Grassland, cottonwoods, conifers	A	B	B	B	B	A
Trailer along 2300 North (Fig. 27)	Agriculture	A	C	B	A	A	A

A=Class A low fire hazard assessment rating

B=Class B medium fire hazard assessment rating

C=Class C high fire hazard assessment rating

The following is a summary of the Structural Hazard Assessment for Butte City. Table 21 shows the complete results. Overall, Butte City received a Class A (low) rating for 5 out of 56 elements (9%); a Class B (medium) rating for 29 out of 48 elements (60%) and Class C (high) rating for 21 out of 56 elements (38%).

Structure Density – The majority of dwellings assessed occupy 10 acres or more resulting in less than one structure per 10 acres.

Proximity to Fuels – The majority of dwellings assessed are less than 40 feet from a flammable fuel source

Building Materials – Sixty-two percent (62%) of the dwellings assessed do not have fire resistant roofs and/or siding.

Survivable Space – Seventy-five percent (75%) of the dwellings assessed do not have improved survivable space around the structure(s).

Roads – Maintained roads exist to all dwellings assessed

Response Time – There is a 20-40 minute response time from the Arco Fire Department to any of the dwellings assessed.

Access – There are at least two access routes to all of the dwellings assessed.

Table 21. Structural Hazard Assessment for LRFPD (Butte City)

Subdivision/Parcels	Rating Elements						
	Structure Density	Proximity of Fuels	Building Materials	Survivable Space	Roads	Response Time	Access
Dwelling along 2900 West	C	C	C	C	B	B	B
Dwelling along 2900 West	C	C	B	C	B	B	B
Dwelling along 2900 West	C	C	B	C	B	B	B
Dwelling along 2150 North	B	C	B	C	B	B	B
Dwelling along 2150 North	C	C	B	C	B	B	B
Dwelling along 2900 West	C	A	B	A	B	B	B
Trailer along 3100 West	C	C	C	C	B	B	B
Trailer along 2300 North	C	A	C	A	B	A	B

A=Class A low fire hazard assessment rating

B=Class B medium fire hazard assessment rating

C=Class C high fire hazard assessment rating

Table 22 summarizes the Community Assessment based on visual observations.

Table 22. Community Assessment for LRFPD (Butte City)

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Community Description	There is a clear line where residential business, and public structures meet wildland fuels. Wildland fuels do not generally continue into the developed area.	There is no clear line of demarcation wildland fuels is continuous outside of and within the developed area.	The community generally exists where homes, ranches, and other structures are scattered by adjacent to wildland vegetation.	A
Response Time	Prompt response time to interface areas (20 min or less).	Moderate response time to interface area (20-40 minutes).	Lengthy response time to interface area (40+ minutes).	B
Firefighting Capability	Adequate structural fire department. Sufficient personnel, equipment, and wildland firefighting capability and experience.	Inadequate fire department. Limited personnel, and or equipment but with some wildland firefighting experience and training.	Fire department non-existent or untrained and/or equipped to fight wildland fire.	B
Water Supply	Adequate supply of fire hydrants and pressure, and/or open water sources (pools, lakes, reservoirs, rivers, etc.).	Inadequate supply of fire hydrants, or limited pressure. Limited water supply.	No pressure water system available near interface. No surface water available.	B
Local Emergency Operations Group (EOG)	Active EOG. Evacuation plan in place.	Limited participation in EOG. Have some form of evacuation process.	No EOG. No evacuation plan in place.	B
Structure Density	At least one structure per 0-5 acres.	On structure per 5-10 acres.	Less than one structure per 10 acres.	C
Community Planning Practices	County/local laws and zoning ordinances require use of fire safe residential design and adequate ingress/egress of fire suppression resources. Fire Department actively participates in planning process.	Local officials have an understanding of appropriate community planning practices for wildfire loss mitigation. Fire department has limited input to fire safe development and planning efforts.	Community standards for fire safe development and protection are marginal or non-existent. Little or no effort has been made in assessing and applying measures to reduce wildfire impact.	A/B
Fire Mitigation Ordinances, Laws, or Regulations in Place	Have adopted local ordinances or codes requiring fire safe landscaping, building and planning. Fire Department actively participates in planning process.	Have voluntary ordinances or codes requiring fire safe landscaping and building practices. Fire Department practices in planning process.	No local codes, laws or ordinances requiring fire safe building landscaping or planning processes.	B
Fire Department Equipment	Good supply of structure and wildland fire apparatus and miscellaneous specialty equipment.	Smaller supply of fire apparatus in fairly good repair with some specialty equipment.	Minimum amount of fire apparatus, which is old and in need of repair. None or little specialty equipment	B/C

Rating Element	Class A	Class B	Class C	Rating (A, B, or C)
Fire Department Training and Experience	Large, fully paid fire department with personnel that meet NFPA or NWCG training requirements, are experienced in wildland fire, and have adequate equipment.	Mixed fire department. Some paid and some volunteer personnel. Limited experience, training and equipment to fight wildland fire.	Small, all volunteer fire department. Limited training, experience and budget with regular turnover of personnel. Do not meet NFPA or NWCG standards.	B/C
Community Fire Safe Efforts and programs already in place	Organized and active groups (Fire Dept.) providing educational materials and programs for their community.	Limited interest and participation in educational programs. Fire Department does some prevention and public education.	No interest of participation in educational programs. No prevention/education efforts by fire department.	B
Community support and attitudes	Actively supports urban interface plans and actions.	Some participation in urban interface plans and actions.	Opposes urban interface plans and efforts.	B



Figure 20. Dwelling along 2900 West with hazardous fuels near structures.



