



FEMA

May 31, 2018

The Honorable Jerry Hoagland
Owyhee County Commissioner
Owyhee County Courthouse P.O. Box 128
Murphy, Idaho 83650

Dear Commissioner Hoagland:

On May 31, 2018, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Hazard Mitigation Plan of Owyhee County, Idaho and the cities of Grand View and Marsing as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance (HMA) grants projects through May 30, 2023, through your state:


Owyhee County

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Lorrie Pahl, Senior Mitigation Planner with Idaho Office of Emergency Management, at (208) 258-6508 who coordinates and administers these efforts for local entities.

Sincerely,


Mark Carey, Director
Mitigation Division

cc: Susan Cleverley, Idaho Office of Emergency Management

Enclosure

AS:vl

OWYHEE COUNTY RESOLUTION NO. 2018-15

ADOPTING THE MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING AS AN OWYHEE COUNTY PLAN FOR INCORPORATION INTO THE OWYHEE COUNTY CODE

WHEREAS, The Draft MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING has received a pre-adoption review and approval letter from FEMA Region 10 on April 24, 2018 committing to FEMA Approval upon adoption by the County; and

WHEREAS, The Board participated in the development of the plan; and

WHEREAS, The recently completed MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING provides either new or updated information and data pertinent to the County's current and future actions to plan for and potentially mitigate identified hazards; and

WHEREAS, The Board supports the MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING; and

WHEREAS, The MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING will be utilized as a guide for planning as related to FEMA Pre-Disaster Mitigation and other purposes as deemed appropriate; and

WHEREAS, Exhibit A contains a copy of the MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING and is hereby made a part of this Resolution; and

WHEREAS, Exhibit B contains a copy of the FEMA Region 10 April 24, 2018 pre-adoption review letter for the MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING and is hereby made a part of this Resolution; and

IT IS HEREBY RESOLVED, for good cause shown, that the Owyhee County Board of Commissioners hereby adopt the MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN OF OWYHEE COUNTY, IDAHO AND THE CITIES OF GRAND VIEW AND MARSING as an Owyhee County Plan to be incorporated into the Owyhee County Code.

IT IS FURTHER RESOLVED THAT this Resolution is effective on the date of signatures of the Board.

Dated this 29th day of May 2018.



Kelly Aberasturi, Chairman



Jerry L. Hoagland, Member



Joe Merrick, Member

ATTEST: Brook Russell, Deputy County Clerk



DATE: May 29, 2018

FEMA REGION 10 LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in [44 CFR §201.6](#) and offers States and FEMA Mitigation Planners an opportunity to provide feedback to participating jurisdictions.

1. The Multi-Jurisdiction Summary Sheet is used to document how each jurisdiction met the requirements in the Plan.
2. The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
3. The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.

The FEMA Mitigation Planner must reference the [Local Mitigation Plan Review Guide](#) when completing this *Local Mitigation Plan Review Tool*.

Jurisdiction: Owyhee County and the Cities of Grand View, Homedale, & Marsing	Title of Plan: The Multi-Jurisdictional Hazard Mitigation Plan of Owyhee County, Idaho and the Cities of Grand View, Homedale, & Marsing	Date of Plan: June 19, 2017
Local Point of Contact: Jim Desmond	Address: P.O. Box 38 Murphy, ID 83650	
Title: Director		
Agency: Owyhee County Emergency Services		
Phone Number: (208) 249-0571	E-Mail: OCNRCDIR@aol.com	

State Reviewer: Susan Cleverley Lorrie Pahl	Title: Mitigation Section Chief Mitigation Planning	Date: 7/10/17, 8/7/17 11/2/17, 12/4/17, 4/10/18
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FEMA Reviewer: Amanda Siok Amanda.Siok@fema.dhs.gov	Title: Mitigation Planner	Date: 02/24/2018; 04/24/2018
Date Received in FEMA Region 10	01/04/2018; 04/16/2018	
Plan Not Approved		
Plan Approvable Pending Adoption	04/24/2018	
Plan Approved	05/31/2018	

SECTION 1: MULTI-JURISDICTION SUMMARY SHEET (used only for multi-jurisdictional plans)

INSTRUCTIONS: The Multi-Jurisdiction Summary Spreadsheet is completed by listing each participating jurisdiction and which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it is used to ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

MULTI-JURISDICTION SUMMARY SHEET (Add additional pages if necessary)										
#	Jurisdiction Name	Jurisdiction Type (city/borough / district, etc.)	POC	Required Revisions / Comments	Requirements Met (Y/N)					
					A. Planning Process	B. Hazard Identification & Risk Assessment	C. Mitigation Strategy	D. Plan Review, Evaluation & Implementation	E. Plan Adoption	F. State Requirements
1	Owyhee	County	Jim Desmond, EM		Y	Y	Y	Y	Y	Y
2	Grand View	City	Franklin Hart		Y	Y	Y	Y		Y
3	Marsing	City	James Ferdinand, Mayor		Y	Y	Y	Y		Y

SECTION 2: REGULATION CHECKLIST

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	PDF 19-29, Appendix C	X		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	PDF 19-29, Appendix C	X		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	PDF 19, 31-33, Appendix F	X		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	PDF 29-30, 79, 81, 168	X		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	PDF 234	X		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	PDF 231-233, Appendix G	X		
ELEMENT A: REQUIRED REVISIONS				

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	PDF 89, 96, 102, 115, 134, 147, 159, 743	X		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	PDF 92, 97, 106, 118, 136, 151, 161, 743	X		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	PDF 92, 99, 108, 120, 138, 156, 171	X		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	PDF 208-210	X		
<u>ELEMENT B: REQUIRED REVISIONS</u>				

ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	PDF 109, PDF205-211	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	PDF 210-211	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	PDF 178	X	
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	PDF 181-203	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	PDF 180-203	X	
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	PDF 237	X	
ELEMENT C: REQUIRED REVISIONS			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	PDF 85 -87 92, 99, 109, 123, 143, 172, 744	X	
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))	PDF 177 (Mitigation Successes & Highlights), PDF 180-203	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Executive Summary; PDF 201, Table 32	X	
ELEMENT D: REQUIRED REVISIONS			

ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Owyhee County Adopted 5/31	X	
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Not yet Adopted: Grand View Marsing		X
<u>ELEMENT E: REQUIRED REVISIONS</u>			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
<u>ELEMENT F: REQUIRED REVISIONS</u>			

SECTION 3: PLAN ASSESSMENT

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

Plan Strengths

- The planning process included input from Silver City, UEI, USAF, and IDL Regional Office.
- The Plan Monitoring Section includes the suggestion that planning committee members annually complete the Capabilities Worksheet as well as suggests recommended topics for the annual review meetings.

Opportunities for Improvement

- The public process only engaged two responses via the survey with zero attendance and the public meeting. Consider revising section 7.4 with an updated process to improve public engagement over the plan's lifecycle.
- Section 3.5 on Review of Existing Plans should include plans from all participating jurisdictions rather than only the county.

Element B: Hazard Identification and Risk Assessment

Plan Strengths

- Thorough description of faults and history of geology supporting the probability of earthquake hazards.
- Great description of Murphy Hot Springs and Silver City Landslide Impact Zones for the landslide hazards and associated vulnerabilities.
- Description of 05-06 floods was thorough and provided a solid understanding of impacts and types of vulnerabilities.
- The connection between wildfire and economic impacts due to grazing was well made. This will be used as an example in future G-318 courses.

Opportunities for Improvement

- Add Appendix J (and all other appendices) to the Table of Contents as the profile was hard to find.
- Add a more detailed description to the Extreme Drought between 2013 and 2017. The Intent of the Previous Occurrences requirement is to understand potential impacts to the community based on hazard events which occurred in the past.

Element C: Mitigation Strategy

Plan Strengths

- A thorough description of ordinances and capabilities is provided for each jurisdiction including Building Codes, Subdivision Ordinances, Transfer of Development Rights, and Appropriation Ordinances.

Opportunities for Improvement

- Table 75 Action Item 7 states “Request FEMA Update of Flood Insurance Rate Maps... not considered a priority by FEMA”. Please note that priorities for Flood Insurance Study updates are determined by the State Risk MAP Coordinator at the Idaho Bureau of Homeland Security. Please reach out to BHS to express interest in mapping.

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

Plan Strengths

- Each hazard profile includes a description of experienced changes in development and anticipated future changes.
 - The Community Profile describes the impact of the new middle school on growth patterns. Consider connecting this noticed change to the Future Development section with each hazard. Additionally, consider how the school impacts vulnerability (more children -, modern building +, etc.).

Opportunities for Improvement

- The plan identifies current and future development along the Snake River. Consider making flood risk awareness and flood mitigation a higher priority.

B. Resources for Implementing Your Approved Plan

The **Region 10 Integrating Natural Hazard Mitigation into Comprehensive Planning** is a resource specific to Region 10 states and provides examples of how communities are integrating natural hazard mitigation strategies into comprehensive planning. You can find it in the FEMA Library at <http://www.fema.gov/media-library/assets/documents/89725>.

The **Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials** resource provides practical guidance on how to incorporate risk reduction strategies into existing local plans, policies, codes, and programs that guide community development or redevelopment patterns. It includes recommended steps and tools to assist with local integration efforts, along with ideas for overcoming possible impediments, and presents a series of case studies to demonstrate successful integration in practice. You can find it in the FEMA Library at <http://www.fema.gov/library/viewRecord.do?id=7130>.

The **Mitigation Ideas: A Resource for Reducing Risk from Natural Hazards** resource presents ideas for how to mitigate the impacts of different natural hazards, from drought and sea level

rise, to severe winter weather and wildfire. The document also includes ideas for actions that communities can take to reduce risk to multiple hazards, such as incorporating a hazard risk assessment into the local development review process. You can find it in the FEMA Library at <http://www.fema.gov/library/viewRecord.do?id=6938>.

The **Local Mitigation Planning Handbook** provides guidance to local governments on developing or updating hazard mitigation plans to meet and go above the requirements. You can find it in the FEMA Library at <http://www.fema.gov/library/viewRecord.do?id=7209>.

The **Integration Hazard Mitigation and Climate Adaptation Planning: Case Studies and Lessons Learned** resource is a 2014 ICLEI publication for San Diego with a clear methodology that could assist in next steps for integration impacts of climate change throughout mitigation actions. <http://icleiusa.org/wp-content/uploads/2015/08/Integrating-Hazard-Mitigation-and-Climate-Adaptation-Planning.pdf>

The **Local Mitigation Plan Review Guide and Tool** resource is available through FEMA's Library and should be referred to for the next plan update. <http://www.fema.gov/library/viewRecord.do?id=4859>

The **Tribal Multi-Hazard Mitigation Planning Guidance**: This resource is specific to tribal governments developing or updating tribal mitigation plans. It covers all aspects of tribal planning requirements and the steps to developing tribal mitigation plans. You can find the document in the FEMA Library at <http://www.fema.gov/media-library/assets/documents/18355>

Volcanic Eruption Mitigation Measures: For information on Mitigation Actions for Volcanic Eruptions that would satisfy the C4 requirement, please visit: <http://earthzine.org/2011/03/21/volcanic-crisis-management-and-mitigation-strategies-a-multi-risk-framework-case-study/> and <http://www.gvess.org/publ.html>.

The FEMA Region 10 **Risk Mapping, Analysis, and Planning program (Risk MAP)** releases a monthly newsletter that includes information about upcoming events and training opportunities, as well as hazard and risk related news from around the Region. Past newsletters can be viewed at <http://www.starr-team.com/starr/RegionalWorkspaces/RegionX/Pages/default.aspx>. If you would like to receive future newsletters, email rxnewsletter@starr-team.com and ask to be included.

The mitigation strategy may include eligible projects to be funded through FEMA's hazard mitigation grant programs (Pre-Disaster Mitigation, Hazard Mitigation Grant Program, Flood Mitigation Assistance). Contact your State Hazard Mitigation Officer, Susan Cleverly at Scleverley@imd.idaho.gov, for more information.

Owyhee County

Multi-Jurisdictional Hazard Mitigation Plan



2018 Update

The Multi-Jurisdictional Hazard Mitigation Plan
of
Owyhee County, Idaho
and the Cities of
Grand View & Marsing

Prepared for:
Owyhee County Board of County Commissioners
(208) 495-2421

Updated 2017-2018

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ACKNOWLEDGEMENTS

Thanks to Jim Desmond (Owyhee County Emergency Manager), Susan Cleverley (State Hazard Mitigation Officer, Idaho Office of Emergency Management), Lorrie Pahl (State Hazard Mitigation Planner, Idaho Office of Emergency Management), the Owyhee County Board of County Commissioners, the Planning Committee, and the public for their support and input.

Cover Material

Cover material provided by Famartin –

https://en.wikipedia.org/wiki/Sagebrush_steppe#/media/File:2013-07-07_15_41_55_Sagebrush-steppe_in_south-central_Idaho_along_3_Creek_Road.jpg

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EXECUTIVE SUMMARY

The Owyhee County Multi-Jurisdictional Hazard Mitigation Plan (HMP) is an update to the June 2008 Owyhee County Multi-Hazard Mitigation Plan. The Owyhee County HMP 2017 update was guided by Dr. Tim Frazier of the Hazards & Climate Impacts Research Center (HazCIRC), Jim Desmond of the Owyhee County Department of Emergency Management, and the Planning Committee. The Planning Committee was composed of members from the Department of Emergency Management and representatives from the communities, State and Federal agencies, and other organizations and stakeholders active within the county.

Major changes to the HMP include an updated and rewritten county profile, the inclusion of additional hazards, much more detailed and comprehensive risk and vulnerability assessments for the hazards of focus, and the addition of new mitigation actions. Additionally, the 2017 update builds a strong foundation for annual review and update, allowing Owyhee County and adopting jurisdictions to maintain the HMP through the plan's five-year lifecycle.

The revised risk analysis assessment resulted in changes in hazard past occurrence rates, probability, vulnerability, spatial extent, magnitude, and prioritization. The update process employed additional datasets and modeling, and included the use of the Spatially Explicit Resilience-Vulnerability model developed by Dr. Frazier. This socioeconomic vulnerability model helps inform where susceptible populations are located across the county, and is important in efficiently allocating resource pre- and post-disaster.

Table 1. Summary of hazard occurrences and risk prioritization

Hazard	2009-2017 Occurrences	Casualties	Property & Crop Damage	Risk Prioritization
Avalanche	-	-	-	6
Drought	1	-	-	-
Earthquake	2	-	-	4
Flood	10	1 Fatality	-	3
Landslide	-	-	-	5
Severe Weather	43	-	\$100,100,000 Property	2
Wildfire*	33	-	\$18,193,000 AUM value \$16,400,000 in loss to ranchers	1

*Wildfires larger than 1,000 acres

Mitigation actions were reviewed and updated per feedback from the Planning Committee and responsible agencies and departments. Additional mitigation actions were included based on

Committee and public input. These actions were scored and ranked to better prioritize efforts and resources towards the completion of listed mitigation actions.

Finally, this document collects both the Owyhee County HMP and the Owyhee County Community Wildfire Protection Plan (CWPP). The most recent CWPP is located in Appendix H.

I. INTRODUCTION

1.1 Overview

The term 'hazard' defines any event with the potential to cause loss of life or property. Hazards affecting Owyhee County include flood, earthquake, landslides, severe weather, wildfires, and more. Hazards become disasters when individual and communities are negatively impacted by such events. This plan identifies the county's hazards, assesses the county's vulnerability to those hazards, and details proposed actions to reduce the loss of life and property from disasters. These actions are defined as mitigation.

Hazard mitigation consists of cost-effective actions that reduce, limit, or prevent individual or community loss from damaging, harmful, or costly hazards. Mitigation consists of many types of actions, including local planning and regulations, capital improvement projects, natural systems protections, education and awareness programs, and preparedness and response actions. Together, these types of actions form a mitigation strategy, which is detailed in this Hazard Mitigation Plan (HMP).

Mitigation is one of the four emergency phases. The other phases are preparedness, response, and recovery. Where mitigation includes activities designed to prevent an emergency, reduce the probability of emergencies happening, or reduce the losses of unavoidable emergencies, preparedness includes plans and preparations to save lives and help response and rescue operations. Response occurs immediately after an emergency, and includes actions taken to save lives and prevent further damage or loss of life. The last phase is recovery, which are those actions taken to return to a state of normalcy.



Figure 1. Emergency and disaster management cycle

Although often viewed as distinct and separate, the four emergency phases are a continuum across time and space undertaken by numerous agencies, organizations, and individuals. Mitigation can occur before and after an emergency or disaster, and mitigation actions can be built into both preparedness and recovery in order to address vulnerabilities and weaknesses that arise during and post-emergency. It is important to distinguish between the HMP and other emergency response or emergency management plans. Where emergency response and management plans direct and detail the county's strategy of allocating resources and efforts to respond to and recover from a disaster, mitigation plans identify past occurrences of hazards and associated losses, possible future occurrences and losses, and help guide and implement actions and projects to reduce or eliminate current and future losses. These plans are interrelated, however, and should be employed as a cohesive planning framework to reduce vulnerability and enhance resilience against hazards.

Often, hazard mitigation is divided into three categories:

- Policies and actions that keep the hazard away from people, property, and structures.
- Policies and actions that keep people, property, and structures away from hazards.
- Policies and actions that reduce the hazard impacts on people, property, and structures.

However, there are many types of hazard mitigation. Table 2 provides an overview and examples of mitigation types.

Table 2. Mitigation types, definitions, and examples

Type of Action	Explanation	Examples
Local Planning and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built (FEMA, 2013).	<ul style="list-style-type: none"> • Comprehensive plans • Land use ordinances • Subdivision regulations • Development review • Cyber security plans
Structure and Infrastructure Projects	<p>These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure.</p> <p>This type of action also involves projects to construct manmade structures to reduce the impact of hazards (FEMA, 2013).</p>	<ul style="list-style-type: none"> • Utility undergrounding • Structural retrofit • Floodwalls • Culverts • Safe Rooms • Acquisitions and elevation of structures in flood prone areas • Off-site record backups
Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems (FEMA, 2013).	<ul style="list-style-type: none"> • Sediment and erosion control • Stream corridor restoration
Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as <i>StormReady</i> or <i>Firewise</i> Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions (FEMA, 2013).	<ul style="list-style-type: none"> • Radio or television spots • Websites with maps and information • Real estate disclosure • Mailings to neighborhoods • Firewise • Stormready • Disease awareness • Cyber security training
Preparedness and Response Actions	Mitigation actions reduce or eliminate long-term risk and are different from actions taken to prepare for or respond to hazard events. Mitigation activities lessen or eliminate the need for preparedness or response resources in the future. When analyzing	<ul style="list-style-type: none"> • Creating mutual aid agreements with neighboring communities

	risks and identifying mitigation actions, the planning team may also identify emergency response or operational preparedness actions (FEMA, 2013).	<ul style="list-style-type: none"> • Purchasing radio communications equipment • Developing procedures for notifying citizens of available shelter locations during and following an event
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1.2 Plan Purpose & Benefits

Owyhee County's HMP identifies both short- and long-term local policies and actions that help reduce risk and future losses from hazards. These policies and actions are practical, cost effective, and politically, culturally, and environmentally acceptable. Local stakeholders and the public are engaged throughout the planning process, and feedback and perceptions are vital to a sound and comprehensive HMP. These policies and actions help to more efficiently and effectively focus resources on hazards that present the greatest risks to the county's populations and resources, while also aligning with other community objectives. The HMP focuses on land use and capital investment, given the effect capital investments and land use have on modulating community and individual vulnerability.

Other benefits of undergoing the planning process and creating and maintaining an HMP include:

- Selection of Risk Reduction Actions – Hazard mitigation is a systematic process of identifying and analyzing the county's risks. By setting clear goals and identifying and implementing mitigation strategies, the county can reduce losses from disasters.
- Builds Local, State, & Federal Partnerships – The hazard mitigation plan builds partnerships through two-way communication and collaboration by involving various stakeholders at the local, State, and Federal levels.
- Facilitates Sustainability – Risk from hazards and sustainability of the county and its communities are linked. Without identifying and mitigation risks, the livelihood and continuance of the county and its communities are threatened. Enhancing resilience to hazards enhances sustainability.
- Establishes Funding & Resource Priorities – By coordinating and consolidating mitigation actions undertaken in the county into a unified strategy, the plan helps prioritize and articulate the county's and its communities' needs to the public, organizations and enterprise, and agencies with stakes in the county.

- Increase Hazard Awareness & Education – The hazard mitigation planning process increases education and awareness of hazards and risks in the county and its communities. This awareness helps individuals understand their risk, self-mitigate, and enhance their resilience. This can translate to support of mitigation actions in the county.

1.3 Legal Authority & Requirements

The legal basis of the HMP is the Stafford Act, as amended by the Disaster Mitigation Act (DMA) of 2000. The DMA emphasized pre-disaster planning, and Section 322 of the Act specifically addressed mitigation planning. The DMA requires state and local governments to prepare and maintain hazard mitigation plans in order to receive FEMA hazard mitigation project grants. This financial assistance can be sought pre- and post-disaster, and is therefore vital in all phases of emergency management.

The requirements for an HMP are located in 44 CFR §201.6 and include criteria for six elements:

- Planning Process
- Hazard Identification and Risk Assessment
- Mitigation Strategy
- Plan Review
- Evaluation
- Implementation and Plan Adoption

Detailed criteria for each of the requirements can be found in Appendix B.

1.4 Hazard Mitigation Plan Update

A community must review and revise their existing HMP, as required by 44 CFR§201.6(c)(v). The revision must reflect changes in development, progress made in local mitigation efforts, and changes in hazard and mitigation priorities. The update then must be resubmitted for approval within five years in order to maintain eligibility for FEMA mitigation grant funding. The county's previous HMP was originally completed and adopted in 2005, and expired in 2009. The plan was updated in 2017 through a collaborative effort between Owyhee County and participating communities, the Hazards & Climate Impacts Research Center (HazCIRC), IOEM, and various agencies and organizations working within the county.

The update process built on the former plan but comprehensively updated the plan's various components. The planning process was rewritten to reflect the update process, and the risk

assessment incorporated new hazard data and modeling to provide more comprehensive analysis of the county's risks. The plan update considered population and development changes over the past eight years, and future development and population growth over the next five years. Likewise, updates were made to include historical hazard occurrences and associated losses after 2009 were included, local regulatory and planning capabilities, the progress of mitigation actions in the county, and new mitigation actions to be implemented in the county over the plan's five-year lifecycle.

1.5 Community Wildfire Protection Plan

A Community Wildfire Protection Plans (CWPP) is similar in nature to the HMP, though primarily focuses on wildfire. Following the enactment of the Healthy Forests Restoration Act (HFRA) in 2003, communities can engage in comprehensive forest planning with federal partners through the creation of a CWPP, which identifies and prioritizes hazards and needs associated with wildfire. In the State of Idaho, the CWPP is under the purview of the Department of Lands (IDL), and county CWPPs tier to the Idaho State Implementation Strategy for the National Fire Plan.

Similar to the HMP, the Owyhee County CWPP identifies and documents areas at risk to wildfire, details strategies and actions to decrease wildfire risk and losses, and provides assistance to residents, organizations, and agencies within the county.

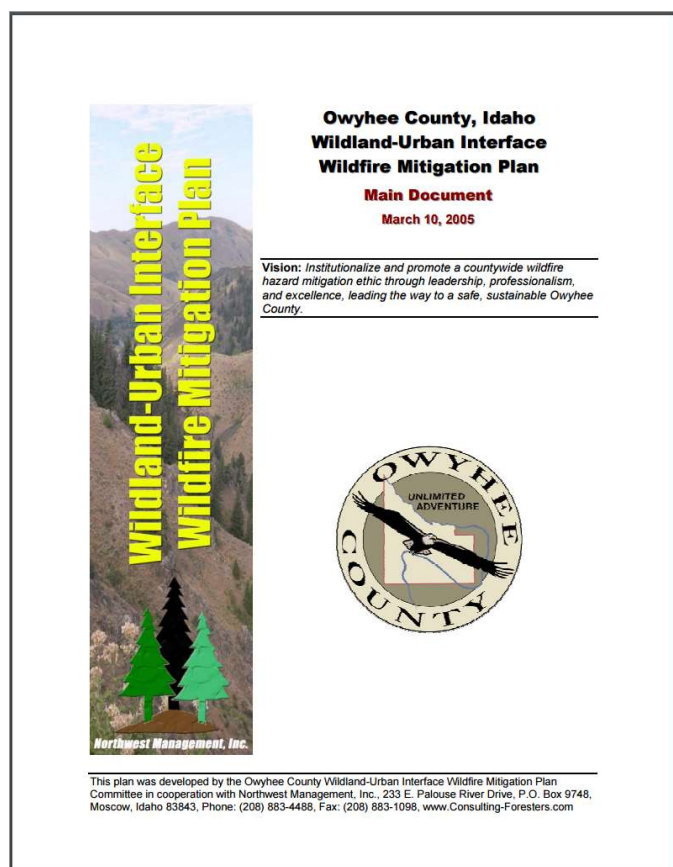


Figure 2. Owyhee County Wildfire Protection Plan

Due to similar plan format and requirements, the 2017 plan update incorporated the Owyhee County Community Wildfire Protection Plan (CWPP) by attaching it in the appendices. Advantages of integrating both plans include a more comprehensive overview of all hazards and mitigation strategies in the county, opens funding avenues not previously available, and allows for the maintenance of one consolidated document.

1.6 Plan Organization

This plan is organized into the following sections:

- Introduction – Provides an overview of mitigation, hazards, and the basis of HMPs.
- Prerequisites & Promulgations – Provides an overview of the jurisdictions that adopted the HMP.
- Planning Process – Details the process undertaken for the 2017 plan update. This section identifies and details the planning committee, participating jurisdictions, and stakeholders.
- County Profile – Provides an overview of Owyhee County and the many factors considered throughout the plan update.
- Risk Assessment – Details identified hazards and risks facing the county. Hazard profiles include hazard descriptions; hazard extents, magnitudes, and past occurrences; population, structure, and structure value exposure; socioeconomic vulnerability assessments; loss estimates; and land use and future developments in relation to hazards.
- Mitigation Strategy – Details the county's commitment and strategy to reduce loss of life and property from hazards and risks identified in the Risk Assessment. Includes goals, objectives, and specific actions. This section also includes funding avenues, detailed National Flood Insurance Program (NFIP) information, and more.
- Plan Maintenance – Details the county's commitment to maintaining the 2017 plan through the five-year lifecycle. The county will monitor, evaluate, and update the plan on a bi-annual basis, and engage the public throughout the process. This section also includes recommended updates for the 2022 plan update.

II. PREREQUISITES & PROMULGATIONS

2.1 Overview

Governing bodies have the authority to promote sound public policy regarding hazards. Copies of the signed resolutions and promulgations are included in Appendix A. Upon approval by IOEM and FEMA and adoption by the local jurisdictions, Owyhee County and the other plan signatories gain eligibility for pre- and post-disaster federal funding assistance, such as grants from the Pre-Disaster Mitigation Grant Program and the Hazard Mitigation Grant Program.

2.2 Jurisdictional Adoption

The following jurisdictions have the authority to adopt the plan:

- Owyhee County
- City of Grand View
- City of Marsing

The City of Homedale is not seeking plan approval as the city did not participate in the 2017 plan update. However, hazard risk assessments and mitigation actions were included for participation and plan adoption in future updates.

III. PLANNING PROCESS

3.1 Overview

The planning process is vital to the development and completion of a comprehensive HMP that best fits a county and its communities. As with almost all planning efforts, the plan is only as good as the process itself. A major component of the planning process is involvement and participation from representatives and stakeholders from the county, local communities, State and Federal agencies, and other organizations. Through the process, perspectives on hazards and risks, community assets, and mitigation needs are discussed and incorporated into the plan. The planning process consisted of the following phases:

- Plan Update Kick-Off – The planning process for the 2017 plan update began in August of 2015 with a kick-off meeting between Jim Desmond (Owyhee County Emergency Manager), Dr. Tim Frazier (HazCIRC), and Mark Stephensen (IOEM State Hazard Mitigation Officer). A work plan was proposed and agreed on, including hazards of focus, timelines, mitigation and adaption planning and stakeholder engagement, and more.
- Plan Review & Evaluation – The former plan was reviewed and evaluated according to the FEMA Local Mitigation Review Tool (2011) and a more stringent and comprehensive evaluation matrix developed by Frazier et al. (2013). The review and evaluation results guided the risk assessment and mitigation strategy for the 2017 plan update by identifying the strengths and weaknesses of the former plan.
- Risk Assessment – Hazard occurrences, damage assessments and estimations, and hazard impacts were collected for the county. Additional hazards were included in the 2017 plan update, and all hazard profiles updated to reflect current science and risk. Various probabilistic models; scenario-based loss estimates; population, structure, and critical facility exposure; and a comprehensive socioeconomic vulnerability analysis were employed to provide a more holistic and comprehensive assessment of the county's risks.
- Mitigation Strategy Review – The mitigation actions listed in the former plan were reviewed and their status determined by the responsible agencies and departments. This involved reaching out to numerous individuals, agencies, and departments in the county in order to collect information on the progress, completion percent, timeline, and challenges of the mitigation actions. Overall mitigation goals and objectives were likewise visited and updated as necessary.
- Mitigation Strategy Update – New and additional mitigation actions were detailed and scored by the planning committee for inclusion into the 2017 plan update. Each jurisdiction was provided the opportunity to put forth mitigation actions for discussion and approval.
- Public Involvement & Outreach – The public was invited to attend a meeting to review the risk assessment, proposed mitigation actions, and provide comments and feedback. Large format

maps provided a place for public participants to locate and draw areas of concern. A hazard survey provided opportunities for both the public and planning committee to provide local risk perceptions for inclusion into the 2017 plan update. Finally, a webpage provided an online presence, and provided links to the draft plan, opportunity to comment and provide feedback, and links to the survey and a CityEngine scene.

- Plan Completion & Adoption – HazCIRC compiled all planning documentation, completed the risk assessment, and collected new mitigation actions to produce the first version Owyhee County Hazard Mitigation Plan 2017 Update. The draft was distributed to the planning committee and IOEM, for review and comment. Feedback and comments were incorporated into the second draft. Additional hazard profiles, modeling, and mitigation actions were also incorporated into the second draft. After the review and edit period, the plan was formally submitted to IEOM and FEMA for approval.

3.1.1 FEMA Requirements

This section was developed consistent with the process and requirements detailed by FEMA. This section satisfies the following FEMA requirements:

- FEMA 44 CFR §201.6(b) – An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
 - FEMA 44 CFR §201.6(b)(i) – An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
 - FEMA 44 CFR §201.6(b)(ii) – An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
 - FEMA 44 CFR §201.6(b)(iii) – Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
- FEMA 44 CFR §201.6(c)(i) – The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.2 The Planning Committee & Jurisdictional Participation

The planning committee helped steer the 2017 plan update and played a key role in the development and completion of the update. The planning committee was headed by Jim Desmond (Owyhee County Emergency Manager) and included representatives from various county and city departments and agencies. Members of the planning committee participated in meetings, provided input on the risk assessment and past hazard occurrences, discussed current issues and potential problems facing the county, reviewed the status of mitigation actions listed in the former HMP, and put forward new mitigation actions for inclusion in the 2017 plan update. Table 3 details the planning committee, their titles and representing jurisdictions or agencies, and their participation history.

Table 3. Planning committee members

Name	Title	Jurisdiction or Agency	2008 Participation	2017 Participation
Wes Anderson	Chief	MRW Fire	-	Yes
Christine Ballard	911 Coordinator	Owyhee County Sheriff's Office	-	Yes
Donna Bennett	Executive Director	Grand View Ambulance	-	Yes
Don Best	Road Supervisor	Owyhee County R&B Dist. III	-	Yes
Josh Bolinger	Health & Safety Coordinator	USEI	-	Yes
Gus Brackett	Secretary/Treasurer	Three Creek Rangeland Fire Protection Association	-	Yes
Jim Desmond	Emergency Manager	Owyhee County	Yes	Yes
Mike Faulkner	Director	Saylor Creek RFPA	-	Yes
James Ferdinand	Mayor	City of Marsing	-	Yes
Terry Geis	General Manager of US Ecology's Idaho Operations	US Ecology	-	Yes
Dr. Andrew Grover	Superintendent	Melba School District	-	Yes
Jerry Hoagland	Member	Silver City Homeowners Association	-	Yes
Mary Huff	Planning and Zoning Administrator	Owyhee County Planning & Zoning	-	Yes
Jim Hyslop	Chief	Silver City Fire & Rescue; Silver City Homeowners Association	Yes	Yes

Name	Title	Jurisdiction or Agency	2008 Participation	2017 Participation
Mitchell Jaurena	Executive Director	Owyhee Initiative Board of Directors	-	Yes
Kenny Kershner	Director	Owyhee Rangeland Fire Protection Association	-	Yes
Jim Morton	Installation Emergency Manager	Mountain Home Airforce Base	-	Yes
Bob Pietras	Area Manager	Idaho Department of Lands Southwest	-	Yes
Daniel Richards	President	Owyhee Cattlemen's Association	-	Yes
Phil Rittenhouse	Road Supervisor	Owyhee County R&B Dist. I	-	Yes
Robert Servis	Public Works Supervisor	City of Grand View	-	Yes
Bill Statham	Chairman	Owyhee County Historic Preservation Commission	-	Yes
Mary Tindall	President	Bruneau Quick Response Unit	-	Yes
Doug Thurman	Power Plant Operator	Idaho Power CJ Strike Dam	-	Yes
Casper Urbanek	Fire Warden	IDL Southwest Sup. Area	-	Yes
Rick Ward	Environmental Staff Biologist	Idaho Department of Fish & Game Southwest Region	-	Yes
Dennis Wilson	Superintendent	Bruneau & Grand View Schools	-	Yes

All jurisdictions were invited to participate in the 2017 plan update process. Table 4 details the participation of the incorporated cities in Owyhee County for both the 2008 and 2017 planning process.

Table 4. Jurisdictional participation

Name	2008 Participation	2017 Participation
Owyhee County	Yes	Yes
City of Grand View	Yes	Yes
City of Homedale	Yes	No

City of Marsing	Yes	Yes
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Due to the rural nature of Owyhee County, coordination of participation within each individual jurisdiction was limited due to time, geographic, and personnel constraints. Jurisdictional participation was achieved through the attendance of representatives at planning meetings, who provided valuable input and feedback regarding the risk assessment and mitigation strategy. Those jurisdictions unable to attend the planning meetings were engaged through discussions with Jim Desmond and HazCIRC. Of note was review and feedback from the City of Marsing, which provided important detail on water use, drought vulnerability, essential facilities, and flooding with regards to Marsing, Homedale, and the county as a whole. The Cities of Grand View and Marsing and Owyhee County participated in the planning process via membership on the planning committee, as well as participation in the planning meetings and a mitigation strategy review held during planning meetings and over email correspondence with city and county personnel.

Additional stakeholders participated in the planning process. Table 5 details stakeholders engaged throughout the 2017 plan update, their role and representation, and their contribution.

Table 5. Participating stakeholders

Name	Title	Jurisdiction or Agency	Participation
Susan Cleverley	State Hazard Mitigation Officer	IOEM	Planning Meeting
Dale Nalder	Area Field Officer	IOEM	Planning Meeting
Lorrie Pahl	State Hazard Mitigation Planner	IOEM	Planning Meeting
Ben Roeber	State Hazard Mitigation Planner (former)	IOEM	Planning Meeting
Paul Walls	Dam Safety Engineer	Idaho Power	Mitigation Review

3.4 Planning Meetings

Meetings attended by the planning committee and other stakeholders were held to review the former HMP, propose updates and the update process, review the mitigation actions listed in the former HMP, discuss the risk assessment, and solicit new and additional mitigation actions. The following summaries provide an overview of the meetings and webinars held throughout the planning process, and Appendix C contains the presentations used in the meetings.

3.4.1 August 2015 Kick-Off Meeting

The kick-off meeting signified the beginning of the 2017 plan update, and was held in August 2015. The meeting was attended by Jim Desmond, Owyhee County Emergency Manager, and Dr. Tim Frazier, Director of HazCIRC. The meeting provided an overview of the grant, some of the hazards to be addressed, the work plan for the update process, mitigation and adaptation plan analysis criteria and metrics, and introduced socioeconomic vulnerability.

Hazards to be addressed included those specific to the county, including severe storms, windstorms, dam and levee breaks, earthquake, mud and landslide, fire, and drought. The need to incorporate climate impacts and climate vulnerability was discussed, as was multi-modal evacuation modeling. Multi-model evacuation modeling employing a HazCIRC-developed MATSim custom travel demand model was presented, which identified evacuees based on a variety of data and modifiable to match county needs and assumptions.

The first step of the work plan discussed was an evaluation of the former HMP. Evaluations using both FEMA requirements and a more comprehensive HazCIRC-developed HMP evaluation matrix was discussed and approved. The HazCIRC-developed evaluation matrix was constructed to better assess the quality of HMPs, and incorporated much more stringent criteria that judged plans on their ability to minimize or prevent losses, their consideration of physical exposure, inclusion of probabilistic mapping and socioeconomic analyses, data quality, the localization of the plan to the county, and more. The Spatially Explicit Resilience-Vulnerability (SERV) model was then detailed, followed by examples of previous application and usability.

Additional aspects of the proposed planning process were discussed, including the need to better integrate the HMP with community planning (e.g., the Owyhee County Comprehensive Plan), the need for better coordination across the county, its communities, and stakeholders, and the need for more extensive public participation throughout the planning process. The difficulty in linking hazard mitigation policy and practice was then discussed, focusing on competing interests, uncertainty in modeling, political environments, and measures to overcome these difficulties.

A skeleton structure of the 2017 plan update was proposed. Specifics included a probabilistic-based risk assessment, vulnerability assessment, hazard mitigation summaries and strategies, and benefit-cost analysis. The proposed end product of the process was a FEMA-certified HMP adopted and effective for five years. Figure 3 shows the proposed timeline that concluded the kick-off meeting.

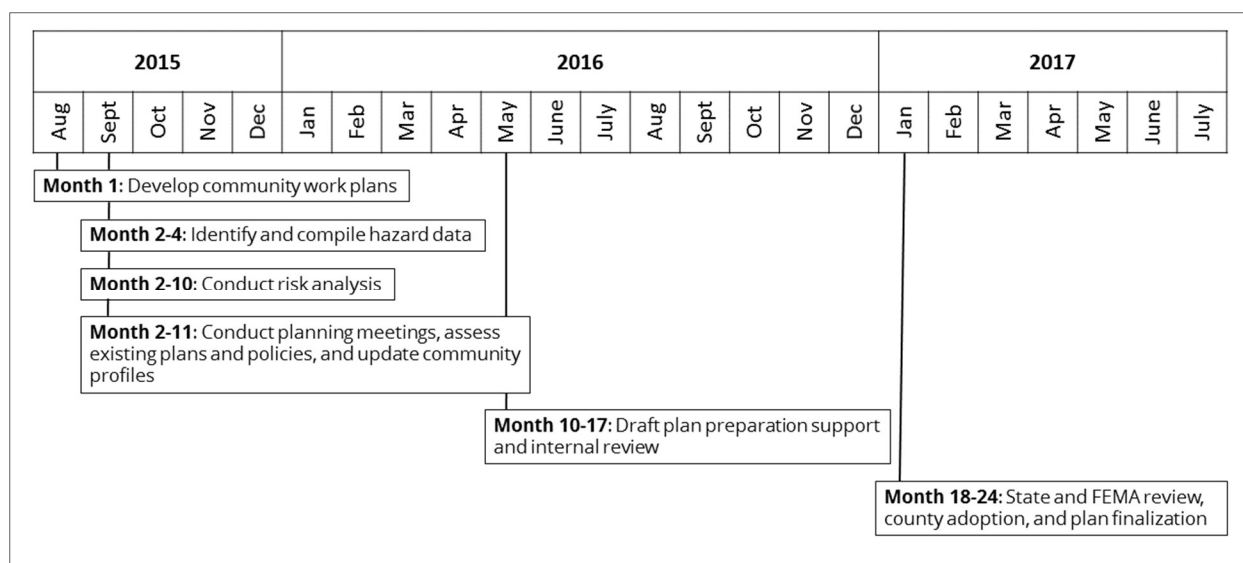


Figure 3. Planning timeline

3.4.2 October 21, 2015 Planning Meeting

Members of the planning committee met on Wednesday, October 21, 2015 to discuss the evaluation of the former HMP. The meeting was held from 9:00am to 11:00am at the Gowen Field in Boise, ID. The meeting was attended by the Owyhee County Emergency Manager, the State Hazard Mitigation Officer from IOEM, and members of HazCIRC.

The meeting was facilitated by Dr. Tim Frazier, Alexander Peterson, and Michelle Ritchie of HazCIRC. The meeting commenced with a grant overview, progress made to date, and next steps in the planning process. An overview of the former HMP evaluation was discussed, beginning with the rationale for the evaluation matrix used. The matrix was developed by Dr. Tim Frazier and graduate students, and built on FEMA requirements by incorporating additional criteria based on pre- and post-disaster experiences and knowledge, interviews with local experts from across the US, and scientific and academic literature.

An overview of various models to be employed throughout the 2017 plan update were then presented. These models included the SERV model and MATSim, a first-in, first-out evacuation model. Both models had been employed successfully across the country in both planning and scientific research. Also presented were ESRI's CityEngine, which visualizes hazard risk in 3D; a mitigation mapping model to highlight the potential area of effect of various mitigation measures; and the Idaho Department of Health & Welfare's (IDHW) Public Health Jurisdictional Risk Assessment (JRA) which assessed public health systems across Idaho from a hazards perspective.

Following this, a data inventory and web portal was presented. Also presented were 2017 plan updates specifically concerning mitigation, including the need for the incorporation of monitoring and

evaluation metrics, a mitigation ranking method and feedback form, and future planning meetings to discuss these metrics.

3.4.3 February 23, 2016 Planning Meeting

The February planning meeting focused on reviewing the mitigation strategies listed in the former plan. The meeting was held at 1:00pm on Tuesday, February 23, 2016 at the Owyhee County Museum in Murphy, ID. The meeting was attended by 16 planning committee members, the State Hazard Mitigation Officer, and the IOEM Area Field Officer for the southwest region. Jurisdictional representation included Owyhee County, Grand View City, and the community of Silver City.

The planning meeting commenced with a presentation by Alexander Peterson of HazCIRC. The presentation consisted of an overview of the community work plan approved in the kick-off meeting held in August 2015 and the evaluation and update meeting held in November 2015. Progress made to date on all targeted areas of the 2017 plan update was detailed, including the risk assessment, the mitigation strategies, and the plan writing. Progress on the risk assessment was discussed with the planning committee, with each component and its associated timeline addressed. These components included the socioeconomic vulnerability assessment utilizing the SERV model, the biophysical exposure assessment, CityEngine, the MATSim evacuation model, HazMat plume modeling, the landslide assessment, and the Level II Hazus-MH runs for earthquake and floods. Draft figures of the CityEngine scene of Grand View and the exposure components of the SERV model were shown to the committee.

Following discussion of the risk assessment, the work plan for the mitigation strategy review and update was presented. The work plan included the mitigation strategy review, a targeted comprehensive plan evaluation and summary to identify possible convergence areas between the plans, mapping current and possible mitigation actions areas-of-effect, and prioritizing and ranking the mitigation actions. Discussion on developing the plan structure and the writing and updating of the 2017 plan update followed, and the incorporation of the planning committee perspectives, the risk assessment results, and public comments from slated public meetings discussed.

The presentation then covered the primary purpose of the planning committee meeting, which was to review and begin evaluating the mitigation strategies listed in the former plan. The review examined the progress made towards implementing the mitigation actions throughout the county during the previous plan's lifecycle. Mandated in the update process by FEMA, the review and input from the planning committee provided a strong foundation for updating the mitigation strategies by revising, removing, carrying forward, or adding mitigation goals, objectives, and actions.

Copies of the Owyhee County Mitigation Review form was passed out to all participants, with a digital version projected to better facilitate group discussion. This form was generated by extracting all mitigation goals, objectives, and actions from the former plan, and provided space to mark the status (ongoing, complete, incomplete, etc.), if the planning committee desired to carry the action forward in

the update process, the percent complete if progress had been made, an estimated timeline for completion, the responsible agency, challenges to implementation, an assigned priority, and notes for any other relevant information.

Of the 47 mitigation actions listed in the outdated HMP, 15 were in progress, 21 as having no progress made, four completed, and 15 as needing more information before being assigned a status.

During the review period, the committee discussed a number of mitigation-related topics, including the incorporation of the County Wildfire Protection Plan (CWPP) into the HMP update. The need to incorporate the Great Shakeout was also discussed as a means of fulfilling public outreach and education regarding earthquake risks. Flood-related topics included the cost-benefit and public support of participating in the National Flood Insurance Program (NFIP), Idaho Power's flood contingency plans if the Snake and CJ Strike Dams were to be breached, and the need to include the drainages that pose a flash flood risk to the county. Using events in the county, such as Outpost Days and Grand View Days, were discussed in order to increase public participation in the update process.

Following the mitigation strategy review, feedback was solicited on the Capabilities Assessment template and the Mitigation Actions Monitoring template. The Stakeholder Involvement form and the FEMA Capabilities Assessment form were discussed, with an April 2016 target to have completed by the planning committee.

3.4.4 April 26, 2016 Planning Meeting

The planning committee met on Tuesday, April 26, 2016 to discuss progress made to date, new and revised mitigation actions, and preliminary risk assessment results. The planning meeting was held from 1:00pm to 4:00pm at the Owyhee County Museum and Library in Murphy, ID. The meeting was attended by 10 members of the planning committee, including representatives from the county, transportation departments, US Ecology, and Silver City.

The meeting was facilitated by Alexander Peterson and Elizabeth Boyden of HazCIRC, and commenced with a narrative on progress made to date on the 2017 plan update. Progress included reviewing all mitigation actions listed in the former plan and a concerted effort by HazCIRC to reach out to county and community officials for feedback on mitigation actions with unknown status. A risk perception survey to be distributed to Owyhee County residents was discussed and approved by the planning committee.

After discussing progress made to date, the committee members worked to revise mitigation actions listed in the outdated plan. Many of the marked actions were revised to be more specific, with specific jurisdictions listed, public outreach avenues such as local and county newspapers identified, and potential avenues of funding discussed. Structural actions, such as elevating roads above the 100-year floodplain, were revised to identify problem areas or areas needing further consideration given the lack of updated regulatory floodplain maps and barriers of implementation.

New mitigation actions were then discussed, with the need to mitigate exposed propane tanks in Silver City commencing the discussion. Other issues brought forth included incompatible communications across agencies and departments, the need for a more powerful pump in Silver City, fuel reduction education programs, hazmat awareness and response training for first responders, the need for evacuation and secondary access to locations around the county, and more.

The preliminary risk assessment figures and results were then presented. Owyhee County experienced losses totaling more than \$250,000 and one fatality since the HMP adoption in 2009 according to the SHELATUS database. The preliminary socioeconomic vulnerability assessment employing the SERV model was detailed, and sensitivity and adaptive capacity figures were shown. Hazard-specific results were presented for flood, earthquake, wildfire, hazardous materials, pandemic influenza, landslide, and severe weather.

Loss estimations were presented for 100 years and 500-year floods. These loss estimation scenarios were modeled in Hazus, FEMA's loss estimation software. Two scenarios employing different flood depth grids were run for the 100-year flood loss estimation, including an interpolated depth grid created by HazCIRC and a non-regulatory depth grid provided by FEMA. One scenario employing FEMA-provided non-regulatory depth grids was run for the 500-year flood loss estimation. Results in tabular and map forms were presented, with the planning committee providing feedback on the loss estimations.

Earthquake figures and loss estimation results were presented next. A probabilistic 7.0 magnitude earthquake with a 1,000-year return interval was run for the county. Losses included 3 casualties and more than \$4 million in structural damages.

The preliminary wildfire risk assessment showed historical ignition points and burn perimeters in the county over the period 2008 to 2013, with the model outputs from the Fire Risk Index providing context of potential ignition and impacts in the future. The committee concluded the Fire Risk Index did not accurately capture the effects of wildfire on rangeland, with recent events providing context for lost livelihoods and the severity of impact that wildfire has on the county.

The location, responsible parties, dates, and chemical of the one recorded hazardous material incident over the 2009 to 2015 period was detailed, and a hazardous materials map showing exposure buffers around Tier II chemical facilities presented. Discrepancies between Tier II reports were discussed, with further research needed to resolve questionable locations, chemicals, and chemical amounts.

The number of communicable disease incidents were reported from IDHW data, with pandemic influenza model results showing the hospital admissions and deaths of the 1918 and 1968 pandemic influenza strains. Landslide and severe weather incidents and figures were presented next, with a preliminary landslide index incorporating landslide-susceptible slopes, aspects, canopy cover, and geologic types providing the landslide risk assessment, and data provided by the NWS showing wind and hail incidents across the county providing the severe weather risk assessment.

3.4.5 April 11, 2017 Planning Meeting

Members of planning committee met on Friday, April 14, 2017 to discuss the final revisions that needed to be made to the plan before submitting it to the state and FEMA. The planning meeting was held from 9:00 A.M to 11:00 A.M. at Gowen Field in Boise, and was attended by Jim Desmond and Mary Huff, as well as representatives from IOEM.

The meeting was facilitated by Alexander Peterson and Elizabeth Boyden of HazCIRC, and commenced with a narrative on progress made to date on the 2017 plan update. Progress included addressing feedback from FEMA after the first drafts were submitted. Revisions included addressing how jurisdictions coordinated the planning process within their jurisdiction, future and land use development patterns at the jurisdictional level, the monitoring and implementation process, and more. Topics discussed included removing hazard profiles from the plan without a corresponding mitigation action, creating additional mitigation actions for those hazard profiles included in the plan but did not already have a corresponding action, and changes in hazard rankings and mitigation priorities.

3.4.6 June 2, 2017 Planning Meeting

Members of the planning committee, HazCIRC, and IOEM met Friday, June 2, 2017 at Gowen Field in Boise. Topics of discussion included the revisions made throughout the prior weeks, and additional revisions needed to be made to the plan prior to approval and submission to the State for review. Of note was concern regarding the maps located in the wildfire hazard profile. Though the data was sourced from the LANDFIRE database, the data is likely skewed towards the eastern part of the county (corresponding to the BLM's Twin Falls District). Also of note was the removal of the targeted comprehensive plan evaluation given the county's incorporation of the HMP into the comprehensive plan by reference.

3.5 Review of Existing Plans

Planning mechanisms were reviewed in both the former plan and 2017 plan update. In addition to re-reviewing those in the 2009 plan, the 2017 update focused more on in-depth evaluations and targeted integrations. The following documents were evaluated in-depth in the 2017 update:

- Owyhee County All-Hazard Mitigation Plan (2009) – This plan was evaluated on both its fulfillment of the FEMA Local Mitigation Review Tool (2011) and a comprehensive evaluation matrix developed by Fraizer et al (2013). The FEMA Local Mitigation Review Tool lists and describes the requirements the HMP must fulfill according to the Code of Federal Regulation. The comprehensive HMP evaluation matrix provides more stringent and in-depth criteria on

which to evaluate HMPs. These criteria are an expansion of the FEMA requirements and included evaluations of internal and external plan characteristics, issue identification and vision, fact-based hazard assessments, mitigation strategies, policy frameworks, monitoring and implementation, planning processes, coordination of local hazard mitigation planning, and organization and presentation. Results of these evaluations (collected in Appendix B) provided guidance throughout the 2017 plan update process.

- Owyhee County Comprehensive Plan (2006, 2009, 2010, 2012) – The comprehensive plan is the document with the most regulatory power, although the document is not regulatory in itself. According to Idaho's Local Land Use and Policy Act (LLUPA), the comprehensive plan needs to consider previous and existing conditions, trends, compatibility of land uses, desirable goals and objectives, or desirable future situations for 17 required components. The comprehensive plan guides the growth of the county and its communities. Often, the majority of the policies are carried out through zoning and subdivision ordinances, and policies within the plan are more likely to be implemented than if they were stated within a separate document, such as the HMP. Many comprehensive plans do not explicitly consider hazards, in spite of the potential for loss of life and property due to hazards and risks present within the county. The comprehensive plan was assessed to ascertain the current status and future potential of HMP integration. Results of this evaluation are collected in Appendix B.
- Owyhee County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan (2004) – The 2004 wildland fire mitigation plan mission statement is to provide Owyhee 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. This plan and its 2006 and 2009 amendments were assessed to determine the aspects that needed to be updated for CWPP plan formulation and how it could be adapted for HMP integration. First, a content analysis of the plan was performed to assess the sections that were included (e.g., introduction, county profile, risk assessment, etc.). These sections were further assessed to determine the analyses performed along with their methodologies. Second, the plan was evaluated on how the current wildfire plan and its elements could be updated and adapted to fit the CWPP format and IDL requirements.

Other plans reviewed and resources considered in the 2017 plan update included the following:

- Owyhee County Energy Plan (2007)
- Owyhee County Ground Water Quality Improvement & Drinking Water Source Protection Plan (2009, 2010)
- Owyhee County Natural Resources Plan (2009)
- Owyhee County Sage-Grouse Management Plan (2000, 2004, 2013)

3.6 Public Involvement

Public involvement is key to capturing diverse points of view about the planning area, its characteristics, and its risks. The strategy for involving the public throughout the planning process emphasized the following elements:

- Distribute a survey questionnaire to each jurisdiction for completion by the public.
- Create, maintain, and update a webpage to host the updated plan document, allow for comments and feedback, and link to the survey questionnaire.
- Host a public meeting during which the planning process, the hazards and risks, and the mitigation strategy are discussed for each of the jurisdictions.

3.6.1 Survey Questionnaire

A survey to assess risk perceptions of various hazards across Owyhee County was created and distributed to the planning committee and the public. The survey focused on events occurring after 2009, and solicited feedback on individual levels of concern, dissemination of safety and preparedness information, the vulnerability of community assets to hazards, and mitigation actions. The survey and survey responses are found in Appendix F. A total number of two surveys were returned.

The image shows a screenshot of a web-based survey titled "Owyhee County Mitigation Public Survey Opinion". The survey is divided into sections, with the first section titled "Hazard Information". The text in this section reads: "First we would like to know about your experiences involving hazards and your exposure to preparedness information." The first question is: "1. During the past five years in Owyhee County, have you or someone in your household directly experienced a hazard such as a severe windstorm, flood, wildfire or other type of hazard?" with radio button options for "Yes" and "No". The second question is: "2. If you responded yes to the previous question, which of these hazards have you or someone in your household experienced in the past five years? Please check all that apply." This is followed by a list of hazards with checkboxes: Drought, Earthquake, Erosion, Extreme Temperatures, Flood, Dam/Canal Failure, Hail, Landslide, Avalanche, Lightning, Severe Wind, and Severe Winter Weather.

