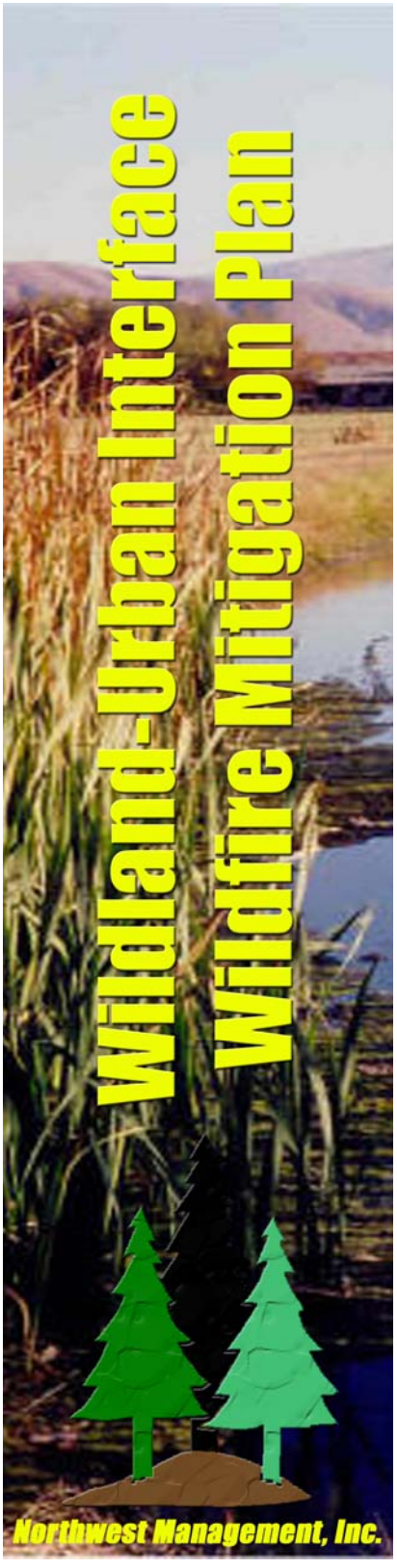

Minidoka County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan

Main Document

October 18, 2004

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

This plan was developed by the Minidoka County Wildland-Urban Interface Wildfire Mitigation Plan Committee in cooperation with Northwest Management, Inc., 233 E. Palouse River Dr. P.O. Box 9748, Moscow, Idaho 83843, Phone: (208) 883-4488, Fax: (208) 883-1098, 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.

Minidoka County Commissioners
and the employees of Minidoka County

Mid-Snake Resource Conservation and Development

USDI Bureau of Land Management

USDA Forest Service

Idaho Bureau of Homeland Security

Federal Emergency Management Agency

Idaho Department of Lands

Minidoka County Fire Protection District
West End Fire Protection District
Rupert Fire Department
&
Local Businesses and
Citizens of Minidoka County

To obtain copies of this plan contact:

Minidoka County Commissioners Office
Minidoka County Courthouse
715 G Street, P.O. Box 368
Rupert, ID 83350
Phone: 208-436-7111
Fax: 208-436-0737

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Chapter I: Overview of this Plan and its Development

1 Introduction

This Wildland-Urban Interface Wildland Fire Mitigation Plan for Minidoka 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 Minidoka County, Idaho. The planning team responsible for implementing this project was led by the Minidoka County Commissioners. Agencies and organizations that participated in the planning process included:

- Minidoka County Commissioners and County Departments
- Idaho Department of Lands
- USDI Bureau of Land Management, Upper Snake River District (also providing funding through the National Fire Plan)
- Idaho Bureau of Disaster Services
- Mid-Snake Resource Conservation and Development
- Minidoka County Fire Protection District
- West End Fire Protection District
- Rupert City Fire Department

The Minidoka County Commissioners, working cooperatively with the Mid-Snake RC&D, solicited competitive bids from companies to provide the service of leading the assessment and the writing of the **Minidoka 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. Established in 1984 NMI provides natural resource management services across the USA. The Project Manager from Northwest Management, Inc. was Dr. William E. Schlosser, a professional forester and regional planner.

1.1 Goals and Guiding Principles

1.1.1 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

1.1.2 Additional State and Federal Guidelines Adopted

The Wildland-Urban Interface Wildfire Mitigation Plan component of this All Hazards Mitigation Plan will include compatibility with FEMA requirements while also adhering to the guidelines proposed in the National Fire Plan, the Idaho Statewide Implementation Plan, and the Healthy Forests Restoration Act (2004). 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.
- Healthy Forests Restoration Act (2004)
- 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 Natural 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**

The objective of combining these four 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 Minidoka County while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

1.1.2.1 National Fire Plan

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 fulfills 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 under estimated, as their input and contribution to all phases of risk assessments, mitigation activities, and project implementation is greatly facilitated by their involvement.

1.1.2.2 Idaho Statewide Implementation Strategy

The Strategy adopted by the State of Idaho is to provide a framework for an organized and coordinated approach to the implementation of the National Fire Plan, specifically the national "10-Year Comprehensive Strategy Implementation Plan".

Emphasis is on a collaborative approach at the following levels:

- County
- State

Within the State of Idaho, the Counties, with the assistance of State and Federal agencies and local expert advice, will develop a risk assessment and mitigation plan to identify local vulnerabilities to wildland fire. A Statewide group will provide oversight and prioritization as needed on a statewide scale.

This strategy is not intended to circumvent any work done to date and individual Counties should not delay implementing any National Fire Plan projects to develop this county plan. Rather, Counties are encouraged to identify priority needs quickly and begin whatever actions necessary to mitigate those vulnerabilities.

It is recognized that implementation activities such as; hazardous fuel treatment, equipment purchases, training, home owner education, community wildland fire mitigation planning, and other activities, will be occurring concurrently with this County wide planning effort.

1.1.2.2.1 County Wildland Fire Interagency Group

Each County within the state has been requested to write a Wildland Fire Mitigation Plan. These plans should contain at least the following five elements:

1) Documentation of the process used to develop the mitigation plan. How the plan was developed, who was involved and how the public was involved.
2) A risk assessment to identify vulnerabilities to wildfire in the wildland-urban interface (WUI).
3) A prioritized mitigation strategy that addresses each of the risks. Examples of these strategies could be: training for fire departments, public education, hazardous fuel treatments, equipment, communications, additional planning, new facilities, infrastructure improvements, code and/or ordinance revision, volunteer efforts, evacuation plans, etc.
4) A process for maintenance of the plan which will include monitoring and evaluation of mitigation activities
5) Documentation that the plan has been formally adopted by the involved agencies. Basically a signature page of all involved officials.

This five-element plan is an abbreviated version of the FEMA mitigation plan and will begin to meet the requirements for that plan. To develop these plans each county should bring together the following individuals, as appropriate for each county, to make up the County Wildland Fire Interagency Group. It is important that this group has representation from agencies with wildland fire suppression responsibilities:

- County Commissioners (Lead)
- Local Fire Chiefs
- Idaho Department of Lands representative
- USDA Forest Service representative
- USDI Bureau of Land Management representative
- US Fish and Wildlife representative
- Bureau of Indian Affairs
- Local Tribal leaders
- Bureau of Disaster Services
- LEPC Chairperson
- Resource Conservation and Development representative
- State Fish and Game representative
- Interested citizens and community leaders as appropriate
- Other officials as appropriate

Role of Resource Conservation and Development Councils (RC&D) If requested by the County Commissioners, the local RC&D's may be available to assist the County Commissioners in evaluating each County within their council area to determine if there is a wildland fire mitigation plan in place, or if a plan is currently in the development phase. If no plan is in place, the RC&D's, if requested, could be available to assist the Commissioners with the formation of the

County Wildland Fire Interagency Group and/or to facilitate the development of wildland fire mitigation plan.

If a plan has been previously completed, the Commissioners will determine if the recommended five elements have been addressed. The Counties will provide a copy of the completed mitigation plan to the Idaho Department of Lands National Fire Plan Coordinator, which will include a contact list of individuals that developed the plan.

1.1.2.3 National Association of State Foresters

1.1.2.3.1 Identifying and Prioritizing Communities at Risk

This plan is written with the intent to provide the information necessary for decision makers (elected officials) to make informed decisions in order to prioritize projects across the entire county. These decisions may be made from within the council of Commissioners, or through the recommendations of ad hoc groups tasked with making prioritized lists of projects. It is not necessary to rank projects numerically, although that is one approach, rather it may be possible to rank them categorically (high priority set, medium priority set, and so forth) and still accomplish the goals and objectives set forth in this planning document.

The following was prepared by the National Association of State Foresters (NASF), 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.

The National Association of State Foresters (NASF) set forth the following guidelines in the Final Draft Concept Paper; Communities at Risk, December 2, 2002.

Task: Develop a definition for "communities at risk" and a process for prioritizing them, per the Implementation Plan for the 10-Year Comprehensive Strategy (Goal 4.e.). In addition, this definition will form the foundation for the NASF commitment to annually identify priority fuels reduction and ecosystem restoration projects in the proposed MOU with the federal agencies (section C.2 (b)).

1.1.2.3.2 Conceptual Approach

1. NASF fully supports the definition of the Wildland Urban Interface (WUI) previously published in the Federal Register. Further, proximity to federal lands should not be a consideration. The WUI is a set of conditions that exists on, or near, areas of wildland fuels nation-wide, regardless of land ownership.

2. Communities at risk (or, alternately, landscapes of similar risk) should be identified on a state-by-state basis with the involvement of all agencies with wildland fire protection responsibilities: state, local, tribal, and federal.
3. It is neither reasonable nor feasible to attempt to prioritize communities on a rank order basis. Rather, communities (or landscapes) should be sorted into three, broad categories or zones of risk: high, medium, and low. Each state, in collaboration with its local partners, will develop the specific criteria it will use to sort communities or landscapes into the three categories. NASF recommends using the publication "Wildland/Urban Interface Fire Hazard Assessment Methodology" developed by the National Wildland/Urban Interface Fire Protection Program (circa 1998) as a reference guide. (This program, which has since evolved into the Firewise Program, is under the oversight of the National Wildfire Coordinating Group (NWCG)). At minimum, states should consider the following factors when assessing the relative degree of exposure each community (landscape) faces.
    - **Risk:** Using historic fire occurrence records and other factors, assess the anticipated probability of a wildfire ignition.
    - **Hazard:** Assess the fuel conditions surrounding the community using a methodology such as fire condition class, or [other] process.
    - **Values Protected:** Evaluate the human values associated with the community or landscape, such as homes, businesses, and community infrastructure (e.g. water systems, utilities, transportation systems, critical care facilities, schools, manufacturing and industrial sites, and high value commercial timber lands).
    - **Protection Capabilities:** Assess the wildland fire protection capabilities of the agencies and local fire departments with jurisdiction.
4. Prioritize by project not by community. Annually prioritize projects within each state using the collaborative process defined in the national, interagency MOU "For the Development of a Collaborative Fuels Treatment Program". Assign the highest priorities to projects that will provide the greatest benefits either on the landscape or to communities. Attempt to properly sequence treatments on the landscape by working first around and within communities, and then moving further out into the surrounding landscape. This will require:
    - First, focus on the zone of highest overall risk but consider projects in all zones. Identify a set of projects that will effectively reduce the level of risk to communities within the zone.
    - Second, determining the community's willingness and readiness to actively participate in an identified project.
    - Third, determining the willingness and ability of the owner of the surrounding land to undertake, and maintain, a complementary project.
    - Last, set priorities by looking for projects that best meet the three criteria above. It is important to note that projects with the greatest potential to reduce risk to communities and the landscape may not be those in the highest risk zone, particularly if either the community or the surrounding landowner is not willing or able to actively participate.
5. It is important, and necessary, that we be able to demonstrate a level of accomplishment that justifies to Congress the value of continuing the current level of appropriations for

the National Fire Plan. Although appealing to appropriators and others, it is not likely that many communities (if any) will ever be removed from the list of communities at risk. Even after treatment, all communities will remain at some, albeit reduced, level of risk. However, by using a science-based system for measuring relative risk, we can likely show that, after treatment (or a series of treatments), communities are at "*reduced risk*".

Similarly, scattered, individual homes that complete projects to create defensible space could be "counted" as "households at reduced risk". This would be a way to report progress in reducing risk to scattered homes in areas of low priority for large-scale fuels treatment projects.

Using the concept described above, the NASF believes it is possible to accurately assess the relative risk that communities face from wildland fire. Recognizing that the condition of the vegetation (fuel) on the landscape is dynamic, assessments and re-assessments must be done on a state-by-state basis, using a process that allows for the integration of local knowledge, conditions, and circumstances, with science-based national guidelines. We must remember that it is not only important to lower the risk to communities, but once the risk has been reduced, to maintain those communities at a reduced risk.

Further, it is essential that both the assessment process and the prioritization of projects be done collaboratively, with all local agencies with fire protection jurisdiction – federal, state, local, and tribal – taking an active role.

1.1.2.4 Healthy Forests Restoration Act

On December 3, 2003, President Bush signed into law the Healthy Forests Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The legislation is based on sound science and helps further the President's Healthy Forests Initiative pledge to care for America's forests and rangelands, reduce the risk of catastrophic fire to communities, help save the lives of firefighters and citizens, and protect threatened and endangered species.

Among other things the Healthy Forests Restoration Act (HFRA):

- Strengthens public participation in developing high priority projects;
- Reduces the complexity of environmental analysis allowing federal land agencies to use the best science available to actively manage land under their protection;
- Creates a pre-decisional objections process encouraging early public participation in project planning; and
- Issues clear guidance for court action challenging HFRA projects.

The Minidoka County Wildland-Urban Interface Wildfire Mitigation Plan is developed to adhere to the principles of the HFRA while providing recommendations consistent with the policy document which should assist the federal land management agencies (US Forest Service and Bureau of Land Management) with implementing wildfire mitigation projects in Minidoka County that incorporate public involvement and the input from a wide spectrum of fire and emergency services providers in the region.

1.1.3 Local Guidelines and Integration with Other Efforts

1.1.3.1 Minidoka County Fire Mitigation Planning Effort and Philosophy

The goals of this planning process include the integration of the National Fire Plan, the Idaho Statewide Implementation Strategy, the Healthy Forests Restoration Act, and 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.

1.1.3.1.1 Mission Statement

To make Minidoka 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.

1.1.3.1.2 Vision Statement

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

1.1.3.1.3 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 Minidoka County
- Strategically locate and plan fuel reduction projects
- Provide recommendations for alternative treatment methods, such as brush density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated fuels
- Meet or exceed the requirements of the National Fire Plan and FEMA for a County level Fire Mitigation Plan

Chapter 2: Planning Process

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.

2.1.1 Description of the Planning Process

The Minidoka 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 Minidoka County. This included an area encompassing Jerome, Cassia, Blaine, Lincoln, Twin Falls and Minidoka Counties to insure a robust dataset for making inferences about fires in Minidoka 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 wildfire specialists, rural fire chiefs and representatives of the BLM.
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. 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). Project Specialist John T. McGee led community and committee involvement efforts. Fire Management specialists Ken Homik and Dennis Thomas coordinated fire mitigation planning recommendations. Together, they led a team of resource professionals that included fire mitigation specialists, wildfire control specialists, resource management professionals, and hazard mitigation experts.

They were the point-people for team members to share data and information with during the plan's development. They and 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 effectively 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.

2.2 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.

2.2.1 News Releases

Under the auspices of the Minidoka County Wildland-Urban Interface Wildfire Mitigation Planning Committee, news releases were submitted to the South Idaho Press and Minidoka County Newspaper. Press releases sent out to four area radio stations KSTA, KZDX, KKMV, KBAR.

2.2.1.1 Radio Messages

A short news release was aired over the KSTA, KZDX, and KKMV and KBAR radio stations the week of July 13, 2004 to announcing the goals of the planning committee, the purpose of the mitigation plan, the date and times of public meetings, and contact information.

2.2.1.2 Public Postings

Notice of the public meetings were posted in the County Courthouse in Rupert, the Heyburn City Hall, The city offices of Paul, and on the doors of the Heyburn City and West End Rural Fire Departments.

2.2.1.3 Newspaper Articles

Committee and public meeting announcements were submitted to the **South Idaho Press** and the **Minidoka County Newspaper**. A newspaper article ran on the front page of the South Idaho Press on August 10th entitled “Minidoka Fire Prevention Plan Nears Completion.” The article outlined the intent of the plan as well as preliminary community assessments and mitigation recommendations for the county. The following is an example of one of the newspaper announcements that was submitted to the local newspaper.

Your Hometown Daily

South Idaho Press

www.southidahopress.com Tuesday, August 10, 2004 50¢ (home delivery 34¢)

Minidoka fire prevention plan nears completion

By ROSE MARIE PARSONS
South Idaho Press

RUPERT — Minidoka County's fire prevention plan which will be essential for approval of grants is nearing completion.

Representatives of Northwest Management, the Moscow consulting firm hired by the county to compile the wildland-urban interface mitigation plan, reported on their progress and presented a list of recommendations to the county commissioners Monday morning.

A survey was mailed July 20 to 240 county residents selected at random. Those who have not returned the survey will be mailed another copy today. The survey responses will be incorporated into the final fire prevention plan, said John McGee, Northwest Management resource advisor.

In addition to the random surveys, meetings will be held Aug. 24, 25 and 26 to gather public comment on the fire plan. The times and locations have not yet been determined.

The consulting company has toured the county to identify the vegetation patterns and to do an overall fuels assessment. It has also studied the history of fire calls throughout the county.

"The primary concern in the county stems from outlying areas where homes and ranches abut expanses of dry grass and rangeland fuels. The adjacency of wildland fuel to homes or farms can lead to economic or property loss.... Generally speaking, the majority of homes in Minidoka County are at low risk to loss from wildfire due to well-planned road construction, gentle topography and isolation of existing native fuels in small islands. However, where homes on the outer periphery of communities abut expanses of dry grass and rangeland fuels, the risk of loss to wildland fire is significantly greater," according to the report prepared for the county officials to review.

Rupert Fire Chief Larry Pool, Minidoka County Fire Protection District Chief Mike Brown and George Falkner, county disaster services director, reviewed a series of maps prepared by Northwest Management.

Areas where Bureau of Land Management property is adjacent to private agricultural land are a concern, said Dennis Thomas, owner of Northwest Management.

West End Fire District, which is bounded roughly by 400 South Road and 350 West Road, has had fires move in from BLM land, Brown said.

Not notifying the fire departments in advance about plans to do a controlled burn is a problem because it results in false alarms, Pool and Brown said.

In these cases, someone sees smoke and calls in a fire. Volunteer firefighters respond, only to find they have left work unnecessarily.

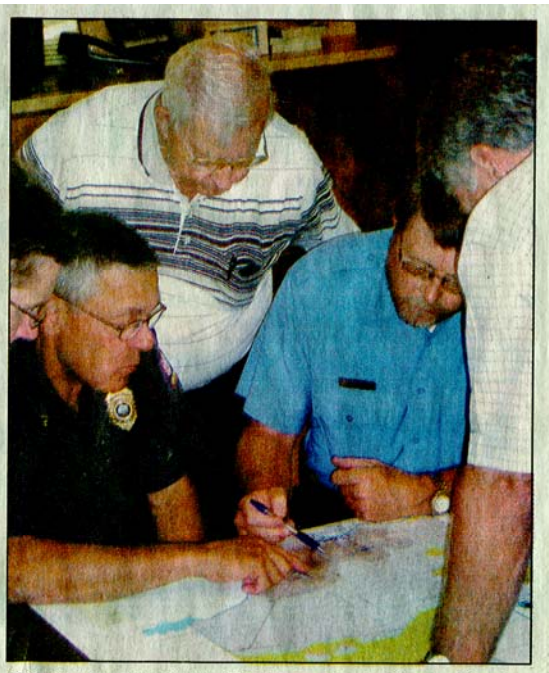
Brown and Pool are the only full time firefighters in the county. Randy Sutton, West End chief, and Terry Tracy, East End chief, have other jobs.

The potential for fires along tracks owned by the Eastern Idaho Railroad and by Northern Pacific Railroad are another area of concern.

Proving the cause of a fire along the railroad tracks can be difficult, Brown said.

The biggest need in building code enforcement is correct addressing. This is especially important for emergency medical responders, Brown said.

"You can usually find a fire by following the smoke," said Brown.



Ken Homik, Rupert Fire Chief Larry Pool, Disaster Services Director George Falkner, Minidoka County Fire Protection District Chief Mike Brown and Dennis Thomas examine the structure density map prepared by Northwest Management. Homik and Thomas met with the county officials on behalf of the company Monday to refine the maps.

2.2.2 Public Mail Survey

In order to collect a broad base of perceptions about wildland fire and individual risk factors of homeowners in Minidoka County, a mail survey was conducted. Using a state and county database of landowners in Minidoka County, homeowners from the Wildland-Urban Interface surrounding each community were identified. In order to be included in the database, individuals were selected that own property and have a dwelling in Minidoka County, as well as a mailing address in Minidoka County. This database created a list of unique names to which was affixed a random number that contributed to the probability of being selected for the public mail survey. A total of 240 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 July 20, 2004, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Minidoka 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 enveloped was included in each packet. A postcard reminder was sent to the non-respondents on July 30, 2004, encouraging their response. A final mailing, with a revised cover letter pleading with them to participate, was sent to non-respondents on August 10, 2004.

Surveys were returned during the months of July and August. A total of 117 residents responded to the survey (as of September 16, 2004 – *this will be updated until the final plan is completed*). No surveys were returned as undeliverable, and two responded that they no longer live in the area. The effective response rate for this survey was 46% (*to date*). Statistically, this response rate allows the interpretation of all of the response variables significantly at the 99% confidence level.

2.2.2.1 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. *Survey information will be updated until the completion of the plan.*

Of the survey respondents, 88% have a home within Minidoka County and consider this home as their primary residence. About 10% of the respondents were from the Acequia area, 18% were from the Heyburn-Burly area, 1% was from the Minidoka area, 3% were from the Norland Area, 20% were from the Paul area, and 37% were from the Rupert area.

Ninety-eight percent of the respondents correctly identified that they have emergency telephone 911 services in their area. Ninety seven percent of the respondents correctly identified that they have structural fire protection, while the remaining 3% identified that they did not have any structural protection. All of these respondents did indeed have structural protection when they thought that they were in an unprotected area.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Approximately 57% of respondents indicated their homes were covered with a composite material (asphalt shingles). About 3% indicated their home were covered with a metal (eg., aluminum, tin) roofing material. Roughly 15% of the respondents indicated they have a wooden roofing material such as shakes or shingles. Three percent of the respondents indicated that they have a ceramic tile roof, and 24% did not indicate what types of roofing material they had.

Residents were asked to evaluate the proximity of brush within certain distances of their homes. Often, the density of brush around a home is an indicator of increased fire risk. The results are presented in Table 2.1

Table 2.1 Survey responses indicating the proximity of brush to homes.

% area in brush	Within 250 feet of your home	Within 75 feet of your home
No brush	76%	84%
Less than 10% of area	13%	9%
Between 10% and 25%	7%	6%
More than 25% of area	4%	2%

Ninety nine percent 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 295 feet long, from their main road to their parking area. Only 4% of the respondents had a driveway over ¼ mile long, with no respondents indicating driveways longer than ½ mile. Of these homes with driveways ¼ mile or more in length, roughly 56% have turnouts allowing two vehicles to pass each other in the case of an emergency. Sixteen percent of the respondents indicate that they have a bridge accessing their property. Of these, 84% indicated that the bridge was adequate to support a heavy fire engine. Approximately 61% of all homeowners indicated they have an alternative escape route, with the remaining 39% indicating only one-way-in and one-way-out.

Nearly all respondents (99%) indicated they have some type of tools to use against a wildfire that threatens their home. Table 2.2 summarizes these responses.

Table 2.2. Percent of homes with indicated fire fighting tools in Minidoka County.
95% – Hand tools (shovel, Pulaski, etc.)
9% – Portable water tank
9% – Stationery water tank
37% – Pond, lake, or stream water supply close
16% – Water pump and fire hose
25% – Equipment suitable for creating fire breaks (bulldozer, cat, skidder, etc.)

