

Wildland-Urban Interface Wildfire Mitigation Plan



Gem County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan

February 2, 2004

Vision: *Institutionalize and promote a countywide wildfire hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Gem County.*



This plan developed by the Gem County Wildland-Urban Interface Wildfire Mitigation Plan Committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Dr., P.O. Box 9748, Moscow, ID 83843, Tel: 208-883-4488, www.Consulting-Foresters.com

Acknowledgments

This Wildland-Urban Interface Wildfire Mitigation Plan represents the efforts and cooperation of a number of organizations and agencies, through the commitment of people working together to improve the preparedness for wildfire events while reducing factors of risk.



Gem County Commissioners
and the employees of Gem County



West Central Highlands of Idaho Resource
Conservation and Development Association



USDI Bureau of Land Management
Lower Snake River District



USDA Forest Service
Boise National Forest



Idaho Department of Lands
Southwest Idaho Area

Emmett Fire Department
Gem County Fire Protection District #1
Gem County Fire Protection District #2

&

Local Businesses and Citizens of Gem County

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Chapter I: Overview of this Plan and its Development

1 Introduction

This Wildland-Urban Interface Wildland Fire Mitigation Plan for Gem County, Idaho, is the result of analyses, professional cooperation and collaboration, assessments of wildfire risks and other factors considered with the intent to reduce the potential for wildfires to threaten people, structures, infrastructure, and unique ecosystems in Gem County, Idaho. The planning team responsible for implementing this project was led by the Gem County Commissioners. Agencies and organizations that participated in the planning process included:

- USDI Bureau of Land Management (also providing funding through the National Fire Plan)
- USDA Forest Service
- US Fish and Wildlife Service
- Idaho Department of Lands
- West Central Highlands Resource Conservation and Development Council
- Gem County Commissioners
- Gem County Bureau of Disaster Services
- Gem County Planning and Zoning
- Gem County Development Service
- Gem County Assessor's Office
- Gem County Fire Protection District #1
- Emmett City Fire Department
- Gem County Fire Protection District #2
- Middleton Fire District
- Little Land & Livestock
- Rodney Herr Livestock
- Northwest Management, Inc.

The Gem County Commissioners in cooperation with the West Central Highlands RC&D solicited competitive bids from companies to provide the service of leading the assessment and the writing of the **Gem County Wildland-Urban Interface Wildland Fire Mitigation Plan**. The Commissioners selected Northwest Management, Inc., to provide this service. Northwest Management, Inc., is a professional natural resources consulting firm located in Moscow, Idaho. The Project Manager from Northwest Management, Inc., was Dr. William E. Schlosser, a professional forester and regional planner. The County also hired a local coordinator to serve as liaison between Northwest Management, Inc., and the Commissioner's Office, local citizenry, and others. The County hired Don Dittmer, a resident of Emmett, and a retired USDA Forest Service employee. Mr. Dittmer is a professional forester with experience in land use planning, forest and range management and wildfire control.

This Wildland-Urban Interface Wildland Fire Mitigation Plan has been prepared in compliance with:

- The National Fire Plan; A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan–May 2002.
- The Idaho Statewide Implementation Strategy for the National Fire Plan–July 2002.
- The Federal Emergency Management Agency’s Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a All Hazards Mitigation Plan.

“When implemented, the 10-Year Comprehensive Strategy will contribute to reducing the risks of wildfire to communities and the environment by building collaboration at all levels of government.”

- The NFP 10-Year Comprehensive Strategy August 2001

1.1 Goals and Guiding Principles

The Wildland-Urban Interface Wildland Fire Mitigation Plan for Gem County takes its targeted outcomes simultaneously from the combination of the National Fire Plan, the Idaho Statewide Implementation Strategy for the National Fire Plan, and FEMA guidelines for the review process for local hazard mitigation plans. The objective of combining these three complimentary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Gem County.

1.1.1 National Fire Plan Philosophy

The goals of this Wildland-Urban Interface Fire Mitigation Plan include:

1. Improve Fire Prevention and Suppression
2. Reduce Hazardous Fuels
3. Restore Fire-Adapted Ecosystems
4. Promote Community Assistance

Its three guiding principles are:

1. Priority setting that emphasizes the protection of communities and other high-priority watersheds at-risk.
2. Collaboration among governments and broadly representative stakeholders
3. Accountability through performance measures and monitoring for results.

This Wildland-Urban Interface Fire Mitigation Plan documents the County’s intentions in meeting the National Fire Plan’s 10-Year Comprehensive Strategy and the Idaho Statewide Implementation Strategy for the National Fire Plan. The projects and activities recommended under this plan are in addition to other Federal, state, and private / corporate forest and rangeland management activities. The implementation plan does not alter, diminish, or expand the existing jurisdiction, statutory and regulatory responsibilities and authorities or budget processes of participating Federal, State, and tribal agencies.

By endorsing this implementation plan, all signed parties agree that reducing the threat of wildland fire to people, communities, and ecosystems will require:

- Firefighter and public safety continuing as the highest priority.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.
- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

The National Fire Plan identifies a three-tiered organization structure including 1) the local level, 2) state/regional and tribal level, and 3) the national level. This plan adheres to the collaboration and outcomes consistent with a local level plan. Local level collaboration involves participants with direct responsibility for management decisions affecting public and/or private land and resources, fire protection responsibilities, or good working knowledge and interest in local resources. Participants in this planning process include Tribal representatives, local representatives from Federal and State agencies, local governments, landowners and other stakeholders, and community-based groups with a demonstrated commitment to achieving the strategy's four goals. Existing resource advisory committees, watershed councils, or other collaborative entities may serve to achieve coordination at this level. Local involvement, expected to be broadly representative, is a primary source of planning, project prioritization, and resource allocation and coordination at the local level. The role of the private citizen is not to be underestimated, as their input and contribution to all phases of risk assessments, mitigation activities, and project implementation is greatly facilitated by their involvement.

1.1.1.1 Identifying and Prioritizing Communities at Risk

The following was prepared by the National Association of State Foresters, June 27, 2003, and is included here as a reference for the identification of prioritizing treatments between communities.

Purpose: To provide national, uniform guidance for implementing the provisions of the "Collaborative Fuels Treatment" MOU, and to satisfy the requirements of Task e, Goal 4 of the Implementation Plan for the 10-Year Comprehensive Strategy.

Intent: The intent is to establish broad, nationally compatible standards for identifying and prioritizing communities at risk, while allowing for maximum flexibility at the state and regional level. Three basic premises are:

- Include all lands and all ownerships.
- Use a collaborative process that is consistent with the complexity of land ownership patterns, resource management issues, and the number of interested stakeholders.
- Set priorities by evaluating projects, not by ranking communities.

References:

1. *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment. 10-Year Comprehensive Strategy Implementation Plan.* May 2002. (Goal 4 Task e: “Develop nationally comparable definitions for identifying at-risk wildland urban interface communities and a process for prioritizing communities within state and tribal jurisdiction.”) (Available at: <http://www.fireplan.gov/reports>).
2. *Memorandum of Understanding for the Development of a Collaborative Fuels Treatment Program.* January 13, 2003. (Available at: <http://www.fireplan.gov/reports>).
3. *Concept Paper: Communities at Risk.* National Association of State Foresters (NASF), December 2, 2002. (Available at: <http://www.stateforesters.org/reports>).
4. *Wildland/Urban Interface Fire Hazard Assessment Methodology.* NWCG, undated (circa 1997). (Available through the NWCG Publications Management System (PMS), NIFC Catalog number NFES 1597.)

Definition – Community at Risk: For the purpose of this document, a community is defined as “a group of people living in the same locality and under the same government” (*The American Heritage Dictionary of the English Language*, 1969). A community is considered at risk from wildland fire if it lies within the wildland/urban interface as defined in the federal register (*FR Vol. 66, No. 3, Pages 751-754, January 4, 2001*).

1.1.2 Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a Local Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM program provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local hazard mitigation plan requirements for HMGP and PDM eligibility is based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote and integrated, cost effective approach to mitigation. Local hazard mitigation plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria covers the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA will only review a local hazard mitigation plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local hazard mitigation plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption. In Idaho the SHMO is:

Idaho Bureau of Disaster Services
4040 Guard Street, Bldg 600
Boise, ID 83705
Jonathan Perry, 208-334-2336 Ext. 271

A FEMA designed plan will be evaluated on its adherence to a variety of criteria.

- Adoption by the Local Governing Body
- Multi-jurisdictional Plan Adoption
- Multi-jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-Jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-Jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation Through Existing Programs
- Continued Public Involvement

1.1.3 Gem County Planning Effort and Philosophy

The goals of this planning process include the integration of the National Fire Plan, the Idaho Statewide Implementation Strategy, and meets the requirements of FEMA for a county-wide Fire Mitigation Plan; a component of the County's All Hazards Mitigation Plan. This effort will utilize the best and most appropriate science from all partners, the integration of local and regional knowledge about wildfire risks and fire behavior, while meeting the needs of local citizens, the regional economy, the significance of this region to the rest of Idaho and the Inland West.

1.1.3.1 Mission Statement

To make Gem County residents, communities, state agencies, local governments, and businesses less vulnerable to the negative effects of wildland fires through the effective administration of wildfire hazard mitigation grant programs, hazard risk assessments, wise and efficient fuels treatments, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

1.1.3.2 Vision Statement

Institutionalize and promote a countywide wildfire hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Gem County.

1.1.3.3 Goals

- To reduce the area of WUI land burned and losses experienced because of wildfires where these fires threaten communities in the wildland-urban interface
- Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy
- Educate communities about the unique challenges of wildfire in the wildland-urban interface (WUI)
- Establish mitigation priorities and develop mitigation strategies in the WUI
- Strategically locate, plan, and implement fuel reduction projects
- Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash
- Meet or exceed the requirements of the National Fire Plan and FEMA for a County level Fire Mitigation Plan

1.2 Documenting the Planning Process

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop this plan, including how it was prepared, who was involved in the process, and how all of the involved agencies participated.

1.2.1 Description of the Planning Process

The Gem County Wildland-Urban Interface Wildfire Mitigation Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Section 1.0 of this document. The County's local coordinator contacted these organizations directly to invite their participation and schedule meetings of the planning committee. The planning process included 5 distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed though out the process):

1. **Collection of Data** about the extent and periodicity of wildfires in and around Gem County. This included an area encompassing Adams, Gem, Payette, Valley, and Washington Counties to insure a robust dataset for making inferences about fires in Gem County specifically; this included a wildfire extent and ignition profile.
2. **Field Observations and Estimations** about wildfire risks including fuels assessments, juxtaposition of structures and infrastructure to wildland fuels, access, and potential treatments by trained wildfire specialists.
3. **Mapping** of data relevant to wildfire control and treatments, structures, resource values, infrastructure, fire prone landscapes, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee, to a public mail survey, news releases, public meetings, public review of draft documents, and acceptance of the final plan by the signatory representatives.

5. **Analysis and Drafting of the Report** to integrate the results of the planning process, providing ample review and integration of committee and public input, followed by acceptance of the final document.

Planning efforts were led by the Project Director, Dr. William E. Schlosser, of Northwest Management, Inc., and Don Dittmer, the Gem County Fire Plan Coordinator. Dr. Schlosser holds 4 degrees in natural resource management (A.S. geology; B.S. forest and range management; M.S. natural resource economic & finance; Ph.D. environmental science and regional planning). They led a team of resource professionals that included fire mitigation specialists, wildfire control specialists, resource management professionals, and hazard mitigation experts.

The planning team met with many residents of the county during the inspections of communities, infrastructure, and hazard abatement assessments. This methodology, when coupled with the other approaches in this process, worked adequately to integrate a wide spectrum of observations and interpretations about the project.

The planning philosophy employed in this project included the open and free sharing of information with interested parties. Information from federal and state agencies was integrated into the database of knowledge used in this project. Meetings with the committee were held throughout the planning process to facilitate a sharing of information between cooperators.

When the public meetings were held, many of the committee members were in attendance and shared their support and experiences with the planning process and their interpretations of the results.

1.3 Public Involvement

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases this led to members of the public providing information and seeking an active role in protecting their own homes and businesses, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning process.

1.3.1 News Releases

Under the auspices of the Gem County Wildland-Urban Interface Wildfire Mitigation Planning Committee, news releases were submitted to area news papers (there are no local television companies servicing this county).

1.3.1.1 Newspaper Articles

Committee and public meeting announcements were published in the local newspapers ahead of each meeting. The following is an example of one of the newspaper announcements that ran in the local newspaper.

1.3.2 Public Mail Survey

In order to collect a broad base of perceptions about wildland fire and individual risk factors of homeowners in Gem County, a mail survey was conducted. Using the cadastral database of landowners in Gem County, homeowners from the Wildland-Urban Interface surrounding each community were identified. They were included in a database of names that integrated individuals living on parcels with a home, at least 3 acres of land, and a mailing address within Gem County. This database created a list of 1,507 names to which was affixed a random

number that contributed to the probability of being selected for the public mail survey. A total of 209 landowners meeting the above criteria were selected.

The public mail survey developed for this project has been used in the past by Northwest Management, Inc., during the execution of other WUI Wildfire Mitigation Plans. The survey used The Total Design Method (Dillman 1978) as a model to schedule the timing and content of letters sent to the selected recipients. Copies of each cover letter, mail survey, and communication are included in Appendix III.

The first in the series of mailing was sent August 8, 2003, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Gem County if they would complete and return the survey. The free map incentive was tied into assisting their community and helping their interests by participating in this process. Each letter also informed residents about the planning process. A return self-addressed envelope was included in each packet. A postcard reminder was sent to the non-respondents on August 20, 2003, encouraging their response. A final mailing, with a revised cover letter pleading with them to participate, was sent to non-respondents on September 1, 2003.

Surveys were returned during the months of August, September, October, and early November. A total of 91 residents responded to the survey. Three of the surveys were returned as undeliverable, and four responded that they no longer live in the area. The effective response rate for this survey was 46%. Statistically, this response rate allows the interpretation of all of the response variables significantly at the 95% confidence level.

1.3.2.1 Survey Results

A summary of the survey's results will be presented here and then referred back to during the ensuing discussions on the need for various treatments, education, and other information.

All of the respondents have a home in Gem County, and 90% consider this their primary residence. About 63% of the respondents were from the Emmett area, 13% were from the Sweet Area, 4% from the Gross area, 4% from Ola area, 3% from Montour, and 3% were from Pearl.

Virtually all of the respondents (99%) correctly identified that they have emergency telephone 911 services in their area.

Respondents were asked to identify if their home is protected by a fire district. Most of the county's residents have rural or city fire protection, with the exception of the homes in the Pearl Area. Of the respondents, 91% identified they live in an area protected by a rural or city fire district. Approximately 6% responded they do not have a fire district covering their home, when in fact they do. Only 3% of the respondents indicated they do have a fire district, when in fact they do not. None of the respondents reported they do not know either way. This ratio of correct answers to incorrect answers on this particular question is substantially higher (better) than in other counties where this question has been asked.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Almost half of the respondents, 49% indicated their homes were covered with a composite material. About 35% indicated their home were covered with an aluminum roofing material. About 11% of the respondents indicated they have a wooden roofing material such as shakes. The additional 5% of respondents had a variety of other materials indicated. The 11% of respondents with flammable roofing materials are the homes potentially most at risk to ignition during a wildfire event.

Residents were asked to evaluate the proximity of trees within certain distances of their homes. Often, the density of trees around a home is an indicator of increased fire risk. The results are presented in Table 1.1

Table 1.1 Survey responses indicating the proximity of trees to homes.

Number of Trees	Within 250 feet of your home	Within 75 feet of your home
None	3%	3%
Less than 10	53%	66%
Between 10 and 25	29%	22%
More than 25	16%	9%

Approximately 87% of those returning the survey indicated they have a lawn surrounding their home. Of these individual home sites, 97% indicated they keep this lawn green through the fire season.

The average driveway length of the respondents was approximately 655 feet long, from their main road to their parking area. Roughly 4% of the respondents had a driveway over ½ mile long, and a corresponding 10% had a driveway over ¼ of a mile long. Of these homes, roughly 53% have turnouts allowing two vehicles to pass each other in the case of emergency. Approximately 76% of all homeowners indicated they have an alternative escape route, with the remaining 24% indicating only one-way-in and one-way-out.

Nearly all respondents (93%) indicated they have some type of tools to use against a wildfire that threatens their home. Table 1.2 summarizes these responses.

Table 1.2. Percent of homes with indicated fire fighting tools in Gem County.

93% – Hand tools (shovel, Pulaski, etc.)
20% – Portable water tank
16% – Stationery water tank
42% – Pond, lake, or stream water supply close
29% – Water pump and fire hose
30% – Equipment suitable for creating fire breaks (bulldozer, cat, skidder, etc.)

Roughly 22% of the respondents in Gem County indicated they have someone in their household trained in wildland fire fighting. Approximately 13% indicated someone in the household had been trained in structural fire fighting. However, it is important to note that these questions did not specify a standard nor did it refer to how long ago the training was received.

A couple of questions in the survey related to on-going fire mitigation efforts households may be implementing. Respondents were asked if they conduct a periodic fuels reduction program near their home sites, such as grass or brush burning. Approximately 78% answered affirmative to this question, while 61% responded that livestock (cattle, horses, sheep) graze the grasses and forbs around their home sites.

Respondents were asked to complete a fuel hazard rating worksheet to assess their home's fire risk rating. An additional column titled "results" has been added to the table, showing the percent of respondents circling each rating (Table 1.3).

Circle the ratings in each category that best describes your home.

Table 1.3. Fuel Hazard Rating Worksheet		Rating	Results
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1	78%
	Medium size fuels (brush, large shrubs, small trees)	2	19%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	3%
Slope Hazard	Mild slopes (0-5%)	1	88%
	Moderate slope (6-20%)	2	11%
	Steep Slopes (21-40%)	3	0%
	Extreme slopes (41% and greater)	4	1%
Structure Hazard	Noncombustible roof and noncombustible siding materials	1	32%
	Noncombustible roof and combustible siding material	3	38%
	Combustible roof and noncombustible siding material	7	12%
	Combustible roof and combustible siding materials	10	18%
Additional Factors	Rough topography that contains several steep canyons or ridges	+2	Average -2.5 pts
	Areas having history of higher than average fire occurrence	+3	
	Areas exposed to severe fire weather and strong winds	+4	
	Areas with existing fuel modifications or usable fire breaks	-3	
	Areas with local facilities (water systems, rural fire districts, dozers)	-3	

Calculating your risk

Values below are the average response value to each question.

$$\begin{array}{rclcl}
 \text{Fuel hazard} & \underline{1.2} & \times & \text{Slope Hazard} & \underline{1.1} & = & \underline{1.4} \\
 \text{Structural hazard} & & + & & \underline{4.0} & & \\
 \text{Additional factors} & (+ \text{ or } -) & & & \underline{-2.5} & & \\
 \text{Total Hazard Points} & = & & & \underline{2.9} & &
 \end{array}$$

Table 1.4. Percent of respondents in each risk category as determined by the survey respondents.

00% – Extreme Risk = 26 + points
00% – High Risk = 16–25 points
30% – Moderate Risk = 6–15 points
70% – Low Risk = 6 or less points

Maximum household rating form score was 14 points, as assessed by the homeowners.

Finally, respondents were asked “if offered in your area, would members of your household attend a free, or low cost, one-day training seminar designed to teach homeowners in the wildland–urban interface how to improve the defensible space surrounding your home and

adjacent outbuildings?” Less than half of respondents, 43% indicated a desire to participate in this type of training.

Homeowners were also asked, “Would you be interested in participating in a cost share program that would pay a portion of the costs of implementing fire risk projects on your property?” To this question, only 23% indicated a willingness to do so. It has been pointed out that some landowners may have interpreted this question and responded with the intention of indicating they would be willing to pay 100% of the costs themselves, or none of the costs themselves, relying on a 100% federal, state, or grant payment to make the treatments happen. Because this vastly differing interpretation of the same question, further elucidation of this response should not be made.

1.3.2.2 Committee Meetings

The following list of people who participated in the planning committee meetings, volunteered time, or responded to elements of the Gem County Wildland-Urban Interface Wildfire Mitigation Plan’s preparation.

- **NAME..... ORGANIZATION**
- Steve Buck Gem County Emergency Mgt. Coordinator
- Colby Buffington Middleton Fire District
- Jim Buffington Gem County Fire Protection Dist. #2
- Sharon Church-Pratt Gem County Commissioner
- Tammy Cook Emmett R.D. U.S.F.S.
- Will Cook University of Idaho Ext. Service
- Shannon Crays Emmett Fire Department
- Randy Eardley BLM
- Greg Himes Gem County Assessor’s Office
- Marcia Herr Rodney Herr Livestock
- Morris Huffman Gem County Development Services
- Kurt Huston Idaho Department of Lands
- Bill Lee Gem County Fire Protection Dist. #1
- Nathan LeFever Bureau of Land Management
- Debra Lish Gem County Planning & Zoning
- Brad & Jim Little Little Land & Livestock
- Ed Mansfield Gem County Commissioner
- Russ Manwaring West Central Highlands RC & D
- Chuck McLaren Gem County Fire Protection District #1
- John McGee Northwest Management, Inc.
- Paul Moroz U.S. Fish and Wildlife Service

- Bob Nanis.....LSRD – BLM
- Dennis Pully Gem County Road and Bridge Dept.
- Dennis Robbins.....Gem County Fire Protection Dist. #2
- Tim Shelton Idaho Fish & Game
- Michele Sherrer.....Gem County Commissioner
- Len Spain Bureau of Land Management
- Rick Welch Gem County Rural Fire District #1
- Don Dittmer Gem County Fire Plan Coordinator
- William E. Schlosser Northwest Management, Inc. Project Manager

Committee Meetings were scheduled and held on the following dates:

July 24-28, 2003

An article was placed in the Messenger Index and the Gem County Gazette (local newspapers) explaining the up coming plan. It identified the rationale, objectives, process and invited the public to participate in future meetings. Specific names and contact information were provided for the public to contact for more information.

July 23, 2003

This was the first meeting for the coordinating team. Don Dittmer gave a brief overview of the Fire Plan and purpose of the team in the plan development. Bill Schlosser gave a slide presentation giving an overview of what a Wildfire Risk and Mitigation Plan will accomplish. It will include a risk analysis at the community level using predictive models showing where fires are likely to ignite and spread. Fire-prone landscapes will be identified and include recommendations to reduce impacts from wildfire in Gem County.

The role of the coordinating team was discussed in more detail and explained the importance of their input at the local level along with public involvement in the plan development. Also, the need for realistic mitigation measures so that the plan will be a usable tool.

NWM Inc. will be sending a mail survey to selected homeowners in the county; refer to the press release dated 7/09/03. This release was published in the Messenger Index the week of July 21, 2003 and the Gem County Gazette, August 2003 issue.

August 21, 2003

This was the second meeting for the coordinating team. Since many present were not at the first meeting, Don Dittmer gave a brief overview of the role of this team in development of the Fire Plan. Bill Schlosser then gave an update of the progress through August 21, 2003 (refer to the Gem County Mitigation Plan update 8/21/03 submitted by William Schlosser). Preliminary drafts of GIS data were displayed and field verification was in progress. Bill noted that the mail survey had been sent out. Again, it was emphasized to the team that they should be thinking about information to be included in the plan as well as recommendations for mitigation measures.

Two public meeting dates were scheduled for 9/24/03 at Sweet, Idaho and 9/25/03 at Emmett, Idaho. Don Dittmer will get news releases out to inform the public of those two meetings.

December 9, 2003

The committee met to review a draft of the WUI Fire Mitigation Plan developed by Northwest Management, Inc. and County Facilitator Don Dittmer. Feedback was shared along with a schedule to facilitate committee and public review of the document. During this period from December 9 through December 19, 2003, follow-up with individual committee members was conducted to solicit plan information.

December 15, 2003

A meeting was held between coordinator Don Dittmer and representatives of Gem County Fire District #2, Jim Buffington and Dennis Robbins. Colby Buffington was also in attendance representing the Middleton Fire District. The attendees reviewed the December 9, 2003, Draft of the plan and discussed specific pages relating to comments to be included in the public review draft.

January 12, 2004

A meeting was held with district fire chiefs and others to review the public draft (pages 90-101) in order to clarify specific action items. Those in attendance included Gem County Fire District #1, Bill Lee and Rick Welch; Gem County Fire District #2, Jim Buffington and Dennis Robbins; Emmett Fire Department, Shannon Crays; Bureau of Land Management, Nathan LeFever and Len Spain; Idaho Department of Lands, Kurt Huston; Northwest Management, Inc., John McGee; and Plan Coordinator, Don Dittmer. The comments from these discussions were integrated into the final plan.

1.3.2.3 Public Meetings

Public meetings were held during the planning process, as an integral component to the planning process. It was the desire of the planning committee, and the Gem County Commissioners to integrate the public's input to the development of the fire mitigation plan.

Formal public meetings were scheduled on September 24, 2003, in Sweet, Idaho, and on September 25, 2003, at Emmett, Idaho. The purpose of these meetings was to share information on the planning process with a broadly representative cross section of Gem County landowners. Both meetings had wall maps posted in the meeting rooms with many of the analysis results summarized specifically for the risk assessments, location of structures, fire protection, and related information. The formal portion of the presentations included a PowerPoint presentation made by Project Director, Dr. William E. Schlosser. During his presentations, comments from committee members, fire chiefs, and others were encouraged in an effort to engage the audience in a discussion.

It was made clear to all in attendance that their input was welcome and encouraged, as specific treatments had not yet been decided, nor had the risk assessment been completed. Attendees were told that they could provide oral comment during these meetings (which was recorded by the County Fire Plan Facilitator Don Dittmer and are summarized below), they could provide written comment to the meetings, or they could request more information in person to discuss the plan. In addition, attendees were told they would have an opportunity to review the draft plan prior to its completion to further facilitate their comments and input.

The formal presentations lasted approximately 1½ hours and included many questions and comments from the audience. Following the meetings, discussions continued with the committee members and the general public discussing specific areas, potential treatments, the risk analysis, and other topics.

Attendance at the public meetings included 6 residents at the Sweet meeting and 8 at Emmett. The following are comments, questions or suggestions from the meetings:

1.3.2.3.1 Sweet Public Meeting

Dr. William E. Schlosser presented a slide program describing the objectives of a Wildfire Risk and Mitigation Plan for Gem County. GIS data maps were displayed showing fire-prone landscapes and how these were developed using past fire history, fuel types and regression models. It was explained how risk assessments were developed by levels: Structural Risk, Home Defensible Space, Community Defensible Space, Defensible Areas within Rural Lands, and Defensible Areas within the Wildland Interface.

It was noted where highest risk areas were located and some possible mitigation measures to reduce losses from wildland fire especially adjacent to communities of Emmett, Letha, Ola and Sweet. It was also noted that livestock grazing has helped in reducing fuel loading on many of the high-risk fire-prone landscapes. Also, results of the mail-in survey were presented.

After the presentation, Bill asked the group for any input they may have on the information collected or additional points to be covered in the plan. Some comments and suggestions included the following:

1. Emphasize more of rangeland problems in urban interface rather than forested areas.
2. County needs certified fire inspectors.¹
3. Access roads and bridge standards need to be improved.
4. Get rural fire district #2 more involved in fire plan development and county-wide involvement in the process.
5. Note that risk from lightning-caused fire is often more of a concern than man-caused fires in Gem County.
6. Some of results of mail-in survey were questionable (in terms of who is qualified to fight fires).

The group then reviewed the GIS data maps created to date and it was noted that a draft plan would be out in a month or so for review by the coordinating team and then an opportunity for public review prior to the final plan to be presented to Gem County Commissioners sometime in late December, 2003.

1.3.2.3.2 Emmett Public Meeting

Dr. William E. Schlosser presented a slide program similar to the previous meeting at Sweet; however, it emphasized more of the rangeland interface problems. As in the previous public meeting, he noted the need for public involvement, explained the problems in wildland interface, fire-prone landscapes and high-risk areas. GIS data maps were displayed and explained to the group.

After the presentation the group was invited to offer comments or suggestions. The following was noted:

¹ Post meeting note, "Rick Welch with Gem County Fire Protection District #1 is a Certified Fire Inspector with the State of Idaho."

1. Some concern was expressed about taxing inequities for fire protection in county vs. high-risk areas.
2. The group felt that information presented was reflective of the problems.
3. A need to look at the Pearl area was point to for further investigations.
4. Some of results of mail-in survey were questionable (especially in terms of the qualifications of wildland fire fighters and structural firefighters).
5. May be some problems in the future since subdivision size went from 40 acre to 5 acre.²

Bill noted that a draft plan will be developed in a month or so and then will be reviewed by the coordinating team in December. This then will be available for final public review prior to submission of a final plan to the Gem County Commissioners in late December, 2003.

1.3.2.3.3 Meeting Notices

Public notices of this meeting were printed in the **Messenger Index** the weeks of September 15 and 22, 2003. Also, flyers were posted in Ola, Sweet, Letha and Emmett, September 12 and 15, 2003. Samples of the press releases are included here for reference only and do not include all of the press information generated during this analysis and planning process.