Figure 21. Dwelling along 2900 West with hazardous fuels within 10 feet of structures.



Figure 22. Dwelling along 2900 West with hazardous fuels within 10 feet of structure.



Figure 23. Single-family dwelling approximately 2 miles southwest of Butte City. This home is along 2150 North and shows an overhanging roof and landscaping and native vegetation (sagebrush-grassland) growing within 10 feet of structure.



Figure 24. Typical single-family dwellings adjacent to agriculture land. This home is typical of many homes in the rural landscape in Butte County where landscaping is often within 10 feet of structure.



Figure 25. Single-family dwelling located along the Big Lost River
This home 2 miles southwest of Butte City shows good defensible space, a metal roof, and landscaping back from structure.



Figure 26. Trailer along 3100 West with hazardous fuels within 10 feet of structure.



Figure 27. Single-family dwelling adjacent to agricultural land.

4.0 SPECIFIC MITIGATIONS

The next sections of this report are presented as follows: (1) Mitigation for Butte County, (2) Equipment and training needs for Arco Fire Department and costs, (3) Equipment and training needs for LRFPD, (4) Specific mitigations for Arco Fire Department and the LRFPD, and (5) Specific mitigations for Howe and Antelope Road.

As discussed in Section 3.0, the main roads within the Lost River Fire Protection District, Antelope Road to the Medicine Rock Equestrian Center, and the main Little Lost River Valley road to the Custer County line near Pass Creek Summit were driven as part of the fire risk assessment for Butte County. In developing the mitigations, fuel loads were inspected adjacent to roads and, if hazardous, the distance this hazardous fuel occurred along the road was calculated. Roads were inspected for accessibility by large firefighting equipment, surface conditions, and bridge weight limits. Equipment and training needs were assessed in consultation with the fire chiefs of Arco Fire Department and LRFPD.

4.1 Butte County

Because such a large area of Butte County remains unprotected in the event of a fire, the need exists for the county to consider forming a countywide fire protection district.

In 1943, the Idaho State legislature passed the first Fire Protection District law. Since then, the Law has been revised several times with the most comprehensive version occurring in 1994 (Idaho Statutes, 1994). The basic purpose of this law is to establish procedures for the formation, operation and dissolution of fire protection districts within the State of Idaho. In 1996, three different fire departments were consolidated to form the Teton County Fire Protection District (personal communication, Gary Henrie, 2004). Teton County serves as a model for other counties to follow.

Steps needed to form Butte County Fire Protection District (BCFPD) and requiring the cooperation of the cities of Moore, Arco, Butte City and Howe, their mayors, council members, and the general public.

- **Establish primary goals and objectives** – These goals and objectives would include but not be limited to: (1) provide upgraded and extended fire protection to everyone within the entire county, including the cities of Moore, Arco, Butte City, Howe and Antelope Road residents, (2) provide this protection at a fair and equitable rate, and (3) off-set the additional cost of fire protection by achieving a lower insurance rate for those in the fire district.
- **Secondary goals and objectives** – These goals would target specific areas that could be enhanced to provide upgraded and extended service to all in the immediate area and include but not be limited to: (1) Upgrade and/or replace select fire fighting equipment, (2) Improve specialized and general training, (3) Improve overall response times, (4) Improve the current Insurance Services Office (ISO) rating and insurance classification, and (5) Upgrade overall fire suppression capabilities.

Three additional steps required under the Fire Protection District Law to establish a fire protection district are to:

- File a petition
- Hold a Hearing
- Secure approval of residents at an election

Henrie (personal communication, 2004) recommends drafting a petition and designating the boundaries of the proposed district to include everyone in the county and cities of Butte County, Idaho. Secondly, fix the tax to run against individual assessed valuations on improvements rather than assessed valuations of real property only.

4.2 Arco Fire Department

This section describes specific equipment and training needs recommended for the Arco Fire Department.