Roughly 10% of the respondents in Minidoka County indicated they have someone in their household trained in wildland fire fighting. Approximately 8% 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 ask whether homeowners conduct periodic fire mitigation efforts on their property. Respondents were asked if they conduct a periodic fuels reduction program near their home sites, such as grass or brush burning. Fifty six percent of the respondents indicate that they periodically burn or mow grass and brush in the vicinity of their home. Fourty-eight percent 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 2.3).

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

Table 2.3. Fuel Hazard Rating Worksheet		Rating	Results
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1	73%
	Medium size fuels (brush, large shrubs, small trees)	2	17%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	6%
Slope Hazard	Mild slopes (0-5%)	1	88%
	Moderate slope (6-20%)	2	6%
	Steep Slopes (21-40%)	3	6%
	Extreme slopes (41% and greater)	4	1%
Structure Hazard	Noncombustible roof and noncombustible siding materials	1	41%
	Noncombustible roof and combustible siding material	3	14%
	Combustible roof and noncombustible siding material	7	28%
	Combustible roof and combustible siding materials	10	12%
Additional Factors	Rough topography that contains several steep canyons or ridges	+2	Average -2.3 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.

Fuel hazard __1.3___ x Slope Hazard ____1___ = ____2.3____
Structural hazard + ____4.3__
Additional factors (+ or -) ____-2.3__
Total Hazard Points = ____4.3_.

Table 2.4. Percent of respondents in each risk category as determined by the survey respondents.
00% – Extreme Risk = 26 + points
05% – High Risk = 16–25 points
21% – Moderate Risk = 7–15 points
68% – Low Risk = 6 or less points

Maximum household rating form score was 24 points, as assessed by the homeowners. These numbers were compared to observations made by field crews trained in wildland fire fighting.

These results indicate that for the most part, these indications are only slightly lower than the risk rating assigned by the "professionals".

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?" Approximately 46% of the respondents indicated a desire to participate in this type of training.

Homeowners were also asked, "How do you feel Wildland-Urban Interface Fire Mitigation projects should be funded in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?" Responses are summarized in Table 2.5.

Table 2.5. Public Opinion of Wildfire Mitigation Funding Preferences.

	Mark the box that best applies to your preference		
	100% Public Funding	**Cost-Share (Public & Private)**	**Privately Funded (Owner or Company)**
Home Defensibility Projects	24%	36%	38%
Community Defensibility Projects	58%	33%	6%
Infrastructure Projects Roads, Bridges, Power Lines, Etc.	70%	12%	15%

2.2.3 Committee Meetings

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

- Dan Stapelman .....Minidoka County Commissioner
- Dave Teeter .....Minidoka County Commissioner
- Marvin Bingham .....Minidoka County Commissioner
- Duane Smith .....Minidoka County Clerk
- George Falkner .....Minidoka County Disaster Coordinator
- Curtis Jensen .....Bureau of Land Management
- Julie Thomas.....Mid-Snake RC&D
- John McGee.....Northwest Management, Inc.
- Larry V. Pool .....Rupert City Fire and Rescue
- Mike Brown .....Minidoka County Fire Protection District
- Paul E. Fries Sr. .....Minidoka County Sheriff
- Randy Sutton .....West End Fire Protection District
- Rose Marie Parsons.....South Idaho Press
- Dennis S. Thomas.....Northwest Management, Inc.

- John McGee.....Northwest Management, Inc.
- Ken Homik.....Northwest Management, Inc.
- Toby Brown .....Northwest Management, Inc.
- William E. Schlosser .....Northwest Management, Inc.

Committee Meetings were scheduled and held on the following dates:

March 8, 2004

John McGee opened the meeting with introductions and an overview of the planning process. He also discussed specific information that members of the committee would have to provide to develop a complete mitigation plan. Contact information was exchanged between the committee members.

- Schedule of Meetings: NMI would like to hold one meeting each month until the conclusion of the planning process. The second Monday of every month at 11 am was approved by the committee. (April 12, May 10, etc.) The location of the meetings will change due to the availability of meeting rooms.
- Map Products: NMI developed several GIS maps showing landowners, fire districts, past fires, and fire prone landscapes. The committee reviewed these maps and made corrections. NMI will update the maps for the next meeting. The committee was asked to provide any additional GIS information that may be available to Dr. Schlosser.
- Resources and Capabilities Guide: John explained the type of information that needed to be included in the survey handed out to all of the fire districts. This information will be made into a booklet including 8 ½ by 11 district maps. This will become a summary of available resources that all emergency response agencies will have a copy of.
- Fire Risk Assessments: NMI personnel has made site visits to all of the identified communities in Minidoka County. A summary of observations about the fuels in each community, the access, and potential mitigation treatments will be handed out hopefully at the next meeting. If any of the committee members has past, current, or future fire mitigation projects planned, please provide this information to either directly to John or NMI.
- Public Involvement: John explained the importance of public involvement to the planning process. Committee members were encouraged to invite interested community members to the meetings. The public surveys will be sent out in the next few weeks to gather feedback from residents. The County Assessor's office is supposed to provide a mailing list. Public meetings will also be held to share information and facilitate public input. The committee will be the first to review the draft document, then it goes out for public review. County Commissioners will have the final approval.

April 12, 2004-

Curtis Jensen explained the importance of fund for mitigation and how the plan can be used to show the need for that money in Minidoka County.

Group asked questions about the makeup of the public survey and asked about changes on the maps.

West End asked how the info. would be monitored, ie a farmer on the edge of the WUI.

Curtis said that it would be handled during the implementation agreement and the biggest hurdle now is getting the plan written

Equipment—West Side needs trucks, in conjunction with the new BLM station, could help reduce fire insurance rates, possible to have near HWY 24

Mike Brown talked about recruitment and retention—very costly, liability issues, too many things that people can now do with their time. BLM does not do structural training academy, many states do

Communications—Curtis talked about homeland security issues and narrow band digital, volunteers can, have the capability currently with analog

Water—need more tenders and systems county wide, Comm. Bingham asked who had fire protection for the Youth Ranch—Mike Brown said it is under his agency

July 29, 2004

Ken Homik from NMI toured the Minidoka County Fire Protection District with Curtis Jensen from the BLM and Mike Brown, Chief of the district. Tour highlighted problem areas within the district and included productive discussions of fire-related issues facing Minidoka County FPD and the county at large.

August 9, 2004

John McGee opened the meeting with introductions and a synopsis of the public survey mailing and the distribution of press releases to area newspapers and radio stations.

Ken Homik and Dennis Thomas from NMI updated the committee on revisions to the community assessments for Minidoka County. Homik and Thomas then presented a list of potential mitigation items that had been developed from past committee meetings as well as from discussions with representatives from the local fire districts. The committee reviewed the list and comments and suggestions for modifications were made.

Resources and capabilities for all the districts had been received and were being incorporated into the plan. Resource needs where identified by district and would be integrated into the plan.

Review of critical infrastructure, fire districts boundaries and WUI maps where completed by fire chiefs. Discussion of other assessment tools such as condition class, fire severity and fire prone landscapes were held.

Thomas and Homik spend three hours with Rupert Fire Chief Larry Pool, Disaster Services Director George Falkner, and Minidoka County Fire Chief Mike Brown discussing fire-related issues facing Minidoka County.

August 10, 2004

Ken Homik and Dennis Thomas from NMI toured the West End Fire District with Fire Chief Randy Sutton. The tour of district boundaries and priority areas was proceeded by a lengthy discussion of fire issues within the district as well as review of infrastructure and WUI maps at the station.

September 13, 2004

John McGee opened the meeting with an update of FMP activities to date. The public meetings held on August 23-25 where discussed, as were survey response rates. The bulk of the meeting was spent reviewing the draft version of the FMP. Ken Homik outlined the structure and format of the plan. Discussion centered on the recommendations and activities outlined in Chapter 5 of the plan. Each action was visited with discussion on points that needed

clarification. At the conclusion of the meeting, a time frame for completion and the next steps in the planning process were discussed. Committee members agreed to get all additional comments to NMI by September 17 for incorporation into the plan before the draft plan is released for public review. The county fire chiefs and Ken Homik met after the meeting for further clarification and review of community assessments and action items.

2.2.4 Public Meetings

Public information meetings were held on August 24, 2004 in Paul, August 15, 2004 in Rupert, and August 26, 2004 in Heyburn, Idaho. The purpose of these meetings was to share information on the planning process with a broadly representative cross section of Minidoka County landowners. All 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.

Attendance at the public meetings included eight individuals at Paul, five at the meeting in Rupert, and five at the meeting in Heyburn.

2.2.4.1.1 Paul Public Meeting

August 24, West End Fire Hall- 7:00 to 9:00 PM

2.2.4.1.2 Rupert Public Meeting

August 25, 2004 – Rupert City Fire Department

2.2.4.1.3 Heyburn Public Meeting

August 26, 2004 – Heyburn Fire Station- 7:00 to 9:00 PM

2.2.4.1.4 Meeting Notices

Public notices of these meetings were submitted to the **South Idaho Press** and the **Minidoka County Newspaper.** The notices were asked to run from August 13 to August 27, 2004.

Minidoka County Wildland Urban Interface Wildfire Mitigation Plan

The public is invited to attend meetings and provide input concerning in the Minidoka County Fire Mitigation Plan. The Plan includes risk analysis at the community level with predictive models for where fires are likely to ignite and where they are likely to spread rapidly once ignited. The committee involved includes rural and wildland fire districts, land managers, elected officials, agency representatives, and others.

For more information on the Fire Mitigation Plan or if you have questions contact Northwest Management, Inc. project managers William Schlosser or Dennis Thomas at (208) 883-4488, the Minidoka local coordinator John McGee at (208) 459-8404, or your County Commissioner.

Meeting dates and locations are listed below:

August 24, 2004 7 PM to 9 PM

Paul City Fire Hall

152 S. 600 W

August 25, 2004 7 PM to 9 PM

Rupert City Fire Hall

620 F Street

August 26, 2004 7 PM to 9 PM

Heyburn Fire Station

901 18th Street

2.3 Review of the WUI Wildfire Mitigation Plan

Reviews of sections of this document were conducted by the planning committee during the planning process as maps, summaries, written assessments and mitigation recommendations were completed. These individuals included fire mitigation specialists, fire chiefs, planners, elected officials, BLM representatives and others involved in the coordination process. Preliminary findings were discussed and comments were collected and integrated into the plan.

Public Review of this document was sought from September 21 through October 8, 2004. Written comments, changes, ideas, and suggestions for inclusion were incorporated into the final plan.

The completed plan was adopted by the County Commissioners on October 18, 2004.

Chapter 3: County Characteristics & Risk Assessment

3 Background and Area Description

3.1 Demographics

Minidoka County reported an increase in total population from 19,361 in 1990 to 20,174 in 2000 with approximately 6,994 households. Minidoka County has five incorporated communities, including Heyburn (pop. 2889), Rupert (pop. 5645), Paul (pop. 998), Minidoka (pop. 129) and Acequia (pop. 144). The 2000 census identifies four census tracts in Minidoka County, including Heyburn (pop. 5,297), Rupert (pop. 10,043), Paul (pop. 3,103), and Minidoka (pop. 1.731). Nearly 50% of the total county population resides in Rupert. Unincorporated communities include Norland. The total land area of the county is 762.98 square miles (488,307.2 acres).

Table 3.1 summarizes some relevant demographic statistics for Minidoka County.

Table 3.1 Selected demographic statistics for Minidoka County, Idaho from Census 2000.

Subject	Number	Percent
Total population	20,174	100.0
SEX AND AGE		
Male	10,060	49.9
Female	10,114	50.1
Under 5 years	1,605	8.0
5 to 9 years	1,757	8.7
10 to 14 years	1,781	8.8
15 to 19 years	1,957	9.7
20 to 24 years	1,134	5.6
25 to 34 years	2,297	11.4
35 to 44 years	2,922	14.5
45 to 54 years	2,340	11.6
55 to 59 years	967	4.8
60 to 64 years	771	3.8
65 to 74 years	1,355	6.7
75 to 84 years	995	4.9
85 years and over	293	1.5
Median age (years)	32.9	(X)
18 years and over	13,803	68.4
Male	6,793	33.7
Female	7,010	34.7
21 years and over	12,813	63.5
62 years and over	3,122	15.5
65 years and over	2,643	13.1
Male	1,179	5.8

Table 3.1 Selected demographic statistics for Minidoka County, Idaho from Census 2000.

Subject	Number	Percent
Female	1,464	7.3
RELATIONSHIP		
Population	**20,174**	**100.0**
In households	20,029	99.3
Householder	6,994	34.7
Spouse	4,638	23.0
Child	7,063	35.0
Own child under 18 years	5,864	29.1
Other relatives	803	4.0
Under 18 years	357	1.8
Nonrelatives	531	2.6
Unmarried partner	232	1.1
In group quarters	145	0.7
Institutionalized population	123	0.6
Noninstitutionalized population	22	0.1
HOUSEHOLDS BY TYPE		
Households	**6,994**	**100.0**
Family households (families)	5,394	77.1
With own children under 18 years	2,714	38.8
Married-couple family	4,569	65.3
With own children under 18 years	2,248	32.1
Female householder, no husband present	555	7.9
With own children under 18 years	288	4.1
Nonfamily households	1,600	22.9
Householder living alone	1,397	20.0
Householder 65 years and over	674	9.6
Households with individuals under 18 years	2,922	41.8
Households with individuals 65 years and over	2,571	36.8
Average household size	2.86	(X)
Average family size	3.32	(X)
HOUSING TENURE		
Occupied housing units	**6,973**	**100.0**
Owner-occupied housing units	5,360	76.9
Renter-occupied housing units	1,613	23.1
Average household size of owner-occupied unit	2.88	(X)
Average household size of renter-occupied unit	2.86	(X)

(X) Not applicable

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] In combination with one or more other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.
Source: U.S. Census Bureau, Census 2000 Summary File 1, Matrices P1, P3, P4, P8, P9, P12, P13, P,17, P18, P19, P20, P23, P27, P28, P33, PCT5, PCT8, PCT11, PCT15, H1, H3, H4, H5, H11, and H12.

3.2 Socioeconomics

Minidoka County had a total of 6,973 occupied housing units and a population density of 26.6 persons per square mile reported in the 2000 Census (Table 3.1). Ethnicity in Minidoka County is distributed: white 78.1%, black or African American 0.3%, Asian 0.4%, American Indian or Alaskan Native 0.9%, other race 17.8%, two or more races 2.5%, and Hispanic or Latino 25.5%.

Specific economic data for individual communities is collected by the US Census; in Minidoka County this includes Rupert, Paul, Heyburn, and Minidoka. Minidoka County households earn a median income of $32,021 annually. In 2000, Rupert had a median household income of $30,916 and Minidoka's median income was $31,827, which were below the County median income during the same period. The communities of Paul and Heyburn had median household incomes of $33,023 and $33,391, respectively, in 2000, which are above the Minidoka County median during the same period.

Table 3.2 shows the dispersal of households in various income categories of all communities.

Table 3.2 Income in 1999.	**Minidoka County**	
	Number	**Percent**
Households	6,994	100.0
Less than $10,000	754	10.8
$10,000 to $14,999	633	9.1
$15,000 to $24,999	1,318	18.8
$25,000 to $34,999	1,172	16.8
$35,000 to $49,999	1,434	20.5
$50,000 to $74,999	1,043	14.9
$75,000 to $99,999	387	5.5
$100,000 to $149,999	112	1.6
$150,000 to $199,999	73	1.0
$200,000 or more	68	1.0
Median household income (dollars)	32,021	(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 Minidoka County, a significant number of families are at or below the poverty level. Approximately 11.9% of Minidoka County families are below poverty level (Table 3.3).

Table 3.3 Poverty Status in 1999.	**Minidoka County**	
	Number	**Percent**
Families	**642**	**(X)**
Percent below poverty level	(X)	11.9
With related children under 18 years	522	(X)
Percent below poverty level	(X)	18.0
With related children under 5 years	317	(X)

Table 3.3 Poverty Status in 1999.	Minidoka County	
	Number	Percent
Percent below poverty level	(X)	24.0
Families with female householder, no husband present	**158**	**(X)**
Percent below poverty level	(X)	28.5
With related children under 18 years	134	(X)
Percent below poverty level	(X)	35.4
With related children under 5 years	96	(X)
Percent below poverty level	(X)	61.9
Individuals	**2,960**	**(X)**
Percent below poverty level	(X)	14.8
18 years and over	1,755	(X)
Percent below poverty level	(X)	12.8
65 years and over	231	(X)
Percent below poverty level	(X)	9.0
Related children under 18 years	1,176	(X)
Percent below poverty level	(X)	18.9
Related children 5 to 17 years	768	(X)
Percent below poverty level	(X)	16.6
Unrelated individuals 15 years and over	563	(X)
Percent below poverty level	(X)	26.9

(Census 2000)

The unemployment rate was 4.2% in Minidoka County in 1999, compared to 4.4% nationally during the same period. Approximately 8.6% of the Minidoka County employed population worked in natural resources, with much of the indirect employment relying on the employment created through these natural resource occupations; Table 3.4 (Census 2000).

Table 3.4 Employment & Industry	Minidoka County	
	Number	Percent
Employed civilian population 16 years and over	8,788	100.0
OCCUPATION		
Management, professional, and related occupations	2,180	24.8
Service occupations	1,162	13.2
Sales and office occupations	1,721	19.6
Farming, fishing, and forestry occupations	759	8.6
Construction, extraction, and maintenance occupations	944	10.7
Production, transportation, and material moving occupations	2,022	23.0
INDUSTRY		
Agriculture, forestry, fishing and hunting, and mining	1,457	16.6
Construction	512	5.8
Manufacturing	1,434	16.3
Wholesale trade	449	5.1

Table 3.4 Employment & Industry	Minidoka County	
	Number	Percent
Retail trade	915	10.4
Transportation and warehousing, and utilities	582	6.6
Information	141	1.6
Finance, insurance, real estate, and rental and leasing	354	4.0
Professional, scientific, management, administrative, and waste management services	359	4.1
Educational, health and social services	1,327	15.1
Arts, entertainment, recreation, accommodation and food services	626	7.1
Other services (except public administration)	366	4.2
Public administration	266	3.0

Approximately 77% of Minidoka County's employed persons are private wage and salary workers, while around 11% are government workers (Table 3.5).

Table 3.5 Class of Worker	Minidoka County	
	Number	Percent
Private wage and salary workers	6,646	75.6
Government workers	939	10.7
Self-employed workers in own not incorporated business	1,128	12.8
Unpaid family workers	75	0.9

(Census 2000)

3.2.1 European Settlement of Minidoka County

Information summarized from Minidoka County Area soil survey

Nomadic Indians frequented the area from about 12,000 B.C. until settlement of the area by white people. Traveling in small family groups, the Indians camped along the Snake River in fall to hunt, fish, and find shelter for winter. In spring, they migrated to uplands outside the survey area. In 1811, the Pacific Fur Company ventured into the area. American and French-Canadian trappers frequented the area in the 1820's and 1830's and established roads that were later used by emigrants to Oregon looking for a shorter route across the Snake River Plain.

Settlement of the area began in 1883 with the construction of a railroad that connected to the Union Pacific Railroad. Kimama and Minidoka supply depots were established along the railroad, which also aided in development of the area. Farmers began to irrigate small tracts of land along the Snake River. The Reclamation Service then designed the Minidoka Project, which was completed in 1907. It included construction of an earthen-filled dam on the Snake River with accompanying delivery canals and thus opened more of the area to irrigated farming.

The towns of Rupert, Heyburn, and Acequia were designed and platted. In the 1950's, a deep-well irrigation project managed by the A & B Irrigation District resulted in additional irrigated farmland. Since then, private deep wells have been used to irrigate other areas. The towns of Rupert and Heyburn are the main shopping and industrial centers in the area. Other smaller towns serve as secondary shopping centers for their immediate areas.

3.3 Description of Minidoka County

Minidoka County on the Snake River Plain in south central Idaho is in an area known as the "Magic Valley". This area and a large portion of southern Idaho is typified as a semiarid steppe environment receiving approximately 8-10 inches of precipitation annually. Native vegetation in this climate type consists of 10-15 species of sagebrush and bunchgrasses. The southern region of the county is relatively flat making it ideal for extensive agricultural development. The Bureau of Land Management (BLM) manages much of the northern region, which is primarily covered by barren lava flows. Portions of this historic geological site are included in the Craters of the Moon National Monument. The highest point in the county, 4,360 feet, occurs in the northeast corner, while the lowest point, 4,180 feet, occurs in the southwest corner; an elevational difference of only 180 feet.

The construction of the Minidoka Dam on the Snake River in the southwest corner of the Minidoka County was completed in 1907. This dam and subsequent canals and laterals provide irrigation resources for farmers and ranchers throughout the Minidoka and Burley Irrigation Districts. Continued access to water has led to agricultural development on the majority of privately owned land in the county.

3.3.1 Highways

The main arterials through Minidoka County are Interstate 84 and State Routes 24. Interstate Hwy I-84 traverses the southern part of the county from west to east, passing just north of Heyburn. I-84 provides adequate on-off ramps for easy access and is the main transportation route for the trucking industry in the northwestern section of the United States. I-84 also provides good connections eastward to Salt Lake City and points beyond. State Route 24 connects the southern and northern regions of the county passing through Heyburn, Rupert, Acequia, Minidoka, and Norland. State Routes 25 and 27 are also primary transportation routes through the county. All of these roadways are typically bordered by rangeland or agricultural fields. Heavy large truck traffic is particularly intense during the summer and fall months due to harvesting activities.

3.3.2 Rivers

The only major river is the Snake River, which forms the southern border of the county. During the Great Migration over the Oregon Trail and still today, the Snake River was a large financial entity in Minidoka County providing many recreational and economic resources. Other important bodies of water in the county are Lake Walcott, Milner Reservoir, and a multitude of small streams and springs and irrigation canals.

3.3.3 Temperature

In winter, the average temperature is 28.0 degrees Fahrenheit and the average daily minimum temperature is 18.5 degrees. The lowest temperature on record, which occurred at Paul on January 25, 1949, was -31 degrees. In summer, the average temperature is 67.0 degrees and the average daily maximum temperature is 83.8 degrees. The highest temperature, which occurred at Paul on August 9, 1990, was 104 degrees.

3.3.4 Growing Season

The total average annual precipitation is about 9.62 inches. Of this, about 3.6 inches, or 38 percent, usually falls in May through September. The growing season for most crops falls within this period.

3.3.5 Days of Sunshine

The sun shines 80 percent of the time possible in summer and 45 percent in winter.

3.3.6 Recreation

The Snake River canyon, Craters of the Moon lava fields, and open rangelands provide year-round outdoor opportunities for hunters, fishermen, water and winter sports enthusiasts, picnickers, hikers, campers, sightseers, and students of photography and nature.

Craters of the Moon National Monument and Preserve, part of which extends into northern Minidoka County, contains three major lava fields covering almost half a million acres and a quarter million acres of sagebrush steppe grasslands. The rugged landscape remains remote and largely undeveloped. The Bureau of Land Management maintains a visitor's center and offers daily interpretive programs. Other popular activities include hiking, biking, caving, camping, hunting, backpacking, cross country skiing, and wildlife viewing.

Lake Walcott State Park is a 22 acre park near the Minidoka Dam east of Acequia. The park site lies within Minidoka County; however, most of the associated recreational activities take place in neighboring Blaine or Cassia counties. This park was created by a joint partnership between the Bureau of Reclamation, Idaho State Parks & Recreation, U.S. Fish and Wildlife Service, and the Idaho Youth Ranch. A hydroelectric plant powered by the dam sits on the north bank of the Snake River adjacent to the park. Also, there is a National Wildlife Headquarters office at the park site; however, only a small section of the Minidoka National Wildlife Refuge, which encompasses most of the lake, is actually in Minidoka County. The park offers a boat ramp and docks, restroom facilities, picnic huts and barbeque stands, overnight camping areas, basketball courts, and a small golf course.

Fishing is a favorite activity of many folks in the area. The Snake River, which forms the southern border of the County, has several sportsman access sites for fishing, boating, and sightseeing. The river also offers a multitude of rafting and swimming opportunities.