NEWS RELEASE

PUBLIC MEETING ANNOUNCEMENT

GEM COUNTY FIRE MITIGATION PLAN

Two public meetings are scheduled to discuss the Gem County Wildland Fire Plan on:

Wednesday, September 24, 2003; 7:00 p.m.; Syringa Hall, Sweet, Idaho

Thursday, September 25, 2003; 7:00 p.m.; U.S.D.A. Service Center 1805 Hwy 16, Emmett, Idaho

The Gem County Fire Mitigation Plan will include risk analysis at the community level with predictive models for where fires are likely to ignite and where they are likely to spread once ignited. A coordinating team including rural and wildland fire districts, land managers, elected officials, and others, in conjunction with Northwest Management specialists have been analyzing fire-prone landscapes and will be making recommendations for potential treatments. These public meetings are an opportunity to review information gathered thus far and solicit further information to incorporate into the Gem County Fire Plan.

If you have any questions you can call the local coordinator, Don Dittmer, at 365-5871 for further information.

² Note from the Gem County Development Services Department, "The discussion must have been regarding the rezoning of the southern portion of the county to five-acre minimums. The rezone does not increase the allowable number of splits, for the most part, the property owners would have to subdivide to create more than a few five acre parcels."

Community Round Up



GEM COUNTY FIRE PLAN REVIEW

The Gem County Wildland Fire Plan will be available for public review and comment during the period of **January 2-15, 2004** at the following

Emmett Public Library,
275 S. Hayes Avenue, Emmett, ID 83617
Gem County Clerk, 415 E. Main, Emmett, ID 83617
Russ Manwaring,
WCHRD&D, 1805 Hwy. 16, Emmett, ID 83617
Don Dittmer,
879 Jackson Avenue, Emmett, ID 83617 (208-365-5871)
Ola Library, Ola, Idaho
Dennis Robins, Sweet, Idaho (208-584-3392)

The public is encouraged to review and make any comments to the proposed Gem County Fire Plan during the above comment period. If you have any questions, you can call the local coordinator, Don Dittmer at 365-5871.

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GEM COUNTY FIRE PLAN REVIEW

The Gem County Wildland Fire Plan will be available for public review and comment during the period of **January 2 - 15, 2004** at the following locations:

Emmett Public Library, 275 S. Hayes Avenue,
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Russ Manwaring, WCHRD&D, 1805 Hwy 16,
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Don Dittmer, 879 Jackson Avenue, Emmett, ID
83617 (208-365-5871)
Ola Library, Ola, Idaho
Dennis Robins, Sweet, Idaho (208-584-3392)

The public is encouraged to review and make any comments to the proposed Gem County Fire Plan during the above comment period. If you have any questions, you can call the local coordinator, Don Dittmer at 365-5871.

1.3.2.4 Public Document Review

The Gem County Wildland-Urban Interface Wildfire Mitigation Plan DRAFT was completed in late November, 2003. This document was made available to the members of the planning committee and others as a first round of edits, modifications, and enhancements. Written and verbal comments were integrated into the revision of the document. Comments from many on the committee, and others involved in land management and fire control were integrated into the document revision.

The revised document (Version 20040105) was completed on January 5, 2004, for distribution to key locale in Gem County in an effort to make it available to those wishing to provide comments to the document draft. The document was printed and made available at local libraries, the RC&D Office, and the County Courthouse from January 6th-16th. Comments from local citizenry and individuals were integrated into the completed plan.

The final plan was presented to the Gem County Commissioners at a General Meeting of the County Commissioners on February 2, 2004, where it was accepted by the Commissioners.

Chapter 2: County Characteristics & Risk Assessment

2 Background and Area Description

2.1 Demographics

Gem County reported a total population of 15,181 in 2000 with approximately 5,888 housing units. Gem County has one incorporated community, Emmett (pop. 5,490). The population of Gem County increased by approximately 28.2% from 1990 to 2000. The total land area of the county is roughly 563 square miles (361,818 acres).

From Gem County's Internet Web Site at <http://www.co.gem.id.us/general/history.htm> the following information is summarized:

Located thirty miles northwest of Boise on Highway 16, the Gem of the Payette is 35 miles long and averages 6 miles wide in Gem County, with the town of Emmett sitting at 2,373 feet above sea level. In the early 1900's fruit packers adopted the label of "Gem of Plenty" because of the fertility of the Gem. During the mining era the Payette Gem was known as the garden for the mining regions.

Rising 5,906 feet the Squaw Butte stands at the north end of the Gem. The Indians used this area as their winter resort and named the butte. The river was named after Francois Payette, who was put in charge of Fort Boise in 1818 and traveled through the Gem. Permanent settlement began in the early 1860's after gold discoveries in the Boise Basin brought people over already established stage and pack train routes. Two of these trails joined at the Payette River north of the present river bridge. It was here that in 1863 Nathaniel Martin and Jonathan Smith decided to build a ferry to cross the river that swelled to over a mile wide each spring. The community of Martinsville, later named Emmett, grew up around this ferry site, which handled not only local trade, but also heavy traffic from the Basin Trail. The next year Doc Burdge came with his family and opened the first store and grist mill. The grinding stones from this mill are located in the Emmett City Park. The Burdge house was one of the grandest in the 1870's, and it still remains today just two miles west from Emmett on Cascade Road.

Road houses were necessary to give travelers a place to stop and get a drink, a meal, or lodging. Falk's Store was one such stop and at one time was the principal village in the lower Gem. Located ten and a half miles from Emmett near the present county line, it provided the only store between Boise and Baker, Oregon, doing an estimated \$60,000 a year in business. Although nothing remains now, there also was a hotel, saloon, two stores and other small businesses.

Six miles from Emmett was the Payette River Ranch, also called the Government Ranch because of the government stockpiles there. The Martinsville Post Office moved to the Payette River Ranch in 1870 and was renamed Emmett for the son of Tom Cahalan, who had the name, recorded in Washington, D.C. When the post office moved back to Martinsville a year later, the recorded name remained with it, and Martinsville eventually became Emmett.

In 1883 Wardwell had the town platted, and in 1900 the town was incorporated as Emmett. After the closing the Pearl mines in 1906, the power lines were extended to Emmett. A series of irrigation projects made it possible for more rapid expansion of the town as the major service center for a farming and fruit-growing Gem.

2.1.1.1 Freezeout Hill

Attempts to enter the Emmett Gem from the southeast end were very limited due to the steep terrain. The early routes went up to Montour and then on to the Boise Basin or the Overland Stage Route west of Emmett. Freezeout Hill was so named because old-timers had to lock or “freeze” their wagon wheels and slide down the hill. Sometimes it took as many as twelve teams of horses and more than a day to pull a freight wagon up the hill. The story is told of early freighters attempting to come down during a winter nearly freezing to death on top before they could get down the next day. The tough old hill has been known as Freezeout ever since. The winding road to the west of the new grade was constructed in 1919.

2.1.1.2 Picket Corral

Four miles north on Highway 52, on the east side of the river, are the rocky cliffs and natural recess called Picket Corral. It became the rendezvous headquarters for horse thieves, bandits, murders, and bogus-gold dust operators that were notorious throughout the northwest. Just down the hill, a cabin of driftwood logs was a roadhouse for weary travelers. A stockade of 10-foot high log pickets was built at the opening of the rocky gorge. Stolen horses were put in the stockade and then led out the back of the canyon during the night and then sold in Oregon. The Payette Vigilantes, headed up by William J. McConnell, eventually brought the outlaws to justice. McConnell later became governor of Idaho.

2.1.1.3 Black Canyon Dam

In 1905 a diversion dam and canals were built on the Payette River, 15 miles northeast of the present dam site. Some of the concrete canal wall remain and can be seen along the highway. With the pressing need for irrigation water, the Bureau of Reclamation completed this dam in 1924. The 183-foot high dam was built on a natural dam site, created by the huge black basalt rocks that blocked travel up the canyon, and for which the canyon was named. The water level behind the dam must remain at a certain level to divert water into the canals that take the water as far as Middleton. Today the backwaters are excellent for water sports and recreation.

2.1.1.4 Roystone

Ten miles northeast of Emmett lies the natural hot springs called Roystone Hot Springs. An early settler developed the, springs into a fruit and vegetable farm taking produce to the various mines. In 1923 Roy Stone and his wife bought the springs and Mrs. Stone was responsible for the development of a summer resort and health spa named Roystone Hot Mineral Springs. Besides the large hotel there was an enclosed swimming pool and bathhouse.

2.1.1.5 Sweet

During the gold rush to the Thunder Mountain Mines, Sweet served as an important freighter's supply station. At the turn of the century Sweet boasted of three hotels, three saloons, a bank, a newspaper, two lodge halls, and other business. It was named for the first postmaster Ezekiel Sweet. After the gold rush subsided and a series of fires in the business district, the town began to deteriorate, and was not rebuilt.

2.1.1.6 Ola

Fifteen miles north of Sweet, the Ola Gem was settled as early as 1864. It was, and remains today, a farming and ranching area. Due to the hardpan and lava rock formations, rock cribs are still used to anchor the fences. Ola's community hall, two-room schoolhouse, and church built around 1910, are still used today.

2.1.1.7 Montour

In the early 1860's the Marsh-Ireton Ranch was established as a stage and mail stop along the freight road to the Boise Basin. After the railroad came through the Gem in 1911, the Montour business district and town were platted. They vied for the Boise County seat, but in 1915, the town was incorporated into Gem County with Emmett as the county seat. Dreams of prosperity faded when in 1941 the new highway bypassed Montour, and shortly thereafter the school closed due to school reorganization. The last store closed in 1968. In the 1970's, ice jams along the backwaters of the dam flooded the Gem. The Bureau of Reclamation bought out the landowners and have since turned the Gem into a wildlife refuge and camping area. A natural landmark is the small butte generally known as Regan Butte and named after the homesteader who ran cattle there in the late 1800's.

2.1.1.8 Letha

Colonel Barnard and W.W. Wilton wanted to extend the railroad from New Plymouth to Emmett and have a town midway of the Gem.

2.1.1.9 Cemeteries

William J. McConnell wrote, "It is a strange analogy that life should mean death, for the life of early places was gauged...by the growth of the cemetery." Emmett's original cemetery located on West Fourth Street was moved to its present location in 1918. Other county cemeteries are located in Sweet, Ola and Pearl. The Pioneer Cemetery is located on the south of the Gem.

Table 2.1 summarizes some relevant demographic statistics for Gem County.

Table 2.1. Selected demographic statistics for Gem County, Idaho, from the Census 2000.

Subject	Number	Percent
Total population	15,181	100.0
SEX AND AGE		
Male	7,578	49.9
Female	7,603	50.1
Under 5 years	1,069	7.0
5 to 9 years	1,064	7.0
10 to 14 years	1,332	8.8
15 to 19 years	1,217	8.0
20 to 24 years	836	5.5
25 to 34 years	1,544	10.2
35 to 44 years	2,153	14.2
45 to 54 years	2,007	13.2

Table 2.1. Selected demographic statistics for Gem County, Idaho, from the Census 2000.

Subject	Number	Percent
55 to 59 years	869	5.7
60 to 64 years	706	4.7
65 to 74 years	1,169	7.7
75 to 84 years	865	5.7
85 years and over	350	2.3
Median age (years)	37.5	(X)
18 years and over	10,935	72.0
Male	5,391	35.5
Female	5,544	36.5
21 years and over	10,304	67.9
62 years and over	2,777	18.3
65 years and over	2,384	15.7
Male	1,078	7.1
Female	1,306	8.6
RELATIONSHIP		
Population	15,181	100.0
In households	14,982	98.7
Householder	5,530	36.4
Spouse	3,572	23.5
Child	4,802	31.6
Own child under 18 years	3,886	25.6
Other relatives	591	3.9
Under 18 years	258	1.7
Nonrelatives	487	3.2
Unmarried partner	197	1.3
In group quarters	199	1.3
Institutionalized population	140	0.9
Noninstitutionalized population	59	0.4
HOUSEHOLDS BY TYPE		
Households	5,530	100.0
Family households (families)	4,174	75.5
With own children under 18 years	1,912	34.6
Married-couple family	3,539	64.0
With own children under 18 years	1,562	28.2
Female householder, no husband present	411	7.4
With own children under 18 years	214	3.9
Nonfamily households	1,356	24.5
Householder living alone	1,154	20.9
Householder 65 years and over	571	10.3
Households with individuals under 18 years	2,116	38.3
Households with individuals 65 years and over	2,230	40.3
Average household size	2.71	(X)
Average family size	3.15	(X)

Table 2.1. Selected demographic statistics for Gem County, Idaho, from the Census 2000.

Subject	Number	Percent
HOUSING TENURE		
Occupied housing units	5,539	100.0
Owner-occupied housing units	4,423	79.9
Renter-occupied housing units	1,116	20.1
Average household size of owner-occupied unit	2.66	(X)
Average household size of renter-occupied unit	2.87	(X)

(X) Not applicable.

When an ancestry group is selected, the data in this table refer to the ancestry of the person or householder.

Source: U.S. Census Bureau, Census 2000 Summary File 4, Matrices PCT1, PCT3, PCT4, PCT8, PCT9, PCT10, PCT11, PCT12, PCT14, PCT15, PCT23, PCT26, HCT2, and HCT7.

2.2 Socioeconomics

Gem County had a total of 5,888 housing units and a population density of 27 persons per square mile reported in the 2000 Census (Table 2.1). Ethnicity in Gem County is distributed: white 93.8%, black or African American 0.1%, American Indian or Alaskan Native 0.7%, other race 3.2%, two or more races 1.8%, Hispanic or Latino 6.9%, and white alone (not Hispanic or Latino) 90.7%.

Specific economic data for individual communities is collected by the US Census; in Gem County this includes Emmett only. Emmett households earn a median income of \$26,480 annually, which is 23% below the Gem County median income during the same period (\$31,460). Table 2.2 shows the dispersal of households in various income categories in both communities.

Table 2.2. Income in 1999	Emmett		Gem County	
	Number	Percent	Number	Percent
Households	2,067	---	5,530	---
Less than \$10,000	322		606	11.0
\$10,000 to \$14,999	261		511	9.2
\$15,000 to \$24,999	367		822	14.9
\$25,000 to \$34,999	345		872	15.8
\$35,000 to \$49,999	382		1,128	20.4
\$50,000 to \$74,999	220		858	15.5
\$75,000 to \$99,999	109		454	8.2
\$100,000 to \$149,999	61		229	4.1
\$150,000 to \$199,999	0		31	0.6
\$200,000 or more	0		19	0.3
Median household income (dollars)	\$26,480	(X)	\$34,460	(X)

(Census 2000)

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs federal agencies to identify and address any disproportionately high adverse human health or environmental effects of its projects on minority

or low-income populations. In Gem County, a significant number of families are at or below the poverty level. Approximately 11.7% of Gem County families are below poverty level (Table 2.3).

Table 2.3 Poverty Status in 1999 (below poverty level)	Gem County	
	Number	Percent
Families	486	(X)
Percent below poverty level	(X)	11.6
With related children under 18 years	318	(X)
Percent below poverty level	(X)	15.4
With related children under 5 years	150	(X)
Percent below poverty level	(X)	19.1
Families with female householder, no husband present	158	(X)
Percent below poverty level	(X)	38.4
With related children under 18 years	138	(X)
Percent below poverty level	(X)	57.7
With related children under 5 years	52	(X)
Percent below poverty level	(X)	70.3
Individuals	1,959	(X)
Percent below poverty level	(X)	13.1
18 years and over	1,284	(X)
Percent below poverty level	(X)	11.9
65 years and over	318	(X)
Percent below poverty level	(X)	13.9
Related children under 18 years	646	(X)
Percent below poverty level	(X)	15.6
Related children 5 to 17 years	453	(X)
Percent below poverty level	(X)	14.7
Unrelated individuals 15 years and over	479	(X)
Percent below poverty level	(X)	25.9

(Census 2000)

The unemployment rate was 3.0% in Gem County in 1999, compared to 4.4% nationally during the same period. Approximately 7.5% of the Gem County employed population worked in natural resources, with much of the indirect employment relying on the employment created through these natural resource occupations; Table 2.4 (Census 2000).

Table 2.4 Employment & Industry	Gem County	
	Number	Percent
Employed civilian population 16 years and over	6,376	100.0
OCCUPATION		
Management, professional, and related occupations	1,399	21.9
Service occupations	1,068	16.8
Sales and office occupations	1,552	24.3
Farming, fishing, and forestry occupations	199	3.1
Construction, extraction, and maintenance occupations	818	12.8

Table 2.4 Employment & Industry	Gem County	
	Number	Percent
Production, transportation, and material moving occupations	1,340	21.0
INDUSTRY		
Agriculture, forestry, fishing and hunting, and mining	478	7.5
Construction	618	9.7
Manufacturing	1,222	19.2
Wholesale trade	238	3.7
Retail trade	629	9.9
Transportation and warehousing, and utilities	344	5.4
Information	147	2.3
Finance, insurance, real estate, and rental and leasing	298	4.7
Professional, scientific, management, administrative, and waste management services	304	4.8
Educational, health and social services	1,126	17.7
Arts, entertainment, recreation, accommodation and food services	364	5.7
Other services (except public administration)	278	4.4
Public administration	330	5.2

Approximately 72.2% of Gem County's employed persons are private wage and salary workers, while around 15.5% are government workers (Table 2.5).

Table 2.5 Class of Worker	Gem County	
	Number	Percent
Private wage and salary workers	4,606	72.2
Government workers	990	15.5
Self-employed workers in own not incorporated business	739	11.6
Unpaid family workers	41	0.6

(Census 2000)

2.2.1 Forestry and Livestock

Over the past century, employment through timber harvesting has been significant in the region. Forestry, logging, trucking, and related support industries have relied on timber harvests from this region. Livestock ranching has been and continues to be an important component of the economy of Gem County. Livestock grazing in Gem and surrounding Counties has provided stable employment while serving to keep rangelands and forestlands alike maintained at a lower wildfire risk than if they had not been present and managed.

2.2.2 Recreation

This region is a favorite destination for a variety of recreational opportunities. Black Canyon Reservoir, is a favorite recreational opportunity in the County. Remote areas offer fishing, hiking and backpacking opportunities as well. Sagehen Reservoir is a very popular National Forest Campground for camping, fishing, snowmobiling, and backpacking receiving extremely heavy use during all seasons.

Bird hunting and big game hunting for deer and elk is especially intense every fall. During the winter, snowmobiling has become a very popular sport, with a smaller amount of cross-country skiing and snowshoeing.

The economic impacts of these activities to the local economy and the economy of Idaho have not been enumerated. However, they are substantial given the many months of the year that activities take place and the staggering numbers of visitors that travel to this location. The large numbers of visitors to the region each year is noteworthy in light of wildfire mitigation efforts because of the combination of visitors traveling to rural and remote area, visitors who are not necessarily familiar with rangeland and forestland fuel risk factors (eg., campfire protocols, use of fire, etc.), and their often unfamiliarity with access routes and other factors. Because of these reasons and others, the rural areas of Gem County will receive increased attention during mitigation treatments.

2.2.3 Resource Dependency

The communities of Gem County have been evaluated by the University of Idaho College of Natural Resources Policy Analysis Group (PAG) for the degree of natural resource dependency each community experiences.

Idaho communities with more than 10% employment in resource-based sectors (wood products, travel & tourism, agriculture, and mining) were evaluated by Harris *et al.* (2003). Their findings indicate the following (Harris *et al.* 2000):³

- Emmett.....Wood Products and Agriculture
- Ola.....Travel and Tourism & Agriculture
- Montour.....Wood Products and Agriculture
- Sweet.....Agriculture Only
- Letha.....Agriculture Only

From 1993 to 1998 sawmill capacity dropped rapidly in response to dwindling public log supplies. Only two of five dominant companies operating in 1995 were still operating in 1998, and one of these, Boise Cascade, closed two of its large sawmills during this period. In the mid-1980s Boise Cascade operated three sawmills, one plywood mill and a finishing-planer mill. Idaho closures included its Council and Horseshoe Bend sawmills. Only two facilities remained open in 1999, the sawmill in Cascade and a plywood mill in Emmett. In the last few years, both of these mills closed, along with Croman's mill (Harris *et al.* 2000).

Harris *et al.* (2003) further evaluated Idaho communities based on their level of direct employment in several industrial sectors. Their findings for communities in Gem County are summarized in Table 2.6.

³ One of the reviewers of this document points out these findings may not take into account specific economic activities in Ola, Sweet and Mountour that would increase the importance of Tourism in Montour, and increase the importance of Wood Products in Sweet. Correspondingly, the data presented in Table 2.6 would show an increase in the importance of Timber in Ola, decrease of the importance of Timber in Montour, and increase Timber importance in Sweet.

Table 2.6. Levels of direct employment by industrial sector.

Community	Economic Diversity Index	Agriculture	Timber	Travel and Tourism	State/Local Government	Federal Government	Mining and Minerals
Emmett	High	High	Med. High	Med. Low	Med. High	Low	Low
Ola	Low	High	Low	Med. High	High	Low	Low
Montour	Low	High	High	Low	Low	Low	Low
Sweet	Low	High	Med. Low	Low	Low	Low	Low
Letha	Low	High	Low	Low	Low	Low	Low

A “low” level of direct employment represents 5% or less of total employment in a given sector; “med. low,” 6 to 10%; “med. high” 11 to 19%; and “high” 20% or more of total employment in a given sector.

Source: Harris *et al.* 2000

2.2.4 Development Trends

Gem County, once a dominantly agriculture and forestry based economy is now less so. Recent trends of development and growth in this area have seen many high-value homes in subdivisions that are purchased for permanent residences whose owners commute to some of the cities to the south for employment, and for recreational use as a second home.

Areas of development around Black Canyon Dam:

- Estimated 800 homes plus golf courses and accessory buildings just south of Black Canyon dam.
- Creates the potential for expedited sales of home sites further East, between the reservoir and Montour.
- Possible sale of several thousand acres North of the reservoir and Highway 52 has had home site developer interest.

Areas in the Southern portion of the county:

- Re-zone of the southern portion of the county south of Farmers Canal to the Ada and Canyon county lines to Five-acre minimum parcel size.
- Potential for home sites and subdivisions on the approximate 5,000 acres of privately owned land.

Only a minor portion of this area (in the southwestern corner) is covered by Middleton Fire, the remainder of the approx. 5,000 acres is outside fire district boundaries.

The majority of interest in development is in the rural areas, outside the expected impact areas and mainly outside the fire district protected areas. Gem County Planning & Zoning would like to have some guidelines to consider for items such as:

- Risk assessment on older home sites outside the fire districts
- Possible requirements for subdivision applications such as Fire safe building materials, Fire protection landscaping, perimeter fire breaks
- Possible ordinance amendment addressing fire mitigation issues for building sites outside the protected areas.

2.3 Cultural Resources

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their proposals on historic properties, and to provide state historic preservation

officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on these actions.

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed during potential fire mitigation activities such as thinning and prescribed fire.

Gem County is within the Aboriginal territory boundary of the Nez Perce Indian Nation. Much of this territory was ceded to the US Government in 1855. Today, the northern edge of Gem County is approximately 170 miles south of the southeastern tip of the Nez Perce Indian Reservation boundary (1863 Treaty).

Typical archeological sites include lithic scatters, village sites, rock art, and hunting blinds. The Nez Perce had a network of trails throughout the area which included various trade routes, as well as gathering and hunting routes. Some of the same trails were later used by homesteaders and miners. Traditional Cultural Properties (TCPs) are cultural resources defined as a significant place or setting, and does not necessarily have any associated material remains. For example, a TCP can be a mountain, river, or natural feature (i.e., rock formation, meadow, etc.). Some of these are present in Gem County.

Many of these sites are at risk from wildland fire due to the increase in fuel accumulation since historic times. The integrity of some cultural resources has been impacted in the past by logging activities, road building, mining, and grazing.

The National Park Service maintains the National Register of Historical Places as a repository of information on significant cultural locale. These may be buildings, roads or trails, places where historical events took place, or other noteworthy sites. The NPS has recorded sites in its database. These sites are summarized in Tables 2.7-2.18.

Table 2.7. Historic Places: Bliss, F. T., House	Added 1982 - Building - #82000345 E. 2nd and McKinley Sts, Emmett
Historic Significance:	Architecture/Engineering
Architect, builder, or engineer:	Tourtellotte, John E. & Company
Architectural Style:	Other, Bungalow/Craftsman, Late 19th And Early 20th Century American Movements
Area of Significance:	Architecture
Period of Significance:	1900-1924
Owner:	Private
Historic Function:	Domestic
Historic Sub-function:	Single Dwelling
Current Function:	Domestic
Current Sub-function:	Single Dwelling

(NRHP 2003)

Table 2.8. Historic Places: Catholic Church of the Sacred Heart	added 1980 - Building - #80001323 1st St., Emmett
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Tourtellotte & Hummel
Architectural Style:	Mission/Spanish Revival
Area of Significance:	Social History, Architecture
Period of Significance:	1925-1949
Owner:	Private

Table 2.8. Historic Places: Catholic Church of the Sacred Heart	added 1980 - Building - #80001323 1st St., Emmett
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Table 2.9. Historic Places: Emmett Presbyterian Church	added 1980 - Building - #80001324 Also known as Emmett First Southern Baptist 2nd St., Emmett
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Unknown
Architectural Style:	Late Gothic Revival
Area of Significance:	Social History, Architecture
Period of Significance:	1900-1924
Owner:	Private
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Table 2.10. Historic Places: First Baptist Church of Emmett	added 1980 - Building - #80001325 1st St., Emmett
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Nisbet & Paradise
Architectural Style:	Italianate
Area of Significance:	Social History, Architecture
Period of Significance:	1900-1924
Owner:	Private
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Table 2.11. Historic Places: First Full Gospel Church	added 1980 - Building - #80004670 207 S. Washington Ave., Emmett
Owner:	Private

(NRHP 2003)

Table 2.12. Historic Places: Fletcher Oil Company Building	added 1989 - Building - #82000346 Main St. and Boise Ave., Emmett
Historic Significance:	Architecture/Engineering
Architect, builder, or engineer:	Tourtellotte & Hummel
Architectural Style:	Mission/Spanish Revival
Area of Significance:	Architecture
Period of Significance:	1925-1949

Table 2.12. Historic Places: Fletcher Oil Company Building	added 1989 - Building - #82000346 Main St. and Boise Ave., Emmett
Owner:	Private
Historic Function:	Commerce/Trade
Historic Sub-function:	Specialty Store
Current Function:	Commerce/Trade
Current Sub-function:	Business

(NRHP 2003)

Table 2.13. Historic Places: Gem County Courthouse	added 1982 - Building - #82000347 Main St. and McKinley Ave., Emmett
Historic Significance:	Architecture/Engineering
Architect, builder, or engineer:	Richardson,David, Hummel, Frank
Architectural Style:	Other, Modern Movement
Area of Significance:	Architecture
Period of Significance:	1925-1949
Owner:	Local Gov't
Historic Function:	Government
Historic Sub-function:	Courthouse
Current Function:	Government
Current Sub-function:	Courthouse

(NRHP 2003)

Table 2.14. Historic Places: Methodist Episcopal Church	added 1980 - Building - #80001326 Also known as United Methodist Church 1st St. and Washington Ave., Emmett
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Unknown
Architectural Style:	Late Gothic Revival
Area of Significance:	Social History, Architecture
Period of Significance:	1900-1924
Owner:	Private
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Table 2.15. Historic Places: Ola School	added 1992 - Building - #92000415 Also known as 01098 5 Ola School Rd., Ola
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Cantrall, John
Architectural Style:	No Style Listed
Area of Significance:	Architecture, Education
Period of Significance:	1900-1924, 1925-1949
Owner:	Local Gov't
Historic Function:	Education
Historic Sub-function:	School

Table 2.15. Historic Places: Ola School	added 1992 - Building - #92000415 Also known as 01098 5 Ola School Rd., Ola
Current Function:	Education
Current Sub-function:	School

(NRHP 2003)

Table 2.16. Historic Places: Oregon Short Line Railway Depot	added 1995 - Building - #95000506 Also known as Emmett Depot 119 N. Commercial Ave., Emmett
Historic Significance:	Event
Area of Significance:	Transportation
Period of Significance:	1900-1924, 1925-1949
Owner:	Private
Historic Function:	Transportation
Historic Sub-function:	Rail-Related
Current Function:	Idaho Northern Pacific Office Space

(NRHP 2003)

Table 2.17. Historic Places: St. Mary's Episcopal Church	added 1980 - Building - #80001327 1st St., Emmett
Historic Significance:	Architecture/Engineering, Event
Architect, builder, or engineer:	Unknown
Architectural Style:	Late Gothic Revival
Area of Significance:	Social History, Architecture
Period of Significance:	1875-1899, 1925-1949
Owner:	Private
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Table 2.18. Historic Places: Sweet Methodist Episcopal Church	added 1997 - Building - #97000766 Also known as Sweet United Methodist Church 7200 Sweet-Ola Hwy, Sweet
Historic Significance:	Event
Area of Significance:	Community Planning And Development
Period of Significance:	1900-1924, 1925-1949
Owner:	Private
Historic Function:	Religion
Historic Sub-function:	Religious Structure
Current Function:	Religion
Current Sub-function:	Religious Structure

(NRHP 2003)

Fire mitigation activities in and around these sites has the potential to affect historic places. In all cases, the fire mitigation work will be intended to reduce the potential of damaging the site due to wildfire. Areas where ground disturbance will occur will need to be inventoried depending

on the location. Such actions may include, but not be limited to, constructed firelines (handline, mechanical line, etc.), new roads to creeks to fill water tankers, mechanical treatments, etc. Only those burn acres that may impact cultural resources that are sensitive to burning (i.e., buildings, peeled bark trees, etc.) would be examined. Burns over lithic sites are not expected to have an impact on those sites, as long as the fire is of low intensity and short duration. Some areas with heavy vegetation may need to be examined after the burn to locate and record any cultural resources although this is expected to be minimal. Traditional Cultural Properties (TCPs) will also need to be identified. Potential impact to TCPs will depend on what values make the property important and will be assessed on an individual basis.