Owyhee County Mitigation Public Survey Opinion

Hazard Information

First we would like to know about your experiences involving hazards and your exposure to preparedness information.

1. During the past five years in Owyhee County, have you or someone in your household directly experienced a hazard such as a severe windstorm, flood, wildfire or other type of hazard?

☐ Yes

☐ No

2. If you responded yes to the previous question, which of these hazards have you or someone in your household experienced in the past five years? Please check all that apply.

☐ Drought

☐ Earthquake

☐ Erosion

☐ Extreme Temperatures

☐ Flood

☐ Dam/Canal Failure

☐ Hail

☐ Landslide

☐ Avalanche

☐ Lightning

☐ Severe Wind

☐ Severe Winter Weather

Figure 4. Survey questionnaire on hazards and mitigation

With only two survey responses, this sample is too small to be definitive as to the issues of importance to the plan. However, despite the small number of returned surveys responses can still be used in an informative manner. The surveys indicated that a high level of experience with hazards within the past five years, with respondents selecting drought, extreme temperatures, flood, lightning, and wildfire as the hazards experienced. Wildfire was especially notable in having the highest experience rate according to respondents, as well as being the hazard they were very concerned about. Other hazards that were marked as very concerned or somewhat concerned included: drought, erosion, extreme temperatures, flood, dam/canal failure, dust storm, hail, landslide, lightning, severe wind, severe winter weather, subsidence, tornado, terrorism, civil unrest and violence, communicable diseases, hazardous materials, and transportation accidents.

Respondents indicated that they had received information about household mitigation of risks from both the news media as well as non-profit organizations, though the level of trust in these outlets was less than if the information had been distributed by an insurance agent or company. Respondents selected a diverse range of activities in terms of the most effective means of receiving hazard-related information, including county or agency websites and public workshops as the most effective means, with ads, newspapers, and outdoor advertisements as the least effective.

Respondents marked susceptible community assets including environmental, human (loss of life and/or injury) and economic (business closures and/or job losses) assets. The respondents marked important community assets including natural diversity, historical and cultural assets, and parks and protected areas.

In terms of the public support for mitigation activities, respondents indicated support for education and awareness programs, investment in structural measures, and preparedness and response actions. Investment in non-structural measures, natural systems protections, and planning and regulation were more divisive. Notably, no respondent marked any categories as not important. For a more comprehensive background on past natural disasters and the public's perception, please refer to the county profile, risk assessment, meeting minutes, as well as the former hazard mitigation plan.

3.6.2 Webpage

A webpage hosted on the HazCIRC website was developed to provide a central online presence throughout the update process. The webpage housed the first version draft

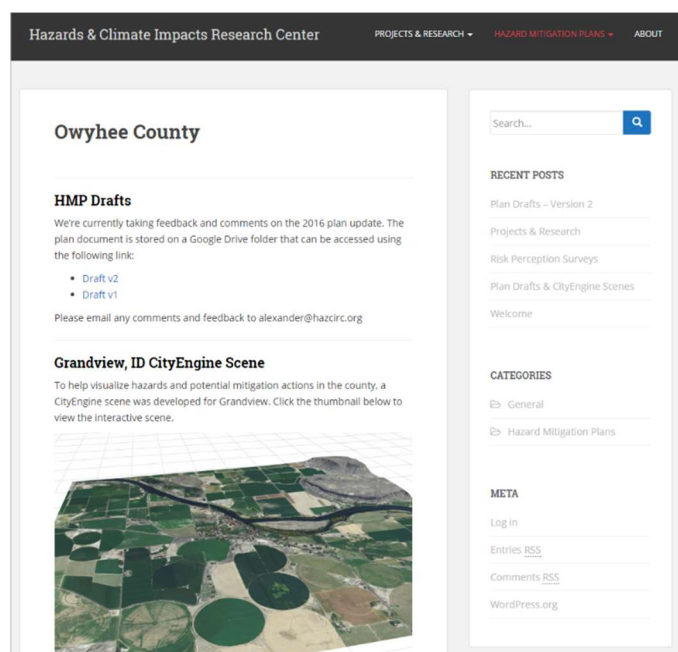


Figure 5. Plan update webpage

of the 2017 plan update and subsequent revisions as edits, additional modeling and hazard profiles, and mitigation actions were completed. The website also housed preparedness information, the risk perception survey developed for the 2017 plan, and a web-based CityEngine scene of Grand View. Visitors were able to leave comments or email HazCIRC with feedback.

3.6.3 July 27, 2016 Public Meeting

A public meeting was held on Wednesday, July 27, 2016 at 6:00pm at the Owyhee County Museum in Murphy, ID, following public notification in the county's paper of record. However, no citizens attended the meeting.

3.9 Plan Review & Approval

Following the completion of the draft, the plan was submitted to IOEM for state review prior to submission to FEMA Region X. Once FEMA Region X completes its review and approves pending adoption, the county will formally adopt the plan. The communities then have up to one year to also adopt the plan.

IV. COUNTY PROFILE

4.1 Overview

Hazard mitigation within Owyhee County should be localized in order to maximize the reduction of losses to both life and property; therefore, it is pertinent to understand the county's characteristics, including current, past, and future trends. The county profile provides a comprehensive description of the county and its characteristics, which are further contextualized with regards to hazards in the Risk Assessment. The county is profiled in the following sections:

- Geographic Setting
- Climate and Weather
- Demographics
- Economy
- Transportation
- Water Resources
- Soils
- Critical Wildlife Habitat
- Land Cover
- Land Ownership

Where possible, updated data was gathered for the Owyhee County Profile in order to make the content relevant to current trends and issues, and for later discussion with the plan. Data was gathered from the following sources:

- Idaho Fish and Game (2004)
- Idaho Department of Transportation (2014)
- United States Census Bureau (2017)
- Bureau of Economic Analysis (2015)
- Idaho Department of Labor (2017)
- Western Regional Climate Center
- U.S. Department of Commerce Bureau of Economic Analysis
- National Wild and Scenic Rivers System

4.2 Geographic Setting

Owyhee County is located in the southwestern corner of Idaho and is the second largest county by area in the state. With Canyon, Ada, and Elmore Counties to the north, it is also bounded by Twin Falls County to the east, the state of Nevada to the south, and the state of Oregon to the west.

The county covers nearly 5 million acres, or approximately 7,700 square miles (US Census Bureau). Dominant geographic features include the Snake River that defines the northern boundary of the county, and the Owyhee Mountains that reside on the western side of the county. The topography generally slopes from the southwest to the northeast, with the greatest elevations occurring along the Owyhee Mountain Range. The highest point occurs at Hayden Peak, with an elevation of 8,401 feet. The lowest elevations are found along the Snake River, with Homedale at 2,210 feet and Marsing at 2,230 feet. The geographic center of Owyhee County averages about 5,000 feet, with Grasmere and Triangle at 5,126 feet and 5,280 feet, respectively.

The county is dotted with several reservoirs, including the Juniper Basin, Blue Creek, Payne Creek, Grasmere, Buckhorn, Lower Nichol Flat, and Otter Reservoirs in the south, and the Sinker Creek, Succor Creek, Foremans, Triangle, and Spencer Reservoirs in the north. These reservoirs are fed by the numerous creeks and rivers that flow through the county, including the Bruneau, Owyhee, and Jarbidge Rivers. Approximately three miles in length, the Bruneau Arm is an extension of the Bruneau Dunes State Park, which is located along the northern border of the county. Also located in the park is the Dunes Lake, which is one of two major lakes in Owyhee County. Mountain View Lake is situated in the south-central area near the state of Nevada, with a length of approximately two miles.

The unincorporated townsite of Murphy is the county seat of Owyhee County and thus serves as the county's administrative center. Incorporated cities include Homedale, Grand View, and Marsing. Unincorporated places within Owyhee County include the Communities of Bruneau, Indian Cove, Oreana, Pleasant Valley, Reynolds, Silver City, Three Creek, Wilson, and Guffey.

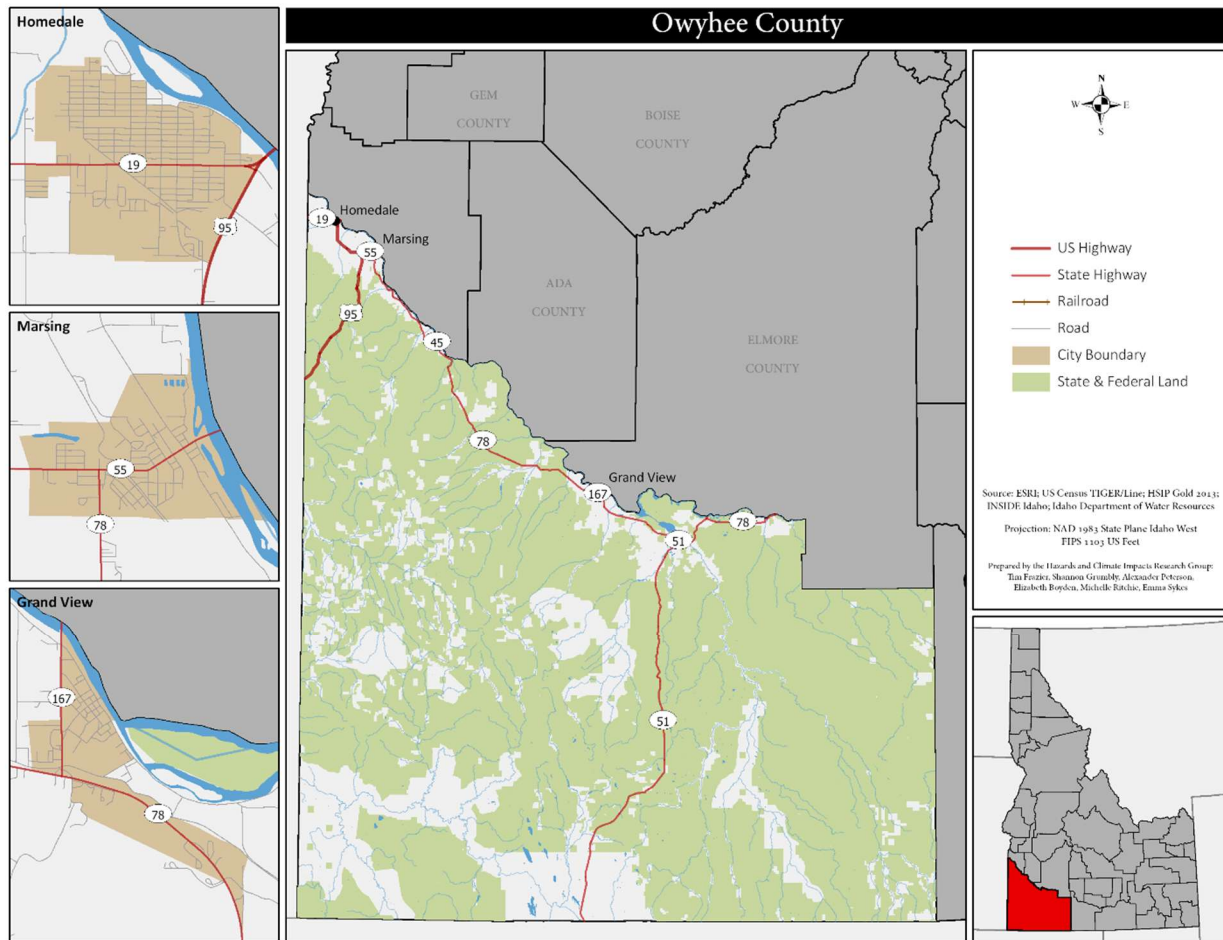


Figure 6. Topographic map

4.3 Climate & Weather

Owyhee County is generally characterized by a semi-arid to arid climate, with hot summers and cool winters. Only areas above 6,000 feet in elevation receive enough yearly precipitation to escape an arid climate classification. Annual average precipitation ranges from less than eight inches in northern communities such as Bruneau, Homedale, and Grand View, to approximately 22 inches in the Owyhee Mountains. The mountain range also experiences high snowfall totals between November and March, with amounts exceeding 93 inches annually in Silver City. In the northern portion of the county, locations along the Snake River receive less than six inches of snow on average per year. The driest months across Owyhee County are typically June through September for all regions.

Significant ranges of temperature can be expected from year to year, with highs reaching 115 degrees F, and lows dropping to minus 34 degrees F. Average annual temperatures along the Snake River in

the summer months rise over 90 degrees, with temperatures averaging in the high 30s in the winter. The Owyhee Mountains experience lower temperatures on average due to the high elevation of the area.

Severe winds associated with thunderstorms are the main meteorological threat to Owyhee County. Large variabilities in precipitation also contribute to drought or flooding, especially in the lower elevations. Certain sand washes, draws, and gullies are particularly susceptible to flash flooding. Other historical occurrences of meteorological hazards include hail and dense fog.

Table 6. Monthly climatological normals (1981-2010)

Month	Total Precipitation Normal (inches)	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	0.68	39.5	23.0	31.3
February	0.55	47.4	25.8	36.6
March	0.80	58.7	31.9	45.3
April	0.63	66.4	37.3	51.9
May	0.94	75.3	45.5	60.4
June	0.68	83.6	52.3	68.0
July	0.21	92.1	57.7	74.9
August	0.21	91.0	55.0	73.0
September	0.40	80.4	45.6	63.0
October	0.48	67.0	36.3	51.7
November	0.79	50.1	28.5	39.3
December	0.78	38.5	21.4	29.9

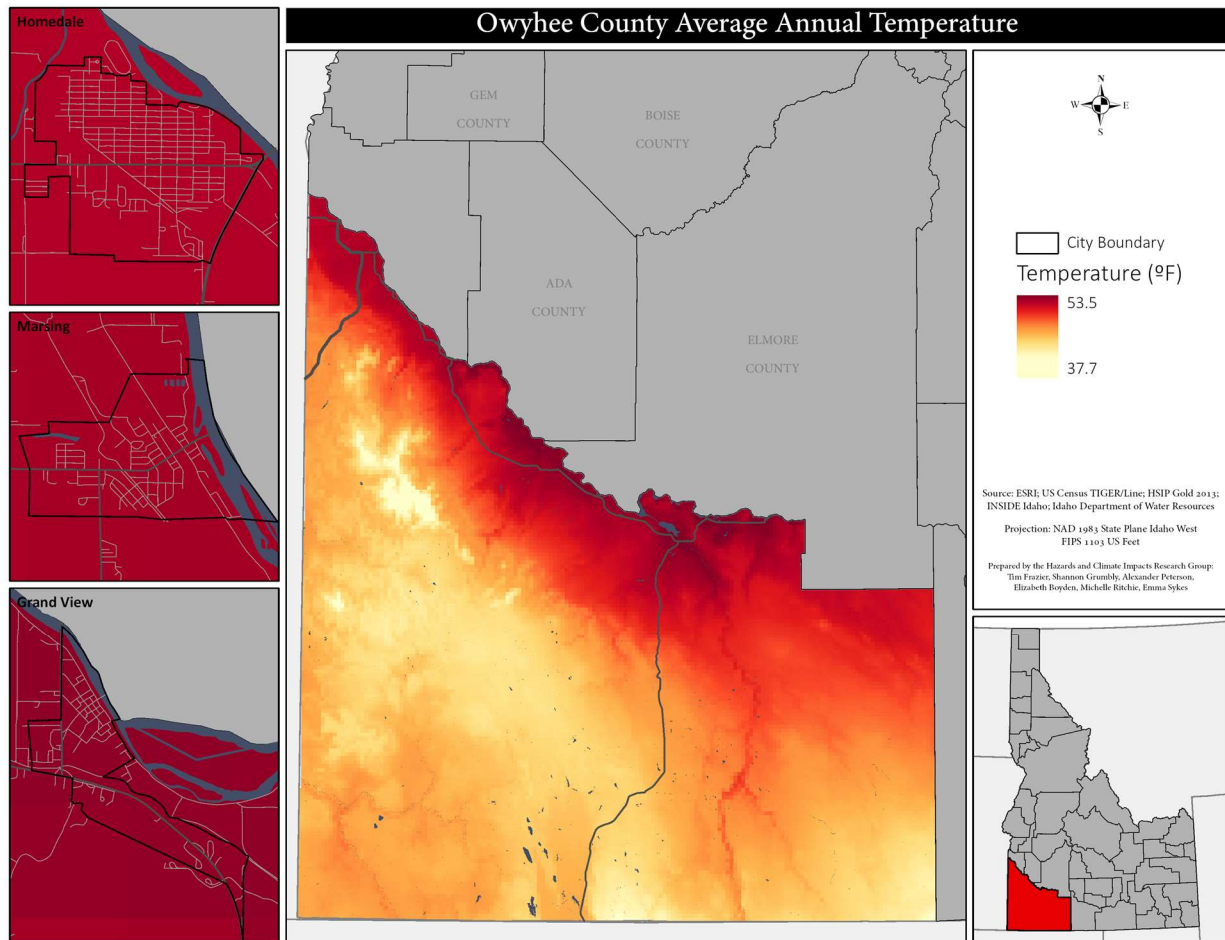


Figure 7. Average annual temperature

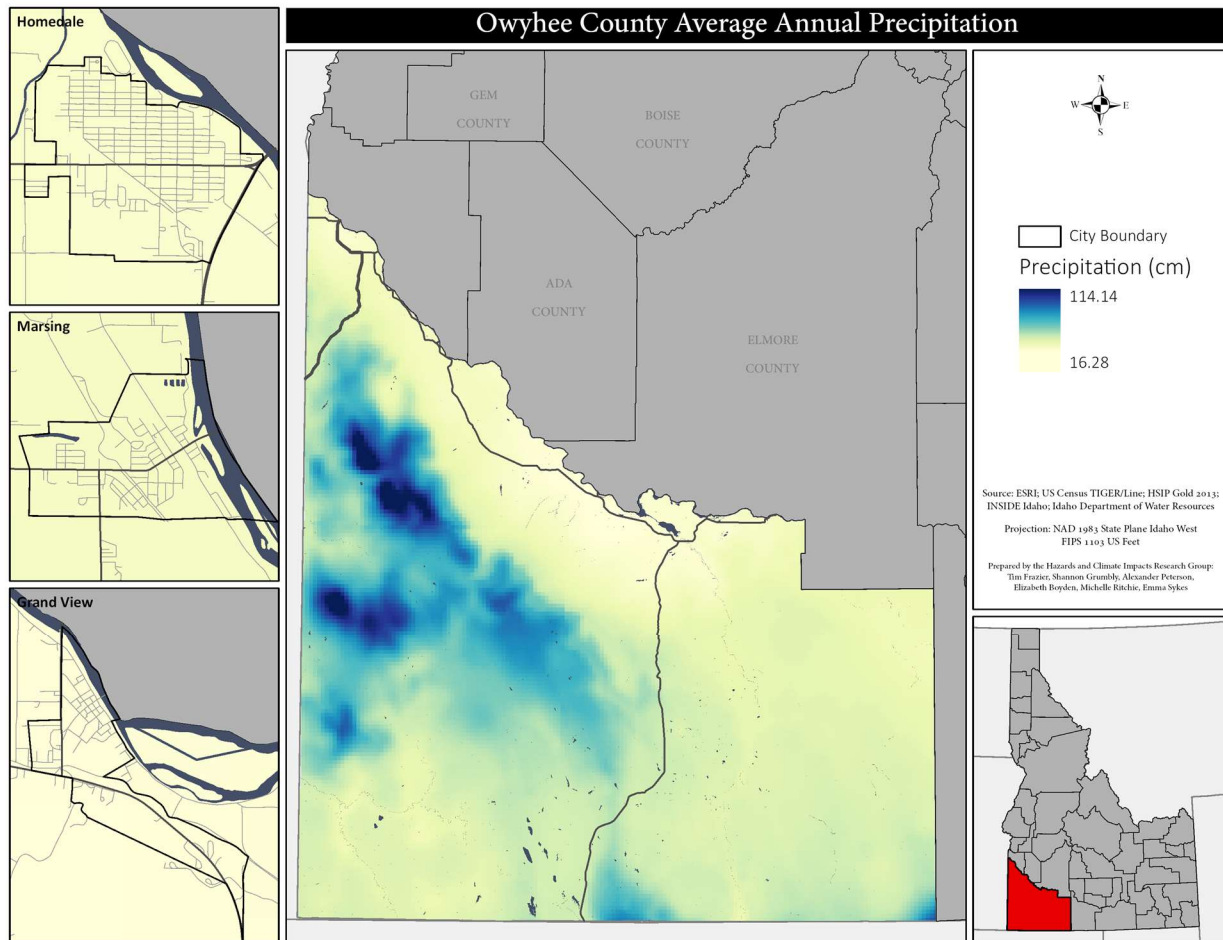


Figure 8. Average annual precipitation

4.4 Demographics

Owyhee became the first established county of the newly-formed Idaho territorial legislature in December of 1863, and was incorporated into US Census population data collection in 1870. With 1,713 people claiming residency in 1870, the population significantly increased to 3,804 at the turn of the 20th century. It then grew steadily until the start of the Great Depression, but rose again slightly until the population boomed between the 1970 and 1980 decennial US Census data collections. By 1990, Owyhee's population exceeded 8,000 people and increased by nearly 27 percent until 2000. According to the 2010 US Census, the county's total population was 11,526 people, with a 2015 estimate of 11,310 people.

The urban-to-rural ratio increased between 1990 and 2010, although Owyhee County remains largely rural. The 2010 US Census indicated that 23 percent of the population lived in urban areas, with the

majority remaining in rural areas. In comparison, the 1990 US Census showed that all residents lived in rural areas. Homedale is the only city within the county that is considered to be an 'Urban Cluster', which is defined as an "urban area that contains a population of at least 2,500 and less than 50,000." The increase in urban population can thus be explained by Homedale's status as an urban area in 2000 and beyond.

The first time that Owyhee County reached a population density of one person per square mile was at the 1980 US Census and over the next 30 years this density remained relatively unchanged. These numbers represent all lands, including government owned-lands, where few if any people reside. If restricted to non-federally or state protected lands, there were nine people per square mile in 2010.

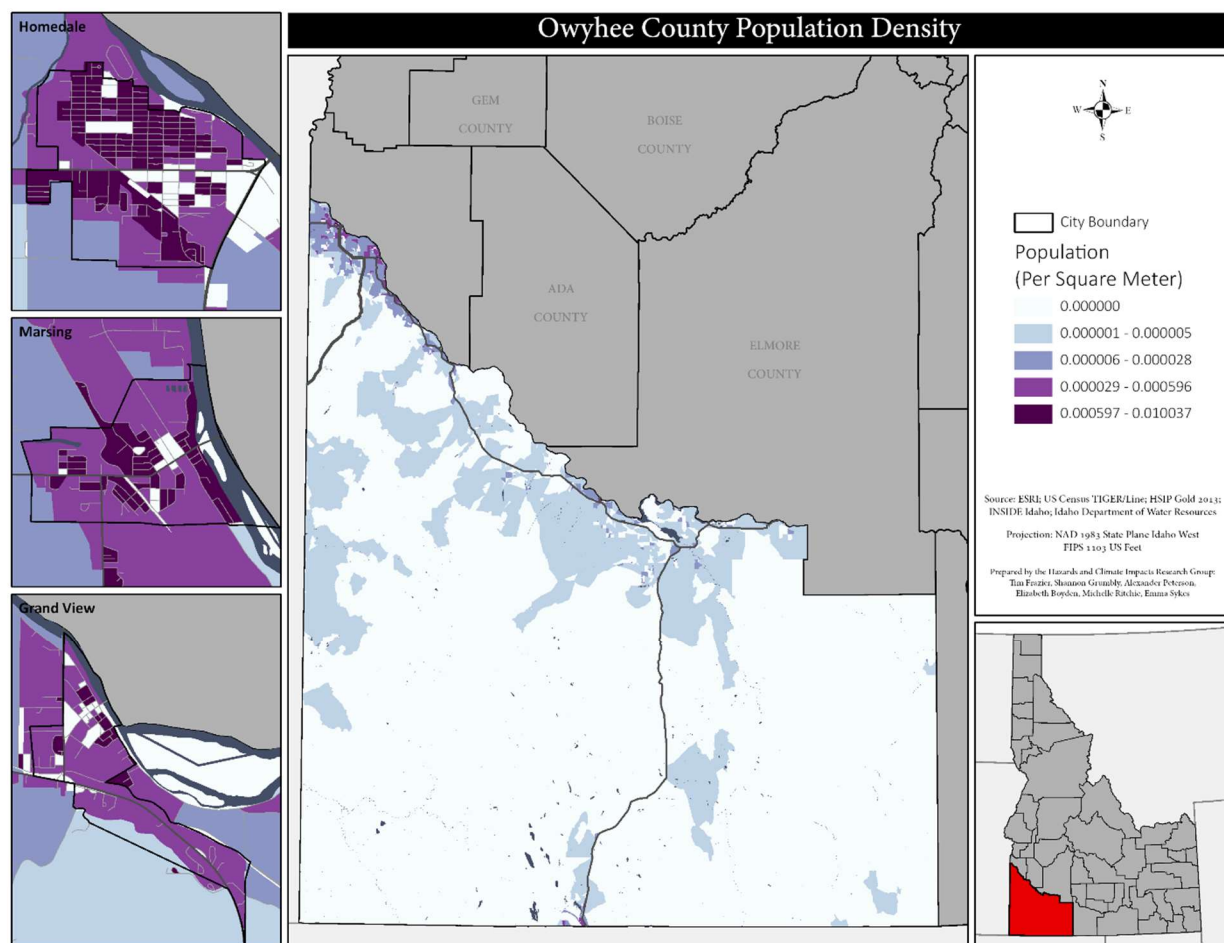


Figure 9. Population density

Ethnicity in Owyhee County has remained somewhat diversified. According to the 2010 US Census, 76 percent of the county population was Caucasian, less than one percent Asian, and less than one

percent African American. With the Duck Valley Indian Reservation on the southern border of the county, the American Indian and Alaskan Native population comprised four percent of the total population. This is a slight increase from the 2000 U.S. Census, which indicated that three percent of the population identified as American Indian or Alaskan Native. In addition, there were slightly more Caucasians in 2000 than 2010. During both data collection periods, over 16 percent of the population identified as some other race.

In 2000, there were 53 percent males compared to 47 percent females. By 2010, the male-to-female ratio began to equalize, with 51 percent of residents identifying as male. One of the most significant changes in Owyhee County's population was the rising number of middle-aged and elderly populations. Between 2000 and 2010, the median age jumped from 33 to 36 years old. The 2014 Census estimate indicates an additional increase in median age, with the population over 65 years compromising over 15 percent of the total population. This is in comparison to the 2000 Census, where the elderly population made up only 11 percent of Owyhee's population. The 2014 Census estimate also shows a decrease in children below the age of 5, suggesting a growing adult and elderly population in the coming years.

4.5 Economy

With the establishment of Owyhee County in 1863, miners flocked to the area and discovered "Orofino", or gold and silver. For nearly five decades following the movement, several million dollars in minerals were taken from the Owyhee Mountains. During the mining boom, range cattle from Texas and California were trailed to the area because of the high demand for meat to feed the miners. Ranching and livestock grazing became a permanent staple of the Owyhee County economy as ranchers settled in the area, laying claim to private lands and the waters which provided the source for stock water.

The mining industry diminished in the mid 1930's as the county seat was moved from Silver City to Murphy because of the remote location and difficult winter travel. The move symbolized the transition from mining to agriculture as the dominant base of the county's economy. Irrigation developed along the Snake River, turning desert into lush farmland and contributing to economic growth and urban development in the area over the years.

4.5.1 Trade

Owyhee County produces goods for consumption within the county and for exports. It also imports goods to meet the demand of industries and consumers. In the case of this model, exports and imports imply both domestic and foreign exports and imports.

The local demand that is fulfilled by local producers is very important, because, the higher the proportion of demand fulfilled by local producers, the greater the amount of economic impact that is generated in the county (Holland and Beleiciks 2006). Similarly, exports are central for growth since they allow an economy to cross the boundaries of its local demand, and import wealth (“new money”) from other communities into its local economy. Exports allow businesses to become “scalable” and grow beyond the limitations of local markets.

Owyhee County has a negative trade balance (i.e. the total value of imports is higher than the value of exports). The county imports \$510 million, with the largest imports coming from the petroleum chemical and plastic manufacturing sector (19.5%); finance and insurance services (10.8%); and health and social services (9.3%).

Total exports in Owyhee County are \$389.5 million. The \$323.7 million (83.1%) in agriculture is the single largest export from the county. Among the agricultural-related sectors, three of them represent 81% of the county's exports. These sectors are crop farming, dairy, and cattle ranching and feedlots, which account for 35%, 26% and 20% of exports, respectively.

4.5.2 Economic Base

An alternative method to measure the importance of a sector to an economy is a base measure, which gives credit to the sector that brings new dollars into the region through exports for the economic activity that it supports in the regional economy. A base measure is different from a gross measure, which simply counts all the measures of economic activity (output, employment, and value-added) that are generated from all sales within a sector. “For example, in a gross analysis, if a tire merchant sells a tire to a local agricultural producer, the value of this transaction (and the associated employment, wages, and value added) would be counted in the “tire store” or retail sector. However, because this sale is only possible because of the new dollars that are brought into the region by the agricultural producer (exports), the base analysis gives credit for this transaction to the agricultural sector” (Watson et al, 2006). In other words, a base measure allows us to answer the question “What is the total output of the Owyhee County economy across all sectors that is generated by agricultural output?” (Watson et al, 2006).

Agriculture is the most important economic driver in Owyhee County. Its base contribution is \$511.6 million or 70% of the Owyhee County total output and \$178.1 million or 60% of the Owyhee County total value added. Similarly, its base employment is about 2,313 jobs or 54% of Owyhee County total employment. This base measure equals the sum of agricultural output, value added, and employment for exports and the indirect output, value added, and employment from other sectors needed by the agricultural sector to produce these exports.

The most critical agriculture-related sectors in Owyhee County's economic base are: crop farming, dairy, and cattle ranching and feedlots. These three sectors represent 68.8% of the base output; 59% of the base value added; and 52% of the base employment.

4.5.3 Economic Impact of Grazing

The Owyhee County economic model was used to estimate the economic impact of decreases in the number of Animal Unit Months (AUM) of public forage available. An AUM is a measure of the amount of forage that 1 animal unit (a cow or cow with calf) will consume in one month. It is common for public and private land grazing leases to be charged based upon the number of AUMs consumed or allotted for the parcel of land. The first step to estimate the direct impact of AUM losses is to calculate a value of output lost per AUM. We calculated that each cow in Owyhee County needs approximately 7.72 AUMs of public land forage and there are 45,660 cows in the cattle ranching sector. Multiplying the number of cows by the number of AUMs per cow yields approximately 352,439 AUMs of public land forage in Owyhee County. This estimate is consistent with the Bureau of Land Management (BLM) estimate of permitted AUMs within the county. Each cow requires 1 AUM of forage each month of the year, totaling 547,920 AUMs for forage. With 352,439 AUMs from public lands, the dependency on public lands is thus 64 percent. In other words, 64 percent of the forage for the Owyhee County cowherd is coming from public lands. The direct output impact of an AUM lost (regardless of land ownership) is \$54.26 per AUM.

4.5.4 Implications for Owyhee County

Agriculture is the most important sector for Owyhee County's economy. It accounts for 43% of employment, 60% of cash receipts, 47% of the county gross product, and 87% of exports. Further, the agriculture base contribution is 54% of total employment, 70% of total output and 60% of total value added. The most critical agriculture-related sectors in Owyhee County's economy are: crop farming, dairy, and cattle ranching and feedlot.

Specifically, the cattle ranching and feedlot sector contributes significantly toward the economic well-being of Owyhee County. This sector accounts for 7.1% of employment, 17.7% of cash receipts, 9.8% of county gross product, and 20.4% of exports. Further, the cattle ranching and feedlot sector provides a stable long-term economic base for agriculture-based communities. Livestock exports from generate additional economic activity, through its economics linkages, that support several industries, communities and families in the county. Cattle ranching and feedlot sector's base contribution is: 13.7% of total employment; 22.5% of total cash receipts; and 16% of county gross product. The base output of the cattle ranching and feedlot sector is the sum of its exports plus the economic activity it generates across all sectors that it touches as it creates livestock products for export and brings new revenue into the county.

If the lifestyle of rural Owyhee residents is to continue, it is important for the public to understand the contribution that cattle production provides to rural economies. The loss of public land grazing in Owyhee County will significantly reduce the opportunities for its rural residents. Public land grazing is a vital component of Owyhee County's economy. A reduction in livestock numbers is not an isolated incident with few repercussions. There are many other individuals and sectors that will feel the economic impacts. The estimated potential annual loss to Owyhee County's economy resulting from

a 10% reduction in grazing AUMs is \$4,043,956 of output, 14.6 jobs and \$1,024,653 of value added. Out of the \$4 million loss in output, \$1.9 million corresponds to economic loss to the livestock sector, \$1.8 relates to economic loss in other industries as they adjust their inter-sector purchases to the new smaller demand from the livestock sector, and \$0.2 million relates to economic loss in household consumption as a result of change in production from the livestock and the other industries in the economy.

4.6 Transportation

4.6.1 Highways

The primary access route connecting rural communities in Owyhee County is State Highway 78. This is a two-lane highway that enters the county near Indian Cove on the eastern side, travels through the communities of Indian Cove, Bruneau, Grand View, Murphy, Guffey, Wilson, Givens Hot Springs, and Marsing. US Highway 95, a two-lane route, bisects the northwestern corner of the county before crossing into Oregon. This access is the only primary route connecting north and south Idaho. State Highway 51 serves as a connection route between Mountain Home in neighboring Elmore County and Nevada. All major roadways in Owyhee County are relatively level and well-maintained with good width and access and exit points.

Smaller roads maintained by the County and the BLM, or private entities provide access to the adjoining areas within the county, including recreational areas and rural agricultural hubs. A variety of unimproved roads are found throughout the publicly owned BLM lands.

Almost all of the roads in the county were originally built to facilitate farming and ranching activities. As such, these roads can support harvesting equipment, trucks, and emergency response equipment referenced in this document. However, many of the new roads have been built for homesite access, especially for new subdivisions. In most cases, these roads are adequate to facilitate emergency response equipment as they adhere to County Building Codes. County building codes for new developments should be adhered to closely to insure this tendency continues.

The Land Use Planning Act located in Title 67, requires Idaho Counties to address transportation in the individual Comprehensive Plans. It requires an analysis, prepared in coordination with the local jurisdiction(s) having authority over the public highways and streets, showing the general locations and traffic ways, and of streets and the recommended treatment thereof. This component may also make recommendations on building line setbacks, control or access, street naming and numbering, and proposes a system of public and other transit lines and related facilities including rights-of-ways, terminals, future corridors, viaducts and grade separations. The component may also include port, harbor, aviation and other related transportation facilities.

4.6.2 Rail

Rail service to Homedale and Marsing was discontinued in 1998, removing any current railroad transportation in Owyhee County.

4.6.3 Airports

There are four public airports located in Owyhee County, which include Homedale Municipal, Murphy, Grasmere, and Murphy Hot Springs. There are also numerous landing fields and several smaller privately-owned airstrips that serve outlying areas of the county, as well as agricultural lands.

The Homedale Municipal Airport is located at the eastern edge of the town, adjacent to the southern edge of the Snake River. Built in 1959, the runway extends 2,900 feet and is approximately 50 feet in width. With the City of Homedale claiming ownership, the air strip is open to the public. However, it is largely unattended and only provides lighting from sunset to sunrise. The asphalt surface permits landing for aircraft that weigh up to 6,000 pounds. Without a control tower, the nearest traffic control center is located in Salt Lake City, Utah. However, any aviation alerts relating to potential hazards or safety relay directly to the Boise International Airport. On average, the Homedale Municipal Airport registers 134 operations (take-offs and landings) per week. Eighty-six percent of these flights are transient general aviation, with the remaining 14 percent being local general aviation.

The Murphy Airport is located along the northeastern edge of Murphy, adjacent to northbound lane of SH-78. The asphalt runway extends 2,500 feet and is approximately 45 feet wide. Constructed by Owyhee County in 1956, the air strip is open to the public. While it is rarely attended and does not have a control tower, the Sheriff's Office in Murphy is listed as the primary contact for assistance when on the airport. Additional airport assistance is provided by Emergency Manager, Jim Desmond, of Owyhee County. In addition, the nearest traffic control center is also located in Salt Lake City, Utah and any aviation alerts are sent to the Boise International Airport. The landing strip receives about 49 operations per week and is 98 percent transient general aviation. The remaining two percent are military operations.

The Grasmere Airport runs southwest to northeast, with the southwest end extending from the northbound lane of SH-51. Also built in 1956, the runway is about 2,750 feet in length and 150 feet in width. Although its dimensions are larger than other landing strips in Owyhee County, its turf and dirt surface can cause issues with grazing livestock, ground vehicles, and rodents. There is no control tower or nearby assistance for this airstrip, leading to maintenance problems during winter months. On average, the Grasmere Airport registers about 175 operations per year. 86 percent is transient general aviation and the remaining 14 percent are military operations.

Running southwest to northeast, the Murphy Hot Springs Airport is nearly adjacent to Three Creek Road in southeastern Owyhee County. Built in 1951, the runway is approximately 5,250 feet long and 120 feet wide. Its turf surface can cause similar issues of the Grasmere Airport, as well as softness in

the spring and after precipitation events. The airport averages 75 landings and take-offs per month and is 100 percent transient general aviation.

Located in Givens Hot Springs, the Sunrise Skypark lays between and runs parallel to the Snake River and SH-78. Owned by the Sunrise Skypark Homeowners Association, the airstrip requires permission prior to landing. The 2,900-foot long by 40-foot wide asphalt landing strip was built in 1983 and is accompanied by privately owned hangars along each side. There is no information regarding the number of operations per year.

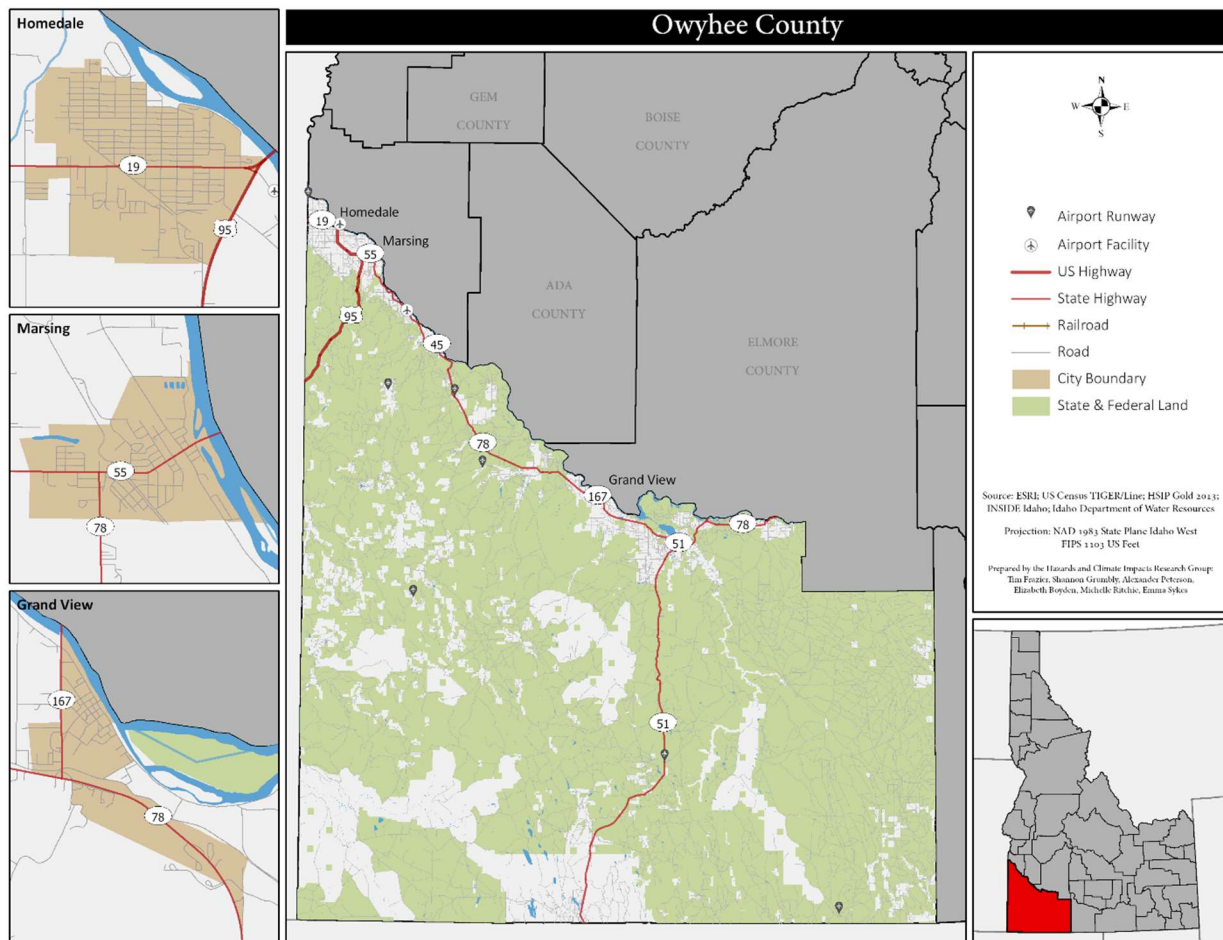


Figure 10. Transportation network map

4.7 Water Resources

Water is one of the most valuable resources of Owyhee County, given its arid to semi-arid climate. In addition to maintaining plant and animal life, the industries in the county rely on the continued use of water and depend on legally recognized rights to collect, distribute, and use the water as it passes through the county.

4.7.1 Surface Water & Groundwater

Surface water comprises less than one percent of the total land area of the county. The primary source of surface water in Owyhee County is snowpack melt and spring seepage in the mountains, as well as seasonal rains. There are four main rivers in the county including the Snake River, the Bruneau River, the Owyhee River, and the Jarbidge River. These rivers are located within four watershed basins, including the Middle Snake-Succor Basin and the C.J. Strike Reservoir Basin along the northern border of the county, the Bruneau Basin to the east, and the Middle Owyhee and Upper Owyhee Basins in the west. A few lakes also make up the surface water area. These include the Bruneau Arm, Mountain View Lake, and the Dunes Lake. The county is also dotted with several reservoirs that provide irrigation water to expanding agriculture, including the Juniper Basin, Blue Creek, Payne Creek, Grasmere, Buckhorn, Lower Nichol Flat, and Otter Reservoirs in the south, and the Sinker Creek, Succor Creek, Foremans, C.J. Strike, Triangle, and Spencer Reservoirs in the north. These reservoirs also provide numerous fishing and recreational opportunities.

Owyhee County lies within a portion of the Owyhee Basin, which also extends into southeastern Oregon and into northern Nevada. The Owyhee River is the primary tributary that drains the basin, with its headwaters located near Wild Horse, Nevada. The river is fed by Deep Creek, Battle Creek, and the South Fork River in Idaho before flowing towards the Owyhee Reservoir in Oregon. The Owyhee River is an exceptionally long tributary that extends approximately 350 miles between Wild Horse, Nevada, the southern edge of the Owyhee Mountains, and through Rome, Oregon.

Partially located in the Snake Upper Middle Basin, the Snake River is the largest tributary in Idaho, extending over 1,000 miles. It is also the largest tributary of the Columbia River, with its headwaters located near the southeastern corner of Yellowstone National Park on the Continental Divide. The river generally flows west into Idaho, where it is fed by the Bruneau and Jarbidge Rivers in Owyhee County before turning north and forming the Oregon-Idaho border. In addition, it serves as the natural divide of the Owyhee County northern border from Canyon, Ada, and Elmore counties.

The Bruneau River resides in the Bruneau Basin, which extends into northern Nevada. The basin is bounded by the Jarbidge Mountains to the southeast and the Owyhee Mountains to the west. The river flows through the Bruneau Canyon, featuring depths up to 1,200 feet. It is approximately 150 miles in length, with headwaters in the Jarbidge Mountains, Nevada and flowing north into the Snake River.

The Jarbidge River is also located in the Bruneau Basin and originates at the Jarbidge Lake in northern Nevada. It is approximately 50 miles long and extends in a northwestern direction, passing Murphy Hot Springs before merging in to the Bruneau River.

Groundwater is the primary source of water for human consumption and has been increasingly developed for irrigation purposes. However, Owyhee County varies greatly in the availability and quality of groundwater. Some areas near the Snake River have an abundant supply while a few miles away, three gallons per minute for domestic use may be impossible to find. The ground water system that underlies the agricultural area between the foothills and the Snake River occurs primarily within fractured basalt and sedimentary sequences of unconsolidated to consolidated gravel, sand, silt, and clay. Some water is obtained from fractured rhyolite at depths. Most domestic wells screen either sedimentary or basalt rocks. Static water levels in the drinking water wells generally range from three feet to over 400 feet, and yields to wells vary widely from three to 3,500 gallons per minute.

Dissolved minerals and gases often render the supply unusable without treatment. Regional ground water quality studies have indicated that arsenic, fluoride, and lead have been detected locally in ground water at concentrations that exceed their federal drinking water standards (0.01 milligrams per liter [mg/L] for arsenic, 4 mg/L for fluoride, and 0.015 mg/L for lead). Dissolved solids and concentrations of dissolved iron and manganese in the county have also been shown to occasionally exceed secondary standards (500 mg/L for dissolved solids, 0.03 mg/L for dissolved iron, and 0.05 mg/L for dissolved manganese). The Owyhee County Natural Resources Plan thus aims to address water quality issues through identification of contaminated waters and prioritizing development and implementation of allotment management plans in the specified areas.

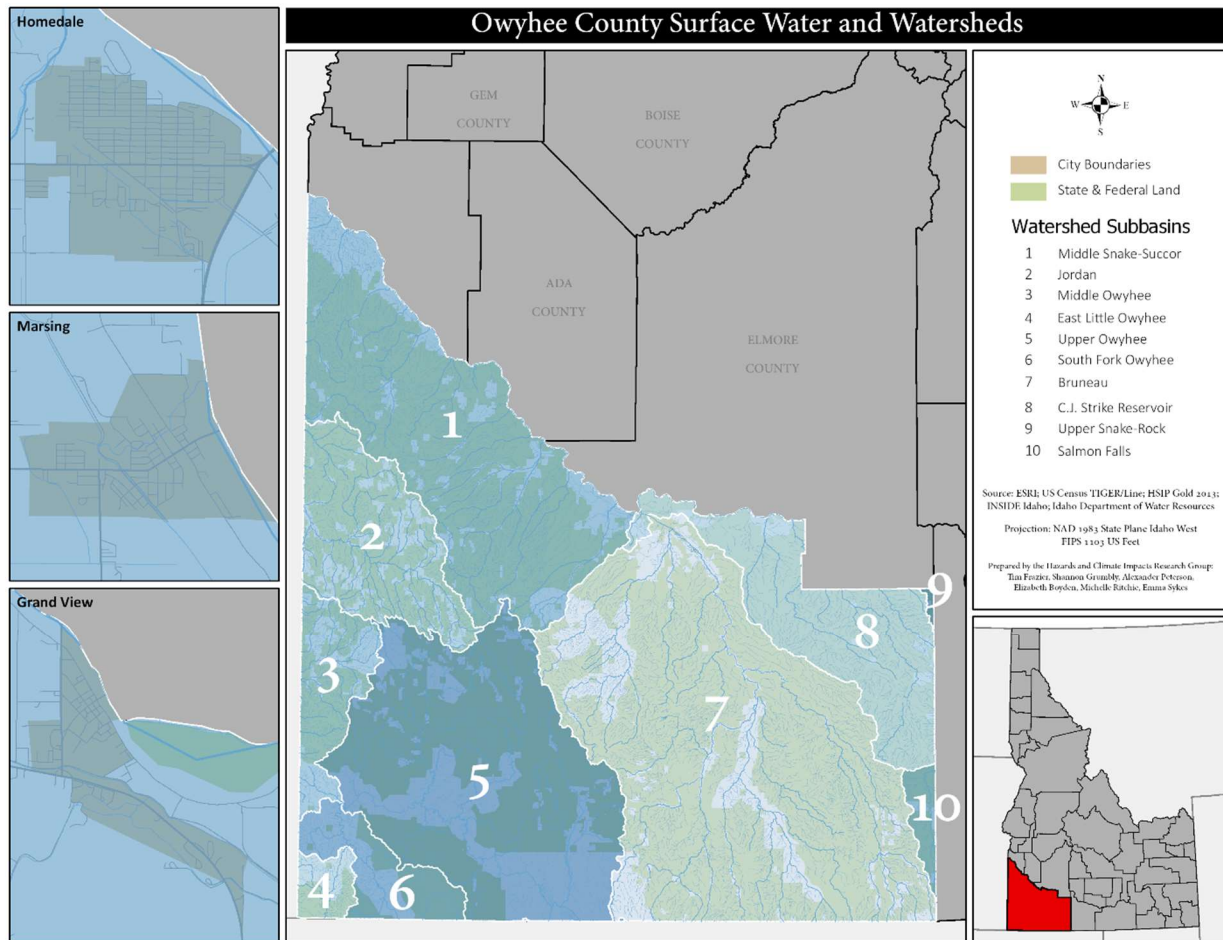


Figure 11. Watershed subbasins

4.7.2 Water Use & Dams

Congress created the National Wild and Scenic Rivers System (WSR) in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The three categories of the WSR system include the wild, scenic, and recreational groups. Wild rivers are free of dams and are generally inaccessible except by trail. Scenic rivers are also free of dams, with undeveloped shorelines that are accessible in places by roads. Recreational rivers are readily accessible by road or railroad, may have some development along their shorelines, and may also have dams.

For a stretch of almost 6 miles, the North Fork of the Owyhee River is designated as recreational from the Idaho-Oregon border to the Juniper Mountain Road crossing. During high spring flows, a portion of the river is used by expert whitewater rafters. Other rivers such as the Jarbidge and the South Fork of the Owyhee also serve as tourist hotspots for whitewater rafting. The Snake River additionally

provides opportunities for jet boating, fishing, hunting, and wildlife viewing access across northern Owyhee County.

The water supply for all the communities in Owyhee County is from groundwater sources. Homedale, Marsing, Murphy, Grand View, Bruneau, and Silver City have central water systems although not all of them serve their entire community. The Gem Irrigation District serves the Homedale-Marsing area, with the Grand View Irrigation District handling the Grand View area. Within each district, several wells provide access to water across Owyhee County. Of the nearly 1,900 wells available, 13 percent are for municipal use, 34 percent are for single residences, two percent for irrigation, and five percent for general domestic use.

In terms of drinking water for the incorporated cities in Owyhee County, the City of Grand View water system provides nearly 175 service connections to over 350 residents year-round. The system draws primarily from groundwater sources using two wells, which are managed by the Grand View Water and Sewer Association.

The City of Homedale water system provides 860 service connections to approximately 2,600 Homedale residents annually. The system was originally comprised of three wells, which have since reached inactive status. Currently, groundwater is the primary source for two wells, with two additional wells providing backup service.

The City of Marsing water system services over 1,000 residents yearly via 586 service connections. The system's primary source is groundwater, which uses four wells and has one backup well.

Across Owyhee County, facilities also house smaller water systems. For example, the Rimrock Junior-Senior High School is served by a groundwater-based well via six service connections. In addition, the Cottonwood Campground uses one well that serves about 25 people every five months via seven service connections. Specific RV lots and truck stations also receive drinking water from one or two wells, with Pioneer Mobile Home Park being served by three wells.

Two major water impoundment structures in Owyhee County exist on the Snake River at the Swan Falls Dam and the C.J. Strike Dam. The Swan Falls Dam is located approximately 11 miles east of Murphy. Built in 1901 to provide electricity to nearby mines, it was the oldest hydroelectric generating site on the Snake River. At its establishment, it generated nearly 10,400 kilowatts of power, and was upgraded to two generators that produced up to 25,000 kilowatts. Since the mid-1990's, it has been decommissioned and converted into a historical display that is open to tours with Idaho Power.

The C.J. Strike Dam is located approximately 35 miles upriver of the Swan Falls Dam, near the community of Grand View. With its spillways standing 115 feet tall and 3,220 feet in length, it has a capacity of 247,000 acre feet. According to Idaho Power, it has a nameplate capacity of 89,000 kilowatts and serves several local communities. In addition to the agricultural value of the waters in C.J. Strike Reservoir, the waters there also serve in the production of hydroelectric power via a generating plant operated by Idaho Power. The reservoir also provides recreational opportunities for visitors such as fishing and camping.

Failure of either of these two dams would be devastating to communities located along the Snake River. Above normal release of flood waters from these dams could heavily impact the communities of Grand View and Homedale, and could reach as far as Marsing and Givens Hot Springs. It is likely that whole communities, structures, and critical infrastructure would be severely damaged or even completely washed away in the event of a dam failure.