3.3.7 Resource Dependency

The communities of Minidoka 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 that Heyburn, Paul, Acequia, and Minidoka fall into the "Agriculture Only" dependent community category. Rupert was not listed (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 Minidoka County are summarized in Table 3.6.

Table 3.6. Levels of direct employment by industrial sector

Community	Economic Diversity Index	Agriculture	Timber	Travel and Tourism	State/Local Government	Federal Government	Mining and Minerals
Acequia	Low	High	Low	Low	High	Low	Low
Heyburn	Med. Low	High	Low	Low	Med. Low	Low	Low
Minidoka	Low	High	Low	Low	High	Low	Med. Low

Table 3.6. Levels of direct employment by industrial sector

Community	Economic Diversity Index	Agriculture	Timber	Travel and Tourism	State/Local Government	Federal Government	Mining and Minerals
Paul	Med. High	High	Low	Low	Med. High	Low	Low
Rupert	High	Med. Low	Low	Med. Low	Med. High	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

3.4 Emergency Services & Planning and Zoning

Minidoka County is serviced by enhanced 911 that is dispatched from the Minidoka County Sheriff's department dispatch center. The communications system was upgraded in 2003 with the purchase of two new repeaters and UHF radios. This has helped emergency communications tremendously in Minidoka County.

The Minidoka County Planning & Zoning Commission recognizes the need for improved Road Standards. The Commission is actively researching design standards and plans to recommend that the County adopt standards for new construction that comply with the International Fire Code.

3.4.1 Growth and Development

Minidoka County has a narrow economic base that is heavily dependent on agriculture or a related industry. Of the 486,208 total acres within the county, 300,441 are privately owned (62% of total) and approximately 204,207 (42% of total) are in agricultural production. Potatoes, corn, sugar beets, peas, grain, and alfalfa are commonly grown in the Snake River plains. Commercial cattle raising operations and industries associated with beef production are also widespread. 165,480 of the total acres (34%) in the county are managed by the BLM, some of which has been leased for livestock grazing.

As of 2002 the population was 19,465; however, Minidoka County has reported a slightly decreasing population trend since 1996. Recently, communities throughout south central Idaho have made efforts to diversify their economic base and expand job opportunities to other economic sectors. Minidoka County has been successful in attracting large factories and manufacturing plants including a sugar beet factory in a Paul and a cheese processing facility in Rupert. Per capita income has increased from $14,173 in 1992 to $17,823 in 2002. This is an increase of 30%, ranking Minidoka County 36th out of Idaho's 44 counties in per capita income.

3.5 Cultural Resources

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 brush thinning and prescribed fire.

The United States has a unique legal relationship with Indian tribal governments defined in history, the U.S. Constitution, treaties, statutes, Executive Orders, and court decisions. Since the formation of the union, the United States has recognized Indian tribes as domestic dependant nations under its protection. The Federal Government has enacted numerous regulations that establish and define a trust relationship with Indian tribes.

The relationship between Federal agencies and sovereign tribes is defined by several laws and regulations addressing the requirement of Federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing Federal undertakings, among these are:

- **EO 13175, November 6, 2000**, Consultation and Coordination with Indian Tribal Governments.
- **Presidential Memorandum, April, 1994**. Government-Government Relations with Tribal Governments (Supplements EO 13175). Agencies must consult with federally recognized tribes in the development of Federal Policies that have tribal implications.
- **EO 13007, Sacred sites, May 24, 1996**. Requires that in managing Federal lands, agencies must accommodate access and ceremonial use of sacred sites and must avoid adversely affecting the physical integrity of these sites.
- **EO 12875, Enhancing Intergovernmental Partnerships, October 26, 1993**. Mainly concerned with unfunded mandates caused by agency regulations. Also states the intention of establishing "regular and meaningful consultation and collaboration with state, local and tribal governments on matters that significantly or uniquely affect their communities."
- **Native American Graves Protection and Repatriation Act (NAGPRA) of 1989**. Specifies that an agency must take reasonable steps to determine whether a planned activity may result in the excavation of human remains, funerary objects, sacred objects and items of cultural patrimony from Federal lands. NAGPRA also has specified requirements for notifying and consulting tribes.
- **Archaeological Resources Protection Act (ARPA), 1979**. Requires that Federal permits be obtained before cultural resource investigations begin on Federal land. It also requires that investigators consult with the appropriate Native American tribe prior to initiating archaeological studies on sites of Native American origin.
- **American Indian Religious Freedom Act (AIRFA), 1978**. Sets the policy of the US to protect and preserve for Native Americans their inherent rights of freedom to believe, express, and exercise the traditional religions of the American Indian . . . including, but not limited to access to sacred sites, use and possession of sacred objects, and the freedom to worship through ceremonies and traditional rites.
- **National Environmental Policy Act (NEPA), 1969**. Lead agency shall invite participation of affected Federal, State, and local agencies and any affected Indian Tribe(s).
- **National Historic Preservation Act (NHPA), 1966**. Requires agencies to consult with Native American tribes if a proposed Federal action may affect properties to which they attach religious and cultural significance. (Bulletin 38 of the act, identification of TCPs, this can only be done by tribes.)
- Treaties (supreme law of the land) in which tribes were reserved certain rights for hunting, fishing and gathering and other stipulations of the treaty.
- Unsettled aboriginal title to the land, un-extinguished rights of tribes.

Table 3.7. National Register of Historic Places in Minidoka County, Idaho.					
Item Number	Resource Name	Address	City	Listed	Architect, builder, or engineer
1	Empire School	300 South 50 East	Rupert	2001	
2	Minidoka Dam and Power Plant	S of Minidoka	Minidoka	1974	
3	Rupert Town Square Historic District	Roughly bounded by 7th St., E St., 5th St. and F St	Rupert	2001	

Hazard mitigation activities in and around these sites has the potential to affect historic places. In all cases, mitigation work will be intended to reduce the potential of damaging the site due to natural and man caused disasters. Areas where ground disturbance will occur will need to be inventoried prior to implementation of mitigation activities.

3.6 Transportation

Primary access to and from Minidoka County is provided by Interstate 84 and State Highway 24, both of which are paved roads. Interstate 84 traverses the county from east to west staying 1 or 2 miles north of the Snake River. State Route 24 connects the communities of Rupert, Acequia, Minidoka, and Norland to Interstate 84 and the urban center of Heyburn. State Highway 25 and 27 offer paved connections between the community of Paul and I-84 and Rupert. Smaller roads (many gravel) provide access to the adjoining areas within the county. A variety of trails and unimproved roads are to be found throughout the region, particularly in the more remote northern region near Craters of the Moon National Monument and Preserve.

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

3.7 Agriculture

Prior to development of irrigated farmland, scattered cattle ranchers along the Snake River used the surrounding rangeland for grazing in winter and spring. Dry farming was attempted on the benchland along the Snake River, and a few crops were grown. Because of unfavorable climatic conditions, however, this practice generally was not feasible. The sparse rainfall in the survey area makes irrigation essential for successful farming. The Reclamation Act of 1902 provided funds for construction of reservoirs, canals, and irrigation control structures. By 1907, water was being delivered to the first irrigated farmland. Presently, irrigation water is applied by surface and sprinkler systems.

The main crops grown are small grain, potatoes, sugar beets, and alfalfa hay. Other important crops are dry beans, corn for silage, dry peas, onions, and alfalfa for seed. Some acreage is used for irrigated pasture. The total number of acres used for each crop varies as crop prices fluctuate. Commercial fertilizers and improved varieties have resulted in increased yields.

Some farms have small to large cow-calf, beef cow, sheep, hog, or dairy cow operations. Livestock enterprises provide about 30 percent of the agricultural income in the survey area. The Blaine Soil Conservation District was established in 1954, the Minidoka Soil and Water

Conservation District was established in 1955, and the Wood River Soil Conservation District was established in 1943. These districts serve the area by helping to control water and wind erosion through efficient use of tillage and irrigation water and by promoting agricultural research to increase crop yields and improve rangeland conditions.

3.8 Vegetation & Climate

Vegetation in Minidoka County is primarily agricultural or rangeland ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the rangeland 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 3.8.

The most represented vegetated cover type is a Agricultural Land at approximately 46% of the County's total area. Basin and Wyoming Big Sagebrush is the second most common plant cover type at 30% of the county's total area. Vegetated lava flows represent 9% of the total area while un-vegetated Lava flows represent 6%. Perennial grasslands occupy approximately 6% of the area of the county.

Table 3.8. Cover Types in Minidoka County

	Acres	Percent of County's Total Area
Agricultural Land	224,794	46%
Basin & Wyoming Big Sagebrush	147,133	30%
Vegetated Lava	42,255	9%
Perennial Grassland	31,686	6%
Lava	29,412	6%
Low Sagebrush	6,488	1%
Water	2,155	0%
High Intensity Urban	1,488	0%
Low Intensity Urban	1,251	0%
Disturbed, High	640	0%
Shrub Dominated Riparian	592	0%
Wet Meadow	453	0%
Deep Marsh	153	0%
Broadleaf Dominated Riparian	97	0%
Mixed Barren Land	91	0%
Disturbed, Low	55	0%
Graminiod or Forb Dominated Riparian	33	0%
Shallow Marsh	27	0%
Foothills Grassland	19	0%
Bitterbrush	8	0%
Shrub/Steppe Annual Grass-Forb	6	0%

Vegetative communities within the county follow the strong moisture and temperature gradient related to the major river drainages. Limited precipitation and soil conditions result in a relatively arid vegetated environment.

3.8.1 Rangeland

Rangeland is generally divided into winter, spring/fall, and summer range depending upon elevation and location. Over 45% of land in Minidoka County are classified as rangeland. The Bureau of Land Management (BLM) and State of Idaho administer the majority of the public lands in the County. Range fires occur frequently in the Snake River Plains during summer. When this happens the land is usually seeded to select grasses in the fall so better forage is obtained.

3.8.2 Monthly Climate Summaries in Minidoka County

3.8.2.1 Craters of the Moon (102260)

Period of Record Monthly Climate Summary

Period of Record : 12/1/1958 to 3/31/2004

Table 3.9 Climate records for Craters of the Moon National Monument.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	28.8	33.7	41.7	53.3	64.7	74.5	84.6	82.9	71.8	59.2	40.4	29.9	55.5
Average Min. Temperature (F)	10.4	14.0	20.7	28.3	37.0	44.7	52.2	50.4	41.1	31.4	20.5	11.4	30.2
Average Total Precipitation (in.)	2.12	1.57	1.23	1.09	1.65	1.22	0.68	0.84	0.84	0.86	1.34	1.90	15.34
Average Total SnowFall (in.)	22.0	17.4	9.2	5.2	2.1	0.0	0.0	0.0	0.4	1.6	10.7	20.5	89.2
Average Snow Depth (in.)	20	25	18	3	0	0	0	0	0	0	2	11	7

Percent of possible observations for period of record. Max. Temp.: 95.2% Min. Temp.: 95.5% Precipitation: 96.6% Snowfall: 95.7% Snow Depth: 91.9%

3.8.2.2 Minidoka, Idaho (105972)

Period of Record Monthly Climate Summary

Period of Record : 10/1/1966 to 4/30/1988

Table 3.10 Climate records for Minidoka, Idaho (Minidoka County).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	32.3	39.6	48.7	58.3	67.3	77.4	87.1	85.7	75.2	63.2	45.9	35.6	59.7
Average Min. Temperature (F)	12.5	17.7	23.6	29.1	36.7	43.6	49.1	45.9	37.2	28.7	22.3	15.5	30.2
Average Total Precipitation (in.)	1.08	0.84	0.90	0.86	1.10	0.90	0.42	0.29	0.68	0.69	0.93	0.80	9.49
Average Total SnowFall (in.)	5.9	3.2	3.7	1.2	0.4	0.0	0.0	0.0	0.0	0.1	2.2	6.0	22.7
Average Snow Depth (in.)	1	1	1	0	0	0	0	0	0	0	0	1	0

Percent of possible observations for period of record. Max. Temp.: 78.5% Min. Temp.: 78.5% Precipitation: 81.3% Snowfall: 78.9% Snow Depth: 71.2%

3.8.2.3 Minidoka Dam, Idaho (105980)

Period of Record Monthly Climate Summary

Period of Record : 5/ 2/1947 to 3/31/2004

Table 3.11 Climate records for Minidoka Dam, Idaho (Minidoka County).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	34.4	40.4	49.5	59.3	68.8	78.3	88.1	86.9	76.9	63.9	46.9	36.3	60.8
Average Min. Temperature (F)	16.5	20.7	26.8	33.2	41.3	48.7	55.5	54.1	45.4	35.6	26.7	19.1	35.3
Average Total Precipitation (in.)	1.02	0.74	0.85	0.89	1.11	0.86	0.31	0.44	0.58	0.65	0.97	0.96	9.39
Average Total SnowFall (in.)	7.6	4.0	3.0	1.0	0.2	0.0	0.0	0.0	0.0	0.5	2.5	5.9	24.7
Average Snow Depth (in.)	2	2	1	0	0	0	0	0	0	0	0	1	0

Percent of possible observations for period of record. Max. Temp.: 96.6% Min. Temp.: 96.6% Precipitation: 96.6% Snowfall: 96% Snow Depth: 95.1%

3.8.2.4 Paul, Idaho (106877)

Period of Record Monthly Climate Summary

Period of Record : 8/ 1/1948 to 3/31/2004

Table 3.12 Climate records for Paul, Idaho (Minidoka County).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.3	41.5	50.0	59.4	68.6	77.8	87.4	86.6	76.4	64.0	47.7	37.4	61.0
Average Min. Temperature (F)	16.8	21.1	26.2	32.2	40.3	47.3	53.0	50.6	41.8	32.6	25.1	18.7	33.8
Average Total Precipitation (in.)	1.04	0.75	0.82	0.86	1.25	0.92	0.36	0.43	0.58	0.67	0.96	1.00	9.63
Average Total SnowFall (in.)	5.7	2.6	2.0	0.9	0.3	0.0	0.0	0.0	0.0	0.2	1.9	5.1	18.8
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.: 99.3% Min. Temp.: 99.4% Precipitation: 99.3% Snowfall: 98.1% Snow Depth: 93.5%

3.9 Wildfire Hazard Profiles

3.9.1 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 July, 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).

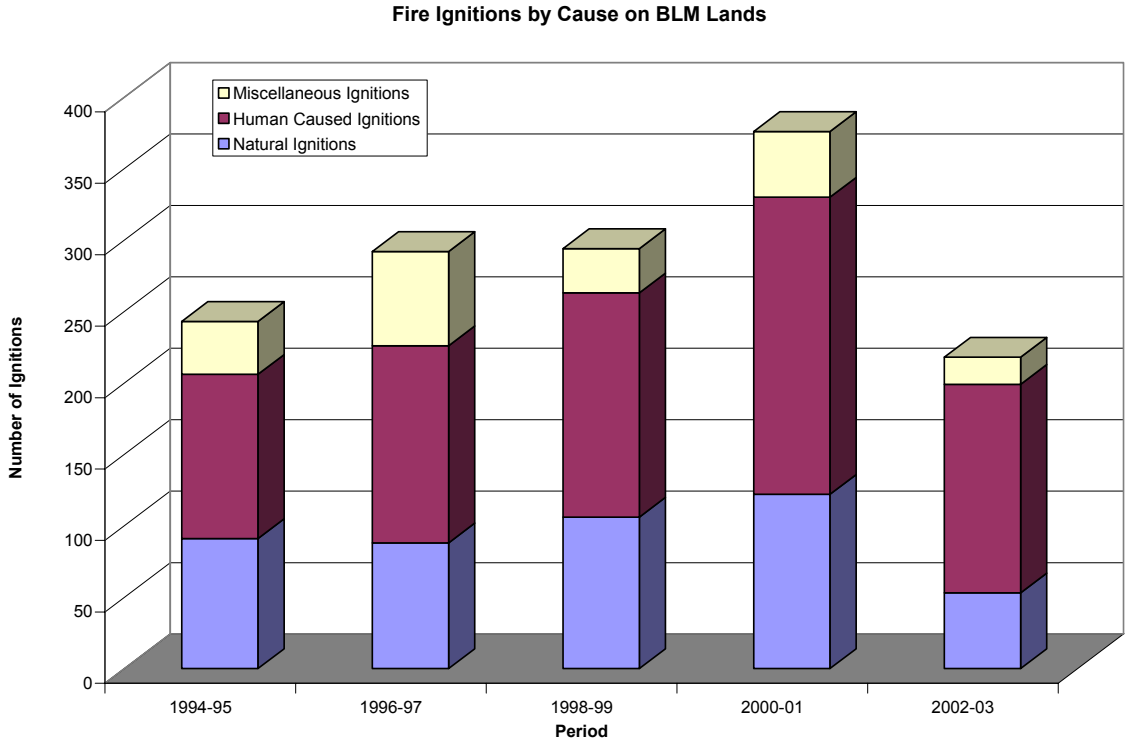
Detailed records of fire ignition and extent have been compiled by the Bureau of Land Management, Upper Snake River District.

The following (Table 3.13) is a summary of fire ignitions as recorded by the Bureau of Land Management Upper Snake River for the period 1983-2002.

Table 3.13. Wildfire ignitions recorded by the BLM Upper Snake River District 1994-2003.

Cause	Cause Code	1994-95	1996-97	1998-99	2000-01	2002-03	% of Ignitions
Natural	1	91	88	106	122	53	28.9%
Campfires	2	4	4	2	7	6	1.4%
Smoking	3	1	0	1	1	2	0.3%
Fire Use	4	20	27	30	11	15	6.5%
Incendiary	5	6	1	5	27	12	3.2%
Equipment	6	28	20	51	81	46	14.2%
Railroads	7	17	18	26	18	13	5.8%
Juveniles	8	2	2	7	9	4	1.5%
Miscellaneous	9	37	66	31	46	19	12.5%
Non-Specific Human Caused		0	0	4	8	29	2.6%
Sub-Total (All Human Caused)		115	138	157	208	146	48.0%
Not Classified		77	110	110	45	27	
Total All Fire Ignitions		**283**	**336**	**373**	**375**	**226**	

Figure 3.1. Bureau of Land Management Upper Snake River Wildfire Ignition Profile.



3.9.2 Wildfire Extent Profile

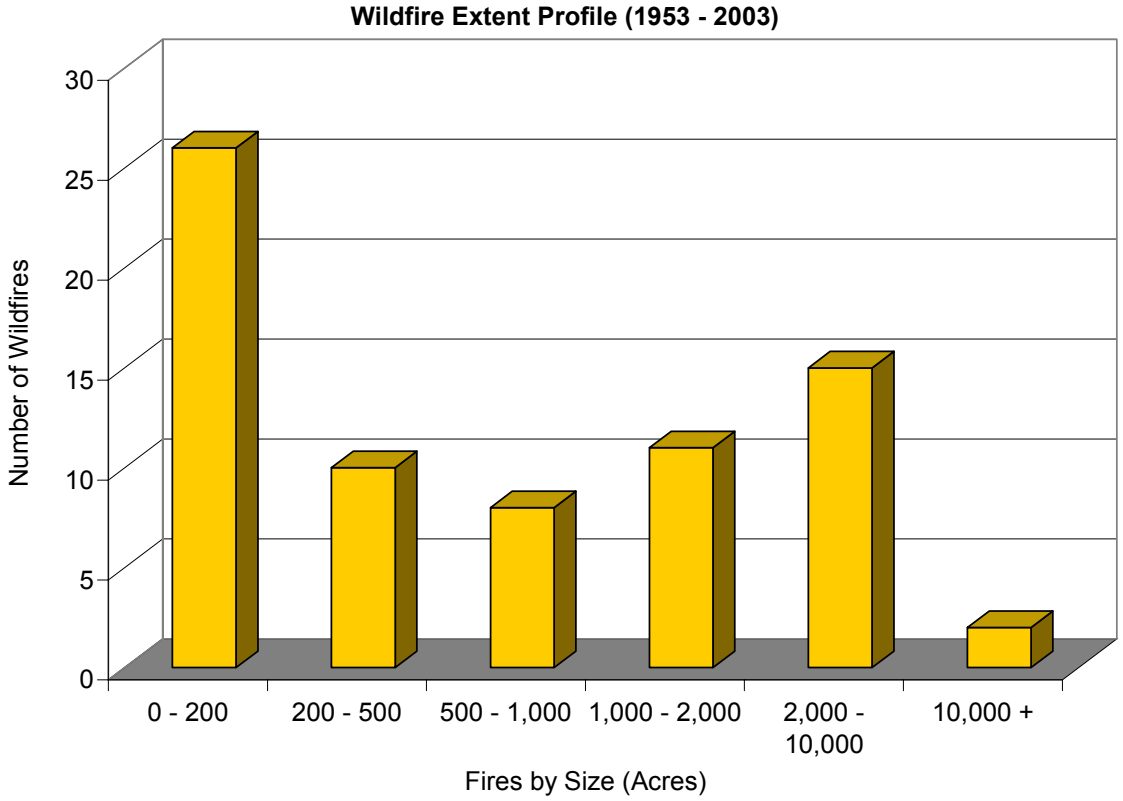
Data on wildfire extent has been collected by the Bureau of Land Management. Within Minidoka County, the data indicates that approximately 193,500 acres have burned within this period during large fire events. Figure 3.3 summarizes the number of large fires according to the number of acres burned in that event. About one-third (36%) of the large fires in the county have been contained under 200 acres. Approximately 14% have grown to 500 acres, 11% to 1,000 acres, 15% to 2,000 acres, and 21% have grown to 10,000 acres. The remaining 3% of all large fires have grown to over 10,000 acres with the Split Lake fire reaching 61,574 acres (1981). Additional wildfires exceeding 2,000 acres are summarized in Table 3.14 (data provided by the BLM).

Table 3.14. Wildfires exceeding 2,000 acres in Minidoka County, Idaho.

Year	Fire Name	Acres Burned
1981	Split Lake	61,574
1992	Black Ridge	24,818
1999	Mule Butte	9,909
1992	Great Rift	9,633
1986	Brigham Point	8,555
1983	German Lake	7,370
1999	Whiskey Butte	7,183
1986	Norland N8	6,131
1983	Whiskey Butte	6,115

Table 3.14. Wildfires exceeding 2,000 acres in Minidoka County, Idaho.		
Year	**Fire Name**	**Acres Burned**
1974	Hynes	4,026
1983	School	3,976
1972	Split Butte	3,464
1983	Norland N	2,632
1999	Brigham Point	2,600
1991	German Lake	2,314
2001	SCHODDE 1	2,184
1995	Bear Trap	2,110

Figure 3.2. Wildfire Extent Profile in Minidoka County, 1953-2003.



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 3.15). By most informed accounts, the 2003 totals will be significantly higher in terms of acres burned and cost.

Table 3.15. 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**

Table 3.15. National Fire Season 2002 Summary	
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 3.16 and 3.17 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 Minidoka County.

Table 3.16. 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 3.17. 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 throughout southern Idaho, the vast majority of fires in Minidoka 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 rural fire districts, including Minidoka County and West End Fire Protections Districts provide primary wildland fire suppression throughout their district boundaries. Rural districts work in close collaboration with the Upper Snake River BLM. The BLM maintains mutual aid agreements with all rural districts. Quick initial attack by rural district resources coupled with the sizable capabilities of the BLM help to reduce the occurrence of large wildland fires in the county.

3.10 Analysis Tools and Techniques to Assess Fire Risk

Minidoka County and the adjacent counties of Jerome and Twin Falls Counties, 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 by specialists from Northwest Management, Inc. were assisted by fire suppression personnel from rural districts and the BLM. The incorporation of local knowledge into the assessment process provided insight in identifying risk factors and developing treatment options.

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

3.10.1 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. The goal of developing the Fire Prone Landscapes analysis is to make inferences about the relative risk factors across large geographical regions (multiple 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.

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).