2.4 Transportation

Primary access to and from Gem County is provided by Highway 52, a two-lane paved road with turnouts which traverses the south end of the county through its center running east and west, and Highway 16, also a two-lane paved road which enters the county across the southern border (from Star and Eagle), traveling north into Emmett where it terminates. Highway 52 is a primary east-west route for transportation networks in the area, as the principal road providing access between Emmett and Payette. Highway 16 is a primary access route for the thousands of daily commuters traveling to Ada and Canyon Counties for work and shopping. Smaller access roads (some gravel) provide access to the adjoining areas within the county. A variety of trails and closed roads are to be found throughout the region.

Almost all of the roads in the county were originally built to facilitate logging, ranching, and farming activities. As such, all of these roads can support timber harvesting equipment, logging trucks, and fire fighting equipment referenced in this document. However, many of the new roads have been built for home site access, especially for new sub-divisions of homes. In most cases, these roads are adequate to facilitate firefighting equipment. County building codes for new developments should be adhered to closely to insure this tendency continues.

The most limiting point of access is found in the northern areas of the county including the communities of Ola and Gross. In some locations, private roads were not built to the high standards adhered to on Federal and State lands. Some of these roads are narrow, have a dirt surface, and have limitations in the form of bridges and cattle guards that cannot guarantee weight standards. This situation is exacerbated by the fact that some of these limiting roads provide access to homes and recreation areas.

2.5 Vegetation & Climate

Vegetation in Gem County is a mix of forestland and rangeland ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the forest vegetation of the area. The full extent of the county was evaluated for cover type as determined from Landsat 7 ETM+ imagery in tabular format, Table 2.15.

The most represented vegetated cover type is perennial grasslands at approximately 17% of the total area. The next most common vegetation cover type represented is agricultural land at 16%. Bitterbrush is the third most common plant cover type at 13% along with annual grass & forbs (11%) and perennial grass slopes (11%). None of the remaining ground cover types total in excess of 6% in any one category (Table 2.19).

Table 2.19. Cover Types in Gem County	Acres	Percent of County's Total Area
Perennial Grassland	60,213	17%
Agricultural Land	59,403	16%
Bitterbrush	46,076	13%
Shrub/Steppe Annual Grass-Forb	39,303	11%
Perennial Grass Slope	38,722	11%
Ponderosa Pine	19,750	5%
Basin & Wyoming Big Sagebrush	19,092	5%
Mixed Xeric Forest	16,373	5%
Low Sagebrush	13,443	4%
Warm Mesic Shrubs	11,874	3%
Douglas-fir	6,513	2%
Mountain Big Sagebrush	5,432	2%
Shrub Dominated Riparian	5,261	1%
Subalpine Fir	3,577	1%
Mixed Subalpine Forest	2,606	1%
Open Water	2,337	1%
Montane Parklands and Subalpine Meadow	2,153	1%
Grand Fir	2,093	1%
Douglas-fir/Grand Fir	1,855	1%
Low Intensity Urban	1,657	0%
Broadleaf Dominated Riparian	1,278	0%
Salt-desert Shrub	717	0%
Lodgepole Pine	431	0%
Foothills Grassland	407	0%
Shallow Marsh	342	0%
Subalpine Pine	289	0%
Needleleaf Dominated Riparian	220	0%
Disturbed, Low	129	0%
Deep Marsh	128	0%
Disturbed, High	57	0%
Wet Meadow	20	0%
Mud Flat	12	0%
Rabbitbrush	12	0%
Graminoid or Forb Dominated Riparian	10	0%
Herbaceous Clearcut	5	0%
Perennial Grassland	60,213	17%

Vegetative communities within the county follow the strong moisture and temperature gradient related to the major river drainages. Limited precipitation and steep slopes result in a relatively arid environment in the southern portion of the county, limiting vegetation to drought-tolerant plant communities of grass and shrublands, with scattered clumps of ponderosa pine and Douglas-fir at the higher elevations in the north end of the county. As moisture availability increases, so does the abundance of conifer species, with subalpine forest communities present in the highest elevations where precipitation and elevation provide more available moisture during the growing season.

2.5.1 Monthly Climate Summaries in Gem County

2.5.1.1 Emmett, Idaho (102942)

Period of Record Monthly Climate Summary

Period of Record : 8/ 1/1948 to 7/31/2003

Table 2.20 Climate records for Emmett, Idaho

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	37.8	45.7	55.3	64.3	73.7	82.4	91.5	89.6	80.0	66.4	50.0	39.3	64.7
Average Min. Temperature (F)	21.7	26.2	31.1	36.0	42.8	49.4	54.7	52.9	45.3	36.4	29.1	23.2	37.4
Average Total Precipitation (in.)	1.80	1.45	1.34	1.16	1.32	0.89	0.22	0.33	0.68	0.85	1.59	1.70	13.32
Average Total SnowFall (in.)	4.2	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	2.4	9.2
Average Snow Depth (in.)	1	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 98.3% Min. Temp.: 98.2%
Precipitation: 99.8% Snowfall: 89.1% Snow Depth: 83.3%

2.5.1.2 Ola, Idaho (106586)

Period of Record Monthly Climate Summary

Period of Record : 8/ 3/1948 to 7/31/2003

Table 2.21. Climate records for Ola, Idaho

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.9	43.1	52.4	61.7	71.1	79.0	90.3	89.9	80.4	65.6	48.0	37.2	62.9
Average Min. Temperature (F)	15.3	20.1	27.6	32.4	40.1	45.2	50.9	49.5	41.5	30.5	24.0	17.4	32.9
Average Total Precipitation (in.)	3.06	2.43	2.09	1.84	1.91	1.07	0.48	0.20	0.55	1.41	2.40	3.51	20.94
Average Total SnowFall (in.)	11.9	6.2	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2.7	12.8	35.4
Average Snow Depth (in.)	8	7	2	0	0	0	0	0	0	0	1	4	2

Percent of possible observations for period of record. Max. Temp.: 24.4% Min. Temp.: 24.3%
Precipitation: 24.4% Snowfall: 23.7% Snow Depth: 23.9%

2.6 Wildfire Hazard Profiles

2.6.1 Wildfire Ignition Profile

Fire was once an integral function of the majority of ecosystems in Idaho. The seasonal cycling of fire across the landscape was as regular as the August and September lightning storms

plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition (Johnson 1998). The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals (Barrett 1979). With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age (Johnson *et al.* 1994). Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation in the Columbia Basin for thousands of years (Steele *et al.* 1986, Agee 1993).

Detailed records of fire ignition and extent have been compiled by the US Forest Service in Emmett and Boise. In addition, the Idaho Department of Lands keeps records of fire ignitions dating back to 1983. Using this data on past fire extents and fire ignition data, the occurrence of wildland fires in the region of Gem County has been evaluated.

Table 2.22 Sample fires Recorded During the Interior Columbia Ecosystem Basin Management Project.

Longitude	Latitude	Final Fire Size	Agency Responsible	Date	Cause Code ¹
-116.4170	44.0500	17,278	BLM	8/10/1986	1
-116.3330	44.3170	3,136	BLM	8/2/1986	1
-116.6330	43.8330	1,568	BLM	6/24/1986	9
-116.5050	43.9301	430	ID	7/9/1991	1
-116.5000	43.9500	430	BLM	7/9/1991	1
-116.5830	43.8170	290	BLM	7/3/1988	9
-116.3670	43.9000	215	BLM	6/14/1987	1
-116.4330	44.1330	205	BLM	7/8/1986	1
-116.3465	43.9589	200	ID	7/21/1992	6
-116.3670	43.8500	132	BLM	8/18/1989	7
-116.5000	43.8170	100	BLM	7/24/1986	9
-116.6000	43.8330	39	BLM	8/29/1986	7
-116.1767	44.4483	20	R4	8/10/1986	1
-116.7000	43.8500	15	BLM	7/22/1988	9
-116.2167	44.4617	6	R4	7/26/1989	1
-116.2871	44.0598	5	ID	8/7/1986	1
-116.3267	44.0454	5	ID	7/10/1991	6
-116.6000	43.8330	5	BLM	7/28/1986	9
-116.7000	43.8670	5	BLM	7/18/1991	9
-116.4170	44.0000	5	BLM	8/10/1986	1
-116.3267	44.0454	3	ID	9/1/1987	3
-116.6170	43.8330	3	BLM	9/30/1987	9
-116.4170	43.8330	3	BLM	8/1/1991	9
-116.2433	44.4617	2	R4	10/16/1991	1
-116.3069	44.0454	2	ID	8/7/1986	1
-116.2833	44.4317	1	R4	7/26/1989	1
-116.1750	44.4150	1	R4	10/15/1988	4
-116.2633	44.3317	1	R4	10/9/1990	3
-116.4000	43.8330	1	BLM	8/8/1992	9

Table 2.22 Sample fires Recorded During the Interior Columbia Ecosystem Basin Management Project.

Longitude	Latitude	Final Fire Size	Agency Responsible	Date	Cause Code ¹
-116.4300	44.1083	1	R4	7/27/1988	1
-116.2633	44.3950	1	R4	8/2/1986	1
-116.1567	44.3617	1	R4	8/10/1986	1
-116.2838	44.3166	1	ID	6/4/1992	7
-116.1767	44.3900	0	R4	8/10/1986	1
-116.2233	44.4317	0	R4	6/22/1992	9
-116.1633	44.3600	0	R4	8/27/1989	1
-116.2233	44.4750	0	R4	10/16/1991	1
-116.2117	44.4683	0	R4	8/10/1986	7
-116.2233	44.4683	0	R4	7/26/1989	1
-116.2233	44.4617	0	R4	7/21/1992	1
-116.2633	44.4617	0	R4	7/21/1992	1
-116.1833	44.4467	0	R4	6/12/1992	1
-116.2233	44.4467	0	R4	8/17/1990	1
-116.2633	44.4467	0	R4	9/20/1992	3
-116.2433	44.4317	0	R4	8/17/1990	1
-116.2833	44.4317	0	R4	9/27/1992	1
-116.1967	44.4200	0	R4	8/30/1986	7
-116.3167	44.4033	0	R4	7/26/1989	1
-116.2433	44.3600	0	R4	7/25/1991	1
-116.2233	44.3367	0	R4	8/10/1986	1
-116.2233	44.3217	0	R4	6/24/1989	3
-116.2433	44.2300	0	R4	8/17/1990	1
-116.2233	44.2150	0	R4	8/1/1992	9
-116.2233	44.2150	0	R4	6/14/1992	1
-116.4200	43.9700	0	R4	8/14/1988	1
-116.2639	44.3166	0	ID	8/10/1986	1
-116.2838	44.3022	0	ID	7/20/1988	7
-116.3237	44.3022	0	ID	8/1/1989	6
-116.2239	44.2877	0	ID	4/21/1986	1
-116.2639	44.2299	0	ID	8/10/1986	1
-116.2239	44.2154	0	ID	6/14/1992	1
-116.2239	44.2154	0	ID	8/1/1992	3

¹See Table 2.23 for Cause Code definitions

Many fires have burned in the region of Gem County. Figure 2.1 summarizes fire ignitions by decade and cause. Since World War II, it would appear that roughly 65% of all fires in the County have been ignited by nature, while the remaining 35%, on average have been human caused. Although the 2000 decade only has 3 years worth of data, an extrapolation of these numbers would indicate that it is matching the pace of ignitions from the 1990s.

The total number of fires ignited in Gem County peaked in the 1980's when approximately 235 fires were ignited and then spread to burn over 191,000 acres (Figure 2.2). It should be noted that in some cases, fires revisited the same parcel of ground more than one time in a decade, and between decades. That is why the total number of acres burned in the county approaches

the total area of the county. During the 1990's and the first few years of the new millennium, the number of fires and the area burned in Gem County has returned to the decadal average of approximately 140 ignitions per decade, and just under 40,000 acres per decade burned (4,000 acres per year).

Table 2.23 Wildfire Ignitions in Gem County by cause.

1983-1998 ¹			
Cause	Cause Reference	Occurrence	Percent
Lightning	1	712	64.8%
Campfire	2	94	8.6%
Smoking	3	61	5.6%
Debris Burning	4	81	7.4%
Arson	5	17	1.5%
Equipment Use	6	39	3.6%
Railroad	7	4	0.4%
Children	8	10	0.9%
Miscellaneous	9	80	7.3%
Total		1,098	

¹ Data from 1983-1998 was provided by the Idaho Department of Lands and includes recorded fire ignitions within Gem County.

Figure 2.1: Fire Starts by Decade in Gem County

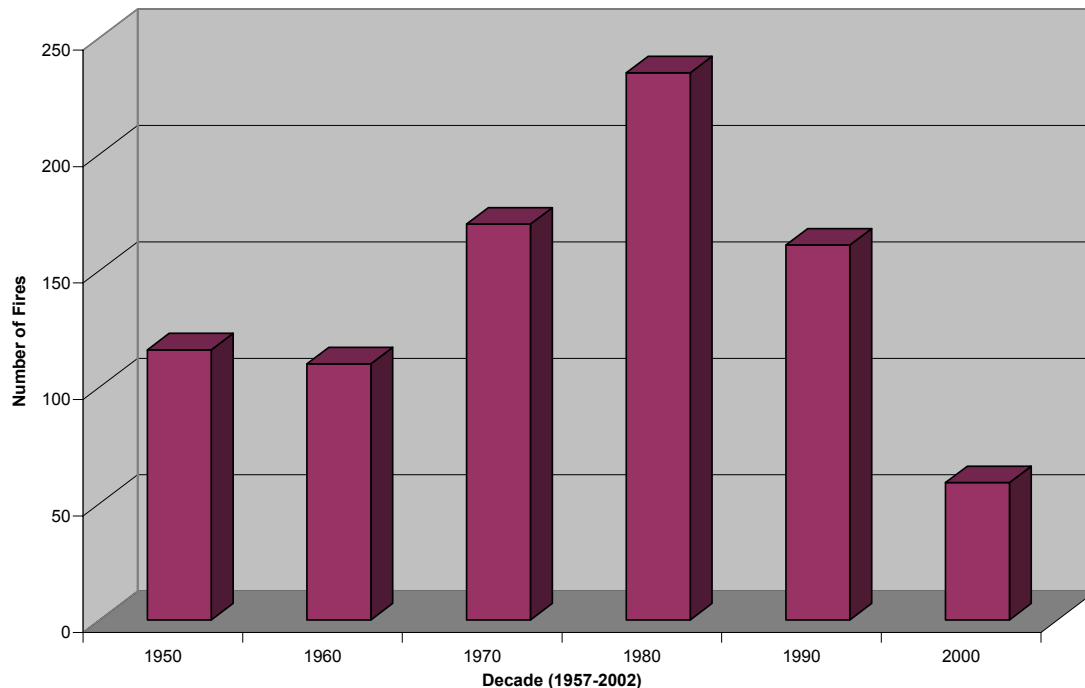
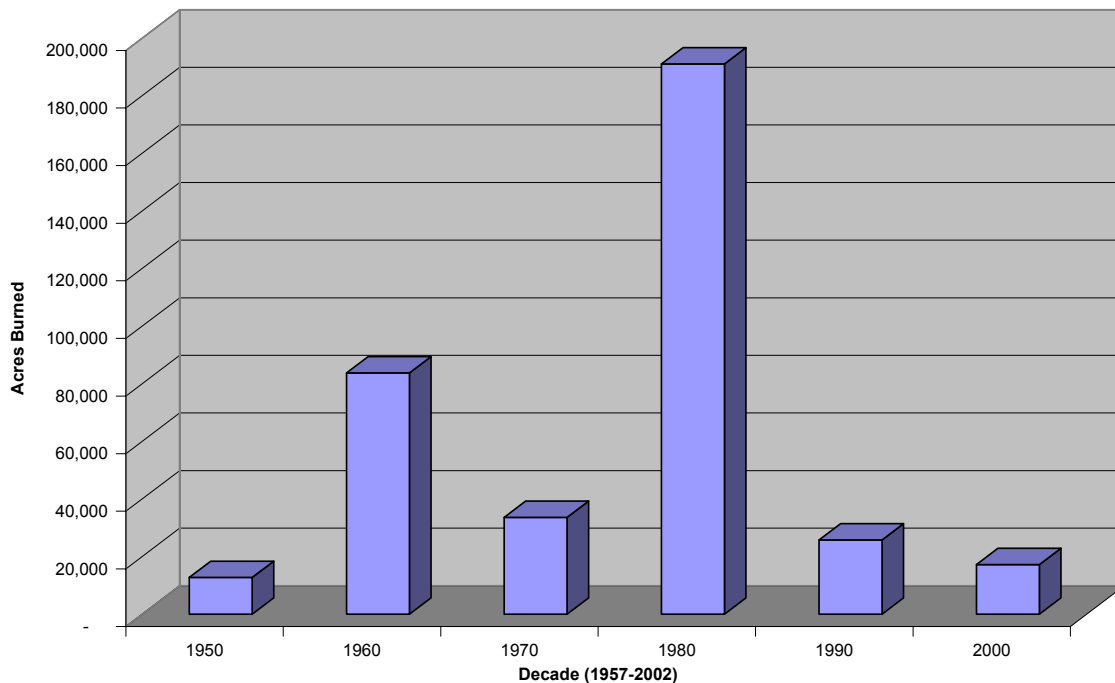


Figure 2.2: Acres Burned by Decade in Gem County



2.6.2 Wildfire Extent Profile

Across the west, wildfires have been increasing in extent and cost of control. The National Interagency Fire Center (2003) reports nearly 88,500 wildfires in 2002 burned a total of nearly 7 million acres and cost \$1.6 billion (Table 2.24). By most informed accounts, the 2003 totals will be significantly higher in terms of acres burned and cost.

Table 2.24. National Fire Season 2002 Summary

Number of Fires (2002 final)	88,458
10-year Average (1992-2001)	103,112
Acres Burned (2002 final)	* 6,937,584
10-year Average (1992-2001)	4,215,089
Structures Burned (835 primary residences, 46 Commercial buildings, 1500 outbuildings)	2,381
Estimated Cost of Fire Suppression (Federal agencies only)	\$ 1.6 billion

- *This figure differs from the 7,184,712 acres burned estimate provided by the National Interagency Coordination Center (NICC). The NICC estimate is based on information contained in geographic area and incident situation reports prepared at the time fires occurred. The 6,937,584 estimate is based on agency end-of-year reports.*

The National Interagency Fire Center, located in Boise, Idaho, maintains records of fire costs, extent, and related data for the entire nation. Tables 2.25 and 2.26 summarize some of the relevant wildland fire data for the nation, and some trends that are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained in areas like Gem County.

Table 2.25. Total Fires and Acres 1960 - 2002 Nationally

These figures are based on end-of-year reports compiled by all wildland fire agencies after each fire season, and are updated by March of each year. The agencies include: Bureau of Land Management, Bureau of Indian Affairs, National Park Service, US Fish and Wildlife Service, USDA Forest Service and all State Lands.

Year	Fires	Acres	Year	Fires	Acres
2002	88,458	* 6,937,584	1980	234,892	5,260,825
2001	84,079	3,555,138	1979	163,196	2,986,826
2000	122,827	8,422,237	1978	218,842	3,910,913
1999	93,702	5,661,976	1977	173,998	3,152,644
1998	81,043	2,329,709	1976	241,699	5,109,926
1997	89,517	3,672,616	1975	134,872	1,791,327
1996	115,025	6,701,390	1974	145,868	2,879,095
1995	130,019	2,315,730	1973	117,957	1,915,273
1994	114,049	4,724,014	1972	124,554	2,641,166
1993	97,031	2,310,420	1971	108,398	4,278,472
1992	103,830	2,457,665	1970	121,736	3,278,565
1991	116,953	2,237,714	1969	113,351	6,689,081
1990	122,763	5,452,874	1968	125,371	4,231,996
1989	121,714	3,261,732	1967	125,025	4,658,586
1988	154,573	7,398,889	1966	122,500	4,574,389
1987	143,877	4,152,575	1965	113,684	2,652,112
1986	139,980	3,308,133	1964	116,358	4,197,309
1985	133,840	4,434,748	1963	164,183	7,120,768
1984	118,636	2,266,134	1962	115,345	4,078,894
1983	161,649	5,080,553	1961	98,517	3,036,219
1982	174,755	2,382,036	1960	103,387	4,478,188
1981	249,370	4,814,206			

(National Interagency Fire Center 2003)

Table 2.26 Suppression Costs for Federal Agencies Nationally

Year	Bureau of Land Management	Bureau of Indian Affairs	Fish and Wildlife Service	National Park Service	USDA Forest Service	Totals
1994	\$98,417,000	\$49,202,000	\$3,281,000	\$16,362,000	\$678,000,000	\$845,262,000
1995	\$56,600,000	\$36,219,000	\$1,675,000	\$21,256,000	\$224,300,000	\$340,050,000
1996	\$96,854,000	\$40,779,000	\$2,600	\$19,832,000	\$521,700,000	\$679,167,600
1997	\$62,470,000	\$30,916,000	\$2,000	\$6,844,000	\$155,768,000	\$256,000,000
1998	\$63,177,000	\$27,366,000	\$3,800,000	\$19,183,000	\$215,000,000	\$328,526,000
1999	\$85,724,000	\$42,183,000	\$4,500,000	\$30,061,000	\$361,000,000	\$523,468,000
2000	\$180,567,000	\$93,042,000	\$9,417,000	\$53,341,000	\$1,026,000,000	\$1,362,367,000
2001	\$192,115,00	\$63,200,000	\$7,160,000	\$48,092,000	\$607,233,000	\$917,800,000
2002	\$204,666,000	\$109,035,000	\$15,245,000	\$66,094,000	\$1,266,274,000	\$1,661,314,000

(National Interagency Fire Center 2003)

Although many very large fires, growing to over 250,000 acres have burned in the West Central Highlands of Idaho, which Gem County is a part, actual fires in this county have usually been controlled at much smaller extents. This is not to imply that wildfires are not a concern in this county, but to point to the aggressive and professional manner to which the wildland and rural fire districts cooperate in controlling these blazes. The Boise National Forest and the BLM Lower Snake District provide primary wildland fire protection to Gem County, while three rural fire districts augment these services with home protection and related services.

Data on large fire events that burned within Gem County have been summarized (Figure 2.2). While some of these fires were centered outside of Gem County, all of the listed fires burned within the geographical extent of the county. On average, wildfires in Gem County which exceed 100 acres, reach a size of 635 acres.

2.7 Analysis Tools and Techniques to Assess Fire Risk

Gem County and the adjacent counties comprising the West Central Highlands of Idaho, were analyzed using a variety of techniques, managed on a GIS system (ArcGIS 8.2). Physical features of the region were represented by data layers including roads, streams, soils, elevation, and remotely sensed images from the Landsat 7 ETM+ satellite. Field visits were conducted by specialists from Northwest Management, Inc., and others. Discussions with area residents and fire control specialists augmented field visits and provided insights to forest health issues and treatment options.

This information was analyzed and combined to develop an assessment of wildland fire risk in the region.

2.7.1 Fire Prone Landscapes

Schlosser *et al.* 2002, developed a methodology to assess the location of fire prone landscapes on forested and non-forested ecosystems in the western US. Working under an agreement with the Clearwater Resource Conservation and Development Council, Inc., (RC&D), Northwest Management, Inc., a natural resources consulting firm, completed a similar assessment for five counties in the north central Idaho area including Clearwater County, Idaho County, Latah County, Lewis County, and Nez Perce County. In a separate project, also funded by the Bureau of Land Management working in cooperation with the Elmore County, Ada County, Canyon County, and the Southwest Idaho RC&D, Northwest Management, Inc., completed a Fire Prone Landscapes assessments on those listed areas. This assessment of Fire Prone Landscapes was completed simultaneously for Adams County, Valley County, Washington County, Payette County, and Gem County, working in cooperation with the West Central Highlands RC&D located in Emmett.

The goal of developing the Fire Prone Landscapes analysis is to make inferences about the relative risk factors across large geographical regions (5 counties) for wildfire spread. This analysis uses the extent and occurrence of past fires as an indicator of characteristics for a specific area and their propensity to burn in the future. Concisely, if a certain combination of vegetation cover type, canopy closure, aspect, slope, stream and road density have burned with a high occurrence and frequently in the past, then it is reasonable to extrapolate that they will have the same tendency in the future, unless mitigation activities are conducted to reduce this potential.

The analysis for determining those landscapes prone to wildfire utilized a variety of sources.

Digital Elevation: Digital elevation models (DEM) for the project used USGS 10 meter DEM data provided at quarter-quadrangle extents. These were merged together to create a continuous elevation model of the analysis area. Elevations were reported in meters in the source files and converted to feet using the relationship of 1 Meter = 3.28084 Feet.

The merged DEM file was used to create two derivative data layers; aspect and slope. Both were created using the spatial analyst extension in ArcGIS 8.2. Aspect data values retained one decimal point accuracy representing the cardinal direction of direct solar radiation, represented in degrees. Slope was recorded in percent and also retained one decimal point accuracy.

Remotely Sensed Images: Landsat 7 Enhanced Thematic Mapper (ETM+) images were used to assess plant cover information and percent of canopy cover. The Landsat ETM+ instrument is an eight-band multi-spectral scanning radiometer capable of providing high-resolution image information of the Earth's surface. It detects spectrally-filtered radiation at visible, near-infrared, short-wave, and thermal infrared frequency bands from the sun-lit Earth. Nominal ground sample distances or "pixel" sizes are 15 meters in the panchromatic band; 30 meters in the 6 visible, near and short-wave infrared bands; and 60 meters in the thermal infrared band.

The satellite orbits the Earth at an altitude of approximately 705 kilometers with a sun-synchronous 98-degree inclination and a descending equatorial crossing time of 10 a.m. daily.

Image spectrometry has great application for monitoring vegetation and biophysical characteristics. Vegetation reflectance often contains information on the vegetation chlorophyll absorption bands in the visible region and the near infrared region. Plant water absorption is easily identified in the middle infrared bands. In addition, exposed soil, rock, and non-vegetative surfaces are easily separated from vegetation through standard hyper-spectral analysis procedures.

Two Landsat 7 ETM images were obtained to conduct hyper-spectral analysis for this project. The first was obtained in 1998 and the second in 2002. Hyper-spectral analysis procedures followed the conventions used by the Idaho Vegetation and Land Cover Classification System, modified from Redmond (1997) and Homer (1998).

Riparian Zones: Riparian zones were derived from stream layers created during the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

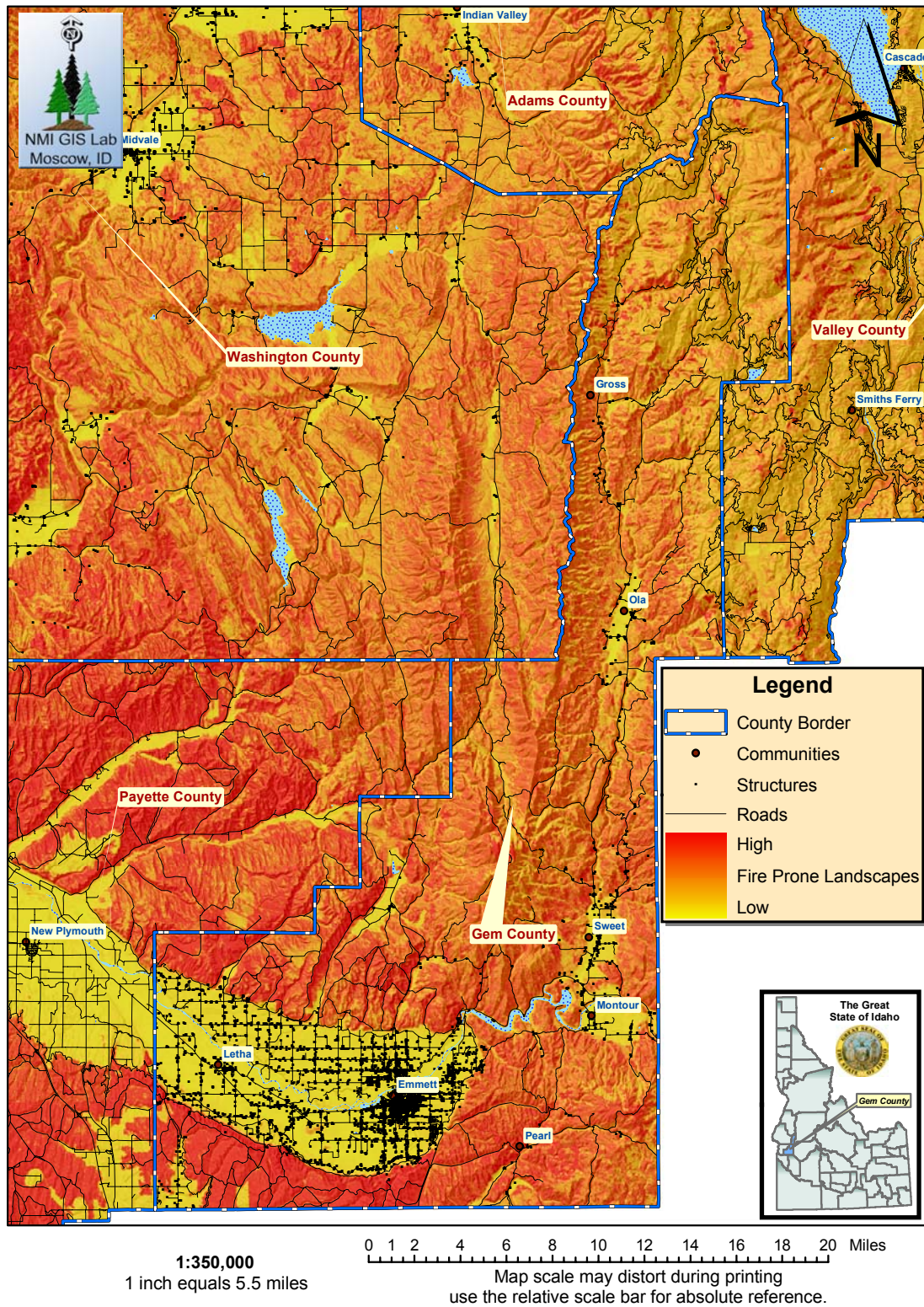
Wind Direction: Wind direction and speed data detailed by monthly averages was used in this project to better ascertain certain fire behavior characteristics common to large fire events. These data are spatially gridded Average Monthly Wind Directions in Idaho. The coverage was created from data summarized from the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

Past Fires: Past fire extents represent those locations on the landscape that have previously burned during a wildfire. Past fire extent maps were obtained from a variety of sources for the central Idaho area including the USFS Boise National Forest and the Lower Snake River B.L.M..