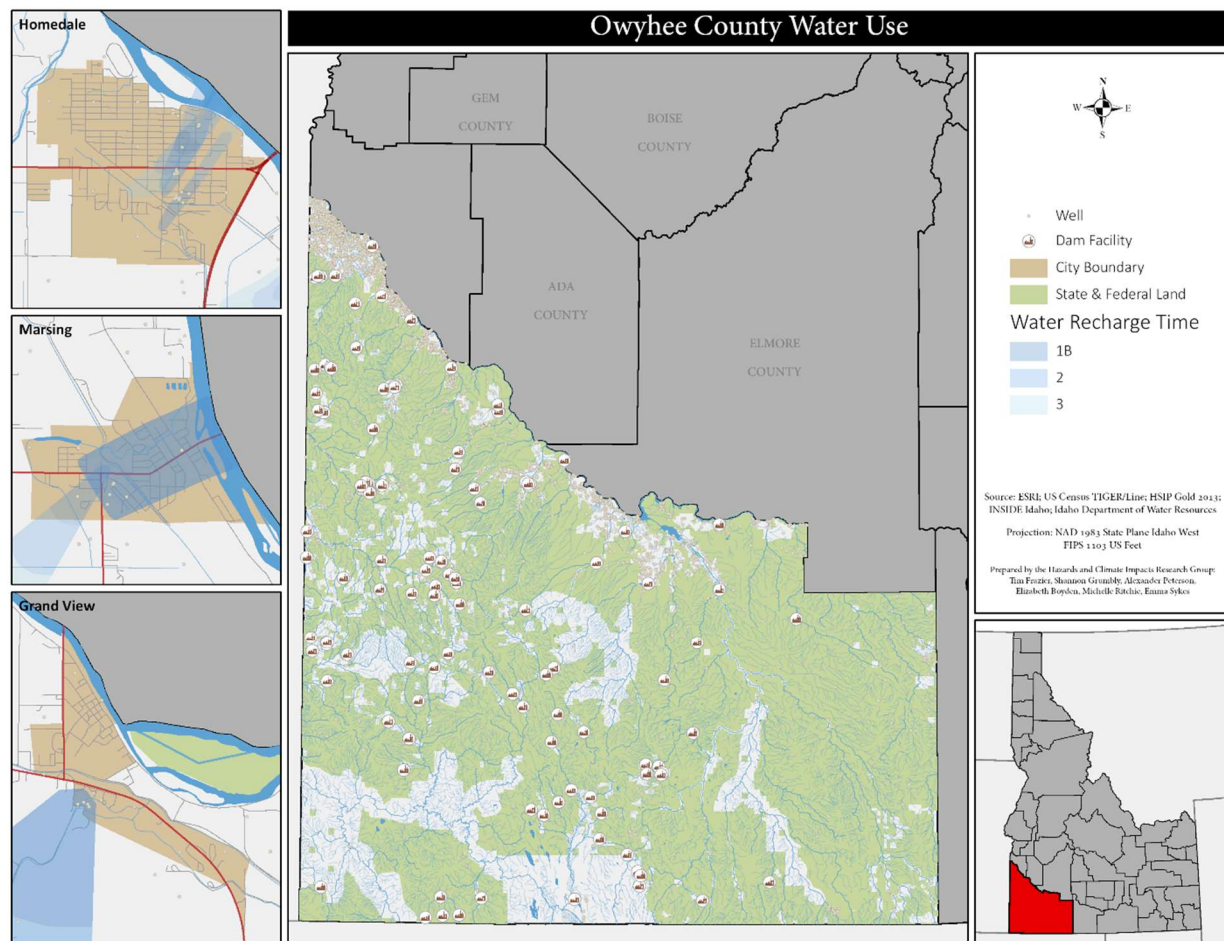


Figure 12. Surface and ground water features and dam facilities

4.8 Critical Wildlife Habitat

Wildlife is overall an important resource to Owyhee County in terms of aesthetic values, economics, and recreation. The varied vegetation and topography of Owyhee County offers a diverse habitat for a wide variety of wildlife. The water resources of the county's rivers, stream, lakes and reservoirs are

breeding grounds for rainbow trout, largemouth bass, catfish, and other aquatic species. These areas also provide a suitable habitat for thousands of mallards, waterfowl, and geese. While bighorn sheep roam the flatlands, the Owyhee Mountains are home to ferruginous and red-tailed hawks, golden eagles, and occasional pronghorns. In addition, deer, antelope, and elk populations are on the rise.

Because of the wide variety of soil types and climate variations, Owyhee County has a wide variety of plant life. The native species vary from semi-arid to aquatic plants; evergreens and deciduous trees; annuals and perennials, fruit bearing, seed bearing and tuberous, broad leaves; and grasses. Douglas-fir stands, juniper and mountain mahogany woodlands, aspen, and mountain shrub communities are the more dominant species on the higher elevation slopes to the south and west of Reynolds. Western juniper and curl leaf mountain mahogany are common on the drier mid-elevation slopes. Aspen, choke cherry, and other riparian species also occur in wetter, mesic habitats. Mountain shrubs, such as mountain big sagebrush and snowberry are also common. The vegetation overall provides a rich variety of food for both native and domestic animals as well as a very limited resource for the timber industry.

The natural vegetation of Owyhee County is limited by low annual precipitation and high evaporation during the growing season. Elevations below 3,000 feet are generally covered with bunch grass and sparse amounts of sage and associated small brush. Some local areas have no vegetated cover and have been smothered by sand dunes that constantly shift with the wind. Areas between 3,000 feet and 5,500 feet are usually covered with sagebrush and some chaparral on slopes facing north where less exposure allows more abundant growth of flora. Mountain peaks with elevations from 6,000 feet to 8,000 feet receive enough precipitation to support sagebrush, chaparral, fir, juniper, and some pine. Forests are especially thin along protected ridges adjacent to mining areas where massive cutting took place during the boom era.

Invasive species and noxious weeds occur within Owyhee County and the control of them is essential. The invasion of juniper has been a problem in areas across the county for more than 25 years. Without initiation of significant effort to control this invasion and expansion, watersheds, wildlife, water quality, recreation, and grazing resource will be destroyed or significantly degraded on sagebrush and grassland areas.

4.9 Land Cover

Owyhee County contains 15 classified land cover types according to the 2006 National Land Cover Database (NLCD). Table 7 provides each land cover type along with a description, and Figure 12 maps the land cover types in Owyhee County.

Table 7. Land cover types

Land Cover Type	Description
Open Water	Areas of open water, generally with less than 25% cover of vegetation or soil.
Developed, Open Space	Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
Developed, Low Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
Developed, High Intensity	Highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
Barren Land (Rock/Sand/Clay)	Areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
Evergreen Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
Mixed Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
Shrub/Scrub	Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
Grassland/Herbaceous	Areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
Cultivated Crops	Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.

Land Cover Type	Description
Woody Wetlands	Areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
Emergent Herbaceous Wetlands	Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

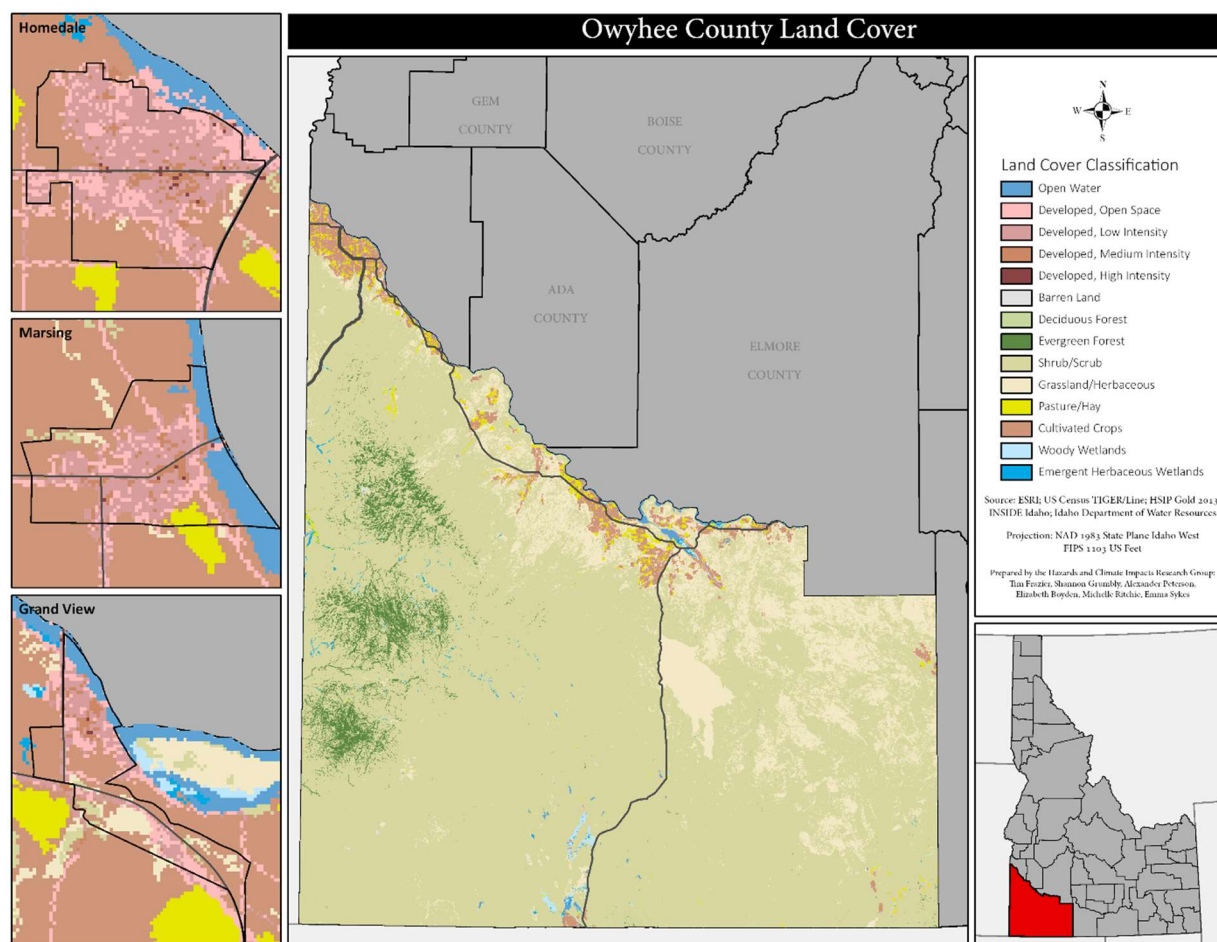


Figure 13. Land cover types map

4.10 Land Ownership & Management

Nearly 76 percent of the county's land is federally owned, with the majority managed by the Bureau of Land Management (BLM). An additional 7 percent of the total land area is owned by the state of Idaho, leaving only 17 percent in private ownership. The western side of the county has more state land, most notably in the Owyhee Mountains. The remainder is comprised of areas surrounding the Owyhee River and Bruneau River, as well as the metropolitan areas that border the Snake River.

4.11 Hazard Management Resources & Capabilities

Fire district personnel are often the first responders during emergencies. In addition to structure fire protection, they are called on during wildland fires, floods, landslides, and other events. The County Road Department can also be called on to assist during emergencies. The Road Department has equipment spread out in various shops across the county that can serve as an integral component of the emergency response team by helping open roads after landslides or washouts, relieve pressure on bridges and culverts due to flooding, or even to create emergency fire lines and safety zones. The following are summaries of the various resources available to Owyhee County during an emergency. Local department capabilities and resources have been updated in 2017 to reflect current conditions. A more detailed and comprehensive resource inventory tracker report is located in Appendix K.

4.11.1 Reverse 911 System

Owyhee County's Reverse 911 system allows the County to rapidly send telephone notifications to all residents and businesses in an affected area in the event of an emergency. An operator using the system can identify the affected neighborhood or region of the county and record a message that describes the situation. The system will automatically call listed and unlisted landline telephone numbers (excluding TTY/TDD) within the affected area and deliver the recorded message. If phone lines are busy, the system will attempt to redial those telephone numbers to make contact. If an answering machine picks up the call, the emergency message will be left on the machine. Cell numbers must be pre-registered with the Sheriff's Dispatch in order to be alerted. Newly established landline numbers may not be alerted until the update of the ANI/ALI records are processed into the system. To ensure alerts, all residents should pre-register their preferred phone contact and means of contact.

4.11.2 NOAA Weather Radio

Owyhee County has access to a National Oceanic & Atmospheric Administration (NOAA) Weather Radio (NWR), which broadcasts National Weather Service (NWS) warnings, watches, forecasts, and other non-weather-related hazard information 24 hours a day. During an emergency, NWS forecasters interrupt routine broadcasts and send a special tone activating local weather radios. Weather radios equipped with a special alarm tone feature sound an alert to give the County immediate information about life-threatening situations. Upon receiving the information, County officials can rebroadcast the information to emergency personnel and affected areas/residents throughout Owyhee County.

NWR broadcasts warnings and post-event information for all types of hazards: weather (e.g., tornadoes, floods), natural (e.g., earthquakes, forest fires and volcanic activity), technological (e.g., chemical releases, oil spills, nuclear power plant emergencies, etc.), and national emergencies (e.g., terrorist attacks). Working with other federal agencies and the Federal Communications Commission's Emergency Alert System, NWR is an all-hazards radio network, making it the most comprehensive weather and emergency information available to the public.

4.11.3 Bruneau Quick Response Unit

The Bruneau Quick Response Unit is a non-profit volunteer organization licensed as a non-transport medical rescue. The Unit provides medical assessment, treatment, and preparation for transport (free of charge). The Unit is staffed by 13 volunteers.

Table 8. Bruneau Quick Response Unit Resources

Equipment	NIMS Type	Additional Information
Medical Response Unit	Other	Non-Medical Transport
Station	-	Partially equipped to be used as an emergency shelter

4.11.4 Bruneau Rural Fire Protection

The Bruneau Fire Protection District provides fire protection for both structure and rangeland fires. The District also provides standby or support service to EMS and law enforcement. The service area extends north from Bruneau to the Snake River, south on Highway 51 to mile marker 60, west on Highway 78 to approximately Rimrock High School, and east on Highway 78 to the Sand Dunes. The District has 14 volunteers and three commissioners.

Table 9. Bruneau Rural Fire Protection Resources

Equipment	NIMS Type	Capacity	Additional Info
Brush Patrol Engine	IV	4000-Gal Tender	-
Structure Engine	-	1500 gpm	-
Water Tender	-	-	Tanker

4.11.5 Grand View Ambulance District

The Grand View Ambulance District acts as an emergency medical transport unit. The District's service area extends from Grand View to the Nevada state line on Highway 51, to the Sand Dunes, near to Murphy on Highway 78, and to Chatten Flats in Elmore County. The District is staffed by 10 volunteers who are paid a small stipend per call. Note that Elmore County taxes the entire county for EMS services. However, Grand View Ambulance receives none of the money, and the issue needs to be addressed with Elmore County.

Table 10. Grand View Ambulance District Resources

Equipment	NIMS Type	Remarks
2 x Ambulance	III	-
4x4 Truck	Other	Small backcountry rescue unit on a 4WD pickup truck.
Building	Other	Equipped to be used as an emergency shelter.

4.11.6 Grand View Rural Fire Protection District

Grand View Rural Fire Protection District encompasses 111 square miles, including portions of Owyhee County, Elmore County, and the City of Grand View. The department responds to wildland, structural and agricultural fire. Grand View has mutual aid agreements with the surrounding fire protection districts, as well as with the BLM. Grand View provides Basic Life Support (BLS), and standby or support services to EMS and law enforcement (including extrication). The District is staffed by 13 volunteers.

Table 11. Grand View Fire Department Resources

Equipment	NIMS Type	Remarks
Brush Patrol Engine	III	-
Engine, Fire, Pumper	I	-
Engine, Fire, Pumper	II	-

Extraction Equipment	Other	Two sets
Water Tender (Tanker)	I	-
Portable Pump	Other	-
Portable Pump	I	-
Stations	Other	Two buildings in Grand View

4.11.7 Homedale Ambulance

Homedale Ambulance is an Emergency Medical Transport Unit and provides standby services. The service area extends from the Oregon state line to Jump Creek and Poison Creek, into Canyon County to Charleston on Hoskins Road, and on Highway 95 to Ustick and south to BLM land. Homedale Ambulance is staffed by 15 EMTs and three drivers. Staff is paid during the day, but act in a volunteer capacity during night.

Table 12. Homedale Ambulance Resources

Equipment	NIMS Type	Remarks
Ambulance	IV	
Ambulance	IV	-

4.11.8 Homedale Fire Department

Homedale Fire Department provides fire protection for both structure and rangeland fires, as well as standby or support services to EMS and law enforcement (including extrication). The service area extends from the Oregon state line to Jump Creek and Poison Creek, into Canyon County to Charleston on Hoskins Road, and on Highway 95 to Ustick and south to BLM land. The Department is staffed by 21 volunteers.

Table 13. Homedale Fire Department Resources

Equipment	NIMS Type	Remarks
Brush Truck	IV	
2 x Fire Engine	IV	-
2 x Water Tender (Tanker)		
3 x Portable Tanks with Pumps		
2 x Extrication Equipment		

4.11.9 Homedale Police Department

The Homedale Police Department provides law enforcement services to the citizens of Homedale. The service area is bounded by the incorporated city limits, but the department also provides assistance as needed in other parts of the county and in Wilder. Staff include six full time and four volunteers.

Table 14. Homedale Police Department Resources

Equipment	NIMS Type	Remarks
SUV		
5 x Police Cars		One vehicle has basic EMT capabilities; the others have defibrillator-
Animal Impoundment Truck		

4.11.10 Marsing Ambulance

Marsing Ambulance is an Emergency Medical Transport Unit that serves the area ranging from the Snake River to the state line on Highway 95, and from about Hoag Road on Highway 78 to Jump Creek Road. Marsing Ambulance currently employs 1 full-time position, with an on-call individual during the evenings. Twelve EMTs and 4 drivers provide further support and expertise.

Table 15. Marsing Ambulance Resources

Equipment	NIMS Type	Remarks
Ambulance	Other	Lucas Device and AED

4.11.11 Marsing Rural Fire Protection

Homedale Fire Department provides fire protection for both structure and rangeland fires.

Table 16. Marsing Rural Fire Department Resources

Equipment	NIMS Type	Remarks
Brush Patrol, Firefighting	VI	-
Engine, Fire	I	Pumper
Hand Crew	II	-
Portable Pump	II	-

Portable Pump	Other	-
Water Tender, Firefighting	I	Tanker
Extrication Equipment	I	-

4.11.12 Murphy/Reynolds/Wilson Fire and Quick Response Unit

The Murphy/Reynolds/Wilson Fire and Quick Response Unit provides fire protection for both structure and rangeland fires, non-transport emergency medical services (including extrication), and backcountry rescue. The service area extends from mile marker 8.5 between Marsing and Givens to mile marker 39, and from the Snake River to Silver Falcon Mine south of Reynolds. The Unit has around 30 volunteers, with a mix of EMTs, firefighters, and combined skillsets.

Table 17. Murphy/Reynolds/Wilson Fire and Quick Response Unit Resources

Equipment	NIMS Type	Remarks
Ambulance	IV	Non-Transport
QRU Backcountry Rescue Vehicle	Other	4x4 pickup
4 x Brush Trucks	VI	Firefighting
4 x Fire Engines	I	Structure fires
5 x Water Tenders (Tankers)	I	Firefighting
4 x Portable Tanks with Pumps	I	
Extrication Equipment	I	
Command Truck		Also acts as QRU
Quick Attack Command Vehicle		
Cargo Van		
4 x Stations		

4.11.13 Owyhee Rangeland Fire Protection Association

The Owyhee RFPA is a voluntary rangeland suppression and initial attack on rangeland wildfires, with the goal to reduce rangeland losses from wildfires by catching fires early. The service area extends from the Oregon state border to the edge of the city fire districts, down Mud Flat Road, and Battle Creek. Between 52 to 55 trained volunteers act in some capacity within the RFPA.

Table 18. Owyhee Rangeland Fire Protection Association Resources

Equipment	NIMS Type	Remarks
5 x Brush Trucks		
2 x Water Tenders (Tankers)		
3/4 Slip-in Units for Pickups		
D6 Dozer		
Lowboy Trailer		Used to haul dozer

4.11.14 Owyhee County Sheriff's Office

The Sheriff's Office provides law enforcement services to the county's citizens, including civil service, jail operations, search and rescue, safety services, and more. The Sheriff's Office employs nine jailers, 13 full-time peace officers, 24 part-time peace officers, six dispatchers, and has a posse 25 members strong.

Table 19. Owyhee County Sheriff's Office Resources

Equipment	NIMS Type	Remarks
Toy Hauler Command Trailer		
6 x ATVs		
16 Vehicles		All 4WD
Prisoner Transport Vehicle		
5 x Snowmobiles		

4.11.15 Saylor Creek Rangeland Fire Protection Association

The Saylor Creek RFPA is a voluntary rangeland suppression and initial attack on rangeland wildfires, with the goal to reduce rangeland losses from wildfires by catching fires early. The service area is composed of the northern half of the Jarbridge Resource Area of the BLM. Approximately 70 trained volunteers act in some capacity within the RFPA.

Table 20. Saylor Creek Rangeland Fire Protection Association Resources

Equipment	NIMS Type	Remarks
Brush Truck		
4 x Slip-in Units for Pickups		

4.11.16 Silver City Fire and Rescue, Inc.

Silver City Fire and Rescue provides fire protection for both structure and rangeland fires, as well as backcountry rescue services. The organization's service area is 18 square miles in the Owyhee Mountains. The area covered includes Silver City, War Eagle Mountain, and most of Florida Mountain. SCF&R volunteers are trained as wildland firefighters, Incident Command, Extrication, Basic Rope Rescue, First Responders, and Epinephrine Auto-Injector Administration. SCF&R is a 501(c)3 non-profit corporation and is supported by donations and grants, with 10 volunteers acting in some capacity for the organization

Table 21. Silver City Fire and Rescue, Inc. Resources

Equipment	NIMS Type	Remarks
3 x Fire Engines	III	Pumper
Brush Truck		
Water Tender (Tanker)	II	
3 x Small Ditch Pumps		
2 x Mark III Wildland Pumps		
6,000 Gallon Helicopter Dip Tank		

Silver City is remote. It lies between mountains that risk steeply to 8,000 feet. Many tourists visit, especially on the weekends. There is only one all vehicle dirt road accessing town. All alternate routes are 4-wheel drive only. Wildland fuel loads in the surrounding area have never been as plentiful since settlement in 1863. There are also many open mines. Wildland fires, structure fires (with minimal water delivery system), access roads, propane tanks, mine rescue, landslides, avalanches, flash floods, and wind storms are all prominent concerns of the fire department.

SCF&R is a new department; therefore, they are still in need of several types of equipment, including the following:

- Wildland Fire – Fuels reduction on public land surrounding Silver City, juniper reduction on private land north of Silver City, aspen grove enhancement, improvement of water supply and impoundments, station water storage tanks around the area, modern (rateable) wildland fire engine, volunteer trainees, and coordinated training between BLM and SCF&R.
- Safety Zones – Need numerous or large safety zones capable of protecting hundreds of people.
- Access/Evacuation – Silver City's sole one-lane, all vehicle entrance road is easily blocked. Need to widen present one-lane road into town, restore a former bypass route into town, and one or more routes out of town for evacuation if main road is not usable or unsafe.

- Structure Fire – Need defensible space around all buildings, upgrade water delivery system for higher flow rates, much more water storage or creek impoundments, develop a water source from Morning Star Mine, acquire portable water tanks, more volunteer firefighters, more training and PPEs for firefighters, a community action plan, and fire suppression system in the large, wooden, 19th century hotel.
- Propane Tanks – Need to bury numerous propane tanks.
- Mine Rescue – Hundreds of mine tunnels and shafts remain open. Need to close mine access points and train and equip rescue teams.
- Landslides – Solid rock mountains seem pretty stable. Noted landslides are in association with wildland fires on steep slopes and from avalanche events.
- Avalanche – Avalanche zones have been long feared and fewer residents are in the area in the event that additional help is needed. Warning signs are needed.
- Flash Flood – Jordon Creek can become a torrent with winter thaws and summer thunderstorms. The Third Street Bridge is woefully inadequate. Fast water rescue training is needed.
- Emergency Operation Center – An EOC in Silver City is needed for fire station and emergency medical equipment storage and to serve as fire crew and law enforcement base station. This will require dedicated electrical power, water, and communications equipment and should include a helicopter landing zone.
- Wind Storms – Old cottonwood trees often fall across road and in town. Need to assess and remove rotted trees.

4.11.17 Three Creek Rangeland Fire Protection Association

The Three Creek RFPA is a voluntary rangeland suppression and initial attack on rangeland wildfires, with the goal to reduce rangeland losses from wildfires by catching fires early. The service area is composed of the southern half of the Jarbridge Resource Area of the BLM. Approximately 50 trained volunteers act in some capacity within the RFPA.

Table 22. Three Creek Rangeland Fire Protection Association Resources

Equipment	NIMS Type	Remarks
Brush Truck		
Trailer with Slip-in Tank		
3 x Discs		
2 x Slip-in Units for Pickups		

4.11.18 Bureau of Land Management

Twin Falls 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. 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. Tables 23 through 29 list the estimated equipment maintained by the district; note, however, that these tables are pulled from the former plan.

Table 23. Shoshone Equipment List (BLM Twin Falls District)

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
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

Table 24. Bellevue Equipment List (BLM Twin Falls District)

Identifier	Description	Make	Water Capacity	Pump GPM
E415	Type 4 Engine	Freightliner FI70	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
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Table 25. Carey Equipment List (BLM Twin Falls District)

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 550	290	85
Contract Dozer	Type 2 Dozer	Varies	-	-

Table 26. Burley Equipment List (BLM Twin Falls District)

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

Table 27. Malta/Almo Equipment List (Twin Falls District)

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

Table 28. Kimima Equipment List (BLM Twin Falls District)

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

Table 29. Rogerson Equipment List (BLM Twin Falls District)

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

The District's air resources include the following:

- 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 an 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 Twin Falls 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 Twin Falls capable of carrying 800 gallons of retardant during the fire season. There are also 2 SEATS (Air Tracker 802) located in Boise and Pocatello. Mountain Home Air Force Base Saylor Creek Range

Boise District – The only wildland fire resources housed within Owyhee County is at the Bruneau Guard Station in Bruneau. Initial attack response for the Jarbidge Resource Area will be shared with the Twin Falls District through an agreement that will allow IA by closest resources. The rest of Owyhee County, the Bruneau Resource Area and the Owyhee Resource Area, are covered by the crews stationed in Bruneau, Hammett, Boise, and Wild West.

The Boise District BLM encompasses approximately 3.9 million acres of BLM-managed land in southwest Idaho. Through agreements with the Idaho Department of Land and the National Forest Service, the BLM also provides support on IDL and FS lands in some areas within the district boundary.

Special features within the district include the 485,000-acre Snake River Birds of Prey National Conservation Area; the Owyhee Canyonlands; portions of the north and south fork Payette River

corridors; the Owyhee Mountains, including the historic Silver City area; the Bruneau River canyon; and several popular recreation areas and wildland-urban interface areas.

The District's primary station is located in Boise, where 3 crews with 2 engines and a command vehicle each are stationed, along with a helicopter, and air attack. Single engine airtankers are generally available during the wildland fire season. They are stationed in Boise or Mountain Home. Depending on daily fire situation a Boise crew may be stationed at Boise City Fire Station 2 or North Ada County Fire and Rescue Station 3.

The District has out-stations at Bruneau, Hammett, and Middleton (at the Middleton Fire Department). Each facility is staffed by one crew with two engines and a command vehicle, on an 8-hour day, 5 day per week basis (on call 24/7) from mid-June to mid-September. Bruneau and Hammett will have different days off to provide 7-day coverage between the two guard stations. A dozer is usually stationed at Bruneau during the wildland fire season.

Wild West Guard Station is going to be demolished this spring with plans to build a new station. In the meantime, Wild West will be stationed at the Middleton Fire Department in downtown Middleton.

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

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

The fire program staff totals 110-135 individuals, including 20 permanent employees, 40 career-seasonal employees who work up to nine months each year, and 75 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

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

The District's top resource priorities includes increasing the amount and level of training for and with partner community fire departments.

Table 30. Boise District Equipment List for Wildland Fire Protection

Call #	Name	Title
Chief 1	Andy Delmas	FMO
Division 1-1	Len Spain	AFMO
Division 1-2	Kole Berrichoa	Fire Operations Manager
Division 1-3	Lance Okeson	Fuels Program Coordinator
Division 1-4	Bob Narus	Prevention/Information
Investigation/Prevention		
Investigation 1		Daily-Investigator
Investigation 2		Daily-Investigator
Prevention 1		
Battalion/FOS Group		
Bat 10	Brad Bolen	FOS North/Owyhee
Bat 20	Todd Floyd	FOS Boise/Four Rivers
Bat 21	Dennis Konrad	FOS Seasonal
Bat 30	Steve Acarregui	FOS South/Bruneau
Bat 40	Scott Sugg	FOS/Helitack Supervisor
Bat 50	Mike Theisen	FOS Fuels, Boise
Unit Superintendents		
Supt 11	Middleton	Daily Supervisor
Supt 15	Perms	Daily Supervisor
Supt 21	Unit A	Daily Supervisor
Supt 22	Unit B	Daily Supervisor
Supt 23	Unit C	Daily Supervisor
Supt 31	Hammett	Daily Supervisor
Supt 32	Bruneau	Daily Supervisor
Supts. Will be qualified as a TFLD and ICT4 or will used Chase as Designator		
Helitack		
HT41	Chase Truck	Yellow Chase
HT42	Chase Truck	Blue Chase
HT43	Chase Truck	White Chase
Fuels		
Fuels Chase 51		
Fuels Chase 52		
Engines		

Call #	Name	Title
E1411	Engine Type IV	Middleton
E1412	Engine Type IV	Middleton
E1415	Engine Type IV	Perms
E1416	Engine Type IV	Perms
E1421	Engine Type IV	Unit A Boise
E1422	Engine Type IV	Unit A Boise
E1423	Engine Type IV	Unit A Boise
E1424	Engine Type IV	Unit B Boise
E1425	Engine Type IV	Unit B Boise
E1426	Engine Type IV	Unit B Boise
E1427	Engine Type IV	Unit C Boise
E1428	Engine Type IV	Unit C Boise
E1429	Engine Type IV	Unit C Boise
E1431	Engine Type IV	Hammett
E1432	Engine Type IV	Hammett
E1433	Engine Type IV	Hammett
E1434	Engine Type IV	Bruneau
E1435	Engine Type IV	Bruneau
E1436	Engine Type IV	Bruneau
E1451	Engine Type IV	Boise
E1452	Engine Type IV	Boise
E1641	Engine Type VI	Helitack
Heavy Equipment		
DZ1280	Dozer Type II, D6	Boise
DZ1281	Dozer Type II, D6	Boise
DZ1182	Dozer Type I, D6R	Boise
WT1290	Water Tender Type II/3500 gal	Boise
WT1291	Water Tender Type II/3500 gal	Boise
FT1199	Fuel Tender	Boise
Air Attack	4SA	Air Attack Base, Boise
Helicopter	63H (Type III Helicopter)	Air Attack Base, Boise

- The Boise District has three dozers, one of which is stationed in Hammett (may change in 2005); and two in Boise
- The Boise District also has three 3,500-gallon water tenders.
- There are four Fire Lookouts, one on Squaw Butte, north of Emmett; one on South Mountain, southeast of Jordan Valley; one on Danskin Peak, north of Mountain Home; and one on Bennett Mountain, northeast of Mountain Home.

Additionally, suppression resources include:

- Helicopter – The district has a new compact for 2005 helicopter on contract from June to October and an 11-member helitack crew. U.S. Forest Service helitack crews stationed at Lucky Peak and Garden Valley are available for assistance if needed and if they are not assigned elsewhere. Additionally, there are other helicopter resources equipped for fire missions that are available on a call-when-needed (CWN) basis.
- Fixed-Wing – The district has a contract AeroCommander 500S fixed-wing aircraft, staffed by a pilot and the air attack supervisor. The air attack supervisor coordinates aerial firefighting resources and serves as an observation and communications platform for firefighters on the ground.
- Air Tankers – There are typically two air tankers (fire retardant planes) on contract in Boise during the fire season. However, these aircraft are considered national resources and are assigned where they're needed at any particular time. These tankers have recently been grounded and may or may not be available for use in the future. Other, nearby, air tankers are located in McCall and various locations in Nevada and Oregon. There are also contract single-engine air tankers (SEATS) located in Oregon and Twin Falls, Idaho.

4.11.19 Mountain Home Air Force Base Creek Ranger

Suppression equipment on SCR includes tow grades to cut in fire lines, one CASE 256 HP tractor that tows a 20-foot-wide disc, one 2.5-ton pumper truck with a 1,200-gallon tank, two 1-ton trucks with 250-gallon and 350-gallon slip-on tanks, respectively, one 10,000-gallon stationary water tank, one 3,000-gallon mobile water tank, hand tools, and various smaller backpack water sprayers.

Suppression equipment on JBR consists of one 1,200-gallon pumper truck, two 250-gallon slip-ons, one 3,000-gallon tanker truck, one CASE 200-hp tractor that tows a 20-foot wide disc, and one 50,000-gallon water tank at the maintenance facility.

The Air Force monitors and responds to all fires on the SCR and JBR. Yearly pre-mitigation work is conducted on the range to reduce the number of fire starts. Pre-mitigation work has included

controlled burns, spraying to kill vegetation before reseeding (fire prone weeds), mechanical treatment (disking) of fuels, and creation of fire breaks around the ranges.

The Air Force has a very good record of keeping fires limited to the two ranges and of responding quickly and with sufficient equipment and personnel to handle the fires on the ranges.

4.11.20 Listed Needs

Table 31 details the technological and human resource needs of the various organizations that operate in Owyhee County. Note that this table is current as of June 2017.

Table 31. Technical and Human Resource Needs

Organization	Resource	Remarks
Bruneau Fire Protection District	Water Tender	Current vehicle is outdated and in poor condition
	Light Rescue Vehicle	Needed to assist when responding to accidents or medical emergencies
	Better Communications Networks	Additional radio repeaters or cell towers are needed
	Training & Funding	County-wide training to facilitate partnerships and capability enhancement
Bruneau Quick Response Unit	23 KW Generator	Auxiliary power for the station during use as an emergency shelter
	Better Dispatch Services	State communication network is currently used, but would like to move to Owyhee County Sheriff's network. However, Sheriff's network does not have an adequate number dispatchers
	Training	Funds for hiring instructors with availability and ability to travel to Bruneau
Grand View Ambulance	Update Defibrillator Units	-
	New Ambulance	-
	Better Communications	-
	Volunteers, Training, & Funding	-
Grand View Fire	Command Vehicle	Currently using a personal vehicle
	Water Tender	-
	Rangeland Personal Protective Equipment	Currently not enough equipment for all volunteers
	New Radios	Currently using outdated radios
	Volunteers & Stipend	-
	Training	Certified Instructor to teach Firefighter 1 & 2

Organization	Resource	Remarks
Homedale Ambulance	New EMS Building	Currently using an old auto mechanic shop with upkeep issues. Lack the funds to begin construction of a new structure on available land
	Lucas Device	-
	Volunteers	-
Homedale Fire	Brush Truck	-
	Irrigation Hook-up Infrastructure	-
	Drug Classes	To teach volunteers how to handle such situations
	Wildland Fire Training	-
Homedale Police	Mobile Computer Access	For mobile dispatch
	Training	Firearms, arrest techniques, public relations, hazmat training
Marsing Ambulance	ATV/UTV	Properly equipped to be used to get into the backcountry
	Volunteers, Training, & Funding	Fully funded staff, additional staff, and training and funds for new staff
Murphy Reynolds Wilson Fire & QRU	Extrication Equipment	-
	New Radios	Need ability to communicate with FEMA
	ATV/UTV	Properly equipped to be used to get into the backcountry
	Training	-
Owyhee RFPA	Better Communications Networks	Communication can be difficult, need additional radio repeaters or cell towers
	Brush Trucks	-
	Road Grader	For Grand View end
	Truck	To pull lowboy trailer
	Additional Radio Training	-
Owyhee County Sheriff's Office	Water Rescue Training	-
	Snow Rescue Training	-
	Fire Rescue Training	-
Saylor Creek RFPA	Better Communications	Updated radios and software to program them properly
	Part-Time Paid Office Personnel	To conduct administrative duties specific to Saylor Creek RFPA (or all in-county RFPAs)
	Addition Training	-
Silver City Fire & Rescue	Water Impoundment Structure	To store water in the creek

Organization	Resource	Remarks
	Propane Tank Burials in Silver City	Extreme hazard if buildings were to catch fire and fall on them
	Additional Volunteers	-
Three Creek RFPA	Type 6 Brush Truck	-
	Type 4 Brush Truck	-
	Water Tender	-
	Better Communications	Updated/bigger radios and software to program them properly
	Part-Time Paid Office Personnel	To conduct administrative duties specific to Three Creek RFPA (or all in-county RFPAs)
	Additional Training	-

V. RISK ASSESSMENT

5.1 Overview

Risk assessments are key in aiding mitigation. A risk assessment identifies and characterizes hazards and potential socioeconomic impacts to the county and its citizens should a disaster occur. By undertaking a comprehensive risk assessment, the emergency manager and decision makers are able to compare, evaluate, and prioritize mitigation actions in the county and its communities in order to most effectively and efficiently reduce loss of life and property. The risk assessment also provides for more effective land use through zoning and planning, ultimately allowing for resilient growth in Owyhee County.

Risk is a statement of probability that a hazard will cause a certain number of casualties and economic losses. The general method of the risk assessment is as follows:

- Assess the hazard (including the location, extent, magnitude, and frequency of hazard occurrence both in the past and the probability of future occurrence).
- Assess the number of individuals and property exposed to the hazard.
- Assess critical and essential facilities exposed to the hazard.
- Assess the socioeconomic vulnerability of the community to the hazard.
- Assess land use and future development in the county with regards to the hazard extent.

The 2017 update significantly reworked the risk assessment in the former plan, with focus on ease of use, consistency, and flow. Changes included restructuring the risk assessment and hazard profiles, incorporating new and additional hazard occurrence data, and incorporating more advanced modeling.

5.1.1 FEMA Requirements

The 2017 plan update developed the risk assessment consistent with the process and requirements detailed by FEMA. This section satisfies the following FEMA requirements:

- FEMA 44 CFR §201.6(c)(2)(i) – [The risk assessment shall include a] description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
- FEMA 44 CFR §201.6(c)(ii) – [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008 must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of:

- (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;
- (B) An estimate of the potential dollar losses to vulnerable structures identified in ... this section and a description of the methodology used to prepare the estimate.
- (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.]
- FEMA 44 CFR §201.6(c)(iii) – For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.

5.2 Hazard Identification & Profiling

The 2009 plan iteration identified hazards through discussions with the former steering committee, past hazard events and declared disasters, interviews with local experts, and public outreach. The 2017 plan iteration carried forward all considered hazards from the former plan, incorporated additional hazards that pose a risk to the county, and restructured the hazard profiles. Table 32 details the hazards profiled in the 2017 plan update as well as the former plan. For those hazards that were profiled but were deemed not a priority, the profiles were moved to Appendix J for future consideration.

Table 32. Hazard profile inclusion and comparison

Hazard	2008 Profile	2017 Profile
Avalanche	-	Yes
Civil Disturbance	-	Appendix J
Communicable Disease	-	Appendix J
Cyber Disturbance	-	Appendix J
Drought	Yes	Yes
Earthquake	Yes	Yes
Flood	Yes	Yes
Hazardous Material	-	Appendix J
Impoundment Structure Failure	-	Appendix J
Landslide	Yes	Yes
Severe Weather	Yes	Yes
Transportation Accident & Incident	-	Appendix J

Utility Outage	-	Appendix J
Volcanic Eruption	-	Appendix J
Wildfire	Yes	Yes

The method to profile each hazard varies, though a general framework was employed to standardize the profiles. Each hazard profile contains a detailed description of the hazard, including the geophysical, biophysical, or human causes, different types of the hazard, and potential impacts. Where applicable, previous occurrences are listed for the period of record. Narratives from local media provide context to some of these events. Likewise, probabilistic modeling was incorporated where applicable. Models employed in the risk assessment vary between the hazards, as no single model captures future hazard probability or impact. Similarly, population, improved structure values, and critical infrastructure exposure is detailed, followed by a socioeconomic vulnerability assessment. Land use and future development is then considered, detailing what land use types fall within hazard-prone areas and where development is located in relation to the hazard. Finally, each hazard is scored according to its risk.

5.3 Socioeconomic Vulnerability Assessment

Risk assessments often focus solely on the physical extent of hazards and the relative location of populations. Although exposure is highly influential in the impacts of hazards, additional factors amplify or dampen an individual's or community's susceptibility to loss. Susceptibility to loss is termed 'vulnerability', and understanding the many socioeconomic factors that influence vulnerability can help allocate resources and efforts to protect those most in harm's way. For example, elderly populations are often more vulnerable due to challenged mobility, which can increase evacuation time and require special care. Female populations are more vulnerable than male populations due to family responsibilities and lower average incomes.

This risk assessment employed the Spatially Explicit Resilience-Vulnerability (SERV) model (Frazier et al. 2013). The SERV model is an advanced socioeconomic vulnerability model designed to overcome the limitations of traditional vulnerability models. Traditional models lack the sophistication to produce sub-county results, account for the local characteristics of communities, or correctly apply spatial analyses and statistics; in contrast, the SERV model measures socioeconomic vulnerability at the sub-county level and takes into account different statistical considerations and methods. The SERV model analyzes multiple indicators (such as age, race and ethnicity, gender, and income) and their positive or negative effects on the population to determine census block-level sensitivity and adaptive capacity (Table 33). Adaptive capacity is the ability of an individual or community to cope and adapt to a hazard. For example, people can use their savings to overcome property damage resulting from a

flood. Sensitivity describes how an individual or community is affected by the hazard. An example of sensitivity is the lack of savings to overcome property damage resulting from a flood. The SERV model also takes into account exposure, or the proximity of an individual or community to a hazard. Finally, a measure of socioeconomic vulnerability is derived. This measure is hazard-specific, given differing vulnerability across the county. Note that census blocks with no population are not considered in the SERV model.

Table 33. Socioeconomic indicators used in the SERV model

Adaptive Capacity		Sensitivity	
Indicator	Directionality	Indicator	Directionality
No High School Diploma	-	Pop Female	+
College	+	Pop Below Poverty	+
Age Dependent	-	Race White	-
Owner Occupied Households	+	Race Minority	+
Female Head of Households	-	Disability	+
Not Single Sector Employment	+	Age Dependent	+
Sales Volume	+	Renter Occupied Households	+
Employee Number	+	Female Head of Households	+
Pop Below Poverty	-	Critical Facilities	-
Health Insurance	+	Essential Facilities	-
Labor Force	+	Dependent Population Locations	+
Female Employees	+	Public Venues	+
Critical Facilities	+	Overnight Venues	+
Essential Facilities	+	Sales Volume	-
		Employee Number	-

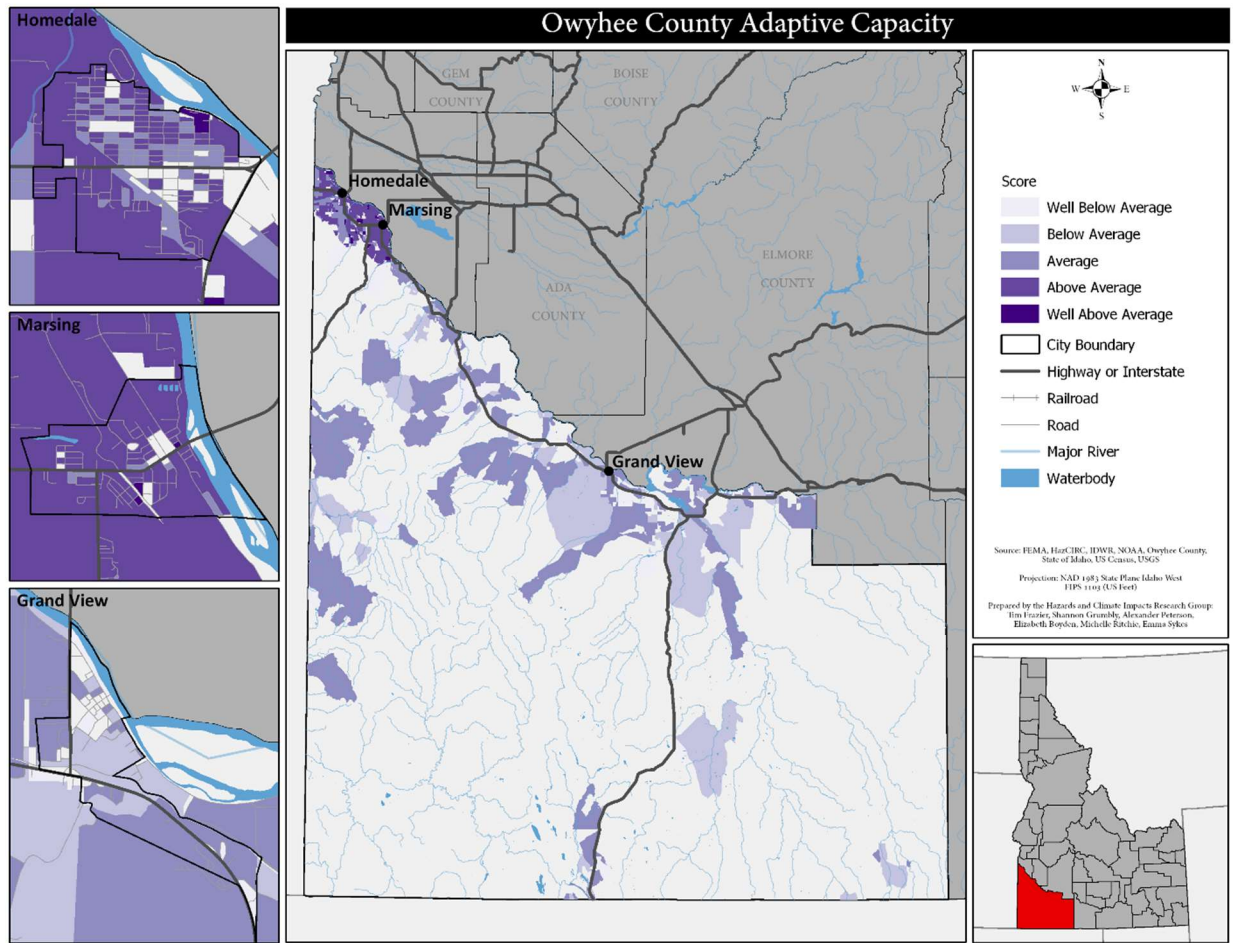


Figure 14. Adaptive capacity map

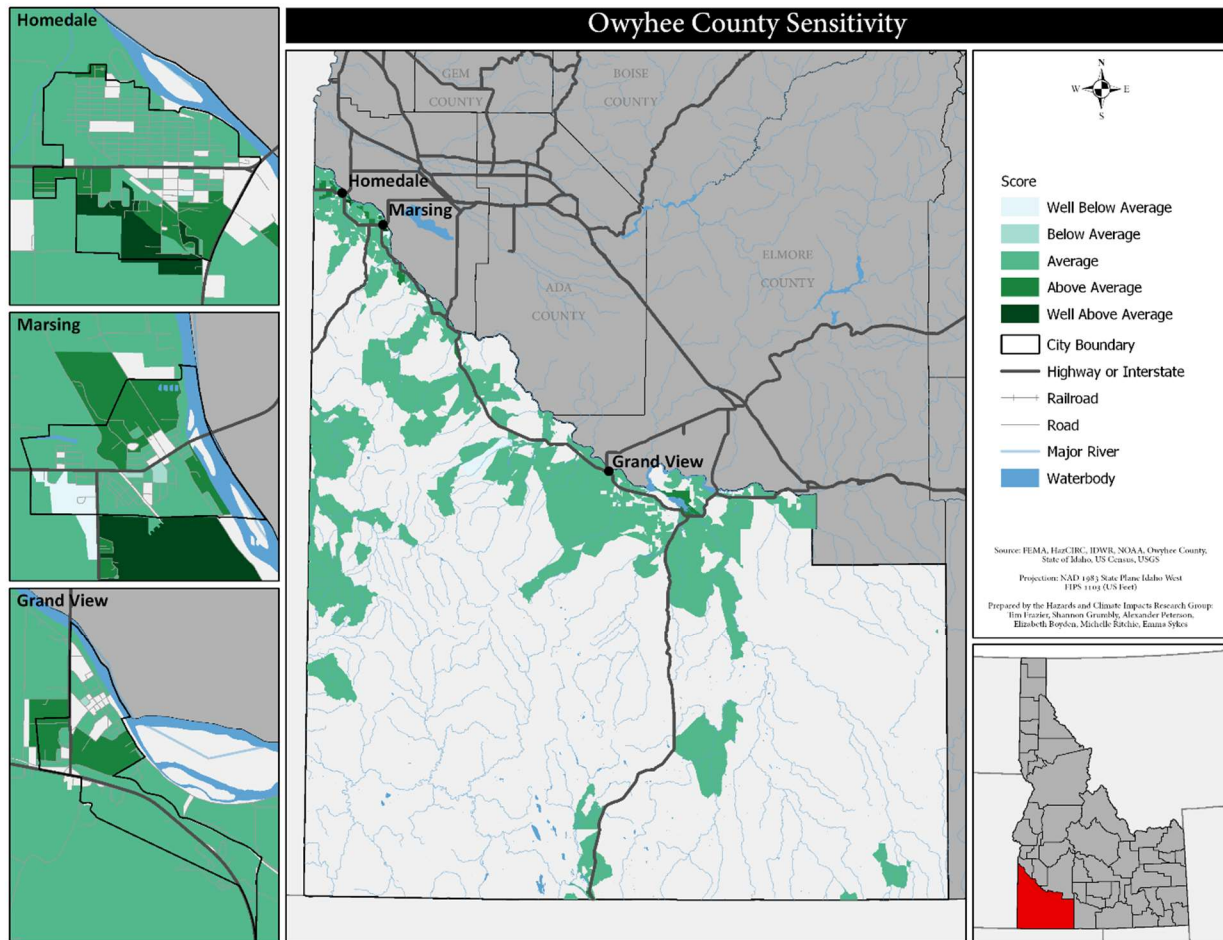


Figure 15. Sensitivity map

5.4 Population, Building Inventory, & Critical Facilities Inventory

Inventorying the county's building and facilities values is vital to assessing a hazard's potential impact. Hazus-MH General Building Stock (GBS) data was used to assess the structural values in Owyhee County and the communities with GIS-ready boundary data. The GBS inventory includes residential, commercial, industrial, agricultural, religious, government, and educational buildings and was developed by FEMA using information from the Bureau of Census, Dun & Bradstreet, and the Department of Energy (DOE). US Census data and Dun & Bradstreet data was used to develop the building inventory, and reports from the DOE helped define regional variations in characteristics including number and size of garages, type of foundation, and the number of stories. Baseline floor areas was based on a distribution from the DOE's Energy Consumption Report. The same report was then used to determine the valuation of single-family residential homes by accounting for income as

a factor on the cost of housing. For all other building types, Dun & Bradstreet used in-house proprietary data to build structure valuations. The building counts by type and jurisdiction are listed in in Table 34, with total building inventory listed in Table 35.

Table 34. Building inventory from Hazus-MH

	Grand View	Homedale	Marsing	Unincorp.
Residential	91	659	194	2,989
Commercial	9	66	20	55
Industry	-	7	3	18
Agriculture	3	4	2	19
Religion	-	10	4	7
Government	2	2	1	3
Education	4	4	3	6

Table 35. Building values from Hazus-MH

	Grand View	Homedale	Marsing	Unincorp.
Residential	\$11,679,000	\$102,377,000	\$21,886,000	\$416,089,000
Commercial	\$3,853,000	\$20,423,000	\$9,779,000	\$22,410,000
Industry	\$226,000	\$3,346,000	\$1,135,000	\$8,553,000
Agriculture	\$544,000	\$2,107,000	\$743,000	\$15,845,000
Religion	-	\$4,861,000	\$2,272,000	\$4,880,000
Government	\$2,262,000	\$328,000	\$246,000	\$3,244,000
Education	\$2,369,000	\$2,832,000	\$2,522,000	\$3,855,000

Critical facilities are vital to the continuance of the county, with emphasis placed on those facilities important in disaster response and recovery or those with the potential to amplify life and property losses. Critical facilities are classified into four categories:

- **Essential Facilities** – Those facilities that are vital to response and recovery from a disaster, including emergency operation centers, police stations, fire stations, schools, and medical care facilities. Most of the county's essential facilities are located in and around the populated areas, such as Homedale, Grandview, and Marsing (Figure 16).

- Transportation Facilities – Transportation is vital in all phases of disaster management, as moving people out of hazardous areas, moving supplies into staging or other areas, and response depends on well-connected and sound transportation infrastructure. This includes airports and runways, railroads, highways, and bridges. The transportation network in the county converges on Grandview, Homedale, and Marsing (Figure 17).
- Utility Facilities – Often termed ‘lifelines’ due to their importance in community continuity and in the post-disaster recovery phases. This include wastewater facilities, electric power facilities, and communication locations. Most of the county’s utilities are located in and around the northwestern corner of the county (Figure 18).
- High-Potential Loss Facilities – Facilities, staging areas, and other locations with the potential to cause significant life and economic losses are classified as high-potential loss facilities. This includes dams and hazardous materials sites. Many of the county’s hazardous materials sites are located on Federal lands (Figure 19).

An inventory of these facilities was created using various sources in order to attain the highest quality data possible. The sources included the Homeland Security Infrastructure Program (HSIP) Gold 2013 dataset, data from the State of Idaho Hazard Mitigation Plan (SHMP) 2013 update, and Infogroup business 2014 data. Note that this inventory is subject to change, may not identify all facilities and infrastructure that can be classified as critical to the communities they serve, and is for planning purposes only.

5.5 Land Use & Future Development

Owyhee County's population has remained relatively steady over the past decade, with some years seeing more growth than others. The county's population in 1990 was 8,000 and from 1990 to 2010, the population increased from 8,000 to 11,526 showing significant growth. However, the 2015 population estimate was 11,310, showing a slight decrease from 11,526 in 2010. For the purposes of this plan, population growth and scattered new development will be expected in the next five years, although at an incremental rate. This is consistent across the county and all jurisdictions. However, the county's rural nature and limited access to water resources may restrict these future development opportunities.

Owyhee County's future development goals are to conserve and encourage the county's historical ranching and farming tradition, to anticipate and provide for a variety of uses in the county to meet

the needs of the citizens while recognizing the importance of maintaining and enhancing agricultural opportunities, to protect private property rights, and to protect and maintain soil, water, air, wildlife and other environmental qualities.

There will be continued interest in rural residential development as people who work in Ada and Canyon Counties seek a rural lifestyle. Property values on land suitable for residential development will probably gradually increase. Changing commodity prices and increases in development pressures will place additional pressure on farmers to consider subdividing their farms.

The new Middle School at Homedale may also tend to draw more people to the area from Canyon County. Retail opportunities may increase in Homedale and Marsing. Homedale will have a new retail building products store associated with the lumber products mill.

Land use in Owyhee County can be divided into seven primary categories: agricultural land use, multi-use, residential, commercial, industrial, historical land use and areas, and other land uses with the addition of the Areas of City Impact (ACI). Irrigated agriculture is the second largest land use in the county and is mostly located adjacent to the Snake River and its tributaries. This agricultural land varies greatly in productivity from prime to marginal. According to the Owyhee County Comprehensive Plan, scattered residential parcels are found in some parts of these agricultural areas, with a number of small lot residential subdivision located on the marginal agricultural lands. The purpose of this zone is to preserve and protect the decreasing supply of agricultural land, and to control the infiltration of urban development into agricultural areas that may adversely impact agricultural operations that might negatively impact the county's tax base and economy. Therefore, lands are rated for development and are based on the following factors: potential crop productivity, availability of irrigation, environmental factors such as water quality and availability, septic capacity, soils, flooding potential, grazing potential, availability of public services, and the availability of adequate transportation systems.

There are areas within the county where commercial growth is expected, and where certain commercial growth is desirable. As residential development increases, there will be a demand and need for particular commercial uses that are compatible with residential development. According to the Owyhee County Comprehensive Plan, commercial development is desired along main transportation routes and corridors within city limits and ACI in order for the county to better provide the general governmental services that become necessary with commercial development.