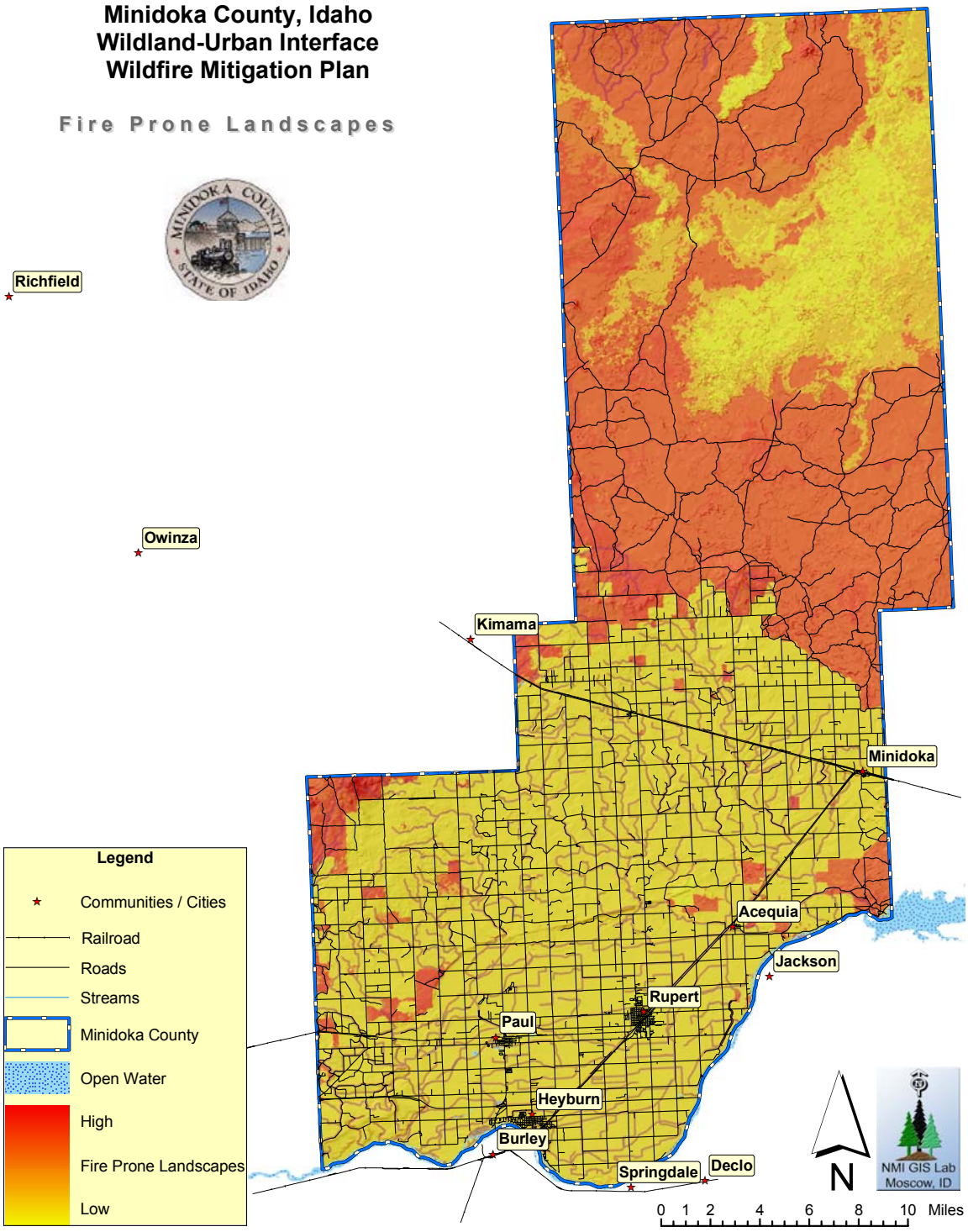
Riparian Zones: Riparian zones were derived from stream layers created during the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

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 Sawtooth National Forest and the Bureau of Land Management.

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 a 10 meter square 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 Minidoka County was 94 with a low of 8.

Figure 3.3. Fire Prone Landscapes in Minidoka County.



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

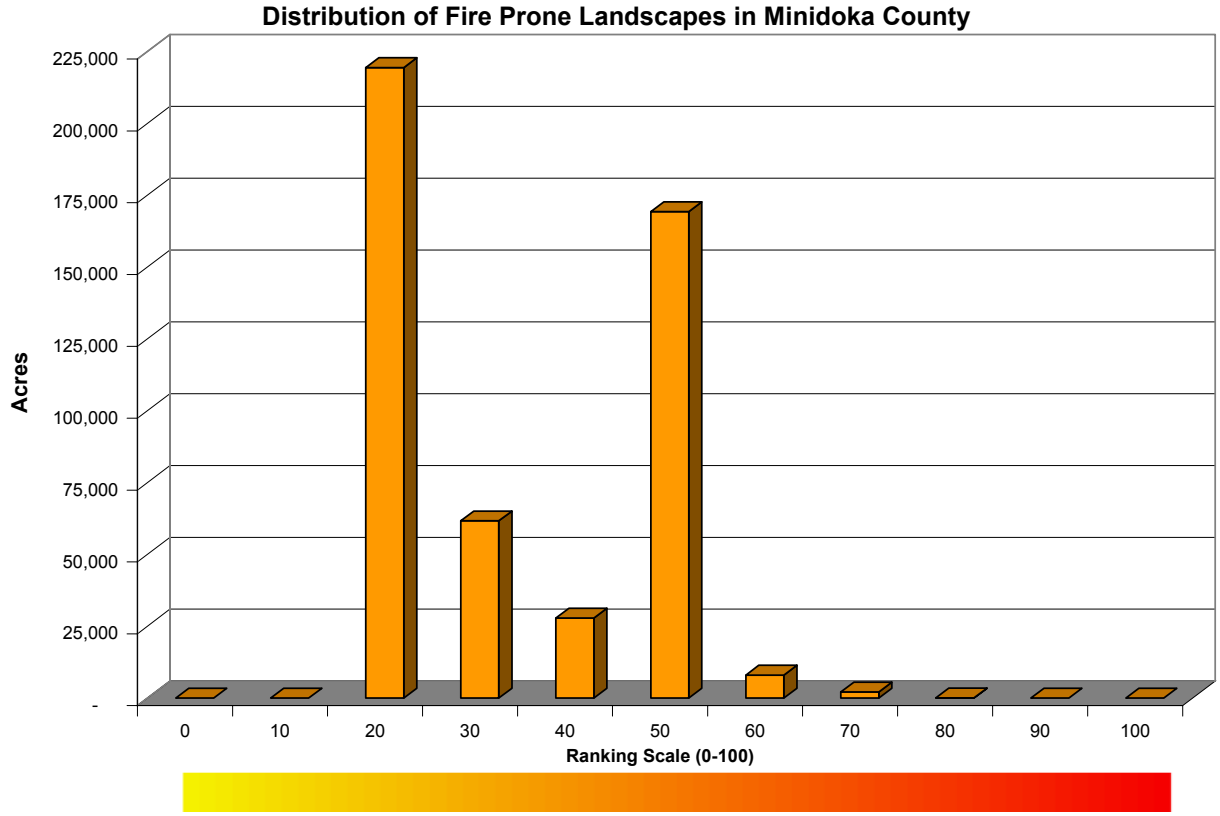
The maps depicting these risk categories display yellow as the lowest risk and red as the highest with values between a constant gradient from yellow to orange to red (Table 3.18).

While large maps (16 square feet) have been provided as part of this analysis, smaller size maps are presented in Appendix I.

Table 3.18. Fire Prone Landscape rankings and acres in each category for Minidoka County.

Color Code	Value	Total Acres	Percent of Total Area
	0	-	0%
	10	-	0%
	20	219,462	45%
	30	61,731	13%
	40	27,861	6%
	50	169,318	35%
	60	8,041	2%
	70	2,144	0%
	80	95	0%
	90	-	0%
	100	-	0%

Figure 3.1: Distribution of area by Fire Prone Landscape Class.



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.

3.10.2 Fire Regime Condition Class

The US Forest Service has provided their assessment of Fire Regime Condition Class for the forest and rangeland areas of Minidoka County to this WUI Fire Mitigation Plan analysis. These measures of vegetative conditions are the standard method of analysis for the USDA Forest Service.

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy *et al.* (2001) and Schmidt *et al.* (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);

II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);

IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);

V – 200+ year frequency and high (stand replacement) severity.

As scale of application becomes finer these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained.

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped by Hardy *et al.* (2001) and Schmidt *et al.* (2001) (FRCC). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy *et al.* 2001, Schmidt *et al.* 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other

associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), "high graded" forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that reduce grassy fuels across relatively large areas at levels that will not carry a surface fire. Determination of the amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the fire regime condition class. A simplified description of the fire regime condition classes and associated potential risks are presented in Table 3.17. Maps depicting Fire Regime and Condition Class are presented in Appendix I.

Table 3.19. Fire Regime Condition Class Definitions.

Fire Regime Condition Class	Description	Potential Risks
Condition Class 1	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.
Condition Class 2	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.
Condition Class 3	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

An analysis of Fire Regime Condition Class in Minidoka County shows that only 2 acres of the County is in Condition Class 1 (low departure), just about 40% is in Condition Class 2 (moderate departure), with an additional 2,150 acres in Condition Class 3 (Table 3.20).

Table 3.20. FRCC by area in Minidoka County.

Condition Class		Acres	Percent of Area
1	low	2,148	0%
2	moderate	196,595	40%
3	high	2	0%
4	agriculture	216,300	44%
5	rock/barren	68,021	14%
7	urban	3,969	1%
8	water	1,813	0%

See Appendix I for maps of Fire Regime and Conditions Class.

3.10.3 Predicted Fire Severity

Current fire severity (CFS) is an estimate of the relative fire severity if a fire were to burn a site under its current state of vegetation. In other words, how much of the overstory would be removed if a fire were to burn today. The US Forest Service (Flathead National Forest) did not attempt to model absolute values of fire severity, as there are too many variables that influence fire effects at any given time (for example, temperature, humidity, fuel moisture, slope, wind speed, wind direction).

The characterization of likely fire severity was based upon historic fire regimes, potential natural vegetation, cover type, size class, and canopy cover with respect to slope and aspect. Each cover type was assigned a qualitative rating of fire tolerance based upon likely species composition and the relative resistance of each species to fire. The US Forest Service researchers defined 3 broad classes of fire tolerance: high tolerance (<20 percent post-fire mortality); moderate tolerance (20 to 80 percent mortality); and low tolerance (>80 percent mortality). We would expect that fires would be less severe within cover types comprised by species that have a high tolerance to fire (for example, western larch and ponderosa pine). Conversely, fires would likely burn more severely within cover types comprised by species having a low tolerance to fire (for example grand fir, subalpine fir). Data assignments were based upon our collective experience in the field, as well as stand structure characteristics reported in the fire-history literature. For example, if they estimated that a fire would remove less than 20 percent of the overstory, the current fire severity would be assigned to the non-lethal class (that is, NL). However, if they expected fire to remove more than 80 percent of the overstory, the current fire severity was assigned to a stand replacement class (that is, SR or SR3).

3.10.3.1 Purpose

Fire is a dominant disturbance process in the Snake River Plain. The likely effect of fire upon vegetation (i.e., current fire severity) is critical information for understanding the subsequent fire effects upon wildlife habitats, water quality, and the timing of runoff. There have been many reports of how fire suppression and range management activities have affected vegetation patterns, fuels, and fire behavior. The US Forest Service researchers from the Flathead National Forest, derived the current fire severity theme explicitly to compare with the historical

fire regime theme to evaluate how fire severity has changed since Euro-American settlement (that is, to derive fire-regime condition class).

3.10.3.2 General Limitations

These data were designed to characterize broad scale patterns of estimated fire severity for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Although the resolution of the CFS theme is 90 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

Current fire severity rule-set was developed for an "average burn day" for the specific vegetation types in our area. Any user of these data should familiarize themselves with the rule sets to better understand our estimate of current fire severity.

Table 3.21. Predicted Fire Severity by area in Minidoka County.

Predicted Fire Severity		Acres	Percent of Area
3	Mixed severity, long	258	0%
5	Stand replacement	1,673	0%
6	Non-forest std replc, shr	126,554	26%
8	Non-forest std replc, mod	70,259	14%
10	Agriculture	216,300	44%
11	Rock / barren	68,021	14%
13	Urban	3,969	1%
14	Water	1,813	0%

See Appendix I for a map of Predicted Fire Severity.

3.10.4 On-Site Evaluations

County fire suppression personnel, representatives from the BLM and specialists from NMI evaluated the communities of Minidoka 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. 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.

3.10.5 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 Minidoka County have all been intricately involved in wildland fire fighting and the incident command system. They made ocular estimates of fuel models

encountered in the field. These estimates are generalizations, as fuel characteristics vary considerably over the landscape. A detailed, county-wide fuels assessment and mapping project would be extremely time consuming and beyond the scope of this project.

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.

3.10.5.1 Grass Group

3.10.5.1.1 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, ¼-inch, tons/acre 0.74
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 1.0

3.10.5.1.2 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 an 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, ¼-inch, tons/acre 2.0
Live fuel load, foliage, tons/acre 0.5
Fuel bed depth, feet 1.0

3.10.5.1.3 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 NFDRS 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, ¼-inch, tons/acre 3.0
Live fuel load, foliage tons/acre 0
Fuel bed depth, feet 2.5

3.10.5.2 Shrub Group

3.10.5.2.1 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 NFDRS 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, ¼-inch, tons/acre 5.0
Live fuel load, foliage, tons/acre 5.0
Fuel bed depth, feet 6.0

3.10.5.2.2 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 NFDRS fuel model is represented, but model 5 can be considered as second choice for NFDRS model D or as third choice for NFDRS 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, ¼-inch, tons/acre 1.0
Live fuel load, foliage, tons/acre 2.0
Fuel bed depth, feet 2.0

3.10.5.2.3 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

3.10.5.2.4 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, ¼-inch, tons/acre 1.1
Live fuel load, foliage, tons/acre 0.4
Fuel bed depth, feet..... 2.5

3.10.5.3 Timber Group

3.10.5.3.1 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 humilities, 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, ¼-inch, tons/acre 1.5
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet..... 0.2

3.10.5.3.2 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, ¼-inch, tons/acre 2.9
Live fuel load, foliage, tons/acre 0
Fuel bed depth, feet 0.2

3.10.5.3.3 Fire Behavior Fuel Model 10

The fires burn in the surface and ground fuels with greater fire intensity than the other timber little 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, ¼-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 wind speed at mid-flame height is 5 mi/h (8 km/h):

Table 3.22. Comparative Fire Intensities and Rates of Spread in Timber Fuel Models.

Fuel Model	Rate of Spread Chains/hour	Flame length 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.

3.10.5.4 Logging Slash Group

3.10.5.4.1 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

3.10.5.4.2 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

3.10.5.4.3 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 I 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 3.23.

Table 3.23. 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

3.11 Wildland-Urban Interface

3.11.1 People and Structures

The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where rangeland fuels meet urban or agricultural fuels. Reducing the 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 danger by creating defensible areas around them and taking other measures to minimize the 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 against other hazard risks. (Norton 2002).

By reducing hazardous fuel loads, brush densities and fine fuels and creating or maintaining 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 range or agricultural fires entering or leaving the area;
- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI.
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Four wildland-urban interface conditions have been identified for use in wildfire control efforts (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 Minidoka County have been mapped and are presented on a variety of maps in this 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 information provided by fire district and other county personnel in developing areas.

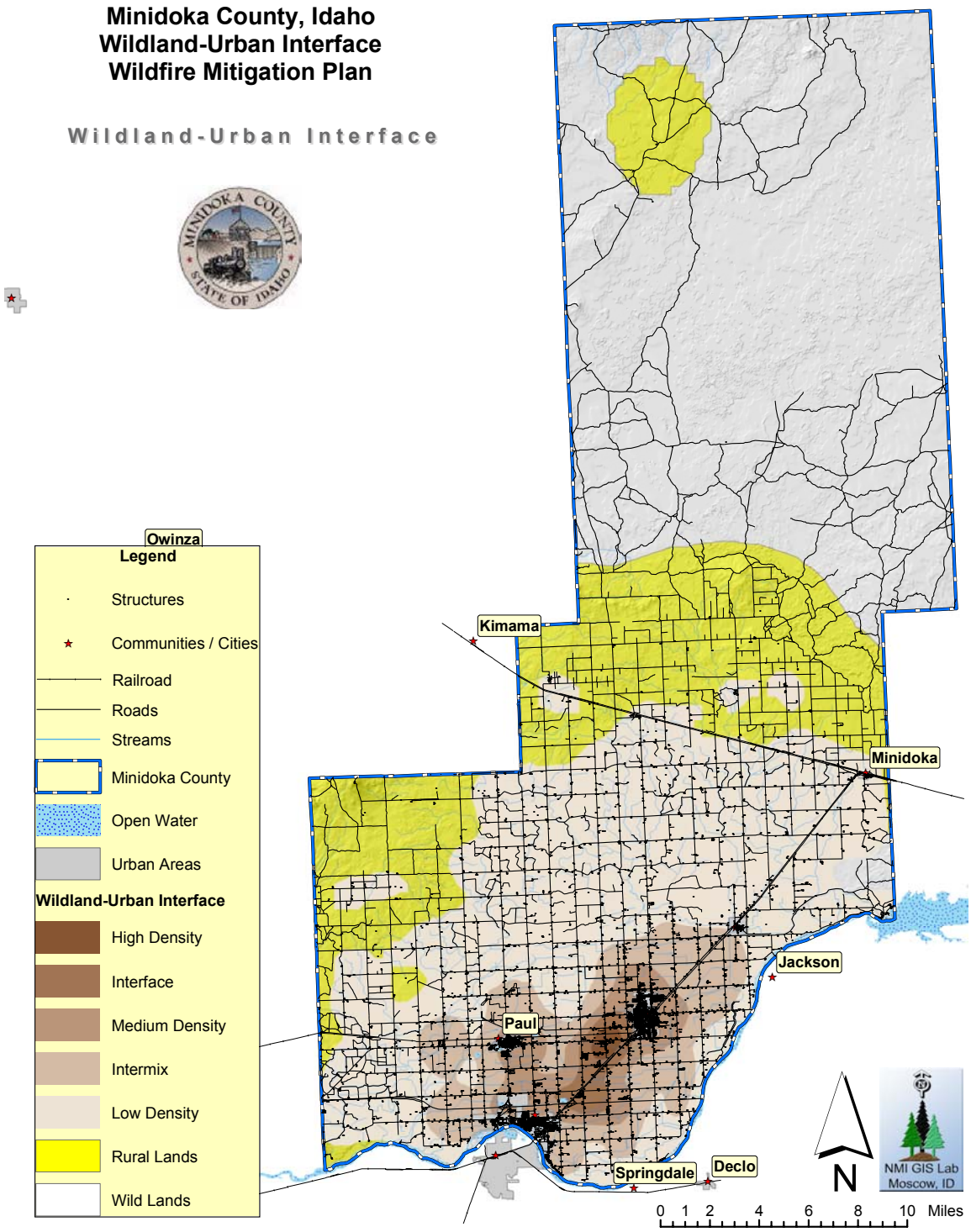
All structures are represented by a “dot” on the map. No differentiation is made between a garage and a home, or a business and a storage building. The density of structures and their specific locations in this management area are critical in defining where the potential exists for casualty loss in the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

Figure 3.4. Wildland-Urban Interface of Minidoka County.



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

3.11.2 Infrastructure

There are multiple infrastructure resources that are potentially at risk to wildland fire in Minidoka County. Damage of infrastructure may be temporary and isolated, only impacting small areas for short periods of time. However, in many cases, the consequence of damage or destruction of major resources would impact the safety, economy and way of life for tens of thousands of people throughout the intermountain and northwest regions.

3.11.2.1 Power Transmission Lines

Primary, secondary, and feeder power lines pass through residential, agricultural and rangland areas throughout the county. Those at greatest risk to direct impact from fires are those that are supported by wooden poles that can easily catch fire in the event of a fire. In many cases, the wooden telephone or power poles can be extinguished before the integrity of the pole is significantly compromised. However, damage to transformers and other power components may result. During large wildland incidents when hundreds or thousands of poles may catch fire, significant numbers of poles may fail, leading to downed lines and significant safety risks. These lines provide power throughout the region and destruction of damage of these lines would significantly interrupt day-to-day life for thousands. Repair times and power outages would be proportional to the scale of the event.

3.11.2.2 Railroads

Both the Union Pacific and Eastern Idaho Railroads maintain lines through Minidoka County. The rail lines are generally not at great risk to the effects of wildland fire due to the gravel right-of-way associated with the tracks. There is a potential for disruption of rail service where wooden bridges and support structures are adjacent to wildland fuels. The creosote treatment of these support structures is highly flammable and quite prone. Thus it is possible for rail transport to be disrupted due to wildland fire.

Rail lines often contribute to wildland fire occurrence along their right-of-way. Numerous fires are sparked along rail lines throughout Minidoka County each year. Although new technologies have significantly reduced the occurrence of railroad fires over time, malfunctioning brakes and other components are frequently responsible for fire ignitions. When vegetation is allowed to accumulate along the right-of-way, the probability of fires associated with the railroad increases dramatically. Frequently, multiple fires over miles of railroad result from a component malfunction.

3.11.2.3 Primary and Secondary Roads

Primary and secondary roads are generally not at risk of damage by wildland fire. However, fires frequently disrupt travel and commerce due to impaired visibility and suppression activities. Large fires can cause prolonged road closures with a notable impact to inter-county and interstate travel.

Smoke from any type of fire, wildland or agricultural, can pose significant risks public safety. Obscured vision can lead to collisions that can result in accidents with significant economic cost and a possible loss of life. Smoke from an agricultural burn was a cited as a contributing factor in a twenty-one car pile up on Interstate 84in western Minidoka County this past year. Amazingly, no serious injuries occurred. However, caused major delay and resulted in a tremendous financial and emotional cost.

As discussed previously, numerous fires are sparked along roads throughout the county each year, particularly along Interstate 84. The frequency of roadway fires demonstrates the need for roadway treatments to reduce the flammability of vegetation immediately adjacent to the road right-of-way.

3.11.2.4 Water Resources

Irrigation water originates from seasonal runoff and the Snake River Plain aquifer. Water stored in Jackson and Walcott Lakes and in American Falls and Palisades Reservoirs is managed by the Minidoka Irrigation District. The A & B Irrigation District and deep private wells supply irrigation water to a majority of the irrigated farmland.

Wells in the Snake River Plain aquifer supply water for domestic, municipal, and industrial uses. Stock water on the rangeland is obtained from streams, springs, and wells. Wells in the northern part of the county generally are deeper than those close to the Snake River. Generally, these water resources are at little direct threat from sedimentation or other secondary effects associated with wildland fire.

3.11.3 Ecosystems

Minidoka County is a diverse ecosystem with a complex array of vegetation, wildlife, and fisheries that have evolved with fire as a natural disturbance process. Introduction of non-native plant species such as cheatgrass, overgrazing and past land-use practices has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, rangelands in Minidoka 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 fires have the potential to seriously damage soils and native vegetation.

Recently, there has been considerable concern regarding the plight of the Sage Grouse. The sage-grouse is one of North America's most spectacular birds. As its name suggests, sage grouse a sage brush obligate species, solely dependant on healthy sage grasslands habitat, which was once abundant throughout the West. Sagebrush provides the birds' primary source of food and shelter, and offers a setting for the birds' traditional courting ritual. In 2000 the U.S. Fish and Wildlife Service designated the Gunnison sage-grouse a "candidate" for the Endangered Species list, having disappeared from most of its historic habitat. The greater sage-grouse has also experienced significant range and population reductions in many areas. These concerns necessitate consideration prior to the implementation of any projects that may further reduce sage grouse habitat.

Large wildland fires also reduce habitat quality for large mammals such as deer and elk as well as for numerous smaller mammals and reptiles. Many of these are sagebrush obligates and are displaced by large, high-intensity wildfires that consume the sage and brush.

3.12 Soils

There are various soil types in the Minidoka County area. Three major soil divisions are found:

1. Seventy-five percent of the land area is level to gently sloping soils that are shallow and moderately deep over a hardpan and formed in alluvium on terraces, hillslopes, and toeslopes. These soils are used for irrigate cropland and rangeland.

2. Sixteen percent of the land area is level to gently sloping soils that are moderately deep over bedrock and formed in Bonneville Flood deposits on terraces. These soils are used for irrigated farming.
3. Nine percent of the land area is level and nearly level very deep soils that are wet and formed in alluvium; on terraces. These soils are used for irrigated cropland.