Table 23. Arco Fire Department Existing Needs: Capital Expenses

Needs	Costs
New Building with Classroom and Training Space	\$500,000
Area Bridge Weight Structural Improvements	TBD
Increased Water Pressure and Flow (System Looped)	TBD
NFPA Compliant Light Rescue Truck	\$125,000
NFPA Compliant Truck Pumper	\$150,000
NFPA Compliant Wildland Engine	\$200,000
Port-a-Tanks	TBD

Table 24. Arco Fire Department Existing Needs: Training and Certification

Needs	Costs
Classroom/Training Facilities	\$50,000
Distance Learning Opportunities	TBD
Certified Instructor Training	\$2,000

Table 25. Arco Fire Department Existing Needs: Communication

Needs	Costs
Repeater	TBD
Improve Communication with the INEEL	TBD
Enhanced 911 Center	TBD

Table 26. Arco Fire Department Existing Needs: Prevention and Inspection

Needs	Costs
Computerized Records	TBD
Training Grants	TBD
Improve City Code Enforcement	TBD

Table 27. Arco Fire Department Existing Needs: Public Education

Needs	Costs
Complete FIREWISE Program	\$10,000
Laptop and Projector for PowerPoint Presentations	\$2,500

4.3 Lost River Fire Protection District (LRFPD)

This section describes specific equipment and training needs recommended for the Lost River Fire Protection District.

Table 28. LRFPD Existing Needs: Capital Expenses

Needs	Costs
Area Bridge Weight Structural Improvements	\$10,000
Increase Water Pressure Flow in Moore	TBD
(2) 4000 gallon Port-a-tanks (drop tank)	\$12,000
Equipment to use Mainlines for Water Supply	\$2,500
Tender in Arco	\$90,000
Additional Fire Hose Capacity	\$5,000
New Brush Trucks (replace older equipment)	\$200,000

Table 29. LRFPD Existing Needs: Training and Certification

Needs	Costs
Distance Learning Opportunities	TBD
Certified Fire Fighter Training	TBD
Certified Instructor Training	TBD

Table 30. LRFPD Existing Needs: Communication

Needs	Costs
Repeater	TBD
New Radios	TBD
New Dispatch System	TBD

Table 31. LRFPD Existing Needs: Prevention and Inspection

Needs	Costs
Computerized Records	TBD
Training Grants	TBD
Improve City Code Enforcement	TBD

Table 32. LRFPD Existing Needs: Public Education

Needs	Costs
Complete FIREWISE Program	\$10,000
Laptop and Projector for PowerPoint Presentations	\$2,500

4.3 Arco Fire Department and LRFPD Mitigation

This section describes specific fuels treatments and other recommended mitigations that would reduce the risk of hazardous fire in Butte County and increase the capacity of the Arco Fire Department and/or LRFPD to respond to fires.

1. Remove hazardous fuels for approximately one mile along the edge of Danielson Addition and Arco Heights Subdivision between structures and the wildland-urban interface using a mower or blade behind a tractor. It is recommended that this be completed at least once

each year, just prior to curing, or preferably up to three times during summer through fall months, depending on vegetation growth.

2. Remove hazardous fuels near Butte City and between the edge of road and fence line parallel to the road using a mower or blade behind a tractor (see Figure 28). Mow or otherwise reduce fuels along the following roads at least once each year, just prior to curing, or preferably up to three times during summer and fall months, depending on vegetation growth.

2700W between 2200N and 2300N	1.0 miles
2350N to 2850W	2.0 miles
2850W to 2450N	0.5 miles
2450N to Highway 20	1.5 miles
2500N along Canyon Road south to 3100N	2.0 miles
3100N to 2100N	2.5 miles
3100N to 2800W	3.0 miles
2800W to 2200N	1.0 miles
2200N to 2300N	1.0 miles
Total	14.5 miles

3. Upgrade all bridges to support fire-fighting equipment (see Figure 29).
4. Remove hazardous fuels near Moore and between the edge of road and fence line parallel to the road along the King Mountain Road or east boundary of the Lost River Fire Protection District. Mow or otherwise reduce fuels along 15 miles of King Mountain Road at least once each year, just prior to curing, or preferably up to three times during summer and fall months, depending on vegetation growth.
 - Estimated cost - \$75 to \$100 per linear mile including tractor/mower/brush hog and operator (personal communication, Mel Ellwein, Ramshorn Ranch).
5. Install a dry hydrant system and/or drafting area for engines and tenders along the Big Lost River Highway at one location northeast of Butte City (see Figure 3 – assessment area and Figure 30).
 - Cost - \$750 to \$1000 per hydrant including contractor labor and machine costs, 6 inch schedule 40 PVC pipe, a commercially made screen, and hydrant connector (Pohlman et al. 2003).
 - Environmental Effects – Potential impact to riparian landowner. Establish a land use agreement(s) between the landowner and the LRFPD. If required, obtain application/permit for dry fire hydrant from state and/or federal agency and county zoning coordinator. Check locations for suitability, such as water depth, composition of streambed or lake bottom, ease of digging, protection of hydrant during winter.
6. Cooperate with landowners to allow access to irrigation mainline valves. This would require a 3-4 inch valve with a fire hose connection adapted to the valve to be used with tenders and engines.