Modified residential zones may be considered where denser residential development already exists. The problems of distance, lack of developed roads, fire protection, emergency services, schools, utilities, and a predictable water source must be ameliorated by the developer or owner. In addition, the Owyhee County Comprehensive Plan states that residential zones should be located in marginal agricultural lands or in waste or rangelands that are reasonably accessible or adjacent to state highways or major county roads and have reasonable access to schools and public services. Residential land may be suitable for residential living and subdivisions and these developments are encouraged to incorporate a reasonable measure of rural atmosphere, country lifestyle, and open

space. These rural subdivisions should be located in impact areas and/or where city services are likely to be available.

It is additionally expected by the Owyhee County Comprehensive Plan that industrial development will occur within areas of impact, where city services are more likely to be available or in already established industrial zones.

One of the prime attractions in Owyhee County is the historic town site of Silver City and as funding allows, other historic areas may be identified including, but not limited to, mining and ranching lands. Silver City will continue to be preserved in its present form as much as possible and commercial development that is incompatible with historic character will not be allowed.

Other land uses in Owyhee County may be established to address characteristics of the land or environment. This may include identifying public lands, floodplain areas and areas of critical concern such as historical sites, geographic features, wildlife areas, and natural resource areas.

ACIs should be looked to as areas in which the developing needs to the cities will be recognized and accommodated, while also aligning with the comprehensive plan and all applicable laws. However, the protection of agricultural uses is a high priority in the ACIs and uses within these areas should allow for the mixture of larger agricultural parcels and smaller parcels for other development.

5.6 Avalanche



5.6.1 Overview

Although Owyhee County has not experienced any recent reported avalanche occurrences resulting in casualties, property damage, or declarations, there is an increasing trend in avalanche-caused impacts across the western US. It is important to mitigate potential loss of life and reduce resources expended during search and rescue. The 2017 update reorganized and expanded the avalanche hazard profile, incorporated additional data and modeling, and considered future development and climate impacts, to provide a more comprehensive analysis of avalanche risk.

5.6.2 Hazard Description

An avalanche is a mass of snow (often mixed with other debris such as ice, water, soil, rock, and trees) in motion down a slope. Avalanches occur rapidly, are difficult to predict with certainty, and are sometimes initiated by their victims.

The complex interaction of weather and terrain factors contribute to the location, size, and timing of avalanches. Avalanche danger increases with major snowstorms and periods of thaw. Most avalanches occur during or just after large snowstorms. About 90 percent of all avalanches start on

slopes of 30-45 degrees, with slopes 25-50 degrees susceptible to the hazard. Avalanches occur most often on slopes above timberline that face away from prevailing winds. Avalanches can also occur on small slopes well below timberline, such as in gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to slopes and prevent avalanches from starting, though avalanches can release and travel through a moderately dense forest.

There are two types of avalanches: loose snow avalanches and slab avalanches. Loose snow avalanches originate from a single point and do not often cause damage, and are composed of dry, fresh snow deposits that accumulate atop a sub-layer composed of stable snow and ice. In contrast, slab avalanches are characterized by a simultaneous release of a cohesive snow layer (otherwise known as a 'slab') and can cause damage and loss of life. Slab avalanches are usually triggered by turbulence or when the internal cohesive strength of the slab layer is greater than the banding at the base and lateral slab boundaries. As the slab moves down the avalanche path it accelerates and gains mass. The avalanche path is determined by the physical characteristics of the terrain over which the avalanche moves, with three zones. The starting zone is located near the top of the ridge, bowl, or canyon usually with steep slopes between 25 and 50 degrees. The track zone has slopes between 15 and 30 degrees, and is where the avalanche normally reaches its greatest velocity and mass. Finally, the runout zone has slopes between 5 and 15 degrees and is located at the base of the path. Avalanches decelerate and deposit the snow and debris in the runout zone.

Of the major avalanche impacts, the interruption of communications lines occurs most frequently. Places of highest concern include ski areas, mountain passes, and other areas where transmission lines cross avalanche paths. Avalanches can also damage or interrupt transportation networks such as highways, railroads, and bridges. Road closures are not uncommon and vehicles are lost on occasion. The economic costs of these disruptions can be significant, especially in areas with limited access options. Forest resources, such as timber and wildlife habitat, may also be impacted by significant slides (IBHS, 2007).

5.6.3 Hazard Location, Extent & Probability

Avalanches occur in the mountainous portions of the State of Idaho. For the period 1950-2017, 71 avalanche-related fatalities were reported in Idaho, placing the state seventh in the nation (Colorado Avalanche Information Center, 2017). Snowmobiling was the leading cause of these fatalities, with climbing and backcountry skiing as secondary causes. However, the geophysical processes that contribute to avalanche occurrence are statistically independent of past events, and avalanche occurrence is not directly attributable to any one single factor. Often, it is a combination of factors that result in an avalanche (such as snow depth, meteorological events, vegetative cover, and human disturbance). Given these limitations and the lack of reported events, it is difficult to develop return periods for avalanches; however, regional avalanche forecast centers employ the North American Avalanche Danger Scale (2010) to determine a qualitative probability of avalanche activity and recommended travel precautions based on observations (Table 36).

Table 36. North American Avalanche Danger System

Danger Level	Avalanche Probability/Triggers	Degree & Distribution of Avalanche Danger	Recommended Action in the Backcountry
Low (Green)	Natural avalanches very unlikely. Human triggered avalanches unlikely.	Generally stable snow. Isolated areas of instability.	Travel is generally safe. Normal caution is advised.
Moderate (Yellow)	Natural avalanches unlikely. Human triggered avalanches possible.	Unstable slabs possible on steep terrain.	Use caution in steeper terrain on certain aspects (defined in accompanying statement).
Considerable (Orange)	Natural avalanches possible. Human triggered avalanches probable.	Unstable slabs probable on steep terrain.	Be increasingly cautious in steeper terrain.
High (Red)	Natural and human triggered avalanches likely.	Widespread natural or human-triggered avalanches certain.	Unstable slabs likely on a variety of aspects and slope angles.
Extreme (Black)	Travel in avalanche terrain is not recommended. Safest travel on windward ridges of lower angle slopes without steeper terrain above.	Extremely unstable slabs certain on most aspects and slope angles. Large, destructive avalanches possible.	Travel in avalanche terrain should be avoided and travel confined to low-angle terrain well away from avalanche path runouts.

To overcome the difficulty of mapping avalanches and to derive avalanche extent within the county, avalanche zones were classified based on the topographic slope across the county above treeline (Figure 20). It is important to note that this is not a technical nor comprehensive assessment of avalanche probability across the county. These zones were created by classifying slopes into the following zones:

- Starting Zones: 25-50 degrees
- Track Zones: 15-30 degrees
- Runout Zones: 5-15 degrees

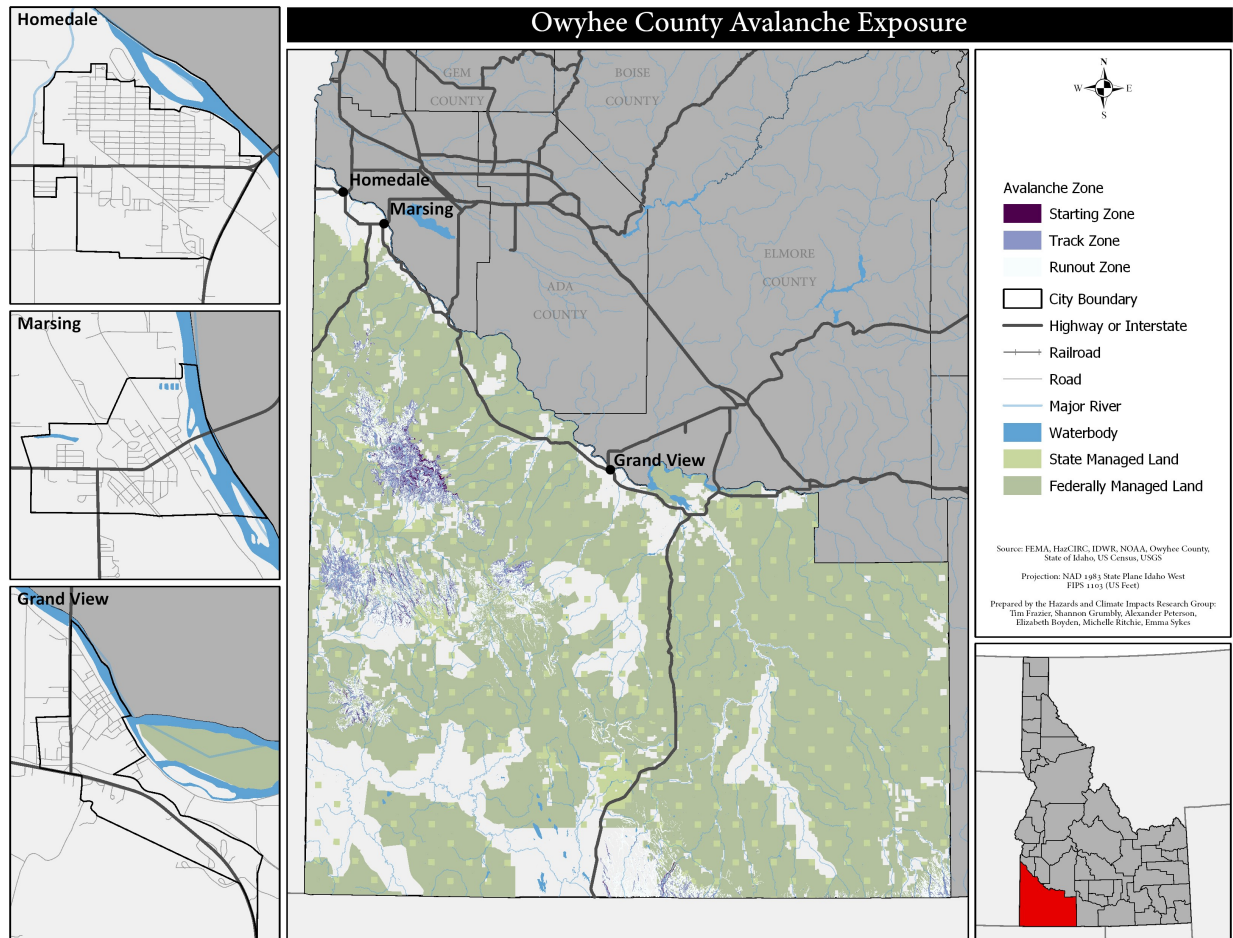


Figure 20. Avalanche zones map

Note that no avalanche zones were found to affect the Cities of Homedale, Marsing, or Grand View. However, there are zones located in the unincorporated areas in the county and are most located in the Owyhee Mountains. Starting, Track, and Runout Zones are all represented within Owyhee County.

Avalanche magnitude varies from low impact avalanches with minimal damage, to avalanches with the power to move large debris such as boulders. Table 37 shows the magnitude of estimated potential for a given range of impact pressure from an avalanche. These avalanche magnitudes have the potential to occur in the avalanche zones in the county.

Table 37. Avalanche impacts pressure and damages

Impact Pressure		Potential Damages
kPa	lbs/ft ²	
2-4	40-80	Break windows
4-6	60-100	Push in doors, damage walls, roofs
10	200	Severely damage wood frame structures
20-30	400-600	Destroy wood frame structures, break trees
50-100	1,000-2,000	Destroy mature forests
>300	>6,000	Move large boulders

5.6.4 Hazard Occurrences

It is important to note that avalanches can occur throughout the winter and spring seasons in the backcountry. These avalanches are often not reported due to no losses of life or property, making it difficult to determine the precise number of actual occurrences. No avalanches have been reported in Owyhee County; however, avalanche risk is present across the county.

5.6.5 Hazard Exposure & Vulnerability

As most recorded avalanches are human-caused, exposure is usually limited to individuals and parties in the backcountry. It is also possible that segments of the transportation network are exposed, notably those in high-elevation areas near steep slopes. A GIS analysis of the relative location of the county's population and structures in relation to avalanche zones indicated though there are both population and structures exposed, exposure is minimal across the county.

Few critical facilities are located near the mapped avalanche zones. A socioeconomic vulnerability assessment was not conducted for this hazard given the limited number of occurrences and impacts in Owyhee County. The Cities of Homedale, Marsing, or Grand View do not show risk to avalanches.

5.6.6 Land Use & Future Development

Development in the mountainous areas of Owyhee County can increase the risk of avalanches. Although avalanches are often naturally-sourced, human activity can cause avalanches, and the development and habitation of avalanche-prone areas increases both the probability and impact of

avalanches. Although avalanches often start in areas with slopes usually too steep for moderate- to high-intensity development, development in the runout zone (between 5 to 30 degrees) directly beneath starting zones can be vulnerable to avalanche impacts. Development of new or expansion of existing ski resorts can also increase vulnerability to avalanches. It is important to note that although structural damages resulting from avalanches are minimal, there is an increasing trend in casualties due to increased recreational activities in backcountry areas across the western US.

Current and future land use and development are minimally impacted by avalanche risk. The majority of avalanche zones (starting zones, track zones, and runout zones) are located on federal lands where residential areas are not likely to be developed. However; critical infrastructure (e.g., communication towers, etc.) may be at risk if located in the western portion of Owyhee County where avalanche risk is the highest.

5.7 Drought



5.7.1 Overview

Drought is caused by a myriad of factors that act across time and space, making predictions difficult. However, drought can have widespread impact on private and public water sources, agriculture, and other natural resource-based economic sectors, and understanding the risk is vital to mitigation. The 2017 update restructured the hazard profile on drought in order to better assess the county's drought risk.

Table 38. Drought summary

	Before 2009	2009-2017	Total
Occurrences*	2	1	3
Disaster Declarations	2 IDWR	1 IDWR	3 IDWR
Casualties	-	-	-
Property Damage	-	-	-
Repetitive Losses	-	-	-

*SHELDUS, NWS, IDWR

5.7.2 Hazard Description

Defined concisely, drought is the physical shortage of water. A broader definition of drought is a deficiency of precipitation over an extended period of time, resulting in shortages of water resources vital to community and ecosystem continuity. Often, drought is simply perceived as a period of unusually dry weather; however, it is important to distinguish between the types of droughts:

- Meteorological Drought – Defined as below-normal precipitation over a set period of time. Often this type of drought is region-specific based on regional climatology. This drought type is often what is thought of as ‘drought’.
- Agricultural Drought – This type of drought occurs when a reduction in soil moisture results in unmet demand for crops. This drought type is region-, crop-, and time-specific, and usually occurs after meteorological droughts. Agricultural drought can cause significant crop losses and economic disruption for agriculture-dependent communities.
- Hydrological Drought – This type of drought is driven by a deficiency of surface and subsurface water resources, often indicated by reduced streamflow, lake or reservoir water levels, and groundwater table heights. Due to the complex hydrological network that feeds surface and subsurface water resources, hydrological drought occurs after meteorological drought.
- Socioeconomic Drought – This type of drought occurs when individuals or communities are impacted by physical water shortages. Socioeconomic drought impacts can vary according to an individual's or community's ability to adapt or mitigate.

Drought is a complex hazard, given the many interrelated factors that determine and influence water supply, such as the amount, frequency, and intensity of precipitation, evapotranspiration from vegetation and surface water, and human use such as groundwater withdrawals. Drought can also drive other hazards, such as wildfire, insect infestation, and vegetation disease and mortality. Drought is also a special type of hazard because it does not often require evacuation or often constitute an immediate threat to life or property. People are not suddenly rendered homeless or without food and clothing. The general effect of a drought is economic hardship, but it can resemble other types of disasters in that those impacted are deprived of their livelihoods, and communities can suffer economic decline. This is notably so for communities reliant on agriculture or water resources as economic drivers.

Empirical studies over the past century across the globe showed that drought is often caused by a multiple of factors, often synergistic in nature. These factors span local to global, and include groundwater levels, streamflow, soil moisture, vegetation, and large-scale global weather patterns. Climate teleconnections, such as El Nino and La Nina, can significantly influence drought frequency and magnitude. Due to the complexity of drought, no cohesive or comprehensive model exists to date to project drought beyond a short timeframe. Currently, the US Drought Monitor is updated weekly and widely used by planners, policymakers, and scientists, and should be the go-to source for drought

information. Additionally, the NWS Climate Prediction Center produces seasonal drought outlooks which can also be employed in the near-term.

Drought in Idaho is often associated with warm winters with reduced snowfall and snowpack. Mountain snowpack feeds a significant portion of Idaho's water supply, and low snowpack results in low streamflow and groundwater recharge. Above-normal winter and spring temperatures further impact snowpack and can cause drought. The Idaho Drought Plan was last revised in 2001, and provides historic information, guidance, and a framework for management of water shortage situations. The Idaho Drought Plan is designed as a resource and educational tool to be used when future water shortages occur.

5.7.3 Hazard Location, Extent & Probability

The extent and magnitude of drought can vary widely through time and space. The US Drought Monitor classifies drought into five magnitudes based on numerous metrics, such as the Palmer Drought Severity Index, CPC Soil Moisture Model, USGS Weekly Streamflow, and more. These drought magnitudes have the potential to occur throughout the entirety of Owyhee county including all jurisdictions especially since the county's past disaster declarations have been classified as Extreme Drought (D3):

- Abnormally Dry (D0) – If the county is entering a drought, possible impacts include short-term dryness that can slow planting or the growth of crops and pastures. If coming out of drought, impacts can include lingering water deficits and crops or pastures unable to recover.
- Moderate Drought (D1) – Potential impacts include some damage to crops and pastures; the development of water shortages due to reduced streamflow, reservoir recharge, and low wells.
- Severe Drought (D2) – Potential impacts likely include crop and pasture losses, common water shortages, and water restrictions.
- Extreme Drought (D3) – Potential impacts include major crop and pasture losses, and widespread water shortages and restrictions.
- Exceptional Drought (D4) – Significant and widespread crop and pasture losses, and water emergencies resulting from minimal reservoir storage, streamflow, and groundwater levels.

Losses associated with the more significant droughts can include:

- Crop, dairy and livestock, timber, and fishery production losses.
- Recreation losses.
- Losses associated with Increased energy costs resulting from increased energy demand and reduced hydroelectric generation capacity.
- Losses associated with reduced tax revenue.

- Losses from non-navigable waterways.
- Loss of long-term economic growth and development.

The extent of drought can be localized, especially in mountainous areas with numerous microclimates. However, cumulative drought impacts can span the entire county, impacting all watersheds, waterways, aquifers, and more. Temporally, drought can be both short- and long-term. Short-term drought is normally defined as drought conditions lasting six or less months. Short-term droughts impact those ecosystem services reliant on precipitation, groundwater, and meteorological conditions, such as agriculture and grasslands. In contrast, long-term drought is typically defined as drought conditions lasting more than six months, with impacts on ecosystem services such as hydrology, long-term water storage, and more.

Forecasting drought is difficult due to the number of contributing factors. However, drought is a naturally occurring climatic phenomena, and is an expected phase of almost all geographic regions in the state.

5.7.4 Hazard Occurrences

Given the many types of drought and the difficulty in measuring drought, it is often difficult to report every drought occurrence, and no singular comprehensive database recording drought occurrence and impacts exists. The county has had three IDWR drought declarations, while the percent area of the county classified as drought by the US Drought Monitor is shown in Figure 21. A significant proportion of the county's area was classified as extreme drought between 2013 and 2017.

Table 39. Drought occurrences

Date	Location	Comment	Casualties	Property Damage	Crop Damage	Source
6/24/2003	Owyhee County	Drought Declaration	-	-	-	IDWR
8/13/2007	Owyhee County	Drought Declaration	-	-	-	IDWR
9/11/2012	Owyhee County	Drought Declaration	-	-	-	IDWR

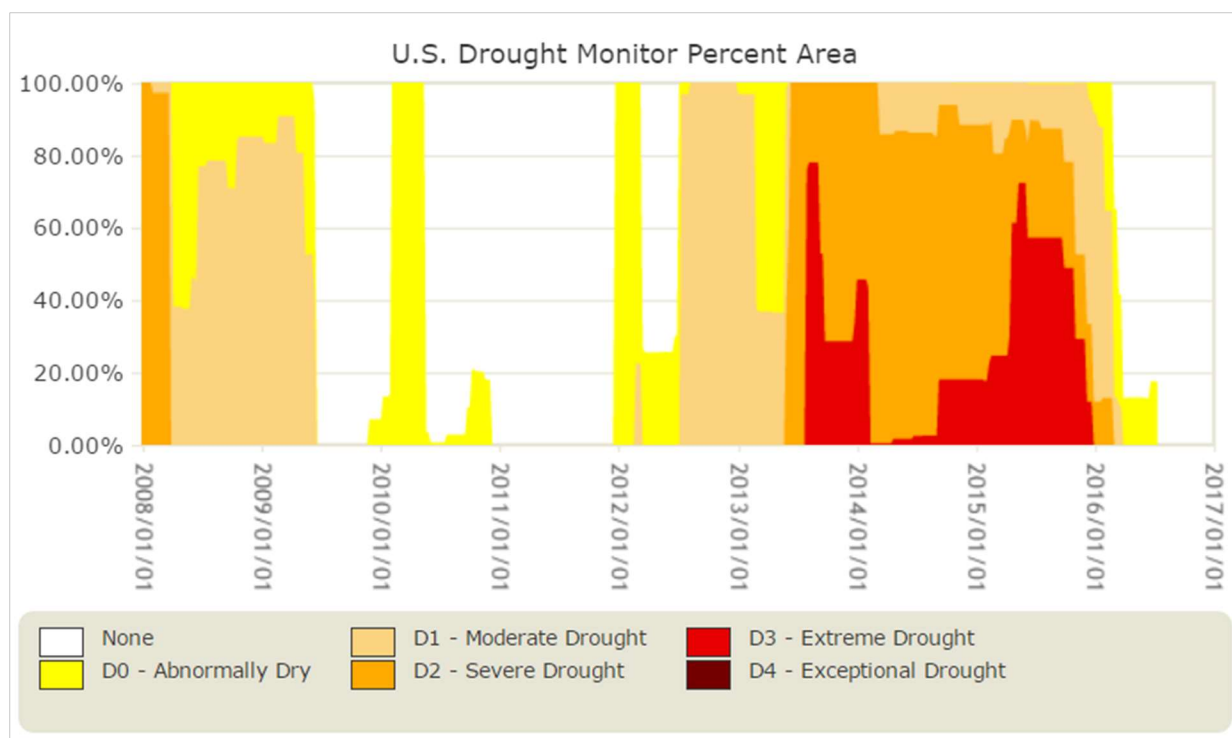


Figure 21. US Drought monitor percent area

5.7.5 Hazard Exposure & Vulnerability

Drought can affect all economic sectors, with particular significance on the energy, agriculture, and natural resource sectors (e.g., timber). Because precipitation is variable across both time and space, classifying drought exposure and vulnerability is difficult. Drought exposure can be both local and statewide, with similar variable impacts. Dryland agriculture and water-related recreational businesses are the most drought vulnerable sectors. If impacted, the county and its communities could experience long-term economic consequences (see 5.7.3). A socioeconomic vulnerability assessment using the SERV model was not completed given the difficulty in classifying drought and its impacts on non-agriculture populations.

The impact of drought varies by area, by crop, and by the status of the irrigation water right holder (junior or senior). Loss of water is far more damaging to perennial crops, such as fruit trees, grapes, hops, and asparagus, than to annual crops because it takes perennials a number of years to return to normal production. Reducing irrigation on annuals such as corn, peas, and other vegetables not only results in loss of a crop for a year, but it also may result in the loss of the food-processing infrastructure because of lack of product or higher costs for hydropower or other energy source.

Drought affects more than Owyhee County farms and ranches. It also can affect availability and cost of hydropower and of shipping capacity for crops dependent on water transport. The cost of

hydropower is critical to food processors; from 30 to 40 percent of the cost of processing and cold storage is for energy. Higher energy costs caused by drought remove local food processors' competitive edge.

Additionally, drought can impact wells that provide water service for thousands of residents served by Marsing, Homedale, and other municipalities across the county. See problem statements below.

5.7.6 Problem Statements

- Agriculture is the most important driver for Owyhee County, the City of Marsing, the City of Homedale, and the City of Grand View with the most critical agriculture-related sectors being: crop farming, dairy, and cattle ranching and feedlots. This sector may be vulnerable to future short-term and possibly long-term drought occurrences which may produce losses as mentioned in Section 5.7.3.
- Water is one of the most valuable resources of Owyhee County, the City of Marsing, the City of Homedale, and the City of Grand View given the arid to semi-arid climate of these areas. The county and its communities rely on the continued use of water and depend on legally recognized rights to collect, distribute, and use the water as it passes through the county. The county and all jurisdictions may be at risk to future long-term droughts that may have the potential to deplete these water sources ultimately resulting in reduced water quantities for activities including, but not limited to, human and livestock consumption, irrigation, recreation, hydroelectric power, and more.

5.7.7 Land Use & Future Development

Development in Owyhee County can increase both the risk and severity of drought occurrence. Development on residential, commercial, industrial and agricultural lands throughout the county can increase water usage from both surface water and groundwater sources, which can result in reduced surface flow and groundwater tables. Reductions in both surface flow and groundwater resources can result in more frequent drought occurrences. Private and public wells, irrigated agriculture, and hydroelectric utilities can be significantly affected.

5.8 Earthquake



5.8.1 Overview

The 2017 update reorganized the earthquake hazard profile, incorporated additional data and modeling, and presented a more comprehensive and cohesive analysis of Owyhee County's earthquake risk.

Table 40. Earthquake summary

	Before 2008	2009-2017	Total
Occurrences	-	2	2
Disaster Declarations	-	-	-
Casualties	-	-	-
Property Damage	-	-	-
Repetitive Losses	-	-	-

5.8.2 Hazard Description

An earthquake is a trembling of the ground resulting from the sudden shifting of rock beneath the earth's crust. Such events cause waves of energy to radiate from the point of release, causing the movement, shaking, and rolling felt during an earthquake event. The durations of earthquakes are normally limited to a few seconds, but the resultant waves can travel hundreds to thousands of miles and can cause damage to locations far from the fault. Faults are the breaks, fractures, or fracture zones in the earth associated with seismic activity. These faults are classified as either active or inactive given any associated known geological activity, and can be sharp cliffs or scarps or buried below the earth's surface.

Movements associated with earthquakes are classified as a foreshock, main shock, or aftershock. Foreshocks occur before the actual onset of the earthquake (main shock), while aftershocks occur after the onset of the earthquake. Both can range between minutes and months, and can be large, damaging events that further impact an area.

Damages associated with earthquakes are influenced by the following:

- Seismic Activity – Varying between earthquake events, seismic activity ranges from localized, small points of energy release to widespread, large and destructive releases. The length of earthquakes ranges from brief (a few seconds) to more than a minute. Earthquake epicenters can be shallow or deep, with depth influencing the type of seismic waves felt and their destructive potential.
- Geology & Soil Types – The underlying geology and soil type of an area influences the propagation of the seismic waves and their impact. Stable geologic types (such as solid bedrock) are less prone to destructive shaking than more unstable geologic types, such as fill soils. The siting of structures and communities as a whole strongly influences the nature and extent of earthquake damages.
- Development & Development Quality – The type and quality of development is vital in considering earthquake damages to a county or community. Isolated, small earthquakes in densely-populated areas or areas with unreinforced masonry can be more devastating than a high-magnitude earthquake in a remote location or in an area with earthquake-appropriate building codes.
- Time of Day – Time of day determines the distribution of the population, and therefore the distribution of injuries and fatalities. Residences house more people in the evening and night, whereas business centers, schools, and other day-use locations house more people in the morning and afternoon. Day of the week is also important to consider, as people's work, travel, and activities vary between weekdays and weekends.

Damages from earthquakes varies, with most damages stemming from shaking. Secondary impacts, such as landslides, are often a result of shaking. The following describes some of the types of damage stemming from an earthquake:

- Shaking – Ranging from minor to severe, minor shaking can cause objects to fall and other minimal damage, while severe shaking causing large structures to collapse and extensive damages. Unreinforced masonry and wood frame structures are most prone to earthquake damage. Non-structural falling hazards include loose or poorly secured objects, and include objects such as bookcases, wall hangings, and building facades. These objects can cause additional structural damage, and injury or fatality. Shaking can also rupture dams, destroy power and telephone lines, gas, sewer, or water mains, and can cause fires or other hazards that impair response and recovery efforts.
- Ground Displacement – The most dramatic visual evidence of an earthquake, ground displacement often occurs along a fault line. Ground can be thrust upward, subside, or move laterally given a severe enough earthquake. Damages from ground displacement is normally limited to utility lines and transportation infrastructure, though structures situated on fault lines can also be impacted.
- Landslides & Avalanches – Earthquakes often cause cascading hazards. If meteorological conditions are right, such as in-place snowpack or recent rain events, even small earthquakes can cause rock falls, landslides, or debris flows.
- Liquefaction & Subsidence – Liquefaction occurs when the energy released from an earthquake weakens the strength and stiffness of a soil, while subsidence is the caving in or sinking of an area. Fill and saturated soils are notably at risk of liquefaction, which can result in widespread structural damage. Liquefaction and subsidence can also impact surface and subsurface water flow, which can impair individual or community wells as well as flash flood-like water flow. These impacts can likewise impact septic systems, which create additional health risks.
- Seiches – Oscillating waves in an enclosed body of water caused by an earthquake are termed seiches. Although not commonly damaging given their rarity, seiches can resemble tsunami characteristics and destructive potential. Shoreline development along a lake in earthquake-prone areas are then at risk of damage, as well as dams or flood mitigation structures such as levees. Seiches can also cause hydrothermal explosions.

5.8.3 Hazard Location, Extent & Probability

Earthquakes are measured in both magnitude and intensity. Earthquake magnitude refers to the energy released at the source of the earthquake, while intensity refers to the strength of shaking produced by the earthquake at a discrete location. Where magnitude is derived from seismograph measurements, intensity is determined by the effects on people, structure, and the environment. The most common measure of intensity is the Modified Mercalli scale:

Table 41. Modified Mercalli scale intensities and descriptions

Modified Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS

The most common measure of magnitude is the Richter scale. The Richter scale measures magnitude as a function of the amplitude of waves recorded by seismographs, with adjustments to account for variations in distances between recording stations and the epicenter. Magnitude is expressed in whole numbers and decimals, and is measured logarithmically – that is, each whole number step corresponds to the release of about 31 times more energy than the preceding whole number.

Owyhee County is located on the margins of the Western Snake River Plain (WSRP), an intercontinental drift basin about 70 km wide and 300 km long. The WSRP is bounded and internally faulted by

northwest trending normal faults. These faults offset Pliocene-Pleistocene deposits and form topographic linears consisting of asymmetric ridges up to 30 meters high. Quaternary deposits are locally deformed by these faults. Along the southwestern margin of the WSRP Fault System between the Owyhee Mountains and the Snake River Plain, active structures have been identified in the Owyhee Mountains Fault System (Phillips 2007).

Causes of rifting in the WSRP remain a topic of research. The Yellowstone Hotspot passed to the south of the WSRP about 11 Ma and may have softened the lithosphere, triggering extension and basin formation. Silicic volcanic rocks (rhyolite flows, domes, and tuffs) were erupted about 11.5-8 Ma to the south of the area and are locally present in the Boise Foothills. Most volcanic rocks within the WSRP are basaltic lavas, beginning with eruptions 10-7 Ma and continuing as recently as about 400,000 years ago in the Boise area (Othberg, 1994; Othberg and others, 1995). Basalt eruptions are characterized by subaerial lava flows forming shield volcanoes, thick canyon fills, and thin flows spreading over alluvial valleys. The WSRP truncates granitic rocks of the Idaho batholith that were intruded at about 90 to 60 Ma. Granodiorite is found in the mountains just north of Boise on Boise Ridge and also in the Owyhee Mountains to the south. Geophysical data indicate that the crust beneath the WSRP is not faulted granite, however, but is of mafic composition all the way to the mantle, about 42 km beneath the plain (Phillips 2007).

North-trending normal faults similar to those of the Basin and Range Province in Oregon and Nevada also occur in southwestern Idaho. Basin and Range faults produce the seismic hazard in much of the western United States including Borah Peak in east-central Idaho and along the Wasatch Front in Utah. Basin and Range-style normal faults produce much of the seismic risk for the Boise area (Phillips 2007).

Communities can expect some structural failure of older multistory buildings. Cornices, frieze, and other heavy decorative portions of these structures may fail. Brick veneer exteriors may collapse and utility interruption should be expected. In some cases, whole structures may collapse. Vehicular travel may be very difficult and congestion could prevent timely emergency response.

The USGS creates earthquake ground motion data for various probability levels across the US. These data are widely accepted and applied in risk assessments, insurance rate studies, building codes provisions, and other public policy. These data incorporate the best available scientific knowledge in earthquake hazards, and include findings in ground shaking, faults, seismicity, and geodesy.

When there is an earthquake, the forces caused by the shaking are measured as a percentage of gravity, or percent g (%g). The USGS's National Seismic Hazards Map describes the annual frequency of exceeding a set of ground motions. Figure 22 shows the probabilistic ground motions with a two percent probability of exceedance over the next 50 years for Owyhee County. Although the northwestern, southwestern, and southeastern areas show relatively higher likely Peak Ground Acceleration (PGA), the values are between six and 10 percent g, which corresponds to minor likely damage if an event were to occur. All jurisdictions within Owyhee County may be affected by earthquakes.

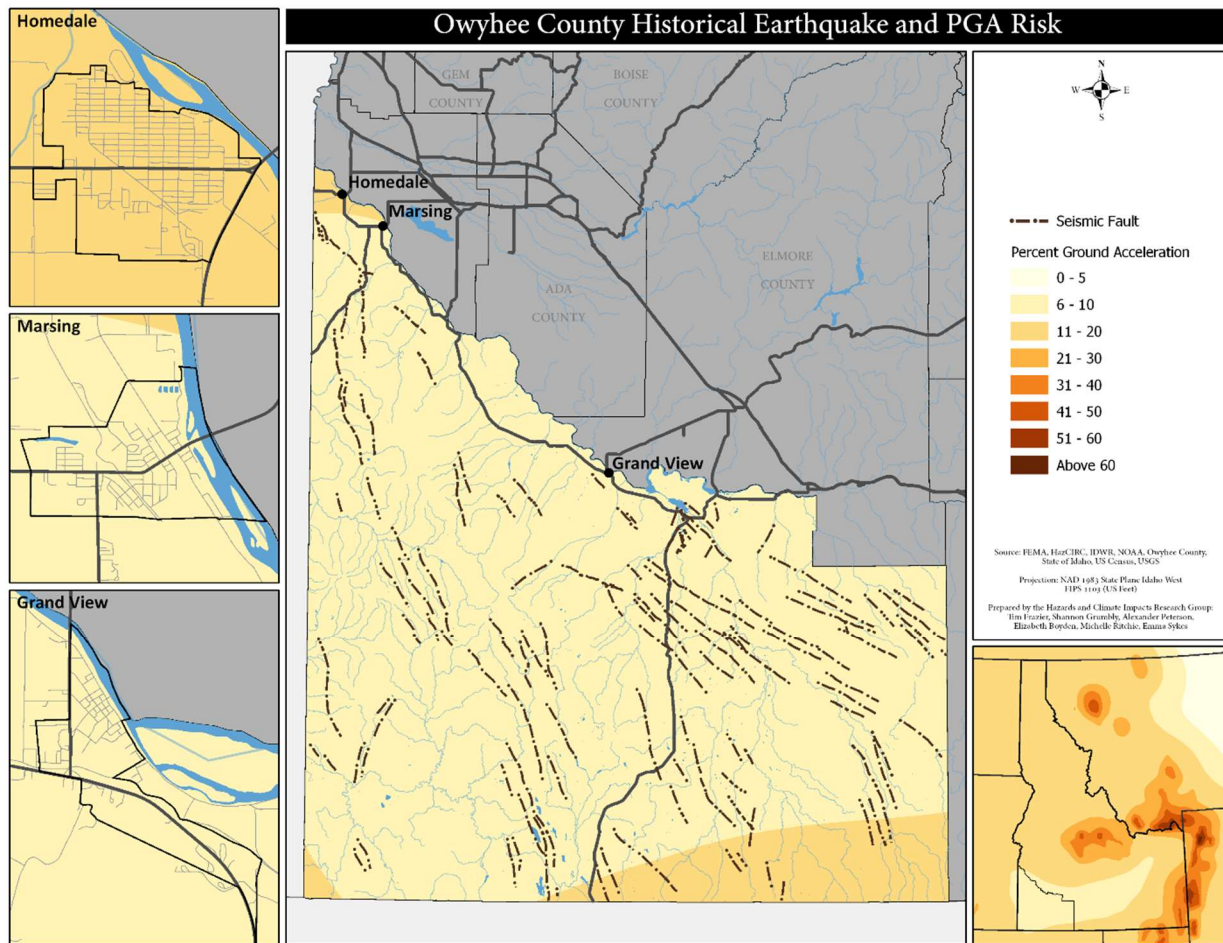


Figure 22. Earthquake occurrences and PGA

Although predicting future occurrences of earthquakes is nearly impossible, the USGS now produces a one-year seismic hazard forecasts. Figure 23 shows the USGS forecast for damage from earthquakes in 2017. Owyhee County exhibits both low shaking intensities and less than one percent change of damage from earthquakes in 2017.

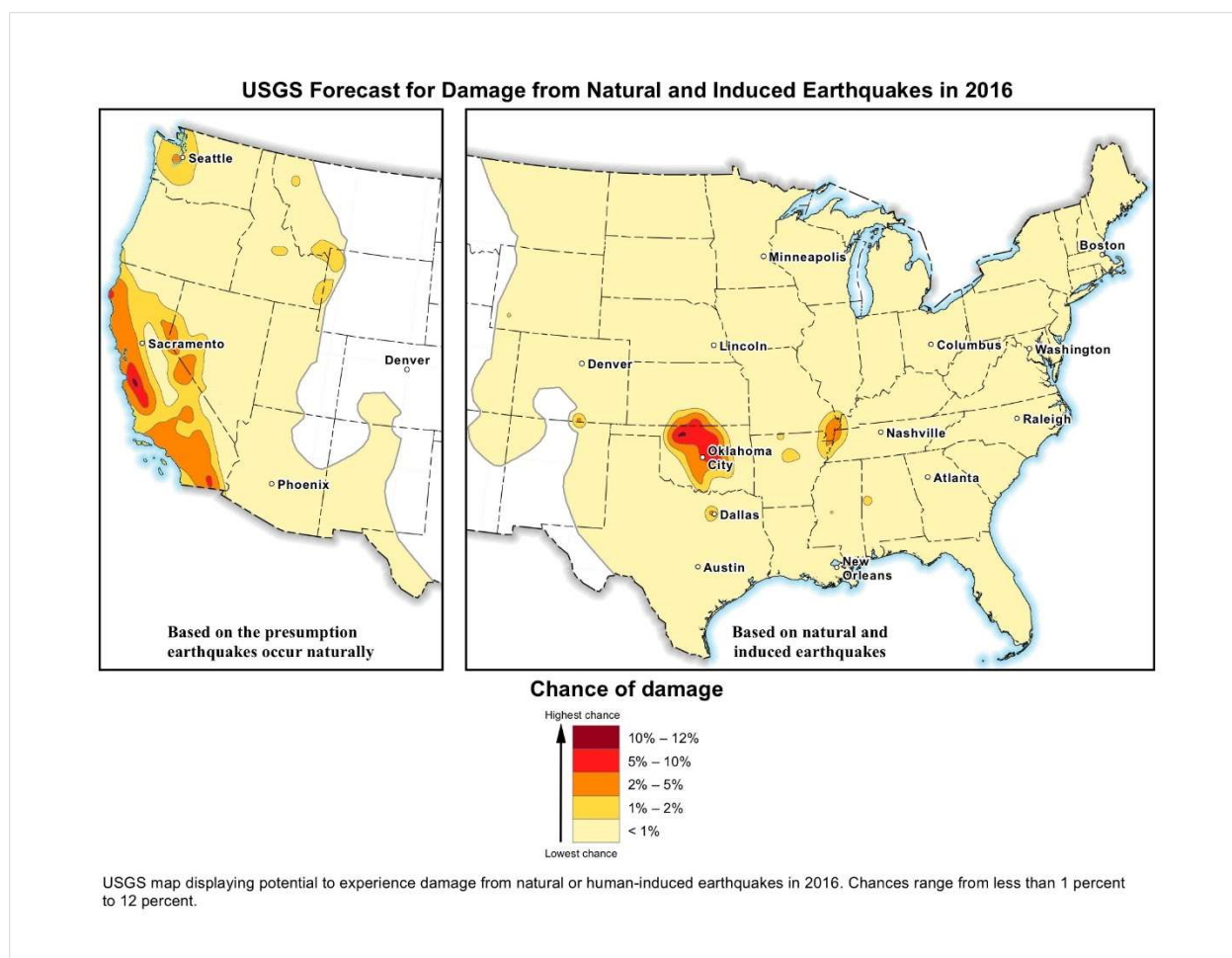


Figure 23. Earthquake probability for 2017

5.8.4 Hazard Occurrences

Based on a historical record extending from about 1872 to the present, Owyhee County has not experienced any seriously damaging earthquakes. Three distant earthquakes produced intensities of VI in Caldwell that were strong enough to cause light nonstructural damage. These were the 1983 Borah Peak (east-central Idaho, magnitude 7.0), the 1959 Hebgen Lake (western Wyoming; magnitude 7.5), and an earthquake in 1947 with an epicenter in Idaho's Salmon River mountains northeast of Boise. Regional seismic networks indicate that low magnitude earthquakes do not generally occur directly beneath Owyhee County and that microseismicity does not outline active faults (Phillips 2005).

Owyhee County has not experienced an earthquake above a 3.0 magnitude, although a number of regional earthquakes have been felt in the county. Table 42 details the two recent earthquakes with an epicenter in Owyhee County.

Table 42. Earthquake occurrences felt

Date	Magnitude	Depth (km)	Casualties	Property Damage	Crop Damage
11-12-2012	2.9	6.2	-	-	-
11-16-2013	2.4	0.8	-	-	-

Source: USGS

5.8.5 Hazard Exposure & Vulnerability

There are many structures throughout the county that may be at risk to damage due to shaking caused by earthquakes. Generally, these structures are older un-reinforced masonry buildings located within the city limits of Grand View, Marsing, and Homedale. Estimating the number and value of these structures is difficult. Without exception, older un-reinforced masonry buildings should be well maintained and have an evacuation plan developed. Expectation that an earthquake will occur sometime in the future should prepare the owner to have emergency information and supplies on hand.

The potential impacts of a substantial earthquake event are highly variable. Many of the structures and infrastructure throughout the county may not incur any damages at all; however, damage to roads, bridges, unreinforced masonry, chimney, foundations, water lines, and many other components are at risk. Fires can also be a secondary hazard to structures sustaining earthquake damage. Currently, the Bruneau-Grand View High School only has overhead sprinklers installed in sections of the school, which could place students and the building itself at risk of sustaining even more severe damage following an earthquake event. Public facilities such as schools and government buildings should have sprinklers installed throughout the structure to help prevent the spread of fires.

Because structural damage by earthquakes is typically not complete destruction, but rather tends to be subtle cracking or settling that undermines the stability of the structure. These types of repairs can be very costly. Additionally, changes to the water table or even the topography can occur resulting in the loss of traditional land uses.

A GIS analysis of population and structural exposure to the likely Peak Ground Acceleration (PGA) over the next 50 years are shown in Tables 43 through 45. Owyhee County's population is mainly located in low PGA zones (Table 37). Grandview and Marsing are both located in areas with a projected PGA of 10 percent g, while a little more than 4,573 individuals reside in unincorporated areas with a projected PGA 10 percent g. Homedale and approximately 1,875 individuals residing in unincorporated places are located in areas with a projected PGA of 12 percent g. The building inventory and values show similar exposure (Table 38 and Table 39).

Table 43. Population exposure to earthquakes

PGA	Grand View	Homedale	Marsing	Unincorp.
10	236	-	558	4,573
12	-	1,957	-	1,875

Table 44. Structure number and type exposure to earthquakes

	%g	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	10	91	9	-	3	-	2	4
	12	-	-	-	-	-	-	-
Homedale	10	-	-	-	-	-	-	-
	12	659	66	7	4	10	2	4
Marsing	10	194	20	3	2	4	1	3
	12	-	-	-	-	-	-	-
Unincorporated	10	2,099	35	11	12	4	3	6
	12	745	15	5	5	2	-	-

Table 45. Structure value and type exposure to earthquakes (thousands of USD)

	%g	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	10	\$11,679	\$3,853	\$226	\$544	-	\$2,262	\$2,369
	12	-	-	-	-	-	-	-
Homedale	10	-	-	-	-	-	-	-
	12	\$102,377	\$20,423	\$3,346	\$2,107	\$4,861	\$328	\$2,832
Marsing	10	\$21,886	\$9,779	\$1,135	\$734	\$2,272	\$246	\$2522
	12	-	-	-	-	-	-	-
Unincorporated	10	\$270,333	\$16,201	\$2,220	\$10,910	\$3,429	\$3,244	\$3,793
	12	\$125,155	\$4,582	\$5,607	\$4,594	\$1,169	-	\$62

The SERV model was employed to assess socioeconomic vulnerability to earthquakes in Owyhee County (Figure 24). Earthquake exposure was quantified using the peak ground acceleration values as seen in Figure 22. The SERV model shows a concentration of above average vulnerable census blocks located in and around Grand View and Marsing, though the highest levels of vulnerability are seen in the more rural unincorporated areas of the county.

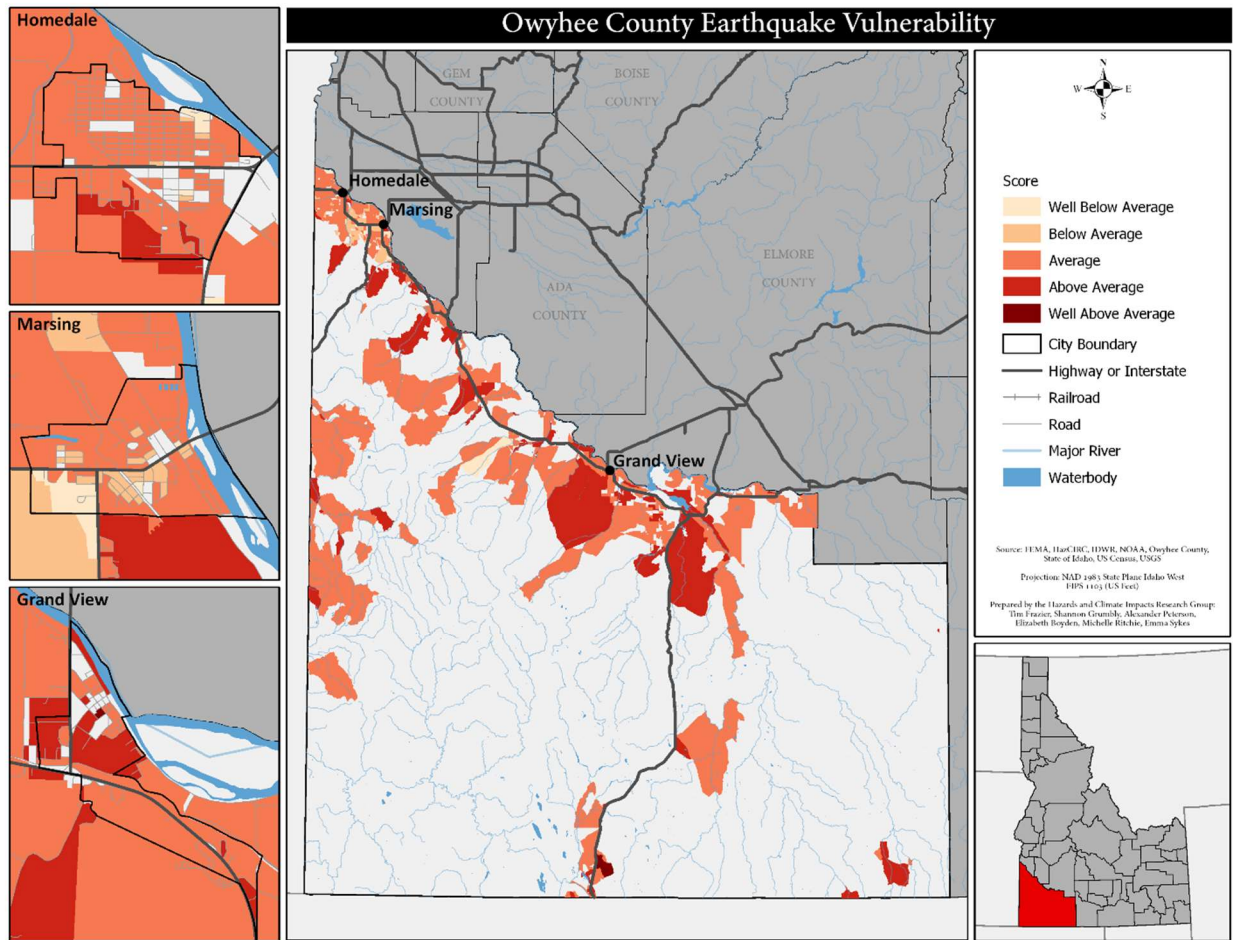


Figure 24. Socioeconomic vulnerability to earthquakes

5.8.6 Land Use & Future Development

Additional development in Owyhee County may increase earthquake risk through increased exposure of populations, structures, and critical infrastructure. The Cities of Homedale and Grand View have adopted, or are in the process of adopting, the International Residential Code (IRC) and International Building Code (IBC), and the enforcement of these building standards on new development can significantly reduce this risk, as they deliver guidance for how structures should be designed and constructed to limit seismic risk. This is especially vital for the future development in the northwestern corner of the county near Homedale and Marsing, where the majority of earthquakes losses would be incurred, and the very southwest and southeast corners, where seismic risk is the highest.

5.8.7 Loss Estimations

Hazus-MH was employed to estimate losses resulting from multiple earthquake scenarios in Owyhee County. A Level II Hazus-MH analysis was performed for the county's earthquake loss estimation. Critical facilities were updated using various data sources including the HSIP Gold data, the SHMP data, and Infogroup economic data. These facilities were further validated and corrected using satellite imagery to ensure accurate positionality, as well as an estimated square footage to derive loss and replacement costs. National Earthquake Hazard Reduction Program (NEHRP) Soil Maps were produced in order to capture more accurate soil measure. It is important to note that Hazus-MH is an empirical model that attempts to best capture the reality of losses stemming from hazard events, but the results are dependent on the data inputted into the model and the quality of its damage functions.

A probabilistic 1,000-year recurrent 7.0 Mercalli Scale magnitude earthquake scenario was run to estimate earthquake losses in Owyhee County. The models showed such an event would generate 1,000 tons of debris, requiring approximately 25 truckloads to clear (Table 46). Though the county was projected to experience one casualty, there were no displaced households or individuals seeking shelter. Most building-related losses were non-structural capital stock losses, with single-family residences experiencing the most losses followed by other residential structures (Table 47). The county was projected to experience income losses, primarily from relocation costs. Critical facilities and infrastructure were also projected to experience damage, though the model showed minimal loss (Table 49). Wastewater infrastructure showed the largest economic losses, with highway and natural gas infrastructure following. Finally, the spatial distribution of economic losses showed a notable concentration of losses in the northwest corner of the county (Figure 25). The Hazus-MH summary reports are located in Appendix E.

Table 46. Short-term response needs

	Probabilistic
Debris (tons)	1,000
Truckloads (25 tons/truck)	40
Households Displaced	-
Shelter Needs	-
Casualties	1 at 2 am 1 at 2 pm 1 at 5 pm

Table 47. Probabilistic 7.0 magnitude earthquake building-related losses (thousands of USD)

	Income Losses				Capital Stock Losses			
	Wage	Capital-Related	Rental	Relocation	Structural	Non-Structural	Content	Inventory
Single-Family	-	-	\$40	\$140	\$310	\$1,420	\$360	-
Other Residential	\$10	-	\$20	\$100	\$160	\$480	\$60	-
Commercial	\$60	\$60	\$40	\$60	\$90	\$260	\$120	\$10
Industrial	-	-	-	\$10	\$20	\$70	\$40	\$10
Others	\$10	-	-	\$40	\$80	\$170	\$80	-
Total	\$80	\$60	\$100	\$350	\$660	\$2,400	\$660	\$20

Table 48. Probabilistic 7.0 magnitude earthquake building-related loss totals (thousands of USD)

	Single-Family	Other Residential	Commercial	Industrial	Others
Total	\$2,270	\$830	\$700	\$150	\$380

Table 49. Critical facility losses

		Damage	Inventory Value	Economic Loss	Loss Ratio Percentage
Probabilistic 7.0 Magnitude Event	Hospitals	None	-	-	-
	Schools	None	-	-	-
	EOCs	None	-	-	-
	Police Stations	None	-	-	-
	Fire Stations	None	-	-	-
	Highway	Minimal	\$1,868,200	\$900	0.05
	Airport	None	\$100	-	-
	Potable Water	None	\$9,570	-	-
	Wastewater	Minimal	\$138,940	\$2,590	1.9
	Natural Gas	Minimal	\$4,920	\$10	0.2
	Communication	None	\$200	-	-
	Total	-	\$2,021,930	\$3,500	0.17

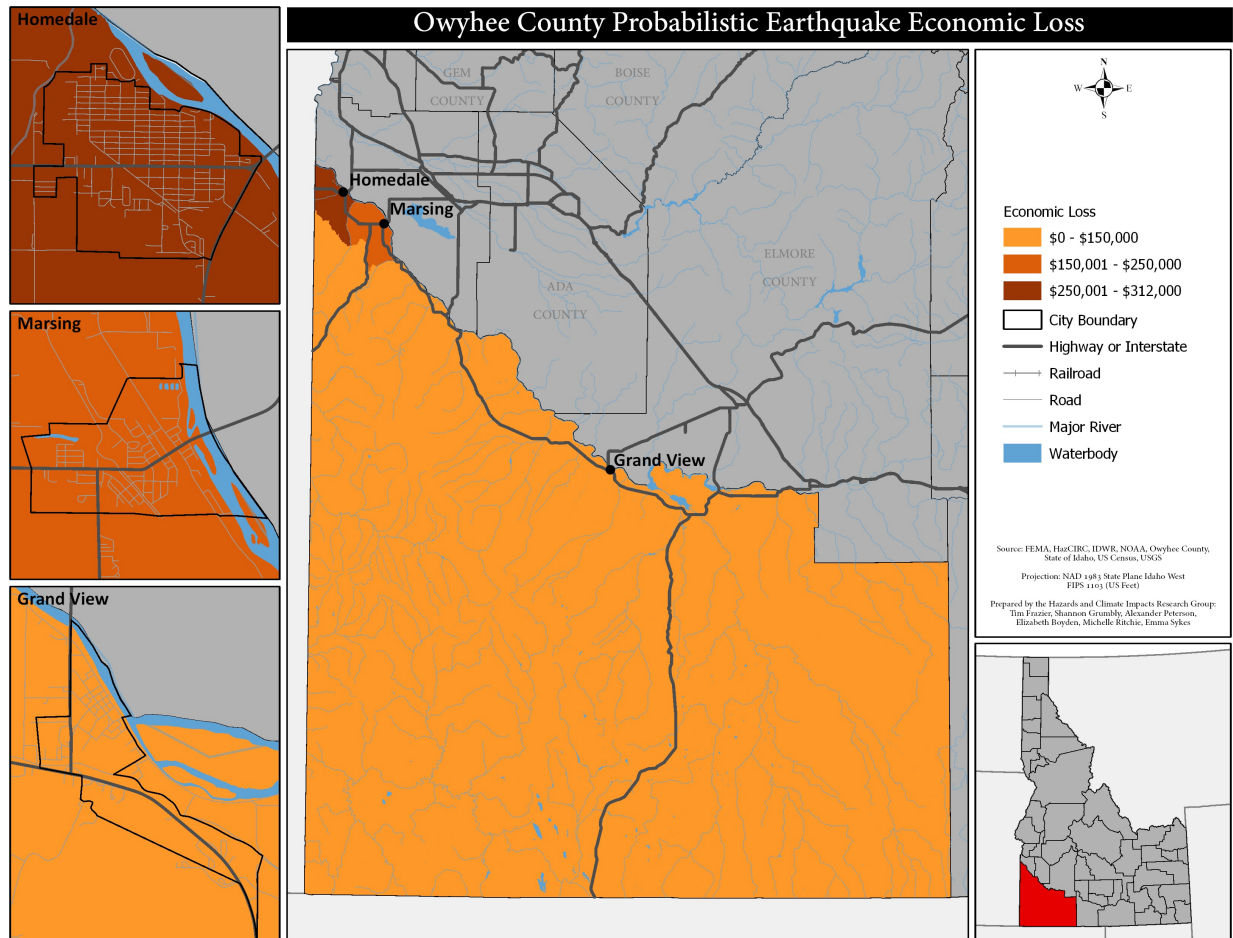


Figure 25. Probabilistic 7.0 magnitude earthquake building losses

5.9 Flood



5.9.1 Overview

Floods are one of the most common hazards across the US, and FEMA's administration of the National Flood Insurance Program (NFIP) makes it one of the highest profile hazards. The 2017 update reorganized the flood hazard profile, incorporated additional data and modeling, and presented a more comprehensive and cohesive analysis of the county's flood risk.