The soil resource is an extremely important component for maintaining a healthy ecosystem and economy. 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 Minidoka County has low clay content in the Bt horizons. Surface horizons are typically sandy or silty loam underlain by silt or clay loam. These soils have highly variable drainage and permeability characteristics.

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 have the potential to create hydrophobic characteristics in that layer. This can result in increased overland flow during heavy rains, following wildfire events, potentially leading to mass wasting. Rocky and gravelly characteristics in the A horizon layer would be expected to be displaced, while the silty and loamy fines in these soils may experience an erosion and displacement potential. These soils will experience the greatest potential impacts resulting from hot fires that burn for prolonged periods (especially on steep slopes).

The National Resource Conservation Service (NRCS) has mapped Minidoka County in detail. A complete soil survey for Minidoka County was distributed in 1999. Please refer the Minidoka Area NRCS Soil Survey Report to view each soil unit in the County and the associated characteristics relating to the effects of wildland fire.

3.12.1 Physiography

Geologically, the survey area is part of the Snake River Plain. During the Mesozoic era, the area uplifted, forming low hills. Events of the Cenozoic era determined the present geology. Faults and fissures released molten lava from low-profile shield volcanoes. Many volcanoes and basalt vents are in the survey area. The bedrock consists of basalt lava flows underlain by rhyolite at a shallow depth. These lava flows intermittently blocked watercourses, creating pluvial lakes that filled with sediment. The basalt flows and volcanics and the glacial debris and lacustrine deposits influenced the soils that developed in the survey area.

3.12.2 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 would result in greater soil heating and localized impacts. Loss of soil carbon, nitrogen, sulphur, phosphorus, potassium, and soil organisms would be high in the soil surface layer. Soil physical structure could be altered thereby creating hydrophobic soils, especially where clay content is moderate or high.

Re-vegetation of burned areas immediately following fire events is critical to maintain soil resources and pre-empting noxious weeds and invasive species from occupying the site. The fire rehabilitation efforts of the BLM have been quite successful in reducing invasion of Cheatgrass and other non-native species. These rehab efforts help maintain soil fertility and plant species composition by establishing less flammable grass and forb species that the invasives that would otherwise dominate the burn area.

Where heavy grazing has occurred in the past, there is also a possibility that 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.

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 and burned areas should be rehabilitated.

3.13 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 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).

A correlation to mass wasting due to the removal of vegetation caused by farming, grazing, and 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%. Disrupted vegetation patterns from farming (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. The greatest watershed impacts from increased sediment will be in the lower gradient, depositional stream reaches. 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.

3.13.1 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, and improvement of rangland health. 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, high intensity rangeland 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 species and ground level natural fuels. Some patches of shade-tolerant, fire intolerant species may also be consumed. Prescribed burning is not designed to consume all vegetation within project areas. Each treatment will leave a mosaic of burned and unburned areas. Once the target fuels and the risk of fire carrying from one tributary to another have been reduced, hand ignition may be considered on a site-specific basis.

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 can greatly increase surface erosion by temporarily creating a hydrophobic soil layer. Soils within the project 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, rangeland 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. The design criteria described above minimizes the risk that landslides, mass movement, significant increases in surface sediment yield, and significant changes in water yield will occur.

Reduction of vegetation will mostly be limited to creeping ground fires, which will reduce understory vegetation, but will not affect mature trees or result in significant mortality to the

overstory. Spring burning often results in minimal riparian vegetation burned because streamside areas have higher humidity and live plant moisture. Fall burning will more likely result in understory vegetation removal, with a possibility of some tree and large shrub mortality, especially outside of riparian zones where live plant moisture is less.

Riparian buffer strips will be maintained, thereby preserving canopy cover for shading, sediment filtering, and streambank and floodplain stability (PACFISH guidelines). 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 are unlikely. The area has been roaded from past management activities. Therefore, increased road densities from road construction are not expected to be of a magnitude to increase sedimentation to affected drainages, provided adequate planning for new road construction is implemented. 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.

3.14 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 central 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 Minidoka 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.

Minidoka County is in South Idaho Airshed Units 19 and 25: 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. The Sawtooth and Craters of the Moon Class I Areas are located north of Minidoka County and would be affected by burning activities.

All of the communities within Minidoka 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).

3.14.1 Fire Mitigation Practices to Maintain Air Quality

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 relative 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 4: Summaries of Risk and Preparedness

4 Overview

4.1 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.

4.1.1 Weather

Weather conditions are ultimately responsible for determining fire behavior. Moisture, temperature, and relative humidity 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.

4.1.2 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. 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. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. 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.

4.1.3 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, 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.

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.

4.2 Minidoka 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:

Table 4.1. Minidoka County Communities

Community Name	Planning Description	Vegetative Community	National Register Community At Risk?[1]
Acequia	Community	Rangeland	No
Heyburn	Community	Rangeland	Yes
Minidoka	Community	Rangeland	Yes
Norland	Community	Rangeland	Yes
Paul	Community	Rangeland	Yes
Rupert	Community	Rangeland	Yes

[1]Those communities with a "Yes" in the National Register Community at Risk column 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.

Site evaluations on these communities are included in subsequent sections. The results of FEMA Hazard Severity Forms for each community are presented in Appendix II.

4.3 Rangeland Communities in Minidoka County

4.3.1 Vegetative Associations

These communities lie in the vegetative ecosystem known as the "sagebrush steppe." The sagebrush steppe ecosystem is widespread over much of southern Idaho and the Snake River Plain, as well as in eastern Oregon and Washington, and portions of northern Nevada, California and Utah. The southern Idaho portion of this ecosystem occurs over a variety of land forms and vegetation types. Native vegetative communities range from vast expanses of grasslands resulting from recent fires, to old-growth sagebrush communities.

The steppe is characterized by a persistently warm and arid environment, that limits non-cultivated vegetative communities to grass and brush rangelands. Dry, fire prone 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 (*Bromus tectorum L.*), 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 frequently disturbed areas.

Irrigation has led to the conversion of the sage-grass ecosystem to productive agricultural lands in many areas of Mindoka County. This has created an agricultural patchwork across the landscape. Depending on crop rotation, farm lands may be irrigated, green and lush, or cured small grain crops. Non-farmed rangeland in the north, east, and west portions of the county are dominated by brush and grass types, with few breaks in continuity. Under dry and windy conditions, fires in the wildland-agricultural interface can burn thousands of acres in a single burning period.

4.3.2 Overall Fuels Assessment

The land ownership pattern in Minidoka County is a mix of state, private, and federal lands. Much of the northern region of the county is owned and administered by the BLM. BLM land is scattered along the eastern and western edge of the county as well. These BLM rangelands are primarily utilized as forage for domestic livestock and wildlife species dependent on the sage-grassland ecosystem. Species composition is generally a mix of sage species, bitterbrush, rabbitbrush, grasses, and a variety of other forbs and dry grass species. The rangelands are quite fire prone, with an abundance of native and introduced grass and brush. Areas dominated primarily by grass with scattered sage can be described as Fuel Models 1 or 2 (FM1 and FM2). Fires in grass fuels tend to spread very rapidly, especially when pushed by wind. Sage-dominated fuel complexes can be described as FM 6. Fires in all fuel types can spread rapidly, burning thousands of acres after only a single hour especially when driven by the wind. In heavy brush fires can travel at over eight miles and hour with flame lengths in excess of 50 feet. Fires of this intensity are nearly impossible to control with suppression resources, requiring a change in weather in order to allow crews and support equipment to gain the upper hand.

The effect of wildland fire infringement on agricultural land is directly related to crop rotation and crop status. Agricultural practices can either mitigate or exacerbate the wildland fire threat. When irrigated crops are planted, agricultural activities can break landscape continuity by creating areas of high live fuel moisture that are unavailable to burn. However when non-irrigated crops are adjacent to rangelands, these crops add to the fuel continuity across the landscape.

Cured small grains or hay fields result in a uniform bed of flashy fuels that support fires with rapid rates of spread and large flame lengths, particularly prior to harvest. Agricultural areas in grain crops can be described as either FM 1, 2 or 3. During the period while grain crops are cured prior to harvest, the mature crops are similar to tall grass (FM 3, greater than 2.5 feet in height). Fires in this fuel type tend to spread very rapidly with large flame lengths. Flame lengths and rates of spread are reduced in the post-harvest condition. However, fires in these fuels can still spread quite rapidly and generate moderate to large flame lengths. The large flame lengths and high intensities these fires generate can be very threatening to homes and safety. Fires prior to harvest can also result in significant economic loss.

The most northern portion of the county is covered by 2,100 year old lava flows. This area has significant geological and wildlife value and is included in the Craters of the Moon National Monument. Although over 300 plant species can be found in the lava flows, the lack of available water and soil limits the growth of vegetation.

In many areas throughout the Snake River Plan and the Great Basin fire behavior and fire regimes have been altered due to the proliferation of cheatgrass. The fine structure and its ability to completely dominate disturbed sites provide a dry, consistent fuel bed for fire. Where this exotic has encroached in sagebrush stands, it now provides a consistent bed of fine fuels that actively carries fire without the encouragement of wind. Because of these characteristics, cheatgrass will support fire during times of the year and under conditions that native vegetation would not be able to sustain. After fire disturbance, native species are often displaced by monocultures of Cheatgrass unless rehabilitation and seeding measures are taken. Because of the grass's ability to dominate disturbed sites and its propensity to burn, cheatgrass has the ability to remain dominant once a site is disturbed.

4.3.3 Ignition Profile

Natural ignition sources from summertime lightning storms are common in Minidoka County. Lightning strikes in light fuels are frequently quickly extinguished if any precipitation accompanies the storm. However during dry lightning events, storm cells can ignite numerous fires throughout rangeland and agricultural areas.

Human caused fires contribute significantly to the probability of fires throughout the county. Residential living and recreational use in the area present innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, roadway fires, and camp fires are just a few of the countless potential human ignition sources in the area. Power lines fires from "fire hawks" can also spark fires when raptors wings arc across power lines.

Also contributing to the ignition profile are accidental ignitions from machinery during harvest and the planned ignitions from burning of residual stubble following grain harvest. Stubble burning has not historically resulted in significant structural damage in the past. However, there have been a number of escaped agricultural fires that have spread between private and federal ownership, requiring suppression resources from rural departments and the BLM. The frequency of burning increases the potential for escaped fire throughout Minidoka County. Each year, fire districts respond to dozens of calls regarding agricultural burning throughout the county, many of which are false alarms. However, each response comes at a cost to the department that is then transferred to the community.

Smoke from an agricultural burn has been identified as a contributing factor leading to a twenty-one car accident on Interstate 84 in the summer of 2004. Smoke from a burn impaired drivers' visibility, leading to a massive pile-up that closed interstate traffic for hours. Amazingly, the incident did not claim any lives. However, there were numerous minor injuries and hundreds of thousands of dollars in vehicle damage.

4.3.4 Fire Suppression in Minidoka County- A Cooperative Effort

Wildland fire suppression throughout Minidoka County can best be described as a cooperative effort between the rural fire departments and the Upper Snake River District of the BLM. The West End, Minidoka County and Rupert City fire districts have developed excellent working relationships with one another. Although Rupert City fire generally does not have a significant wildland fire threat within its district, it provides necessary back-up resources for both West End and Minidoka County when the rural districts are engaged in wildland suppression. This helps to maintain a level of structural protection throughout the county at all times.

The abundance of ignition sources and flashy fuels results in numerous fire starts each year. Rapid and aggressive initial attack is the key to keeping economic and property loss to a minimum. Local fire departments and the BLM have developed a dependence on one another in the ongoing attempt to control wildland fires before they become a large incident. The scattering of rural resources throughout the county allows for rapid initial attack of most wildland fires regardless of land ownership or fire protection jurisdiction. Quick response by rural forces allows for initial size-up and engagement while BLM forces respond from districts or staging areas. Between 60 to 80% of BLM fires are initially attacked by rural fire districts. If fires grow beyond the capabilities of the rural initial attack ground forces, BLM aerial resources including helicopters and retardant tankers are utilized in containment efforts. The close working relationship between the BLM and the rural departments is mutually beneficial and essential for reducing wildfire losses.

Recognizing the beneficial relationship between the federal land management and the local fire departments, the BLM has been very pro-active in assisting rural fire departments in purchasing of equipment and training material through the Rural Fire Assistance program. The BLM administers funding appropriated through The Department of the Interior to enhance the fire protection capabilities of rural and volunteer fire departments. This occurs through training, equipment purchases, and fire prevention work on a cost-shared basis. The DOI assistance program targets rural and volunteer fire departments that routinely help fight fire on or near BLM lands. Grants range from a thousand dollars to a maximum of $20,000 on a 10% cost share payable through in kind services. This program has benefited both West End and the Minidoka County Fire Protection District in augmenting their firefighting capabilities.

4.4 Community Assessments

The objective of the community assessments is to determine the extent to which wildland fire threatens the safety of people, homes, infrastructure, and other important resources throughout Minidoka County. Assessing fire risk can be a challenging, as there are numerous individual factors that individually or cumulatively define the overall risk to a community or area. Fuel characteristics, ignition sources, topography, proximity of fire protection resources, emergency vehicle access and egress, home construction, presence or absence of defensible space, and water availability are just some of the factors that determine risk.

The community assessments summarize the factors that have been identified as contributing to risk in a given area. Assessments are based on field observation as well as on discussion with local fire department representatives. Fire district jurisdictional boundaries define assessment areas, with high risk areas addressed individually.

By necessity, generalizations need to be made in efforts to assess risk. Each and every site is unique, as are the characteristics of the home that contribute to its vulnerability to wildland fire. Thus the assessments attempt to capture the “average” condition, while noting attributes that significantly increase wildland fire risk in specific areas.

The assessments are then followed by a series of recommendations to mitigate the identified risk. The recommendations will then be summarized later in Chapter 5: Mitigation Recommendations, along with other recommendations that are applicable to individual fire departments, such as purchase of equipment and such. Recommendations targeted at the county level will be addressed later in the document as well.

Elimination of all risk is not possible, or is it desirable. Attempts at eliminating all risk would compromise the quality of life that Minidoka County residents enjoy. Open space, native vegetation, recreation, and biological diversity would be adversely impacted if complete elimination of fire risk were to be the ultimate objective. The mitigation recommendations attempt to reduce risk to people, firefighters, homes and economically important assets at an acceptable level while not compromising the qualities that help define Minidoka County.

4.4.1 County Overview

The primary concern in the county stems from outlying areas where homes and ranches abut expanses of dry grass and rangeland fuels. The adjacency of wildland fuel to homes or farms can lead to significant economic or property loss. Fires moving into cured crops can result in significant economic loss and potentially threaten homes, buildings, and public safety.

Generally speaking, the majority of homes throughout Minidoka County are at low risk to loss from wildfire due to well-planned road construction, gentle topography and isolation of existing native fuels in small islands. However, where homes on the outer periphery of communities abut expanses of dry grass and rangeland fuels, the risk of loss to wildland fire is significantly greater.

4.4.2 Minidoka Rural Fire Protection District, including the Communities of Acequia, Heyburn, Minidoka, Norland and Rupert.

The Minidoka County Fire Protection District is a rural district covering approximately 385 square miles in Minidoka County, a small part of Blaine County and a newly annexed section of Cassia County. The district provides structural protection for Acequia, Heyburn and Minidoka. Fire protection for the City of Rupert is provided by the Rupert City Fire Department. Minidoka Rural also provides wildland fire protection throughout the district. Community risk assessments for communities within the district and a discussion of high risk areas follows.

4.4.2.1 Acequia

The small community of Acequia is located approximately 6 miles north of Rupert on State Highway 24. The vegetation surrounding Acequia is a mosaic of various crops and pastureland extending for several miles in all directions. Patches of dry grassland and native sage rangeland are found on the scattered BLM and other ownerships in the area.

The lands surrounding the community are relatively flat, with productive soils making it ideal for irrigated farming. A network of irrigation ditches from the nearby Snake River and Minidoka Dam provides ample water resources for the area. There is a small cluster of residences near the city center; however, many citizens of Acequia are larger landowners scattered throughout the surrounding countryside.

The primary access into Acequia is via State Highway 24. There are several other primary routes including 300 North Road and Youth Ranch Road that are adequate for emergency vehicle travel. Secondary roads have been built on a grid around much of the community providing for a road at 1-mile. Most of these roads are located in areas that are at low risk of fire. However the potential for accidental ignition by vehicle use or cigarettes is increased by

the presence of dry grasses in ditches along roadways and on vacant lots. Road names and house numbers are generally present throughout the area. Numbers on some rural homes may be difficult to see due to homes being built at the end of long, single-lane dead end driveways.

The majority of homes and structures within and surrounding Acequia are at low risk of loss to wildland fire due to the nature of the landscape of the area. Most residents maintain satisfactory defensible spaces around structures increasing the probability of homes withstanding an advancing wildland or agricultural fire.

Homes near the Snake River canyon may have slightly increased risk. This risk is largely dependent on whether fuels have been allowed to accumulate adjacent to structures. Also contributing to risk is the steepness of slope and the consistency of fuels below the home. Due to increased recreational use along the river, the potential for a human-caused ignition is elevated.

The majority of the fire risk in the Acequia area comes from annual field burning, debris burning, or other forms of human ignition. The xeric nature of the surrounding vegetation and abundance of hot, dry and windy weather greatly increases the possibility of a fire escaping its designated boundaries or igniting neighboring fields and potentially resulting in a fast moving fire. A number of farm and ranch structures could be at risk in the event of an ignition. This risk depends largely on the season and status of cropland surrounding homes. Fire can travel through dry, cured grain fields very rapidly, especially when driven by gusty winds. Fires in these fuel types leave very little time to prepare a home to withstand a wildfire event. Thus, it is critical that all precautionary measures take place prior to the fire season.

4.4.2.2 Minidoka National Wildlife Refuge

Lake Walcott State Park near Minidoka Dam approximately 5 miles west of Acequia presents additional fire risks. This park was created by a joint partnership between the Bureau of Reclamation, Idaho State Parks & Recreation, U.S. Fish and Wildlife Service, and the Idaho Youth Ranch. A hydroelectric plant powered by the dam sits on the north bank of the Snake River adjacent to the park. The park offers a boat ramp and docks, restroom facilities, picnic huts and barbeque stands, overnight camping areas, basketball courts, and a small golf course. Although the park and camping areas are kept green and well groomed, wildland fuels are prevalent along the main access road and on undeveloped areas surrounding the park and along the riverbank. The potential fire risk linked to Lake Walcott State Park is high due to the high volume of recreators that visit the site each year and the dry, fire prone nature of the environment. An ignition within the park area or in nearby wildland fuels due to vehicle use, carelessness, or other source could easily result in an uncontrolled rangeland fire.

4.4.2.3 Heyburn

The community of Heyburn is located just north of the Snake River on U.S. Highway 30. Although the Snake River canyon introduces some steeper topography, the rangeland north of the river is quite flat and ideal for agricultural development. Irrigation canals stemming from the river provide water resources to sustain this community's agriculturally based economy.

The primary access into Heyburn is via U.S. Highway 30 from Burley or State Highway 24 from Minidoka. There are several other primary routes including Interstate 84 and 400 South Road that are adequate for emergency vehicle travel.

The majority of homes and structures within and surrounding Heyburn are at low risk of loss to wildland fire due to agricultural use of the surrounding land, gentle topography, and high quality roads for emergency access and proximity of fire suppression resources.

Further contributing to the low risk in the area is the defensible space that surrounds most homes in the area. Maintaining a buffer of non-flammable vegetation around structures dramatically reduces the potential for fire to move to the home.

Fire risk to the community of Heyburn comes from annual field burning activities, debris burning, or other human ignition. Depending on the season and status of cropland surrounding homes, there are a number of farm and ranch structures that could be at risk in the event of an ignition.

The abundance of recreational opportunities along the Snake River corridor near Heyburn also increases the probability of human-caused fires. Landowners near the Snake River canyon may be at a slightly higher risk of loss due to factors that contribute to rapid wildland fire spread. The degree of risk is largely dependent on the type of fuels adjacent to structures. The greatest risk comes from the combination of dry continuous fuels and steep slopes.

4.4.2.4 Minidoka

Minidoka is located in the northeast portion of the county, north of the Snake River and Lake Wolcott. The primary access to the community from the south is State Highway 24, with multiple secondary roads accessing the community. The Minidoka economy is almost exclusively dependant on the agricultural industry. The community serves as an important rail stop for the transportation of agricultural products from the area. An Eastern Idaho rail lines off the main Union Pacific main railway runs from Minidoka, southwest through the county, terminating in Twin Falls. The main Union Pacific line continues heading west of Minidoka through the county. The large agricultural transfer station on this spur is the most prominent feature in the community.

Multiple improved and secondary roads provide good ingress and egress routes to the community. Water sources for emergency use are quite abundant in the area, reducing turn-around time in suppression efforts. These characteristics combined with the level ground and lack of wildland fuels results in a minimal threat to the community.

There are a number of roads that are poorly signed in the outlying area, reducing emergency response time. Improved signage would assist emergency response in the area.

4.4.2.5 Norland and Idaho Youth Ranch

The community of Norland is located in central Minidoka County, at the junction of Meridian Road and State Highway 24. Norland provides large storage facilities for agricultural crops from the area. There are very few homes in the community of Norland itself, rather most homes are associated with the farms that dominate the land use in the area.

To the northeast of Norland on North 400 East Road is the Idaho Youth Ranch. The ranch is a 56-bed facility for the residential treatment of troubled children and adolescents. The Ranch includes five residential lodges, administrative offices, school, gymnasium, indoor riding arena, dining hall, chapel, firehouse, wood shop, staff housing, and farm buildings. Like most areas on the Snake River Plains of Minidoka County, farm fields surround the Youth Ranch.

The system of secondary roads throughout the northern portion of Minidoka County provides good access to the scattered rural homes and ranches in the area. Roads are wide, and well maintained easing access for emergency vehicles. Signage is lacking in some areas, possibly leading to delayed response times by emergency services. Some homes in the area lack visible house numbers, which could potentially slow emergency response. The on-site firehouse at the Youth Ranch ensures rapid response to fire emergencies in the immediate area. This station

will soon be re-located further to the south of the Youth Ranch. However, emergency services will remain close by maintaining quick response times in the area.

Crop fields, roads, and gentle topography surround Norland and the Idaho Youth Ranch. These characteristics result in a low potential for structural loss from wildland fire. The primary fire threat to homes within northern Minidoka County comes from the cured grass and vegetation that is sometimes allowed to accumulate in direct contact with homes and other structures. Fires originating from debris burning, vehicle fires or from escaped agricultural burns can rapidly spread to the structure if preventative measures have not been taken. Wildland fires infringing from BLM lands to the north contribute to the potential for crop loss due to wildland fire.

4.4.2.6 Other High Risk Areas:

- As mentioned earlier, the greatest wildland fire risk is to agricultural lands on the periphery of the district. The agricultural-BLM rangeland interface areas extend for miles along the northern and eastern borders of the district. Where ever wildland fuels and agricultural crops meet, the potential for fire loss exists.
- Field burning practices throughout the district significantly elevate overall fire risk as well. Prescribed or unintentional fires in agricultural croplands can burn at intensities and at rates of spread that pose a significant threat to resources and public safety.
- The Union Pacific Railroad line in the northern portion of the district and the Eastern Idaho Railroad from Minidoka to Heyburn have been the origin for numerous fires over the years. Lack of adequate vegetation management along the railroad right-of-way has allowed for the accumulation of dry fuels that provide a receptive fuel bed for ignitions associated with the rail line.
- Recreational activities at the Minidoka National Wildlife Refuge increase the probability of human ignitions in the wildland fuels surrounding Lake Walcott. Large expanses of mature sage and grass rangelands surround the lake. Fires in these rangelands could burn thousands of acres, threatening agricultural fields, structures and public safety.

4.4.3 Rupert City Fire Protection and the City of Rupert

The Rupert City Fire Department is responsible for the protection of structures and public safety within the city limits of Rupert. Although the city does not have a significant wildland fire problem within the city limits, the department is frequently engaged in mutual aid incidents with surrounding departments. During these times Rupert City provides support and back-up for structure protection while other departments are engaged in wildland fire suppression activities. This ensures adequate fire protection throughout the county under most circumstances.