7. Contract with local water well users to provide water during fire activities.
8. Install large water storage tanks to be used where present water conditions are not adequate for large fires.
9. Recommend to Rural Electric Association and other relevant power companies to install fireproof sleeves around their wooden power poles.
10. Recommend employment of FIREWISE Educational Programs – Arco residents and residents within the LRFPD would become familiar with FIREWISE practices through education and outreach programs sponsored by the Arco Fire Department, Bureau of Land Management, and National Park Service (Hodgson 2001).
11. Use fire-blocking gel (Bartlett 2003). Provides a level of protection against radiant heat, direct flame impingement, flying brands and burning embers. Can be applied to structures, vehicles, fuel tanks, propane cylinders or any object exposed to the effects of a fire. Can be applied by homeowners using a standard garden hose.
 - Cost - \$500 per 4000 square feet or for more information - (info@barricadegel.com)
12. Create Defensible Space. Defensible spaces are areas between improved property and a potential wildland fire where the combustible fuel has been removed or modified. One or more of the following can provide defensible space:
 - Homes and outbuildings -
 - Water or “greenup” lawn areas
 - Pave or gravel driveways
 - Mow vegetation or disk/blade ground to bare, mineral soil out to a minimum of 50 feet
 - Remove and/or reduce vegetation immediately around buildings

Homes and outbuildings adjacent to agriculture lands--Greenstripping, or establishing strips of fire-resistant vegetation to reduce the spread of wildfire, is an established practice on BLM lands in Idaho (Pellant 1992). Greenstripping reduces wildfire spread by disrupting fuel continuity, reducing fuel accumulations and volatility and increasing the density of plants with higher moisture content. The reduction of the overall fuel load reduces the flame lengths and heat intensity produced on the greenstrips, but the increase in annual species composition and fine fuels produces increased rates of spread. Therefore, the following characteristics are important when selecting species for greenstripping on semiarid rangelands such as Butte County: 1) adaptability to the range sites, 2) competitiveness with annual weeds, 3) ease of establishment, 4) low flammability, 5) open canopy and spacing, 6) palatability by livestock and wildlife (for efficient removal and control of litter and fine fuel buildup), and 7) resilience and re-growth capabilities.

- Cost - \$18 to \$35 per acre to prepare seedbed for planting and \$100 to \$120 per acre for seed mix, fertilizer and yearly maintenance (personal communication - Steve Cote, NRCS).

13. Maintain survivable space at each residence:
 - Remove portions of any tree extending within 10 feet of the flue opening of any stove or chimney.
 - Clean roof surfaces and gutters of pine needles, leaves, branches, etc, regularly to avoid accumulation of flammable materials.
 - Maintain a screen constructed of non-flammable material over the flue opening of every chimney or stovepipe. Mesh openings of the screen should not exceed 1/2 inch.
 - Landscape vegetation should be spaced so that fire cannot be carried to the structure or surrounding vegetation.
 - Remove branches from trees to height of 15 feet.
 - A fuel break should be maintained around all structures and especially if residence is near a flammable fuel source (see Figure 19).
 - Dispose of stove or fireplace ashes and charcoal briquettes only after soaking them in a metal pail of water.
 - Store gasoline in an approved safety can away from occupied buildings.
 - Propane tanks should be far enough away from buildings for valves to be shut off in case of fire. Keep area clear of flammable vegetation.
 - All combustibles such as firewood, picnic tables, boats, etc. should be kept away from structures.
 - Garden hose should be connected to outlet.
 - Addressing should be indicated at all intersections and on structures.
 - All roads and driveways should be at least 16 feet in width.
 - Have fire tools handy such as: ladder long enough to reach the roof, shovel, rake and bucket for water.
 - Each home should have at least two different entrance and exit routes.

14. Practice the “zone” approach (Simmerman and Fischer 1989) at each residence
 - Clean zone – 0-3 feet from buildings, remove all combustibles (i.e. decorative bark or shrubs, stack firewood uphill or contour away from building).
 - Short surface fuels – 3-30 feet from buildings, keep grass, and all other low plants short, < 3 inches high. Isolate trees so no branches overhang roofs.
 - Tall surface fuels – 30-100 feet from buildings, uncut grasses, scattered patches of medium shrubs is acceptable, however, keep all plants less than 18 inches high.
 - Tree and tall shrub thinning and pruning – For 100 feet around all buildings, thin (remove) trees and large shrubs so there is 10 feet of open space between all crowns and tops of plants. Remove the lower branches of all trees to a minimum of 10 feet above the ground. Scattered, isolated trees may be left unpruned for landscape purposes.
 - Recommend the use of noncombustible roofing materials
 - Replace wood shingles, or
 - Apply SHINGLE SAFE Fire Retardant on Wood Shake Shingles.

15. Develop site specific MIST guidelines for your area similar to Craters of the Moon National Monument MIST guidelines discussed earlier.

16. Install a new water distribution system within the city of Arco, from East Street and up to the residential areas and hospital on the hill.
17. Install a third deep well within Arco.
18. Form a county-wide fire district (as stated in section 4.1).
19. Within Butte City, install a new water supply system capable of delivering a minimum of 1000 gallons per minute (gpm).
20. Within the Moore, upgrade fire hydrants at LDS church from 300 gpm @20psi. to 2500 gpm @20psi. and fire hydrant at the railroad and highway 93 junction from 300 gpm to 3000 gpm. This hydrant serves two large potato storage buildings.