Table 50. Flood summary

	Before 2009	2009-2017	Total
Occurrences	19	10	29
Disaster Declarations	1	-	1
Casualties	-	1 Fatality	1 Fatality
Property Damage	\$2.8 Million	-	-
Repetitive Losses	-	-	-

5.9.2 Hazard Description

Thousands of floods occur each year, making it one of the most common hazards in all 50 states. Flooding is a natural process where excess water overflows a waterway and inundates adjacent land. Flooding results from a number of different causes, including riverine flooding, flash flooding, ice or debris jam flooding, structural failures or breakages, precipitation or snowmelt, and mudflows. Floodplains are those areas the excess water inundates, and range from narrow and confined channels to wide and flat areas depending on the topographical features near the waterway. Floodplain characteristics contribute to the speed and characteristics of flooding. In narrow and confined channels, flooding is normally rapid but short duration, with deep and rapid floodwaters. In contrast, flooding can be relatively slow and shallow and last for long periods of time in flat floodplains. The size of a flood is influenced by many factors, such as the size of the catchment area or watershed, topographic characteristics such as mountainous slopes and elevation changes, land-use characteristics or structural modifications, and the characteristics of meteorological events.

The following are short descriptions of flood types:

- Riverine Flood – Most commonly thought of as a ‘flood’ given its commonality and dangers. Riverine flooding occurs when the floodplain (the lowland areas adjacent to rivers and lakes) is inundated with water, usually caused by a weather system with prolonged or intense rainfall. Large-scale weather systems can cause both large and small rivers and streams to flood, notably if prolonged or intense rainfall is distributed over a wide area. Localized weather systems can also produce flooding, though normally such systems impact smaller rivers and streams. Riverine flooding can result from snowmelt, which in turn can be caused by above-freezing temperatures and rain-on-snow events.
- Flash Flood – This type of flooding is characterized by a rapid rise in surface water levels, and normally characterized by high water flow velocity. Flash floods are capable of carrying large amounts of debris, such as trees and boulders, and are capable of extensive damage. Flash floods are often driven by intense rainfall events in areas with steep watershed or stream gradients. Dam or levee failure, wildfire, debris or ice jam breakage, and rapid snowmelt can cause flash floods as all can release large volumes of stored water in a short period of time. Urban development also drives flash floods due to an increase of impervious surfaces, inadequate or failing drainage systems, and channelization of rivers and streams.
- Alluvial Fan Flood – This type of flood occurs most commonly in the alluvial fans created by the meandering of streams and rivers, and are the most prevalent flood type in arid regions. Alluvial fans pose a significant flood risk due to active erosion, sedimentation, deposition, and unpredictability of flow paths. As the floodway fills with deposited sediment, the river or stream can quickly reach overbank flood stages and channelize a new floodway. Human activities often exacerbate flooding and erosion on alluvial fans by altering flow patterns and constructing impervious surfaces with the potential to carry high-velocity flows to lower portions of the fan.

- Ice & Debris Jam Flood – Similar in characteristics to riverine floods and flash floods, ice jams or debris can accumulate at obstruction points on a stream or river and restrict water flow upstream, causing the banks behind the obstruction to inundate. These jams can also break, resulting in a sudden large discharge of stored water to the downstream reaches. The formation of these jams is dependent on meteorological and other physical conditions, often occurring at natural channel constrictions or where the channel is shallow enough to allow waters to freeze. Human-built structures such as bridges can also act as obstruction points. Ice and debris jam flooding most often occurs in the fall, winter, and spring due to the formation and loss of ice. Flood damages from ice and debris jam breakages often exceed that caused by riverine flooding, as flood elevations are higher and more unpredictable and flood waters can also carry debris.

Floods kill an average of 150 people per year nationwide. Most injuries and deaths occur when people are swept away by flood currents and most property damage results from inundation by sediment-laden water. Faster moving floodwater can wash buildings off their foundations and sweep vehicles downstream. Pipelines, bridges, and other infrastructure can be damaged when high water combines with flood debris. Effects from flooding can also include floating fuel tanks, inundation of subdivisions, road washouts, and basement flooding all of which can result in extensive damage.

5.9.3 Hazard Location, Extent & Probability

Four major drainages flow through Owyhee County: Snake River, Bruneau River, Jarbidge River, and the Owyhee River. The Snake River forms the northern border of the County and is the largest watershed in southern Idaho. All other rivers and tributaries ultimately empty into the Snake River. The Bruneau and Jarbidge River flow out of Nevada and encompass much of the eastern region of Owyhee County. The Owyhee River flows north out of Nevada through the Duck Valley Reservation and central Owyhee County before exiting into Oregon along the southern extent of the Owyhee Mountains.

All three types of flood events occur in Owyhee County. Riverine flooding occurs along all tributaries to the Snake River. Summer thunderstorms can result in flash flooding of specific smaller drainages. Often there is little time to react to the quickly rising waters. Due to the nature of the terrain within the county, localized flooding from thunderstorms tends to be more of a storm drainage problem for many communities. Short term blockage of roads is usually the biggest impact as drainage structures are overwhelmed by the amount of water.

Rain-on-snow events can and do occur at almost all elevations across the county. These events often contain enough moisture to cause flooding on these rivers and most of the smaller tributaries in the county. To a lesser extent, the Snake River is also affected by rain on snow events. However, due to its larger drainage area, the impact of these events on the main stem of the Snake is muted. Tributaries to the Snake River can be greatly influenced by rain on snow events. In general, these flood events can be predicted 24 to 72 hours in advance of the rising waters. Existing emergency plans can

be executed before flood waters overtop the river or stream channels, minimizing loss of life and business disruption. Plans for reducing structural damage need to be put into place and executed long before the rain begins to fall and the snow begins to melt.

Ice and debris flows occur as part of riverine and flash flooding, usually exacerbating the effects of those types of flood events. Heavy accumulations of tumbleweeds in ditches and stream channels frequently results in plugged culverts and free flowing waterways. In the case of a fire or heavy farming activity, flash flooding can result from the loss of vegetation that usually intercepts some of the waters velocity flowing downhill.

Lands proximate to a river that is identified as susceptible to flooding is termed the floodplain. Oftentimes, floodplains are delineated for the 100-year flood, otherwise known as the one percent annual chance floodplain. The 100-year flood designation corresponds to a statistically-independent one percent chance every year of water levels exceeding a set magnitude. It is important to note that this base flood level can occur every year, and can occur consecutively. Similarly, a 500-year flood corresponds to a 0.2 percent annual chance of water levels exceeding a set magnitude. Flood damage is influenced by the speed and volume of water flow, the inundation level and length of time, and the amount of sediment and debris carried and deposited by the floodwaters.

Although portions of the county's waterways have been mapped by FEMA, the county does not have Digital Flood Insurance Rate Maps (DFIRMs). This risk assessment used non-regulatory depth grids provided by FEMA to map flood hazard extent and magnitude (Figure 26 and Figure 27). It is important to note that these depth grids are incomplete, and flooding can occur on any waterway in the county. For example, spring snow melt in the mountains can cause streams to exceed the stream channel capacity, inundating adjacent banks and lands.

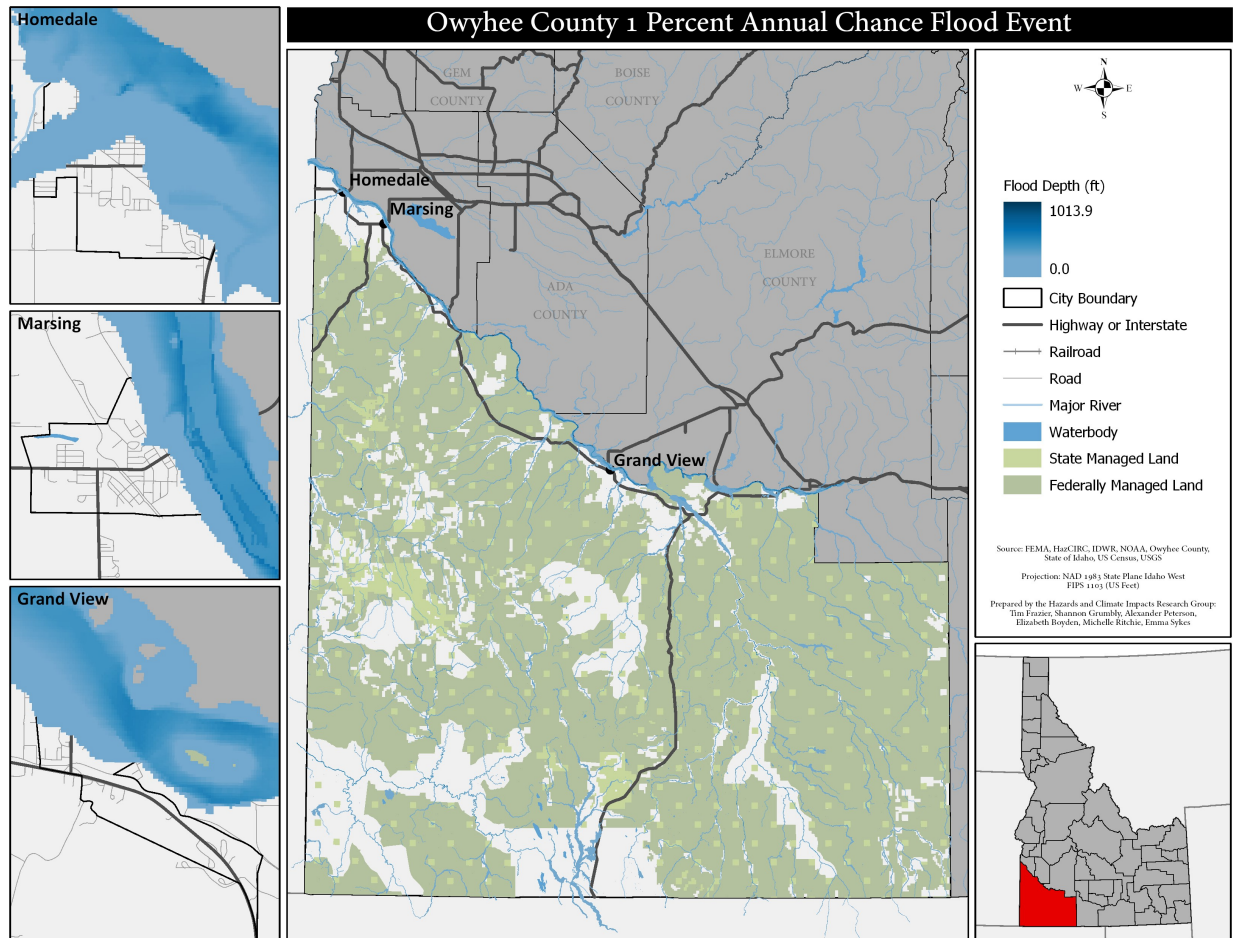


Figure 26. 100-year flood event extent and depth

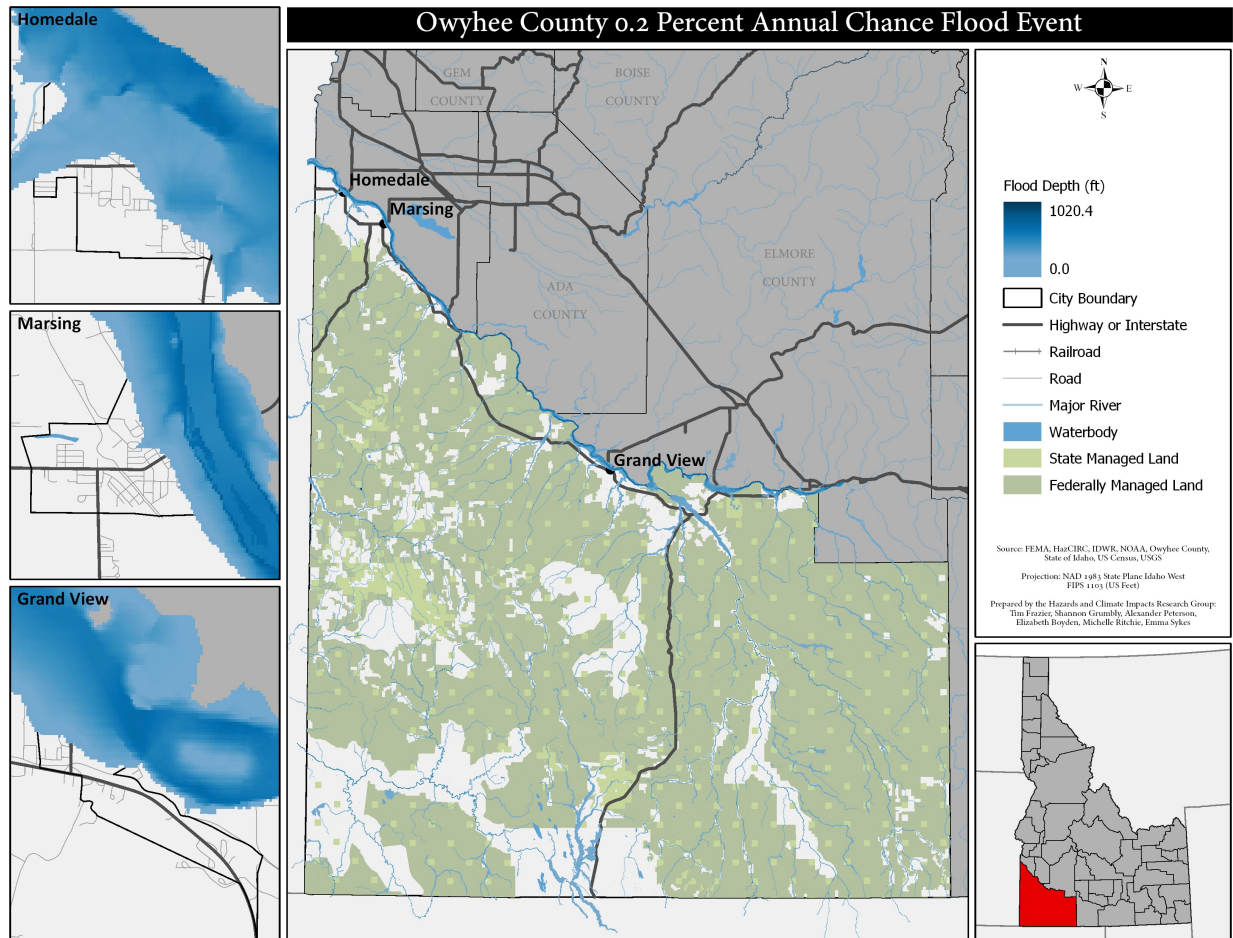


Figure 27. 500-year flood event extent and depth

5.9.4 Hazard Occurrences

In Owyhee County, there are numerous small tributaries feeding into the Snake River from the Owyhee Mountains, most of which have to cross Highway 78 as well as several other secondary routes before they reach their destination. Examples of some of the larger tributaries include Succor Creek, Jump Creek, Reynolds Creek, Sinker Creek, Castle Creek, Browns Creek, and even the Bruneau River. In the winter of 2005 and 2006, flash flooding on the Browns Creek drainage overtopped two bridges on the Oreana Loop Road effectively isolating several rural residents in this area. The Army Corp of Engineers installed temporary bridges in order to provide access to these homes. Table 51 shows the recorded flood events in Owyhee County. Since the last plan adoption, the county 10 flood events, with a majority classified as flash floods.

Table 51. Flood occurrences

Date	Location	Type	Casualties	Property Damage	Crop Damage	Source
1/29/1965	Homedale	Flood	-	\$1.3 Million	-	HMP
2/1986	Pleasant Valley	Flood	-	-	-	HMP
8/27/1996	-	Flash Flood	-	-	-	NWS
8/27/1996	Murphy	Flash Flood	-	-	-	NWS
1/1/1997	-	Flood	-	-	-	NWS
5/16/1997	Murphy	Flash Flood	-	-	-	NWS
9/2/1997	Reynolds	Flash Flood	-	-	-	NWS
9/11/1997	Murphy	Flash Flood	-	-	-	NWS
3/23/1998	-	Flood	-	-	-	NWS
4/4/1998	Reynolds	Flood	-	-	-	NWS
5/13/1998	Homedale	Flood	-	-	-	NWS
5/26/1998	-	Flood	-	-	-	NWS
5/26/1998	-	Flood	-	-	-	NWS
7/27/1998	Reynolds	Flash Flood	-	-	-	NWS
8/22/2003	Murphy	Flash Flood	-	-	-	NWS
5/18/2004	Murphy	Flash Flood	-	-	-	NWS
6/30/2004	Homedale	Flash Flood	-	-	-	NWS
7/1/2004	Homedale	Flash Flood	-	-	-	NWS
12/30/2005	-	Flood	-	-	-	Declaration
1/2006	Murphy	Flood	-	\$1.5 Million	-	NWS
6/5/2009	Bruneau	Flash Flood	-	-	-	NWS
6/6/2009	Murphy	Flash Flood	1 Fatality	-	-	NWS
6/14/2009	Givens Hot Spgs	Flash Flood	-	-	-	NWS
6/21/2009	Bruneau	Flash Flood	-	-	-	NWS
5/9/2011	Hot Spg	Flood	-	-	-	NWS
5/14/2011	Hot Spg	Flood	-	-	-	NWS
9/5/2013	Murphy	Flash Flood	-	-	-	NWS
9/12/2013	Grand View	Flash Flood	-	-	-	NWS
9/12/2013	Oreana	Flash Flood	-	-	-	NWS
10/19/2015	Givens Hot Spgs	Flash Flood	-	-	-	NWS

Source: Former HMP, NWS

Below are summaries and pictures of flood-related Federal disaster declarations:

- Idaho Severe Storms and Flooding (FEMA-1630-DR)
 - Incident Period: December 30, 2005 to January 4, 2006
 - Major Disaster Declaration declared February 27, 2006



On Sunday Jan. 1 at 10 a.m., Owyhee County Sheriff Gary Aman, declared the county a disaster area because of flooding. A New Year's storm that brought several inches of rain to the Murphy area, and runoff created when warmer temperatures melted snow at higher elevations, caused normally dry creek bottoms to swell and overflow their banks. About two dozen people had to be rescued from the Silver City area after they became stranded when Silver City Road washed out.

FEMA, ITD, DHS, and USACE ultimately offered assistance to the county in order to re-open and repair several county roads. The National Guard placed a temporary bridge over Browns Creek to help restore Oreana Loop Road. Silver City Road suffered the most extensive damage. Work wasn't completed on the roadway until September. Elsewhere in the county, a Homedale resident was injured in a bizarre accident on when the roadway collapsed into rain-swollen Jump Creek. Some said the storm was the worst to lash the county in nearly 40 years. The damage was put at about \$1.5 million.

5.9.5 Hazard Exposure & Vulnerability

The Bruneau River flows north out of Nevada within the steep walls of the Bruneau Canyon in a relatively straight path to Hot Spring. At Hot Spring, the river widens forming several meandering channels on the floor of the Bruneau Valley. All of these channels eventually flow into CJ Strike Reservoir near the community of Bruneau. There is a drastic increase in the number of people, structures, and infrastructure located in the Bruneau Valley. This area has been more heavily

developed for agricultural purposes due to the fertile valley floor. The Bruneau River is currently unregulated by dams; thus, the spread of recorded peak streamflows is much wider. Nevertheless, significant events are still discernible.

High water events in the Bruneau River drainage have not historically caused significant damage due to the lack of development in the upper reaches (Bruneau Canyon) and the natural flood control offered by the wide valley bottom. Increased discharge is typically divided by the dissecting channels in addition to the increased capacity of channels as they flow through the Bruneau Valley. Problems have occurred at several of the bridge and culvert crossings associated with State Highways 51 and 78. Natural debris and silt buildup in the channels cause backups to occur as culverts become plugged or are inadequate to handle the increased water volume. Tumbleweeds have become a recurring problem as they tend to accumulate in ditches and stream channels. Neglecting to remove these accumulations periodically can lead to plugged culverts and channel migration. Bridge abutments have also been known to accumulate debris, which has caused water to backup and eventually flow over the river banks and/or roadway. This has occurred during several high-water events on State Highways 51 and 78; however, it is particularly an issue for the Bruneau Bridge on State Highway 78.

Severe flash flooding of the rivers and streams in Owyhee County occur, by definition, very rapidly usually following a heavy rainfall event. Ice jams and plugged or undersized culverts can exacerbate the impact of this type of flooding. Although infrequent, flash flooding typically causes more damage and loss of life than normal high-water events because they happen very quickly and often catch communities unprepared. The 100-year floodplains along the Snake River in Homedale and Grand View are not highly susceptible to this type of flooding due to the regulation of water flow by the Snake River dams. Nevertheless, the numerous smaller tributaries such as Succor Creek, Jump Creek, Jacks Creek, and Reynolds Creek are highly susceptible to this type of flooding and have been known to cause damage in the past. Succor Creek and Jump Creek are two of the few streams that flow through populated areas in Owyhee County. Flooding on Succor Creek in 2006 caused moderate damage to structures in Homedale. Usually, damage caused by flash flooding in these streams is limited to roadways and culverts; however, there is a significant amount of damage to agricultural areas due to the loss of soil. In many cases, this type of damage is not recorded.

Most of Owyhee County's population does not reside in census blocks proximate to the FEMA non-regulatory floodplains (Table 52). Homedale and the unincorporated areas of the county do, however, have more than 1,000 individuals exposed to flood, with Grand View and Marsing having more than 100. Similar results were found in the structure counts and values exposed to flood (Table 53 and Table 54).

Table 52. Population exposure to floods

Event	Grand View	Homedale	Marsing	Unincorp.
100-Year	190	1,525	186	3,894
500-Year	190	1,607	216	3,924

Table 53. Structure count and type exposure to floods

	Event	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	100 Yr	74	9	-	3	-	2	4
	500 Yr	74	9	-	3	-	2	4
Homedale	100 Yr	534	59	7	3	7	2	4
	500 Yr	559	61	7	3	9	2	4
Marsing	100 Yr	65	12	3	1	2	1	1
	500 Yr	74	14	3	2	3	1	2
Unincorporated	100 Yr	1,701	30	5	6	3	1	5
	500 Yr	1,720	30	5	6	3	1	5

Table 54. Structure value exposure to floods (thousands of USD)

	Event	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	100 Yr	\$9,891	\$3,853	\$226	\$496	-	\$2,262	\$2,369
	500 Yr	\$9,891	\$3,853	\$226	\$495	-	\$2,262	\$2,369
Homedale	100 Yr	\$85,091	\$18,543	\$3,343	\$1,933	\$3,406	\$328	\$2,832
	500 Yr	\$88,740	\$19,083	\$3,343	\$1,933	\$4,698	\$328	\$2,832
Marsing	100 Yr	\$7,451	\$7,054	\$820	\$539	\$1,614	\$235	\$1,578
	500 Yr	48,483	\$7,683	\$895	\$734	\$1,800	\$246	\$2,149
Unincorporated	100 Yr	\$233,356	\$14,872	\$1,219	\$8,007	\$1,764	\$901	\$3,449
	500 Yr	\$235,829	\$14,872	\$1,219	\$8,007	\$1,764	\$901	\$3,449

The SERV model was employed to assess socioeconomic vulnerability to floods in Owyhee County (Figure 28). High levels of vulnerability are notable though dispersed across the county. Marsing, Grand View, and census blocks located in the unincorporated areas of the county exhibited the highest levels of social vulnerability to floods.

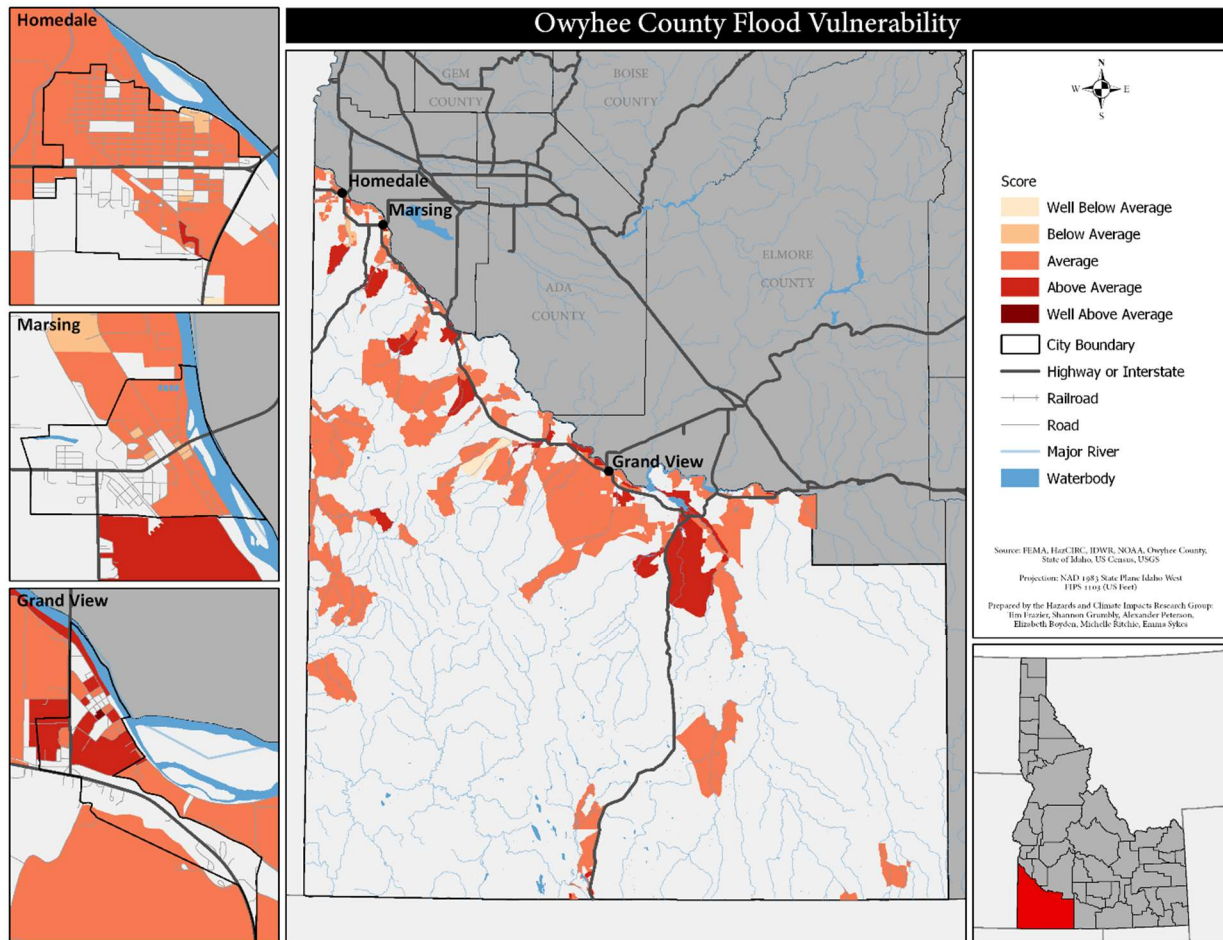


Figure 28. Socioeconomic vulnerability to floods

5.9.6 Land Use & Future Development

Future development in flood-prone areas in Owyhee County may increase losses to both life and property. Throughout the county the greatest flood risk is located along the Snake River and its tributaries. This flooding may potentially impact the Cities of Homedale, Grand View, and Marsing and their respected ACIs, as the Snake River flows through city limits in the northern portions of each city. According to the Owyhee County Comprehensive Plan, development is likely to occur in and around these established communities. Due to current and projected future development in these high-density areas, Homedale, Grand View, and Marsing are likely to incur the greatest damages if a 100-year or 500-year flood event were to occur. Full service rural subdivision developments are also likely in the near future and should avoid the flood prone areas of the Snake River. If future development were to occur in these flood prone areas, flood hazard risk may increase in the county through increased exposure of populations, structures, and critical infrastructure.

5.9.7 Loss Estimations

Hazus-MH was employed to estimate losses resulting from multiple flood scenarios in Owyhee County. A Level II analysis was performed for the county's flood loss estimation, and critical facilities were updated using various data sources including the HSIP Gold data, the SHMP data, and Infogroup economic data. These facilities were further validated and corrected using satellite imagery to ensure accurate positionality in the county, as well as an estimated square footage to derive loss and replacement costs.

The following Hazus-MH scenarios were performed for Owyhee County's Flood Risk Assessment:

- 100-year flood event using non-regulatory depth grid provided by FEMA.
- 500-year flood event using non-regulatory depth grid provided by FEMA.
- Snake River 44,000 cfs flood event
- Snake River 47,300 cfs flood event
- Bruneau River 6,860 cfs flood event

The loss estimates vary across all the scenarios, increasing in estimated losses relative to the flood event's magnitude (Table 55 through Table 58). Both the 100-year and 500-year flood events generated more than 25,000 tons of debris, requiring more than 1,000 truckloads to clear (Table 49). In both events, more than 1,000 households were displaced, and more than 1,400 and 1,700 individuals required shelter, respectively. The individual stream events exhibited far less short-term response needs. Damage to critical facilities and infrastructure followed this pattern (Table 50), with critical facilities damaged in the 100-year and 500-year events but not in the individual stream events. Note that the Hazus-MH model did not include wastewater facilities in the summary reports; however, these facilities are especially vulnerable to flooding because they are necessarily located in low-lying areas for discharge to the receiving waters. Schools showed the highest level of damage, with at least moderate damage to two schools and loss of use of three facilities in both scenarios. Police stations and fire stations likewise showed at least moderate damage and loss of use of the respective facility.

Building-related economic losses were significant in the 100-year and 500-year events, with most losses incurred in building and content losses (Table 57). Although losses were incurred from business interruption, building losses were significantly greater, notably for residential and commercial structures. Spatially, Homedale, Marsing, and Grand View exhibited the highest levels of economic losses (Figure 29 through Figure 33). The Hazus-MH summary reports are located in Appendix E.

Table 55. Short-term response

	100-Year Flood	500-Year Flood	6,860 cfs Flood	44,000 cfs Flood	47,300 cfs Flood
Debris (Tons)	26,687	34,221	57	17	3,090
Truckloads (25 Tons/Truck)	1,067	1,369	2	1	124
Households Displaced	1,020	1,171	5	1	166
Individual Shelter Needs	1,447	1,710	1	-	150

Table 56. Damage to essential facilities

		Number of Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
100-Year Flood	Hospitals	-	-	-
	Schools	2	-	3
	EOCs	-	-	
	Police Stations	1	-	1
	Fire Stations	1	-	1
500-Year Flood	Hospitals	-	-	-
	Schools	2	1	3
	EOCs	-	-	
	Police Stations	1	-	1
	Fire Stations	1	-	1
6,860 cfs Flood	Hospitals	-	-	-
	Schools	-	-	-
	EOCs	-	-	-
	Police Stations	-	-	-
	Fire Stations	-	-	-
44,000 cfs Flood	Hospitals	-	-	-
	Schools	-	-	-
	EOCs	-	-	-
	Police Stations	-	-	-
	Fire Stations	-	-	-
47,300 cfs Flood	Hospitals	-	-	-
	Schools	-	-	-

	EOCs	-	-	-
	Police Stations	-	-	-
	Fire Stations	-	-	-

Table 57. Building-related economic losses (thousands of USD)

		Building Losses			Business Interruption			
		Building	Content	Inventory	Income	Relocation	Rental Income	Wage
100-Year Flood	Residential	\$69,640	\$35,550	-	-	\$40	\$10	\$10
	Commercial	\$8,640	\$21,100	\$610	\$70	-	-	\$90
	Industrial	\$2,330	\$5,230	\$650	-	-	-	-
	Others	\$5,990	\$13,690	\$420	\$20	\$10	-	\$180
	Total	\$86,600	\$75,570	\$1,680	\$90	\$50	\$10	\$280
500-Year Flood	Residential	\$91,250	\$46,660	-	-	\$60	\$10	\$20
	Commercial	\$10,830	\$25,000	\$730	\$80	\$10	-	\$100
	Industrial	\$2,720	\$5,990	\$730	-	-	-	-
	Others	\$723	\$16,040	\$440	\$30	\$10	-	\$200
	Total	\$105,523	\$93,690	\$1,900	\$110	\$80	\$10	\$320
6,860 cfs Flood	Residential	\$140	\$60	-	-	-	-	-
	Commercial	\$20	\$70	-	-	-	-	-
	Industrial	-	-	-	-	-	-	-
	Others	\$20	\$90	-	-	-	-	-
	Total	\$180	\$220	-	-	-	-	-
44,000 cfs Flood	Residential	\$30	\$10	-	-	-	-	-
	Commercial	-	-	-	-	-	-	-
	Industrial	-	-	-	-	-	-	-
	Others	-	-	-	-	-	-	-
	Total	\$30	\$10	-	-	-	-	-
47,300 cfs Flood	Residential	\$8,890	\$4,430	-	-	\$10	-	-
	Commercial	\$1,370	\$4,670	\$160	\$10	-	-	\$20
	Industrial	\$390	\$940	\$110	-	-	-	-
	Others	\$770	\$3,380	\$170	\$10	-	-	\$50
	Total	\$11,420	\$13,420	\$440	\$20	\$10	-	\$70

Table 58. Building economic loss totals (thousands of USD)

	Residential	Commercial	Industrial	Others
100-Year Flood	\$105,250	\$30,510	\$8,210	\$20,310
500-Year Flood	\$138,000	\$36,750	\$9,440	\$17,443
6,860 cfs Flood	\$200	\$90	-	\$110
44,000 cfs Flood	\$40	-	-	-
47,300 cfs Flood	\$13,330	\$6,230	\$1,440	\$4,380

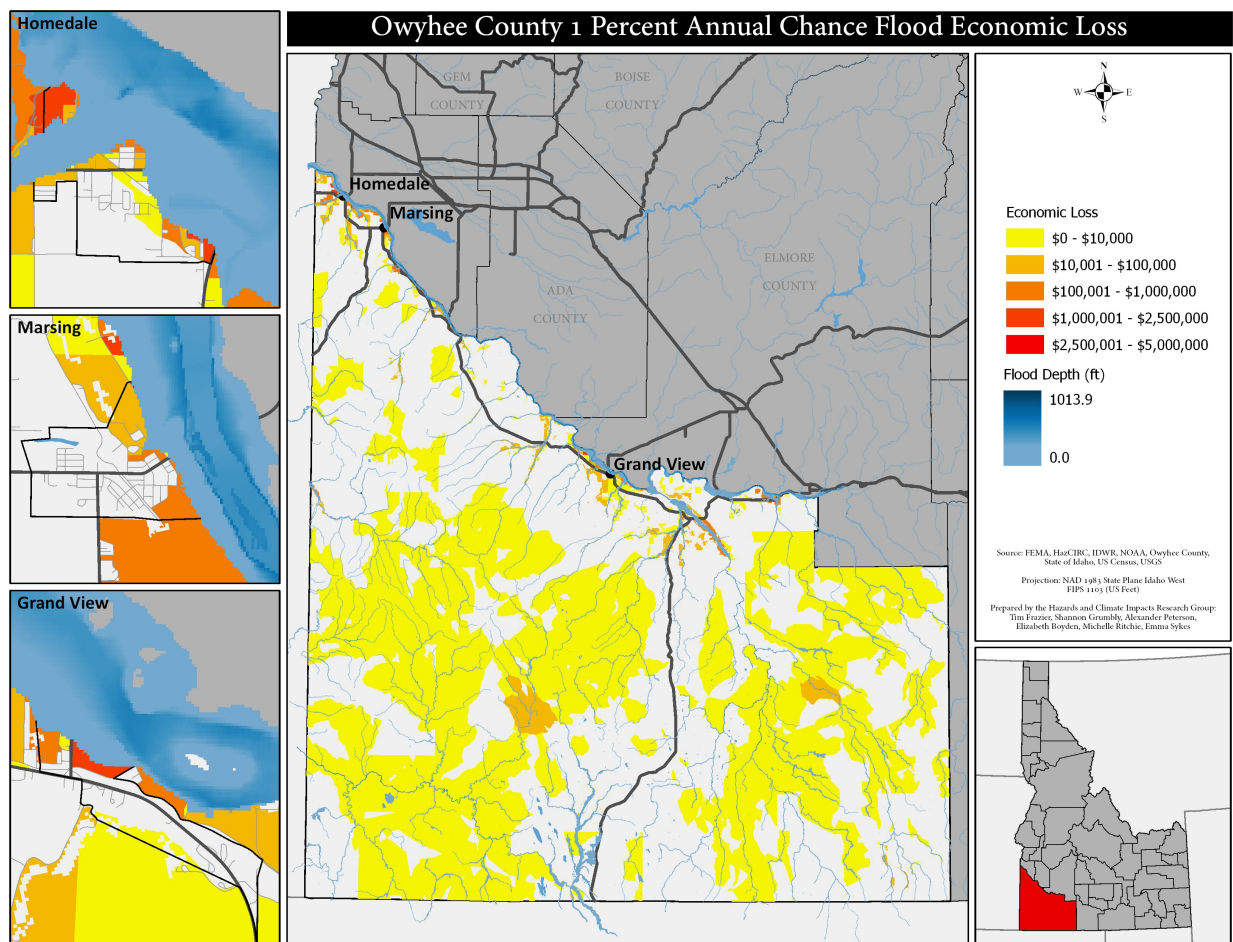


Figure 29. HazCIRC modeled 100-year flood event estimated losses

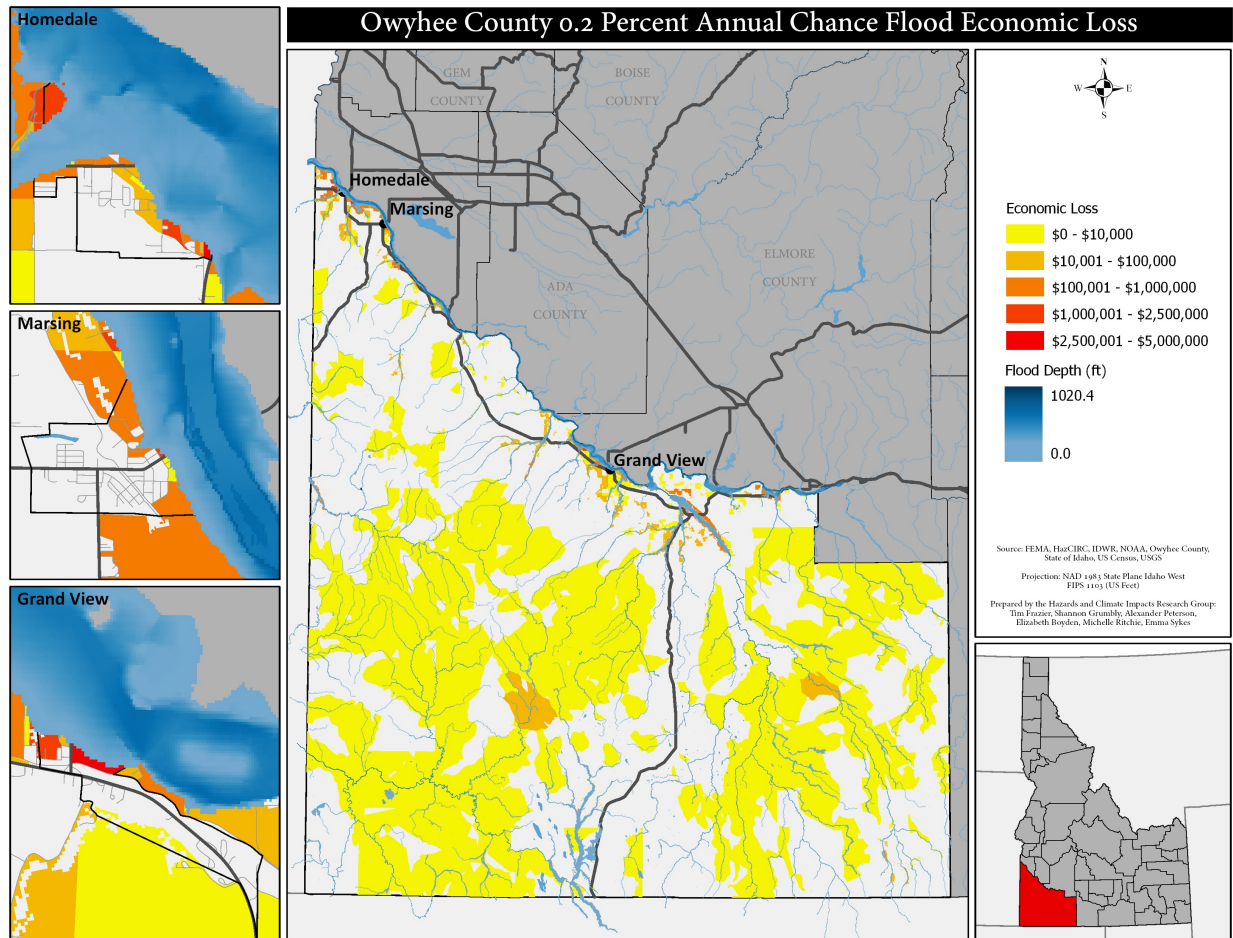


Figure 30. FEMA non-regulatory 100-year flood event estimated losses

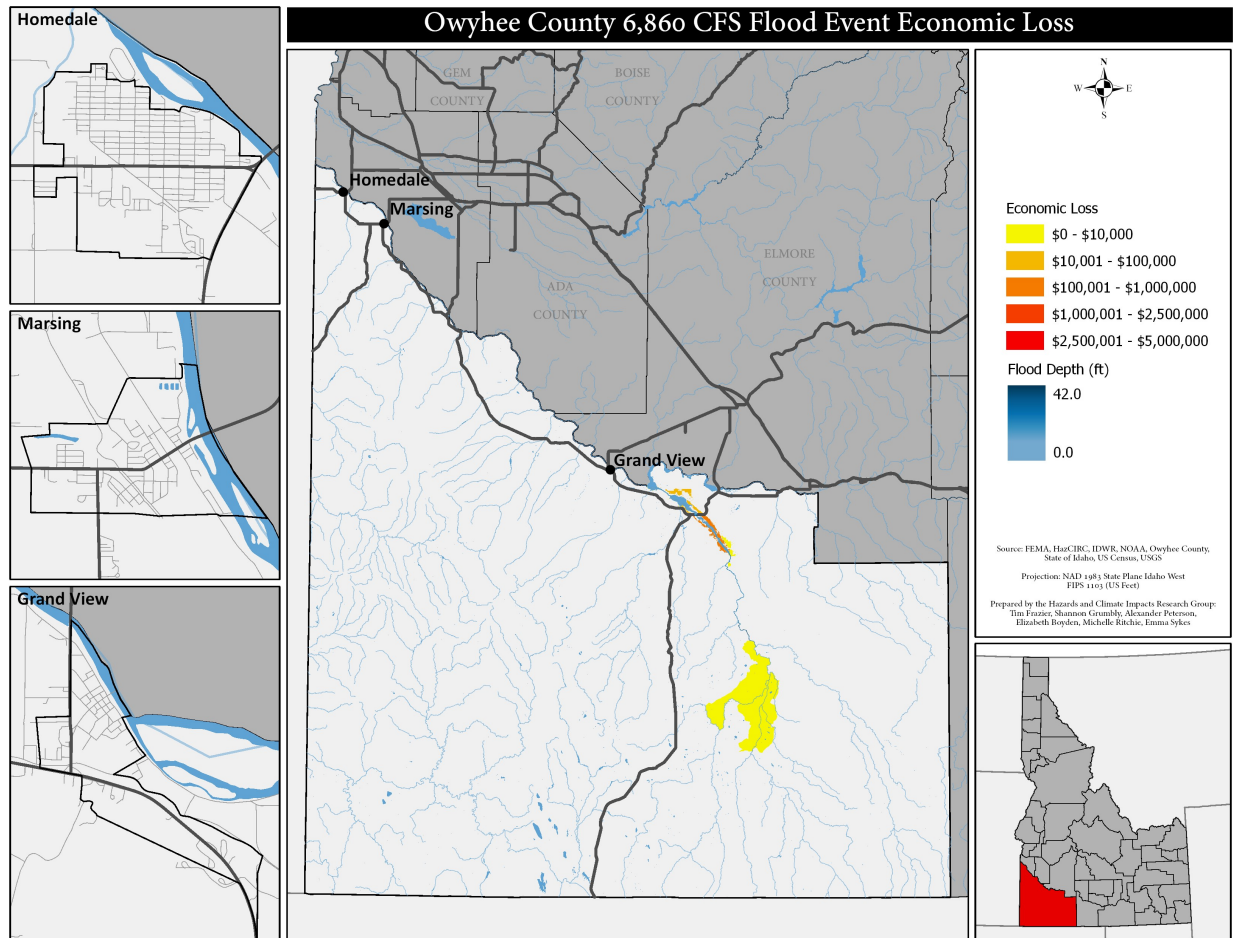


Figure 31. 6,860 cfs Bruneau River flood event estimated losses

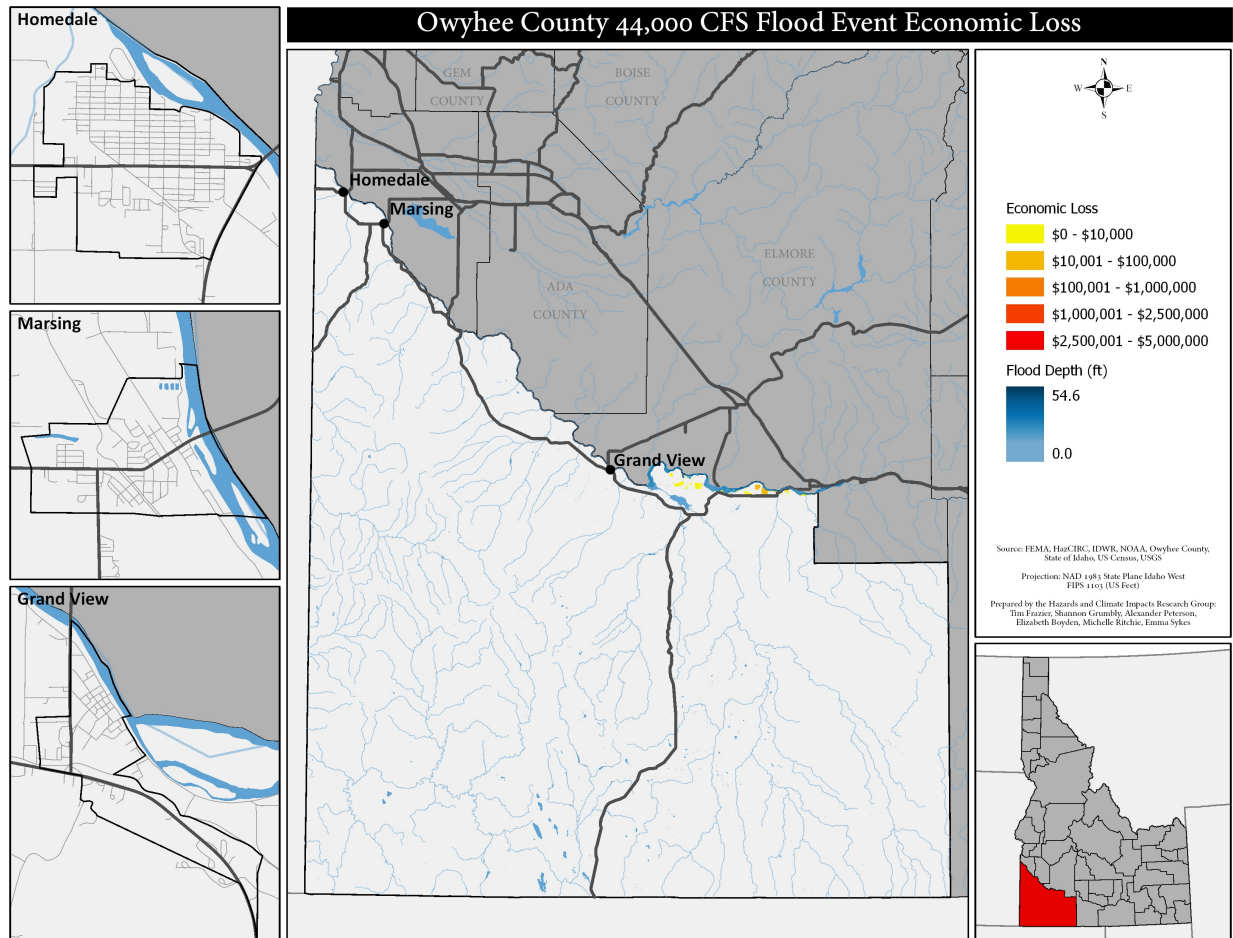


Figure 32 44,000 cfs Snake River flood event estimated losses

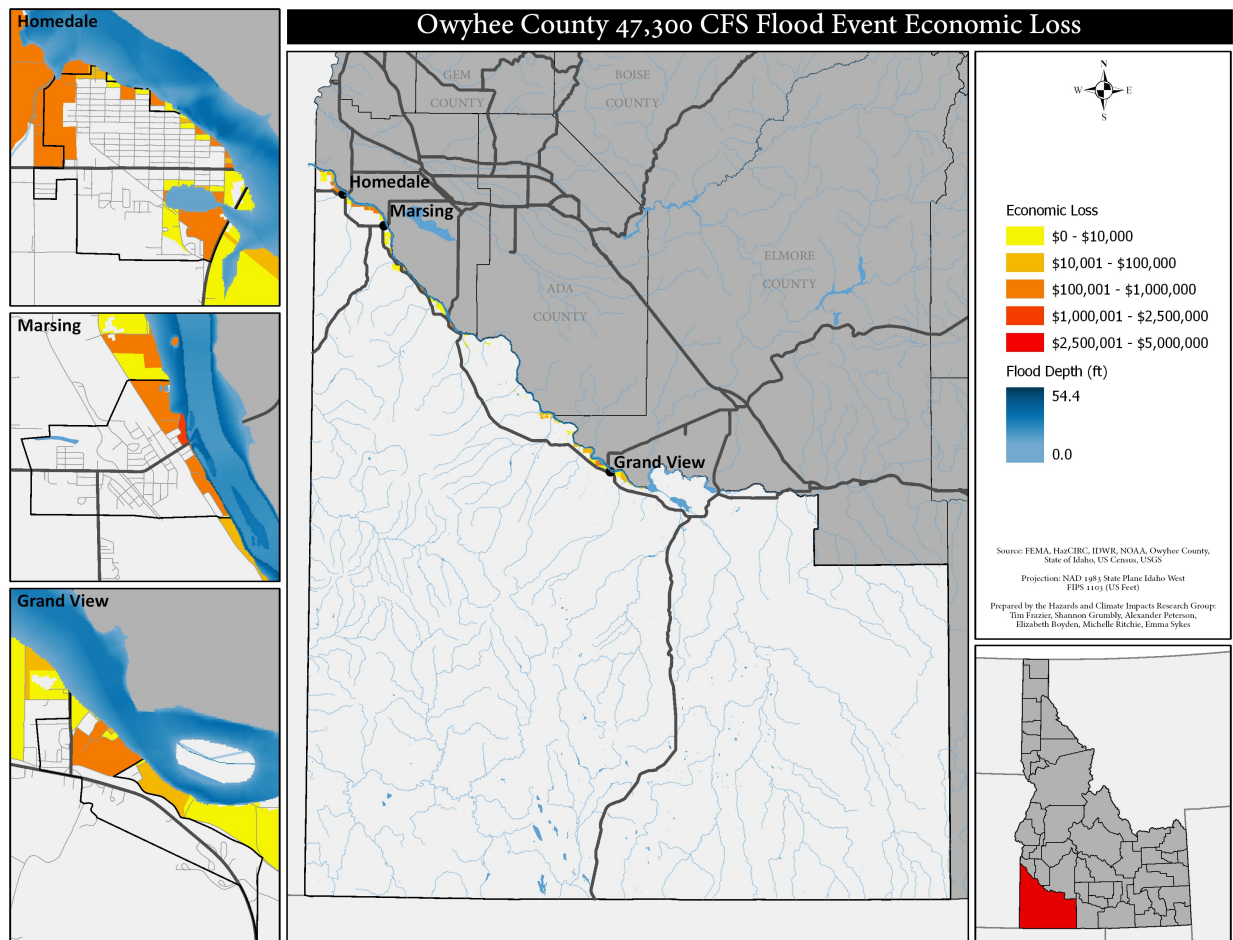


Figure 33 47,300 cfs Snake River flood event estimated losses

5.10 Landslide



5.10.1 Overview

Although Owyhee County has not experienced any recent reported landslide occurrences resulting in casualties, property damage, or declarations, there is risk of a landslide event that can result in casualties or losses. The hazard profile for landslides was reworked in the 2017 update. Changes include a more detailed hazard description, the use of a landslide index developed by HazCIRC to better assess the landslide susceptibility, and a vulnerability assessment of landslides across the county.