Fire Prone Landscapes: Using the methodology developed by Schlosser *et al.* (2002), and refined for this project, the factors detailed above were used to assess the potential for the landscape to burn during the fire season in the case of fire ignition. Specifically, the entire region was evaluated at a resolution of 10 meters (meaning each pixel on the screen represented 10 square meters on the ground) to determine the propensity for a particular area (pixel) to burn in the case of a wildfire. The analysis involved creating a linear regression analysis within the GIS program structure to assign a value to each significant variable, pixel-by-pixel. The analysis ranked factors from 0 (little to no risk) to 100 (extremely high risk) based on past fire occurrence. In fact, the maximum rating score for rangelands was 88, while a few acres of forestland ranked as high as 99.

The maps depicting these risk categories display yellow as the lowest risk and red as the highest with values between a constant gradient from yellow to orange to red (Tables 2.27 & 2.28). While large maps (12 square feet) have been provided as part of this analysis, smaller size maps are presented in Appendix I.

Fire Prone Landscapes in Gem County:



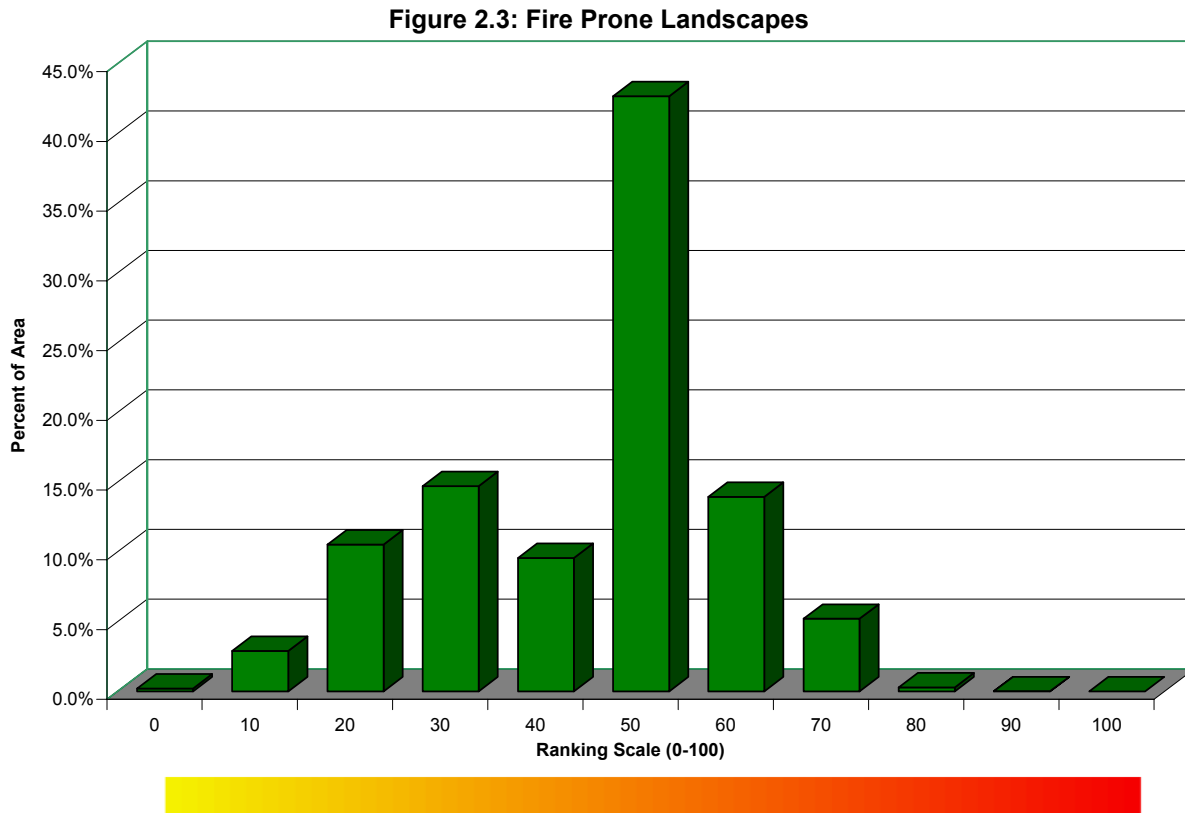
This map is presented for reference in this section of the plan. This map, and additional maps are detailed in Appendix I.

Table 2.27. Fire Prone Landscape rankings and associated acres in each category for the entire West Central Highlands Area.

Color Code	Acres			Percent of Total Area	
	Value	Forestlands	Rangelands		Total
	0	23	4,026	4,049	0.1%
	10	49,207	76,978	126,186	2.6%
	20	131,378	97,229	228,607	4.7%
	30	974,129	121,784	1,095,913	22.7%
	40	976,803	138,115	1,114,918	23.1%
	50	699,750	829,636	1,529,387	31.7%
	60	138,152	210,525	348,677	7.2%
	70	151,801	90,535	242,336	5.0%
	80	117,034	2,218	119,251	2.5%
	90	19,067	-	19,067	0.4%
	100	-	-	-	-
Total			4,828,391		

Table 2.28. Fire Prone Landscape rankings and associated acres in each category for Gem County.

Color Code	Acres				Percent of Total Area
	Value	Forestlands	Rangelands	Total	
	0	0	716	716	0.2%
	10	16	10,472	10,488	2.9%
	20	1,258	36,799	38,057	10.5%
	30	33,259	19,998	53,257	14.7%
	40	13,898	20,678	34,576	9.6%
	50	9,303	145,077	154,380	42.7%
	60	2,444	47,993	50,437	13.9%
	70	2,085	16,746	18,831	5.2%
	80	1,017	12	1,029	0.3%
	90	21	-	21	0.0%
	100	-	-	0	0.0%
Total				361,792	



The risk category values developed in this analysis should be considered **ordinal data**, that is, while the values presented have a meaningful ranking, they neither have a true zero point nor scale between numbers. Rating in the “40” range is not necessarily twice as “risky” as rating in the “20” range. These category values also do not correspond to a rate of fire spread, a fuel loading indicator, or measurable potential fire intensity. Each of those scales is greatly influenced by weather, seasonal and daily variations in moisture (relative humidity), solar radiation, and other factors. The risk rating presented here serves to identify where certain constant variables are present, aiding in identifying where fires typically spread into the largest fires across the landscape.

2.7.2 On-Site Evaluations

Fire control and evaluation specialists as well as hazard mitigation consultants evaluated the communities of Gem County to determine, first-hand, the extent of risk and characteristics of hazardous fuels in the Wildland-Urban Interface. The on-site evaluations have been summarized in written narratives and are accompanied by photographs taken during the site visits (Chapter 3). These evaluations included the estimation of fuel models as established by Anderson (1982). These fuel models are described in the following section of this document.

In addition, field personnel completed FEMA’s Fire Hazard Severity Forms and Fire Hazard Rating Criteria Worksheets. These worksheets and standardized rating criteria allow comparisons to be made between all of the counties in the country using the same benchmarks. The FEMA rating forms are summarized for each community in Appendix II.

2.7.3 Fuel Model Descriptions

Anderson (1982) developed a categorical guide for determining fuel models to facilitate the linkage between fuels and fire behavior. These 13 fuel models, grouped into 4 basic groups: grass, chaparral and shrub, timber, and slash, provide the basis for communicating fuel conditions and evaluating fire risk. There are a number of ways to estimate fuel models in forest and rangeland conditions. The field personnel from Northwest Management, Inc., that evaluated communities and other areas of Gem County have all been intricately involved in wildland fire fighting and the incident command system. They made ocular estimates of fuel models they observed. In an intense evaluation, actual sampling would have been employed to determine fuel models and fuel loading. The estimations presented in this document (Chapter 3) are estimates based on observations to better understand the conditions observed.

Fuel Model 0- This type consists of non-flammable sites, such as exposed mineral soil and rock outcrops. Other lands are also identified in this type.

2.7.3.1 Grass Group

2.7.3.1.1 Fire Behavior Fuel Model 1

Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model.

This fuel model correlates to 1978 NFDRS fuel models A, L, and S.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and alive, tons/acre	0.74
Dead fuel load, 1/4-inch, tons/acre	0.74
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	1.0

2.7.3.1.2 Fire Behavior Fuel Model 2

Fire is spread primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities than that may produce firebrands. Some pinyon-juniper may be in this model.

This fuel model correlates to 1978 NFDRS fuel models C and T.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and alive, tons/acre	4.0
Dead fuel load, 1/4-inch, tons/acre	2.0
Live fuel load, foliage, tons/acre	0.5
Fuel bed depth, feet	1.0

2.7.3.1.3 Fire Behavior Fuel Model 3

Fires in this fuel are the most intense of the grass group and display high rates of spread under the influence of wind. Wind may drive fire into the upper heights of the grass and across standing water. Stands are tall, averaging about 3 feet (1 m), but considerable variation may occur. Approximately one-third or more of the stand is considered dead or cured and maintains the fire. Wild or cultivated grains that have not been harvested can be considered similar to tall prairie and marshland grasses.

This fuel correlates to 1978 NFD RS fuel model N.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	3.0
Dead fuel load, 1/4-inch, tons/acre	3.0
Live fuel load, foliage tons/acre	0
Fuel bed depth, feet.....	2.5

2.7.3.2 Shrub Group

2.7.3.2.1 Fire Behavior Fuel Model 4

Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary overstory. Stands of mature shrubs, 6 or more feet tall, such as California mixed chaparral, the high pocosin along the east coast, the pinebarrens of New Jersey, or the closed jack pine stands of the north-central States are typical candidates. Besides flammable foliage, dead woody material in the stands significantly contributes to the fire intensity. Height of stand qualifying for this model depends on local conditions. A deep litter layer may also hamper suppression efforts.

This fuel model represents 1978 NFD RS fuel models B and O; fire behavior estimates are more severe than obtained by Models B or O.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre	13.0
Dead fuel load, 1/4-inch, tons/acre	5.0
Live fuel load, foliage, tons/acre	5.0
Fuel bed depth, feet.....	6.0

2.7.3.2.2 Fire Behavior Fuel Model 5

Fire is generally carried in the surface fuels that are made up of litter cast by the shrubs and the grasses or forbs in the understory. The fires are generally not very intense because surface fuel loads are light, the shrubs are young with little dead material, and the foliage contains little volatile material. Usually shrubs are short and almost totally cover the area. Young, green stands with no dead wood would qualify: laurel, vine maple, alder, or even chaparral, manzanita, or chamise.

No 1978 NFD RS fuel model is represented, but model 5 can be considered as second choice for NFD RS model D or as third choice for NFD RS model T. Young green stands may be up to 6 feet (2m) high but have poor burning properties because of live vegetation.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre	3.5
Dead fuel load, 1/4-inch, tons/acre	1.0
Live fuel load, foliage, tons/acre	2.0
Fuel bed depth, feet	2.0

2.7.3.2.3 Fire Behavior Fuel Model 6

Fires carry through the shrub layer where the foliage is more flammable than fuel model 5, but this requires moderate winds, greater than 8 mi/h (13 km/h) at mid-flame height. Fire will drop to the ground at low wind speeds or at openings in the stand. The shrubs are older, but not as tall as shrub types of model 4, nor do they contain as much fuel as model 4. A broad range of shrub conditions is covered by this model. Fuel situations to be considered include intermediate stands of chamise, chaparral, oak brush, low pocosin, Alaskan spruce taiga, and shrub tundra. Even hardwood slash that has cured can be considered. Pinyon-juniper shrublands may be represented but may over-predict rate of spread except at high winds, like 20 mi/h (32 km/h) at the 20-foot level.

The 1978 NFDRS fuel models F and Q are represented by this fuel model. It can be considered a second choice for models T and D and a third choice for model S.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acres.....	6.0
Dead fuel load, 1/4 –inch, tons/acre	1.5
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	2.5

2.7.3.2.4 Fire Behavior Fuel Model 7

Fires burn through the surface and shrub strata with equal ease and can occur at higher dead fuel moisture contents because of the flammability of live foliage and other live material. Stands of shrubs are generally between 2 and 6 feet (0.6 and 1.8 m) high. Palmetto-gallberry understory-pine overstory sites are typical and low pocosins may be represented. Black spruce-shrub combinations in Alaska may also be represented.

This fuel model correlates with 1978 NFDRS model D and can be a second choice for model Q.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre	4.9
Dead fuel load, 1/4-inch, tons/acre	1.1
Live fuel load, foliage, tons/acre	0.4
Fuel bed depth, feet	2.5

2.7.3.3 Timber Group

2.7.3.3.1 Fire Behavior Fuel Model 8

Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional “jackpot” or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have

leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. Representative conifer types are white pine, and lodgepole pine, spruce, fire and larch

This model can be used for 1978 NFDRS fuel models H and R.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch, dead and live, tons/acre	5.0
Dead fuel load, 1/4-inch, tons/acre	1.5
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	0.2

2.7.3.3.2 Fire Behavior Fuel Model 9

Fires run through the surface litter faster than model 8 and have longer flame height. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Closed stands of long-needled pine like ponderosa, Jeffrey, and red pines, or southern pine plantations are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

NFDRS fuel models E, P, and U are represented by this model. It is also a second choice for models C and S.

Fuel model values for estimating fire behavior

Total fuel load, <3-inch dead and live, tons/acre	3.5
Dead fuel load, 1/4-inch, tons/acre	2.9
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	0.2

2.7.3.3.3 Fire Behavior Fuel Model 10

The fires burn in the surface and ground fuels with greater fire intensity than the other timber litter models. Dead-down fuels include greater quantities of 3-inch (7.6 cm) or larger limbwood, resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees are more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect- or disease-ridden stands, wind-thrown stands, overmature situations with dead fall, and aged light thinning or partial-cut slash.

The 1978 NFDRS fuel model G is represented.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	12.0
Dead fuel load, 1/4-inch, tons/acre	3.0
Live fuel load, foliage, tons/acre	2.0
Fuel bed depth, feet	1.0

The fire intensities and spread rates of these timber litter fuel models are indicated by the following values when the dead fuel moisture content is 8 percent, live fuel moisture is 100 percent, and the effective windspeed at mid-flame height is 5 mi/h (8 km/h):

Table 2.29. Comparative Fire Intensities and Rates of Spread in Timber Fuel Models.

Fuel Model	Rate of Spread	Flame length
	Chains/hour	Feet
8	1.6	1.0
9	7.5	2.6
10	7.9	4.8

Fires such as above in model 10 are at the upper limit of control by direct attack. More wind or drier conditions could lead to an escaped fire.

2.7.3.4 Logging Slash Group

2.7.3.4.1 Fire Behavior Fuel Model 11

Fires are fairly active in the slash and herbaceous material intermixed with the slash. The spacing of the rather light fuel load, shading from overstory, or the aging of the fine fuels can contribute to limiting the fire potential. Light partial cuts or thinning operations in mixed conifer stands, hardwood stands, and southern pine harvests are considered. Clearcut operations generally produce more slash than represented here. The less-than-3-inch (7.6-cm) material load is less than 12 tons per acre (5.4 t/ha). The greater-than-3-inch (7.6-cm) is represented by not more than 10 pieces, 4 inches (10.2 cm) in diameter, along a 50-foot (15 m) transect.

The 1978 NFDRS fuel model K is represented by this model.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch, dead and live, tons/acre 11.5
 Dead fuel load, ¼-inch, tons/acre 1.5
 Live fuel load, foliage, tons/acre 0
 Fuel bed depth, feet 1.0

2.7.3.4.2 Fire Behavior Fuel Model 12

Rapidly spreading fires with high intensities capable of generating firebrands can occur. When fire starts, it is generally sustained until a fuel break or change in fuels is encountered. The visual impression is dominated by slash and much of it is less than 3 inches (7.6 cm) in diameter. The fuels total less than 35 tons per acres (15.6 t/ha) and seem well distributed. Heavily thinned conifer stands, clearcuts, and medium or heavy partial cuts are represented. The material larger than 3 inches (7.6 cm) is represented by encountering 11 pieces, 6 inches (15.3 cm) in diameter, along a 50-foot (15-m) transect.

This model depicts 1978 NFDRS model J and may overrate slash areas when the needles have dropped and the limbwood has settled. However, in areas where limbwood breakup and general weathering have started, the fire potential can increase.

Fuel model values fore estimating fire behavior

Total fuel load, < 3-inch, dead and live, tons/acre 34.6
 Dead fuel load, ¼-inch, tons/acre 4.0
 Live fuel load, foliage, tons/acre 0
 Fuel bed depth, feet 2.3

2.7.3.4.3 Fire Behavior Fuel Model 13

Fire is generally carried across the area by a continuous layer of slash. Large quantities of material larger than 3 inches (7.6 cm) are present. Fires spread quickly through the fine fuels and intensity builds up more slowly as the large fuels start burning. Active flaming is sustained for long periods and a wide variety of firebrands can be generated. These contribute to spotting problems as the weather conditions become more severe. Clearcuts and heavy partial-cuts in mature and overmature stands are depicted where the slash load is dominated by the greater-tayhn-3-inch (7.6-cm) diameter material. The total load may exceed 200 tons per acre (89.2 t/ha) but fuel less than 3 inches (7.6 cm) is generally only 10 percent of the total load. Situations where the slash still has “red” needles attached but the total load is lighter, more like model 12, can be represented because of the earlier high intensity and quicker area involvement.

The 1978 NFDRS fuel model 1 is represented. Areas most commonly fitting his model are old-growth stands west of the Cascade and Sierra Nevada Mountains. More efficient utilization standards are decreasing the amount of large material left in the field.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre 58.1
Dead fuel load, ¼-inch, tons/acre 7.0
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 3.0

For other slash situations:

Hardwood slash Model 6
Heavy “red” slash.....Model 4
Overgrown slash.....Model 10
Southern pine clearcut slash.....Model 12

The comparative rates of spread and flame lengths for the slash models at 8 percent dead fuel moisture content and a 5 mi/h (8 km/h) mid-flame wind are presented in Table 2.30.

Table 2.30. Comparative Fire Intensities and Rates of Spread in Slash Fuel Models.

Fuel Model	Rate of Spread Chains/hour	Flame length Feet
11	6.0	3.5
12	13.0	8.0
13	13.5	10.5

2.8 Wildland-Urban Interface

2.8.1 People and Structures

A key component in meeting the underlying need is the protection and treatment of fire hazard in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where forest fuels meet urban fuels (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to a risk to urban developments. Reducing the fire hazard in the wildland urban interface requires the efforts of

federal, state, local agencies, and private individuals (Norton 2002). “The role of [most] federal agencies in the wildland urban interface includes wildland fire fighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of Tribal, state, and local governments” (USFS 2001). Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures (USFS 2001). With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities. In addition, a wildland urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

By reducing hazardous fuel loads, ladder fuels, and tree densities, and creating new and reinforcing defensible space, landowners would protect the wildland-urban interface, the biological resources of the management area, and adjacent property owners by:

- minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior (McCoy *et al.* 2001 as cited in Norton 2002);
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Four wildland/urban conditions have been identified for use in the wildland urban interface (Norton 2002). These include the Interface Condition, Intermix Condition, Occluded Condition, and Rural Condition. Descriptions of each are as follows:

- **Interface Condition** – a situation where structures abut wildland fuels. There is a clear line of demarcation between the structures and the wildland fuels along roads or back fences. The development density for an interface condition is usually 3+ structures per acre;
- **Intermix Condition** – a situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres;
- **Occluded Condition** – a situation, normally within a city, where structures abut an island of wildland fuels (park or open space). There is a clear line of demarcation between the structures and the wildland fuels along roads and fences. The development density for an occluded condition is usually similar to that found in the interface condition and the occluded area is usually less than 1,000 acres in size; and
- **Rural Condition** – a situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters.

The location of structures in Gem County have been mapped and are presented on a variety of maps in this analysis document; specifically in Appendix I. The location of all structures was determined by examining two sets of remotely sensed images. The more detailed information was garnered from digital ortho-photos at a resolution of 1 meter (from 1998). For those areas

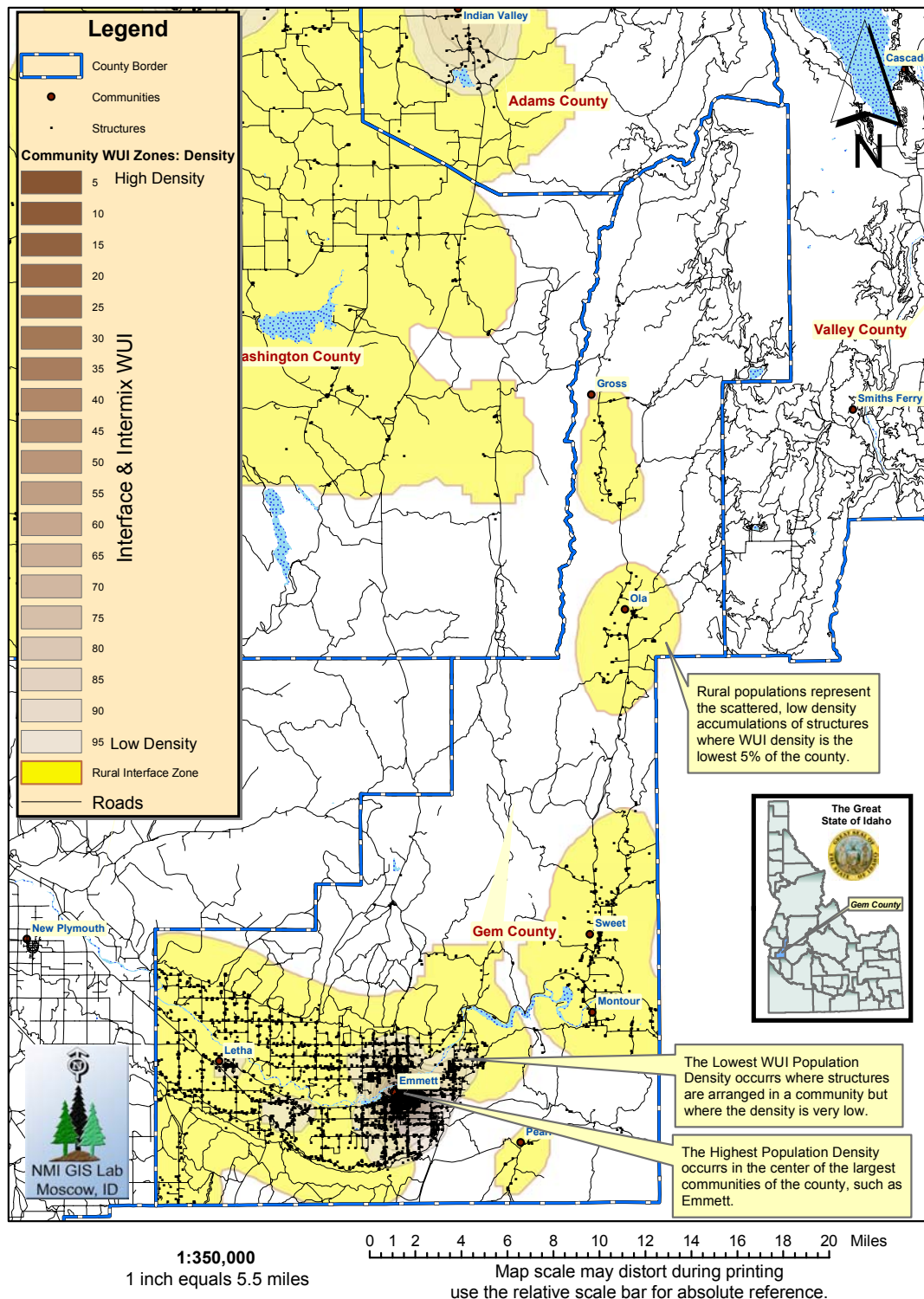
not covered by the 1 meter DOQQ images, SPOT satellite imagery at a resolution of 10 meters was used (from 2002). These records were augmented with data collected on hand-held GPS receivers to record the location of structures, especially in areas where new housing developments were seen.

All structures are represented by a “dot” on the map. No differentiation is made between a garage and a home, or a business and a storage building. The density of structures and their specific locations in this management area are critical in defining where the potential exists for casualty loss in the event of a wildfire in the region.

By evaluating this structure density, we can define WUI areas on maps by using mathematical formulae and population density indexes to define the WUI based on where structures are located. The resulting population density indexes create concentric circles showing high density areas of Interface and Intermix WUI, as well as Rural WUI (as defined by Secretary Norton of the Department of Interior). This portion of the analysis allows us to “see” where the highest concentrations of structures are located in reference to high risk landscapes, limiting infrastructure, and other points of concern.

It is critical to understand that in the protection of people, structures, infrastructure, and unique ecosystems, this portion of the analysis only serves to identify structures and by some extension the people that inhabit them. It does not define the location of infrastructure and unique ecosystems. Other analysis tools will be used for those items.

Wildland-Urban Interface in Gem County:



This map is presented for reference in this section of the plan. This map, and additional maps are detailed in Appendix I.

2.8.2 Infrastructure

Gem County has both significant infrastructure and unique ecosystems within its boundaries. Of note for this WUI Fire Mitigation Plan is the existence of state highway routes (Highways 16 & 52), and the presence of high tension power lines supplying surrounding counties. These resources will be considered in the protection of infrastructural resources for Gem County and to the larger extent of this region, and the rest of Idaho.

2.8.3 Ecosystems

Gem County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. A century of wildland fire suppression coupled with past land-use practices (primarily timber harvesting) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition (USDA 1999). As a result, forests and rangelands in Gem County have become more susceptible to large-scale, high intensity fires posing a threat to life, property, and natural resources including wildlife and special status plant populations and habitats. High-intensity, stand-replacing fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large high intensity fires throughout the nation's forest and rangelands, has resulted in significant safety risks to firefighters and higher costs for fire suppression (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

Changes in plant community composition and structure are most pronounced in the dry and semi-Mesic areas. In some dry meadows and grassland habitats, a shift in fire regimes has resulted in changes in ecological succession patterns, such as accelerated encroachment of trees and shrubs. A shift in plant species composition, due to invasion and spread of invasive herbaceous species, has also influenced fire regime and frequency.

2.9 Soils

Most of central and north-central Idaho, including Gem County, is in a geographic region known as the Idaho Batholith. This area is typically characterized as a granites soil composition with high erosion potential and often times, poor slope stability. Recovery potential of disturbed sites is poor due to thin organic horizons.

Many of the soils in Gem County are shallow, well drained soils formed in residuum from basalt overtopping the batholiths on foothills and mountains. The average annual precipitation is about 13-20 inches and the average monthly-maximum air temperature is about 60-65 degrees F. Much of this area consists of very deep, well drained soils on mountains and break lands. They formed in material weathered from meta-sedimentary bedrock, mainly siltite and argillite, with a thick mantle of volcanic ash and loess. Permeability is moderate to high. These basaltic soils are not typically prone to compaction but can develop rapid erosion characteristics.

Alluvial fans and terraces in the region consist of very deep, moderately well drained soils that formed in mixed alluvium from glacial outwash or glacial till. Permeability is moderate.

Deep and very deep soils are present on well drained mountains and ridgetops. Soils formed in material derived from granite, gneiss, or schist with a thick mantle of volcanic ash. Permeability is moderate in the solum and moderately rapid to rapid in the substratum. Slopes are 15 to 75 percent.

Our soil resource is an extremely important resource for maintaining a healthy ecosystem. Fire can play an intricate role in this process, if it occurs under normal conditions of light fuels

associated with low intensity underburns. However, the buildup of fuels and consequent high severity fires can cause soils to become water repellent (hydrophobic), and thus greatly increases the potential for overland flow during intense rains. Soil in degraded conditions does not function normally, and will not be able to sustain water quality, water yield, or plant communities that have normal structure, composition, and function. Fire is also strongly correlated with the carbon-nutrient cycles and the hydrologic cycle. Fire frequency, extent, and severity are controlled to a large degree by the availability of carbon, as well as the moisture regime (Quigley & Arbelbide 1997).