4.4.3.1 Rupert

The community of Rupert is located approximately 5 miles north of Heyburn and the Snake River along State Highway 24. Rupert is the Minidoka County seat as well as the most populace city. Structural fire protection for the City of Rupert is provided by the Rupert City Fire Department. Protection outside the city limits is provided by Minidoka County Fire Protection.

The primary access into Rupert is via State Highway 24 from Interstate 84 or State Highway 25 from Paul. There are several other primary routes including Meridian Road and Baseline Road that are adequate for emergency vehicle travel. Road names and house numbers are generally present throughout the area; however, numbers on rural homes may be difficult to see due to

homes being built at the end of long, single-lane dead end driveways. The abundance of high quality, easily accessible roads in the area facilitates emergency response.

The vegetation surrounding Rupert is a mosaic of crops and pastureland. In general, these lands are at very little risk to wildland fire due to isolation from BLM rangelands. Like most areas in Minidoka County, the bulk of the fire risk comes from annual field burning activities, debris burning, or other human ignition. In general, most homes, residents and outbuildings have established adequate defensible space to protect against fire spreading to the structure. However, during the summer months, fine grasses and crops may cure and become available to burn. Some precautions may be necessary in order to reduce the probability of a fire event resulting in home or resource loss.

4.4.4 West End Fire Protection, Including the Communities of Paul

West End Fire Protection District is responsible for providing structural and wildland fire suppression for the western half of Minidoka County as well as the eastern edge of Jerome County. The City of Paul, with the population of 998, is the largest concentration of people within the district. The majority of the district is quite rural, with a number of large farms and ranches intermixed with large expanses of rangeland under BLM ownership. Due to the nature of the district, the majority of responses are to grassland or agricultural fires. The lack of water in rural areas is a significant challenge to the district. Community risk assessments for communities within the district and a discussion of high risk areas follow.

4.4.4.1 Paul

The community of Paul is located approximately 5 miles west of Rupert and 4 miles north of the Snake River on State Highway 27. The availability of water resources has allowed for widespread irrigation around the community, transforming lands once dominated by sage and grass into productive cropland. The primary access into Paul is via State Highway 27 from Interstate 84 or State Highway 25 from Rupert. There are several other primary routes including 600 West and 400 West Road that provide good access for emergency vehicle travel. Well-maintained secondary roads are also abundant, providing multiple emergency access routes throughout the area. Road names and house numbers are generally present throughout the area, facilitating emergency response.

The majority of homes and structures within the immediate vicinity of Paul are at low risk of loss to wildland fire. The urban character of the community and abundance of natural and man-made fuel breaks such as roads, ditches and green lawns reduce the potential for wildland fires to directly threaten the community. Further reducing the threat to the community is the choice of home building materials. The majority of structures in the Paul area have been constructed with fire-resistant building materials such as tin or composite roofing material. Most homes have also established adequate defensible space zones in the form of watered lawns.

Outside the city limits, landscape characteristics change quickly. Large farms on the edge of town do pose some risk when in grain crops, increasing the risk of damage or loss from agricultural fires. Accidental ignitions associated with roads or equipment can spread rapidly through cured grass or grain fields, posing a threat to homes that lack defensible space. The speed at which fire can travel through these fuel types leaves very little time to prepare a home to withstand a wildfire event. Thus, it is critical that all precautionary measures take place prior to the fire season.

4.4.4.2 Other High-Risk Areas

Chief areas of concern are generally along the periphery of the district, where large expanses of BLM rangeland abut district boundaries. These areas are at elevated risk of economic and property loss due to the potential for rangeland fires to move into agricultural lands. A number of the districts primary concern areas are outside of Minidoka County. However, the issues associated with these areas pose a direct threat to the homes, property and economically important crops within the county. The Crest View Fire of 2003 is an example of a large-scale fire event originating in neighboring counties that can pose a direct threat to Minidoka County.

- **Kimama Area:** Currently, there is no structural fire protection in the Kimama area of south eastern Lincoln County. The Kimama area is an area subject to frequent fire events, with an abundance of ignitions from human and natural causes. West End is often times asked to respond to fires in this area; however the district does not currently provide protection in the area. The lack of protection results in an elevated risk of large and costly fires, as large fields of grain crops abut vast expanses of BLM rangelands, with few breaks in fuel continuity. West End has repeatedly provided structure protection to the same homes that are threatened year after year by large fire events.
- **Milner Area:** The Milner Area in the southeast corner of Jerome County has been an area of repeated fires over the years. Many of these have been equipment related or due to agricultural burning practices in the area.
- The Eastern Idaho Railroad west of Paul has been responsible for numerous ignitions over the years. The lack of adequate vegetation management has lead to accumulations of flammable vegetation that frequently result in fires. This is particularly true where BLM lands are intersected by the rail line.
- The BLM lands in the 600 West 300 North are frequently the site of rangeland fires due to off-road vehicle use and unattended campfires and fire works by teenagers who use the area as a site for parties.
- The BLM-agricultural interface is a concern area within the district, particularly in the northern-western portion of the county and in any other area of the district where BLM land is interspersed with agricultural lands.

4.4.5 Mitigation Activities

Public education will continue to be a corner stone of mitigation efforts throughout the county. Quick and effective initial attack by rural fire departments and the BLM will continue to protect property and ensure the safety of Minidoka County residents over the long-term.

There are a number of other activities that can help reduce the potential for wildland fire loss in throughout the county. A number of mitigation activities will be presented here, and later enumerated in Chapter 5: Mitigation Recommendations. Resources needs specific to individual fire departments will be addressed in Chapter 5.

- **Incorporation of Kimana Area into the West End Fire Protection District.**
- **Development of a county-wide burn policy.** Currently, there is no county-wide burn permit system. Agricultural field burning adds to call volume each year, with costs transferred to the tax paying public. Although the Idaho Department of Agriculture has developed rules for burning, there are no penalties for non-adherence. Furthermore, there are no liability ties to individuals who are responsible for escaped burns that burn onto BLM grounds. A system of financial disincentives may encourage more cautious burning.

- **Add physical addresses to BLM burn permits.** Currently, the BLM only provides legal (township and range) descriptions of burn locations to rural departments. Supplementing this will a physical address would assist rural departments.
- **Adoption of building codes by the Planning and Zoning Board compliant with NFPA standards to address access and water availability issues in developing areas.**
- **Enforcement of building codes by Building Department.** Once adopted, codes need to be strictly enforced in order to be effective.
- **Continuation of the Red Zone Program.** Gathering and compiling of characteristics that result in high wildland fire hazard with structure location to identify chief areas of wildland-urban interface concerns should continue county-wide.
- **Refresher training for Red Zone Program.** Fire district personnel are in need of refresher training in order to efficiently implement the program.
- **Updated rural addressing:** This information then needs to be distributed to emergency dispatch as well as to fire districts.
- **Hire full-time Technical Assistance Coordinator/Special Project Leader.** This individual could potentially work through the Emergency Services department and would be coordinate training and equipment needs county wide in order to reduce redundant purchasing and maximize suppression effectiveness. This individual could also take the lead on grant writing and administration for the county.
- **Move forward with all-state mutual aid agreement.**
- **Augment emergency water supplies**. This includes establishment of pressurized water delivery systems in subdivisions as well as establishment of dry hydrants and drafting sites where ready access to water is limited. Retrofit dependable, year-round irrigation water sources with necessary fittings for use by departments. Once identified, agreements with landowners of emergency water sources and rural departments and the BLM need to be established. These sources should then be incorporated into the Red Zone program.
- **Purchase of Fire Works kits for education for use in schools.**
- **Roadway fire treatments:** Practices such as mowing or creation of non-combustible road buffers can help to reduce ignitions associated with vehicle traffic. Such treatments would reduce the potential for ignitions along the access roads to the Minidoka National Wildlife Refuge. Other treatment corridors will need to be determined.
- **Railway fire treatments:** Create buffers along railway to reduce the potential for railroad ignitions.
- **Develop of comprehensive fire district growth plans that address issues associated with growing populations.** Plans should establish benchmarks for expansion of district resources.
- **Establishment of programs to aid in retention and recruitment.** Investigate the possibility of enhanced volunteer incentives or retirement system.
- **Increased training between all county fire resources.** Establishment of a yearly training exercise with all departments each year to familiarize tactics and build relationships.

4.5 Issues Facing Minidoka County Fire Protection

There are a number of Issues that relate directly to fire occurrence or suppression abilities that have been identified county-wide and will be presented here.

4.5.1 Recruitment and Retention, Funding, Equipment Needs, Etc.

There are a number of pervasive issues that challenge rural districts within Minidoka County. A short list of such issues include recruitment and retention of volunteers, lack of funding for equipment needs, keeping pace increases in training requirements, as well as numerous other factors that test district's abilities. The members of both West End and Minidoka County Fire Protection Districts should be recognized for the dedication they have shown and the excellent level of protection they provide for residents throughout the county. Volunteers take time out of their lives every day in order to assure the safety of the community.

The demands on volunteer departments are considerable. Keeping pace with ever-increasing training requirements can lead to burn-out of volunteers who are scantly compensated for their time and efforts. Keeping pace with the growing needs of the communities the districts serve is a constant challenge as well. Although there are many potential funding sources available for rural districts to acquire equipment and other needs, grant writing and chasing of funding sources takes considerable time and effort. Recommendations that can help to reduce these challenges will be presented in the Chapter 5: Mitigation Recommendations to follow.

4.5.2 Development of County-wide Burn Permit Policy

Currently, there is no county-wide burn permit system. The issues associated with agricultural burning that have been identified throughout this document include increased call volume, reduced visibility that has contributed to vehicle accidents in recent past, and the suppression cost of extinguishing escaped agricultural fires. Agricultural field burning adds to call volume each year, with costs transferred to the tax paying public. Some landowners feel that a burn permit policy is unnecessarily restrictive. However, there are significant risks associated with the use of fire adjacent to expanses of flammable vegetation under certain scenarios.

For many growers, the practice of burning crop residues is not only practical but necessary for the control of certain diseases, insects and weeds. In 2003, the Idaho State Department of Agriculture enacted rules specifically designed to lower the impacts of crop residue burning. The department established a set of rules for Idaho growers. However, these rules are voluntary. There is no means of enforcement if growers are found to burn outside these rules.

Rural 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, agricultural burning has largely been exempt from these provisions. 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.

The BLM does ask that those intending to burn apply for a burn permit through the BLM office. However, there is frequently many more burn conducted than permits issued. Furthermore, there is no liability in the event of non-compliance and subsequent escaped burns. Approved permits are then forwarded to the corresponding rural fire departments for their information. The information provided to the fire districts is very general and does not include physical address of the burn location. Including a physical address in addition to a legal description would assist fire districts. Addressing agricultural and debris burning issues will take considerable effort and discussion between all involved parties.

4.5.3 Railroad Ignitions

There are currently two active railways within Minidoka County, the Union Pacific line that passes through the northern portion of the district and the Eastern Idaho line that runs southeast from Minidoka to Rupert, where it then splits into two lines, one continuing on into Heyburn and Burley and the other heading west through Paul and into Jerome County. The rail lines have been the source of countless ignitions in both the West End and Minidoka County districts. Although there are avenues for billing the rail lines for train-related fires, these have not been pursued because of lack of cooperation with the rail companies. The cost of suppressing these railroad fires is transferred to the tax payers. Since the railroad issue has been a problem not only in Minidoka County but surrounding counties as well, a joint letter from multiple counties may provide the impetus for the rail carriers to agree on an equitable compensation agreement that can help offset the cost of suppressing train-related fires.

4.5.4 Lack of Emergency Water Supplies

In many areas of Minidoka County, there are no readily accessible, year-round water resources available for use by local fire districts. Thus, it is necessary for firefighters to keep large amounts of water loaded on trucks at all times. In the event of a larger fire situation, additional water supplies must be transported to the site. The Minidoka County fire districts feel that establishing permanent augmentations to emergency water supplies is necessary throughout the County. This includes establishment of pressurized water delivery systems in subdivisions as well as establishment dry hydrants and drafting sites where immediate access to water is limited. Retrofitting dependable, year-round irrigation water sources with necessary fittings for use by emergency response equipment would also be highly beneficial. Once developed, these water sources need to be mapped and use agreements need to be made between landowners, rural departments, and the Bureau of Land Management.

4.6 Fire Fighting Resources and Capabilities

The Fire Fighting Resources and Capabilities information provided in this section is a summary of information provided by the Rural Fire Chiefs or Representatives of the Wildland Fire Fighting Agencies listed. Each organization completed a survey with written responses. Their answers to a variety of questions are summarized here. ***In an effort to correctly portray their observations, little editing to their responses has occurred.***

4.6.1 Wildland Fire Districts

4.6.1.1 Upper Snake River BLM, Minidoka District

Shoshone	Duty Location	400 West F Street	83352
Bellevue	Duty Location	11053 Highway 75	83313
Carey	Duty Location	20548 North Main	83320

Boundary Description of Minidoka District:

The east boundary of the District starts at the Utah border and goes north along the Range/Township line dividing Range 28 and Range 29; stair steps around the Sublett Division of the Sawtooth Forest and the Sublett Range to the boundary of Cassia and Power County; goes due west for approximately 8 miles along the county line; turns due north to the Snake River; follows the Snake River to approximately one mile southwest of the city of American Falls; turns due north for three miles along the Township/Range line dividing Range 30 and 31; turns due west on the southern border of Sections 24, 23, 22, 21, 20 and 19 of Township 8S,

Range 30E; the southern border of Sections 24, 23, 22, and 21 of Township 8S, Range 29E; where the line, meeting BLM administered ground turns north and stair steps to Highway 93, approximately 7 miles northeast of the Craters of the Moon National Monument and Preserve.

The north boundary starts at this point and stair steps in a southwest direction to the northwest corner of the Craters of the Moon National Monument and Preserve; turns to a westerly direction and ties to the Blaine County boundary line just east of Blizzard Mountain; follows the Blaine County line north and then west to where the Blaine County line meets the Elmore County line.

The west boundary starts at this point and continues to follow the Elmore County line in a southern direction to the southwest corner of Section 31 of Township 2N, Range 12E; turns east for five miles; stair steps in south west direction to southwest corner of Section 6 of Township 1S, Range 10E; follows the Township/Range line due south to King Hill Creek; follows King Hill Creek to it's confluence with the Snake River; follows the Snake River to the west until it meets the Township/Range line between Range 8E and Range 7E: turns south along the Township/Range line to the border of the Saylor Creek Air Force Range; turns west following the boundary of the Saylor Creek Air Force Range; turns south for two miles along the boundary; turns to the west and ties into the Bruneau River; follows the Bruneau River south across the Nevada border to the boundary of Humboldt National Forest.

The south boundary starts at this point and continues to the east along the Forest boundary until it meets the Idaho state line; follows the Idaho/Nevada and Idaho/Utah state lines until it meets the east boundary of the District.

There is approximately 3.9 million acres of ground administered by the BLM within the defined boundary of the District. Sage grouse and sage grouse habitat is a primary issue for the District. Lepidium is also a major issue but is concentrated in a small area of the Jarbidge resource area.

Personnel: The fire program staff totals 212 individuals, including 29 permanent employees, 35 career-seasonal employees who work up to nine months each year, and 148 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

Apparatus List:

Shoshone

Table 4.2. Upper Snake River BLM Equipment List: Shoshone.

Identifier	Description	Make	Water Capacity	Pump GPM
E403	Type 4 Engine	International 4070	900	100
E405	Type 4 Engine	International 4070	875	90
E408	Type 4 Engine	International 4070	875	90
E411	Type 4 Engine	Freightliner FL70	875	160
E420	Type 4 Engine	International 4070	850	160
E421	Type 4 Engine	International 4070	850	100
E422	Type 4 Engine	International 4070	850	145
E423	Type 4 Engine	Freightliner FL70	900	100
E682	Type 6 Engine	Ford F-550	290	80
E685	Type 6 Engine	Ford F-550	290	85
E690	Type 6 Engine	Ford F-550	280	80
E692	Type 6 Engine	Ford F-550	290	80
E694	Type 6 Engine	Ford-450 SD	295	80

Table 4.2. Upper Snake River BLM Equipment List: Shoshone.

E695	Type 6 Engine	Ford-450 SD	295	90
W24	Type 2 Tender	Freightliner F9000	3500	750
Contract Dozer	Type 2 Dozer	Varies	N/A	N/A

Bellevue

Table 4.3. Upper Snake River BLM Equipment List: Bellevue.

Identifier	Description	Make	Water Capacity	Pump GPM
E415	Type 4 Engine	Freightliner Fl70	875	90
E418	Type 4 Engine	International 4070	875	100
E684	Type 6 Engine	Ford F-550	290	85
W21	Type 2 Tender	Ford F9000	3000	450

Carey

Table 4.4. Upper Snake River BLM Equipment List: Carey.

Identifier	Description	Make	Water Capacity	Pump GPM
E402	Type 4 Engine	International 4070	900	95
E414	Type 4 Engine	Freightliner FL70	875	90
E683	Type 6 Engine	Ford F550	290	85
Contract Dozer	Type 2 Dozer	Varies	N/A	N/A

Burley

Table 4.5. Upper Snake River BLM Equipment List: Burley.

Identifier	Description	Make	Water Capacity	Pump GPM
E419	Type 4 Engine	International 4070	900	95
E416	Type 4 Engine	Freightliner FL70	875	90
E678	Type 6 Engine	Ford F550	290	85
W22	Type 2 Tender	Ford F9000	3000	450
E404	Type 4 Engine	International 4070	900	95
E410	Type 4 Engine	Freightliner FL70	875	90
E681	Type 6 Engine	Ford F550	290	85

Malta/Almo

Table 4.6. Upper Snake River BLM Equipment List: Alomo.

Identifier	Description	Make	Water Capacity	Pump GPM
E417	Type 4 Engine	International 4070	900	95
E412	Type 4 Engine	Freightliner FL70	875	90

Kimama

Table 4.7. Upper Snake River BLM Equipment List: Kimima.

Identifier	Description	Make	Water Capacity	Pump GPM
E406	Type 4 Engine	International 4070	900	95
E413	Type 4 Engine	Freightliner FL70	875	90
E688	Type 6 Engine	Ford F550	290	85

Rogerson

Table 4.8. Upper Snake River BLM Equipment List: Rogerson.

Identifier	Description	Make	Water Capacity	Pump GPM
E424	Type 4 Engine	International 4070	900	95
E407	Type 4 Engine	Freightliner FL70	875	90
E693	Type 6 Engine	Ford F550	290	85
W23	Water Tender	Ford F9000	3000	450

Air Resources

Helicopter: The district has an A-Star medium helicopter capable of carrying 130 gallons of water on contract from June to October with a 10 member helitack crew. U.S. Forest Service Helitack crews are stationed at Hailey and are available for assistance if needed. Additionally, there are other helicopter resources equipped for fire missions that are available on a aircraft-rental-agreement (ARA) basis.

Fixed-Wing: The district has an 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.

Tanker Base: The district's Tanker Base consists of 4 contract personnel, 1 Aviation Manager, 1 Tanker Manager, 2 Single Engine Air tanker (SEATS) managers. This base is located in Minidoka but has the capability of setting up 5 remote bases throughout the district at any time. This base is also capable of serving Type 1 heavy air takers when needed.

Air Tankers: There are typically 2 SEATS (Air Tracker 802F) on contract in Minidoka capable of carrying 800 gallons of retardant during the fire season. There are also 2 SEATS (Air Tracker 802) located in Boise and Pocatello.

4.6.2 Rural Fire Districts

4.6.2.1 Minidoka County Fire Protection District

Mike Brown Fire Chief
208-679-8250
mcfd@pmt.org
PO Box 166 Heyburn ID 83336

District Summary:

The Minidoka County Fire Protection District is a rural district covering approximately 385 square miles in Minidoka County, a small part of Blaine county and a newly annexed section of Cassia County. Our major role is fire protection for our current taxpayers of this district, but we also help out the local BLM around the outskirts of our district with the help of a cooperative agreement between agencies. The district also contracts with the BLM for wild land fires outside our normal coverage area as needed. The fire district has mutual aid agreements with all surrounding fire departments, as well as agreements with MVERT (magic valley emergency response team) for hazardous materials response. The Minidoka County Fire Protection District has 3 stations within our boundaries, one station near the Northern and Southern edges, and one centrally located in the City of Rupert. We have a combined total force of 50 volunteers. The district has only one full time person, the District Fire Chief. The volunteer members are trained to the basic wild land level, with refresher courses on survival annually. Along with structural training, all firefighters are certified in first aid and CPR. Two of the outermost stations

are beginning to implement Quick Response Units into their services. The fire district is also involved in numerous fire prevention activities with schools, civic groups, and senior citizens.

Priority Areas:

Residential Growth: Area growth has stabilized, and in some areas due to the economy, the actual population has declined slightly. Fire calls have remained near normal, but due to our assistance with local wild land agencies, our call volume has increased slightly. Emergency medical calls and extrications have also shown to be on the increase. Some residential growth and farming practices have pushed the agriculture area into the wild land urban interface area. This has increased the risk of potential wildfire reaching dwellings.

Communications: Communications in our area have been marginal at best, but with the recent FEMA grant, we have installed new repeaters with the UHF frequency, on a tall mountain site and have added new radios for all personnel. This has helped tremendously. We are now compatible with all local emergency agencies. The local BLM agencies, however, are not on this frequency, so we left our old radios in trucks that respond to wild land emergencies. This adds some confusion with more than one radio for firefighters to remain familiar at using, as well as upkeep on older radios.

Fire Fighting Vehicles: Our current fleet of firefighting vehicles consists of 2 pumpers, 1 tanker and 1 type 6 engine at our Southern station in Heyburn, 2 pumpers, 1 tanker and 2 type 6 light engines in our central station in Rupert (East End Station) and 1 pumper/tanker combo, 1 pumper and 1 type 6 light engine at our Northern station.(North Side Station)

The oldest pumper (1983) is scheduled for replacement and the next oldest piece of apparatus is a 1986. The fire district is trying to get to a 15 year replacement schedule on all vehicles. Funding is the key to this goal.

Burn Permit Regulations: Currently, the fire district does not have a burn permit policy. Guidance is given to anyone burning within the district, and all persons requesting information are given the local dispatch number to contact for state regulations concerning burn permits. If the fire district had a restrictive permit process, many fires and fire related accidents could be averted. Agricultural burning is still a problem, many residents complain about smoke related or health issues and many fires get out of control causing unnecessary damage.

Effective Mitigation Strategies:

The fire district is aggressive in keeping up with current trends in growth, population, and state and local requirements. All avenues of funding are used to upgrade and replace aging or obsolete equipment. State grants, federal funding and contract services help support the budget requirements of the district. It is the intent of the district to continue to replace equipment as needed and build or improve fire stations as the future needs dictate. More restrictive burning regulations and building requirements in the urban interface area would help alleviate dangers to the local population as well as reduce strains on emergency services. Funding needs to be in place for inspections/permit processing to become effective. Also, burn barrels or trash burning needs to be regulated or proper guidelines followed to avoid unnecessary fires. Fuel breaks or defensible spaces need to be initiated to reduce dangers of fire spreading from interface areas to wild land areas and also the reverse from wild land to interface.

Education and Training:

Training of fire department members is a top priority for the Minidoka Fire Protection District. Safety plays a key role in all fire department functions. In order to keep the levels of safety and training desired in the fire district, a part time training officer has been hired by the fire district. This will insure the continuing education of all personnel. Along with our in house training, the

fire district utilizes the Southern Idaho Fire Academy, the State Fire School, local courses sponsored by the BLM, and various courses subsidized by Idaho Emergency Services Training. The training needs of the fire district could also be helped by a permanent training academy in the state to bring a fresh supply of trained applicants to our doors. The fire district trains or educates the public on fire code issues by inspections of businesses or homes as needed. We also run a fire safety education trailer with live smoke for schools, churches, civic groups and senior citizens. Escape drills, burn prevention, and fire prevention at home and in outdoor areas, proper use of extinguishers, and a hunt for home hazards are some items that are addressed in our presentations.