5.10.2 Hazard Description

Landslides are the movement of a mass of soil and rock down a slope, and can occur on any area composed of weak or fractured materials resting at an angle. Materials and movement together produce landslides, and are important in producing composite classification schemes. Landslide materials include rock (e.g., bedrock), debris (e.g., coarse material), and earth (e.g., fine material), and landslide movement types include falls (characterized by the free movement and rolling, bouncing, or sliding of soil and rock), slides (the lateral and downslope movement of partially-intact masses), and

flows (viscous fluid-like movement of completely fragmented material saturated with water). Together, materials and movement produce landslides.

Types of landslides include rock falls, earth flows, and debris flows (often known as mud flows). Landslides such as debris flows can be difficult to distinguish from flash floods given their similar characteristics – debris flows often occur suddenly with significant destructive potential during or immediately after a period of intense rainfall and/or rapid snowmelt. The consistency of debris flows ranges from watery mud to thick, rocky mud with the capacity to carry large items such as boulders, trees, and cars. When the flow reaches flatter ground, the debris can spread over a broad area and accumulate in thick deposits. These types of meteorological-related landslides are most common in Idaho, although the state does not maintain a landslide inventory.

Many different physical and meteorological factors contribute to landslides. The physical morphology of the landscape can increase the susceptibility of failure, as generally the steeper the slope the more prone it is to landslide. Slope aspect captures rain shadow, wind, and solar radiation factors. In Idaho, west-facing aspects and slopes between 30 and 41 degrees were found to be most landslide-susceptible. Slope shape also influence landslides, as concave slopes (e.g., hollow, swale, gully) allow water and debris to accumulate, increasing landslide probability. Convex slopes (e.g., ridge, nose) do not allow such accumulation, and are less prone to landslide.

Surface materials and the underlying geology of slopes are also influential in landslide occurrence. In general, landslides occur where surface materials are weak. Surface materials that are impermeable are problematic as they allow subsurface water accumulation, while the geology underlying a slope controls the movement of subsurface water and can either reduce or amplify slope weaknesses. Vegetation can stabilize slopes, however, by increasing slope shear strength and removing water from the soil. The removal of vegetation (such as through wildfire and human disruption) can significantly increase the probability of landslides. Human activities such as road construction, timber harvesting, grazing, mining, and fire suppression all modify slope stability and contribute to landslides.

It is important to note that climate is a deterministic factor of landslides, and the size and timing of precipitation is influential in landslides. Depending on the soil saturation level prior to an event, a slide can follow days or even weeks after above-normal precipitation. Landslides most often occur in late spring and early summer, coincident with the seasonality of rainfall events.

Omitting weather-caused landslides, landslide occurrence is often coincident with other natural hazards, such as earthquakes, floods, and volcanic eruptions. Consequences of landslide in Idaho generally occur directly at the site and downslope of the slide area, as well as in adjacent waterways. Temporary road closures and lengthy detours during debris removal and infrastructure repair are the most probable impacts. Landslides can also destroy structures, fuel and energy lines, and communication infrastructure.

5.10.3 Hazard Location, Extent & Probability

To-date, no statewide landslide assessment or inventory exists, and occurrence and risk data is difficult to obtain. To overcome this limitation, a proxy index incorporating the biophysical factors known to contribute to landslide susceptibility were aggregated and mapped. The analyzed biophysical factors included slope, aspect, canopy cover, and geologic type. Previous research found high slide occurrence on southeast-to-west facing aspects, and the least number of slides on north-facing aspects. Slopes between 31 and 40 degrees were likewise susceptible, with most landslides occurring in brush- and grass-covered landscapes. Finally, certain geologic classes are known to contribute to instability (Table 59).

Table 59. Geologic types known to cause slope instability

Type	Description
Kg	Granodiorite and two-mica granite (Cretaceous)—Granodiorite and granite containing biotite, commonly with muscovite.
Qs	Fluvial and lake sediment (Quaternary)—Largely fine-grained sediment, in part playa deposits of evaporative lakes.
Qg	Glacial deposits (Pleistocene)—Till and outwash consisting of gravel, sand, silt, and clay. Formed by valley glaciers at higher elevations and by the Cordilleran ice sheet in northern Idaho.
Tes	Sedimentary rocks (Eocene)—Fluvial, lacustrine, and air-fall deposits of conglomerate, volcanic sandstone, mudstone, and tuff near Challis, conglomerate north of Sandpoint, and conglomerate and sandstone of the Wasatch Formation in extreme southeastern Idaho.
Tcr	Columbia River Basalt Group (Miocene)—Large-volume lava flows of tholeiitic basalt, basaltic andesite, and subordinate andesite in western Idaho.
Qls	Landslide deposits (Quaternary)—Unsorted gravel, sand, and clay of landslide origin; includes rotational and translational blocks and earth flows.
Tcv	Challis Volcanic Group (Eocene)—Dacite, andesite, and rhyolite tuffs and flows and subordinate basalt and latite flows; covers large area in south-central Idaho.
Kpro	Riggins Group, Orofino series, and related rocks (Cretaceous to Permian)—Metasedimentary and metavolcanic schist, gneiss, amphibolite, and marble, all of uncertain age, along eastern margin of island-arc complex; typically, hornblende-rich.
QTb	Basalt (Pleistocene and Pliocene)—Flows and cinder cones of olivine tholeiite basalt in and near Snake River Plain. Largely Pleistocene (<2.6 Ma) but includes flows as old as 3 Ma. Covered with 1-3 m (3-10 ft) of loess.

Slope and aspect were calculated from 10m digital elevation models (DEMs). Canopy cover was obtained from the 2011 National Land Cover Database (NLCD), while geologic types were obtained from the Idaho Geological Survey (IGS). Each factor was assigned a binary classification, with 0 indicating lack of susceptibility and 1 indicating susceptibility. The binary classifications were then summed to produce the Landslide Index (LI) shown in Figure 34. It is important to note that the LI is

not a deterministic or probabilistic risk model, but a proxy index identifying the number of biophysical factors that contribute to landslides.

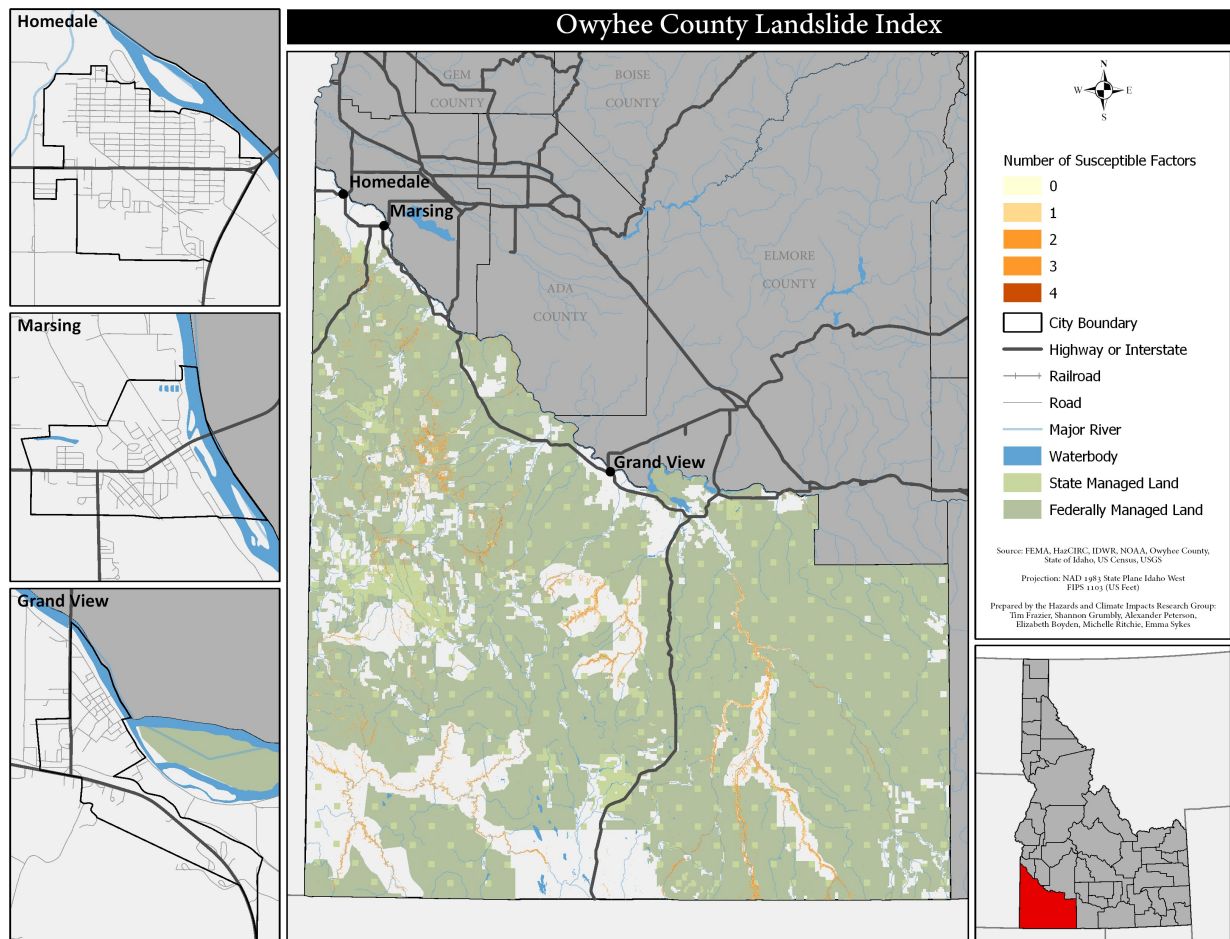


Figure 34. Landslide Index map

The LI shows a number of areas within the county with susceptible factors. Note that although none of the incorporated cities show susceptibility within city boundaries, potential to be affected by landslide does exist should one occur on a transportation thoroughfare. Likewise, there are non-incorporated communities that are exposed (see Section 5.10.5 Hazard Exposure & Vulnerability). Again, the analyzed biophysical factors included slope, aspect, canopy cover, and geologic type and based on the type, number, and location of these factors, the magnitude of each landslide may vary in Owyhee County and all jurisdictions.

5.10.4 Hazard Occurrences

There are no reported instances of landslides in Owyhee County. Similar to avalanches, however, landslides often occur in the backcountry where they are not reported. As shown by Figure 34 and detailed in the following sections, occurrence potential does exist across the county.

5.10.5 Hazard Exposure & Vulnerability

Societal vulnerability to landslides is shown in Figure 35. Social vulnerability is dispersed throughout the county, though only Grand View shows proximate census blocks with social vulnerability to landslide. There are notable census blocks with above average and well above average vulnerability, primarily along the county's northern boundary.

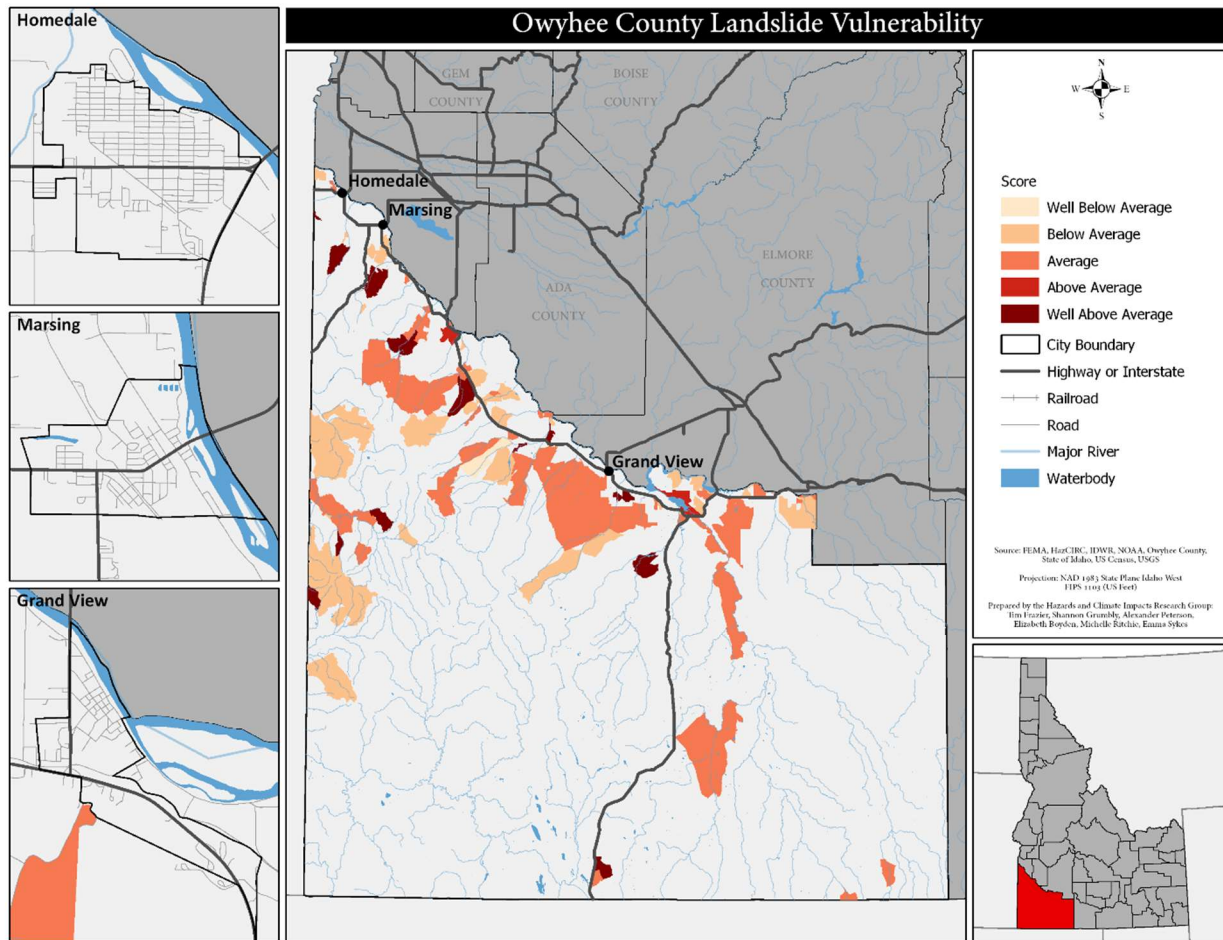


Figure 35. Socioeconomic vulnerability to landslides

A more detailed landslide risk profile for the communities of Murphy Hot Springs and Silver City was completed in the former HMP. Those sections have also been included in the 2017 HMP plan update and are provided below:

5.10.5.1 Murphy Hot Springs

The Murphy Hot Springs Landslide Impact Zone is located along Three Creek Road at the community of Murphy Hot Springs in the southeast corner of Owyhee County. The Impact Zone covers approximately 576 acres surrounding 51 structures within the Murphy Hot Springs community along the East Fork of the Jarbidge River.

Much of the soil along the bottom of the narrow canyon is comprised of material deposited by past sloughing and small landslides of the steep canyon walls. The presence of this material indicates the historic occurrence of high-energy, short duration floods and debris flows in

these chutes in response to climatic conditions, such as thunderstorms and rain-on-snow events. These events are historically infrequent, with recurrence cycles on the order of years to decades. However, they can result in significant damage to buildings and infrastructure, disrupt travel, reduce water quality, and jeopardize safety.

The secondary slope stability problem at Murphy Hot Springs is associated with the steepness of the slopes and the presence of unconsolidated soils. The slopes rising from the East Fork of the Jarbidge River are very steep; thus, landslides could easily be triggered by water saturation of the overlying soils, flash flooding, human activity, wildfires, earthquakes, or other factors.

Wildfires in this impact zone, such as the 2007 Murphy Complex, may cause a domino effect of multiple hazards. Higher intensity fires not only remove most of the vegetation, but they also cause soils to become hydrophobic or water repellent for a period of time after the fire. This combination leads to unusually high runoff after rain showers or during the spring runoff season. Currently, there is very little road construction or other building projects occurring in the Murphy Hot Springs Landslide Impact Zone.

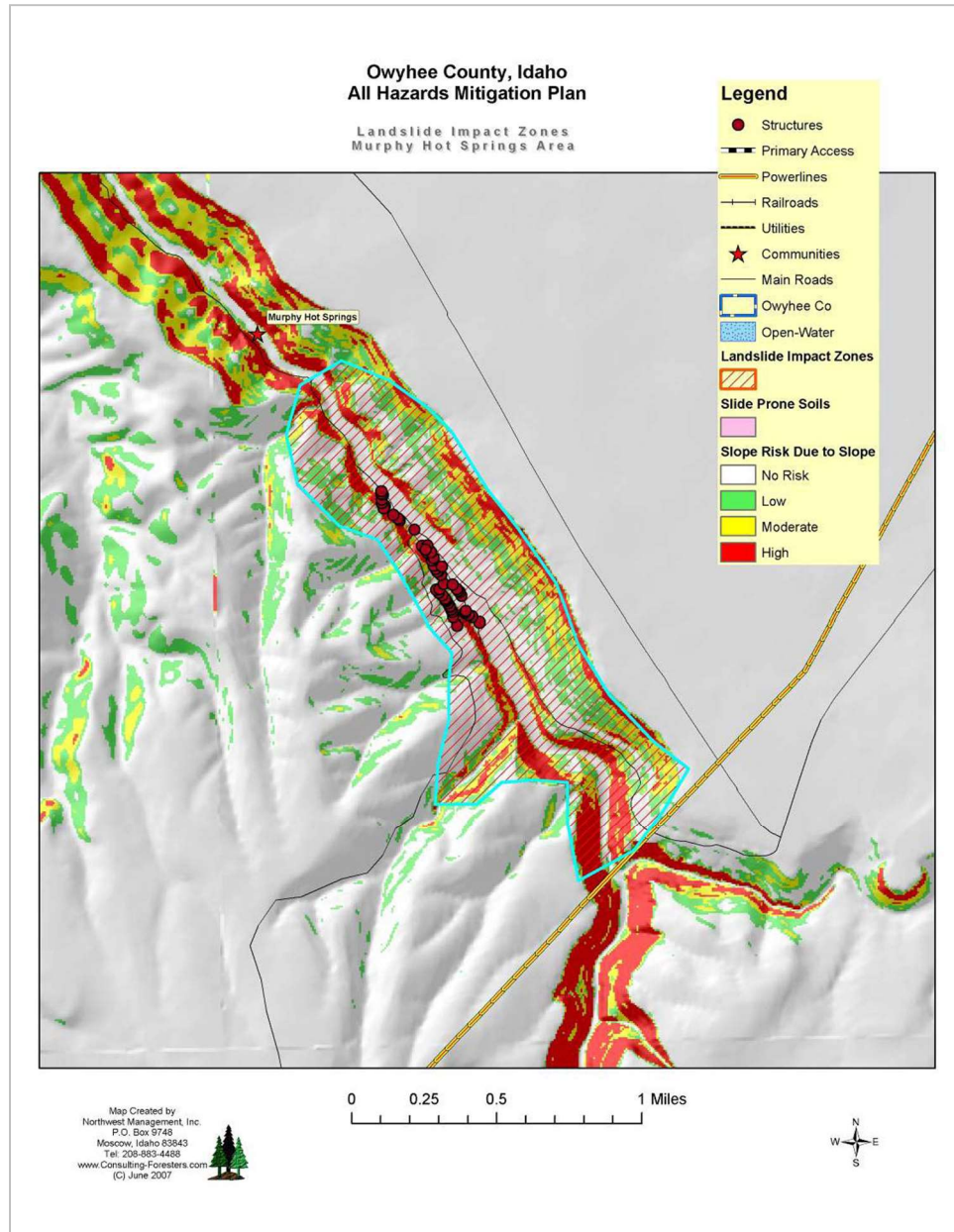


Figure 36. Murphy Hot Springs landslide impact zone

The probability of future landslide activity in the Murphy Hot Springs area is low; however, earthquakes or wildland fires could easily trigger slides or falling rocks that could cause severe damage to the limited access routes or the community.

Individual homes in the Murphy Hot Springs Impact Zone are at moderate to high risk of landslide activity. Nearly all of the homes in this area are located in the bottom of the canyon near the river. Due to the narrowness of the canyon, even a small slide in the vicinity of the community will likely impact homes either directly or by cutting off access. Currently, there

are approximately 51 structures in Murphy Hot Springs with an estimate value of \$86,658 each or a total value of \$4,419,558.

Three Creek Road, which was cut into the steep wall on the east side of the canyon, is the only access route to the north from this community. Three Creek Road does continue down the East Fork of the Jarbidge River to the confluence of the West Fork before turning south to follow the West Fork of the Jarbidge River canyon into Nevada. There is one additional gravel route that climbs the west side of the canyon from Murphy Hot Springs and heads south into Nevada. However, this road may only be accessible seasonally. Murphy Hot Springs is a very rural community with few services available nearby. Temporary closure of the Three Creek Road, particularly access to the north, will severely limit resident's ability to obtain groceries, medical assistance, fuel, and other basic necessities.

Debris flow activity and the resulting alluvial sediment deposition is associated with soil saturation and precipitation events. As mentioned, landslide events are generally associated with large precipitation events. The probability of these events occurring during normal weather conditions is quite low. However, during large precipitation events, residents and county representatives should monitor these areas for landslide activity. The recent fire activity in this area exacerbates the need for close monitoring. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the soil. The loss of vegetation and potential hydrophobicity of the soils increases the potential risk for slide events and severe erosion.

5.10.5.2 Silver City

The Silver City Landslide Impact Zone surrounds the historic community of Silver City in the very rural northwest region of Owyhee County. This is a fairly large Impact Zone covering nearly 48,778 acres. There are 73 homes in this zone with an average value of \$86,658 each or a total value of \$6,326,034.

Silver City has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. The Silver City Road has been damaged by several rock and snow slides impeding traffic into and out of the community on numerous occasions. The primary slope stability problem near Silver City is associated with the steepness of the slopes and the presence of unconsolidated soils. Silver City is located in the middle of the Owyhee Mountains on the north end of the Silver City Range. The slopes rising from the numerous small drainages in these mountains are typically steep; thus, landslides could easily be triggered by water saturation of the overlying soils, flash flooding, human activity, wildfires, earthquakes, or other factors.

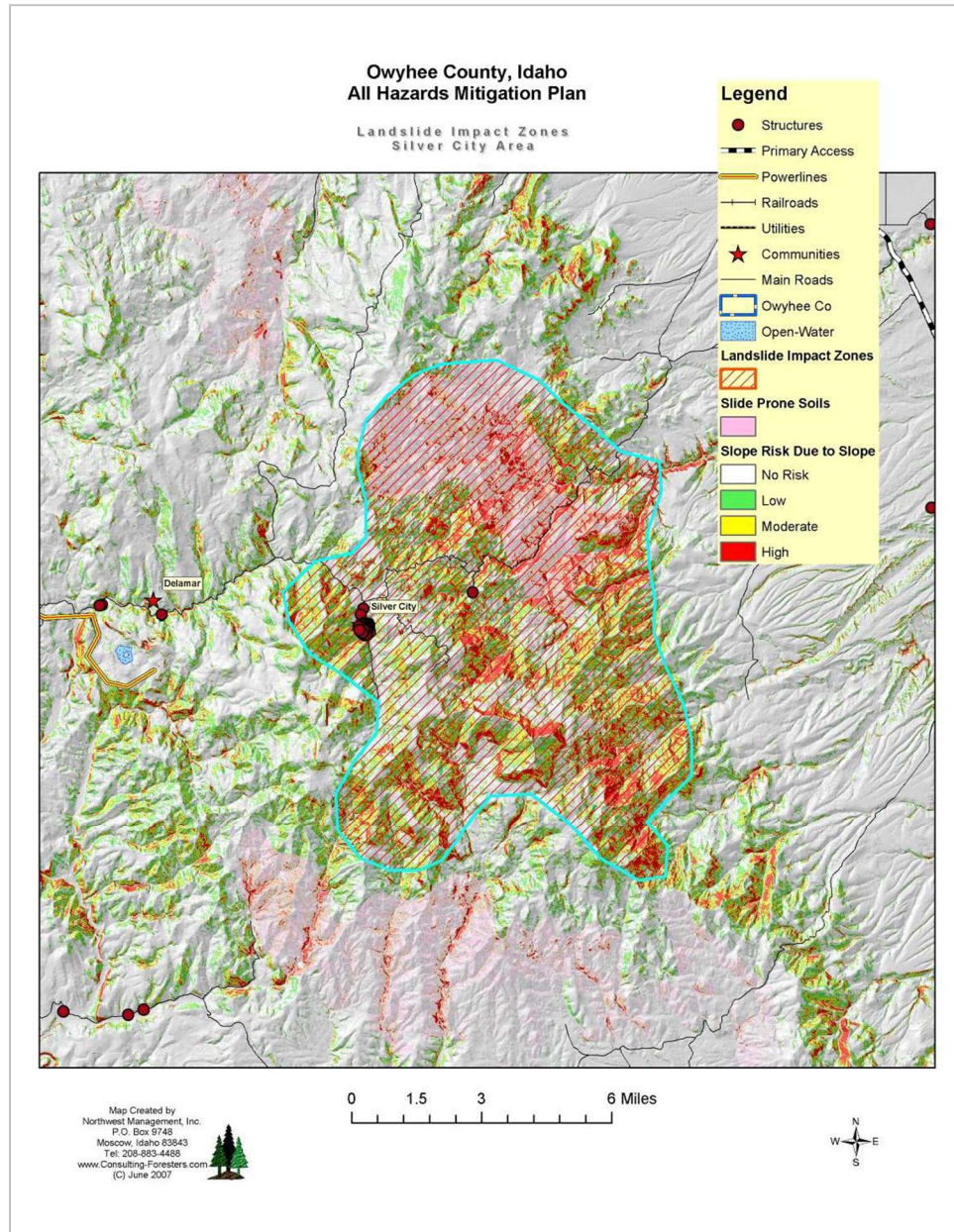


Figure 37. Silver City landslide impact zone

Many of the slopes and hillsides on the north end of this Impact Zone are comprised by material deposited by past landslides. In fact, much of the lower slopes are alluvial fans created by sediment being carried downstream and deposited at the mouths of the numerous small drainages. The presence of this material indicates the historic occurrence of high-energy, short duration floods and debris flows in these chutes in response to severe climatic conditions, such as thunderstorms and rain-on-snow events. These events are historically infrequent, with recurrence cycles on the order of years to decades. However, they can result

in significant damage to buildings and infrastructure, disrupts travel, reduces water quality, and jeopardizes safety.

Location of landslide deposits in canyons is controlled by the presence of sedimentary interbeds, the hydrologic regime, and the occurrence of basalt overlying weathered sedimentary rocks. The largest landslides occur where canyon cutting has exposed landslide-prone sediments to steep topography. Today, initiation and reactivation of landslides is closely tied to unusual climatic events and land-use changes. Even small landslide activity on the upper parts of the slopes can transform into high-energy debris flows that endanger roads, buildings, and people below. Landslide debris is highly unstable when modified through natural variations in precipitation, artificial cuts, fills, and changes to surface drainage and ground water (Weisz *et al.* 2003).

Fires in the Silver City area can cause a domino effect of multiple hazards. Higher intensity fires not only remove most of the vegetation, but they also cause soils to become hydrophobic or water repellent for a period of time after the fire. This combination leads to unusually high runoff after rain showers or during the spring runoff season. As streams begin to reach and exceed flood stage, bank failures and channel migration are common. Road building and other soil disturbances tend to exacerbate this effect leading to even more severe land and soil slides.

The probability of future landslide activity in the Silver City area is moderate due to the intense mining and recreational use. Additionally, earthquakes or wildland fires could easily trigger slides or mine shaft cave-ins that may cause damage to the limited access routes or nearby structures.

Individual homes in Silver City area are at moderate risk to landslide activity. Nearly all of the structures in this Impact Zone are located within the community of Silver City, which sits along Jordan Creek at the western base of War Eagle Mountain. There has been no recorded occurrence of landslides in this area; however, mining activity in combination with relatively steep slopes and unconsolidated soils, puts this area at a higher level of risk. Evidence of historic deposits in the surrounding area are strong indicators of debris flows in the future.

Furthermore, access into Silver City is very limited. The Silver City Road is the only primary access route to and from the community. This route travels from Silver City in a northeastward direction towards State Highway 78 near Murphy. There is one additional access route that travels north and then westward into Oregon; however, this is typically only accessible seasonally to four-wheel drive vehicles. A slide along the main Silver City Road, particularly during the warm months when residents and tourists are frequenting Silver City, could effectively isolate residents.

Debris flow activity and the resulting alluvial sediment deposition is associated with soil saturation and precipitation events. As mentioned, landslide events are generally associated with large precipitation events. The probability of these events occurring during normal

weather conditions is quite low. However, during large precipitation events, residents and County representatives should monitor this area for landslide activity.

The potential for debris flows and landslides is dramatically escalated after large wildland fires that denude the steeper slopes of vegetative cover. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the fragile soil to the mountainsides.

5.10.6 Land Use & Future Development

Current and future land use and development are minimally impacted by landslide risk. The majority of landslide susceptible factors are located on federal lands where residential areas are not likely to be developed.

5.11 Severe Weather



5.11.1 Overview

Although the term ‘severe weather’ is nebulous, the plan defines severe weather as any destructive meteorological phenomenon. Such phenomena include (but are not limited to) winter storms, extreme heat and cold temperatures, hydrometeorological events (e.g., hail and heavy rain), thunderstorms, and wind. Often these events are coincident, making delineation difficult. The 2017 update incorporated additional datasets in the risk assessment, and provided a more comprehensive and cohesive hazard profile on severe weather risk in Owyhee County.

Table 60. Severe weather summary

	1950-2008	2009-2017	Total
Occurrences	157	43	200
Disaster Declarations	1	1	2
Casualties	9 Injuries	1 Fatality	1 Fatalities; 9 Injuries
Property Damage	\$192,000 Property	\$100,100,000 Property	\$100,292,000 Property
Repetitive Losses	-	-	-

5.11.2 Hazard Description

Extreme temperatures pose risk to both humans and the environment. The following are brief descriptions of extreme temperatures:

- Extreme Heat – Also known as a heat wave, extreme heat is a period of significant above-normal temperatures in a locality. Urban development amplifies extreme heat effects due the heat island effect. Extreme heat impacts human health through heat exhaustion, sunstroke, and heat cramps. Most susceptible are age-dependent populations, including the elderly and small children, and those with other and chronic illness. Environmental impacts include loss of wildlife and increased wildfire probability. Extreme heat can stress power grids due to an increase in energy demand for cooling.
- Extreme Cold – A period of significant below-normal temperatures in a locality is defined as extreme cold. Winds of 10 mph or greater can amplify extreme cold impacts. Advisories are issued when wind chill temperatures reach -20 degrees F or lower with winds of 10 mph or higher for one hour or more. Similar to extreme heat, extreme cold is of greatest concern under persistence over an extended period of time, and like extreme heat, the most susceptible are the age-dependent and those with chronic illness. The environmental and other impacts are similar, though extreme cold can be associated with the formation of ice and freezing which can result in flooding.

Severe storms are the most nebulous of severe weather. The term ‘severe storm’ is a general categorization of any atmospheric disturbance resulting in one or more meteorological phenomena with the potential to cause losses, such as thunderstorms, hail, lightning, and wind. Severe storms often produce cascading hazards, including floods and landslides.

- Hail – A product of thunderstorms and is defined as precipitation in the form of irregular pellets or balls of ice more than 5 mm in diameter falling from a cumulonimbus cloud. Created by the vertical cycle of a wind and water in a storm mass (or cell), the ice accumulation that forms hail can reach sizes up to four inches, though hail of three-fourths of an inch or greater is sufficient to classify a thunderstorm as severe. Nationally, hail causes nearly \$1 billion in property and crop damage annually, as peak activity coincides with peak agricultural seasons. Severe hailstorms also cause considerable damage to buildings and automobiles, but rarely result in loss of life.
- Lightning – A product of the violent movement of air within a thunderstorm, and defined by the NWS as “visible electrical discharge produced by a thunderstorm.” The discharge can occur within or between clouds, between clouds and air, between clouds and the earth’s surface, and between the earth’s surface and clouds. Lightning can be over 5 miles in length, generate temperatures above 50,000 degrees F, and carry 50,000 volts of electrical potential. Lightning strikes can be deadly, notably direct strikes where the person or structure is the direct path for lightning conduction to the ground. Side strikes are similar to a direct strike, but diverts to an alternate path from the initial grounding point. Conducted strikes occur when the electrical

current is carried from the initial grounding point through a conductive material (such as electrical and electronic equipment). Lightning can also induce secondary discharges by altering the electrical potential between adjacent structures, through the earth's surface, and in electrical equipment.

- Straight-Line Wind – A term used to distinguish between non-rotating and rotating winds, the latter often sourced from tornados. Straight-line winds are generated by thunderstorms and can reach speeds in excess of 100 miles per hour (mph). The National Weather Service (NWS) defines 'high winds' as sustained wind speeds of 40 mph or greater over a one-hour period or longer, or winds of 58 mph or greater over any period. Windstorms affect areas with significant tree stands, as well as areas with exposed property, major infrastructure, and aboveground utility lines. Of particular note are downbursts (also known as microbursts), which are a particular type of straight-line wind and are small areas of rapidly descending rain and rain-cooled air beneath a thunderstorm with potential wind velocities equal to that of a strong tornado.
- Thunderstorms – Produced when unstable atmospheric conditions exist and warm, moist air is forced upward and condenses to form cumulonimbus clouds. Most common in the spring and summer months during the afternoon and evening hours, thunderstorms persist an average of 10 to 20 minutes (though can persist much longer), during which they can produce heavy rain, hail, lightning, strong winds, and tornadoes. Thunderstorm types include dry thunderstorms, pulse severe thunderstorms, severe thunderstorms, and supercell thunderstorms. Dry thunderstorms are characterized by 'dry lightning', where lightning is observed but little to no precipitation reaches the earth's surface due to evaporation into the dry air beneath the storm cell. Pulse severe thunderstorms are single-cell thunderstorms that produce brief periods of severe weather, such as a tornado, winds of at least 58 mph, and/or at least three-fourths of an inch hail size. A severe thunderstorm is one in which winds reach at least 40 mph and/or hail of at least one-half inch in size. Finally, a supercell thunderstorm is the most dangerous. These storms produce downbursts, large hail, and long-lived violent tornados.
- Tornadoes – The most concentrated and violent storms produced by the atmosphere. A tornado is a column (also known as a vortex) of air composed of rotating wind and strong vertical motion. Wind speeds within the vortex range between 40 and 300 mph, and the vortex itself can travel at speeds up to 70 mph over a distance between 10 and 200 miles (although shorter distances have been reported). Though damages are generally confined to a narrow path, tornadoes can devastate a large distance, and a single storm can produce multiple tornados.
- Winter Storms – Characterized by low/freezing temperatures, blowing snow, and ice. Like all severe storms, winter storms range in size, duration, and intensity, with potential to impact both large and localized areas. Severe winter storms deposit four or more inches of snow during a 12-hour period, or six inches during a 24-hour period. To be classified as a blizzard,

winds must exceed 35 mph with temperatures below 20 degrees F. Particularly damaging are ice storms, characterized by cold rain freezing immediately on contact with a surface. In general, the principal hazards associated with severe winter storms are snow/ice accumulation, extreme cold, and reduction of visibility. Such storms can also disrupt transportation, power and communication lines, and halt everyday activities.

5.11.3 Hazard Location, Extent & Probability

Severe weather affects the entirety of Owyhee County including all jurisdictions. To quantify extreme heat and cold, the NWS employs a Heat Index and a Wind Chill Temperature index, respectively. The Heat Index accounts for both air temperature and relative humidity, and categorizes heat into likelihood of heat disorders due to exposure (Figure 38). Similarly, the Wind Chill Temperature index calculates the dangers from winter winds and freezing temperatures (Figure 39). The Wind Chill Temperature index accounts for air temperature, wind speed, and incorporates heat transfer theory (heat loss from the body).

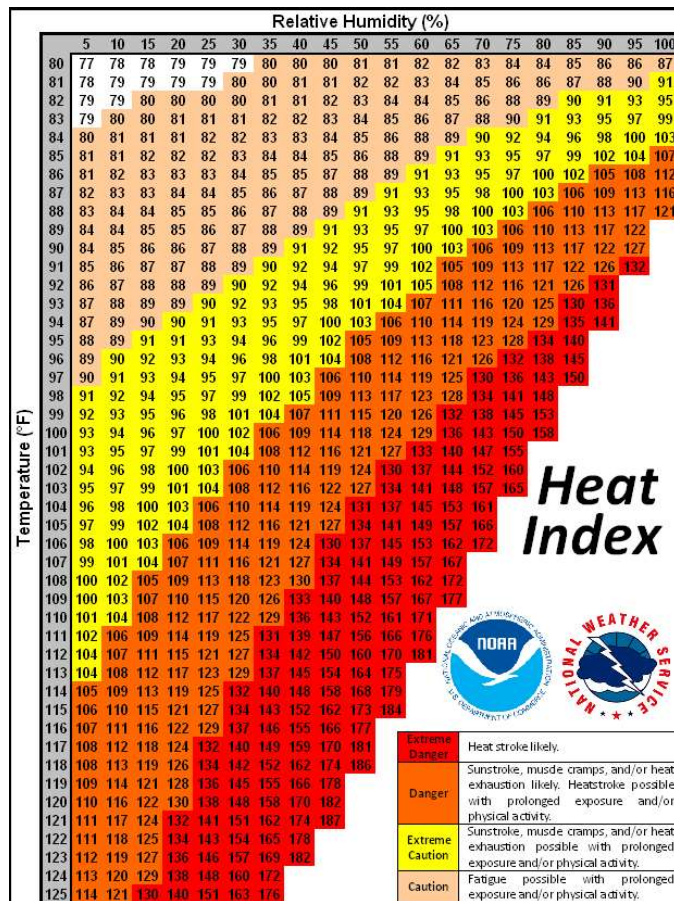


Figure 38. Heat Index chart

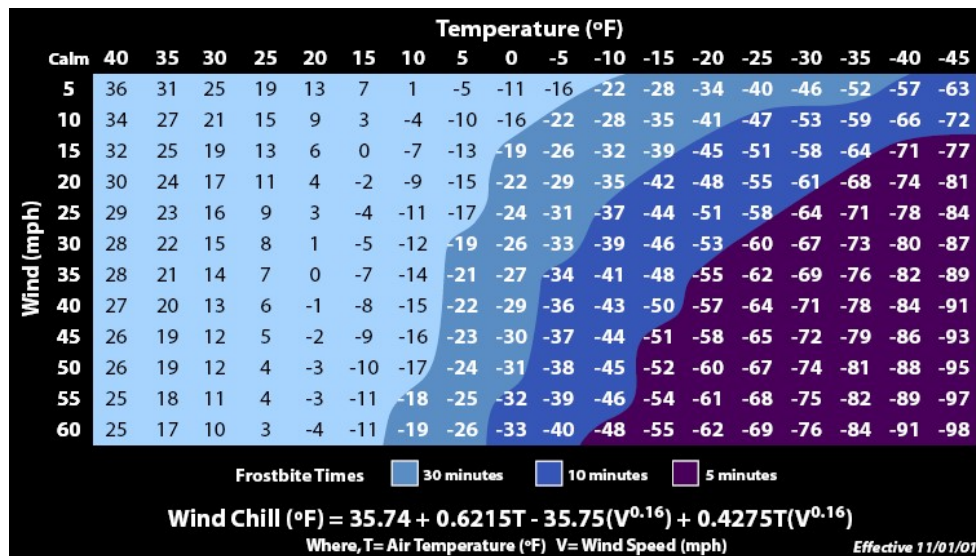


Figure 39. Wind Chill Index chart

Extreme heat does not normally affect Owyhee County and all jurisdictions, though a number of temperatures above 100F have been recorded (Table 61). The recorded 3-day minimum temperatures show Owyhee County can experience lows 30F below (Table 62).

Table 61. Recorded 3-day maximum temperatures

Station Name	Type	Temperature	Date
BRACE FLAT IDAHO	RAWS	105.3	2002-07-13
HOMEDALE 1 SE	COOP	111.0	2003-07-24
HORSE BUTTE IDAHO	RAWS	102.3	2002-07-13
Mud Flat	Snotel	99.7	2002-07-13
MURPHY 10 W	WBAN	101.0	2006-07-23
MURPHY DESERT HOT SPRINGS	COOP	100.0	2007-07-15
POLE CREEK IDAHO	RAWS	104.0	2002-07-13
Reynolds Creek	Snotel	97.7	2002-07-13
SHO-PAI IDAHO	RAWS	100.7	2003-07-23
South Mtn.	Snotel	94.3	1990-08-07
TRIANGLE IDAHO	RAWS	101.0	2002-07-13
TWIN BUTTES IDAHO	RAWS	110.0	2002-07-13

Table 62. Recorded 3-day minimum temperatures

Station Name	Type	Temperature	Date
BRACE FLAT IDAHO	RAWS	-31.7	1990-12-23
HOMEDALE 1 SE	COOP	-15.0	1990-12-23
HORSE BUTTE IDAHO	RAWS	-22.0	1990-12-22
Mud Flat	Snotel	-30.3	1990-12-23
MURPHY 10 W	WBAN	-9.0	2009-12-10
MURPHY DESERT HOT SPRINGS	COOP	-22.5	1990-12-23
POLE CREEK IDAHO	RAWS	-26.0	1990-12-22
Reynolds Creek	Snotel	-3.3	2009-12-09
SHO-PAI IDAHO	RAWS	-13.0	2013-01-03
South Mtn.	Snotel	-19.3	1990-12-22
TRIANGLE IDAHO	RAWS	-32.7	1990-12-23
TWIN BUTTES IDAHO	RAWS	-19.7	1990-12-24

Hail size comparisons are shown in Figure 40. In general, hail does not become severe until it reaches one inch in diameter (roughly the size of a quarter). Hail can affect the entirety of the county, with likely yearly occurrences.

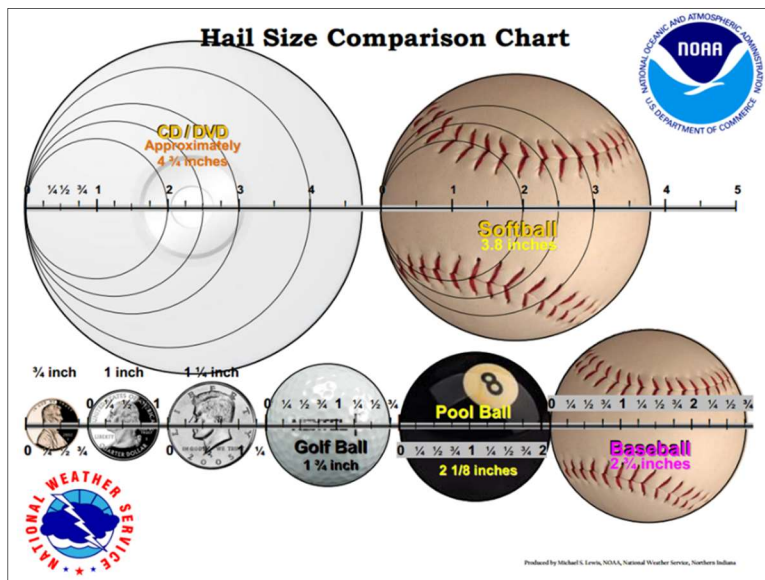


Figure 40. Hail size comparison chart

Table 63 shows general damage from wind speeds. Windstorms can affect the entirety of the county, with high probabilities of occurring in any given year.

Table 63. Wind speeds and damage estimates

Wind Speed Estimate	Description
25-31 mph	Large branches in motion; whistling heard in telephone wires
32-38 mph	Whole trees in motion; inconvenience felt walking against the wind
39-54 mph	Twigs break off trees; wind generally impedes progress
55-72 mph	Damage to chimneys and TV antennas; pushes over shallow rooted trees
73-112 mph	Peels surfaces off roofs; windows broken; light mobile homes pushed or overturned; moving cars pushed off road
113-157 mph	Roofs torn off houses; cars lifted off ground

The Enhanced Fujita (EF) tornado scale is used by the NWS to estimate wind speeds within tornadoes based on damage to buildings and structures. The EF scale has six categories from zero to five representing increasing degrees of damage (Table 64). Tornadoes are not a regular occurrence in the county nor are there any repetitive losses.

Table 64. Enhanced Fujita tornado scale and damage estimates

Category	3 Second Gust	Typical Damage
0	65-85 mph	Light damage. Causes some damage to siding and shingles.
1	86-109 mph	Moderate damage. Considerable roof damage. Winds can uproot trees and overturn single-wide mobile homes. Flagpoles bend.
2	110-137 mph	Considerable damage. Most single-wide mobile homes destroyed. Permanent homes can shift off foundations. Flagpoles collapse. Softwood trees debarked.
3	138-167 mph	Severe damage. Hardwood trees debarked. All but small portions of houses destroyed.
4	168-199 mph	Devastating damage. Complete destruction of well- built residences, and large sections of school buildings.
5	200-234 mph	Incredible damage. Significant structural deformation of mid and high-rise buildings.

Table 65 shows the warning and advisory criteria used by the NWS for winter weather. Winter weather occurs in Owyhee County and all jurisdictions on an annual basis, though they do not always cause

damage. However, winter weather can affect the entirety of the county, and has high probability of occurrence in the future.

Table 65. Winter weather warning and advisory criteria

Winter Weather Event	Winter Weather Advisory	Winter Storm/Blizzard Warning
Snow	2-5 inches of snow in 12 hours	6 inches or more in 12 hours, or 8 inches in 24 hours
Blizzard	(see blowing snow)	Sustained winds or frequent gusts to 35 mph with visibility below a ¼ mile for three hours or more
Blowing Snow	Visibility at or less than a ½ mile.	Visibility at or less than a ½ mile in combination with snowfall at or greater than 6 inches and/or freezing precipitation
Ice/Sleet	(see freezing rain/drizzle)	Accumulations of ¼ inch or more of ice.
Freezing Rain/Drizzle	Light precipitation and ice forming on exposed surfaces.	None
Wind Chill	Wind chills of 20 to 39 degrees below zero with a 10-mph wind in combination with precipitation.	Wind chills 40 degrees below zero or colder with a 10-mph wind in combination with precipitation.

5.11.4 Hazard Occurrences

The NWS lists more than 330 events from 1950 to 2017 in the Storm Events Database for Owyhee County. Table 66 details those events with casualties or losses, while Table 67 consolidates the recorded events by type, number of occurrences between 1950-2008 and 2009-2017, total casualties, and total property and crop damage.

Table 66. Severe weather occurrences

Date	Type	Magnitude	Location	Casualties	Property Damage	Crop Damage
4/4/1993	Thunderstorm Wind	-	-	-	\$50,000	-
5/3/1993	Thunderstorm Wind	-	-	4 Injuries	\$50,000	-
4/27/1995	Thunderstorm Wind	-	-	-	\$50,000	-
7/30/1996	Heavy Rain	-	-	-	\$10,000	-
9/17/1997	High Wind	34 knots	-	-	\$2,000	-
7/10/1998	Tornado	F0	Oreana	1 Injury	\$30,000	-
11/28/2001	Heavy Snow	-	-	4 Injuries	-	-
12/30/2005	Severe Storms	-	-	-	-	-
8/25/2008	Wildfire	-	-	1 Fatality	\$5,000,000	-
3/29/2009	High Wind	50 knots	-	-	\$100,000	-
6/6/2009	Flash Flood	-	Murphy	1 Fatality	-	-
12/7/2013	Heavy Snow	-	-	1 Fatality	-	-
01/18/2017	Heavy Snow	-	Lower Treasure Valley Zone	-	\$100,000,000	-

Source: NWS, SHELDUS

Table 67. Severe weather occurrences by type

Type	Number of Events		Total Casualties		Total Property Damage		Total Crop Damage	
	1950-2007	2008-2017	1950-2007	2008-2017	1950-2007	2008-2017	1950-2007	2008-2017
Blizzard	-	2	-	-	-	-	-	-
Dense Fog	5	3	-	-	-	-	-	-
Dust Storm	2	-	-	-	-	-	-	-
Extreme Cold/Wind Chill	2	-	-	-	-	-	-	-
Frost/Freeze	-	1	-	-	-	-	-	-
Hail	20	1	-	-	-	-	-	-
Heavy Rain	3	-	4 Injuries	1 Fatality	\$10,000	-	-	-
Heavy Snow	48	27	-	-	-	\$100 mill	-	-
High Wind	16	20	-	-	\$2,000	\$100,000	-	-
Thunderstorm Wind	27	6	4 Injuries	-	\$150,000	-	-	-
Tornado	2	1	1 Injury	-	\$30,000	-	-	-

Source: NWS, SHELDUS

Below is an account of the Winter 2016-2017 event:

- Winter of 2016 and 2017 Heavy Snow Event – The winter of 2016/2017 produced historic weather events across southwest Idaho and southeast Oregon.

Snowfalls in the Treasure Valley met or exceeded previously recorded levels. Owyhee County, though not as seriously affected as other southwestern Idaho Counties, such as Payette, was impacted to such a degree that the County Commission declared a Disaster Emergency on January 10, 2017.

In their Declaration, the Commission documented the threat to life and property in Owyhee County as the result of winter storms which have occurred and which are forecast to continue for at least the next week; and the resulting snowfall, impacts to roads and travel, and potential flooding is threatening structures, roadways, infrastructures, public utilities, and other lines of communications.

The Commission confirmed that a disaster emergency, as defined in Section 46-1002, Idaho Code, is in existence in Owyhee County, due to the imminent threat to life and property created by these storms. These conditions require the activation of the response and recovery aspects of all applicable local disaster emergency plans. The Commission also noted that the disaster may require State emergency assistance to supplement local efforts to protect,

rehabilitate, and replace public property and to provide a coordinated multi-agency effort to mitigate, avert and lessen the threat and impact of the disaster.

During the worst of the snow portion of the event, residents across the county were unable to move about on roads, had difficulty feeding livestock, dealt with heavy snow loads on buildings, among other issues. County Road and Bridge crews as well as crews from City and Separate Highway Districts were hard-pressed to perform snow removal and other activities made necessary by the storms. County crews placed their initial priorities on essential county roadways. Once those had been cleared, the crews moved to lesser traveled roads and to private roads and lanes where residents remained stranded. In many areas of the County, private parties assisted in clearing roads for their neighbors and communities. The County did not suffer the major structure collapses that occurred in neighboring counties. When National Weather Service Forecasts predicted significantly warmer weather and rain, with forecast flooding, county crews prepositioned sand and sand bags to at risk areas in addition to the multitude of other actions performed by them. The County also purchased, and prepositioned, ten 125/gpm diesel-powered water pumps for use in controlling local flooding.

On April 10, 2017, the Commission extended their Disaster Declaration with the following stated concerns.

There is continuing threat to life and property in Owyhee County, as the result of weather events which were the basis for the January 10th Declaration. The current and projected rain events in conjunction with the melting of the above average snow packs have potential for significant impacts to roads and travel, and potential flooding which may cause additional damage to structures, roadways, infrastructures, public utilities, and other lines of communications. Damage to structures, roadways, infrastructures, public utilities and other lines of communication which occurred during the snow events, ice storms, and flooding which has previously occurred may not yet be readily apparent and cannot be assessed. The Commission declared that the disaster may yet require State emergency assistance to supplement local efforts to protect, rehabilitate, and replace public property and to provide a coordinated multi-agency effort to mitigate, avert and lessen the threat and impact of the disaster.

While the snows are gone in the lower elevations of the county at the time of this writing (late May 2017), there is still a potential for flooding in the county as the result of the runoff of the much higher than normal snow packs in the Owyhee Mountains. The County continues to monitor potential flooding. Additionally, the county will continue to monitor impacts to roads and other infrastructure associated with the storms of 2016/17.

On the positive side, no lives were lost and no major structures failed. County and other municipal governments and separate highway district crews successfully managed the work required to cope with this extraordinary event.

Although not comprehensive, Figure 41 shows aggregated severe weather events from the NWS Severe Storms Database.

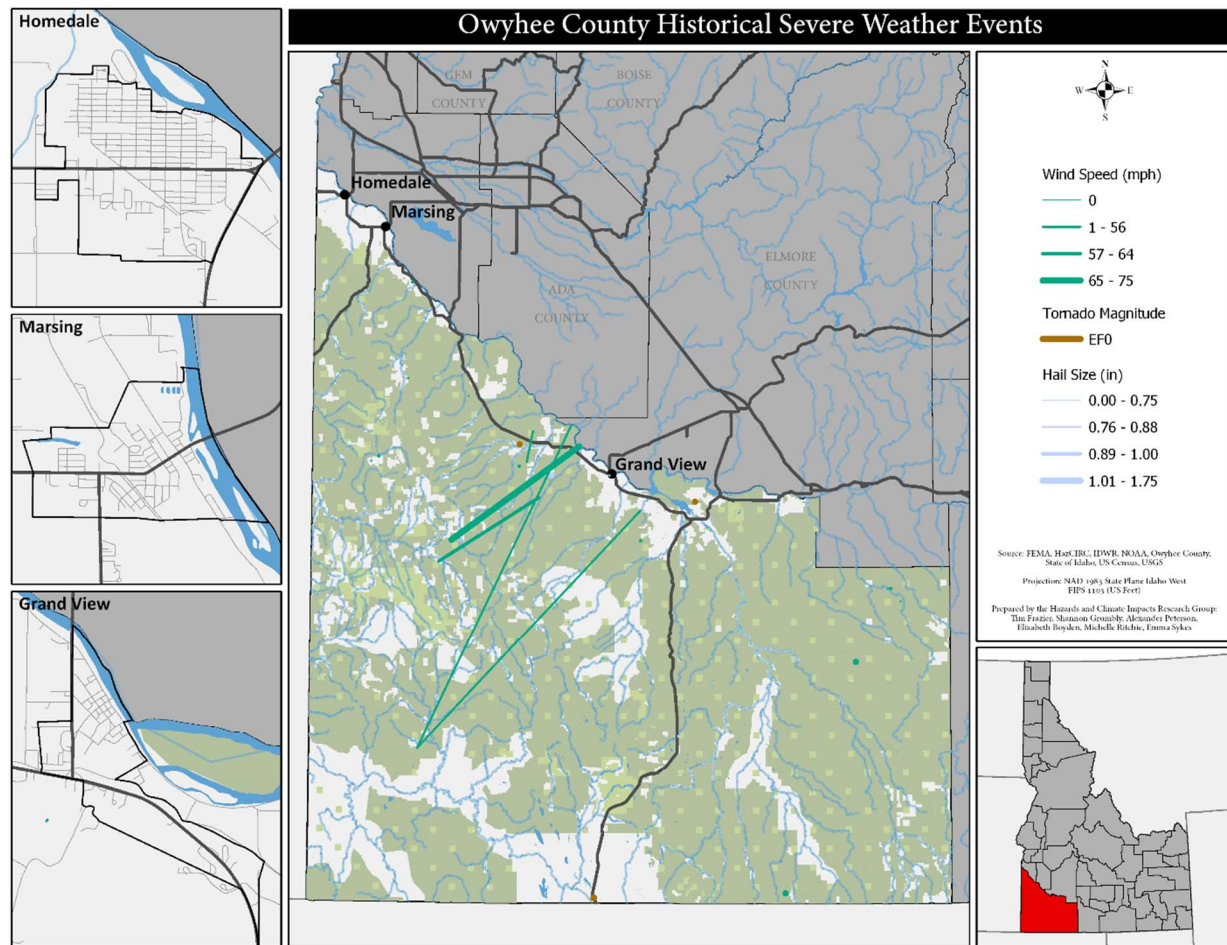


Figure 41. Historical severe weather events

5.11.5 Hazard Exposure & Vulnerability

Severe weather can occur anywhere within Owyhee County, exposing all individuals and structures to a potentially damaging event. Individuals with above average sensitivity are more likely to experience losses should they be impacted by a severe weather event while those with below average adaptive capacity are less likely to overcome impacts. Severe weather can also impact critical and essential facilities, such as municipal water systems, wastewater treatment plants, and more. See problem statements below.