Soils were evaluated for their propensity to become hydrophobic during and after a fire as evidenced by the presence of clay and clay derivatives (e.g., clay loam, cobbly clay) in the upper soil layers. In addition, their permeability and tendency to allow runoff to infiltrate the soil rapidly was evaluated. In general, with notable exceptions, the majority of the area within Gem County has a clay content in the Bt horizon from 17 to 82 percent. Much of the area has a medial silt loam to a gravelly medial silt loam present. On average these soils are well drained with moderately slow permeability.

Low to moderate intensity fires would be not be expected to damage soil characteristics in the region, especially if the hotter fires in this range were limited to small extents associated with jackpots of cured fuels. Hot fires providing heat to the Bt horizon substrate depth would have the potential to create hydrophobic characteristics in that layer. Rocky and gravelly characteristics in the A horizon layer would not be expected to be displaced greatly, however, the silty and loamy fines in these soils will have an erosion and displacement potential. These soils will experience the greatest potential impacts resulting from hot fires that burn for prolonged periods.

2.9.1 Fire Mitigation Practices to Maintain Soil Processes

Firelines constructed by hand or with the use of machinery will have varying impacts, depending upon construction techniques. If only the surface litter is removed in the fireline construction, minor increases to soil erosion may occur. If trenches are dug which channelize runoff down steep slopes, heavy rilling or gullying could occur depending upon rock content of surface layers exposed. Jackpot burning and, to a greater extent, pile burning could result in greater soil heating and localized impacts. Loss of soil carbon, nitrogen, sulphur, phosphorus, potassium, and soil organisms may be high in the soil surface layer. Soil physical structure could be altered thereby creating hydrophobic soils. Impact severity and duration depend upon the amount of slash accumulation in each pile, the number of piles, and the amount of soil mixing in burn piles.

Indirect effects of burning to slope stability are comparatively minor in the soil types found in Gem County. Vegetation structure, including root strength after surface burning, is maintained from three to fifteen years following the burn and therefore soil saturation potential is not greatly altered. Research on similar soil types using the Level 1 Slope Analysis (LISA) model (Hammond *et al.* 1992) calculated the probability for slope failure for slopes ranging from 60 to 90 percent. The 10 percent probability threshold was utilized to delineate landslide prone areas. The landslide prone areas corresponded to 78 percent slopes and greater for the stream breaklands. Slumps and debris flows are the most common form of slope failure in the area (Thompson *et al.* 1973).

Cumulative effects on the soil resource include past effects from timber harvest, grazing, mining, and fire. Timber harvest has the potential to cause substantial soil damage due to the use of heavy equipment for harvesting, yarding, and site preparation. The damage mostly includes soil compaction and displacement of the organic rich surface soil layers. Where tractor yarding and tractor-piling have occurred, typically from 30 to 80 percent of a treated unit will have damaged soils, with negative effects on long-term soil productivity.

Where heavy grazing has occurred in the past, there is also a likelihood soil productivity has been reduced. This is especially true in riparian areas where animal concentrations have historically been the greatest. These areas generally have easily compacted soils, and are where cattle tend to linger if not managed well. Mining also has significant effects on soil quality through soil compaction and mass displacement. Grazing across Gem County was observed to be maintained in a sustainable manner without the overgrazing found in other areas of the region.

Severe fires in the past have consumed surface organics and volatilized nitrogen into the air. On some sites, however, these severe burns are a natural process, and therefore the inherent soil productivity may not be reduced. On other sites, however, where low intensity underburns typically occurred, high intensity wildland fires have consumed amounts of soil organics in excess of the historic patterns. Furthermore, excessive soil heating in these intense fires likely resulted in creation of water repellent soils, and therefore increased overland flow and soil erosion. In these cases, it can be assumed that wildland fires have reduced long-term soil productivity. Soil compaction damage typically is persistent in the area; several to many decades of rest from further compactive forces are needed until adequate soil recovery occurs. Loss of organics due to displacement and severe fire also requires decades to recuperate. This slow recovery from soil damage makes cumulative effects to soil productivity and soil hydrologic function a major concern.

To avoid potential impacts, wherever possible, firelines should be located outside of highly erosive areas, steep slopes, intermittent streams, and riparian and other sensitive areas. Following prescribed fire or fire suppression activities, firelines should be rehabilitated. Thinning activities involving heavy machinery can result in compaction of soils in localized areas of ingress and egress. The degree of soil compaction depends on the number of passes over a particular area as well as the type of vehicle. Idaho Forest Practices Act guidelines should be used when implementing treatments.

Prescribed fire (low to moderate intensity) should release nutrients into the soil and the fertilization effects of ash would provide an important source of nutrition for vegetation in the area. In addition to increasing nitrification of the soils and increasing minerals and salt amounts in the soil, the ash and charcoal residue resulting from incomplete combustion would aid in soil buildup and soil enrichment by being added as organic matter to the soil profile. The added material works in combination with dead and dying root systems to make the soil more porous, better able to retain water, and less compact while increasing needed sites and surface areas for essential microorganisms, mycorrhiza, and roots (Vogl 1979, Wright and Bailey 1980, Wright and Bailey 1982).

2.10 Hydrology

The Idaho Water Resource Board is charged with the development of the Idaho Comprehensive State Water Plan. Included in the State Water Plan are the statewide water policy plan, and component basin and water body plans which cover specific geographic areas of the state (IDEQ 2003). The Idaho Department of Water Resources has prepared General Lithologies of the Major Ground Water Flow Systems in Idaho. The majority of Gem County is in the “Payette” watershed analysis area.

The state may assign or designate beneficial uses for particular Idaho water bodies to support. These beneficial uses are identified in sections 3.35 and 100.01 - .05 of the Idaho water quality standards (WQS). These uses include:

- **Aquatic Life Support:** cold water biota, seasonal cold water biota, warm water biota, and salmonid spawning;

- **Contact Recreation:** primary (swimming) and secondary (boating);
- **Water Supply:** domestic, agricultural, and industrial; and
- **Wildlife Habitat and Aesthetics.**

While there may be competing beneficial uses in streams, federal law requires DEQ to protect the most sensitive of these beneficial uses (IDEQ 2003).

The geology and soils of this region lead to rapid to moderate moisture infiltration. Slopes are moderate to steep, however, headwater characteristics of the watersheds in the north end of the county lead to a high degree of infiltration as opposed to a propensity for overland flow. Thus sediment delivery efficiency of first and third order streams is fairly low. The bedrock is typically well fractured and moderately soft. This fracturing allows excessive soil moisture to rapidly infiltrate into the rock and thus surface runoff is rare. Natural mass stability hazards associated with slides are low. Natural sediment yields are low for these watersheds. However, disrupted vegetation patterns from logging (soil compaction) and wildland fire (especially hot fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches.

Timberlands in the northern regions of Gem County have been extensively harvested for the past four decades, therefore altering riparian function by moving streamside shade and changing historic sediment deposition. Riparian function and channel characteristics have been altered by ranch and residential areas as well. The current conditions of wetlands and floodplains are variable. Some wetlands and floodplains have been impacted by past management activities.

2.10.1 Fire Mitigation Practices to Maintain Hydrologic Processes

The effects of wildland fire and prescribed burning on water quality are variable. The removal of the vegetative canopy will tend to reduce transpiration and increase water yield, especially during the growing season and immediately afterwards (MacDonald *et al.* 1991). Prescribed burning is used to maintain a healthy, dynamic ecosystem while meeting land management objectives. Prescribed burning objectives include reduction of natural fuels, assuring current and future habitat conditions for native plants and animals, improvement of forest health, and enhancement, protection, and maintenance of old growth and riparian areas. The majority of the burned areas are expected to receive a low intensity ground fire with some areas of moderate intensity. This may include occasional torching of single trees or larger clumps or trees and consumption of some patches of regeneration. Impacts to soil and large woody debris are expected to be minimal, given project targets. In rangeland ecosystems, prescribed fire will have variable impacts dependant on burn intensity and proximity to streams. Stream buffering (low intensity to no burn around streams) has been shown to preserve most if not all normal sediment filtering functions.

A large, stand-replacing fire could have negative effects on watershed conditions, thus affecting both fish and habitat in streams. Treatment with low to moderate intensity fire would result in a mosaic pattern of burned and unburned areas of ground level vegetation. Some patches of shade-tolerant, fire intolerant species may also be consumed. Each treatment may leave a mosaic of burned and unburned areas.

The effects on sediment yield vary according to the intensity of fire; degree of soil disturbance; steepness of the slope and drainage network; the size of the area burned; and the extent to which the vegetation controls the movement and storage of sediment. Fire also increases surface erosion and sediment delivery rates by removing the litter layer and organic debris that traps sediment both on slopes and in the stream channel (MacDonald *et al.* 1991). The magnitude of these effects will depend on the geomorphic sensitivity of the landscape, which is largely a function of slope steepness and parent material (Swanson 1978).

Fire may greatly increase surface erosion by temporarily creating a hydrophobic soil layer. Some soils within the area are generally at moderate risk for hydrophobic conditions due to their fine-grained textures and clay content. In addition, the relatively low burn intensity of the prescribed fires will also help prevent the formation of hydrophobic soils.

The effects of wildland fire or prescribed fire are generally considered in terms of potential short-term, negative effects and long-term benefits of fuels reduction, which will result in a decreased risk of high intensity, stand-replacing fire. Potential short-term effects to streams and fish include increased risk of landslides, mass movement and debris torrents, increases in surface sediment erosion, possible reduction in streamside vegetation resulting in changes within management areas, and possible increases in water yield depending on the amount and severity of the vegetation burned. Long-term effects include increases in nutrient delivery, possible increases in woody debris in streams, and possible increases in stream temperature if shading is significantly reduced.

Riparian buffer strips should be maintained, thereby preserving canopy cover for shading, sediment filtering, and streambank and floodplain stability. Areas not burned will provide significant protection from adverse water quality impacts associated with wildland fire and prescribed burning. Therefore, effects to fish and habitat in these streams from increased water yield and sediment yield are unlikely. Forest practices in the area will be conducted to meet the standards of the Idaho Forest Practices Act. These rules are designed to use best management practices that are adapted to and take account of the specific factors influencing water quality, water quality objectives, on-site conditions, and other factors applicable to the site where a forest practice occurs.

2.11 Air Quality

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (USDA Forest Service 2000).

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in the West Central Highlands of Idaho are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. In Gem County, winds are generally from a southwesterly direction throughout the year. Air quality in the area and surrounding airshed is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect Emmett and Letha more than other communities in Gem County.

Gem County is in the North Idaho Airshed Units 14 & 15: Montana/Idaho Airshed Group Operating Guide (Levinson 2002). An airshed is a geographical area which is characterized by

similar topography and weather patterns (or in which atmospheric characteristics are similar, e.g., mixing height and transport winds). The USDA Forest Service, Bureau of Land Management, and the Idaho Department of Lands are all members of the Montana/Idaho State Airshed Group, which is responsible for coordinating burning activities to minimize or prevent impacts from smoke emissions. Prescribed burning must be coordinated through the Missoula Monitoring Unit, which coordinates burn information, provides smoke forecasting, and establishes air quality restrictions for the Montana/Idaho Airshed Group. The Monitoring Unit issues daily decisions which may restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Burning restrictions are issued for airsheds, impact zones, and specific projects. The monitoring unit is active March through November. Each Airshed Group member is also responsible for smoke management all year.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The act established a process for designation of Class I and Class II areas for air quality management. Class I areas receive the highest level of protection and numerical thresholds for pollutants are most restrictive for this Class.

Some of the Class I airsheds in the immediate area include:

- **Hell's Canyon Wilderness Area:** A sensitive Class I airshed is the Hell's Canyon Wilderness Area (86,116 acres), which is managed for high scenic and recreation values.
- **Selway-Bitterroot Wilderness:** Another Class I Airshed nearby is the Selway-Bitterroot Wilderness (1.1 million acres). The Selway-Bitterroot Wilderness is directly in the path of the prevailing winds crossing over Gem County.

All of the communities within Gem County could be affected by smoke or regional haze from burning activities in the region. Idaho Department of Environmental Quality maintains Air Pollution Monitoring Sites throughout Idaho. The Air Pollution Monitoring program monitors all of the six criteria pollutants. Measurements are taken to assess areas where there may be a problem, and to monitor areas that already have problems. The goal of this program is to control areas where problems exist and to try to keep other areas from becoming problem air pollution areas (Louks 2001).

The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, OAQPS (Organization for Air Quality Protection Standards) is responsible for setting standards, also known as national ambient air quality standards (NAAQS), for pollutants which are considered harmful to people and the environment. OAQPS is also responsible for ensuring these air quality standards are met, or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources (Louks 2001).

Air quality measurement stations juxtaposed near Gem County include McCall, Sawtooth Wilderness Station, Garden Valley, and Salmon.

2.11.1 Fire Mitigation Practices to Maintain Air Quality

Vehicle use associated with thinning operations can increase fugitive dust levels on the access roads. To mitigate for any potential increase in dust a variety of recommendations may be implemented including limiting vehicle speed on dirt and gravel roads, watering travel surfaces, or other methods deemed adequate and appropriate on a case-by-case basis.

Smoke consists of dispersed airborne solids and liquid particles, called particulates, which can remain suspended in the atmosphere for a few days to several months. Particulates can reduce

visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from multiple burn days and/or multiple owners burning within an airshed over too short a period of time to allow for dispersion.

For prescribed fires, there are three principle strategies to manage smoke and reduce air quality effects. They include:

1. **Avoidance** - This strategy relies on monitoring meteorological conditions when scheduling prescribed fires to prevent smoke from drifting into sensitive receptors, or suspending burning until favorable weather (wind) conditions exist. Sensitive receptors can be human-related (e.g. campgrounds, schools, churches, and retirement homes) or wildlife-related (threatened and endangered species and their critical habitats);
2. **Dilution** – This strategy ensures proper smoke dispersion in smoke sensitive areas by controlling the rate of smoke emissions or scheduling prescribed fires when weather systems are unstable, not under conditions when a stable high-pressure area is forming with an associated subsidence inversion. An inversion would trap smoke near the ground; and
3. **Emission Reduction** – This strategy utilizes techniques to minimize the smoke output per unit area treated. Smoke emission is affected by the number of acres burned at one time, pre-burn fuel loadings, fuel consumption, and the emission factor. Reducing the number of acres burned at one time would reduce the amount of emissions generated by that burn. Reducing the fuel beforehand reduces the amount of fuel available. Prescribed burning when fuel moistures are high can reduce fuel consumption. Emission factors can be reduced by pile burning or by using certain firing techniques such as mass ignition.

If weather conditions changed unexpectedly during a prescribed burn, and there was a potential for violating air quality standards or for adverse smoke impacts on sensitive receptors (schools, churches, hospitals, retirement homes, campgrounds, wilderness areas, and species of threatened or endangered wildlife), the management organization may implement a contingency plan, including the option for immediate suppression. Considering 1) the proposed action would result in prescribed fire on a relatively small number of acres, 2) burning as part of this mitigation plan's implementation in the County will most likely occur over a 5-year or 10-year period at a minimum, and 3) the County will adhere to Montana/Idaho Airshed Group advisories and management strategies to minimize smoke emissions, prescribed fire activities would not violate national or state emission standards and would cause very minor and temporary air quality impacts. The greatest threat to air quality would be smoke impacts on sensitive receptors, however, the scarcity of sensitive receptors within the County minimizes this potential air quality impact.

In studies conducted through the Interior Columbia Basin Management Project, smoke emissions were simulated across the Basin to assess relative differences among historical, current, and future management scenarios. In assessing the whole Upper Columbia Basin, there was a 43 percent reduction in smoke emissions between the historical and current periods (Quigley and Arbelbide 1997). The projected smoke emissions varied substantially with the vastly different management scenarios. The consumptive demand and passive management scenarios were projected to substantially increase smoke emissions above current levels. The active management scenarios were projected to result in a decrease of current levels.

Although prescribed fire smoke would occur more frequently than wildland fire smoke, since prescribed fires are scheduled during the year, the effects of wildland fire smoke on visibility are

more acute. Prescribed fires produce less smoke than wildland fires for comparatively shorter periods, because they are conducted under weather conditions that provide for better smoke dispersion. In a study conducted by Holsapple and Snell (1996), wildland fire and prescribed fire scenarios for the Columbia Basin were modeled. In conclusion, the prescribed fire scenarios did not exceed the EPA particulate matter (PM 10) standard in a 24-hour period. Similar projections were observed for a PM 2.5 threshold. Conversely, all wildland fire scenarios exceeded air quality standards. Similar responses were reported by Huff *et al.* (1995) and Ottmar *et al.* (1996) when they compared the effects of wildland fire to prescribed fire on air quality. The impacts of wildland fire and management ignited prescribed fire on air quality vary because of the differences in distribution of acres burned, the amount of fuel consumed per acre (due to fuel moisture differences), and the weather conditions in which typical spring and fall prescribed burns occur. This analysis reveals wildland fire impacts on air quality may be significantly greater in magnitude than emissions from prescribed burns. This may be attributable, in part, to the fact that several states within the project area have smoke management plans requiring favorable weather conditions for smoke dispersion prior to igniting wildland fires (Quigley and Arbelbide 1997).

Chapter 3: Summaries of Risk and Preparedness

3 Overview

3.1 *Wildland Fire Characteristics*

An informed discussion of fire mitigation is not complete until basic concepts that govern fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn; the manner in which fuels ignite, how flames develop and how fire spreads across the landscape. The three major physical components that determine fire behavior are the fuels supporting the fire, the topography in which the fire is burning, and the weather and atmospheric conditions during a fire event. At the landscape level, both topography and weather are beyond our control. We are powerless to control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment, the fuels which support the fire. By altering fuel loading and fuel continuity across the landscape, we have the best opportunity to determine how fires burn.

A brief description of each of the fire environment elements follows in order to illustrate their effect on fire behavior.

3.1.1 Weather

Weather conditions contribute significantly to determining fire behavior. Wind, moisture, temperature, and relative humidity ultimately determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions are capable of sustaining a fire, atmospheric stability and wind speed and direction can have a significant affect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

3.1.2 Topography

Fires burning in similar fuel conditions burn dramatically different under different topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influence vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later curing of fuels, and lower rates of spread. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. These slopes also tend to be on the windward side of mountains. Thus these slopes tend to be “available to burn” a greater portion of the year.

Slope also plays a significant roll in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

3.1.3 Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and home sites (the structures) are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content and continuity and arrangement all have an affect on fire behavior. Generally speaking, the smaller and finer the fuels, the faster the potential rate of fire spread. Small fuels such as grass, needle litter and other fuels less than a quarter inch in diameter are most responsible for fire spread. In fact, “fine” fuels, with high surface to volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grass fires burn. As fuel size increases, the rate of spread tends to decrease, as surface to volume ratio decreases. Fires in large fuels generally burn at a slower rate, but release much more energy, and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potentially development of crown fire. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. It is the unique combination of these factors, along with the topography and weather, which determine how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected affect small changes in any single component has on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given set of conditions. However, through countless observations and repeated research, the some of the principles that govern fire behavior have been identified and are recognized.

3.2 Gem County Conditions

Gem County is characterized by a persistently warm and arid environment, that limits non-cultivated vegetative communities to grass and brush rangelands. Xeric vegetation and hot, dry and windy conditions has resulted in a rich fire history, with relatively frequent fires. The last decade has seen the proliferation of Cheatgrass, an exotic grass species that is able to out-compete native bunchgrasses. Cheatgrass responds well to soil disturbance and is found in abundance along roadsides, driveways, new construction areas, and in recently burned areas. Over time, vegetative species composition in unmanaged or non-irrigated land has shifted toward fire prone species, particularly in high use areas where disturbance is common.

Irrigation within the Payette River valley bottom creates a patchwork of green, lush vegetation and cured rangeland. This patchwork helps to break the continuity of fuels that are available to burn. However, dry fuels become continuous above the irrigated zone, providing a consistent fuel bed for fire spread.

Gem County has been experiencing some growth, particularly in and around Emmett. At the same time, the number and value of resources at risk is on the increase, as more and more homes are built in the midst of cured, fire-ready fuels. Human use is strongly correlated with fire frequency, with increasing numbers of fires as use increases. The combination frequent ignitions and flammable vegetation has greatly increased the probability that incendiary devices will find a receptive fuel bed, resulting in increased fire frequency. Discarded cigarettes, tire fires, and hot catalytic converters have increased the number of fires experienced along roadways. Careless and unsupervised use of fireworks also contributes their fair share to

unwanted and unexpected wildland fires. Further contributing to ignition sources are the debris burners and “sport burners” who use fire to rid ditches of weeds and other burnable materials.

Fire departments within Gem County have reported a general increase in the number of fires within the county. This is particularly true in the Emmett area, where population has been consistently on the rise. Although there have been few homes lost to wildland fires in the recent past, the potential is growing. Fire departments feel as though pure luck has been on the side of many homeowners, as more and more fires seem to be controlled at the doorstep of residents’ homes. It is quite probable that homes will eventually be lost to wildland fire. However, there are a number of actions that can be taken now that can decrease the probability that these events will occur.

3.2.1 County Wide Potential Mitigation Activities

There are four basic opportunities for reducing the loss of homes and lives to fires. There are many single actions that can be taken, but in general they can be lumped into one of the following categories:

- Prevention
- Education/ Mitigation
- Readiness
- Building Codes

3.2.1.1 Prevention

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective. Prevention campaigns can take many forms. Traditional “Smokey Bear” type campaigns that spread the message passively through signage can be quite effective. Signs that remind folks of the dangers of careless use of fireworks, burning when windy, and leaving unattended campfires can be quite effective. It’s impossible to say just how effective such efforts actually are, however the low costs associated with posting of a few signs is inconsequential compared to the potential cost of fighting a fire.

Slightly more active prevention techniques may involve mass media, such as radio or the local newspaper. Fire districts in other counties have contributed the reduction in human-caused ignitions by running a weekly “run blotter,” similar to a police blotter, each week in the paper. The blotter briefly describes the runs of the week and is followed by a weekly “tip of the week” to reduce the threat from wildland and structure fires. The federal government has been a champion of prevention, and could provide ideas for such tips. When fire conditions become high, brief public service messages could warn of the hazards of misuse of fire or any other incendiary device. Such a campaign would require coordination and cooperation with local media outlets. However, the effort is likely to be worth the efforts, costs and risks associated with fighting unwanted fires.

Fire Reporting: Fires cannot be suppressed until they are detected and reported. As the number and popularity of cellular phones has increased, expansion of the #FIRE program throughout Idaho may provide an effective means for turning the passing motorist into a detection resource.

Burn Permits: The issues associated with debris burning during certain times of the year are difficult to negotiate and enforce. However, there are significant risks associated with the use of fire adjacent to expanses of flammable vegetation under certain scenarios. Fire departments

typically observe the State of Idaho Closed fire season between May 10 to October 20. During this time, an individual seeking to conduct an open burn of any type shall obtain a permit to prescribe the conditions under which the burn can be conducted and the resources that need to be on hand to suppress the fire, from a State of Idaho fire warden. Although this is a state-wide regulation, compliance and enforcement has been variable between fire districts. Tackling this issue is difficult. Typically, the duty falls to the chief of whichever fire protection district the burning is planned for. However, this leads to an increased burden on the fire chiefs, who are already juggling other department obligations with obligations to work and to home. There is also considerable confusion on the part of the public as to when a permit is necessary and the procedure for which to obtain the permit. The best-intentioned citizen may unknowingly break this law for a lack of understanding. Clearly, there is a need to coordinate this process and educate the public as when a permit is needed and the necessary channels to obtain a permit.

The State of Idaho can designate a State Deputy Fire Warden to issue burning permits in local jurisdictions. This would require coordination with law enforcement and cooperators to insure consistency and notification of burning activities.

3.2.1.2 Education

Once a fire has started and is moving toward home or other values resource, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home as to whether the home will survive the passing fire front. Also of vital importance is the accessibility of the home to emergency apparatus. If the home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event.

The majority of the uncultivated vegetation in Gem County is comprised of grass and brush rangeland. Although these fuels are very flammable and can support very fast moving fires, fires in these fuel types tend to be of relatively low intensity. In many cases, homes can easily be protected by following a few simple guidelines that reduce the ignitability of the home. There are multiple programs such as FIREWISE that detail precautions that should be taken in order to reduce the threat to homes, such as clearing cured grass and weeds away from structures and establishing a green zone around the home.

However, knowledge is no good unless acted upon. Education needs to be followed up by action. Any education programs should include an implementation plan. Ideally, funds would be made available to financially assist the landowner making the necessary changes to the home. The survey of the public conducted during the preparation of this WUI Fire Mitigation Plan indicated that approximately 43% of the respondents are interested in participating in this type of an activity.

3.2.1.3 Readiness

Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of a wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

In order to assure a quick and efficient response to an event, emergency responders need to know specifically where emergency services are needed. Continued improvement and updating of the rural addressing system is necessary to maximize the effectiveness of a response.

3.2.1.4 Building Codes

The most effective, all be it contentious, solution to some fire problems is the adoption of building codes in order to assure emergency vehicle access and home construction that does not “invite” a fast and intense house fire. Codes that establish minimum road construction standards and access standards for emergency vehicles are an effective means of assuring public and firefighter safety, as well as increasing the potential for home survivability. County building inspectors should look to the fire departments in order to assure adequate minimum standards. Fire districts may want to consider apparatus that may be available during mutual aid events in order that the adopted standards meet the access requirements of the majority of suppression resources. In Gem County, such standards may be drafted in consultation with the Snake River Valley Fire Chiefs Association in order to assure accessibility is possible for all responding resources.

3.3 *Gem County’s Wildland-Urban Interface*

Individual community assessments have been completed for all of the populated places in the county. The following summaries include these descriptions and observations. Local place names identified during this plan’s development include:

- Letha¹
- Emmett¹
- Ola¹
- Sweet¹
- Gross² (Squaw Creek)
- Montour²
- Pearl¹

¹Those communities with a “1” following the name are included in the Federal Register, Vol. 66, Number 160, Friday, August 17, 2001, as “Urban Wildland Interface Communities within the vicinity of Federal Lands that are at high risk from wildfires”. All of these communities have been evaluated as part of this plan’s assessment.

²Communities with a “2” following the name were also evaluated for this plan in subsequent sections.

Site evaluations on these communities are included in subsequent sections. Maps of Gem county, indicating the location of each community are presented in Appendix I.

3.3.1 Letha

3.3.1.1 Fuels Assessment

Although there is a defined community center, the majority of the homes in this area are scattered across the broad valley bottom of the Payette River along Highway 52. This creates a mosaic of privately owned ranchettes. The Payette River running just north of the city center and the Seven Mile Slough, which is a slow moving canal directly south of town, provide an ample water resource for irrigation. Development is occurring both north and south of the highway in areas with a low-risk rating. Fuel model 1 is most common, but fuel



model 2 occurs along the northern and southern boundaries. These fuel types tend to support lower intensity surface fires. The greater part of the area is heavily utilized for agricultural purposes and pastureland due to well established irrigational access. This significantly reduces the risk of wildfire by controlling the herbaceous vegetation.



Letha is located in the Payette River valley north of Highway 52. It is bordered by a series of rolling hills to the north and a steep, rocky ridge on the southern side of the basin. The Emmett Bench, a small (30 to 50 feet tall) plateau with steep, rocky edges runs along the base of much of the slopes to the north. This sharp, rock face could potentially serve as a fuel break in the event of an escaped field fire. The vegetation is dominated by low growing grasses and various agricultural

crops. There are few structures or agricultural activities beyond the reaches of the valley bottom. The greatest risk for rapid rate of fire spread in Letha is associated with the hot, dry slopes that are common in the area. Small grass fires occur frequently; thus, fire suppression response is rapid and generally efficient.

The primary access into the area is from State Highway 52, a paved two-lane highway that runs both east and west. There is a multitude of additional potential escape routes using roads leading away from the community to the east and west. Most of these roads are located in areas with little risk due to the agricultural land use. Some signing of these roads as alternate escape routes would help visitors in the area.

3.3.1.2 Community Risk Assessment

The Letha community is protected by the Gem County Fire Protection District #1, which has a small station near the city center. In addition, there is a larger equipment storage garage southeast of town. The steeper range on the southern side of the valley is at moderate risk for



wildland fire. Letha is not at subsequent risk due to the agricultural development in the valley. Moreover, the prevailing winds from the southwest would likely drive fires upslope and away from structures. Annual agricultural field burning has the potential to increase risk to the community. Nevertheless, the fire protection available in combination with the vast water resources places this community at a low risk of uncontrolled wildfire.

3.3.1.3 Potential Mitigation Activities

Many of the homes in this area were constructed with building materials and landscaping techniques favorable for protecting them against wildfire. Individual home site evaluations can increase homeowners' awareness and improve the survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides good protection; however, maintaining a lean, clean, green zone within 100 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating the homeowners in techniques for protecting their homes is critical in these hot, dry environments. Approximately 50 homes around Letha would benefit from a home site evaluation and possible treatments.