Because noxious weeds are a large potential fire hazard, special consideration is given to them here. Idaho has hundreds of weed species, however, only 36 are designated noxious by Idaho law (Prather et al. 2002). The word “noxious” simply means deleterious, and all listed weeds are deleterious by definition.

Confirmed sitings of the following noxious weeds have been identified in Butte County (Prather et al. 2002): spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), field bindweed (*Convolvulus arvensis*), rush skeletonweed (*Chondrilla juncea*), hoary cress (*Cardaria draba*), Russian knapweed (*Acroptilon repens*), Scotch thistle (*Onopordum acanthium*), puncture vine (*Tribulus terrestris*), black henbane (*Hyoscyamus niger*) yellow starthistle (*Centaurea solstitialis*) and yellow toadflax (*Linaria vulgaris*). Some species, such as halogeton (*Halogeton glomeratis*), and downy brome (cheatgrass) (*Bromus tectorum*), are not listed as noxious but do impact the environment. Cheatgrass has increased the extent and frequency of wildland fires in the Great Basin and Upper Columbia River Basin with significant impacts in natural and fiscal resources (Billings 1994).

The following recommended mitigations to reduce the spread of weeds pertain to all of Butte County.

Before Construction Of Fuel Breaks, Mowing, Disking Or Other Disturbance

Survey and map invasive and noxious weeds occurring on site scheduled for construction.

1. Determine infestation size and control weeds with appropriate methods (Table 28). Use a State-certified pesticide applicator for specific recommendations and chemical treatment.
2. Train equipment operator on weed issues prior to start date. This training should include:
 - Consequences of disturbance.
 - Reasons for and methods of prevention including cleaning equipment.
 - Identification of problem plants in the immediate area.
 - What to do when an invasive or noxious weed is sighted.
3. Decontaminate vehicles and equipment entering construction site to remove weed seeds and other propagules.
 - Inspect equipment before entering project area.
 - Wash equipment (if possible) to remove all plant parts including seeds and root.

- Prevent equipment from leaving site until inspections have been preformed.
4. Minimize soil disturbance.

During Construction Of Fuel Breaks, Mowing, Disking Or Other Disturbance

1. Control all infestations on construction site (Table 28).
 - Consult State-certified pesticide applicator.
2. Minimize and control vehicular traffic entering and exiting construction site, especially those within the decontamination boundaries.
 - Decontaminate vehicles, equipment, and personnel.
 - Wash (if possible) equipment to remove all plant parts.
 - Inspect vehicles, equipment, and clothing.
3. Take precautions to prevent the spread of weeds.
 - Avoid entering areas infested with weeds.
4. Minimize soil disturbance.
 - Restrict vehicles to specified pathways.
5. Conduct surveys of project area every two weeks during the growing season (April - October) to confirm weed free status or identify new weed infestations.

After Construction Of Fuel Breaks, Mowing, Disking Or Other Disturbance

1. Decontaminate all outgoing equipment before permitting them to leave.
2. Survey all disturbed areas, adjacent areas, and destination areas for noxious weeds.
 - Map infestations, critical sites, and sensitive areas.
 - Treat weeds with appropriate method in a timely fashion (Table 28).
 - Use a State-certified pesticide applicator for specific recommendations.
3. Establish native perennial vegetation in all disturbed areas and monitor for emergence of non-native species.
4. Continue to monitor construction site and treat infestations until weeds no longer appear or are controlled equal to or better than before the commencement of the project.
 - Document all monitoring and treatment of noxious weeds.

Table 33. Simplified Weed Treatments

Weed Species	Infestation Size	Likely Treatment
Black Henbane (<i>Hyoscyamus niger</i>)	Single Plant *Patch (Or multiple plants) *Large Infestation	Pull/Grub, Chemical Chemical Chemical
Canada Thistle (<i>Cirsium arvense</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Chop/Mow Chemical Chemical, Combo
Cheat Grass (<i>Bromus tectorum</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Does not apply Chemical, Graze Chemical, Graze, Combo
Field Bindweed (<i>Convolvulus arvensis</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub, Chop/Mow Chemical Tillage, Chemical
Halogeton (<i>Halogeton glomeratus</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Chop/Mow Chemical, Tillage Tillage, Chemical

Hoary Cress (<i>Cardaria draba</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Dig Up Chemical, Tillage Tillage, Chemical
Leafy Spurge (<i>Euphorbia esula</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Chemical Graze, Chemical Graze, Combo
Musk Thistle (<i>Carduus nutans</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Chemical Biological, Chemical
Puncture Vine (<i>Tribulus terrestris</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Does not apply Chemical Biological, Chemical
Rush Skeletonweed (<i>Chondrilla juncea</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Tillage, Fertilize, Combo Tillage, Biological, Combo
Russian Knapweed (<i>Acroptilon repens</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Chemical, Tillage Chemical, Biological, Combo
Scotch Thistle (<i>Onopordum acanthium</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Chemical Biological, Chemical
Spotted Knapweed (<i>Centaurea maculosa</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub, Chop/Mow Graze, Chemical Chemical, Biological, Combo
Yellow toadflax (<i>Linaria vulgaris</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Chemical Chemical, Biological, Combo
Yellow starthistle (<i>Centaurea solstitialis</i>)	Single Plant Patch (Or multiple plants) Large Infestation	Pull/Grub Grazing, Chemical, Tillage Biological, Chemical

*Patch is denoted as a monoculture up to ¼ acre or irregular distribution up to an acre. A large infestation is a monoculture over ¼ acre or irregular distribution over an acre or more.