5.11.6 Problem Statements

- Severe weather can occur anywhere within Owyhee County, exposing all individuals and structures to a potentially damaging event that may result in losses such as those that have historically occurred (see Table 66 and 67). Within the County, there are approximately 3,000 residential structures and an estimated \$416 million dollars' worth of residential structure values vulnerable to severe weather. Residential structures are at high risk from utility outages and structural damage from high winds and fallen trees. Severe weather can also impact critical and essential facilities, such as municipal water systems, wastewater treatment plants, and more.
- Severe weather can occur anywhere within the City of Marsing, exposing all individuals and structures to a potentially damaging event that may result in losses such as those that have historically occurred (see Table 66 and 67). Within the City, there are approximately 200 residential structures and an estimated \$22 million dollars' worth of residential structure values vulnerable to severe weather. Residential structures are at high risk from utility outages and structural damage from high winds and fallen trees. Severe weather can also impact critical and essential facilities, such as municipal water systems, wastewater treatment plants, and more.
- Severe weather can occur anywhere within the City of Grand View, exposing all individuals and structures to a potentially damaging event that may result in losses such as those that have historically occurred (see Table 66 and 67). Within the City, there are approximately 100 residential structures and an estimated \$12 million dollars' worth of residential structure values vulnerable to severe weather. Residential structures are at high risk from utility outages and structural damage from high winds and fallen trees. Severe weather can also impact critical and essential facilities, such as municipal water systems, wastewater treatment plants, and more.
- Severe weather can occur anywhere within the City of Homedale, exposing all individuals and structures to a potentially damaging event that may result in losses such as those that have historically occurred (see Table 66 and 67). Within the City, there are approximately 700 residential structures and an estimated \$100 million dollars' worth of residential structure values vulnerable to severe weather. Residential structures are at high risk from utility outages and structural damage from high winds and fallen trees. Severe weather can also impact critical and essential facilities, such as municipal water systems, wastewater treatment plants, and more.

5.11.7 Land Use & Future Development

All new development is at risk to severe weather. Development in rural areas and areas with limited road network are especially vulnerable to severe weather, as inclement weather can result in road closures, wildfire, and other cascading hazards.

5.12 Wildland Fire



5.12.1 Overview

Numerous wildland fires (also known as wildfires) have burned in Owyhee County. Like many of the counties of the State of Idaho, wildfire often poses a high risk to the county's populations, structures, economies, and natural resources. The high percentage of federally and state managed lands within the county (in excess of 80% of all lands) and the checkerboard distribution of those lands increases the impact of wildland fire on Owyhee County's citizens and economy. Together, the fuels, weather, land ownership, and topography of the county make wildfire an annual hazard with potentially devastating consequences. The 2017 plan update attached the county's CWPP (see Appendix H). However, to align the risk rankings, the HMP includes a stand-alone hazard profile.

Table 68. Wildfire summary

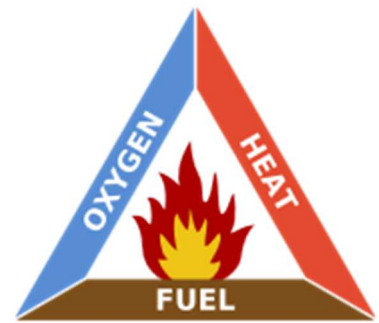
	1980-2008	2009-2017	Total
Occurrences	181	33	214
Disaster Declarations	-	-	-
Casualties	1 Fatality	-	1 Fatality
Property Damage	\$5 Million Property	\$18,193,000 AUM value \$16,400,000 in loss to ranchers	\$39,593,000 estimated
Repetitive Losses	-	-	-

*Greater than 1,000 acres in size

5.12.2 Hazard Description

A wildland fire is defined as any non-structure fire occurring in the wildland. Wildland fires – or wildfires – are unplanned events, and include grass fires, forest fires, and scrub fires. Wildfire is vital to the functioning of many ecosystems within the State of Idaho, and occurs across many different landscapes ranging from arid grassland to coniferous forests on a regular basis. Wildfire as a hazard poses a significant risk to human populations and development due to its extent and destructive potential. Both natural- and human-caused wildfires burn homes and structures, displace populations, and can require significant monetary, human, and technological resources to contain and suppress. Wildfires can also result in secondary hazards, such as flood, mudslide, and landslide.

Wildfires occur when the three primary elements of the fire triangle converge. Wildfires occur when an ignition source (e.g., lightning, an untended campfire, etc.) comes into contact with a combustible material such as vegetation. If sufficient heat is applied and there is adequate oxygen from the ambient air, the material will ignite with the potential to create a wildfire front.



A wildfire front is the intersection of active flame with unburned material, or the smoldering transition between unburned and burned material. There are four classification types of wildland fires:

- Surface Fire – Also known as crawling fires, this type of wildfire burns along forest floors and is fueled by low-lying vegetation such as leaf and timber litter, grass, and shrubbery.
- Ground Fire – These fires move slowly and normally have low damage potential. They are fed by roots, duff, and other buried organic matter, and can burn slowly for lengths ranging from days to months.
- Ladder Fire – These fires consume the material between low-level vegetation and tree canopies. A ladder fire can be a transition from a surface fire to a crown fire.
- Crown Fire – Also known as canopy or aerial fires, this type of wildfire burns suspended materials at the canopy level, such as vines, mosses, leaves, and needles. Crown fires can be devastating, and can spread rapidly dependent on conditions. Conditions that determine crowning include canopy height, weather (especially wind), suspended materials, and canopy continuity.

Wildfire is significantly affected by three principle factors:

- Topography – The arrangement of natural and built environments significantly influences fire behavior, primarily due to the movement of air over the terrain. For example, gulches and canyon act as chimneys by funneling air, intensifying wildfire with the potential to cause rapid spread. Other topographic factors include ridge tops and south-facing aspects, both of which complicate fire behavior with the potential to intensify wildfire. Likewise, slope and terrain

type can act to inhibit or amplify wildfire intensity. Wildfire spreads rapidly up steep slopes, especially those on south-facing aspects where solar radiation preheats and dries fuels. Downslope wildfires spread more slowly, while ridgetops can act as breaks to slow or prevent further spread.

- Fuel – Fuels are combustible material ignitable by wildfire, varying by burn qualities and quantities across a landscape. Often, fuels are classified by weight or volume and type, and expressed as fuel loading (i.e., tons per acre). Fuel types are classified by their estimated potential energy, expected flame length if ignited, and the effort required to contain a fire in a given fuel. Fuels are generally classified into three categories:
 - Ground Fuel – Vegetation close to or on the ground, including dead grass and leaves, pine needles, twigs, and branches.
 - Surface Fuel – Vegetation proximate to the ground but not lying on the ground. Usually entails shrubs, grasses, and low-hanging branches. Also known as ladder fuels.
 - Crown Fuel – Located in the crowns or tops of trees, crown fuels can be volatile and burn rapidly at extreme temperatures.
 - Other fuel-related factors that affect wildfire are fuel continuity and fuel moisture. Fuel continuity represents the distribution of fuels over the landscape and within a forest. Fuel moisture is the percentage of saturation within the fuel, and varies according to climatic and meteorological conditions. Low fuel moisture can significantly contribute to the ignition and severity of wildland fire.
- Weather – The most variable of all factors influencing wildfire, weather can ignite wildfire, cause it to spread and intensify, and also inhibit or dampen wildfire. High temperature, low humidity, and lightning strikes can result in significant wildfire activity, whereas cool temperatures, high humidity, and precipitation can suppress wildfire activity. Fronts and thunderstorm-produced winds impacts and directs wildfire fronts and flame length, as sudden changes in wind speed and direction can result in unpredictable and variable wildfire activity. The most damaging wildfires are usually driven by strong winds.

5.12.3 Hazard Location, Extent & Probability

Wildland fire can occur in any landscape in Owyhee County and all jurisdictions as seen in Figure 42. To assess wildland fire risk, flame length, fireline intensity, and crown fire activity are analyzed given their importance in determining potential fire hazards.

- Flame Length – Fire suppression activities and strategies are determined by fire behavior and intensity. Fire behavior can be thought of as a function of flame length, or the distance from the ground at the leading edge of the flame to the flame's tip. Flame length varies from less than one foot in length, to over 10 feet in length. Table 64 details flame length classifications.

- **Fireline Intensity** – A numerical product of a fire’s rate of spread, fuel consumption, and heat yield at a given point on a fire’s perimeter.
- **Crown Fire Activity** – Canopy base height is defined as the lowest point in a stand of trees where fuel is available for the vertical propagation of fuel through the canopy. Fire has a greater chance of transitioning into the tree canopies (becoming a crown fire) the closer the tree canopy is to the surface.

Table 69. Flame length and fire intensity classifications

Class	Flame Length	Fireline Intensity	Vegetation Types	Fire Suppression
Low	<4 ft	<100 Btu/ft/s	Grasses, forbs, cropland, some timber	Fires can generally be attacked at the head or flanks by crews with handtools. Handline should hold the fire.
Medium	4-8 ft	100–500 Btu/ft/s	Grasses, forbs, cropland	Fires are too intense for direct attack by handtools; handline cannot be relied on to hold fire. Bulldozers, engines, and retardant drops can be effective.
High	8-11 ft	501–1,000 Btu/ft/s	Sagebrush, timber	Fires can present control problems; torching, crowning, and spotting. Control efforts at head likely ineffective.
Very High	>11 ft	>1,000 Btu/ft/s	Sagebrush, timber	Crowning, spotting, and major fire runs probable. Control efforts at head ineffective.

This risk analysis likewise employed a modified wildfire risk model originally developed by IDL. The wildfire model incorporates slope, aspect, vegetation, wildfire occurrences, and the WUI. Slope and aspect were calculated from 10-meter DEMs obtained from USGS. Vegetation and wildfire occurrence data were obtained from the Landscape Fire and Resource Management Planning Tools (LANDFIRE) program, and the WUI used in the model was obtained from the SHMP.

Previous research showed slopes above 10 degrees, and east-, south-, and west-facing aspects more at risk to wildfire. Vegetation was classified into conifer, brush, and grass according to the potential fire severity. Fire occurrences were summarized by populated census block, and areas in the WUI were weighted more heavily than areas outside the WUI. Each factor was classified according to the impact and influence on wildfire and summed to create a composite of the biophysical risk. The results were then classified into low, moderate, and high risk for the Owyhee County (Figure 42).

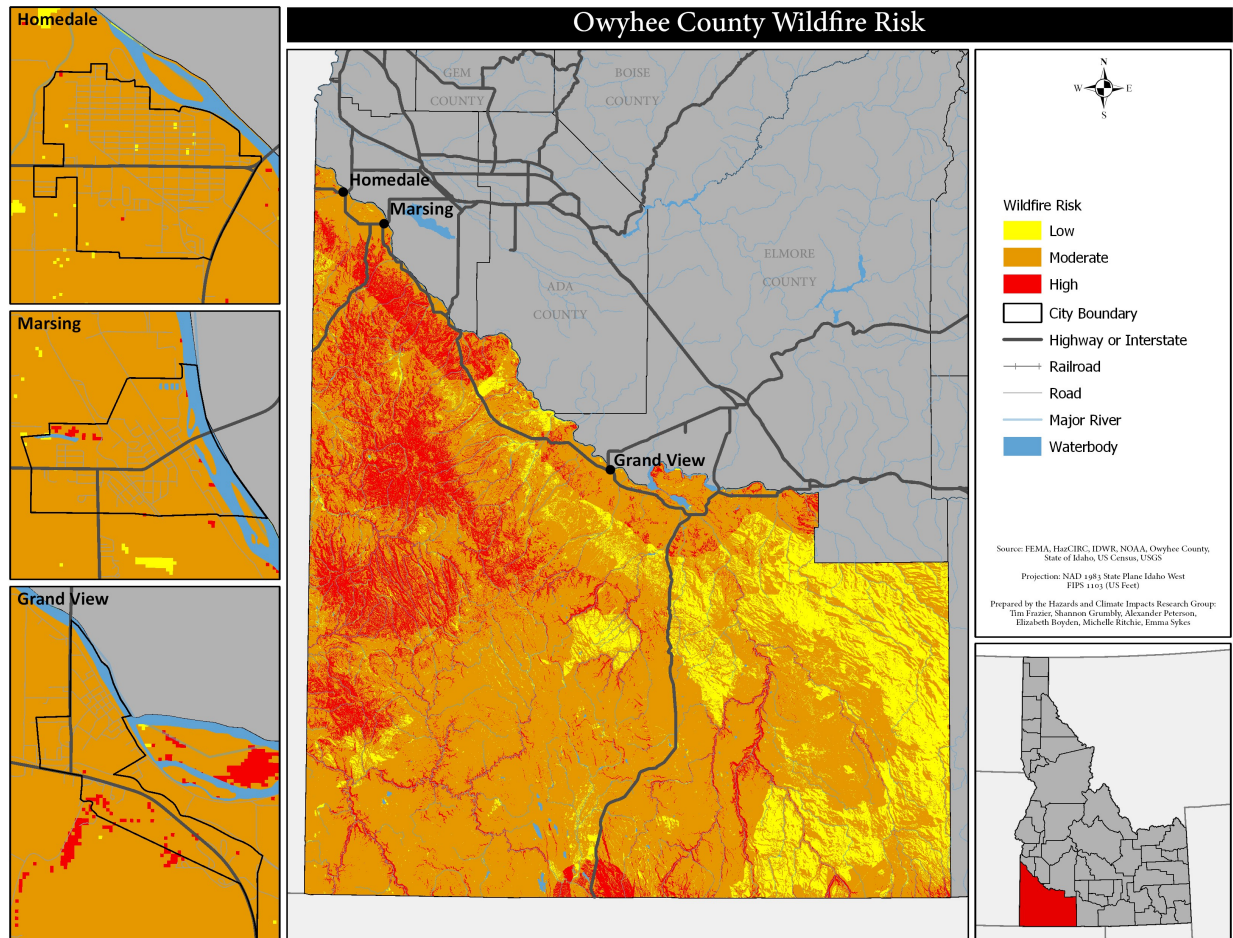


Figure 42. Wildfire risk model map

5.12.4 Hazard Occurrences

Hundreds of wildfires have burned in Owyhee County from 1980 to the present date. Wildfire is an annual event in the county, as it is in many counties across the state. The county has experienced more than 200 wildfires burning more than 1,000 acres (Table 70). The largest wildfire for the period of record is the Murphy Complex Fire in 2007, which burned more than 650,000 acres. In 2010, the Long Butte fire then burned more than 300,000 acres, followed by the Soda Fire in 2015 which burned approximately 280,000 acres. In total, from 1980 onwards more than two million acres have burned across the county.

Table 70. Wildfire occurrences

Year	Fire Name	Ignition Cause	Acres Burned
1980	100 MILEPO	Human	1,720
1980	SAYLORCREE	Human	5,334
1980	BIG HILLY	Natural	6,440
1980	INDIANSPRI	Natural	6,300
1980	POISONBUTT	Human	2,000
1980	DEVILS CR2	Human	2,320
1980	SQUEAKY	Natural	8,950
1981	POT HOLE	Human	3,320
1981	SUGAR CK	Human	16,800
1981	BROWNS GLC	Natural	19,505
1981	CLOVER	Human	1,558
1981	HORSEBUTTE	Human	2,260
1981	SINKERBUTT	Human	3,447
1982	BIG DRAW	Human	2,814
1982	SINKERBUTT	Natural	1,440
1982	POTHOLE 2	Human	2,385
1982	CROWS NEST	Human	2,730
1982	SORRYCHARL	Natural	14,690
1983	WATERHOUSE	Human	5,778
1983	SAYLOR RNG	Human	2,067
1983	BIG BEND	Human	1,072
1983	POT HOLE	Natural	2,070
1983	BROWNS CK	Natural	27,360
1984	HOT CK	Natural	2,816
1984	HOLEN ROCK	Human	2,641
1984	BIRCH CR	Human	1,248
1984	BROWNSGULC	Human	5,520
1984	BLUE BUTTE	Natural	1,500
1984	HORSEBASIN	Natural	9,009
1984	BENNETT	Natural	25,840
1984	CHEAT II	Natural	7,695
1984	DUNES	Natural	19,200
1984	BIG DRAW 2	Natural	23,040

Year	Fire Name	Ignition Cause	Acres Burned
1984	BIG HILL	Natural	2,347
1984	BLACKSTONE	Natural	3,299
1984	WNTR CMP 2	Natural	2,559
1985	WILDWEST	Human	2,559
1985	MILLER TBL	Natural	1,711
1985	WATERHAUL	Natural	2,482
1985	W. CLOVER	Natural	10,050
1985	SUGAR CR	Natural	1,231
1985	CROWS NEST	Natural	28,883
1985	CROWS II	Natural	4,508
1985	WINTERCAMP	Natural	11,535
1985	HOT CR	Natural	9,744
1985	WEST WICK	Natural	7,363
1985	BLACKBUTTE	Natural	1,110
1985	GARAT 1	Natural	23,898
1985	GARAT 2	Natural	3,858
1985	3 CKWELL	Natural	18,936
1985	HORSE BSN	Natural	3,668
1985	COONSKIN	Natural	4,210
1985	HELLWELL	Natural	1,647
1985	W. JUNIPER	Human	1,423
1985	SHEEPSHEAD	Natural	4,554
1985	TERRENCE	Natural	1,281
1985	MP 48	Human	3,780
1985	RYE GRASS	Natural	1,126
1986	SHEEP HEAD	Natural	8,928
1986	BIG LAKE	Natural	23,740
1986	BLACKSTONE	Natural	1,400
1986	BIG HILL	Natural	4,288
1986	JUNIPER	Natural	10,500
1986	WICKAHONEY	Natural	8,020
1986	3CK SCHOOL	Natural	1,500
1986	BLUE BUTTE	Natural	52,463
1986	RIDDLE	Natural	3,575

Year	Fire Name	Ignition Cause	Acres Burned
1986	PORCUPINE	Natural	2,880
1987	WILSON	Natural	1,398
1987	BROWNS CRK	Natural	58,152
1987	INDIAN TUB	Natural	19,682
1987	C J STRIKE	Natural	1,635
1987	BIG HILL	Natural	3,840
1987	RIZZI TABL	Natural	6,650
1988	BLACKSTONE	Natural	3,302
1988	BRKN WAGON	Human	8,536
1989	LITTLE CK	Natural	1,115
1990	RATTLER	Natural	1,096
1990	CASTLE CK	Natural	10,670
1991	JARBIDGE	Natural	3,069
1991	3CKWELL	Natural	3,757
1991	RED CANYON	Natural	2,100
1991	FLAT CK	Natural	1,044
1992	WELL FIELD	Natural	12,677
1994	CRAWFISH S	Human	2,889
1994	WEST SPR.	Human	3,430
1994	DEVILS CR.	Natural	3,308
1994	WHITE SIDE	Natural	1,375
1994	CROWSNEST	Human	8,045
1994	TEXAS BASN	Human	1,195
1995	POT HOLE	Natural	3,842
1995	SAILOR	Natural	2,392
1995	THREE CK	Human	2,426
1995	TWIN BUTTE	Natural	30,237
1995	TWINBUTTE2	Natural	2,632
1995	TUANA	Natural	64,193
1995	S. CLOVER	Natural	13,456
1995	INSIDE DES	Natural	4,312
1995	MILLERTAB.	Natural	1,583
1995	HEIL WELL	Natural	1,660
1995	SIGNALBUT.	Human	6,698

Year	Fire Name	Ignition Cause	Acres Burned
1996	LOVERIDGE	Natural	2,522
1996	GRINDSTONE	Natural	1,264
1996	JARVIS CK	Human	1,038
1996	SINKERBUTT	Human	9,164
1996	NOTCHBUTTE	Human	24,608
1996	BROWNSGLCH	Natural	22,374
1996	BRKWGN	Natural	2,297
1996	TWINBUTTE	Natural	2,806
1996	POISON CK	Natural	1,339
1996	MP50/HWY51	Human	2,805
1996	DORSEY	Natural	1,000
1996	HOT SPRING	Natural	1,226
1996	3 CR. WELL	Human	25,315
1996	SWINTRCAMP	Natural	5,834
1996	CRANEFALLS	Natural	4,004
1996	COVE	Natural	1,965
1997	BLUEGULCH	Natural	1,823
1998	ROSWRTHS#1	Human	1,047
1998	BAD	Natural	1,341
1998	THIRD FIRE	Natural	2,607
1999	Buck	Natural	2,513
1999	Doe	Natural	6,455
1999	LITTLE BIG	Natural	4,652
1999	MILLER TIM	Natural	1,149
1999	DEER CK	Natural	2,684
1999	BROKE WAGO	Natural	5,026
1999	Fritz Spur	Human	2,109
1999	MidButte 1	Natural	6,908
1999	SHOOFLY	Natural	7,502
1999	Impact SE	Human	4,802
1999	Buck N Doe	-	1,030
2000	SE Impact	Human	9,210
2000	5N 3CREEK	Natural	2,144
2000	BLUE CREEK	Natural	3,426

Year	Fire Name	Ignition Cause	Acres Burned
2000	Flat Broke	Natural	5,787
2000	WORLEYDRAW	Human	1,702
2000	MEADOW	Natural	2,083
2000	GRASS FIRE	Natural	35,613
2000	CRIMSONCLO	Natural	16,502
2000	Arch Canyn	Human	4,114
2001	CrimsonClv	-	3,350
2001	NotchButte	Natural	11,198
2001	Big Knob	Natural	8,767
2001	Doe Flat	Natural	6,263
2001	Mp47Hwy51	Human	5,928
2001	Rough Diamond	Human	8,904
2002	BIG CROW	Natural	2,800
2002	GUFFEY	Natural	1,346
2002	CLOT	Natural	4,218
2002	HORSESKIN	Natural	8,140
2002	SHEEPSHEAD	Human	2,120
2002	GRINDER	Natural	3,459
2003	PILGRIM	Human	1,623
2003	WILKINS	Natural	4,848
2004	SOUTH POT	Natural	1,086
2005	BROWN DUNE	Natural	9,133
2005	EAST HORSE	Natural	1,240
2005	CLOVER	Natural	192,846.1
2005	MARSHALLBT	Natural	2,575
2005	INDIANRDGE	Natural	3,414.4
2006	LITTLE SOUTH	Natural	1,011
2005	20 MILE	Natural	1,254.9
2006	SAILOR CAP	Human	61,929.1
2006	OLD WIND	Human	3,264.6
2006	IMPACT AREA	Human	1,107.4
2006	Chubby Spain	Natural	6,074
2006	BIG DRAW	Natural	1,761.9
2006	GUFFEY	Natural	1,356

Year	Fire Name	Ignition Cause	Acres Burned
2007	BRUNEAU ARMS COMPLEX	Natural	3,495
2007	YATAHONEY	Natural	1,110
2007	SAILOR 2	Natural	2,209
2007	SMITHS CROSSING	Natural	3,000
2007	INSIDE DESERT	Natural	3,041
2007	ELK MOUNTAIN*	Natural	78,429
2007	BOULDER CREEK	Natural	4,333
2007	CRUTCHER CROSSING	Natural	38,124
2007	RED CANYON	Natural	1,500
2007	BALD MOUNTAIN	Natural	7,010
2007	Murphy Complex Fire	Natural	652,016
2008	BROWNS	Human	1,279
2010	Dove Spring	Natural	1,526
2010	Sailor Creek	Natural	9,837
2010	Black Butte	Natural	16,126
2010	Big Draw	Natural	12,389
2010	Long Butte	Natural	306,113
2010	Big Draw 2	Natural	2,217
2010	CROWBAR	Natural	29,508
2010	BLACKSHEEP	Natural	4,337
2011	BIG HILL	Natural	67,061
2011	Pole Creek	Natural	1,294
2011	Sailor Creek	Natural	1,722
2011	Grindstone	Natural	21,604
2011	Hot Springs 2	Natural	10,394
2012	SOUTH INDIAN	Natural	14,095
2012	CON SHEA	Human	8,898
2012	JACKS	Natural	48,894
2012	EAST ROCK	Natural	2,688
2012	TINDALL	Natural	3,222
2012	Diamond Ranch	Natural	3,028
2012	JUMP	Human	1,762
2012	GRASSHOPPER	Natural	2,729

Year	Fire Name	Ignition Cause	Acres Burned
2013	Bruneau	Natural	4,913
2013	Horse Butte 2	Natural	5,681
2013	Browns Gulch	Natural	4,936
2013	Coonskin	Natural	4,378
2013	Sheepshead	Natural	2,301
2013	BONJOUR	Natural	1,174
2013	SUNK	Natural	2,121
2013	JUNI	Natural	2,225
2015	Catspaw	Natural	1,616
2015	Saylor	Natural	2,260
2015	Soda Fire	Natural	283,180
2015	Celebration	Human	6,868

*One of six fires composing the Murphy Complex Fire.

While Figure 43 shows the spatial distribution of wildland fires for those reported to the LANDFIRE database it appears to lack full data regarding the western portion of the county. Table 43 shows a majority of reported fires are located in the eastern areas of the county. Local knowledge obtained from County Planning and Zoning and Emergency Management show distribution of fires across the western portion of the county as well. With the exception of the more densely populated private lands which lie adjacent to the Snake River, Owyhee County is a checkerboard of land ownership. Ownership within that checkerboard structure is predominantly federal. This distribution is the result of the Township survey and land distribution dating to the settlement of the west. In that system, the Township contained 36 sections of land, of which 2 sections were set aside for the state school system. During the greatest period of settlement under the Homestead Act, some federal lands were “homesteaded” and transferred to private ownership. This settlement pattern, though granting private ownership of relatively small parcels across the county, still left Federal, and, to a lesser extent, state, agencies managing the majority of the lands across the county which are at greatest risk of wildfire.

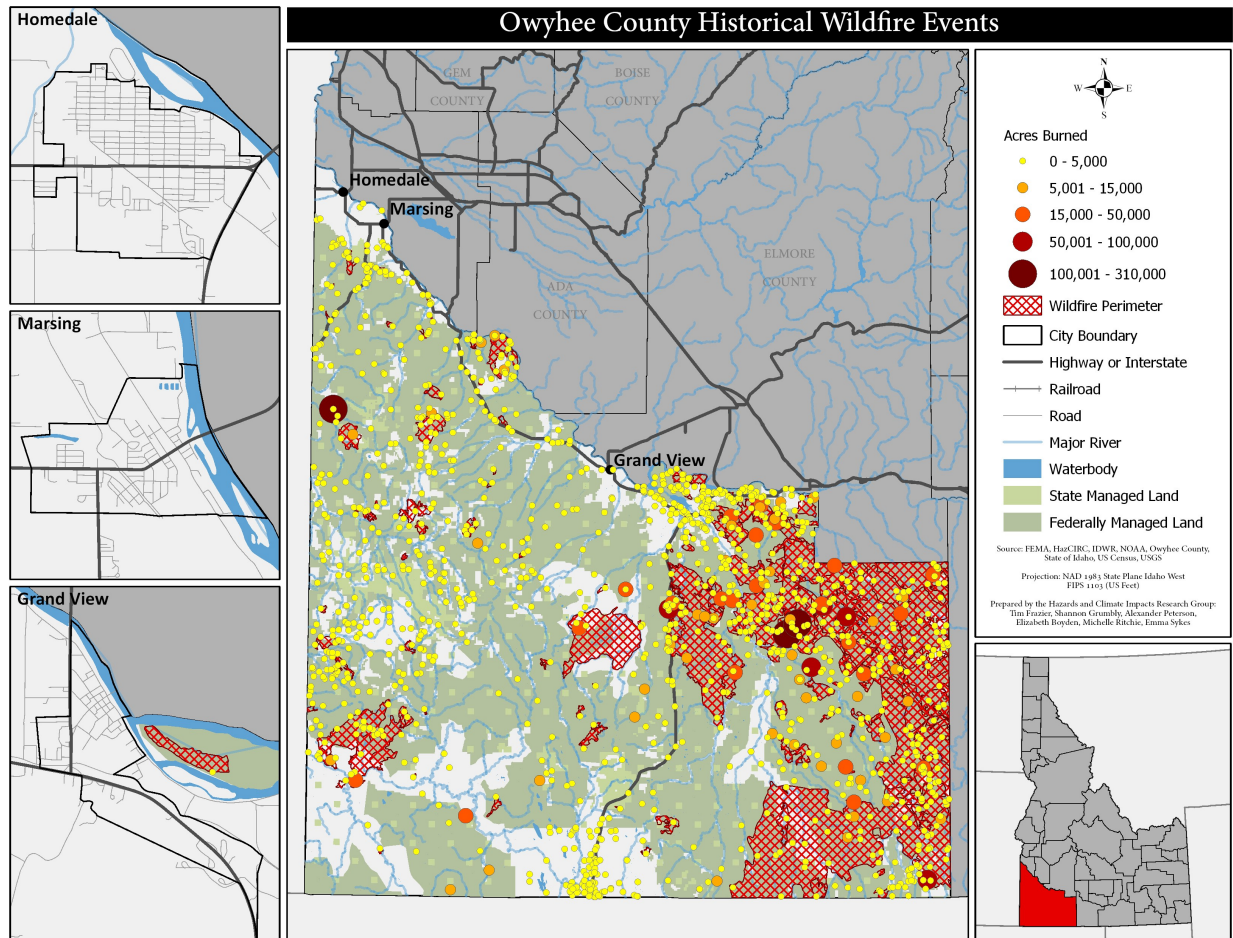


Figure 43. Historical wildfire events

5.12.5 Hazard Exposure & Vulnerability

Table 71 through 73 shows the distribution of population, structures, and structure value in each of the wildfire risk classes from the model. However, Owyhee County is unique to the fact that wildfires impact livelihoods as the economy largely depends on grazing operations in the less populated areas of the county. For example, although no primary residences or lives were lost in the Soda Fire, livelihoods were lost or severely damaged. The impact of the Soda Fire is estimated to be at approximately \$35 million thus far to the county economy and to private operators.

Table 71. Population exposure to wildfire

Risk	Grand View	Homedale	Marsing	Unincorp.
Low	-	7	-	243
Moderate	236	1,950	558	6,046
High	-	-	-	512

Table 72. Structure exposure to wildfire

	Risk	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	Low	-	-	-	-	-	-	-
	Mod	91	9	-	3	-	3	4
	High	-	-	-	-	-	-	-
Homedale	Low	3	1	-	-	-	-	-
	Mod	656	65	7	4	10	2	4
	High	-	-	-	-	-	-	-
Marsing	Low	-	-	-	-	-	-	-
	Mod	194	20	3	2	4	1	3
	High	-	-	-	-	-	-	-
Unincorporated	Low	115	-	1	1	-	-	1
	Mod	2,724	52	15	17	6	1	5
	High	139	3	2	1	1	2	-

Table 73. Structure value exposure to wildfire (thousands of US\$)

	Risk	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	Low	-	-	-	-	-	-	-
	Mod	\$11,679	\$3,853	\$226	\$544	-	\$2,262	\$2,369
	High	-	-	-	-	-	-	-
Homedale	Low	\$477	\$462	-	-	-	-	-
	Mod	\$101,900	\$19,961	\$3,346	\$2,107	\$4,861	\$328	\$2,832
	High	-	-	-	-	-	-	-
Marsing	Low	-	-	-	-	-	-	-
	Mod	\$21,886	\$9,779	\$1,135	\$734	\$2,272	\$246	\$2,522
	High	-	-	-	-	-	-	-
Unincorporated	Low	\$14,235	\$48	\$137	\$155	-	\$86	\$406
	Mod	\$382,788	\$21,679	\$8,155	\$14,675	\$4,036	\$901	\$3,449
	High	\$17,642	\$683	\$261	\$1,015	\$844	\$2,257	-

The SERV model was used to assess societal vulnerability (Figure 44). Vulnerability was found to be spatially variable across the county, with notable concentrations of average and above average vulnerability proximate to Grand View. Much of the high vulnerability is found in the more rural unincorporated areas of the county.

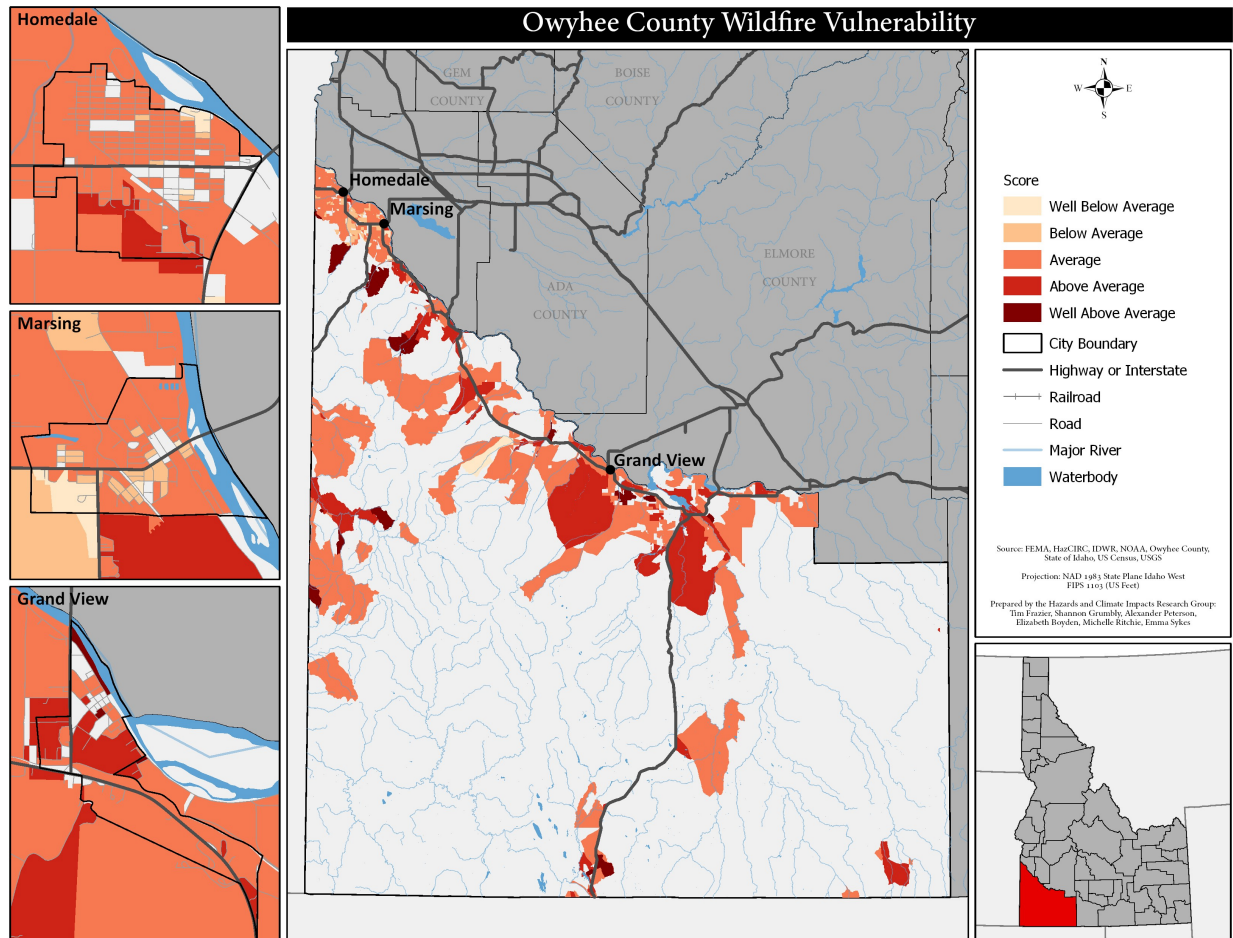


Figure 44. Socioeconomic vulnerability to wildfire events

5.12.6 Land Use & Future Development

Current land use as well as future development in Owyhee County will on some level be at risk to wildfire. Cattle grazing is a vital part of Owyhee County's tax base, and wildfires have adversely impacted the economy due to immediate losses from large fires (livestock, forage, structures) and from post-fire rehabilitation actions which have stalled grazing operations for up to a minimum of two years and up to four years. All other multiuse, residential, commercial, and industrial zoned areas in the county have a low to moderate risk, while agricultural zones areas have moderate to high risk since a significant proportion of agricultural zoned areas are dry grazing rangeland. However, in the higher-density residential areas in and around the incorporated cities more structures, and infrastructure are exposed to potential wildfire events. If the current grazing use of the unincorporated lands within the county is made so uneconomical as to cause those businesses to cease, rural subdivisions are also likely to be developed throughout those portions of Owyhee County. Increased development in those areas would increase wildfire exposure as subdivisions bring the

development of critical infrastructure, structures, as well as increased populations. Additionally, the county's rural nature and limited access to water resources may exacerbate wildfire risk as the ability to suppress fires significantly diminishes without access to water sources.

5.13 Risk Calculations & Rankings

5.13.1 Overview

Due to challenges in replicating the Hazard Risk Calculation methodology from the former plan, a statistical method was employed to better inform the mitigation strategy. Risk calculations provide a numerical ranking of the relative impact of each hazard, taking into account both past occurrences and event magnitudes, and the current exposure of populations and structures. The numerical output from each hazard-specific risk calculations were then compared and ranked to allow for a standard means of comparing disparate hazards that often entail many different impacts.

The standardized scores, risk score, and hazard rankings are shown in Table 74. Due to limitations in the data, risk calculations were limited county-wide calculations and to avalanche, communicable disease (specifically pandemic influenza), earthquake, flood, hazmat, landslide, severe weather, and wildfire.

Due to these data limitations, the planning team and local officials have said that since the last plan adoption, efforts and resources were primarily dedicated to Wildfire and Severe Weather. Over the plan's 2017 to 2022 lifecycle, this resource allocation is expected to stay the same and therefore, hazard risk priorities have stayed the same since 2008. This is consistent across all jurisdictions in the county.

Probability of Occurrence	High		Severe Weather	Wildfire
	Medium		Pestilence	Epidemic Hazardous Materials
	Low	Landslide Volcano	Earthquake Terrorism / Civil Unrest	Flood Dam Failure
		Low	Medium	High
		Potential to Impact People, Structures, Infrastructure, and the Economy		

Figure 45. Phase 1 Hazard Assessment of Owyhee County for 2008 HMP

5.13.2 Methodology

To derive the risk calculation, population and structure value exposure for all hazard magnitudes was weighted and summed. Return periods, fatalities, injuries, property and crop damage from past occurrences, and the weighted exposure were standardized using the z-score. The final risk score was derived from the following equation:

$$\text{Risk} = \text{Return Period} * (\text{Fatalities} + \text{Injuries} + \text{Property Damage} + \text{Weighted Exposure})$$

Table 74. Risk calculations and rankings

	Standardized Scores							Risk Ranking
	Return Period	Fatalities	Injuries	Prop Damage	Population Exposure	Structure Exposure	Risk Score	
Avalanche	0	-0.71	0	-0.45	-1.33	-1.29	0.00	6
Earthquake	0.25	-0.71	0	-0.45	0.36	0.41	0.10	4
Flood	1.25	1.41	0	-0.45	0.96	1.05	3.72	3
Landslide	0	-0.71	0	-0.45	-1.33	-1.29	0.00	5
Severe Weather	5.25	1.41	0	-0.44	0.16	-0.06	5.63	2
Wildfire	4.125	-0.71	0	2.24	1.18	1.18	16.05	1

VI. MITIGATION STRATEGY

6.1 Overview

Owyhee County's mitigation strategy represents a comprehensive effort to reduce or eliminate potential losses from the hazards detailed in the risk assessment. The goals, objectives, and actions that comprise the mitigation strategy were carried forward from the former plan, with additional goals, objectives, and actions developed through collaborative effort across the county that included its communities, various State and Federal agencies, and through public engagement.

6.1.1 FEMA Requirements

The 2017 plan update developed the mitigation strategy consistent with the process and requirements detailed by FEMA. This section satisfies the following FEMA requirements:

- FEMA 44 CFR §201.6(c)(3) – A mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.
 - FEMA 44 CFR §201.6(c)(3)(i) – A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.
 - FEMA 44 CFR §201.6(c)(3)(ii) – A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure. All plans approved by FEMA after October 1, 2008, must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate.
 - FEMA 44 CFR §201.6(c)(3)(iii) – An action plan, describing how the action identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to cost benefit review of the proposed projects and their associated costs.
 - FEMA 44 CFR §201.6(c)(3)(iv) – For multijurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.
- FEMA 44 CFR §201.6(c)(4)(ii) – A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive capital improvements, when appropriate.

6.2 Mitigation Successes & Highlights

Owyhee County actively mitigates against various hazards and risks. The following are some of the successes and highlights of past mitigation efforts:

- Incorporating the Owyhee County HMP into the Comprehensive Plan – Within the most recent Owyhee County Comprehensive Plan dated August 9, 2010, the Owyhee County All Hazards Mitigation Plan (HMP) has been incorporated. The HMP, along with other plans such as the Fire Mitigation Plan, are also included by reference in the comprehensive plan. Since the size of the referenced plans are substantial, the decision was made to include them by reference only. However, incorporation by reference neither diminishes the importance of the plans nor prevents them from use in the Planning and Zoning Commission's or Board of County Commissioners' Decision Process. As decisions are made in regard to applications for use, the information within these plans are available to the deciding body, and used by them. Additionally, the Owyhee County Initiative Agreement was incorporated into the county's Natural Resources Plan, which was then subsequently adopted into the comprehensive plan.
- Replacing Third Street Bridge in Silver City – The Third Street Bridge in Silver City was replaced with a structure capable of accommodating at least a 100-year flood as well as heavy truck use. New timbers, donated by the Idaho Department of Transportation (ITD) were donated and the Owyhee County Road and Bridge Department used their budget to install them.
- Developing and Delivering Public Education Programs on Hazard Mitigation – Progress was made by developing and adopting public education programs on hazard mitigation. For example, Alert Sense was put in place in 2014. This allowed for easy and efficient communication with the public by way of emergency warnings. For example, the system was used when a wildfire broke out in Soda Springs. The system is tested annually and a test drill for dam failure is also conducted in the City Grand View. Additionally, the elementary schools in the county practice evacuation drills. Sirens in the area can also be turned on directly by Idaho Power and the school has radio communication with them should an emergency occur. Other public outreach occurs through the county's website and Facebook pages, as well as at the Emergency Operation Center (EOC).
- Developing Policy to Enforce all International Building Codes as Adopted by the State of Idaho – As of June 2017, Owyhee County and the City of Grand View have adopted the latest versions of the International Building Codes (IBC). The City of Homedale is in the process of adopting these codes. By adopting the IBC, it ensures that all new construction and updates to existing construction will be held to a higher standard and will aid in the prevention of damages from natural hazards.
- Assessing and Hardwiring Shelters throughout the County for use with a Portable Generator – The Owyhee County emergency shelter and EOC is located in the Owyhee County Museum.

This facility was hardwired for a portable generator, which was then purchased and installed in March of 2015 using a grant from the Bureau of Homeland Security, now Idaho Office of Emergency Management.

6.3 Mitigation Goals

Mitigation goals and objectives frame the mitigation strategy, and provide the framework in which mitigation actions are situated. Mitigation goals are general statements of desired outcomes for the community, and provide direction for decisions within the strategy. In general, there were no major changes in the 2017 update to the plan's overarching goals listed in the former plan. Those goals that pertained to mitigation actions completed and not carried forward were removed. The following goals structure the mitigation strategy:

- 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 natural hazard preparedness in the county
- Reduce the impact of hazard events and potential losses incurred by both public and private residents and entities
- Develop land use policies to alleviate potential hazard risks and impacts for future development
- Increase county and city participation in the National Flood Insurance Program and strive to reduce premiums by lowering their Community Rating System score
- Strategically locate and plan infrastructure projects that take into consideration the impacts of natural hazards

6.4 Mitigation Actions

6.4.1 Overview

Mitigation actions are specific projects, plans, programs, policies, or activities designed to reduce risk or eliminate risk to human life and property from the hazards identified in the risk assessment. The 2017 plan update steering committee reviewed the mitigation actions listed in the former plan,

assessed the level of progress and challenges to successful implementation, and made decisions on which mitigation actions to carry forward or eliminate.

Table 75 details the 2017 HMP update status of each mitigation action. These actions have either been marked as Completed, Deferred, Ongoing/Iterative, Deleted. In addition to 2017 statuses, the mitigation actions that were carried forward into the plan’s next lifecycle have updated lead agencies, timelines, costs, and funding sources where appropriate. Following the table of mitigation actions are explanations for those mitigations actions that were removed from the former plan and were not carried forward. There were no new mitigation actions put forth by the county during this 2017 plan update. Any mitigation action that does not explicitly list unincorporated Owyhee County as the lead agency is meant to include all adopting jurisdictions. Although the City of Homedale did not participate in this HMP plan update, mitigation actions were carried over from the former plan for participation and adoption in future plan updates.

Table 75. Owyhee County Mitigation Actions

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
All Hazards	1. Maintain current hazard mitigation programs and deliver additional public education programs on hazard mitigation through publishing articles in the newspaper when avalanche danger is high, conducting a fuel reduction campaign for wildfire, and participating in the "Turn Around Don't Drown" program for flooding.	N/A High Priority	Owyhee County, City of Homedale, City of Marsing, City of Grand View, Owyhee Conservation District, Southwest Idaho RC&D, and BLM.	Cost Not Provided; Immediate Short Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	Progress has been made through Alert Sense, identification of an EOC, Facebook, and county website
Flood	2. Develop county and city policies to restrict development in flood zone to help prevent losses.	N/A High Priority	Owyhee County, City of Homedale, and City of Grand View.	Cost Not Provided; Immediate	Deleted	N/A	N/A
Landslide and Avalanche	3. County policy to restrict development near landslide and avalanche prone landscapes.	N/A High Priority	Owyhee County	Cost Not Provided; Immediate	Deferred; Avalanche added	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Funding: FEMA grant funding, Owyhee County	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						budget or seek funding through list of funding sources	
Flood	4. Encourage county participation in the Flood Mitigation Assistance Program.	N/A High Priority	Owyhee County	Cost Not Provided; Immediate	Deleted	N/A	N/A
All Hazards	5. Incorporate the Owyhee County Multi-Hazard Mitigation Plan into the Owyhee County Comprehensive Plan, where applicable.	N/A High Priority	Owyhee County	Cost Not Provided; Immediate;	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	6. Maintain the City of Homedale participation in National Flood Insurance Program.	N/A	Owyhee County, City of Grand View, and City of Homedale	Cost Not Provided; Immediate Short Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Short Term	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	7. Request FEMA update of Flood Insurance Rate maps.	N/A	Owyhee County, City of Grand View, City of Homedale, and FEMA	Cost Not Provided; Immediate	Deferred	<p>Cost not provided by County; seek cost within 6 months of adoption</p> <p>Timeline: Immediate</p> <p>Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources</p>	Limited by funds and not considered a priority by FEMA
Flood	8. Request FEMA Flood Insurance Studies for unincorporated areas in Owyhee County, particularly the Bruneau Valley.	N/A High Priority	Owyhee County and FEMA	Cost Not Provided; Immediate	Deferred	<p>Cost not provided by County; seek cost within 6 months of adoption</p> <p>Timeline: Immediate</p> <p>Funding: FEMA grant funding, Owyhee County</p>	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						budget or seek funding through list of funding sources	
All Hazards	9. Develop county and city policy to actively enforce all International Building Codes as adopted by the State of Idaho.	N/A High Priority	Owyhee County, City of Grand View, City of Marsing, and City of Homedale	Cost Not Provided; Immediate	Ongoing; City of Homedale and City of Marsing has adopted the IBC; the City of Grandview is in the process of IBC adoption	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	10. Develop ordinance to regulate future construction in the 100-year floodplain within the cities of Grand View and Homedale.	N/A High Priority	City of Grand View and City of Homedale	Cost Not Provided; Short Term	Completed	N/A	N/A
Wildland Fire	11. Continue to adopt and/or amend existing building codes and zoning ordinances as	N/A Not Scored	Owyhee County, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R,	Cost Not Provided; Short Term Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	necessary to address wildland fire risks for all construction within the county.		Bruneau RFD, and Mountain Home AFB FD			Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Wildland Fire	12. Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction.	N/A Not Scored	Owyhee County, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Wildland Fire	13. Develop a formal WUI Advisory Committee to advise County Commissioners on wildland urban interface issues	N/A Not Scored	Owyhee County Commissioners and Emergency Manager	Cost Not Provided; Short Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline:	WUI needs to be defined

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	and treatments.					Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	14. Identify and assess additional facilities including the hospital, LDS Church, and schools in the City of Grandview and hardwire them for use with a portable generator.	N/A Low Priority	Owyhee County, City of Grand View, City of Marsing, City of Homedale, and unincorporated communities.	Cost Not Provided; Immediate Short Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	15. Obtain needed resources for health care facilities, community centers, and other shelters to protect themselves from potential hazards (e.g. sandbags, cots,	N/A Low Priority	Owyhee County, City of Grand View, City of Marsing, City of Homedale, and unincorporated communities.	Cost Not Provided; Immediate Short Term Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Short Term	Red Cross willing to open shelters. County only has sandbags, no other supplies. Grand View has no shelters.

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	nonperishable foods, etc).					Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	16. Evaluate structures located in the flood zone to determine measures needed to protect them from flood waters (elevation of structure, barrier, wet protection, etc).	N/A Medium Priority	Owyhee County, City of Grand View, City of Marsing, City of Homedale, and unincorporated communities.	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	17. Reinforce Well #5 Riverside in Homedale to withstand 500 year flood events.	N/A Medium Priority	City of Homedale	Cost Not Provided;	Completed	N/A	N/A
Earthquake	18. Implement a program to seismically stabilize	N/A Medium Priority	Owyhee County, BLM, Southwest Idaho RC&D, Owyhee Conservation	Cost Not Provided; Short Term	Deferred	Cost not provided by County; seek cost within 6	PDM grants available for this action, but cost-

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	historically and culturally important sites in Flint (stone wall, mill, & two houses), Silver City (powder house, walls, & courthouse), and Oreana (church).		District, City of Grand View, City of Marsing, City of Homedale, and unincorporated communities.			months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	benefit analysis must be done. Some sites listed are privately owned
Earthquake	19. Evaluate existing URM's including the Grand View Medical Clinic, Marsing Fire Station, Marsing Senior Center, Homedale City Hall/Courthouse, Homedale Medical Clinic, and Homedale Assisted Health Care facilities, for seismic stability and implement recommendations for retrofit, if necessary.	N/A Medium Priority	Owyhee County, cities of Grand View, Homedale, and Marsing, Owyhee County Health District, Marsing RFD, and others.	Cost Not Provided; Short Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	20. Post hazard and emergency response related rural signage such as road identification signs, house numbers, and	N/A High Priority	Owyhee County	Cost Not Provided; Immediate	Ongoing	Cost not provided by County; seek cost within 6 months of adoption	House identification complete and evacuation routes listed in Emergency

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	evacuation route signage.					Timeline: Immediate Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	Operations plan, but signage has yet to be done
Severe Weather Landslides, and Avalanche	21. Post avalanche warning signs at each end of the Long Gulch Avalanche zone to warn winter recreators of the potential danger.	N/A High Priority	Owyhee County	Cost Not Provided; Immediate	Deferred; Avalanche added	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	22. Identify repeated flooded areas and develop a countywide strategy to lessen the impact of flash flooding on agricultural lands	N/A High Priority	Owyhee County, Owyhee Conservation District, BLM, Southwest Idaho RC&D, and private landowners	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Earthquake and Wildland Fire	23. Install additional components to the overhead sprinkler system where necessary in the Bruneau-Grand View High School.	N/A Medium Priority	Bruneau – Grand View School District and area residents	Cost Not Provided; Short Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	Possible funding challenges
Wildland Fire	24. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects as outlined in the Owyhee County WUI Wildfire Mitigation Plan (2005 or most recent document).	N/A Not Scored	Owyhee County, cities of Marsing, Homedale, and Grand View, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD.	Cost Not Provided; Immediate Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate Short Term Long Term	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Landslide and Avalanche	25. Install roadside debris catchment devices.	N/A Medium Priority	Owyhee County and Idaho Transportation Department	Cost Not Provided; Short Term Long Term	Revised; Avalanche also added	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	26. Identify where retention ponds are needed in the county	N/A High Priority	Owyhee County, Owyhee Conservation District, Southwest Idaho RC&D, and Idaho Transportation Department	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	27. Identify roads in the county that need to be elevated above the 100-year flood zone including areas near Homedale Airport and Pioneer Road.	N/A High Priority	Owyhee County, City of Homedale, City of Grand View, and Idaho Transportation Department	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	28. Replace undersized culverts near Silver City Road, Scorpion Creek, Sunrise Sky Park, Jarbidge and Bruneau Rivers.	N/A High Priority	Owyhee County and Idaho Transportation Department	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding,	Progress has been made in Silver City

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						Owyhee County budget or seek funding through list of funding sources	
Flood	29. Conduct evaluation and implement a strategy to prevent ice and debris jams on bridges and culvert crossings on State Routes 51 and 78.	N/A High Priority	Owyhee County, Owyhee Conservation District, Southwest Idaho RC&D, and Idaho Transportation Department	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	30. Develop an alternative access route into Silver City.	N/A High Priority	Owyhee County, community of Silver City, BLM, and private landowners	Cost Not Provided; Short Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						funding through list of funding sources	
Severe Weather	31. Construct snow fences in strategic locations to prevent drifting on primary (e.g. Highway 95) and secondary access routes and near population centers.	N/A Medium Priority	Idaho Transportation Department, Owyhee County, City of Grand View, City of Marsing, City of Homedale, and private landowners	Cost Not Provided; Short Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	32. Develop storm water retention swales and install flood water diversion mechanisms such as canals and ditches where necessary in new developments near communities and in flood prone areas.	N/A High Priority	Owyhee County, Owyhee Conservation District, BLM, Southwest Idaho RC&D, and private landowners	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						sources	
Flood	33. Install flood water diversion mechanisms such as canals and ditches where necessary.	N/A Medium Priority	Owyhee County, Owyhee Conservation District, BLM, Southwest Idaho RC&D, and private landowners	Cost Not Provided; Short Term Long Term	Deleted	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	34. Replace Third Street Bridge in Silver City with a structure capable of accommodating at least a 100-year flood as well as heavy truck use.	N/A Medium Priority	Community of Silver City, Owyhee County, Southwest Idaho RC&D	Cost Not Provided; Short Term	Completed	N/A	N/A
Flood and Wildland Fire	35. Partner with BLM to develop a strategy to systematically burn tumbleweed accumulations from ditches and at culvert and bridge crossings	N/A High Priority	Owyhee County, Owyhee Conservation District, and private landowners	Cost Not Provided; Immediate	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Immediate	

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Flood	36. Conduct a study to address potential water flow capacity issues at Grand View Road's Snake River bridge crossing.	N/A Medium Priority	Owyhee County Highway Districts, City of Grand View, and Owyhee County.	Cost Not Provided; Long Term	Completed	N/A	Idaho Power has developed action plan maps
Flood	37. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components as outlined in the Owyhee County WUI Wildfire Mitigation Plan (2005 or most recent document).	N/A Not Scored	Owyhee County, cities of Grand View, Marsing, and Homedale, utility companies, and highway districts	Cost Not Provided; Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	Fuel Reduction undertaken in Silver City by the BLM
All Hazards	38. Obtain 1-2 additional generators for the county, 1	N/A Medium Priority	Owyhee County, City of Grand View, City of Marsing, City of	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6	Currently 1 generator for EOC, 3 for fire district,

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	generator for each identified shelter location, 1 generator for each incorporated city that is powerful enough to run a pump for a central well in order to obtain drinking water during power outages.		Homedale, Bruneau-Grand View School District, Marsing School District, and Homedale School District, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD			months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	and 1 for city use
All Hazards	39. Evaluate location of emergency services headquarters, field offices, and storage facilities for proximity to potential hazards, particularly the flood zone.	N/A High Priority	Owyhee County, City of Grand View, and City of Homedale	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	40. Develop a plan to enhance emergency response capabilities and public safety in	N/A High Priority	Community of Silver City, BLM, and Owyhee County	Cost Not Provided; Immediate	Deferred	Cost not provided by County; seek cost within 6 months of	Landing zone in county.