Letha	
Item	Score
FEMA: Overall wildfire hazard rating score	Low Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	20
Average slope of community and surrounding area:	2%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.3.2 Emmett

3.3.2.1 Fuels Assessment

Many of the homes in this area are scattered across the broad valley bottom of the Payette River forming a mosaic of privately owned ranchettes. The Payette River runs through town just north of the city center and is used heavily for irrigation. Highway 52 comes into town from the west and follows the river out of town to the northeast. Development is occurring in all directions from the highway, most in areas with a low-risk rating for wildfire. Fuel model 1 is most common in the valley, but fuel model 2 is prevalent on the slopes along the northern, southern and western boundaries. These fuel types tend to support lower intensity surface fires. The greater part of the area is heavily utilized for agricultural purposes and pastureland due to well established irrigational access. This significantly reduces the risk of wildfire by controlling the herbaceous vegetation.





Emmett is bordered to the north by a fairly steep, dry southwest facing slope. The vegetation consist primarily of low growing grasses with interspersed sagebrush and rock outcroppings. The western and southern boundaries are defined by a steep, rocky ridge that extends westward. This part of the range has little viable vegetation, except some areas of sparse grass and scattered clumps of sagebrush. There are very few homeowners on these slopes, most preferring to remain in the valley bottom where irrigation canals are well established. The

vegetation within the valley is dominated by irrigated pastureland and various agricultural fields. Black locust and Russian olive are also common along the waterways and around homes. The greatest risk for rapid rate of fire spread in Emmett is associated with the hot, dry slopes that are common in the adjacent areas. Small grass fires occur frequently, especially on the north facing aspects; thus, fire suppression response is rapid and generally efficient.

The primary access into the area is from State Highway 52, a paved two-lane highway that runs both east and west. Highway 16 also enters the community from the south. There are multiple potential escape routes using roads leading away from the communities to the east and west. Most of these roads are located in areas with little risk due to the agricultural land use. Some signing of these roads as alternate escape routes would help visitors in the area.



3.3.2.2 Community Risk Assessment



The community of Emmett is protected by Gem County Fire Protection District #1 (city and rural) located within the city center. The steeper range on the southern and western borders of the valley is at moderate risk for wildland fire. Emmett is not at a high subsequent risk due to agricultural development in the valley. Moreover, the prevailing winds from the southwest would likely drive fires upslope and away from structures. Annual agricultural field burning marginally increases the risk associated with the community. Nevertheless, the fire protection available in combination with the vast water resources places

this community at a low risk of uncontrolled wildfire.

The Black Canyon Dam and Recreational Area, operated by the Bureau of Reclamation, is located approximately 6 miles northeast of Emmett on the Payette River. There is an electricity plant at the dam site, which is used to provide power for commercial and irrigation purposes to many residences of the Payette River valley and parts of Boise. The recreational areas are located between Highway 52 and the northern shore of the reservoir. Boaters, campers, and fishermen are very active in this area. Although the parks are kept clean and green, the much

steeper south-facing slope rising from the highway is covered with low growing grasses and sagebrush (fuel model 2), which due to the heavy use, has an increased likelihood of fire ignition. In the event of wildland fire in this area, the Black Canyon Highway (State Highway 52) would be the only escape route for recreational users.



3.3.2.3 Potential Mitigation Activities

Many of the homes in this area were constructed with building materials and landscaping techniques favorable for protecting them against wildfire. Individual home site evaluations can increase homeowners' awareness and improve the survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides good protection; however, maintaining a lean, clean, green zone within 100 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating homeowners in techniques for protecting their homes is critical in these hot, dry environments. Approximately 150 homes along the perimeter of the community, located adjacent to and within the wildland fuels of the rangelands require fuels modification to reduce wildland fire risk factors. Protecting these homes would lead to increasing the defensibility of the entire community.

Additionally, park officials within the Black Canyon Recreational Area should keep campfire rings and barbecues well maintained and fire-use regulations clearly posted and strictly enforced. This will not only protect visitors, but will also minimize the likelihood of wildfire spreading to the community.

Emmett	
Item	Score
FEMA: Overall wildfire hazard rating score	Low Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	28
Average slope of community and surrounding area:	15%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.3.3 Montour & Sweet

3.3.3.1 Fuels Assessment

The small town of Sweet is approximately 3.5 miles north of Montour. Although Montour has a sign marking the community center, all of the buildings endemic to a community, such as a post office, are located in Sweet. Most of the residents in this area own ranches or farms that extend from the city limits across the Payette River valley and Sweet Valley to the base of the mountains on all sides. The Payette River flows directly between the two towns providing an ample irrigation resource for both. Squaw Creek, running



west of Sweet, also supplies water for irrigation. The greater part of the area is heavily utilized for agricultural purposes and pastureland due to the water resources. This significantly reduces the risk of wildfire by controlling the herbaceous vegetation.

Sweet is located in Sweet Valley north of the Payette River along the Ola Highway. It is bordered by steep ridges to the east and west. The eastern range is dominated by low-growing grasses and intermittent patches of sagebrush and rock outcroppings. A few ponderosa pine trees can be seen growing in the shallow draws. The western range rises sharply from the other side of the valley and is primarily vegetated by sparse grasses and sagebrush. Fuel model 2 is most common on the slopes while fuel model 1 covers the valley floor, which is mostly grazed pastureland and various agricultural crops.



Montour is identified by a sign announcing an elevation of 2517 feet. The Bureau of Reclamation has established a small RV and tent camping facility in this area. The Payette River and State Highway 52 are north of town both extending to the east and west. Although most of the valley bottom is broken up into private ranches and farms, a small, marshy area west of town has been set aside as a protected nesting area for ducks and other waterfowl. Montour is bordered to the south by a fairly gradual slope

and to the west by a much steeper canyon rising from the Payette River. Fuel model 2 is most prevalent with sagebrush and sparse grasses as the dominant vegetation.

Although slopes within 3 miles of the two communities are identified higher risk to wildfire, there are few structures or agricultural activities beyond the reaches of the valley bottom. The greatest risk for rapid rate of fire spread in Montour and Sweet is associated with the hot, dry slopes that are common in the area.

The primary access into the area is from State Highway 52, a paved two-lane highway that runs both east and west; however both communities are located on secondary roads. Nevertheless, there are multiple potential escape routes using roads leading away from the communities to the north, east, and west. Most of these roads are located in areas with little risk due to the agricultural land use. Some signing of these roads as alternate escape routes would help visitors in the area.



3.3.3.2 Community Risk Assessment

The Montour-Sweet area is protected by Gem County Fire Protection District #2, which has a station in Sweet. The area protected by this fire district is fairly large, which may lead to unavailability of resources in the event of multiple ignitions. However, Montour and Sweet are the closest communities to the fire fighting resources. The steeper regions of the ranges surrounding the area, particularly the north and east facing aspects, are at moderate to high risk for wildland fire. Additionally, many of the agricultural fields in the valleys are likely to burn annually increasing the risk to the community. However, the prevailing winds from the southwest are likely to travel up the valley and upslope away from structures. The close proximity of a

large water source places these communities at a low to moderate risk of uncontrolled wildland fire. Many of the homes in this area have been built with ‘firesafe’ construction materials and landscaping techniques. Also, members of the community have made an effort to erect clear addressing signs at road intersections.

3.3.3.3 Potential Mitigation Activities

Many of the homes in this area were constructed with building materials and landscaping techniques favorable for protecting them against wildfire. Individual home site evaluations can increase homeowners’ awareness leading to the potential survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides good protection; however, maintaining a lean, clean, green zone within 100 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating homeowners in techniques for protecting their homes is critical in these hot, dry environments.



Home site treatments in this area are important, especially for those homes and ranches in the intermix and interface conditions. There are approximately 75 structures that would benefit from the creation of a 100 foot wide defensibility zone in these two communities. In addition, a number of the homes in this area would benefit from improved access and the creation of multiple access routes for homeowners to use in the case of an emergency. This area has experienced the losses of a large wildfire in the recent past (twice during the last century). Improved protection and preparation is warranted.

Montour	
Item	Score
FEMA: Overall wildfire hazard rating score	Moderate Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	45
Average slope of community and surrounding area:	51%
Land cover type:	Rangeland
Sweet	
Item	Score
FEMA: Overall wildfire hazard rating score	Moderate Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	53
Average slope of community and surrounding area:	64%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.3.4 Ola

3.3.4.1 Fuels Assessment

Although there is a defined community center, the majority of the homes in the Ola area are scattered across the Valley floor. Most of the residents in this area own ranches or farms that extend from the city limits across the valley to the base of the mountains. Squaw Creek flows west of town, but provides only a limited amount of water for irrigation. The greater part of the area is utilized for pastureland and agricultural purposes.

This significantly reduces the risk of wildfire by controlling the herbaceous vegetation. Due to the decreased use of irrigation, some areas have been left undeveloped leaving thick patches of cured grass.



Ola is located in the Ola Valley north of Sweet along the Ola Highway. The valley, which becomes much narrower to the north, is bordered by steep ridges to the east and west. The eastern boundary rises gradually at the base, but becomes much steeper. The lower and midslopes are dominated by short grasses, sagebrush, and small rock outcroppings. Ponderosa



pine and Douglas-fir become more frequent near the ridge top and in the draws. The range on the western side of the small valley rises more sharply and is vegetated by cured, low-growing grasses and sagebrush. The Ola Valley floor and lower slopes are primarily fuel model 1, while fuel model 2 is more prevalent on the upper slopes. These fuel types tend to support lower intensity fires. There are few structures or agricultural activities beyond the reaches of the valley bottom; thus, the greatest risk for rapid rate of fire spread in Ola is associated with the hot, dry

slopes.

The primary access into the area is from the Ola Highway, a paved two-lane road that runs north and south through the canyon. There are several additional escape routes, all of which travel over the eastern range to Smith's Ferry. Most of these roads are located in areas with high risk due to fire prone aspects, steep gradients, and vegetative cover. Some signing of these roads as alternate escape routes would help visitors in the area.

3.3.4.2 Community Risk Assessment

All of the structures in the Ola community are protected by Gem County Fire Protection District #2 with a station in Ola. Both ranges bordering the valley, particularly the northern and eastern slopes, are at moderate to high risk for wildland fire. Even though many of the structures are surrounded by agricultural fields, due to the narrow width and the patches of cured grass within the valley, the Ola community is at moderate to high risk of uncontrolled wildland fire.

3.3.4.3 Potential Mitigation Activities

Many of the homes in this area were constructed with building materials and landscaping techniques favorable for protecting them against wildfire. Individual home site evaluations can increase homeowners' awareness potentially leading to improved survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides good protection; however, maintaining a lean, clean, green zone within 100 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating the homeowners in techniques for protecting their homes is critical in these hot, dry environments.



Fuel treatments in this area should focus on the treatments around a few, easily identified homes and along critical access routes. In total, it is estimated that 25 homes and ranch buildings are in need of treatment (125 foot fuel treatment around structures). In addition, approximately 5 miles of roadway should be treated (intermittently) in order to increase defensibility in the case of a wildfire and improve the ability to serve simultaneously as an escape route and primary fire fighting access.

Ola	
Item	Score
FEMA: Overall wildfire hazard rating score	Moderate Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	50
Average slope of community and surrounding area:	57%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.3.5 Gross (Squaw Creek)

3.3.5.1 Fuels Assessment

The area where the community of Gross historically existed is currently inhabited by only a handful of residents. There are no signs or buildings marking it as an identifiable community. This cluster of structures is located near the intersection of Forest Route 618 and Forest Route 653 in a narrow draw along the Second Fork of Squaw Creek. Homes in this area are primarily small ranches raising horses, cows, and some sheep and goats. The grazing of these animals in the immediate vicinity of the structures significantly reduces the risk of wildfire by controlling the herbaceous vegetation.



The town site is in a canyon formed by the Second Fork of Squaw Creek with the primary slopes rising steeply to the north and south. As this tributary drains into the main Squaw Creek drainage west of town, the canyon turns and begins flowing southward. Both drainages are vegetated by light grasses with interspersed patches of sagebrush and small rock outcrops. Ponderosa pine and some Douglas-fir are growing on the upper portions of the more eastern slopes and in the draws. The creek bottoms contain black locust, some willow, and various other shrubs. Fuel models 1 and 2 are most common, which tend to support low intensity fires. Although much of the upper slopes within the 3-mile zone surrounding the community are identified as being higher risk, most of the structures are concentrated near the creek. The greatest risk for rapid rate of fire spread in Gross is associated with the hot, dry adjacent slopes.

The primary access into the area is from Secondary Forest Route 618 from the north and south. There are three other secondary forest route roads leading out of the area to the east and west that could potentially serve as alternate escape routes. Most of these roads are located in areas with high risk due to the topography and vegetation. Some signing of these roads as alternate escape routes would reduce confusion.

3.3.5.2 Community Risk Assessment

The Gross area is protected by Gem County Fire Protection District #2 with the closest station in Ola. Due to the remoteness of the homes in relation to the fire stations in Ola and Sweet, suppression response may be delayed. The area protected by this fire district is very large, which may lead to unavailability of resources in the event of multiple ignitions (as is the case in many areas in Gem County and other Counties). The steeper, upper regions of the ranges surrounding the area, particularly the east facing aspects, are at moderate to high risk for wildland fire. The narrow width of the canyon also presents the possibility of wildfire either spotting or producing enough convective heat to ignite fuels on the opposite side of the canyon. Prevailing winds traveling up the canyon also increases the risk to the residents in the area.

3.3.5.3 Potential Mitigation Activities

Individual home site evaluations can increase homeowners' awareness and potentially improve the application of practices leading to the survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides some protection; however, maintaining a lean, clean, green zone within 150 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the outlying areas can address the issue of escape routes and home defensibility characteristics. Educating homeowners in techniques for protecting their homes is critical in these hot, dry environments.

Approximately 20 structures in this community and surrounding areas would benefit from the creation of home defensibility extending 150 feet beyond the actual structure. These would be minor treatments in comparison with some of the proposed treatments in the West Central Highlands region. Current livestock grazing activities should be maintained into the future as these animals serve to significantly reduce the fuels buildup in the region.

Access improvements in this area are recommended. Roads, bridges, and cattle guard improvements will facilitate both wildfire response and the possible escape of residents and visitors alike in the event of a wildfire. Bridge inspections for axle weight maximums and width should be conducted on surfaces that will be needed during fire fighting activities. Cattle guards in the region seemed to be accessible with most accompanied by a pass-around gate. Also in terms of access, this area would benefit from improved signage that indicates the road's name, number, and possibly an indication of "evacuation routes" to access the valley bottom.

Surrounding forest areas near Gross are managed by a combination of private and industrial forestland owners and the US Forest Service and Bureau of Land Management. Forest management to control insect and disease problems should be continued. In addition, the road networks in the region have been developed and are available for use during fire fighting efforts. Maintaining these forests for health and vigor is one of the best methods of maintaining a defensible forest ecosystem against wildfire.

Gross	
Item	Score
FEMA: Overall wildfire hazard rating score	Moderate Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	72
Average slope of community and surrounding area:	79%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.3.6 Pearl

3.3.6.1 Fuels Assessment

Pearl is located to the east of Emmett, nestled amongst sagebrush and grasslands historically grazed by wildlife and livestock. Rolling hills indicative of the foothills rise and fall along the Schiller Creek and Sand Hollow Creek drainages. The community has developed in this area as new homes are built and larger parcels are subdivided into home lots.

There are no signs or buildings marking it as an identifiable community. Structures are scattered across five square miles. Homes in this area are primarily upscale homes, some with paved driveways. Grazing of animals in the immediate vicinity of the structures is variable, some with livestock and some without.



Both mentioned drainages and the Willow Creek drainages are vegetated by light grasses with thick patches of sagebrush and small rock outcrops. The drainage bottoms contain black locust, some willow, and various other shrubs. Fuel models 1 and 2 are most common, which tend to support low intensity fires. Although much of the upper slopes within 3-miles surrounding the home sites are identified as being higher risk, most of the structures are concentrated near the creek. Unlike most of the communities of Gem County, Pearl's homes are scattered in, and surrounded by, high-risk fuels. Although these fuels tend to be flashy and fast burning, with a lower intensity than forest type fires, the homes in this area are at risk to wildfires. Many of the homes in this area have sagebrush and grasses growing continuously from ridgetops to the edge of homes.

There are a number of access points to homes in this community. Jackass Gulch Road and Sand Hollow Road provide primary access into this area from Highway 16 (Eagle to Emmett). There are numerous other secondary roads leading out of the area to the east and north that could potentially serve as alternate escape routes. Most of these roads are located in areas with high risk due to the topography and vegetation. In addition, many of the roads are single track

dirt and gravel roads (e.g., Pearl Road, Sand Hollow Road). Some signing of these roads as alternate escape routes would reduce potential confusion.

3.3.6.2 Community Risk Assessment

The Pearl area is not protected by any of the Rural Fire Districts. This area is located adjacent to Gem County Fire Protection District #1. There has been some level of discussion during the evaluation of factors concerning this plan of adding this region to the coverage responsibilities of District #1. However, the authors of this document provide caution of following this path. Gem County Fire Protection District #1 provides protection in agricultural areas and developed subdivisions found in the areas surrounding Emmett and Letha. These areas are paved for the most part, on flatlands, with wildland fuels common to the valley bottom. In contrast, the Pearl area is characterized by sagebrush and grass fuels which are substantially drier and located in the rolling foothills at higher elevations. Homes in this area are scattered and accessed by sometimes steep and narrow rural roads.

The residents of Pearl may concur that they are prepared to form a rural volunteer fire district to protect their homes and property. If and when this occurs, the authors of this plan support that decision. It will be difficult to provide any level of protection for these homes without the formation of a district. A station should be centrally located in the region which hosts wildland trucks and structural vehicles that can navigate the less than customary roads.

The steeper, upper regions of the ranges surrounding Pearl, particularly the east facing aspects, are at moderate to high risk for wildland fire. Prevailing winds traveling across this area also increases the risk to the residents in the area.

3.3.6.3 Potential Mitigation Activities

Individual home site evaluations can increase homeowners' awareness and potentially improve the application of practices leading to the survivability of structures in the event of a wildfire. Current management of the vegetation surrounding homes provides some protection; however, maintaining a lean, clean, green zone within 150 feet of structures to reduce the potential loss of life and property is recommended. Assessing individual homes in the Pearl area can address the issue of escape routes and home defensibility characteristics. Educating homeowners in techniques for protecting their homes is critical in these hot, dry environments.



Approximately 25 structures in this community and surrounding areas would benefit from the creation of home defensibility extending 150 feet beyond the actual structures. These would be minor treatments in comparison with some of the proposed treatments in the West Central Highlands region. Livestock grazing activities should be maintained and increased in the future as these animals serve to significantly reduce the fuels buildup in the region. Livestock re-introduction and even the possibility of prescribed burning in this area should be evaluated in an effort to reduce existing fuels buildup near structures and critical access routes.

Pearl	
Item	Score
FEMA: Overall wildfire hazard rating score	High Hazard
FEMA: Potential fire hazard severity	Moderate Hazard
Fire Prone Landscapes: average score	59
Average slope of community and surrounding area:	60%
Land cover type:	Rangeland

This information is summarized in Appendix II

3.4 Fire Fighting Resources and Capabilities

Key points of the resources and capabilities guide are identified here.

3.4.1 Wildland Fire Districts

3.4.1.1 Bureau of Land Management, Lower Snake River District

- Boise BLM Fire Office, 3948 Development Ave., Boise, 83705; 208-394-3400
- Hammett Guard Station, north of Exit 112 on Interstate 84, 208-366-7722
- Bruneau Guard Station, Hot Creek Road, Bruneau, 208-845-2011
- Wild West Guard Station, Exit 13 off I-84, 208-454-0613

The Lower Snake River District BLM does not have any equipment stationed in Gem County but does provide protection for much of the county. Resources and capabilities of the Lower Snake River District BLM have been included in this document. The BLM has been involved in Gem County through assistance to rural fire districts and national fire prevention programs. The Department of Interior, BLM, provided funding for this Wildland-Urban Interface Wildfire Mitigation Plan.

The Lower Snake River District BLM encompasses approximately 5.5 million acres of BLM-managed land in southwest Idaho. Through agreements with the Idaho Department of Land and the National Forest Service, the BLM also provides initial suppression on IDL and FS lands in some areas within the district boundary. The border of the district extends from the Nevada border near Jackpot and runs north along Salmon Falls Creek; just west of Hagerman and follows the Snake River from just south of Bliss to King Hill; then runs north to a point approximately 7 miles west of Hill City; then follows the foothills west and north across the Boise Front; up Highway 55 and includes some scattered areas into the Crouch area; then jogs in a northwesterly direction to the Oregon border west of New Meadows.

Special features within the district include the 485,000-acre Snake River Birds of Prey National Conservation Area; the Owyhee Canyonlands; portions of the north and south fork Payette River corridors; the Owyhee Mountains, including the historic Silver City area; the Jarbidge and Bruneau river canyons; and several popular recreation areas and wildland-urban interface areas.

The district's primary station is located in Boise, where 3 crews, with 3 engines per crew are based, along with both helicopter and fixed-wing aircraft resources. One of the three Boise crews is stationed during the day at Boise Fire Station #2 at the base of the foothills. Additional day-use stations are available in Kuna, Hidden Springs, Eagle, and at Juniper Butte.

Additionally, the district has out stations at Bruneau, Hammett, and Wild West (at Exit 13 on Interstate 84). Each facility is staffed by one crew, with three engines, on a 24-hour, 7-day per week basis from mid June to mid September. A dozer also is typically based at Hammett.

BLM crews are neither trained nor equipped for structure suppression. Primary protection responsibilities are on public land throughout southwest Idaho and we respond to fires originating on public lands and those on private land that threaten public land. Additionally, through mutual aid agreements with local fire departments, we will provide assistance when requested on wildland fires.

The BLM does not provide formal EMT services. The crews are trained in first-aid, and some staff members have EMT and first-responder training, but this is not a service we provide as part of our organization.

Personnel: The fire program staff totals 135 individuals, including 20 permanent employees, 40 career-seasonal employees who work up to nine months each year, and 75 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

Mutual Aid Agreements: The BLM has an interagency working relationship with the US Forest Service (Boise National Forest and Payette National Forest) and the Idaho Department of Lands and the crews are dispatched on a closest-forces concept to public lands. Additionally, the BLM has mutual aid agreements with approximately 42 community fire departments.

Top Resource Priorities:

- **Training:** Increasing the amount and level of training for and with partner community fire departments .
- **Communications:** Using the Rural Fire Assistance Program to allow departments to purchase radios for partner community departments to facilitate communication, coordination, and safety at the fire scene.

The district encompasses a broad spectrum of resources at risk, including recreation sites, power lines, wildlife habitat, wilderness study areas, wild horse management areas, historic districts, cultural and archaeological sites, and a range of vegetation types, from rare plant species to sagebrush and timber resources.

Table 3.1 summarizes available equipment.

Truck #	Assigned Station	Make/ Model	Capacity (gallons)	Pump capacity (GPM)	Type
7158	Duck Valley	Internat'l	Heavy 800 – 1000	120 GPM	Wildland
7130	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7131	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7132	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7133	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7134	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7135	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7136	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7137	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7138	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7154	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7155	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7143	Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland

Table 3.1. BLM Equipment List for Wildland Fire Protection

Truck #	Assigned Station	Make/ Model	Capacity (gallons)	Pump capacity (GPM)	Type
7144	Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7145	Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7146	Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7147	Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7148	Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7140	Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7141	Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7142	Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7150	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7151	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7156	Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
7161	Boise	Ford	Light 300	120 GPM	Wildland

- The LSRD has 3 dozers, one of which is stationed in Hammett; and two in Boise
- The LSRD also has 3, 3500 gallon water tenders.
- There are 4 Fire Lookouts, one on Squaw Butte, north of Emmett; one on South Mountain, southeast of Jordan Valley; one on Danskin Peak, north of Mountain Home; and one on Bennett Mountain, northeast of Mountain Home.

Additionally, suppression resources include:

- **Helicopter:** The district has an Aerospatiale helicopter on contract from June to October and an 11 member helitack crew. U.S. Forest Service helitack crews stationed at Lucky Peak and Garden Valley are available for assistance if needed and if they are not assigned elsewhere. Additionally, there are other helicopter resources equipped for fire missions that are available on a call-when-needed (CWN) basis.
- **Fixed-Wing:** The district has a contract AeroCommander 500S fixed-wing aircraft, staffed by a pilot and the air attack supervisor. The air attack supervisor coordinates aerial firefighting resources and serves as an observation and communications platform for firefighters on the ground.
- **Air Tankers:** There are typically two air tankers (fire retardant planes) on contract in Boise during the fire season. However, these aircraft are considered national resources and are assigned where they're needed at any particular time. Other, nearby, air tankers are located in McCall and various locations in Nevada and Oregon. There are also contract single-engine air tankers (SEATS) located in Vale, Oregon, and Twin Falls, Idaho.

The primary operational challenges facing the district include:

- Continued development of wildland-urban interface areas across the district.
- Communications and coordination with current, new, and developing community fire departments and working with them to stay abreast of communication and technological developments so that we can continue and improve working together effectively at the fire scene.

- Internally, an operational challenge is to have sufficient and appropriate staff available throughout the year to foster partnerships with local departments and facilitate continued and improved coordination, training, communications, and other joint efforts with our partners across the district.
- Our effectiveness in addressing these challenges will largely hinge on funding available for the fire program and its various elements.

3.4.1.2 Idaho Department of Lands, Southwest Idaho Area

Kurt Houston, Fire Warden
8355 W. State St.
Boise, Idaho 83703
334-3488
khouston@idl.state.id.us

Description of Protection Area: Idaho Department of Lands provides wildland fire protection along the northeast portion of Gem County. Through protection agreements, the IDL assumes protection on Boise National Forest Lands. Suppression resources are dispatched from the High Valley Station east of Ola and at the Centerville Station near Idaho City.

Priority Areas: The greatest resources at risk are the homes scattered along the outskirts of Ola and along Bancroft Road. IDL resources have working closely with the rural districts in providing protection of these homes.

Current Resources

High Valley Station: The station is staffed with five personnel, seven days a week during fire season.

- Type 6 wildland engine- 250 gallon capacity.
- Type 4 wildland engine- 750 gallon capacity.

Centerville Station: The station is staffed as the High Valley Station.

- Type 6 wildland engine- 250 gallon capacity.
- Type 4 wildland engine- 750 gallon capacity.

A six person IDL hand crew is also available from Boise. Additional resources are also available as needed through regional and national dispatching.

Mutual Aid Agreements: The IDL has good working relationships with Gem County Fire Protection District #1 and #2, as well as with the Star and Eagle VFD in Ada County. The IDL also has mutual aid agreements with the Boise and Payette National Forests.

Continuing efforts to expand rural departments' water handling capabilities will further maximize the effectiveness of the mutual aid agreements. Water availability is often an issue in the dry areas of southwest Idaho. Water tenders are an essential tool in reaching suppression objectives. The IDL would like to see continued funding and government assistance to rural fire departments for the procurement of fully functioning water tenders. Once in the ownership of the rural departments, the tenders can be used for both structural needs as well as in support of wildland fires. Thus, there is a dual benefit to each department in an efficient and economic manner.

Mutual aid responses could also be more effective with better communications between all involved agencies.

Effective Mitigation Activities:

- **Prevention-** Increase in traditional “Smokey Bear” awareness campaigns.
- **Prevention-** Closer coordination on issuance of burn permits throughout the county. All involved parties need to follow similar guidelines for when and when not to issue permits, as well as some means by which to catalog where and when burn permits have been issued. Compliance and enforcement should be monitored at the individual burn level.

3.4.2 Rural Fire Districts

3.4.2.1 Emmett Fire Department

Physical Address: 231 South Washington
Mailing Address: 501 East Main
Emmett, Idaho 83617

District Summary:

The Emmett Fire Department is a paid-by-call department, with a part-time salaried chief. The force currently has 11 fully trained personnel, with another four in training. By October of 2003, the department will have a staff of 15 trained firefighters. The department provides protection on approximately 3.3 square miles of ground within the Emmett City limits, which include large commercial and residential structures, as well as many undeveloped areas. Although the department does not provide formal medical treatment, the department has a verbal agreement to provide Basic Life Support to Gem County EMS in a mass casualty event.

Emmett has a relatively new station, constructed in 1998, with five bays, meeting rooms, and a kitchen. As Emmett continues to serve as a bedroom community for surrounding areas, the city has expanded and recently annexed additional ground. In response, the city has secured land for a second station on the east side of town to be built in three to five years.

Priority Areas: The eastern boundary of the city in the direction of Pearl has become increasingly an area of concern, as annexation continues into areas that are within wildland fuels.

Effective Mitigation Strategies:

Education- A program that stresses the importance of maintaining defensible space and reducing home ignitability would significantly reduce the potential for loss to wildland fire. Home survivability in light flashy fuels such as those that dominate the district can be greatly enhanced by taking a few simple precautions.

Greatest Resource Need:

- Continued training is a top priority for city personnel.
- A light wildland engine is needed to support suppression activities within the city and in order to support interface agreements with other departments.

Cooperative Agreements: Emmett FD is a member of the 24 department Snake River Valley Fire Chiefs Association, which provides both training and mutual aid resources for the department. The department also has an agreement with the Star Fire District as well as a mutual aid agreement with the BLM. All departments provide well-trained personnel for structural, wildland and technical operations.