In addition to the above specific mitigations, there are costs associated with ongoing training, prevention, and education efforts by the fire department. The estimates below are provided for planning purposes and only represent estimated costs (R&S Enterprise 2003).

Training:

Officer and Crew Refresher Courses

20 participant's @ 40 Hours @ \$12.00/hour	9,600
Instructor	4,000
Equipment and Materials	<u>4,000</u>
	\$17,600

Crew Level Training - New Recruits

Ten (20) Participants @ 40 Hours @ \$12.00/hour	9,600
Instructor	4,000
Equipment and Materials	<u>4,000</u>
	\$17,600

Prevention:

Participation in: Parades, Career Days,	10,000
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County Fair, Equipment and Supplies:	10,000
Four (4) FIREWISE Programs	<u>40,000</u>
	\$60,000

Education:

Fifty-two (52) home inspections annually; fire prevention seminars, educating homeowners on defensible space and what they should do in case of a wildfire: (pre attack planning).	10,000
Equipment and Supplies	<u>10,000</u>
	\$20,000

Equipment & Supplies:

Suppression equipment and supply need:	12,000
Annual maintenance	3,000
Replacement through attrition	<u>15,000</u>
	\$30,000



Figure 28. Weed infestation 0.5 mile southeast of Butte City along 2700 west.



Figure 29. Limited capacity bridge.
This four (4) ton weight limit bridge is located at 2400 North 2800 West intersection and one-mile north-northwest of Butte City.



Figure 30. Potential dry hydrant source 0.5 mile northeast of Butte City along 2350 N.

4.5 Howe and Antelope Road Mitigation

Howe

The Little Lost River Valley assessment area (Figure 3) is comprised mostly of single-family dwellings buffered by agricultural lands and livestock confinement operations or feedlots immediately north and east of Howe and large ranch holdings on the upper end of the valley. A couple of single-family dwellings occur along the wildland-urban interface. Sagebrush-grassland fuels present the most hazardous fuel conditions at the interface; however, as the home in Figure 31 demonstrates, good defensible space is possible. Weed infested, stubble and fallow fields nearer to Howe present the greatest fuel hazard to structures in this area. The assessed portion of the valley within Butte County has no fire protection. As noted earlier in this report, the INEEL maintains a Cooperative Fire Protection Agreements and MOU with Butte County and would respond to a fire in Howe if manpower were available.



Figure 31. Single-family dwelling along the Little Lost River Valley Highway. This home is 1.5 miles northwest of Howe and shows good defensible space, metal roofs, and landscaping 30 feet beyond structures.



Figure 32. Potential dry hydrant location at Warm Springs Creek. This creek is 10.5 miles northwest of Howe where the Little Lost River Valley Road intersects the creek.



Figure 33. Potential dry hydrant location on Wet Creek. This site is located approximately 33 miles northwest of Howe.



Figure 34. Potential dry hydrant location near Pass Creek Summit.

Recommended Mitigations for Howe and Antelope Road

Howe

1. Install a dry hydrant system and/or drafting area for engines and tenders along the Little Lost River Highway at three locations (see Figure 3 – assessment area and Figures 32, 33, and 34). The cost is estimated at \$750 to \$1000 per hydrant including contractor labor and machine costs, 6 inch schedule 40 PVC pipe, a commercially made screen, and hydrant connector (Pohlman et al. 2003).

Environmental Effects – Potential impact to riparian landowner. Establish a land use agreement(s) between the landowner and the LRFPD. If required, obtain application/permit for dry fire hydrant from state and/or federal agency and county zoning coordinator. Check locations for suitability, such as, water depth, composition of streambed or lake bottom, ease of digging, protection of hydrant during winter.

2. Cooperate with landowners to allow access to irrigation mainline valves. This would require a 3-4 inch valve with a fire hose connection adapted to the valve to be used with tenders and engines.
3. Purchase two water tenders complete with drop tanks and shuttle capability. These tenders would be strategically located to serve rural residents east and north of Howe and utilize dry hydrants and/or mainline valves.

4. Remove hazardous fuels using a mower or blade behind a tractor once prior to curing, or preferably up to three times during summer through fall months. Depending on the road, mow or blade the surface between the edge of road and fence line parallel to the road.

Treat the following roads located north and east of Howe:

- 3400N to 1300W = 3.0 miles
- 3700N to 1300W = 3.5 miles
- 3800N to 1300W = 4.0 miles
- 3900N to 1300W = 5.0 miles
- Total** **15.5 miles**

- Along 1300W = 3.0 miles
- Along 1400W = 2.0 miles
- Along 1500W = 4.0 miles
- Along 1600W = 3.0 miles
- Along 1700W = 3.0 miles
- Total** **15.0 miles**

The costs are estimated at \$75 to \$100 per linear mile including tractor/mower/brush hog and operator (personal communication, Mel Ellwein, Ramshorn Ranch).