Cooperative Agreements:

The Minidoka County Fire Protection District has cooperative agreements with all local fire agencies. We also have an all hazard agreement with the six surrounding counties which includes hazardous materials response. We have a cooperative agreement with our local Bureau of Land Management agency which works well for both parties. The sharing of these resources allows the fire district the most "bang for the buck".

Current Resources:

Station #1, Heyburn:

Year	Make	Model	Tank Capacity	Pump Capacity
1988	Ford	F-800 Water Tender	2000	350 GPM
1989	Ford	F-800 Type 2	1000	1250 GPM
1992	Ford	F-350 Type 6	250	125 GPM
2001	Smeal	Custom Type 1	1000	1500 GPM

Station #2:East End (Rupert)

Year	Make	Model	Tank Capacity	Pump Capacity
1986	Ford	F-250 Type 6	200	125 GPM
1991	GMC	Top Kick Type 2	1000	1250
1995	International	Type 2 CAFS	750	500
1999	International	WTR2	3000	500
2003	Ford	F-550 CAFS	300	250

Station #3, North End (Norland)

Year	Make	Model	Tank Cap.	Pump Capacity
1983	GMC	8000 Type 2	500	750 GPM
1997	Ford	F-350 Type 6	250	125 GPM
2003	Freightliner	FL80 Type 2	2000	1250 GPM

Future Considerations:

The Minidoka County Fire Protection District will continue to aggressively fight structure and wild land fires as well as provide medical services as needed for the community. Protecting our taxpayers as well as our firefighters is our number one priority. We expect to provide excellent customer service and be a progressive department. Our plans call for replacing a station in our northern section with a station designed to house more and better equipment as well as providing a better training ground for all members. At two stations, we plan to upgrade their emergency medical capabilities. An additional fill station for SCBA's needs to be acquired. If the

needs of the residents are not being met in areas East of our district, additional annexations along with plans for personnel and a additional station needs to be implemented. Our training officer will need additional training tools and time allotted for training these personnel. At least two trucks need to be consolidated to allow for additional QRU vehicles to be placed in existing stations. Stricter regulations on burning need to be implemented to protect the community and property within our district. Standards need to be developed in house to keep personnel trained at a certain level, as well as more standards followed to keep safety of firefighters a priority. Proper equipment including washing machines for turnouts as well as SCBA's that meet current safety standards need to be purchased. All policies of the district need to be adhered to for the safety of the firefighters and the public at large. To save the taxpayer money in the long run and to provide the most current safety standards to be met, the district needs to be able to rotate trucks out every 10 years. This makes the trucks have a resale value and all the latest safety features are on all department vehicles. The purchases of 3 thermal imaging cameras need to be planned or budgeted for or when additional grants become available. Possible bending and breaking devices need to be purchased for the district as a backup or support for local first responders. Future considerations shall include the use of full or part time personnel to man stations around the clock. An additional goal of the fire district shall include the training of all firefighting personnel to at least fire fighter 1 certification, and all personnel to the first responder or EMT basic level, and all personnel to at least the basic wild land module.

Needs: See above

4.6.2.2 West End Fire Protection District

Randy Sutton, Chief

P.O. Box 94
Paul, ID 83347
208-438-4511
westend@pmt.org

District Summary:

West End Fire Protection District is responsible for Structure Fire, Hazmat, High Angle, Extrication, and Wildland fire protection for the western half of Minidoka County, including the City of Paul, with the population of 998. We have one station in the district which is located on the south side of town. We are an all-volunteer department with a total of 18 firefighters. Our chief area of concern is structural fire protection and water supply, but due to the nature of our district the majority of our responses are to grassland or agricultural burn. We are capable of handling most of these fires because of our C.A.F.S. systems. Because of overlapping areas of responsibility we have mutual aid agreements with the Idaho Department of Lands, Bureau of Land Management, US Forest Service, and the Magic Valley Fire Co-op.

Priority Areas:

Residential Growth: The southern end of the district is seeing most of the growth. It has been experiencing significant commercial and residential growth over the last several years due to the Interstate I-84 and indications are that this trend will continue into the foreseeable future.

Communications: Communication capabilities in our district are adequate at this time due to the new purchase of two new repeaters in November 2003. Some 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 years the district has replaced one vehicle and is currently in the process of replacing one more truck. We just received a BLM light brush truck through the BLM Rural Assistance Program in 2003.

Future plans include working with BLM and having the use of their new building on the northern end of our boundary‘s to possibly store a truck at their station, as well as replacing present vehicle and portable radio communications equipment as needed to stay up with the times of communications.

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.

We participate in community education by providing our “Smoke House” to the youths at our pre-schools, ”Fire Safe” videos to interested persons and, on request, an on-site evaluation of property, to assist property owners in making their homes more protected in the event of a fire. Additionally, we participate very highly 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:

West End Fire Protection District has a written mutual aid agreement through the Magic Valley Fire Co-op, Idaho Department of Lands, Bureau of Land Management, and the US Forest Service. We feel we have a very good working relationship with these agencies and enjoy the cooperative nature of this mutually beneficial association.

Current Resources:

West End Station:

Year	Make	Model	Tank Capacity	Pump Capacity
1971	American LaFrance	Pumper	1500 gal	1250 gpm PTO
1996	Ford Super Duty	Brush Truck	300 gal	CAFS
1995	International	Structural Engine	1500 gal	CAFS
1995	International	Tender	2,500 gal	250 gpm
1995	Ford F350	Brush Truck	250 gal	31 gpm

Year	Make	Model	Tank Capacity	Pump Capacity
1988	Chevrolet, Van	Support		

Most of our vehicles are foam ready which is a great advantage due to the shortage of water when we are away from the city. Rural fire fighting is a challenge in the winter time due to the demand of water.

Future Considerations:

West End Fire Protection District 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 our new fire station was a great achievement for our area and our community. 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 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.

Needs:

Our department has put in for a 75' Quint on our FEMA grant for the year of 2004. We have a need for a piece of equipment like this as well as a new structural engine due to some of the high rise structures in our community. We are also in need of thermal imaging equipment, fire hoses, nozzles, K-12 saw with blades, S.C.B.A's with communication capabilities, lighting, hydraulic power unit for extrication, high angle rescue equipment such as ropes, pulleys, accenders, riggers plate, strapping and webbing. EMS equipment such as suction devices, long boards, jump kits, oxygen, traction splints, AED, K.E.D., stair chair

Training needs:

Advanced training manikin, training props such as training tower for structural fire fighting, high angle rescue and confined space.

4.6.2.3 Rupert Fire Department

Larry V. Pool, Fire Chief
620 F. Street
PO Box 426
Rupert ID 83350
208-436-9600
208-431-8028 cell

District Summary:

Rupert City Fire and Rescue is responsible for the protection of lives and structures for the City of Rupert. Fire protection outside the Rupert City Fire jurisdiction is provided by the Minidoka County Fire Protection District with stations in Heyburn, Rupert and Norland. Rupert Fire also works closely with the West End Fire Prevention District out of Paul.

Rupert is an all volunteer district, with a full-time, paid chief. The department has a total of 25 fire fighters. The Department is equipped with structural fire equipment only. However, through mutual aid agreements and excellent working relationships with the surrounding departments, Rupert Fire contributes to wildland incidents when possible. The Department often serves as back-up for the other county departments when they are engaged in wildland fire suppression

activities. This ensures adequate fire protection throughout the county under most circumstances.

Priority Areas:

Residential Growth: There has been a slight decrease in economic activity in the Rupert area since the closing of Simplot. However new businesses in the area are filling the economic gap. The City has recently updated the water delivery system, augmenting fire fighting capabilities.

Communications: Recent FEMA grants have allowed for the updating of communications in the area. However, these upgrades are not compatible with BLM or Forest Service radio frequencies, creating some confusion during mutual aid incidents.

Fire fighting Vehicles: Due to the aging of the fleet, updating and replacement of fire fighting vehicles is a primary concern.

Burn Permit Regualtion: The City of Rupert has a burn ordinance within the city limits. However, the surrounding area does not, occasionally leading to problems.

Effective Mitigation Strategies:

Improved Equipment: The department has not been successful in the upgrading of equipment do to budget concerns. It is the intent of the department to continue to update and replace equipment. The most recent addition to the fleet was in 1995.

Education and Training*:*

The Department emphasizes continued training for fire personnel. Much of this training occurs jointly with the surrounding districts.

The department is also engaged in public outreach campaigns for all age groups.

Cooperative Agreements:

Rupert City Fire and Rescue maintains MAA's with ten departments in the Minidoka and Cassia area. The department also has MAA's with the Department of Lands as well as the BLM and Forest Service.

Rupert City Fire and Rescue: Station One

Year	Make	Model	Tank Capacity	Pump Capacity
1977	American LaFrance	Structural Engine	500 gal	1250 gpm
1985	Pierce	55' Anerial and pumper	400	1500 gpm
1995	Smeal	Structural Engine	750	1500 gpm
1969	Dodge A-200	Command Van		

Future Considerations:

Rupert City Fire and Rescue will continue to actively upgrade equipment and vehicles. The Department always emphasizes community protection and firefighter safety despite budget constraints.

Chapter 5: Treatment Recommendations

5 Overview

Critical to the implementation of this Wildland-Urban Interface Wildfire Mitigation Plan will be the identification and implementation of an integrated schedule of treatments designed to reduce the potential for wildland fire loss throughout Minidoka County. The treatments that are outlined in the following text and tables are designed to address wildfire vulnerabilities that have been identified throughout all stages of the planning process. Local knowledge of current conditions fire risks provides the basis for the proposed recommendations. Representatives from rural fire chiefs, federal land managers, county representative, the general public and provided necessary insight to develop treatments and strategies to best address the unique challenges of fire management in Minidoka County.

5.1 Fire Mitigation Opportunities

There are four basic opportunities for reducing the loss of homes and lives to fires. Local and federal fire suppression agencies have been quite active in Minidoka County and throughout southern Idaho in efforts to reduce adverse impacts from wildland fire. Many mitigation activities have been on-going within the county in years past. On-going activities should be encouraged and supported over the long-term. Those that have not been well-supported should be augmented to the greatest extend possible to further reduce fire risk within the county.

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
- Vegetation Modification

5.1.1 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.

The Upper Snake River BLM, the US Forest Service and local fire departments have been very active over the years in the prevention campaign in southern Idaho. The prevision campaigns have often taken creative and very active forms. Frequent contact with recreational users and homeowners seem to have been very successful. Over time there has been a reduction in the number of human-caused fires within the Upper Snake River Plane. Much of this can be directly attributed to the continuing efforts of local and federal fire prevention campaigns.

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 BLM and Forest Service have 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 devise. 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. The Upper Snake River BLM has been expanding this program along interstates and highways throughout southern Idaho. Further expansion of the program should be encouraged.

5.1.2 Education

Public education and awareness has been and will continue to be a cornerstone in fire mitigation strategies county-wide. Once a fire has started and is moving toward home or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. 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.

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. Individual home site evaluations can increase homeowners' awareness and improve the survivability of structures in the event of a wildfire. Maintaining a lean, clean, green zone within at least 100 feet of structures to reduce the potential loss of life and property is highly 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 environments.

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 46% of the respondents are interested in participating in this type of an activity.

5.1.3 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.

5.1.4 Building Codes

The most effective, albeit 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 Minidoka County, such standards may be drafted in consultation with the Fire Chiefs and based on National Fire Protection Association (NFPA) standards in order to assure accessibility is possible for all responding resources.

Coupled with this need is the potential to implement a set of requirements or recommendations to specify construction materials allowed for use in high risk areas of the county. The Minidoka County Commissioners may want to consider a policy for dealing with this situation into the future as more and more homes are located in the wildland-urban interface.

5.1.5 Vegetation Modification

There are numerous methods by which vegetative modification can help reduce the manner in which vegetative fuels burn. Reducing fuelbed height and density through mechanical or chemical means can reduce flame length, rate of spread, and fire intensity when burned. That is, tall grass of brush burns with much more vigor than grass that has been mown. Controlling vegetation species composition can also reduce flammability across the landscape. Planting grass species that remain green for longer periods of time in efforts to control Cheatgrass invasion can reduce fire potential across a landscape. The BLM has often used a mix of crested wheat grass and other native grass species in fire rehabilitation efforts to reduce flammability across the landscape over the long term.

Targeted vegetation modification can be very effective in reducing fire occurrence. Ignition points in Minidoka County are frequently concentrated along the roads and railway lines that run through the county. These travel routes have historically served as the primary source of human-caused ignitions. In areas with high concentrations of resource values along these corridors, vegetative treatments such as mowing and planting of less flammable species may be considered in order to provide a fire break in the event of a roadside ignition. Access route mitigation can provide an adequate control line under normal fire conditions. Alternatively, permanent fuel breaks can be established in order to reduce the potential for ignitions originating from the main travel roads to spread into the surrounding lands.

5.2 Existing Practices That Should Continue

Minidoka County currently is implementing many projects and activities that have been successful in the potential for mitigating wildland fire risk within the county. By enumerating some of them here, it is the desire of the authors to point out successful activities.

- The dedication of Fire District Volunteers has contributes tremendously to the safety and well-being of residents of Minidoka County. Volunteer should be commended and

recognized for the sacrifices they make in order to provide the excellent level of community protection afforded to residents throughout Minidoka County.

- The aggressive Fire Prevention campaign by local fire departments, the Forest Service and BLM has contributed to a reduction in the number of human caused fires over time in Twin Fall County. The prevention program should receive necessary support over the long term.
- The BLM Rural Fire Assistance has made significant contributions to the capabilities of the rural fire districts throughout Minidoka County.
- Continued implementation of the Red Zone Program helps local authorities identify areas of high concern by gathering information on characteristics that result in high wildland fire hazard and nearby structure locations. Home site evaluations associated with this program not only help firefighters, they also facilitate education of homeowners on home protection and defensible space practices.

5.3 Mitigation Recommendations

As part of the Policy of Minidoka 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 Minidoka 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 approved 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 (signatures by the cooperators would be collected at the Chairman's discretion). Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

Treatments have been divided between those that should be targeted at county level and those that are specific to individual fire districts. The mitigations recommendations are based on the findings discussed in detail in Chapter 4: Summaries of Risks and Preparedness.

Considering the differing land management philosophies of land management agencies, the county, and private landowners, it is reasonable to expect that consensus building will be necessary before some projects are fully implemented. Combined with other factors such as budget shortages, policies, and interest in participation, it is quite likely that implementation will occur at differing degrees and timeframes over the long-term.

The following Mitigation Recommendations follow a format that identifies a specific **Action Item**, followed by a **Treatment Category** that is tiered to both the National Fire Plan and FEMA. The **Goals and Objectives** of each Action Item are then identified, followed by the **Responsible Organization** for coordinating and implementing the proposed Action Item. Finally, the **Planning Horizon** identifies time frames and estimated costs of implementation, when applicable.

The Federal land management agencies in Minidoka County, specifically the Bureau of Land Management, and the state land management agency, the Idaho Department of Lands, are participants in this planning process and have contributed to its development. Where available,

their schedule of WUI treatments has been summarized in this chapter to better facilitate a correlation between their identified planning efforts and the efforts of Minidoka County.

5.3.1 Treatment Categories

5.3.1.1 WUI Safety and Policy

Wildfire mitigation efforts must be supported by county policies and regulations that maintain a solid foundation for safety and consistency. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related in nature. It is likely that debate and formulation of alternatives will serve to make these recommendations suitable and appropriate for Minidoka County.

Prioritization of activities recommended in this plan should be made by the Minidoka County Commissioners consistent with the recommendations made in Chapter 1 of this document. During the annual review of this plan, reprioritization can be justified in response to changing conditions and funding opportunities.

5.3.1.2 People and Structures

Many of the recommendations in this category involve education and increasing awareness of the residents of Minidoka County. Continuing public education is essential to increase the awareness of the factors that contribute to the wildland fire hazard in Minidoka County. Although prevention campaigns and public education efforts have been quite successful in many areas, there is still much that residents can do to protection themselves and their property from wildland fire.

In addition to those items enumerated in Table 5.1, residents and policy makers of Minidoka 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 Minidoka 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 Minidoka County has led to a reduction of many of the fine fuels in rangelands throughout Minidoka County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. There are ample opportunities throughout the county to continue grazing. This will continue to contribute to the economic output of the county as well as reduce fine fuel loading. 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.

5.3.1.3 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. Protection of these elements is critical in protecting the health, safety and economy of Minidoka County.

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 local networks directly, 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 Minidoka County. The hub of Minidoka County's transportation network is located in the Rupert-Heyburn area. Specific infrastructure components have been discussed in this plan.

Ignitions along highways are significant and should be address as part of the implementation of this plan. Various alternatives from herbicides to intensive livestock grazing coupled with mechanical treatments, have been utilized in other counties southern Idaho. As part of the multi-agency team WUI team proposed in the previous section, these corridors should be further evaluated with alternatives implemented. A variety of approaches will be appropriate depending on the landowner, fuels present, and other factors. These ignitions are substantial and the potential risk of lives to residents in the area is significant.

Many roads in the county have limiting characteristics such as narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to some roads. Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county.

Energy Transport Supply Systems (gas and power lines): (Minidoka County - Appendix I) A number of power lines pass through Minidoka County. Many of these pass through undeveloped, rangeland areas that are subject to wildland fire events. In cases where non-flammable steel support structures are used, there is little direct threat of power supply damage. However, where wooden power poles have been used, there is some risk of failure. Since retrofitting of these infrastructure components is not practical, no such recommendations will be made.

Water Supply: In some areas of Minidoka County, irrigation water is derived from surface flows that feed larger irrigation network that sustain the county's agricultural economy. High intensity wildfires threaten quality of these surface water sources by removing the organic material and vegetation that keeps sediments from entering streams.

5.3.1.4 Resource and Capability Enhancements

There are a number of enhancements that could increase the capabilities of rural fire districts county-wide. Satisfying these needs will assist in increasing the ability of rural departments to suppress fires quickly, reducing the potential for loss of valued resources. As mentioned previously, the cooperative effort between the BLM and the rural fire districts dramatically increases fire suppression effectiveness county-wide.

5.3.1.5 Regional Land Management Recommendations

Wildfires are an inevitable component of rangeland ecosystem the cover the northern portion of Minidoka County. 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 Bureau of Land Management, the Idaho Department of Lands, Industrial land owners, private land owners, and all other landowners in the region to actively administer their Wildland-Urban Interface lands in a manner consistent with the management of reducing fuels and risks in this zone.

5.4 County-Wide Recommendations and Activities

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.a: Develop a formal WUI Advisory Committee comprised of representatives from all fire and emergency service entities to coordinate and develop strategies to advance fire mitigation activities county-wide.	**Protection of people and structures, infrastructure, and ecosystems**	**Protection of people and structures, infrastructure, public and firefighter safety and ecosystems** by coordinating efforts and improving communication avenues between all parties to make informed decisions about wildfire issues.	**County Commissioners, Rural Fire Districts, Mid-Snake RC&D, Emergency Services, BLM, and all departments and entities** responsible for safety of Minidoka County Residents.	• Year 1 (2004) activity: Develop committee, to prioritize and implement the recommended treatments and to build upon the momentum generated during the Minidoka County Fire Mitigation planning process. • The committee will serve to bring all involved parties together to further build and discuss issues pertinent to providing safety to residents county-wide. • Members potentially to include land management organizations and companies, private landowners, and fire protection personnel.
5.1.b: Continued public education campaigns through targeted media campaigns, brochure and leaflet distribution, mailings, billboards, door-to-door visits, and any other means by which to communicate the need for fire safety throughout Minidoka County.	**People and Structures**	**Protection of people and structures** by informing the general public of the wildland fire issue and providing the information and resources they need to act accordingly.	**County Commissioners, Rural Fire Districts, Mid-Snake RC&D, Emergency Services, BLM, Forest Service, and all departments and entities** responsible for safety of Minidoka County Residents.	• Work together to form a county-wide public education working group to strategize on methods and tactics to maximize outreach effectiveness. • Identify and coordinate mitigation opportunities and work as a single cohesive unit to see projects through. • Determine needs for educational material and advertising budgets.
5.1.c: Begin discussion to develop county-wide burn permit policy and enforcement mechanism.	**WUI Safety and Policy**	**Protection of people and structures** by reducing the potential for escaped agricultural fires from jeopardizing life and	**County Commissioners** in cooperation with Rural Fire Districts and BLM	• Immediately recommend BLM update burn permits to include physical address. • Year 1 discussion and debate as to rules and regulations and enforcement mechanisms.

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
		property.		
5.1.d: Adopt and enforce applicable components of NFPA code 1144 that address the unique needs of Minidoka County. Ensure policy addresses the specific needs of fire suppression resources, building materials and applies to subdivisions as well as new single home construction.	**WUI Safety and Policy**	**Protection of people and structures** by applying a standard of road widths, access, water supply, and building regulations suitable to insure new homes can be protected while minimizing risks to firefighters.	**County Commissioners** in cooperation with Rural Fire Districts Planning and Zoning and Building Department.	• Year 1 debate and adoption of revised code (2004). • Adopt recommended codes. • Ensure enforcement of codes by building department. • Integrate into county Comprehensive Plan
5.1.e: Draft letter to Eastern Idaho and Union Pacific Railroad concerning vegetation treatments along railroad and compensation for railroad fires.	**Infrastructure and WUI Safety and Policy**	**Protection of people and structures** by reducing number of railroad fires.	**County Commissioners** in cooperation with Rural Fire Districts.	**Engage surrounding counties** and fire districts in an effort to gauge interest and begin negotiation with railroads to reduce in incidence of wildland fire ignitions from this source.
5.1.f: Develop comprehensive fire district growth plans that address issues associated with growing populations and integrate into county Comprehensive Plan**.**	**Resources and Capabilities and WUI Safety and Policy**	**Protection of people and structures** by incorporating new developments and structures into fire protection districts.	**Rural Fire District** in cooperation with County Commissioners and Planning and Zoning	• **Year 1 (2004):** Establish community growth benchmarks for the expansion of district resources. • Expand fire districts' planning horizon beyond five-years. • **Ongoing Activity:** Evaluate need to expand district resources as set benchmarks are reached. • Integrate plan into county Comprehensive Plan
5.1.g: Purchase of Fire Works Trunk to assist with Youth and Adult Wildfire Educational Programs	**People and Structures**	**Protect people and structures** by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk	**Mid Snake RC&D, Idaho Department of Lands, USFS Sawtooth NF, BLM, Local School Districts and Local Fire Departments**	• To start immediately using existing educational program materials and staffing. 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. • Education will be on-going over the long term
5.1.h: Develop agreement with private landowners for	**People and Structures,**	**Protection of people** and	**Rural Fire Districts** in cooperation **BLM**	• Develop agreement and compensation mechanism for access and use of private water supplies during

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
access and use of water sources during fire emergencies.	**Infrastructure**	structures by enhancement of **infrastructure**	and **local landowners**	emergency responses. • Will occur concurrently with **Augmentation of Water Resources** action item identifies by district in the tables to follow.
5.1.i: Continuation and Expansion of the Red Zone Program county-wide.	**People and Structures, Resources and Capabilities**	**Protect people, structures, and increase fire fighter safety** by identifying factors that contribute to interface risk prior to a fire event to assure public and firefighter safety	To be implemented by **Rural Fire Departments, Mid-Snake RC&D and the BLM**.	• **Cost:** Training, software and hardware purchases. • **Needs**: Determine needs by district, but will include laptops, GPS, digital camera, palm pilot, software.
5.1.j: Addition of mobile repeaters.	**People and Structures, Resources and Capabilities**	**Protection of people and structures and firefighter safety** by establishing and maintaining clear lines of communication.	**Rural and Wildland Fire Districts** in cooperation with the Mid-Snake RC&D.	• Determine districts that would benefit most from mobile repeaters.
5.1.k: Develop strategy to assure radio frequency compatibility between Rural Fire Districts, dispatch, the BLM, and other emergency services during wide band to narrow band conversion	**People and Structures, Resources and Capabilities**	**Protect people, structures, and increase fire fighter safety** by assuring good lines of communication during emergency response.	**Rural districts, the BLM, and Emergency Services.**	• **Year 1 (2004):** Engage, Emergency Services, Federal Agencies, Rural Fire Departments in developing strategy for conversion. • Discuss timelines for implementation between committee members.
5.1.l: Hire Technical Assistance Coordinator/Special Project Leader to aid in grant writing, coordination of training and equipment needs, and administration of funds county-wide.	**People and Structures, Resources and Capabilities**	**Protection of people and structures** by coordinating county needs and by facilitating writing of district and county grants for fire and	**Rural Fire Districts in cooperation with Emergency Services Office and County Commissioners.**	• Begin discussion between county commissioners and Emergency Services to determine position location and essential functions.