Current Resources:

- 2004 Pierce KW Contender 1000 gal, 1250 gpm. Structural Pumper.
- 1994 Pierce Saber. 750 gal, 1250 gpm. Structural Pumper.
- 1978 LaFrance 750gal, 1250 gpm. Structure/wildland support.
- 1985 Ford 2wd 1-ton. 200 gal, 10 gpm. Light duty wildland engine.
- 1989 Chevy Caprice. Command Vehicle.

Future Considerations:

As Emmett and Gem County increasingly become bedroom communities for Ada and Canyon Counties, the demand on the departments continues to increase. There is a need for greater financial support, especially with the planned construction of a new station and the need for apparatus and additional manpower.

3.4.2.2 Gem County Fire Protection District #1

Bill Lee, Chief
115 West 3rd St.
Emmett ID 83617
208-365-2012

Gem County Fire Protection District #1 has both wildland and structure protection throughout the fire district. The district covers the southern portion of the county. Emmett Fire Department provides protection for the City of Emmett. There is a station in Emmett as well as a station to the east in the community of Letha. The district has an all-volunteer force of 22 firefighters, trained in both wildland and structural fire. Although the department's primary responsibility is structural fire, the nature of the dry environment and the proximity of homes to flammable vegetation result in wildland suppression activities as well. The department's available resources are successful in suppressing small to mid-sized grass and range fires. However, when fires exceed capacities or involve forest fuels, the department relies on cooperative agreements with the both federal cooperators as well as on assistance from surrounding VFD's.

Continuing growth and development in the Emmett area is beginning to stretch the capacities of the department. This trend will continue as Emmett increasingly serves as a bedroom community to Boise and as a retirement destination. To this point, few structures have been lost to wildland fire. There has been a trend of increasing numbers of ignitions in the last few years. Increasing development in the dry grasslands will put more homes at risk to loss.

Priority Areas: The urbanizing areas to the north, south and west sides of the district are at the greatest risk to loss from wildland fires.

Effective Mitigation Strategies:

- **Education-** A program that stresses the importance of maintaining defensible space and reducing home ignitability would significantly reduce the potential for loss to wildland fire. Home survivability in light flashy fuels such as those that dominate the district can be greatly enhanced by taking a few simple precautions.

Top Resource Priorities to further department:

- **Equipment-** Gem County Fire Protection District #1 could benefit from an expansion of its training program. The department is also in need of an additional heavy brush engine. This need will continue to increase as more and more homes are built in the flammable landscapes.
- **Training-** For both new recruits and continuing training for veteran personnel in order to further advance the district.

Cooperative Agreements: Gem County Fire Protection District #1 has cooperative agreements with both the surrounding federal and rural departments. In addition, Gem County Fire Protection District #1 is a member of the Snake River Valley Fire Chiefs association. Mutual aid agreements are in place with the following districts:

- Lower Snake River (Boise) BLM
- Salmon National Forest
- Star RFD (Ada County)
- Middleton RFD (Canyon Co.)
- City of Emmett Fire Department

The good working relationships between both federal and volunteer organizations has been instrumental in providing fire suppression resources for both structural and wildland fire fighting.

Future Considerations: Responsible officials may find it useful to work with emergency response personnel to establish road and building codes that reduce home ignitability and require minimum road construction standards to accommodate emergency vehicle traffic.

The town and department may also consider developing a prevention campaign and a more restrictive burn season.

Current Resources: Emmett Station

- 1997 Freightliner 2500 gal, 500 gpm tender
- 2001 Freightliner 750 gal, 750 gpm structural pumper
- 1997 International 1000 gal, 1250 gpm pumper
- 1987 Chevrolet 300 gal brush truck

Current Resources: Letha Station

- 1997 Freightliner 2500 gal, 500 gpm tanker
- 1992 Freightliner 750 gal, 1000 gpm Pierce Pumper
- 2000 Dodge 300 gal, 250 gpm brush truck
- 1983 Ford 500 gal, 250 gpm brush truck

Most effective mitigation activities for the future:

- Adoption of building codes that reduce home ignitability/ improve defensible space.
- Continued education of homeowners as to the hazard they are living in.
- Additional brush trucks for quicker response.
- Increase in prevention program, including closer coordination of the issuance of burn permits during the closed fire season.

Emmett has been experiencing an increase in number of ignitions as well as an increase in development. These two factors are leading to increases in the number of near misses. Establishment of permanent firebreaks may be considered in areas of high resource value or in areas with frequent fires, such as along Highway 16.

3.4.2.3 Gem County Fire Protection District #2

Jim Buffington, Chief
208-989-3388
firechief41@hotmail.com, buffingtonjim@hotmail.com
P.O. Box 70
Sweet, ID 83670

District Summary:

Gem County Rural Fire Protection District #2 is responsible for structure and wildland fire protection for the eastern half of Gem County, including the towns of Montour, Sweet, and Ola. There are two fire stations in the district. One station is located at the southern end in Sweet, the other, a new station, is located at the northern end in Ola. We are an all-volunteer department with a total of 30 firefighters divided between the two fire houses. Our chief area of concern is structural fire protection, but due to the nature of our district the majority of our responses are to wildland fires in either grassland or timber environments. We are capable of handling most Type 4 wildland incidents. Because of overlapping areas of responsibility we have mutual aid agreements with the Idaho Department of Lands, and through them with the Bureau of Land Management and the US Forest Service to handle larger and more complex wildland incidents.

Priority Areas:***Residential Growth:***

The southern end of the district, the Sweet-Montour area, has been experiencing significant residential growth over the last several years and indications are that this trend will continue into the foreseeable future.

The use of improper building materials, and/or construction practices, for new construction, in “high risk” wildland-urban interface areas, and indefensible ground surrounding existing structures is a problem in some areas.

Communications:

Communication capabilities in our district are barely adequate. Topographical features within the district make radio communications, with county dispatch and other agencies, difficult to impossible in some areas.

Fire Fighting Vehicles:

Due to limited funding, the age and capabilities of the fire fighting vehicles in our department has been a concern.

Burn Permit Regulations:

The careless and unregulated use of fire to remove trash, weeds, and other burnable materials in addition to burning during state burn ban periods needs to be addressed.

Effective Mitigation Strategies:

The department continues to keep pace with expansion in the district and has been successful in the upgrading of equipment and resources through the use of state and federal grants, as well as monies received from contract services to state and federal agencies during major wildland incidents. The intent of the department is to continue to replace our aging equipment. Over the past six years the district has replaced eight vehicles and is currently in the process of replacing our ninth truck. We are also scheduled to receive a BLM heavy brush truck (Type 3 or 4) through the BLM Rural Assistance Program, in either 2004 or 2005.

Future plans include building a new fire station in the Sweet-Montour area, relocating our current radio repeater, adding a second repeater, as well as replacing present vehicle and portable radio communications equipment.

County development of stricter building codes for designated “high risk” wildland-urban interface areas is needed. These codes should focus on the use of fire proof or fire retardant roofing, siding materials, and roof ventilation systems that inhibit entry of airborne burning materials into

roof and attic areas. Recommendations to persons building new homes to consider earthen terraces and patios constructed of non-flammable materials instead of highly flammable wooden decks, should be developed. Additional considerations should also be made for the possible regulation of non-“Fire Wise” landscaping treatments and the mandatory inclusion of defensible space with green zones in these “high risk” areas.

County development and **enforcement** of a more restrictive burn permit system in conjunction with a more restrictive burning season should be implemented.

Education and Training:

Our department continues to emphasize the importance of continued training to our firefighters, and this issue could have just as easily been included in the “Priorities” section of this discussion. Our members participate in training activities provided to us through our mutual aid agreement with surrounding departments and agencies in addition to local training activities conducted at our fire department drills. However, we feel a countywide training program, if one were to be developed, would benefit us and the other departments by creating a more standardized level of training and familiarizing each agency to the other’s equipment, personnel, and operating procedures.

We participate in community education by providing “Fire Safe” home videos to new homeowners and interested persons and, on request, with on-site evaluations of property to assist property owners in making their homes more defensible in the event of a wildland fire. Additionally, we participate with the local schools in child fire safety education. We familiarize the children to the appearance of firefighters in full turnout gear with S.C.B.A.s and instruct them in safe evacuation techniques.

Cooperative Agreements:

Gem County Rural Fire Protection District #2 has mutual aid agreements, through the “Snake River Valley Chiefs Association” with 24 fire departments to the west of our district and through the “Boise County Fire Fighters Association”, with 12 departments to the east. In addition to these two associations we have agreements with the Idaho Department of Lands, Bureau of Land Management, and the US Forest Service. We feel we have very good working relationships with these agencies and enjoy the cooperative nature of this mutually beneficial association.

Current Resources:

Sweet-Montour Station:

Table 3.2. Gem County Fire Protection District #2, Sweet-Montour Resources.

Year	Make	Model	Tank Capacity	Pump Capacity
1987	Grumman Fire Cat.	Structural Engine	600 gal	1,500 gpm
1976	Dodge, 1 ton, 4x4	Type 6 Wildland Engine	250 gal	150 gpm
1974	Kenworth	Tender	3,200 gal	125 gpm high pressure PTO 290 gpm portable
1975	International, 4x4	Type 3 Wildland Engine	800 gal	250 gpm
1972	Toyota, 6x6	Type 3 Wildland Engine	1,200 gal	390 gpm

Ola Station:**Table 3.3. Gem County Fire Protection District #2, Ola Resources.**

Year	Make	Model	Tank Capacity	Pump Capacity
1986	Mack	Tender	4,000 gal	600 gpm PTO
1977	Chevrolet	Tender	2,000 gal	100 gpm
1981	Ford, F700	Structural Engine	1,400 gal	150 gpm
1980	Ford, F700	Brush Truck	1,500 gal	250 gpm
1958	Diamond T, 6x6	Type 3 Wildland Engine	750 gal	250 gpm
1988	Chevrolet, 1 ton, 4x4	Type 6 Wildland Engine	200 gal	100 gpm

Three of these vehicles, the 1972 Toyota in Sweet, and the 1986 Mack and 1958 Diamond T in Ola are on loan to Gem County Rural Fire Protection District #2 from the Federal Government, through the Idaho Department of Lands. Though these trucks are owned by the federal government, the fire district is responsible for their equipping, and operating costs.

Future Considerations:

Gem County Rural Fire Protection District #2 will continue to be actively engaged in upgrading and modernizing existing vehicles and equipment assets. Protecting our community and our firefighters is our paramount objective. The building of a new fire station in the Sweet-Montour area is in the initial stages at this time (January 2004), with planned completion within the next three to five years. This station will provide the fire department with much needed space and training facilities to allow the department to keep pace with needs of the firefighters and the community.

As previously stated, there is a need in the County for new regulations concerning new construction in “high risk” wildland-urban interface areas and stricter burn permit regulations. Some individuals may view these new regulations as unnecessarily restrictive, but these changes could reduce insurance rates and the loss of life and property within our communities.

3.4.2.4 Middleton Fire District in Gem County

Data not provided.

Chapter 4: Treatment Recommendations

4 Overview

Critical to the implementation of this Wildland-Urban Interface Wildfire Mitigation Plan will be the identification of, and implementation of, an integrated schedule of treatments targeted at achieving an elimination of the lives lost, and reduction in structures destroyed, infrastructure compromised, and unique ecosystems damaged that serve to sustain the way-of-life and economy of Gem County and the region. Since there are many land management agencies and hundreds of private landowners in Gem County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across all ownerships.

The Federal land management agencies in Gem County, specifically the USDA Forest Service and the Bureau of Land Management, are participants in this planning process and have contributed to its development. Where available, their schedule of WUI treatments has been summarized in this section to better facilitate a correlation between their identified planning efforts and the efforts of Gem County.

This chapter of the plan will be separated into a few, logical sections grouping like activities together. Section 4.2 will summarize the US Forest Service's proposed treatments in Gem County, section 4.3 details policy and safety proposals, section 4.4 explores activities related to people and structure protection, section 4.5 looks at infrastructure improvements, section 4.6 explores fire fighting resources and capabilities, while 4.7 makes recommendations linked to land management. These six sections of this chapter are intended to address, together, the interrelated components making up the WUI issues for Gem County with recommendations. Proposals in this chapter have been generated from the preceding chapters where the detailed risk assessments were made.

All risk assessments were made based on the conditions existing during 2003, thus, the recommendations in this section have been made in light of those conditions. However, the components of wildfire risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

As part of the Policy of Gem County in relation to this planning document, this entire **Wildland-Urban Interface Wildfire Mitigation Plan** should be reviewed annually at a special meeting of the Gem County Commissioners, open to the public, where action items, priorities, budgets, and modifications can be made or confirmed. A written review of the plan should be prepared (or arranged) by the Chairman of the County Commissioners, detailing plans for the year's activities, and made available to the general public ahead of the meeting (in accord with the Idaho Open Public Meeting Laws). Amendments to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the WUI Wildfire Mitigation Plan. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

Prioritization of activities recommended in this plan should be made by the Gem County Commissioners. During the annual review of this plan, reprioritization can be justified in response to changing conditions and funding opportunities.

4.1 Possible Fire Mitigation Activities

As part of the implementation of fire mitigation activities in Gem County, a variety of management tools may be used. Management tools include but are not limited to the following:

- Homeowner and landowner education
- Building code changes for structures and infrastructure in the WUI
- Home site defensible zone through fuels modification
- Community defensible zone fuels alteration
- Access improvements
- Access creation
- Emergency response enhancements (training, equipment, locating new fire stations, new fire districts)
- Regional land management recommendations for private, state, and federal landowners

Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

4.2 Proposed Projects Being Developed by the US Forest Service in Gem County

The Boise National Forest manages much of the highest risk forestlands in the region, (see maps in Appendix I). Their staff of resource and fire professionals has conducted analysis and developed management projects in the WUI, that are designed to reduce the risk of wildfire and the risk of WUI losses from those fires. The following discussions were developed by the Boise National Forest's District Fuels Specialist (Emmett Ranger District).

4.2.1 Mill Creek Watershed Project

4.2.1.1 Vegetation

The vegetation of the Mill Creek Project analysis area is described using an ecological land classification as proposed by Haufler (1994), based upon habitat types developed by Steele (1981). Using this approach, individual habitat types are arranged into groups, which share similar physical environments. These groups are called habitat type classes (HTC).

Habitat type classes within the analysis area range from dry ponderosa pine / xeric Douglas-fir at the warm, dry end of the environmental spectrum, to high elevation sub-alpine fir at the cool, wet extreme on top of West Mountain. On the driest sites, usually at lower elevations and/or on south or west aspects, ponderosa pine and Douglas-fir are the most common tree species. These stands are often interspersed with range lands, supporting various shrubs, forbs, and grasses. Timber productivity is low on the driest of these sites, but rises rapidly as moisture becomes more available in the dry Douglas-fir / moist ponderosa pine HTC (Steele 1981). Common understory shrubs include: sagebrush, currant, mallow nine-bark, choke and bitter cherry, velvet-leaved ceanothus, snowberry, and scouler willow.

The middle of the moisture-temperature gradient is occupied by the cool, moist grand fir, and dry grand fir HTCs. These two HTCs are likely the most abundant within the watershed, and are

often located on north or east aspects and/or above 4,500 feet. Grand fir is the climax species, while ponderosa pine, Douglas-fir, lodgepole pine, western larch, and Engelmann spruce all occur as seral components, depending upon the habitat type. Timber productivity is very high on these sites (Steele 1981). Blue huckleberry, mountain maple, mallow nine-bark, white spirea, and alder are shrubs common to grand fir HTC.

The coolest and/or wettest sites support subalpine fir and lodgepole pine HTCs. These habitats generally occur at the highest elevations, on north aspects, or within cold air drainages and frost pockets. The climax species is usually subalpine fir, but may be whitebark pine or lodgepole pine on some habitat types. Seral species include Douglas-fir, lodgepole pine, western larch, and Engelmann spruce. Understory shrubs associated with the subalpine fir HTCs are: dwarf huckleberry, grouse wortleberry, Utah honeysuckle, and thimbleberry.

Vegetation structure and species composition within the analysis area has been heavily influenced by man-caused and natural disturbance agents. Historically, frequent, low-intensity fires perpetuated open, park-like stands of large-diameter ponderosa pine in the drier HTCs. More recently, years of fire suppression, intensive logging, and western pine beetle mortality has resulted in the replacement of this large-tree, multi-storied stand structure with single-storied stands of small or medium-sized trees of mixed species.

In the more moist HTCs, such as the cool, moist grand fir and the subalpine fir types, fire occurred at longer intervals and could result in either mixed severity or lethal burns. As a result, these HTCs often were a “mosaic” of different size classes, structures, and species compositions. These types have also been influenced by fire suppression and logging, but not to the extent of the drier HTCs. Western spruce budworm and Douglas-fir tussock moth infestations have also resulted in significant amounts of mortality in recent years.

4.2.1.2 Fire Occurrence/Risk

Historically, this portion of the Emmett Ranger District has not been a high fire occurrence area. Large stand replacing fires also have been infrequent to this watershed. The lack of typical summer lightning storms moving across this area, the presence of grassland areas to the west and south of the watershed, agriculture, grazing, fire suppression, have contributed to the decrease in fire occurrence.

Fire history information for this area was developed from a review of historical fire starts. Large fire history records (>100 acres) during the period of 1900-2002 show 4 large fires within the watershed burning approximately (1,470 acres) occurring in the southern portion of the analysis area. Approximately 80 smaller (less than 9 acres) size fires have occurred since the early 1900's that required fire suppression action. The majority events occurred mid-late summer apparently on south and west facing slopes in the mid to lower elevations. Approximately 45-50% of these ignitions were lightning caused with the remainder human caused (i.e. the area has higher potential for human caused fires due to good road access into the analysis area). The Forest Hazard/Risk Assessment (Boise National Forest 1996) placed this area at Low Risk for fire ignition and at Moderate Risk for an uncharacteristic fire event.

4.2.1.3 Wildfire Risk

Wildfire risk was calculated for this area using the methodology described by Steele, *et al.* (1996). This rating system provides an estimate of tree mortality from crown scorch, resulting from a surface fire. It does not reflect the interaction of stand structure and density on various aspects of fire behavior, such as crowning and torching.

A more dynamic model has recently become available for Central Idaho, which works interactively with the Forest Vegetation Simulator (FVS). This model is known as the Fire and Fuels Extension (FFE) (Beukema 2000) to FVS. The FFE estimates wildfire risk, and allows the user to model fuels mitigation treatments to mitigate these risks.

The FFE generates two wildfire risk indices: torching index and crowning index.

A principle advantage of the FFE over the Steele rating system is the inclusion of stand structure and density, via the calculation of crown bulk density, in the determination of the crowning and torching indices. Since stand management activities are typically applied to alter stand structure, density, and species composition, it is important to consider these variables in the calculation of wildfire risk.

In this project area, crowning index is used to quantify wildfire risk. This decision is predicated upon recent work by Fiedler (2001). Crowning index is defined as the twenty- foot wind speed, above which an active crown fire is possible. Consequently, crowning index values are inversely related to wildfire risk; a low crowning index value corresponds to high wildfire risk. Wildfire risk ratings for this analysis are the same as defined by Fiedler: <25 mph = high, 25-50 mph = moderate, and >50 mph = low. An estimated 5,445 acres of the project area came out at High, 15,090 acres Moderate and 7,970 acres were evaluated as Low.

4.2.1.4 Current Condition by Fuel Models

An analysis was done to identify existing fuels models for the Mill Creek Watershed project area. These models were identified using “Aids to Determining Fuel Models for Estimating Fire Behavior” (Anderson 1982), by examining the stand exam information regarding cover types, and by potential vegetation groups. Fuel models describe general vegetation properties and what current conditions would be to fire risk when considering surface fuels. More site-specific data is needed for future projects. The models are characterized in four groups: grass, brush, timber and slash. Four fuel models are present in the analysis area. The fuel models are described in Section 2.7.2.1 of this document.

Fuel Model 0- 615 acres of the project for approximately 5% of the watershed.

Fuel Model 1- (Grass Group) 7,240 acres of the project area are in this fuel model type for approximately 20% of the watershed.

Fuel Model 5- (Shrub type) 4,366 acres were identified in this fuel model type, approximately 10% of the area.

Fuel Model 8 – (Timber type) 18,315 acres were identified in this fuel model type, majority of the area for approximately 45%.

Fuel Model 9 – (Timber type) 6,990 acres were identified in this fuel model type, for approximately 20% of the area.

Before active grazing and fire suppression in the late 1800’s and early 1900’s, wildfires occurred as non-lethal surface fires, with occasional crown fires every 3-35 years in these forest types (Crane and Fisher 1986, USDA Forest Service 1998). These frequent fires would maintain relatively open forests of ponderosa pine and Douglas-fir in a variety of age and diameter classes with low surface fuel loadings and herbaceous plants. Widely spaced overstory trees, lack of dense regeneration over large areas and lack of heavy surface fuel loadings have and will continue to keep unwanted fire events at a low to moderate risk in these treated areas. Continued maintenance with prescribed fire and mechanical tree thinning would keep fuel loadings low, reduce brush and seedlings and help develop and perpetuate stands more typical of historic conditions. The remainder of the analysis area has missed one to numerous fire

events and is at risk of experiencing a fire event over a large area. Fuel loads and ladder fuels would be expected to increase, potentially leading to an uncharacteristic fire event. However, it is unclear what the potential is this event occurring at this time.

4.2.1.5 Project Area Objectives:

Primarily, treatments are going to focus on prescribed burning of natural fuels and reducing stand densities by using mechanical treatments. The prescribed burning project will be completed on approximately 3,700 acres. The main objectives for this treatment are tied to research. The objectives of the research are to study the effects of prescribed fire on intermittent streams and their adjacent terrestrial areas, reduce existing surface fuels and reduce stand densities. The mechanical treatments occurring within this area are small timber sales of approximately 2,900 acres. The purpose and need will be to reduce the potential for uncharacteristic and undesirable disturbances such as wildfires, insect, and disease infestations. These projects are to be completed within the next 5 years (2004-2008).

4.2.2 North Kennedy-Cottonwood Stewardship Project

The North Kennedy-Cottonwood Stewardship Project encompasses about 8,600 acres and is 7 miles north of Ola Idaho and lies primarily in Gem County. The proposed actions include modify the existing road system, treat 3,646 acres of vegetation through commercial thin, and noncommercial thin, and create a fuel brake on approximately 117 acres. North Kennedy-Cottonwood Project was chosen as one of 28 national pilot projects to demonstrate the use of stewardship contracts.

The associated need for action is as follows:

- Reduce big game vulnerability
- Reduce road sediment
- Improve fish habitat
- Improve management of motorized access
- Reduce forest susceptibility to severe, uncharacteristic wildfire
- Reduce forest susceptibility to western spruce budworm
- Increase long-term forest productivity

4.2.2.1 Vegetation

Primary habitat type for this area is cool and moist grand fir, warm and dry Douglas-fir/moist ponderosa pine. Current wildfire risk ratings were calculated using the procedure developed by Fiedler (2001), and described in: A Strategic Assessment of Fire Hazard in Montana. This approach utilizes a recently developed component of FVS, the Fire Fuels Extension (FFE) to estimate crown fire hazard from tree, stand, and site characteristics (Buekema *et al.* 2000). FFE calculates fire hazard in terms of Crowning Index, or the wind speed necessary for a fire that reaches the tree canopy to continue as a crown fire. Fiedler defines high-hazard conditions as those stands with a Crowning Index less than 25 miles per hour, high hazard, a Crowning Index from 25 to 50 mph, moderate hazard and a low hazard a Crowning Index over 50 miles per hour. This project area current fire hazard is moderate to high.

4.2.2.2 Fire History/Occurrence

Large fire history from 1900 to 2003 shows three large fires for approximately 725 acres. Approximately 24 smaller size fires occurred in the area mainly caused by lighting. In 1995/96 1,500 acres of natural fuels were treated using prescribed fire.

4.2.2.3 Proposed Vegetation Management Activities

Silvicultural prescriptions would include Shelterwood, Improvement cuts, Commercial thins, Pre-commercial thins and tree planting. Post harvest activities would include, whole tree yarding, prescribed burning, and mechanical piling. Project is to be implemented within the next 5 years (2004-2008).

4.3 WUI Safety & Policy

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related in nature and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

Table 4.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
4.3.a: Amend existing building codes to require a site plan be approved by Fire District Chiefs prior to issuance of Building Permits.	Protection of people and structures by applying a standard of road widths, access, and building regulations suitable to insure new homes can be protected while minimizing risks to firefighters. (defensible space, roads and access management, water systems, building codes, signage, and maintenance of private forest and range lands)	County Commissioners in cooperation with Rural Fire Districts and Planning and Zoning.	• Year 1 debate and adoption of revised code (2004). • Review adequacy of changes annually, make changes as needed.
4.3.b: Rural Addressing Update	Protection of people and structures by improving database of structures in the county which will link to fire fighting efforts and improved response times. Also linked to developing an enhanced 911 system.	County Assessor's office in cooperation with the County Commissioners Office	• To be implemented during first year (2004), pending funding and adoption by elected officials. May take most of a year to complete. • Estimate cost at around \$40,000 to complete entire county
4.3.c: Enhanced 911 Service with emphasis on cellular phone locators.	Protection of people and structures by improving the ability of emergency response personnel to respond to an emergency.	County Commissioners in combination with County Sheriff's Office, County Assessor's Office and Fire Departments.	Can be completed only after the Rural Addressing project is completed. Target implementation during year 2 (2005) of this project.

Table 4.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
4.3.d: Rural Road Sign Improvements across the county , link local names to USFS road numbers when possible, use standardized signs 9' signs with 6" letters.	Protection of people, structures, and infrastructure by improving the ability of emergency services personnel, residents, and visitors to navigate roads.	County Roads Department in cooperation with County Commissioners, and Assessor	Can be completed during year 1 (2004) pending funding to implement the project. Estimate \$8,000 for signs and posting.
4.3.e: Rural Fire District Boundary Signs Improvements across the county (entering and exiting signs).	Protection of people, structures, and infrastructure by improving the familiarity of residents and visitors to understand boundaries and protection zones.	City and Rural Fire Districts in cooperation with County Commissioners	Can be completed during year 1 (2004) pending funding to implement the project. Estimate \$6,000 for signs and posting.
4.3.f: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction (esp. Pearl, Gross, Ola, Sweet, and Montour), emphasis on water supplies and building materials.	Protection of people and structures by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas.	County Commissioners Office in cooperation with Rural Fire Departments, Planning and Zoning, and Building Inspectors.	Year 1 (2004) activity: Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where juxtaposed near wildland fuels.
4.3.g: Development and Enforcement of a more restrictive burn permit system in conjunction with a more restrictive burning season. Consider a central clearing house for issuance of all burning permits in Gem County.	Protection of people and structures by reducing wildfire ignition through debris burning where resources or conditions are not adequate to support burning (approx. 7.4% of ignitions in Gem County were ignited from debris burning).	Idaho Department of Lands, Rural Fire Departments and local Landowners	Consider and develop policy to address this issue in cooperation with rural fire chiefs and the IDL to better coordinate on timing and location of allowable debris burning.
4.3.h: Development of a "camp fire" use policy for recreation related camp fires in camp grounds and rural areas. Also include better signing during periods of high or extreme fire danger.	Protection of people and structures by reducing wildfire ignition through camp fire escape where resources or conditions are not adequate to contain fires (approx. 8.6% of ignitions in Gem County were ignited from escaped camp fires).	US Forest Service, Idaho Department of Lands, Rural Fire Departments and local Landowners	Consider and develop policy to address this issue in cooperation with the US Forest Service (camp ground management), rural fire chiefs and the IDL to better coordinate on timing and location of allowable camp fires.
4.3.f: Develop a formal WUI Advisory Committee to advise County Commissioners on WUI Issues and Treatments	Protection of people and structures by improving the ability of decision makers to make informed decisions about wildfire issues.	County Commissioners Office	Year 1 (2004) activity: Formalize a committee, its membership and service decided on by the County Commissioners, to collaborate on WUI issues within Gem County. Members potentially to include land management

Table 4.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
			organizations and companies, private landowners, and fire protection personnel.
4.3.g: Develop a county-wide GIS database which can be used for rapid response during wildfire events assisting fire suppression efforts.	Protection of people and structures by utilizing a GIS system to facilitate rapid dispatch of people to fire incidents.	County Commissioners Office, Rural Fire Departments, US Forest Service, Bureau of Land Management.	Year 1 (2004) activity: Develop a needs assessment to determine GIS needs and follow-up to implement within the next 2 years. Use the database created during the preparation of this plan as initial data for this effort.

4.4 *People and Structures*

The protection of people and structures will be tied together closely as the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire. The other incident is a fire fighter who suffers the loss of life during the combating of a fire. Many of the recommendations in this section will define a set of criteria for implementation while others will be rather specific in extent and application.

Many of the recommendations in this section involve education and increasing awareness of the residents of Gem County. These recommendations stem from a variety of factors including items that became obvious during the analysis of the public surveys, discussions during public meetings, and observations about choices made by residents living in the Wildland-Urban Interface. Over and over, the a common theme was present that pointed to a situation of landowners not recognizing risk factors:

- Homeowners in the public mail survey ranked their home site wildfire risk factors significantly lower than a random sample of home rankings completed by fire mitigation specialists.
- Fire District personnel pointed to numerous examples of inadequate access to homes of people who believe they have adequate ingress.
- Discussions with the general public indicated an awareness of wildland fire risk, but they could not specifically identify risk factors.
- Almost half of the respondents to the public mail survey indicated (43%) that they want to participate in educational opportunities focused on the WUI and what they can do to increase their home's chances of surviving a wildfire.