5. Upgrade the community service infrastructure (all costs per Raft River Fire Protection District Communities at Risk Program Costing 2001).

Infrastructure Needs/Costs

Construct a fire station within Howe city limits	\$260,000
Install a computer system	\$5,000
Purchase a heavy brush truck	\$85,000
Purchase two shuttle water tenders	<u>\$30,000</u>
Total	\$380,000

Program Needs/Costs

Volunteer Training	\$10,000
Fire-Wise Program	\$10,000
Fire Prevention	\$10,000
Fire Education	\$10,000
Equipment and Supplies	<u>\$5,000</u>
Total	\$45,000

Antelope Road

Lost River Fire Protection District protection extends only to the Custer County line 2.6 miles west on the Antelope Road (Figure 9). Although two single-family dwellings extend outside this boundary they remain within the protection zone. An additional 18.5 miles of road, or up to the Medicine Rock Equestrian Center, was assessed and considered unprotected. Other information for the area was compiled from interviews with the Arco Natural Resource Conservation Service personnel and landowners residing in the area.

Agricultural lands buffer most single-family dwellings on the lower end of the Antelope Road and to the Custer County line (Figure 35). Beginning at the Custer/Butte County line and continuing up the road to at least the Medicine Rock Equestrian Center, sagebrush-grassland becomes the primary hazardous fuel found along the interface (Figures 36 and 37).

1. Form a separate Fire District (or be part of the County-wide fire protection district mentioned in section 4.1).
2. Install a dry hydrant system and/or drafting area for engines and tenders at the location identified in Figure 3 and seen in Figure 38. The cost is estimated at \$750 to \$1000 per hydrant including contractor labor and machine costs, 6 inch schedule 40 PVC pipe, a commercially made screen, and hydrant connector (Pohlman et al. 2003).

Environmental Effects – Potential impact to riparian landowner. Establish a land use agreement(s) between the landowner and the LRFDP. If required, obtain application/permit for dry fire hydrant from state and/or federal agency and county zoning coordinator. Check locations for suitability, such as, water depth, composition of streambed or lake bottom, ease of digging, protection of hydrant during winter.

3. Cooperate with landowners to allow access to irrigation mainline valves. This would require a 3-4 inch valve with a fire hose connection adapted to the valve to be used with tenders and engines.
4. Mow hazardous fuels along Antelope Road for approximately 3 miles to the Custer County line. It is recommended that this be completed once or twice during summer through fall months.
 - Cost - \$75 to \$100 per linear mile including tractor/mower/brush hog and operator (personal communication, Mel Ellwein, Ramshorn Ranch).
5. Plan and implement a strategy to encourage Antelope Road residents to create neighborhood-wide, fire-adapted landscapes. Residents would need to become familiar with FIREWISE practices through education and outreach programs (Hodgson 2001).
 - Cost - \$100 per single-family dwelling including educational materials
6. Encourage Antelope Road residents to create defensible space by practicing any one or all of the following:

Homes and outbuildings:

- Water or “greenup” lawn areas
- Pave or gravel driveways
- Mow vegetation or disk/blade ground to bare, mineral soil out to a minimum of 50 feet
- Remove and/or reduce vegetation immediately around buildings

Practice the “zone” approach (Simmerman et al. 1989) -

- Clean zone – 0-3 feet from buildings, remove all combustibles (i.e. decorative bark or shrubs, stack firewood uphill or contour away from building.
- Short surface fuels – 3-30 feet from buildings, keep grass, and all other low plants short, < 3 inches high. Isolate trees so no branches overhang roofs.
- Tall surface fuels – 30-100 feet from buildings, uncut grasses, scattered patches of medium shrubs is acceptable, however, keep all plants less than 18 inches high.
- Tree and tall shrub thinning and pruning – For 100 feet around all buildings, thin (remove) trees and large shrubs so there is 10 feet of open space between all crowns and tops of plants. Remove the lower branches of all trees to a minimum of 10 feet above the ground. Scattered, isolated trees may be left unpruned for landscape purposes.
- Recommend the use of noncombustible roofing materials, replace wood shingles, or apply SHINGLE SAFE Fire Retardant on wood shake shingles.



Figure 35. Crested wheatgrass along Antelope Creek Road.
Photo taken one-half mile west of Highway 93 looking southwest along side of road.



Figure 36. Single-family dwelling 15 miles west of Antelope Creek Road. This home has substantial sagebrush-grassland vegetation within 30 feet of structure. Cheatgrass and rabbitbrush fuels are also along the edge of road and interspersed with sagebrush.



Figure 37. Hazardous fuel loads along Antelope Road 12.5 miles west of Highway 93.



Figure 38. Potential dry hydrant located 4.0 miles southwest of Highway 93.