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
		other special projects.		
5.1.m: Establish programs to assist in the **Retention and Recruitment** of Volunteer Fire Fighters	**People and Structures**	**Protection of people and structures** by increasing recruitment and retention of qualified, skilled firefighters.	**Rural and Wildland Fire Districts** working with state legislature and a 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, which may include health insurance, supplemental insurance, and other incentives.
5.1.n: Develop and Post FEMA "Emergency Evacuation Routes" along the identified Primary and secondary access routes in the county.	**People and Structures, Infrastructure**	**Protection of people and structures** by informing residents and visitors of **significant infrastructure** in the county that will be maintained in the case of an emergency.	**County Commissioners** in cooperation with Rural Fire Districts and Roads Department.	• Purchase of signs (2004). • Posting roads and make information available to residents of the importance of Emergency Routes
5.1.o: Fuels mitigation of the FEMA "Emergency Evacuation Routes" in the county to insure these routes can be maintained in the case of an emergency.	**People and Structures, Infrastructure**	**Protection of people and structures** by providing residents and visitors with ingress and egress that can be maintained during an emergency.	**County Commissioners** in cooperation with Rural Fire Districts and Roads Department.	• Full assessment of road defensibility and ownership participation (2004). • Implementation of projects
5.1.p: Update and improve Road Signing and Rural Addressing compliant with NFPA standards for visibility throughout Minidoka County	**People and Structures, Infrastructure**	**Protection of people and structures** by reducing emergency response time.	**Emergency Services**	• Update rural addressing and assure that SIRCOMM, rural fire departments, sheriff, and all emergency services are aware of new addresses • New subdivisions should be signed with names as well as county grid addresses to assure consistency in addressing throughout the county

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.q: Roadside vegetation treatments to reduce flammability of fuels immediately adjacent to roads at high risk of ignitions.	**People and Structures, Infrastructure**	**Protection of people and structures** by reducing probability of ignitions along travel corridors.	**County highway department, BLM, and other responsible agencies**	• Treatments may include mowing, herbicide treatments or other treatments to reduce flammability. • This item is applicable to county and state roads not specifically identified by fire district.
5.1.r: Draft letter to County Road Departments and State Highway Department outlining the need for roadside management and priority areas for treatment.	**People and Structures, Infrastructure**	**Protection of people and structures** by reducing probability of ignitions along travel corridors.	**County Commissioners, Rural Fire Districts.**	• Draft letter as upon plan completion. Gauge interest in surrounding counties for a possible multi-county letter.
5.1.s: Access Improvements of bridges, cattle guards, and limiting road surfaces	**People and Structures, Infrastructure.**	**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 BLM, State of Idaho (Lands and Transportation), and forestland or rangeland owners.	• **Year 1 (2004):** Update existing assessment of travel surfaces, bridges, and cattle guards in Minidoka 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 $150,000 which might be shared between County, 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 $25-$30,000 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
5.1.t: Investigate funding opportunities for paid, full time rural fire chief positions county wide. Also, investigate potential for full or part time assistant positions.	**People and Structures, Resources and Capabilities**	**Enhance fire protection capabilities** by providing opportunities for rural chiefs to seek	**Rural Fire Districts** in cooperation with County Commissioners	• Determine district needs and seek all available funding sources.

Table 5.1. WUI Action Items Applicable at the County Level

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
		opportunities to advance the departments.		

5.5 West End Fire Protection District- Recommendations and Activities

Table 5.2. WUI Action Items identified for the West End Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.2.a: Work in conjunction with BLM to establish house apparatus at northern end of district.	**Resources and Capabilities**	**Protection of people and structures** by direct fire fighting capability enhancements.	**West End Fire and BLM**	• Continue conversation with BLM to develop agreement.
5.2.b: Acquisition of an additional wildland engine or other needed apparatus.	**Resources and Capabilities**	**Protection of people and structures** by direct fire fighting capability enhancements.	**West End Fire** in conjunction with the BLM's Rural Fire Assistance program	• Determine needs immediately. • Work in conjunction with BLM Rural Fire Assistance program
5.2.c: Consider funding Fire Chief and training officer as paid, compensated positions.	**Resources and Capabilities**	**Protection of people and structures** by increasing ability of district to keep pace with training and administration needs.	**West End Fire and County Commissioners**	• Investigation of funding opportunities and development of position descriptions.
5.2.d: Consider expansion of West End district to provide coverage to **Kamima area**	**WUI Safety and Policy**	**Protection of people and structures** by providing fire protection coverage to unprotected areas.	**Local residents** in cooperation with the County Commissioners and rural and wildland fire districts.	• Engage community members as soon as possible to determine interest.
5.2.e: Augment emergency water supply through	**Resources and Capabilities,**	**Protection of people and structures** by	**West End Fire, BLM and private landowners.**	• Identify locations immediately to be incorporated into the plan

Table 5.2. WUI Action Items identified for the West End Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
establishment of dry hydrants and cisterns at designated locations	**People and Structures, Infrastructure**	improving water accessibility.		
5.2.f: Acquisition of necessary radio equipment for communication with BLM	**Resources and Capabilities**	**Increase firefighter safety** by improving tactical operations during mutual aid responses.	**West End Fire District and BLM**	• Assess needs and acquire equipment**.**
5.2.g: Wildfire risk assessments of at-risk homes.	**People and Structures**	**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 **West End Fire Department, Mid Snake RC&D and the BLM**. Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	• Approximately 300 homes in the area need assessments. • **Cost:** Approximately $100 per home site for inspection, written report, and discussions with the homeowners for cost of $30,000. Benefit/cost ratio for this assessment is approximately 217:1. • **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.
5.4.h: Home Site WUI Treatments for at risk homes identified as per 5.4.g above**.**	**People and Structures**	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Minidoka County	**County Commissioners** in cooperation with Fire Mitigation Consulting company and Rural Fire Districts	• **Estimate** 150 homes estimated need treatments estimated at $1,000 per home for a total cost of $150,000 and a benefit cost ratio (including assessment and treatment) of 87:1. • Actual funding level will be based on the outcomes of the home site assessments and cost estimates • 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).
5.4.i: Increased wildland and structural training for department members.	**Resources and Capabilities**	**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 to acquire. • Year 1 (2004): Begin implementing training opportunities for volunteers.

5.6 Minidoka County Fire District- Recommendations and Activities

Table 5.3. WUI Action Items identified for the Minidoka County Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.a: Pursue planned construction of new fire station at north end of district.	**Resources and Capabilities, People and Structures**	**Protection of people and structures** by increasing district capabilities by providing facilities for training and housing of additional equipment	**Minidoka Rural Fire District and County Commissioners**	• Need to develop planning horizon and other outfitting needs for incorporation into this plan.
5.3.b: Augment wildland capabilities of rural districts through acquisition of additional apparatus	**Resources and Capabilities**	**Protection of people and structures** by direct fire fighting capability enhancements.	**Minidoka County Fire** in conjunction **with the BLM's Rural Fire Assistance program**	• Need to determine specifics
5.3.c: Augment emergency water supply through establishment of dry hydrants and cisterns at designated locations	**Resources and Capabilities, People and Structures, Infrastructure**	**Protection of people and structures** by improving water accessibility	**Minidoka County Fire in cooperation with BLM and Emergency Services**	• Determine specific areas for immediate incorporation into the plan.
5.3.d: Secure funding for training officer for coordination of district training needs.	**Resources and Capabilities**	**Protection of people and structures** by increasing training level of fire personnel.	**Minidoka Rural Fire Department** in conjunction with commissioners	• Determine job description and funding needs for position. • Investigate funding opportunities.
5.3.e: Increased wildland fire structural training for department personnel.	**Resources and Capabilities**	**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 to acquire. • Year 1 (2004): Begin implementing training opportunities for volunteers.
5.5.f: Road-side fuels	**People and**	**Protection of**	**Fish and Wildlife**	• **Year 1 (2004):** Update existing assessment of roads in Minidoka

Table 5.3. WUI Action Items identified for the Minidoka County Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
treatments along entrance of Minidoka National Wildlife Refuge.	**Structures, Infrastructure**	**people, structures, and ecosystems** reducing probability of vehicle ignitions.	**service**	County as to location. Secure funding for implementation of this project (grants). • **Year 2 (2005):** Specifically address access issues listed in column one, plus recreation areas, and others identified in assessment. • **Year 3 (2006):** Secure funding and implement projects to treat road-side fuels.
5.3.g: Acquisition of necessary radio equipment for communication with BLM.	**Resources and Capabilities**	**Increase firefighter safety** by improving tactical operations during mutual aid responses.	**Filer Rural Fire District and BLM**	• Assess needs and acquire equipment**.**
5.2.h: Wildfire risk assessments of homes in on the Snake River Canyon Rim and other high-risk areas within the district.	**People and Structures**	**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, Mid Snake RC&D and the BLM**. Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	• Approximately 300 homes in the area need assessments. • **Cost:** Approximately $100 per home site for inspection, written report, and discussions with the homeowners for cost of $30,000. Benefit/cost ratio for this assessment is approximately 217:1. • **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.
5.2.i: Home Site WUI Treatments for at risk homes identified as per 5.2.h above**.**	**People and Structures**	**Protect people, structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Minidoka County	**County Commissioners** in cooperation with Fire Mitigation Consulting company and Rural Fire Districts	• **Estimate** 150 homes estimated need treatments estimated at $1,000 per home for a total cost of $150,000 and a benefit cost ratio (including assessment and treatment) of 87:1. • Actual funding level will be based on the outcomes of the home site assessments and cost estimates • 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).

5.7 Rupert City Fire Department- Recommendations and Activities

Table 5.4. WUI Action Items identified for the Rupert City Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.a: Augment wildland capabilities of rural districts through acquisition of large capacity water tender and heavy wildland fire engine.	**Resources and Capabilities**	**Protection of people and structures** by direct fire fighting capability enhancements.	**Rupert City Fire Department** in conjunction **with the BLM's Rural Fire Assistance program**	• Need to determine specifics
5.3.b: Increased wildland fire structural training for department personnel.	**Resources and Capabilities**	**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 to acquire. • Year 1 (2004): Begin implementing training opportunities for volunteers.
5.3.c: Acquisition of necessary radio equipment for communication with BLM for communication during mutual aid responses**.**	**Resources and Capabilities**	**Increase firefighter safety** by improving tactical operations during mutual aid responses.	**Filer Rural Fire District and BLM**	• Assess needs and acquire equipment**.**
5.2.d: Wildfire risk assessments of homes in on the Snake River Canyon Rim and other high-risk areas within the district.	**People and Structures**	**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, Mid Snake RC&D and the BLM**. Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	• **Cost:** Approximately $100 per home site for inspection, written report, and discussions with the homeowners for cost of $30,000. Benefit/cost ratio for this assessment is approximately 217:1. • **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.
5.2.e: Home Site WUI	**People and**	**Protect people,**	**County**	• **Estimate** 150 homes estimated need treatments estimated at $1,000

Table 5.4. WUI Action Items identified for the Rupert City Fire District.

Action Item	Treatment Category	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
Treatments for at risk homes identified as per 5.2.h above.	**Structures**	**structures, and increase fire fighter safety** by reducing the risk factors surrounding homes in the WUI of Minidoka County	**Commissioners** in cooperation with Fire Mitigation Consulting company and Rural Fire Districts	per home for a total cost of $150,000 and a benefit cost ratio (including assessment and treatment) of 87:1. • Actual funding level will be based on the outcomes of the home site assessments and cost estimates • 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).

Chapter 6: Supporting Information

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6.1 List of Tables

6.2 List of Figures

6.3 List of Preparers

The following personnel participated in the formulation, compilation, editing, and analysis of alternatives for this assessment.

Table 6.1. List of Preparers

Name	Affiliation	Role
William E. Schlosser, Ph.D.	Northwest Management, Inc.	**Lead Author,** Project Manager, GIS Analyst, Natural Resource Economist, Hazard Mitigation Specialist
Vincent P. Corrao, B.S.	Northwest Management, Inc.	Resource Management Specialist, Deputy Project Manager
Tera Duman, B.S.	Northwest Management, Inc.	Natural Resource Manager, Fire Control Technician
John McGee, B.A.	Northwest Management, Inc.	Policy Analyst
Toby Brown, B.S.	Northwest Management, Inc.	Resource Manager
Dennis S. Thomas	Northwest Management, Inc.	Fire & Fuels Specialist, Prescribed Burning Manager
Ken Homik, M.S.	Northwest Management, Inc.	Fire Use & Air Quality Specialist
Vaiden E. Bloch, M.S.	Northwest Management, Inc.	GIS Analyst
Greg Bassler, M.S.	Northwest Management, Inc.	Roads Engineer, Timber Sale Layout & Harvest Manager

6.4 Signature Pages

This **Minidoka County Wildland-Urban Interface Wildfire Mitigation Plan** has been developed in cooperation and collaboration with the representatives of the following organizations, agencies, and individuals.

By: Dave Teeter, Chairperson Minidoka County Commissioner	Date
By: Marvin Bingham Minidoka County Commissioner	Date
By: Dan Stapelman Minidoka County Commissioner	Date
By: Randy Jones Mayor– City of Paul	Date
By: Audrey Neiwerth Mayor– City of Rupert	Date
By: Larry Wall Mayor– City of Acequia	Date
By: George Anderson Mayor–Heyburn	Date

By: Maxine Homer
Mayor–Minidoka

Date

By: Bryce Taylor, Supervisor
Idaho Department of Lands

Date

By: Chris Simonson
USDI Upper Snake River BLM

Date

By: Randy Sutton, Chief
West End Fire Protection District

Date

By: Mike Brown, Chief
Minidoka Rural Fire District

Date

By: Larry V. Pool
Chief, Rupert City Fire Department

Date

By: Travis Rothweiler, Chairman
Mid-Snake RC&D

Date

By: George Falkner
Minidoka County Emergency Management

Date

By: William E. Schlosser, Ph.D.
Project Manager–Minidoka County WUI Wildfire Mitigation Plan, Lead Author
Northwest Management, Inc.

Date

6.5 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 prestated 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.

6.6 Literature Cited

Agee, J.K. 1993. Fire ecology of the Pacific Northwest forests. Washington: Island Press.

Agee, J.K. 1998. The Landscape Ecology of western Forest Fire Regimes. Northwest Science, Vol. 72, Special Issue 1998.

Anderson, H. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. USDA Forest Service, Intermountain Forest and Range Experiment Station. INT-GTR-122. 22 pp.

Barrett, J.W. 1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 106 p.

Brown, J.K. 1995. Fire regimes and their relevance to ecosystem management. Pages 171-178 *In* Proceedings of Society of American Foresters National Convention, Sept. 18-22, 1994, Anchorage, AK. Society of American Foresters, Wash. DC.

Beukema, S.J., D.C. Greenough, C.E. Robinson, W.A. Kurtz, E.D. Reinhardt, N.L. Crookston, J.K. Brown, C.C. Hardy, and A.R. Stage. 1997. An Introduction to the Fire and Fuels Extension to FVS. In: Teck, R., Moeur, and Adams. Proceedings of the Forest Vegetation Simulator Conference, 1997 February 3-7, Fort Collins, Co. Gen. Tech. Rep. INT-373. Ogden UT:USDA Forest Service , Intermountain Research Station.

Dillman, D.A. 1978. Mail and Telephone Surveys: The Total Design Method. Hoboken: John Wiley & Sons, Incorporated. 344 p.

Fiedler, Carl E., Charles E. Keegan III, Chris W. Woodall, Todd A. Morgan, Steve H. Robertson, John T. Chmelik. 2001. A STRATEGIC ASSESSMENT OF FIRE HAZARD IN MONTANA. Report submitted to the Joint Fire Sciences Program, September 29, 2001. Pp. 39.

Final Environmental Impact Statement North-Kennedy Cottonwood stewardship Project Emmett Ranger District, Boise National Forest March 2003.

Graham, W.G. and L.J. Campbell. 1995. Groundwater Resources of Idaho. Idaho Department of Water Resources, Boise, ID. GIS Data.

Hammond, C.; Hall, D.; Miller, S.; Swetik, P. 1992. Level 1 stability analysis (LISA) documentation for version 2.0 USDA, Forest Service. General Technical Report INT-285. Intermountain Research Station, Ogden, UT.

Hann, W.J., Bunnell, D.L. 2001. Fire and land management planning and implementation across multiple scales. Int. J. Wildland Fire. 10:389-403.

Hardy, C.C., Schmidt, K.M., Menakis, J.M., Samson, N.R. 2001. Spatial data for national fire planning and fuel management. International Journal of Wildland Fire 10:353-372.

Harris, C., P.S. Cook, and J. O'Laughlin. 2003. Forest Resource-Based Economic Development in Idaho: Analysis of Concepts, Resource Management Policies, and Community Effects. Policy Analysis Group, University of Idaho, College of Natural Resources, Report № 22. Pp 82.

Holsapple, L.J., Snell, K. 1996. Wildfire and prescribed fire scenarios in the Columbia River Basin: relationship to particulate matter and visibility. In: Keane, R.E., Jones, J.L., Riley, L.S., Hann, W.J., tech. eds. Compilation of administrative reports: multi-scale landscape dynamics in the Basin and portions of the Klammath and Great basins. On file with: U. S. Department of Agriculture, Forest Service, Department of Interior, Bureau of Land

Management; Interior Columbia Basin Ecosystem Management Project, 112 E. Poplar, Walla Walla, WA 99362.

Homer, C.G. 1998. Idaho/western Wyoming landcover classification report and metadata. Department of Geography and Earth Resources. Utah State University. Logan, UT 84322-9635. chomer@gis.usu.edu

Huff, M.H., Ottmar, R.D., Alvarado, E., et al. 1995. Historical and current forest landscapes in eastern Oregon and Washington. Part II: Linking vegetation characteristics to potential fire behavior and related smoke production. Gen. Tech. Rep. PNW-GTR-355. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 43p. (Everett, Richard L., team leader; Eastside forest health assessment; Hessburg, Paul F., science team leader and tech. ed., Volume III: assessment.).

IDEQ (Idaho Department of Environmental Quality). 2003. Rules of the Department of Environmental Quality, IDAPA 58.01.02, "Water Quality Standards and Wastewater Treatment Requirements". Idaho Administrative Code (3-20-97), IDAPA 58.01.02, Boise, ID.

Johnson, C.G.; Clausnitzer, R.R.; Mehringer, P.J.; Oliver, C.D. 1994. Biotic and Abiotic Processes of Eastside Ecosytems: the Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics. Gen. Tech. Report PNW-GTR-322. USDA-Forest Service. PNW Research Station. Portland, Oregon. 722pp.

Johnson, C.G. 1998. Vegetation Response after Wildfires in National Forests of Northeastern Oregon. 128 pp.

Levinson, D.H. 2002. Montana/Idaho Airshed Group; Operating Guide. Montana / Idaho Airshed Group, Missoula, MT 59808

Louks, B. 2001. Air Quality PM 10 Air Quality Monitoring Point Source Emissions; Point site locations of DEQ/EPA Air monitoring locations with Monitoring type and Pollutant. Idaho Department of Environmental Quality. Feb. 2001. As GIS Data set. Boise, Id.

McCoy, L., K. Close, J. Dunchrack, S. Husari, and B. Jackson. 2001. May 6 –24, 2001. Cerro Grande Fire Behavior Narrative.

MacDonald, L. H.; Smart, A.W.; and Wissmar, R.C. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. USEPARegion 10 Report No. 910/9-91-001.

Mill Creek Watershed Assessment Emmett Ranger Districts, Boise National Forest May 2003

National Interagency Fire Center. 2003. Information posted on the Agency's Internet web site at http://www.nifc.gov/

National Register of Historic Places. 2003. Internet web site listings for Minidoka County, Idaho. On the Internet at www.nationalregisterofhistoricalplaces.com

Norton, P. 2002. Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental Assessment, June 20, 2002. Fish and Wildlife Service, Bear Valley National Wildlife Refuge.

Ottmar, Roger D.; Alvarado, E.; Hessburg, P.F.; [and others]. 1996. Historical and current forest and range landscapes in the interior Columbia River basin and portions of the Klammath and Great basins. Part III: Linking vegetation patterns to potential smoke production and fire behavior. Draft report. On file with: U.S. Department of Agriculture, Forest Service;

U.S. Department of interior, Bureau of Land management; Interior Columbia Basin Ecosystem Management project, 112 E. Poplar, Walla Walla, WA.

Quigley, T. and S. Arbelbide (Tech. Editors). 1997. An assessment of Ecosystem Components in the Interior Columbia Basin. Pacific Northwest Research Station, Walla Walla, WA. GTR-405. pp. 372, 460, 462, 480-486, 855-869.

Quigley, T.M., R.A. Gravenmier, R.T. Graham, tech. eds. 2001. Interior Columbia Basin Ecosystem Management Project: project data. Station Misc. Portland, OR. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Redmond, R.L. 1997. Mapping existing vegetation and land cover across western Montana and Northern Idaho. Wildlife Spatial Analysis Lab. Montana Cooperative Fish and Wildlife Research Unit. University of Montana, Missoula, MT 59812.

Schlosser, W.E., V.P. Corrao, D. Thomas. 2002. Shoshone County Wildland Urban Interface Fire Mitigation Plan, Final Report. Northwest Management, Inc., Moscow, ID.

Schmidt, K.M., Menakis, J.P. Hardy, C.C., Hann, W.J., Bunnell, D.L. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. General Technical Report, RMRS-GTR-87, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

Scott, H.S. 1998. Fuel reduction in residential and scenic forests: a comparison of three treatments in western Montana ponderosa pine stand. Res. Pap. RMRS-RP-5. Ogden, UT. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 19 p.

Steele, R.; Arno, S.F.; and Geier-Hayes, K. 1986. Wildfire patterns change in Central Idaho's ponderosa pine-Douglas-fir forest.

Swanson, F.J. 1978. Fire and geomorphic processes; in Fire Regimes and Ecosystem Properties. USDA Forest Service Gen. Tech. Rep. WO. 26 pp.

Thompson, R.A., P.H. Skabelund, N.C. Kulesza, E.N. Dean. 1973. Soil - Hydrologic Reconnaissance. New Meadows Ranger District, Payette National Forest. 242 pp.

USDA. 1999. Salmon River Canyon Project Draft Environmental Statement. USDA Forest Service. Nez Perce National Forest.

USDA-Forest Service (United States Department of Agriculture, Forest Service). 2000. Incorporating Air Quality Effects of Wildland Fire Management into Forest Plan Revisions – A Desk Guide. April 2000. - Draft

USFS. 2001. United States Department of Agriculture, Forest Service. Wildland Urban Interface. Web page. Date accessed: 25 September 2001. Accessed at: http://www.fs.fed.us/r3/sfe/fire/urbanint.html

Vogl, R.J. 1979. Some basic principles of grassland fire management. Environmental Management 3(1):51-57, 1979.

Wright, H.A. and A.W. Bailey. 1980. Fire ecology and prescribed burning in the Great Plains – A research review. United States Department of Agriculture, Forest Service, Intermountain Forest Range Experiment Station, Ogden, Utah. General Technical Report. INT-77.

Wright, H. A. and Bailey, A.W. 1982. Fire ecology: United States and Southern Canada. John Wiley and Sons, Inc. 501 pp.

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Schlosser, W.E., K.D. Homik, T.R. Duman, D.S. Thomas, T.R. Brown. *Lead Auths.* 2004. Minidoka County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan Appendices. Northwest Management, Inc., Moscow, Idaho. October 18, 2004. Pp. 46.

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Northwest Management, Inc.
233 East Palouse River Drive
PO Box 9748
Moscow ID 83843

208-883-4488 Telephone
208-883-1098 Fax
NWManage@consulting-foresters.com e-Mail
http://www.Consulting-Foresters.com/ Internet

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