In addition to those items enumerated in Table 4.4, residents and policy makers of Gem County should recognize certain factors that exist today, that in their absence would lead to an increase in the risk factors associated with wildland fires in the WUI of Gem County. These items listed below should be encouraged, acknowledged, and recognized for their contributions to the reduction of wildland fire risks:

- **Livestock Grazing** in and around the communities of Gem County has led to a reduction of many of the fine fuels that would have been found in and around the communities and in the wildlands of Gem County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing resource professionals into the forests and rangelands of the area where they may observe ignitions, or potentially risky activities. Livestock grazing in this region should be encouraged into the future as a low cost, positive tool of wildfire mitigation in the Wildland-Urban Interface and in the wildlands.
- **Forest Management** in Gem County has been affected greatly by the reduction of operating sawmills in the region (see section 2.2). However, the active forest management program of Boise Corp., the Idaho Department of Lands, and many of the private forestland owners in the region has led to a significant reduction of wildland fuels where they are closest to homes and infrastructure. An excellent example of this has already been highlighted in this document (Section 3.3) involving the US Forest Service's planned activities from 2004-2008. This management will improve forest health, reduced the buildup of forestland fuels, and provided for the effective treatment

of logging residue. All of this management will occur in an area that if ignited could easily threaten the homes of Gross, Sweet, Montour, and Ola. In addition, forest resource professionals managing these lands, and the lands of the state and federal agencies are generally trained in wildfire protection and recognize risk factors when they occur. One of the reasons that Gem County forestlands have not been impacted by wildland fires to a greater degree historically, is the presence and activities related to active forest management.

- **Agriculture** is a significant component of Gem County's economy (see Section 2.2). Much of the valley bottomlands and rangeland interface is dotted and intermixed with agricultural crops. The original conversion of these lands to agriculture from valley bottom and rangeland, was targeted at the most productive soils and juxtaposition to water. Many of these productive ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is that much of the valley bottom and rangeland historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Gem County is integral to the continued management of wildfire risk in this region.

Table 4.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
4.4.a: Youth and Adult Wildfire Educational Programs	Protect people and structures by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk	Cooperative effort including: - University of Idaho Cooperative Extension - Idaho Department of Lands - USFS Boise National Forest and State and Private Forestry Office - Bureau of Land Management - Local School Districts	To start immediately using existing educational program materials and staffing. Formal needs assessment should be responsibility of University of Idaho Cooperative Extension faculty and include the development of an integrated WUI educational series by year 3 (2006). Costs initially to be funded through existing budgets for these activities to be followed with grant monies to continue the programs as identified in the formal needs assessment.
4.4.b: Wildfire risk assessments of homes in identified communities	Protect people and structures by increasing awareness of specific risk factors of individual home sites in the at-risk landscapes. Only after these are completed can home site treatments follow.	To be implemented by County Commissioners Office in cooperation with the Rural Fire Departments . Actual work may be completed by Wildfire Mitigation Consultants.	Cost: Approximately \$100 per home site for inspection, written report, and discussions with the homeowners. - There are approximately 5,888 housing units in Gem County, roughly 350 (6%) of these structures would benefit from a home site inspection and budget determination for a total cost estimate of \$35,000. Action Item: Secure funding and contract to complete the inspections during years 1 & 2 (2004-05) - Home site inspection reports and estimated budget for each home site's treatments will be a requirement to receive funding for treatments through grants.
4.4.c: Home Site WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Gem County	County Commissioners in cooperation with Fire Mitigation Consulting company and Rural Fire Districts <i>Complete concurrently with 4.4.b.</i>	- Actual funding level will be based on the outcomes of the home site assessments and cost estimates Estimate that treatments in rangelands will cost approximately \$1,000 per home site for a defensible space of roughly 150'. Approximately 350 homes in this category for an estimated cost of \$350,000. Median home and business assessed value in County is \$28,373 (average \$57,800): B/C Ratio of this treatment is approximately 57.8:1. - Home site treatments can begin after the securing of funding for the treatments and immediate implementation in 2004 and will continue from year 1 through 5 (2008).

Table 4.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
4.4.d: Community Defensible Zone WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding high risk communities in the WUI of Gem County	County Commissioners in cooperation with Fire Mitigation Consulting company and Rural Fire Districts	• Actual funding level will be based on the outcomes of the home site assessments and cost estimates. • Years 2-5 (2004-08): Treat high risk wildland fuels from home site defensible space treatments (4.4.c) to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented. • Communities to target: Sweet, Ola, Montour, and Pearl. High risk areas along northern and southern edge of Emmett and Letha. • Approximate average cost on a per structure basis is \$1,500. Couple this cost with the home defensibility space costs of \$1,000. The number of structures to benefit from these treatments include the 350 structures receiving home site treatments plus an estimated 2,100 more structures. The average B/C Ratio for these treatments combined in Gem County is 161.8:1.
4.4.e: Maintenance of Home Site WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Gem County	County Commissioners Office in cooperation with Rural Fire Departments and local home owners	• Home site defensibility treatments must be maintained periodically to sustain benefits of the initial treatments. • Each site should be assessed 5 years following initial treatment • Estimated re-inspection cost will be \$50 per home site on all sites initially treated or recommended for future inspections (\$17,500) • Follow-up inspection reports with treatments as recommended years 5 through 10.
4.4.f: Re-entry of Home Site WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Gem County	County Commissioners Office in cooperation with Rural Fire Departments and local home owners	• Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.

Table 4.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
4.4.g: Survey and Rate bridges, cattle guards, and limiting road surfaces in the county on all private property.	Protection of people, structures, infrastructure, and economy by improving access for residents and fire fighting personnel in the event of a wildfire. Reduces the risk of a road failure that leads to the isolation of people or the limitation of emergency vehicle and personnel access during an emergency.	County Roads and Bridges Department in cooperation with US Forest Service, BLM, State of Idaho (Lands and Transportation), industrial forestland owners, ranchers, and private landowners.	• Year 1 (2004): Update existing assessment of travel surfaces, bridges, and cattle guards in Gem County as to location. Secure funding for implementation of this project (grants) • Year 2 (2005): Conduct engineering assessment of limiting weight restrictions for all surfaces (e.g., bridge weight load maximums). Estimate cost of \$35,000 which might be shared between County, USFS, BLM, State, and private based on landownership associated with road locations. • Year 2 (2005): Post weight restriction signs on all crossings, copy information to rural fire districts and wildland fire protection agencies in affected areas. Estimate cost at roughly \$5-\$10,000 for signs and posting. • Year 3 (2006): Identify limiting road surfaces in need of improvements to support wildland fire fighting vehicles and other emergency equipment. Develop plan for improving limiting surfaces including budgets, timing, and resources to be protected for prioritization of projects (benefit/cost ratio analysis). Create budget based on full assessment.
4.4.h: Access Improvements for private property with one-way-in and one-way-out. Identify key private roads that access larger areas.	Protection of people, structures, infrastructure, and economy by improving access for residents and fire fighting personnel in the event of a wildfire. Allows for alternative escape routes when a primary access is compromised.	County Roads and Bridges Department in cooperation with US Forest Service, BLM, State of Idaho (Lands and Transportation), and industrial forestland owners (e.g., Boise Corp.).	• Year 1 (2004): Update existing assessment of roads in Gem County as to location. Secure funding for implementation of this project (grants). • Year 2 (2005): Specifically address access issues in Gross, Ola, Pearl, and others identified in assessment. Develop alternatives for improving access limitations. Landowners and agencies to play significant role in alternative development. • Year 3 (2006): Secure funding and implement projects to improve limiting access. No way to estimate costs until priorities are set and options identified.
4.4.i: Access Improvements through road-side fuels management	Protection of people, structures, infrastructure, and economy by improving access for residents and fire fighting personnel in the event of a wildfire. Allows for a road based defensible area that can be linked to a terrain based	County Roads and Bridges Department in cooperation with US Forest Service, BLM, State of Idaho (Lands and Transportation), and industrial forestland owners.	• Year 1 (2004): Update existing assessment of roads in Gem County as to location. Secure funding for implementation of this project (grants). • Year 2 (2005): Specifically address access issues to Gross, Ola, Pearl, the Sweet-Montour Corridor, recreation areas in the extreme north end of the County, and others identified in assessment. Target 100' on downhill side of roads and 75' on uphill side for estimated cost of \$15,000 per mile of road treated. If 10 miles of roadway are prioritized for treatment (est.) B/C Ratio of 14.3:1 is achieved. This B/C ratio may be

Table 4.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
	defensible areas.		maintained in many rural treatment areas of the county. • Year 3 (2006): Secure funding and implement projects to treat road-side fuels.

4.5 *Infrastructure*

Significant infrastructure refers to the communications, transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region or a surrounding area. All of these components are important to the West Central Highlands, and to Gem County specifically. These networks are by definition a part of the Wildland-Urban Interface in the protection of people, structures, **infrastructure**, and unique ecosystems. Without supporting infrastructure a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and on-the-ground activities.

Communication Infrastructure: This component of the WUI seems to be diversified across the county with multiple source and destination points, and a spread-out support network. Although site specific treatments will impact directly local networks, little needs done to insure the system's viability.

Transportation Infrastructure (road and rail networks): This component if the WUI has some potential limitations in Gem County. The hub of Gem County's transportation network is located in Emmett (as is the County Seat). Highway 16 and Highway 52 cross paths in Emmett to provide access to and from Eagle (and points south), Payette (and points west), Montour (and points north and east). Literally dozens of other surface streets and gravel roads provide access to many points across the County and surrounding Counties. For the most part, these roads cross over rangelands and agricultural lands.

Near Montour, State Highway 52 continues eastward. The Sweet-Ola Highway begins here running northward to access Sweet, Ola, and then splitting to the Third Fork Road to access Gross. These roads cross through a variety of rangeland and forestland vegetation types. In most locale, these roads are adequate to serve local access, recreation use, and fire fighting access. Short stretches of these roads, however, are very narrow or have dense vegetation on steep slopes crowding the roadways. In addition, as has been pointed out earlier in this document, there are scattered bridges in the roadways, especially on private lands, that are not suitable to support water laden trucks, or at least have not been rated as to the maximum weight they will support. Brush cutting, tree thinning and pruning, targeted herbicide treatments, and grass mowing should be maintained along these major access roads during the spring and summer seasons. The bridges and cattle guards should be rated for maximum load allowances and posted with the data.

A few roads in the county have limiting characteristics, such as steep grades, narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to, and overtopping some roads. Some of these road surfaces access remote forestland and rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not necessarily the priority for treatments in the county.

Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county. Specific recommendations for these roads are enumerated in Table 4.4.

Energy Transport Supply Systems (gas and power lines): During the Hall Fire in nearby Adams County, the high tension power lines maintained by Idaho Power that cross the region from the Snake River to McCall and then to Riggins were threatened by heat, smoke and particulate matter in the smoke. The power lines were at risk to arcing and potentially failure. Fortunately, power was not lost to the communities of Adams and Valley counties as a result of the fire, but it did point to the need for an increased focus on fuels management under and immediately adjacent to the high tension power lines in this region (Appendix I).

A number of power lines crisscross Gem County from the Black Canyon Hydroelectric Dam supply, to supplies located along the Snake River. Because of the location, Gem County's land surfaces provide access to power supplies and population centers in Idaho and parts of Oregon. Most of these power lines cross over rangeland ecosystems. When fires ignite in these vegetation types, the fires tend to be fast moving and burn at lower intensities than those in forestland fires. However, when these sagebrush communities become very mature and thick, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Observations across the county of these high tension power lines lead to the conclusion that current agricultural uses coupled with livestock grazing and urban developments have mitigated this potential substantially. It is the recommendation of this Wildfire Mitigation Plan that this situation be evaluated annually and monitored and treatments be targeted where the need is the greatest. Local ranchers and land managers will be the greatest resource for identifying these opportunities.

Water Supply: In many of Idaho's communities, water is derived from surface flow that is treated and piped to homes and businesses. When wildfires burn a region, they threaten these watersheds by the removal of vegetation, creation of ash and sediment. As such, watersheds should be afforded the highest level of protection from catastrophic wildfire impacts. In Gem County, water is supplied to the majority of homes from single home or multiple home wells.

Agricultural water supply from the region's rivers and lakes is an important component of the viability of the regional economy (agriculture and ranching). These resources are at-risk to wildland fires. Their protection comes from the limiting of the extent and frequency of wildfires in any given watershed. Based on the analysis of past fires in Gem County and the current status of wildland fire protection in the region, this component of the economy seems to be stable and reasonably protected. Changes to the status quo are not recommended at this time, in light of the other recommendations in this plan.

4.6 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland fire fighting districts in Gem County. For specific details on these comments, refer to sections 3.4.1 and 3.4.2. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies in the WUI and are fully supported by the planning committee.

Specific reoccurring themes of needed resources and capabilities include:

- More water tenders for Rural Fire Districts
- Improved radio capabilities within each district and for mutual aid operations (including digital capability and improved coverage)
- Retention and recruitment of volunteers
- Training and development of rural firefighters in structure and wildland fire
- New Volunteer Fire District servicing Pearl. This should only be done with the concurrence of the local residents who will serve as the volunteer base, assisted by the other Fire District's personnel in the county.

The implementation of each issue will rely on either the isolated efforts of the fire districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve county wide equity. However, the West Central Highlands Resource Conservation and Development Council may be an organization

uniquely suited to work with all of the districts in Gem County and adjacent counties to assist in the prioritization of needs across district and even county lines. Once prioritized, the WCH RC&D is in a position to assist these districts with identifying, competing for, and obtaining grants and equipment to meet these needs. The BLM and the US Forest Service will be integral partners in this process.

Table 4.3. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
4.5.a: Obtain additional 3,000-5,000 gal water tenders for rural fire districts: 4 now, potentially one additional for Pearl Department if created.	Protection of people and structures by direct fire fighting capability enhancements.	West Central Highlands Resource Conservation and Development Council in cooperation with rural and wildland fire districts and the County Commissioners.	• Year 1 (2004): Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources. • Year 1 or 2 (2004-05): Acquire and deliver needed equipment to districts based on prioritization by need and funding awards.
4.5.b: Enhance radio availability in each district, link in to existing dispatch, improve coverage and range within the region. Upgrade to digital capability if federal agencies are making that transition first. Emphasize the addition of a radio repeater located on Squaw Butte.	Protection of people and structures by direct fire fighting capability enhancements.	BLM and the West Central Highlands Resource Conservation and Development Council in cooperation with rural and wildland fire districts	• Year 1 (2004): Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities. • Year 2-3 (2005-06): Identify opportunities for radio repeater towers located in the region for multi-county benefits. • Year 2 (2005): Acquire and install upgrades as needed.
4.5.c: Structural facilities for existing districts or new one, expansion of a district or increasing storage of existing facilities.	Protection of people and structures by direct fire fighting capability enhancements.	West Central Highlands Resource Conservation and Development Council in cooperation with rural and wildland fire districts.	• Priority Districts: ○ GCFP#2 ○ Pearl VFD • 5 Year Planning Horizon
4.5.d: Retention of Volunteer Fire Fighters	Protection of people and structures by direct fire fighting capability enhancements.	Rural and Wildland Fire Districts working with broad base of county citizenry to identify options, determine plan of action, and implement it.	• 5 Year Planning Horizon, extended planning time frame • Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers • Year 1 (2004): Develop incentives program and implement it.

Table 4.3. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
4.5.e: Increased training and capabilities of fire fighters for individual districts and as annual or periodic, countywide training opportunities to facilitate standardized level of training and cross district familiarization of people and resources.	Protection of people and structures by direct fire fighting capability enhancements.	Rural and Wildland Fire Districts working with the BLM and USFS for wildland training opportunities and with the State Fire Marshall's Office for structural fire fighting training.	• Year 1 (2004): Develop a multi-county training schedule that extends 2 or 3 years in advance (continuously). • Identify funding and resources needed to carry out training opportunities and sources of each to acquire. • Year 1 (2004): Begin implementing training opportunities for volunteers.

4.7 Regional Land Management Recommendations

In section 4.4 of this plan, reference was given to the role that forestry, grazing and agriculture have in promoting wildfire mitigation services through active management. Gem County is both a rural county (east and north sides) and an urban center (Emmett). It is dominated by wide expanses of forest and rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn fuels and homes depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the US Forest Service, the Bureau of Land Management, the Idaho Department of Lands, Industrial forestland owners, private forestland owners, and all other landowners in the region to actively manage their Wildland-Urban Interface lands in a manner consistent with the management of reducing fuels and risks in this zone.

Chapter 5: Supporting Information

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5.4 Glossary of Terms

Anadromous - Fish species that hatch in fresh water, migrate to the ocean, mature there, and return to fresh water to reproduce (Salmon & Steelhead).

Appropriate Management Response - Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Biological Assessment - Information document prepared by or under the direction of the Federal agency in compliance with U.S. Fish and Wildlife standards. The document analyzes potential effects of the proposed action on listed and proposed threatened and endangered species and proposed critical habitat that may be present in the action area.

Backfiring - When attack is indirect, intentionally setting fire to fuels inside the control line to contain a rapidly spreading fire. Backfiring provides a wide defense perimeter, and may be further employed to change the force of the convection column.

Blackline - Denotes a condition where the fireline has been established by removal of vegetation by burning.

Burning Out - When attack is direct, intentionally setting fire to fuels inside the control line to strengthen the line. Burning out is almost always done by the crew boss as a part of line construction; the control line is considered incomplete unless there is no fuel between the fire and the line.

Canyon Grassland - Ecological community in which the prevailing or characteristic plants are grasses and similar plants extending from the canyon rim to the rivers edge.

Confine - Confinement is the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

Contingency Plans: Provides for the timely recognition of approaching critical fire situations and for timely decisions establishing priorities to resolve those situations.

Control Line - An inclusive term for all constructed or natural fire barriers and treated fire edge used to control a fire.

Crew - An organized group of firefighters under the leadership of a crew boss or other designated official.

Crown Fire - A fire that advances from top to top of trees or shrubs more or less independently of the surface fire. Sometimes crown fires are classed as either running or dependent, to distinguish the degree of independence from the surface fire.

Disturbance - An event which affects the successional development of a plant community (examples: fire, insects, windthrow, timber harvest).

Disturbed Grassland - Grassland dominated by noxious weeds and other exotic species. Greater than 30% exotic cover.

Diversity - The relative distribution and abundance of different plant and animal communities and species within an area.

Drainage Order - Systematic ordering of the net work of stream branches, (e.g., each non-branching channel segment is designated a first order stream, streams which only receive first order segments are termed second order streams).

Duff - The partially decomposed organic material of the forest floor beneath the litter of freshly fallen twigs, needles, and leaves.

Ecosystem - An interacting system of interdependent organisms and the physical set of conditions upon which they are dependent and by which they are influenced.

Ecosystem Stability - The ability of the ecosystem to maintain or return to its steady state after an external interference.

Ecotone - The area influenced by the transition between plant communities or between successional stages or vegetative conditions within a plant community.

Energy Release Component - The Energy Release Component is defined as the potential available energy per square foot of flaming fire at the head of the fire and is expressed in units of BTUs per square foot.

Equivalent Clearcut Area (ECA) - An indicator of watershed condition, which is calculated from the total amount of crown removal that has occurred from harvesting, road building, and other activities based on the current state of vegetative recovery.

Exotic Plant Species - Plant species that are introduced and not native to the area.

Fire Adapted Ecosystem - An arrangement of populations that have made long-term genetic changes in response to the presence of fire in the environment.

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

Fire Behavior Forecast - Fire behavior predictions prepared for each shift by a fire behavior analysis to meet planning needs of fire overhead organization. The forecast interprets fire calculations made, describes expected fire behavior by areas of the fire, with special emphasis on personnel safety, and identifies hazards due to fire for ground and aircraft activities.

Fire Behavior Prediction Model - A set of mathematical equations that can be used to predict certain aspects of fire behavior when provided with an assessment of fuel and environmental conditions.

Fire Danger - A general term used to express an assessment of fixed and variable factors such as fire risk, fuels, weather, and topography which influence whether fires will start, spread, and do damage; also the degree of control difficulty to be expected.

Fire Ecology - The scientific study of fire's effects on the environment, the interrelationships of plants, and the animals that live in such habitats.

Fire Exclusion - The disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire Intensity Level - The rate of heat release (BTU/second) per unit of fire front. Four foot flame lengths or less are generally associated with low intensity burns and four to six foot flame lengths generally correspond to "moderate" intensity fire effects. High intensity flame lengths are usually greater than eight feet and pose multiple control problems.

Fire Prone Landscapes - The expression of an area's propensity to burn in a wildfire based on common denominators such as plant cover type, canopy closure, aspect, slope, road density, stream density, wind patterns, position on the hillside, and other factors.

Fireline - A loose term for any cleared strip used in control of a fire. That portion of a control line from which flammable materials have been removed by scraping or digging down to the mineral soil.

Fire Management - The integration of fire protection, prescribed fire and fire ecology into land use planning, administration, decision making, and other land management activities.

Fire Management Plan (FMP) - A strategic plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the approved land use plan. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch, burn plans, and prevention. The fire implementation schedule that documents the fire management program in the approved forest plan alternative.

Fire Management Unit (FMU) - Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that set it apart from management characteristics of an adjacent unit. FMU's are delineated in FMP's. These units may have dominant management objectives and preselected strategies assigned to accomplish these objectives.

Fire Occurrence - The number of wildland fires started in a given area over a given period of time. (Usually expressed as number per million acres.)

Fire Prevention - An active program in conjunction with other agencies to protect human life, prevent modification, of the ecosystem by human-caused wildfires, and prevent damage to cultural resources or physical facilities. Activities directed at reducing fire occurrence, including public education, law enforcement, personal contact, and reduction of fire risks and hazards.

Fire Regime - The fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long-interval, high-intensity (stand replacement) fires.

Fire Retardant - Any substance that by chemical or physical action reduces flareability of combustibles.

Fire Return Interval - The number of years between two successive fires documented in a designated area.

Fire Risk - The potential that a wildfire will start and spread rapidly as determined by the presence and activities of causative agents.

Fire Severity - The effects of fire on resources displayed in terms of benefit or loss.

Foothills Grassland - Grass and forb co-dominated dry meadows and ridges. Principle habitat type series: bluebunch wheatgrass and Idaho fescue.

Fuel - The materials which are burned in a fire; duff, litter, grass, dead branchwood, snags, logs, etc.

Fuel Break - A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Fuel Loading - Amount of dead fuel present on a particular site at a given time; the percentage of it available for combustion changes with the season.

Fuel Model - Characterization of the different types of wildland fuels (trees, brush, grass, etc.) and their arrangement, used to predict fire behavior.

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

Fuels Management - Manipulation or reduction of fuels to meet protection and management objectives, while preserving and enhancing environmental quality.

Gap Analysis Program (GAP) - Regional assessments of the conservation status of native vertebrate species and natural land cover types and to facilitate the application of this information to land management activities. This is accomplished through the following five objectives:

1. Map the land cover of the United States
2. Map predicted distributions of vertebrate species for the U.S.
3. Document the representation of vertebrate species and land cover types in areas managed for the long-term maintenance of biodiversity
4. Provide this information to the public and those entities charged with land use research, policy, planning, and management
5. Build institutional cooperation in the application of this information to state and regional management activities

Habitat - A place that provides seasonal or year-round food, water, shelter, and other environmental conditions for an organism, community, or population of plants or animals.

Heavy Fuels - Fuels of a large diameter, such as snags, logs, and large limbwood, which ignite and are consumed more slowly than flash fuels.

Hydrologic Unit Code - A coding system developed by the U. S. Geological Service to identify geographic boundaries of watersheds of various sizes.

Hydrophobic - Resistance to wetting exhibited by some soils, also called water repellency. The phenomena may occur naturally or may be fire-induced. It may be determined by water drop penetration time, equilibrium liquid-contact angles, solid-air surface tension indices, or the characterization of dynamic wetting angles during infiltration.

Human-Caused Fires - Refers to fires ignited accidentally (from campfires or smoking) and by arsonists; does not include fires ignited intentionally by fire management personnel to fulfill approved, documented management objectives (prescribed fires).

Intensity - The rate of heat energy released during combustion per unit length of fire edge.

Inversion - Atmospheric condition in which temperature increases with altitude.

Ladder Fuels - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Landsat Imagery - Land remote sensing, the collection of data which can be processed into imagery of surface features of the Earth from an unclassified satellite or satellites.

Landscape - All the natural features such as grasslands, hills, forest, and water, which distinguish one part of the earth's surface from another part; usually that portion of land which the eye can comprehend in a single view, including all its natural characteristics.

Lethal - Relating to or causing death; extremely harmful.

Lethal Fires - A descriptor of fire response and effect in forested ecosystems of high-severity or severe fire that burns through the overstory and understory. These fires typically consume large woody surface fuels and may consume the entire duff layer, essentially destroying the stand.

Litter - The top layer of the forest floor composed of loose debris, including dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Maximum Manageable Area - The boundary beyond which fire spread is completely unacceptable.

Metavolcanic - Volcanic rock that has undergone changes due to pressure and temperature.

Minimum Impact Suppression Strategy (MIST) - “Light on the Land.” Use of minimum amount of forces necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives. It implies a greater sensitivity to the impacts of suppression tactics and their long-term effects when determining how to implement an appropriate suppression response.

Mitigation - Actions to avoid, minimize, reduce, eliminate, replace, or rectify the impact of a management practice.

Monitoring Team - Two or more individuals sent to a fire to observe, measure, and report its behavior, its effect on resources, and its adherence to or deviation from its prescription.

National Environmental Policy Act (NEPA) - This act declared a national policy to encourage productive and enjoyable harmony between humans and their environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and will stimulate the health and welfare of humankind; to enrich the understanding of important ecological systems and natural resources; and to establish a Council on Environmental Quality.

National Fire Management Analysis System (NFMAS) - The fire management analysis process, which provides input to forest planning and forest and regional fire program development and budgeting.

Native - Indigenous; living naturally within a given area.

Natural Ignition - A wildland fire ignited by a natural event such as lightning or volcanoes.

Noncommercial Thinning - Thinning by fire or mechanical methods of precommercial or commercial size timber, without recovering value, to meet MFP standards relating to the protection/enhancement of adjacent forest or other resource values.

Notice of Availability - A notice of Availability published in the Federal Register stating that an EIS has been prepared and is available for review and comment (for draft) and identifying where copies are available.

Notice of Intent - A notice of Intent published in the Federal Register stating that an EIS will be prepared and considered. This notice will describe the proposed action and possible alternatives, the proposed scoping process, and the name and address of whom to contact concerning questions about the proposed action and EIS.

Noxious Weeds - Rapidly spreading plants that have been designated “noxious” by law which can cause a variety of major ecological impacts to both agricultural and wild lands.

Planned Ignition - A wildland fire ignited by management actions to meet specific objectives.

Prescribed Fire - Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescription - A set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Programmatic Biological Assessment - Assesses the effects of the fire management programs on Federally listed species, not the individual projects that are implemented under these programs. A determination of effect on listed species is made for the programs, which is a valid assessment of the potential effects of the projects completed under these programs, if the projects are consistent with the design criteria and monitoring and reporting requirement contained in the project description and summaries.

Reburn - Subsequent burning of an area in which fire has previously burned but has left flareable light that ignites when burning conditions are more favorable.

Riparian Habitat Conservation Areas (RHCA) - Portions of watersheds where riparian-dependent resources receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent headwater streams, and other areas where proper ecological functioning is crucial to maintenance of the stream's water, sediment, woody debris, and nutrient delivery systems.

Riparian Management Objectives (RMO) - Quantifiable measures of stream and streamside conditions that define good fish habitat and serve as indicators against which attainment or progress toward attainment of goals will be measured.

Road Density - The volume of roads in a given area (mile/square mile).

Scoping - Identifying at an early stage the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental analysis accordingly.

Seral - Refers to the stages that plant communities go through during succession. Developmental stages have characteristic structure and plant species composition.

Serotinous - Storage of coniferous seeds in closed cones in the canopy of the tree. Serotinous cones of lodgepole pine do not open until subjected to temperatures of 113 to 122 degrees Fahrenheit causing the melting of the resin bond that seals the cone scales.

Stand Replacing Fire - A fire that kills most or all of a stand.

Sub-basin - A drainage area of approximately 800,000 to 1,000,000 acres, equivalent to a 4th - field Hydrologic Unit Code.

Surface Fire - Fire which moves through duff, litter, woody dead and down, and standing shrubs, as opposed to a crown fire.

Watershed - The region draining into a river, river system, or body of water.

Wetline - Denotes a condition where the fireline has been established by wetting down the vegetation.

Wildland Fire - Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP) - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will have two-three stages of the WFIP completed while some fires that receive a suppression response may only have a portion of Stage I completed).

Wildland Fire Situation Analysis (WFSA) - A decision making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Use - The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", which is a broader term encompassing more than just wildland fires.

Wildland Fire Use for Resource Benefit (WFURB) - A wildland fire ignited by a natural process (lightning), under specific conditions, relating to an acceptable range of fire behavior and managed to achieve specific resource objectives.

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