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Personnel Contacted

John Apel – Integrated Resource Program Manager, National Park Service, Craters of the Moon National Monument & Preserve
Kenneth W. Babcock – Project Manager
Larry Barnes – L.P. Barnes Realty – Arco
Steve Cote – District Conservationist, Livestock Handling Specialist – Natural Resources Conservation Service – Arco
Bob Duke – Mackay Watermaster
Carol Eckert – Challis National Forest
Mel Ellwein – Owner – Ramshorn Ranch near Pass Creek Road
Laurie Gamett – Butte County Assessor
Linda Hastag – Mackay Action Center
Gary Henrie, Fire Chief, Teton Fire Protection District, Driggs, ID
Jody Hogan – Program Assistant – Three Rivers RC&D Council
Fred Judd – Bureau of Land Management
Daniel Koste – Fire Chief – Arco
Will Moorecroft – Challis National Forest
Jim Morris – Superintendent - Craters of the Moon National Monument
David Mull – Fire Chief Lost River Fire Protection District
Mike Munts – Wildlife Biologist - Craters of the Moon National Monument
Harold Smith, Jr. – Owner – Medicine Rock Equestrian Center – Antelope Creek

Process Used to Develop Wildland Fire Hazard Mitigation Plan

An Agreement was made between Butte County and North Wind, Inc to provide a Wildland Fire Hazard Mitigation Plan for Butte County. This plan involved the County Commissioners, Fire District Chiefs, and other local officials.

The scope of work included:

- Collecting and compiling existing fire information from County, State, and/or Federal land management agencies.
- Identify any data gaps and collect field information.
- Assess problems, needs, and potential solutions through interview with Fire District personnel as well as elected county officials.
- Assess problems, needs, and potential solutions by 1) receiving input from the general public through a minimum of three (3) public meetings.
- Create an individual Wildland Fire Hazard Mitigation Plan for Butte County by completing the following:
 - Evaluate the data and information from the Hazard Assessment

- Meet with Fire District personnel and elected officials
- Hold (3) public meetings to discuss findings from the Hazard Assessment and receive input related to mitigation planning
- The Wildland Fire Hazard Mitigation Plan will include the following items:
 - Recommended action or actions
 - Location of mitigation projects
 - Discussion of physical, biological, and social resources that may be affected
 - Alternatives that were considered
 - Time frame for implementation and priority of mitigation projects
 - Funding anticipated and potential sources
 - Implementation of the specific mitigation projects

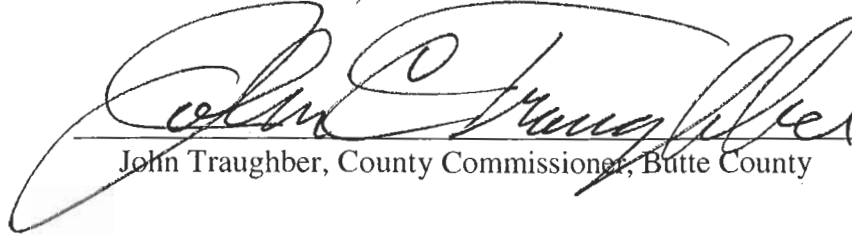
Public Involvement

A public meeting was held on June 17th at 7:00 pm in the Arco Butte Business Center to discuss the Butte County Fire Risk Assessment and Mitigation Plan. A notice for the meeting was placed in the Arco Advertiser on June 6, 2004. The Arco Advertiser is widely circulated throughout Butte County and was selected based on this. In addition to this notice, letters were sent to 17 persons including the three Butte County commissioners, the mayor of Arco, Arco city council members, the mayor of Moore, Moore city council members, Lost River Fire Protection District fire chief and chairman, Arco fire chief, and the BLM Fire Mitigation and Education Specialist. Posters highlighting the findings of the assessment and detailing specific mitigation actions were generated for the public to view and copies of the FEMA checklist for homeowners were made available.

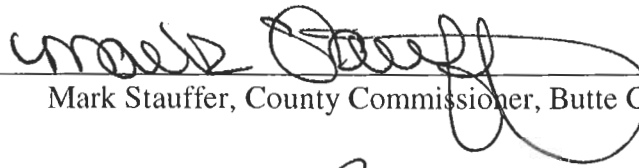
This plan has been reviewed and approved by the following individuals.



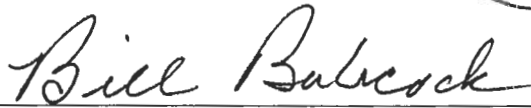
Seth Beal, Chair, County Commissioner, Butte County



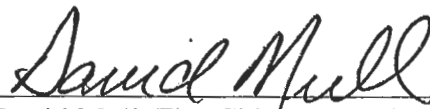
John Traugber, County Commissioner, Butte County



Mark Stauffer, County Commissioner, Butte County



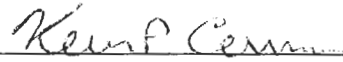
Bill Babcock, Chair, Lost River Fire Protection District



David Mull, Fire Chief, Lost River Fire Protection District



Dan Koste, Fire Chief, Arco Fire Department



Kevin Conran, Fire Mitigation and Education Specialist, BLM