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	Silver City (safety zones, alert system, helipads, etc.).					adoption Timeline: Immediate Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	41. Develop an additional water supply resource for municipal as well as fire department use in Silver City.	N/A Medium Priority	Community of Silver City and Owyhee County	Cost Not Provided; Short Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	New sources are limited, though progress has been made to develop water in old mines
All Hazards	42. Construct an Emergency Operations Center in Silver City for use by firefighters, law enforcement, and other emergency	N/A Low Priority	Community of Silver City, Silver City Fire and Rescue, and Owyhee County	Cost Not Provided; Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline:	Temporary setups are made by agencies. Sheriff's office has mobile command; need to still consider permanent EOC.

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	responders in the area.					Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Wildland Fire	43. Identify and assess fire department needs and needed RFPA trainings	N/A Not Scored	Owyhee County, City of Grand View, City of Marsing, City of Homedale, Bruneau-Grand View School District, Marsing School District, Homedale School District, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term Long Term	Revised	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	The county has mutual aid agreements with BLM and RFPAs have mutual aid agreements with BLM
Wildland Fire	44. Enhance radio availability in each district, link into existing dispatch, and improve range within the region, update to new digital, narrow band frequency adopted by feds and	N/A Not Scored	Owyhee County, BLM, IDL, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term	BLM is not digital

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
	state.					Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Wildland Fire	45. Redistricting of Rural Fire Districts.	N/A Not Scored	Owyhee County, City of Grand View, City of Marsing, City of Homedale, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	Add RFPAs and fill any remaining gaps between coverage
Wildland Fire	46. Identify areas lacking a sufficient water supply and develop publicly accessible fill sites.	N/A Not Scored	Owyhee County, BLM, IDL, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term Long Term	Ongoing	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA	The county requires fire hydrants in new development areas

Hazard	Action Item	Goals & Objective	Lead Agency	Former Est. Cost & Timeline	New Status Update	New Timeline, Cost, & Funding Source	Comments
						grant funding, Owyhee County budget or seek funding through list of funding sources	
All Hazards	47. Develop a radio interoperability working plan and provide funding for necessary hardware.	N/A High Priority	Owyhee County, City of Grand View, City of Marsing, City of Homedale, Homedale RFD, Marsing RFD, MRW RFD, Shoshone-Paiute Tribes Fire Mgmt, Grand View RFD, Silver City F&R, Bruneau RFD, and Mountain Home AFB FD	Cost Not Provided; Short Term Long Term	Deferred	Cost not provided by County; seek cost within 6 months of adoption Timeline: Short Term Long Term Funding: FEMA grant funding, Owyhee County budget or seek funding through list of funding sources	
Drought	48. Preserve economic stability during a drought by encouraging agricultural interests to obtain crop insurance to cover potential losses due to drought.	N/A Not scored	Owyhee County, City of Grand View, City of Marsing, City of Homedale	N/A	New Mitigation Action	Cost: No cost Timeline: Long-term Funding: No cost	

The following items were deleted during the 2017 update:

- Action Item: 2 – FEMA said that county was not priority and are therefore not in the NFIP
- Action Item: 4 – FEMA said that county was not priority and are therefore not in the NFIP
- Action Item: 33 – Merged with action 32

6.4.2 Changes in Mitigation Action Priorities

The prioritization scheme from the 2008 AHMP was carried forward into the 2017 HMP update. According to the emergency manager, planning team, and other local officials the mitigation action priorities have not changed since the plan's last update in 2008. Therefore, the same timeline was carried forward in this update. The STAPLEE scores for each mitigation action have also been carried forward although the specific scores are unavailable for review.

Additionally, there were no new mitigation actions added in the 2017 HMP update and therefore, no new actions needed to be scored. The guidelines for the STAPLEE scoring are provided below:

- Hazard Magnitude/Frequency – The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 10, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.
- Potential for Repetitive Loss Reduction – Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 10. Those that do not address repetitive losses receive a rating of 1.
- Benefit / Cost – The analysis process will include summaries as appropriate for each project, but will include benefit /cost analysis results. Projects with a negative benefit /cost analysis result will be ranked as a 0. Projects with a positive benefit /cost analysis will receive a score equal to the projects benefit /cost analysis results divided by 10. Therefore, a project with a BC ratio of 50:1 would receive 5 points; a project with a BC ratio of 100:1 (or higher) would receive the maximum points of 10.
- Vulnerability of the Community – A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote participation by the smaller or less vulnerable communities in the County, the score will be based on the relationship to other communities being considered. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.
- Population Benefit – Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (county, city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may

not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

- Property Benefit – Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save \$1,000,000 or more in losses. Property benefit of less than \$1,000,000 will receive a score of the benefit divided by \$1,000,000 (a ratio below \$1 million). Therefore, a property benefit of \$300,000 would receive a score of 3. In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.
- Economic Benefit – Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 5 would prevent a total economic collapse, a ranking of 3 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.
- Project Feasibility (Environmentally, Politically & Socially) – Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.
- Potential to Mitigate Hazards to Future Development – Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the County will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.
- Potential Project Effectiveness & Sustainability – Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

- Final Ranking – Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranked high, medium, or low based on the non-planning project thresholds of:
 - Project Ranking Priority Score Non-Planning Projects
 - High 40-65
 - Medium 25-39
 - Low 1-24
 - Project Ranking Priority Score Planning Projects
 - High 18-30
 - Medium 12-17
 - Low 1-11

6.4.3 Additional Mitigation Actions

All jurisdictions were provided the opportunity to propose mitigation actions. Some of these discussed mitigation actions were not formally adopted or scored, but for future planning purposes and HMP updates, the following lists the additional proposed mitigation actions initially discussed by the committee and later considered and broadened to county-wide issues by the Emergency Manager and the Planning and Zoning Administrator. Many the actions initially raised by a community of Silver City representative were found to be pertinent to a wider area of Owyhee County.

- Wildfire fuels reduction: In general terms as needed for defensible spaces for rural residences. and one option for solution would be education. Another concern regarding wildfire fuels reduction is related to invasive juniper which can be addressed through mastication and prescribed burns. A third concern regarding Wildfire fuels reduction is related to the large percentage of federally managed lands within the county (approximately 80%) which are primarily grazing lands where decades of BLM grazing reductions have resulted in increased fuels and, thus, increased fire risk. This issue may be mitigated through increased grazing as the most economical form of fuels reduction.
- Improve roads and bridges proximate to Jarbridge Rivers and East Fork of the Bruneau, and clean debris from streams. Due to the steep terrain and flash flooding issues that may occur on even those drainages that may not normally carry large quantities of water for the greater portion of the year, this issue is also relevant to a number of other roads and drainages within Owyhee County.
- Designate community shelters for use during severe weather in incorporated cities and unincorporated communities across the county.
- Improve limited cell service in rural areas of county, and implement backup communication systems.
- Reduce juniper across the county.

- Encourage aspen and regenerate current aspen stands where appropriate.
- Bury propane tanks at-risk propane tanks where appropriate in the county; assess other propane tanks and buildings.
- Develop additional fire suppression waters and/or pumping capacity of water across the county.
- Develop egress plan with focus on busy weekends and tourists for areas that are heavily impacted by recreational users from out of county.
- Identify available water sources (Three Creek Well for example) which needs power hookup/generator to remain available for emergencies.

6.5 Federal & State Planning & Regulatory Capabilities

A number of federal and state regulations and policies form the legal framework in which to implement Owyhee County's hazard mitigation goals and projects. A list of these regulations and plans is presented below:

- Federal
 - The Federal Civil Defense Act of 1950
 - Public Law 96-342, The Improved Civil Defense Act of 1980
 - Public Law 91-606, Disaster Relief Act
 - Public Law 93-288, The Robert T. Stafford Disaster Relief Act of 1974.
 - Presidential Executive Order 11988, Floodplain Management
 - Presidential Executive Order 11990, Protection of Wetlands
- State of Idaho
 - Idaho State Code Title 46, Chapter 10, State Disaster Preparedness Act
 - Idaho State Code Title 39, Chapter 71, Hazardous Material Act
 - Idaho State Title 67, Chapter 65, Local Land Use Planning Act
 - Governor's Executive Order 2000-04, April 20, 2000

6.6 County Planning & Regulatory Capabilities

Owyhee County and its incorporated communities employ other measures that regulate development and certain activities in hazardous areas. These include, but are not limited to, overlay districts, subdivision ordinances, building codes, and fireworks ordinances.

Throughout the lifecycle of this HMP, each jurisdiction should continue to maintain and enforce these planning and regulatory capabilities. Each jurisdiction should strive to adopt additional planning mechanisms that address hazard mitigation. Examples of these mechanisms can be found in *Section 7.3 Examples of Regional Best Practices for Hazard Mitigation & Comprehensive Plan Integration*, *Section 7.4 Implementation through Existing Plans & Programs* and *Section 7.5 Recommended Strategies & Tools for Implementation & Future Updates*.

6.6.1 Subdivision & PUD Ordinance

The purpose of a subdivision and PUD regulation is not only to provide a simple method of conveying land by a developer, but also to address factors associated with the orderly development of land and provision of services and infrastructure, such as sidewalks and open space. A common practice in Idaho is the adoption of subdivision and PUD regulations for hazardous areas. These regulations may include the completion of a hazardous area analysis during the application process, often submitted with the preliminary plat, or compliance with other adopted hazardous area ordinances. If it is determined that a subdivision is located within a hazardous area or has the presence of hazardous conditions an additional environmental impact statement may also be necessary.

Owyhee County has adopted a Subdivision Ordinance that included elements considering hazardous areas. Information that sufficiently details the proposed development within any special development area, such as hillside, planned unit development, floodplain, cemetery, mobile home, large scale development, hazardous and unique areas of development must be included within a proposed development's preliminary plat.

Additionally, public improvements must be made for proposed subdivisions in the county including storm drainage. Design and construction standards have been adopted for Special Development Subdivisions that include: Hillside Subdivisions, Floodplain Subdivisions, and Areas of Critical Concern Subdivisions.

The City of Homedale has also adopted a Subdivision Ordinance that includes design and construction standards for Special Development Subdivisions that include: Hillside Subdivisions, Rural Subdivisions, and Floodplain Subdivisions, as well as the requirement for storm drainage improvements in the preliminary plat of a proposed subdivision.

The City of Grand View has adopted a Subdivision Ordinance that requires an analysis of the existing conditions and characteristics of the land on or adjacent to the proposed subdivision site, as well as areas set aside for open space, in the pre-application process. Additionally, within the preliminary plat, information that sufficiently details the proposed development within any special development area, such as hillside, planned unit development, floodplain, cemetery, mobile home, large scale development, hazardous and unique areas of development must be provided. Design and construction standards have also been adopted for Special Development Subdivisions that include: Hillside Subdivisions, Floodplain Subdivisions, and Areas of Critical Concern Subdivisions.

The City of Marsing has adopted a Subdivision Ordinance (Title 9) requiring that information that sufficiently details the proposed development within any special development area, such as hillside, planned unit development, development within a designated floodplain, or hazardous and unique areas of development is required in the preliminary plat of a proposed subdivision. Within the required improvements section of this ordinance, adequate water mains, laterals, and fire hydrants must be installed in accordance with city standards.

6.6.2 Building Codes

Building codes are regulations that govern the design, construction, alteration and maintenance of structures. These codes specify the minimum requirements for safeguarding the health, safety, and welfare of those who occupy buildings. Rather than creating and maintaining their own codes, most communities adopt those maintained by the International Code Council (ICC).

Owyhee County and the Cities of Homedale, Grand View, and Marsing have adopted, or are in the process of adopting, the International Building Code (IBC) and the International Residential Code (IRC) and the International Energy Conservation Codes.

The City of Marsing has also adopted the 2015 International Fire Code to develop more effective methods and procedures in preparing and combating fires.

6.6.3 City & County Ordinances

The City of Homedale has adopted various city ordinances that may contribute to reducing losses to life and property from hazard events. The city has adopted a Fireworks Ordinance (Chapter 8.20) prohibiting the use and selling of fireworks within city limits and an Open Burning Ordinance (Chapter 8.20) to eliminate all forms of open burning except of which there is no means of producing a similar public benefit, or such as may be permitted. Lawful burning activities include outdoor fireplaces and grills, combustible and non-odor offensive paper products, and the burning of vacant areas, garden debris and leaves.

The City of Marsing has also adopted an Open Burning Ordinance (Chapter 3) to eliminate all forms of open burning except of which there is no means of producing a similar public benefit, or such as may be permitted. Lawful burning activities include outdoor fireplaces and grills, combustible and non-odor offensive paper products, and the burning of vacant areas, garden debris and leaves as well as a Fireworks, Explosives, and Combustible Materials Ordinance (Chapter 5) that states that “no person shall have, keep, store, use, manufacture, sell, handle, or transport any fireworks as defined by state law, except in certain circumstances.”

Marsing has also adopted an ordinance that has established the volunteer fire department as the emergency response authority for hazardous substance incidents that occur within the corporate limits of the city (Chapter 1).

6.6.4 Transfer of Development Rights (TDR) Programs

Transfer of Development Rights (TDR) is a program based on the concept that property rights consist of many types of rights, including development rights, which can be used, unused, transferred, or sold separately by the owner of the parcel. The overall promise of the program is to provide economic benefit to landowners of sensitive lands by a means other than the development of that particular land. TDR programs separate the development potential of these sensitive lands and create a market where this development can be transferred or sold in order to receive the economic benefit the landowner otherwise would have had if they developed on the original property. In order to be a successful program, TDRs should have designated sending and receiving zones. Sending zones are generally easy to identify by local communities, as they are the lands that are environmentally sensitive or have the highest risk to natural hazards. Identifying receiving zones, on the other hand, is a more complicated task. These zones must be growing areas with a market demand for increased density. Potential sending and receiving zones should also be consistent with goals of the comprehensive plan put forth by the community.

Owyhee County has created a TDR Committee that can prepare a recommendation to the planning and zoning commission and to the board of commissioners regarding creation of development rights and the procedure by which landowners can voluntarily transfer such development rights. The recommendation shall be made after study of and consideration of the elements related to the transfer of development rights as set forth in Idaho Code section 67-6515A.

6.6.5 Annual Appropriation Ordinances

The City of Grand View has adopted its 2016 Annual Appropriation Ordinance that has appropriated the sum of \$614,816.00 that includes funds for streets & roads, parks, sewer, water, and for the city's general fund.

6.7 National Flood Insurance Capabilities

6.7.1 Overview

In response to the mounting flood-related losses over the 20th century, the US Congress passed the National Flood Insurance Act (NFIA) of 1968, which instituted the National Flood Insurance Program (NFIP). The NFIP made flood insurance available to communities that agreed to adopt and enforce floodplain management ordinances, through hazard mitigation planning, site design and construction standards, and land use regulations. The NFIP was based on the premise that populations located in flood-prone areas (e.g., the 100-year floodplain) should bear a substantial portion of the cost to reduce community vulnerability and bear responsibility for a majority of losses should the community experience a flood disaster. Table 67 details the county's participation and policies in the NFIP.

According to FEMA's policy statistics for Idaho, the City of Homedale is the only NFIP-participating community with at least one active policy (Table 76).

Table 76. National Flood Insurance Program statistics

Community Name	NFIP Status	CRS Status*	Flood Claims**	Claims Paid	Repetitive Loss Properties	Total NFIP Policies	Total Insurance Coverage	Avg. Premium Price
Owyhee County (unincorporated areas)	No	-	-	-	-	-	-	-
City of Grand View	No	-	-	-	-	-	-	-
City of Homedale	Yes	No	0	\$0	0	1	\$350,000	\$412
City of Marsing	No	No	-	-	-	-	-	-
County-wide	-	-	0	\$0	0	1	\$350,000	-

*as of 5/1/2014

**as of 7/5/2017

6.7.2 NFIP Community Rating System

The NFIP Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: reduce flood losses; facilitate accurate insurance rating; and promote the awareness of flood insurance.

The CRS provides for 10 classes, with Class 1 having the most premium credit and communities in Class 10 receiving none. A community's CRS class is based on the number of credit points calculated for the activities that are undertaken to reduce flood losses, facilitate accurate flood insurance rating, and promote the awareness of flood insurance. Owyhee County does not currently participate in the CRS program.

The following is a brief description of the 18 activities that receive credit under the CRS:

- 300 Series – Public information
 - 310 - Elevation Certificates
 - 320 - Map Information Service
 - 330 - Outreach Projects
 - 340 - Hazard Disclosure
 - 350 - Flood Protection Information
 - 360 - Flood Protection Assistance
- 400 Series – Mapping and Regulations
 - 410 - Additional Flood Data
 - 420 - Open Space Preservation
 - 430 - Higher Regulatory Standards
 - 440 - Flood Data Maintenance
 - 450 - Storm Water Management
- 500 Series – Flood Damage Reduction
 - 510 - Floodplain Management Planning
 - 520 - Acquisition and Relocation
 - 530 - Flood Protection
 - 540 - Drainage System Maintenance
- 600 Series – Flood Preparedness
 - 610 - Flood Warning
 - 620 - Levee Safety
 - 630 - Dam Safety

Additional benefits a community realizes from participation in the CRS include:

- The CRS floodplain management activities provide enhanced public safety, a reduction in damage to property and public infrastructure, avoidance of economic disruption and losses, reduction of human suffering, and protection of the environment.
- A community can evaluate the effectiveness of its flood program against a nationally recognized benchmark.
- Technical assistance in designing/implementing some activities is available at no charge. A CRS community's flood program benefits from having an added incentive to maintain its flood programs over the years. The fact that the community's CRS status could be affected by the elimination of a flood-related activity, or a weakening of the regulatory requirements for

new development, should be taken into account by the governing board when considering such actions. A similar system used in fire insurance rating has had a strong impact on the level of support local governments give to their fire protection programs.

- Implementing some CRS activities, such as floodplain management planning, can help a community qualify for certain federal assistance programs.

6.7.3 NFIP Repetitive Loss Properties

Repetitive loss properties under the NFIP are those which have had two or more flood losses reported which were paid more than \$1,000 for each loss within a 10-year period. Significant repetitive loss properties are those that have experienced four or more separate building and content claims since 1978 each exceeding \$5,000. Owyhee County has no repetitive loss or significant loss properties.

6.7.4 Current & Future NFIP Compliance

The City of Homedale is currently participating in the NFIP, holds one active insurance policy, and has adopted and enforced a floodplain management ordinance in order to maintain good standing within the program.

The city was designated a Flood Hazard Boundary Map (FHBM) in 1974 and was then updated to a FIRM in 1987. However, no elevation has been determined on the FIRM, and all Zones are either A, C, or X. A Flood Hazard Ordinance based on the FHBM, and any published revisions, has been adopted by Homedale and Zone A on this map delineates the area within which the requirements of the flood ordinance are enforced. Requirements include, but are not limited to, applying for a permit for each structure, requiring that proposed building sites must be anchored to prevent flotation, collapse, or lateral movement of the structure and must be constructed with materials and utility equipment resistant to flood damage and by methods and practices that minimize flood damage. Floodplain regulations also apply to proposed subdivisions and if a proposed development is in a flood-prone area, it must be assured that all proposals are consistent with the need to:

- Minimize flood damage within the flood-prone area
- Locate and construct utilities and facilities to minimize or eliminate flood damage
- Provide adequate drainage
- Provide elevation data if proposed developments are greater than 50 lots or five acres, whichever is lesser

Additional requirements are provided for mobile homes, altered flood-carrying capacity or relocated watercourses, and floodproofing of the lowest floor of structures

Provisions for flood insurance rates are also provided and it is required that within Zone A on the FHBM or FIRM, the responsible person must obtain or furnish the elevation of the lowest habitable

floor and whether or not the structure has a basement, and the elevation to which the structure was floodproofed. A record of all such information should be maintained.

The City of Homedale has also adopted a Subdivision Ordinance (Chapter 16.24.060) where a development plan is required and must show the following:

- Locations of improvements
- Location of the floodway and floodway fringe
- Location of present water channel
- Any planned re-routing of waterways
- All major drainage ways
- Areas of frequent flooding
- Means of floodproofing buildings
- Means or insuring loans for improvements within the floodplain
- Justification for developments

The approval of a proposed subdivision should be denied if levees, fills, structures, or other features individually or collectively increase flood flows, heights, or damages.

The City of Homedale will continue to enforce their floodplain management ordinance over this plan's life-cycle in order to maintain good standing within the program; this will be done with oversight and collaboration with the State Floodplain Coordinator and FEMA.

Table 77. Floodplain ordinances

Community ID Number	Community Name	Floodplain Ordinance	Ordinance
160107	City of Homedale	Yes	Flood Hazard Ordinance (Chapter 15.20)

6.8 Mitigation Funding Programs & Opportunities

Mitigation assistance can be sought after through various funding sources. These sources can be financial, technical, or education/outreach related. Provided below are funding sources that are available for communities and individuals within the county.

Table 78. Funding sources for mitigation actions

<p>Name: Bureau of Land Management (BLM) Communities at Risk (Community Assistance) Program</p>
<p>Description: Provides financial assistance to local jurisdictions in Idaho for efforts that support fire prevention activities. Funds may be used for planning efforts (including the use of GIS software and support), the hiring of countywide WUI coordinators, and education efforts such as FIREWISE. Funds may also be used to reduce hazardous fuels accumulations on non-Federal lands; however, use of funds for this purpose may require environmental clearance. Applications are available through Grants.gov. Please contact your local BLM line officer or fire mitigation specialist for more information.</p> <p>Eligible Recipients: County Wildland Fire Interagency Groups, county governments, communities, not-for-profit entities.</p>
<p>Additional Information: Jon Skinner, Idaho Fire Mitigation Specialist Bureau of Land Management, Idaho State Office (208) 373-3854</p>

<p>Name: Community Assistance Program – State Support Services Element (CAP-SSSE)</p>
<p>Description: This program provides funding to States to provide technical assistance to communities in the National Flood Insurance Program (NFIP) and to evaluate community performance in implementing NFIP floodplain management activities.</p>
<p>Additional Information: http://www.fema.gov/plan/prevent/floodplain/fema_cap-ssse.shtm</p>

<p>Name: Community Development Block Grant (CDBG) Program</p>
<p>Description: The CDBG program provides grants and technical assistance to federally designated and non-designated municipalities for any type of community development. An Entitlement component provides funding for designated communities via a set formula. The Competitive component provides funding of up to \$500,000 to non-federally designated communities. These grants may be used for infrastructure improvement, public services, or development and planning, but 70% of the project must benefit low- and moderate-income persons. CDBG money can be used as matching funds for the FEMA HMA grant programs.</p>
<p>Additional Information: U.S. Department of Housing and Urban Development; Phone: 208-334-1990 ID_Webmanager@hud.gov</p>

<p>Name: Community Forestry Program</p>
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Description: The Community Forestry Program transfers technology and provides financial assistance to develop awareness and understanding of the value of sound urban/community forestry management among community citizens and leaders. Assistance is provided to Idaho communities to establish and enhance sustainable urban and community forestry management programs for public and private lands.

Additional Information: http://www.idl.idaho.gov/bureau/community_forestry/home/index.htm

Joyce Jowdy

Phone: 208-666-8622

Fax: 208-769-1524

Email: jjowdy@idl.idaho.gov

Name: The Conservation Reserve Program (CRP)

Description: The CRP is a voluntary program for agricultural landowners. Through CRP, landowners can receive annual rental payments and cost-share assistance to establish long-term, resource-conserving vegetative covers on eligible farmland. The Commodity Credit Corporation (CCC) makes annual rental payments based on the agriculture rental value of the land, and it provides cost-share assistance for up to 50% of the participant's costs in establishing approved conservation practices. Participants enroll in CRP contracts for 10 to 15 years.

Additional Information:

USDA/FSA

Idaho State FSA

9173 West Barnes Drive

Boise, ID 83709-1573

Phone: 208-378-5650

Fax: 208-378-5678

Name: Continuing Authorities Program

Description: Congress has provided the USACE with a number of standing authorities to study and build water resource projects for various purposes without additional project specific congressional authorization. The types of projects addressed by the Continuing Authorities Program include emergency streambank and shoreline erosion, small flood control projects, small navigation projects, and snagging and clearing for flood control.

Additional Information: US Army Corps of Engineers cenww-pa@usace.army.mil

Name: Department of Commerce/Economic Development Authority (EDA)

Description: EDA was created by Congress pursuant to the Public Works and Economic Development Act of 1965 to provide financial assistance to distressed communities, both rural and urban. EDA's mission is to lead the Federal economic development agenda by promoting innovation and competitiveness, preparing American regions for growth and success in the worldwide economy. EDA will fulfill its mission by fostering entrepreneurship, innovation, and productivity through investments in infrastructure development, capacity building, and business development. These investments will be made to attract private capital investments and higher-skill, higher-wage jobs to regions experiencing substantial and persistent economic distress. EDA works in partnership with distressed regions to address problems associated with long-term economic distress and to assist regions experiencing sudden and severe economic dislocations, such as those resulting from natural disasters, conversions of military installations, changing trade patterns, and the depletion of natural resources. EDA investments generally take the form of grants to or cooperative agreements with eligible recipients.

EDA provides assistance via:

- Construction Grant Program
- Planning Grants
- Revolving Loan Fund
- Technical Assistance Grants

Additional Information:

Economic Development Authority

Jackson Federal Building, Room 1890
915 Second Avenue
Seattle, WA 98174-1001
Phone: 206-220-7660
Fax: 206-220-7669
A. Leonard Smith, Regional Director
lsmith7@eda.doc.gov

Idaho Department of Commerce

700 W State Street
P.O. Box 83720
Boise, ID 83720-0093
Phone: (208) 334-2470
Fax: (208) 334-2631

Name: Department of Homeland Security Grant (HSGP) Program

Description: The HSGP consists of three sub-programs: the State Homeland Security Program (SHSP), Urban Areas Security Initiative (UASI), and Operation Stonegarden (OPSG). The SHSP is the core assistance program in this suite; it provides funds to build capabilities at the State and local levels and to implement the goals and objectives included in State homeland security strategies and initiatives in their State Preparedness Reports. At least 25% of these funds are dedicated towards anti-terrorism activities. UASI focuses on enhancing regional preparedness in metropolitan areas, while OPSG is intended to enhance cooperation and coordination among law enforcement agencies in a joint mission to secure the U.S. border. Program priorities include the integration of law enforcement, fire, and emergency medical service providers for a coordinated response to mass casualty incidents; and support citizen preparedness drills and exercises. Priorities may vary each fiscal year.

Additional Information: <http://www.bhs.idaho.gov/Pages/FinanceAndLogistics/Grants.aspx>

Name: Department of Transportation/Federal Highway Administration (FHWA) Emergency Relief Program

Description: Congress authorized in Title 23, United States Code, Section 125, a special program from the Highway Trust Fund for the repair or reconstruction of Federal-aid highways and roads on Federal lands which have suffered serious damage as a result of (1) natural disasters or (2) catastrophic failures from an external cause. This program, commonly referred to as the emergency relief or ER program, supplements the commitment of resources by States, their political subdivisions, or other Federal agencies to help pay for unusually heavy expenses resulting from extraordinary conditions.

Additional Information:

FHWA Idaho Division Office

3050 Lakeharbor Lane, #126
Boise, ID 83703
FHWA Office Phone : (208) 334-1843

Name: Drought Assistance Programs

Description: Natural disaster is a constant threat to America's farmers and ranchers and rural residents. USDA provides assistance for losses from drought, flood, fire, freezing, tornadoes, pest infestation, and other calamities.

Additional Information:

Dennis McNees, Commodity Technician (Emergency Food Assistance)

Tel: (208) 332-6820
Fax: (208) 334-2228
Email: dwmcnees@sde.idaho.gov

Gene Sue Weppner (Food Stamp- Emergency Assistance)

Program Manager
Division of Welfare
State of Idaho
450 West State Street, 2th Floor
Boise, ID 83720
Tel: (208) 334-5656
Cell: (208) 850-8250
Fax: (208) 334-5817
Email: weppnerg@dhw.idaho.gov

Christine Baylis, CPM

Policy Specialist
Idaho Department of Health & Welfare
Division of Welfare
State of Idaho
450 West State Street, 2nd Floor
Boise, ID 8372
Tel: (208) 334-5742
Fax: (208) 334-5817
Email: baylisc@dhw.idaho.gov

Name: Emergency Management Performance Grants (EMPG)

Description: The Federal Government, through the EMPG Program, provides necessary direction, coordination, and guidance, and provides necessary assistance, as authorized in this title so that a comprehensive emergency preparedness system exists at all levels for all hazards for States, Territories, federally-recognized tribes and local communities. Participating communities develop performance goals for their emergency management programs and design projects to meet those goals. After being funded, the participants must evaluate progress and report back to BHS to remain eligible.

Additional Information: <http://www.fema.gov/fy-2013-emergency-management-performance-grants-empg-program-0>

Name: Environmental Planning and Historic Preservation (EHP) Program

Description: The EHP Program integrates historic preservation considerations with FEMA's mission of preparedness, response, recovery, and mitigation. During disaster recovery operations, the agency assesses damages to historic and cultural resources, provides technical assistance to States and local jurisdictions, and ensures compliance with applicable Federal laws and regulations, such as the National Historic Preservation Act.

Additional Information: <http://www.fema.gov/environmental-planning-and-historic-preservation-program>

Name: Federal Excess Personal Property Program

Description: The program is administered by the USDA's Forest Service with delivery through the State Forester. The Federal Excess Personal Property (FEPP) program re-utilizes excess Federal property obtained from military and other Federal sources for use in rural and wildland firefighting. This equipment is loaned by agreement to State Foresters, who can sub-loan it to local firefighting organizations.
Eligible Recipients: Rural Fire Departments serving 10,000 people or less.

Additional Information:

Dee Sessions

Stewardship/Forest Land Enhancement Program/Legacy/Forest Resource Management/Cooperative Watershed/CostShare

Phone: 801-625-5189

Email: dsessions@fs.fed.us

Cathy Scofield

Coop Fire - Idaho, N. Dakota, and Montana

Phone: 406-329-3409

cscofield@fs.fed.us

Name: FEMA: Firefighter Assistance Grants

Description: This competitive grant from the Federal Emergency Management Agency provides direct assistance to fire protection organizations. Funds may be awarded for training safety and equipment, firefighting vehicles, fire prevention equipment, or emergency services.

Eligible Recipients: fire departments at all levels.

Additional Information: Firefighter Assistance Grants website: <http://www.fema.gov/welcome-assistance-firefighters-grant-program> or firegrants@dhs.gov

Name: Fire Management Assistance Grant Program

Description: Fire Management Assistance is available to State, local, and Tribal governments for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a State submits a request for assistance to the FEMA Regional Administrator at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis, and FEMA's decision is rendered in a matter of hours.

Additional Information:**Federal Emergency Management Agency**

Federal Regional Center

130 - 228th Street, Southwest

Bothell, WA 98021-8627

(425) 487-4600

Name: Flood Mitigation Assistance Program (FMA) Program

Description: The FMA program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FMA provides funding to States, Territories, federally-recognized tribes and local communities for projects that reduce or eliminate long-term risk of flood damage to structures insured under the NFIP. FMA funding is available for flood hazard mitigation projects, plan development and management costs. Funding is appropriated by Congress annually.

Additional Information: <http://www.fema.gov/pre-disaster-mitigation-grant-program>

Name: Flood Plain Management Services (FPMS) Program

Description: Section 206 of the 1960 Flood Control Act (PL 86-645), as amended, provides the authority for the U.S. Army Corps of Engineers (USACE) to provide assistance and guidance on all aspects of floodplain management planning. The program develops or interprets site-specific data on obstructions to flood flows, flood formation and timing; and the extent, duration, and frequency of flooding. Upon request, program services are provided to State, regional, and local governments, Indian Tribes, and other non-Federal public agencies without charge.

Additional Information: US Army Corps of Engineers cenww-pa@usace.army.mil

Name: Forest Stewardship Program (FSP)

Description: the FSP provides technical assistance, through State forestry agency partners, to nonindustrial private forest owners to encourage and enable active long-term forest management. A primary focus of the FSP is the development of comprehensive, multi-resource management plans that provide landowners with the information they need to manage their forests for a variety of products and services.

Participation in the FSP is open to any non-industrial private forest landowners who are committed to the active management and stewardship of their forested properties for at least 10 years. The FSP is not a cost-share program. Cost-share assistance for plan implementation may be available through other programs, such as the Forest Land Enhancement Program.

Additional Information:

Dee Sessions

Stewardship/Forest Land Enhancement Program/Legacy/Forest Resource Management/Cooperative Watershed/CostShare

Phone: 801-625-5189

Email: dsessions@fs.fed.us

Name: Hazard Mitigation Assistance Grant Program (HMAGP)

Description: The FMA program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FMA provides funding to States, Territories, federally-recognized tribes and local communities for projects that reduce or eliminate long-term risk of flood damage to structures insured under the NFIP. FMA funding is available for flood hazard mitigation projects, plan development and management costs. Funding is appropriated by Congress annually.

Additional Information: <http://www.fema.gov/government/grant/hma/index.shtm>

Name: Hazardous Materials Emergency Preparedness Grant (HMEPG)

Description: Grant funds will be passed through to local emergency management offices and HazMat teams having functional and active LEPC's.

Additional Information: <http://www.bhs.idaho.gov/Pages/FinanceAndLogistics/Grants.aspx>

Name: Idaho Fish and Wildlife Foundation

Description: The Idaho Fish and Wildlife Foundation is dedicated to the conservation of natural resources; fish, wildlife, and habitat. The Foundation is a 501 (c) (3) nonprofit organization established in 1990 and is headquartered in Boise, Idaho. Board members represent all regions of the State and work to enhance Idaho's fish and wildlife habitat. The Foundation grants funding for statewide conservation and education projects.

Additional Information: (208)334-2648 or ifwf@idfg.idaho.gov

Name: Individuals and Households Program (IHP)

Description: The IHP is a combined FEMA and State program. When a major disaster occurs, this program provides money and services to people in the declared area whose property has been damaged or destroyed and whose losses are not covered by insurance. In every case, the disaster victim must register for assistance and establish eligibility.

Additional Information: <http://www.fema.gov/individual-assistance-program-tools>

Name: Inspection of Completed Works Program

Description: Civil works structures whose failure or partial failure could jeopardize the operational integrity of the project, endanger the lives and safety of the public, or cause substantial property damage are periodically inspected and evaluated to ensure their structural stability, safety, and operational adequacy. For structures constructed by the USACE and turned over to others for operation and maintenance, the operating entity is responsible for periodic inspection and evaluation. The USACE may conduct the inspection on behalf of the project sponsor, provided appropriate reimbursement to the USACE is made. However, the USACE may participate in the inspection with the operating entity at the government's expense.

Additional Information: US Army Corps of Engineers cenww-pa@usace.army.mil

Name: Internal Revenue Service (IRS) Casualty Loss-Special Disaster Provisions

Description: Special tax law provisions may help taxpayers and businesses recover financially from the impact of a disaster, especially when the Federal government declares their location to be a major disaster area. Depending on the circumstances, the IRS may grant additional time to file returns and pay taxes. Both individuals and businesses in a federally declared disaster area can get a faster refund by claiming losses related to the disaster on the tax return for the previous year, usually by filing an amended return.

The IRS also offers audio presentations on Planning for Disaster. These presentations discuss business continuity planning, insurance coverage, record keeping and other tips to stay in business after a major disaster.

Additional Information: <http://www.irs.gov/businesses/small/article/0,,id=156138,00.html>

Name: National Earthquake Hazards Reduction Program (NEHRP)

Description: Under NEHRP, The National Earthquake Technical Assistance (NETAP) Program is a technical assistance program created to provide short-term, no-cost architectural and engineering support related to earthquake mitigation. Examples of NETAP projects are seismic retrofit/evaluation training, evaluation of seismic hazards to critical/essential facilities, post-earthquake evaluations of buildings, and the development of retrofit guidance for homeowners. BHS administers this program in Idaho.

Additional Information: http://www.fema.gov/plan/prevent/earthquake/training_pubs.shtml for training information. For more information:

Ms. Tamra Biasco

Federal Emergency Management Agency
(425) 487-4645
tamra.biasco@dhs.gov

Name: National Flood Insurance Program (NFIP)

Description: The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Communities participate in the NFIP by adopting and enforcing floodplain development controls designed to reduce future flood risks in the 1-percent-annual-chance floodplain. The program is available to all floodprone communities (participation in NFIP is voluntary), and most eligible communities have elected to participate. IDWR administers the program in Idaho, and insurance is sold through State-licensed companies. The NFIP includes Increased Cost of Compliance (ICC) coverage for new and renewed Standard Flood Insurance Policies. ICC is an effective way to help cover costs of meeting community floodplain ordinance requirement for high risk properties and may be considered in combination with other funding streams.

Community Rating System - The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premium rates are discounted to reflect the reduced flood risk resulting from community actions meeting the three goals of the CRS.

Additional Information: <http://www.fema.gov/business/nfip/>

Name: National Oceanic Atmospheric Restoration Center Grants

Description: The NOAA Restoration Center is devoted to restoring the Nation's coastal ecosystems and preserving diverse and abundant marine life. Through its strong commitment to restoration and by promoting partnerships and local stewardship, our programs inform and inspire people to act on behalf of a healthier coastal environment

Additional Information:

Lauren Senkyr

Idaho NOAA
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232
Phone: 503-231-2110
Fax: 503-231-6265
Lauren.Senkyr@noaa.gov

Name: Pacific Northwest Region Water Quality Program

Description: The goal of the Pacific Northwest Program is to provide leadership for water resources research, education, and outreach to help communities, industry, and governments prevent and solve current and emerging water quality and quantity problems. To achieve this goal, the Partners have developed a coordinated regional water quality effort based on promoting and strengthening individual State programs.

The Pacific Northwest Program promotes regional collaboration by acknowledging existing programs and successful efforts; assessing program gaps; identifying potential issues for cross-agency and private sector collaboration; and developing a clearinghouse of expertise and programs. In addition, the program establishes or enhances partnerships with Federal, State, and local environmental and water resource management agencies, such as placing a University Liaison within the offices of EPA Region 10.

Additional Information:

Robert L. Mahler

Ph.D., Professor
University of Idaho
Soil and Environmental Sciences,
Soil Science Division
Moscow, ID 83844-2339
Phone: 208-885-7025
FAX: 208-885-7760
bmahler@uidaho.edu

Name: Planning Assistance to States Program

Description: Section 22 of the Water Resources Development Act (WRDA) of 1974, as amended, provides authority for the USACE to assist States, local governments, and other non-Federal entities in the preparation of comprehensive plans for the development and conservation of water and related land resources. Section 208 of the WRDA of 1992 amended the WRDA of 1974 to include Native American Tribes as equivalent to a State.

Additional Information: US Army Corps of Engineers cenww-pa@usace.army.mil

Name: Pre-Disaster Mitigation (PDM) Program

Description: The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, Federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

Additional Information: <http://www.fema.gov/pre-disaster-mitigation-grant-program>

Name: Public Assistance (PA) Program

Description: Funding provided through federally declared disaster assistance programs may be used for mitigation actions as part of the recovery process. This funding is administered by BHS. Examples of such applications include the PA Program. The measures must apply only to the damaged elements of a facility rather than to other, undamaged parts of the facility or to the entire system. Section 406 mitigation measures are

considered part of the total eligible costs of repair, restoration, reconstruction, or replacement of a facility. They are limited to measures of permanent work, and the Applicant may not apply mitigation funding to alternate projects or improved projects if a new replacement facility is involved. Required upgrades meeting applicable codes and standards are part of eligible restoration work and are not considered mitigation measures.

Additional Information: <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit/hazard-mitigation-funding-under-section-406-0>

Name: Rehabilitation and Inspection Program

Description: The Rehabilitation and Inspection Program is the USACE program that provides for inspection of flood control projects, the rehabilitation of damaged flood control projects, and the rehabilitation of federally authorized and constructed hurricane or shore protection projects

Additional Information: US Army Corps of Engineers cenww-pa@usace.army.mil

Name: Reimbursement for Firefighting on Federal Property

Description: Under Section 11 of the Federal Fire Prevention and Control Act of 1974, fire departments may be reimbursed for fighting fire on property owned by the Federal government. Only firefighting costs over and above normal operating costs are reimbursable. Claims are submitted to USFA and are reviewed by the Deputy Administrator to ensure they meet the criteria outlined in the Code of Federal Regulations.

Additional Information: Reimbursement is paid to the fire departments by the U.S. Department of Treasury after a claim is approved for payment. For more information, please contact the USFA's Tim Ganley at (301) 447-1358.

Name: Rural Fire Assistance (RFA) Program

Description: Eligible Recipients: Rural Fire Departments serving 10,000 people or less that are adjacent to BLM land. Types of projects or purchases that are acceptable:

- Personal Protective Equipment
- New-generation fire shelters/case
- Communications equipment
- Basic Tools
- Basic Wildland Fire Training

Contact BLM for specifics on purchasing guidelines.

The U.S. Fish & Wildlife Service, Bureau of Indian Affairs, and National Park Service also have RFA funds available for rural fire departments with protection areas adjacent to these Federal lands. Please contact your local Federal representative for information.

Additional Information:

BLM Rural Fire Assistance Program (RFA):
Jon Skinner, Rural Fire Assistance Coordinator
Bureau of Land Management, Idaho State Office
(208) 373-3854

Name: Rural Housing Programs

Description: This service is responsible for providing safe, sanitary, and affordable housing for rural families with very low income, low income, and moderate income. The Rural Housing Program delivers its services through a wide range of housing programs, including programs supporting single-family homeownership, multi-family rental housing, and farm labor housing.

Additional Information:

Roni Atkins, Director, Housing Program Director
9173 West Barnes, Ste A1
Boise, ID 83709
Phone: 208-378-5630
E-Mail: roni.atkins@id.usda.gov

Name: Small Business Administration (SBA) Disaster Loan Programs

Description: The SBA Disaster Loan Program provides businesses low-interest, long-term loans to repair or replace damaged property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Homeowners may also qualify for low-interest loans to help rebuild or repair their homes or repair or replace uninsured or underinsured flood-damaged personal property. Renters may qualify for loans to repair or replace personal property. Economic Injury Disaster Loans provide working capital to small businesses and small agricultural cooperatives to assist them through the recovery period.

Additional Information: Small Business Administration; Phone: (916) 735-1500

Name: State Dam Safety Program

Description: The State DSP is administered in Idaho by the IDWR. This program focuses on inspection, classification, and emergency planning for dam safety and permitting of Emergency Action Plans (EAPs). Funding may be used for a variety of projects, including dam safety – related training for State personnel and training in the

field for dam owners on conducting annual maintenance reviews; revision of State maintenance and operation guidelines; improvements to dam inventory databases; and, creation of dam safety videos and outreach materials.

Additional Information:

The Idaho Water Center

322 East Front Street
PO Box 83720
Boise, Idaho 83720-0098
Phone: (208) 287-4800
Fax: (208) 287-6700

Name: The Steele-Reese Foundation Grant Program

Description: The Steele-Reese Foundation, a trust for charitable purposes, was created by Eleanor Steele Reese on August 10, 1955. The foundation makes grants to charitable organizations operating in Idaho and Montana, and in the southern Appalachian mountain region of eastern Kentucky.

Rural Conservation: Examples include composting programs, wildlife projects, ecosystem protection programs, and water projects. All conservation/environmental programs must be locally, rather than regionally, focused. National organizations are eligible for support only if all Steele-Reese funds will be employed directly in projects located in the geographical areas served by this foundation.

Rural Health: Examples include hospices; preventive health programs; equipment for clinics, small hospitals, EMS and ambulance units; family-planning programs.

Rural Humanities: Examples include local arts groups and local historical projects.

Additional Information:

Linda Tracy

Western Program Director
The Steele-Reese Foundation
PO Box 8311
Missoula, MT 59807-8311
E-mail: linda@steele-reese.org
Phone: (406) 207-7984
Fax: (207) 470-3872

Name: USDA Farm Service Agency's (FSA) Emergency Conservation Program (ECP)

Description: The ECP provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland damaged by natural disasters and to carry out emergency water conservation measures in periods of severe drought. Funding for ECP is appropriated by Congress.

County FSA committees determine land eligibility based on onsite inspections of damage, taking into account the type and extent of damage. For land to be eligible, the natural disaster must create new conservation problems that, if untreated, would:

- impair or endanger the land;
- materially affect the land's productive capacity;
- represent unusual damage which, except for wind erosion, is not the type likely to recur frequently in the same area; and
- be so costly to repair that Federal assistance is or will be required to return the land to productive agricultural use.

Additional Information: <http://disaster.fsa.usda.gov>

Name: USDA Farm Service Agency's (FSA) Tree Assistance Program (TAP)

Description: TAP provides financial assistance to qualifying orchardists and nursery tree growers to replant or rehabilitate eligible trees, bushes and vines damaged by natural disasters occurring on or after Jan. 1, 2008, and before Oct. 1, 2011. TAP was authorized by the 2008 Farm Bill and is funded through the Agricultural Disaster Relief Trust Fund.

Additional Information:

USDA/FSA

Idaho State FSA
9173 West Barnes Drive
Boise, ID 83709-1573
Phone: 208-378-5650
Fax: 208-378-5678

Name: USDA Water and Waste Disposal Programs

Description: The Rural Utilities Service (RUS), the Rural Business-Cooperative Service, and the Rural Housing Service comprise USDA's Rural Development mission area. As the name suggests, the three agencies' programs are designed to meet the needs of people who live in rural areas, including infrastructure, housing, health and medical, education, and employment. The Rural Utilities Service's Water Programs Division has four programs, which provide financial and technical assistance for development and operation of safe and affordable water supply systems and sewage and other forms of waste disposal facilities.

Recipients must be public entities. These can include municipalities, counties, special purpose districts, Indian Tribes, and corporations not operated for profit, including cooperatives. A new entity may be formed to provide the needed service, if an appropriate one does not already exist.

Additional Information:

USDA/FSA

Idaho State FSA
9173 West Barnes Drive
Boise, ID 83709-1573
Phone: 208-378-5650
Fax: 208-378-5678

Name: U.S. Department of Housing and Urban Development (HUD) Programs

Description: HUD awards grants to organizations and groups for a variety of purposes. To participate in the HUD grants program, you need to be registered with Grants.gov.

Some HUD programs and services are:

- HUD 5-H Homeownership Program
- HUD Home Program
- HUD Partnership for Advancing Technology in Housing
- HUD/Federal Housing Administration (FHA) Title I Home Repair Loan Program
- HUD/FHA Section 203(h) Mortgage Insurance for Disaster Victims
- HUD/FHA Section 203(k) Rehabilitation Mortgage Insurance Program
- HUD Disaster Recovery Grants

Additional Information: <http://portal.hud.gov/hudportal/HUD> or

HUD Boise Field Office

Plaza IV, Suite 220
800 Park Boulevard
Boise, Idaho 83712-7743
Phone: (208) 334-1990
Fax: (208) 334-9648

Name: U.S. Forest Service/Idaho Department of Lands (USFS/IDL) Community Fire Protection and BLM Partnership Funds

Description: Provide funding for hazardous fuels treatments on private lands adjacent to National Forests (Community Fire Protection) and BLM (Partnership Fund) boundaries. Funds may only be used for hazardous fuels work and not for related activities.

Eligible Recipients: County Wildland Fire Interagency Groups (or county governments)

Additional Information:**Tyre Holfeltz**

Idaho Department of Lands
tholfeltz@idl.idaho.gov
208-666-8653

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Name: Volunteer Fire Assistance (VFA) Program
Description: The Volunteer Fire Assistance (VFA) Program, formerly known as the Rural Community Fire Protection (RCFP) Program, provides financial, technical, and other Federal assistance to State Foresters and other appropriate officials to organize, train and equip fire departments in rural areas and rural communities to suppress fires. A rural community is defined as having a population of 10,000 or less. This 10,000-person limit for participation facilitates the distribution of VFA funding to the neediest fire departments. Eligible Recipients: Rural Fire Departments serving 10,000 people or less.
Additional Information: VFA Program Website: http://www.fs.fed.us/fire/partners/vfa/ or Ken Ockfen ID Department of Lands 3284 W. Industrial Loop Coeur d'Alene, ID 83815 (208) 769-1525 Fax: (208) 769-1524 kockfen@idl.idaho.gov

Name: Water Quality Improvement Projects
Description: Department of Environmental Quality (DEQ) administers Federal and State funds used to provide grants and low-interest loans to eligible entities for specific activities designed to improve the quality of Idaho's water resources. Each grant and loan has its own application requirements and time schedule. In addition, DEQ often receives notice of funding opportunities for water quality improvement projects from other agencies and organizations and passes relevant information on to stakeholders. These are not DEQ-administered funds or programs, and DEQ is not involved in decisions relating to them but provides the information as a public service.
Additional Information: Water Quality Division DEQ State Office 1410 North Hilton Boise, Idaho 83706 Phone: (208) 373-0502 Fax: (208) 373-0576

Name: Western States Fire Manager's Grant Program
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Description: This grant program is the primary source of funding used to conduct hazardous fuels treatments on private lands in Idaho. The ILRCC prioritizes all applications received in Idaho. These applications are then reviewed by a panel of Western States Fire Managers, where final funding decisions are made.

Eligible Recipients: County Wildland Fire Interagency Groups (or county governments)

Additional Information:

General ILRCC questions:

Suzanne Schedler, Administrative Assistant

Idaho Department of Lands

3780 Industrial Ave South

Coeur d'Alene, ID 83815

Phone: (208) 666-8649

Fax: (208) 769-1524

Specific questions regarding policies or procedures of the ILRCC:

Craig Glazier, Idaho National Fire Plan Coordinator

Idaho Department of Lands/USDA Forest Service

Phone:(208) 666-8646

Name: The Wilburforce Foundation Grant Program

Description: Wilburforce Foundation protects wildlife habitats in Western North America by actively supporting organizations and leaders advancing conservation solutions. Wilburforce makes investments that contribute to the following types of outcomes:

- Increase access to and use of scientific, legal, political, and economic information resources;
- Improve the efficiency and effectiveness of grantee organizations conservation leaders, and other allies;
- Increase communication, cooperation and collaboration among grantees, stakeholders, decision-makers and/or allies;
- Increase awareness, support and utilization of conservation policies, plans and practices that protect wildlife habitat;
- Decrease or mitigate threats to wildlife habitat;
- Improve the protected status of wildlife habitat;
- Improve the ecological resilience of the landscapes in which we work.

Additional Information:

Wilburforce Foundation

3601 Fremont Ave N, #304

Seattle, WA 98103-8753

Phone: 206-632-2325

Fax: 206-632-2326

Email: grants@wilburforce.org

VII. PLAN MAINTENANCE

7.1 Overview

To remain an effective and relevant document, it is vital the plan is actively maintained throughout the five-year lifecycle. This section describes the method and schedule for monitoring, evaluating, and updating the HMP, as well as continued community participation throughout the five years. This section also details existing plans, policies, and programs that the county and responsible agencies can employ or work through to more effectively implement the mitigation strategy, as well as recommended updates for 2022.

7.1.1 FEMA Requirements

This section is consistent with the process and requirements detailed by FEMA. The FEMA requirements addressed in this section include:

- FEMA 44 CFR §201.6(c)(4)(i) – A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
- FEMA 44 CFR §201.6(c)(4)(ii) – A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, where appropriate.
- FEMA 44 CFR §201.6(c)(4)(iii) – A discussion on how the community will continue public participation in the plan maintenance process.

7.2 Administration & Mitigation Items

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

Owyhee County and the incorporated cities, encourage the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

All risk assessments were made based on the conditions existing during 2017; thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the County's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

A coordinating agency or organization is identified for each proposed action item. It is up to the County Emergency Manager along with the County Board of Commissioners and city governments to hold these entities accountable for implementation, including applications for funding, of the proposed projects. The responsible agency or organization should elect a project manager in charge of carrying out the action item as directed by the planning committee. Specific tasks may be delegated to other planning committee members, but the project manager is ultimately responsible for project completion. In most cases the entity responsible for management of the mitigated item will be the project applicant; however, the planning committee may choose to provide additional support.

The Mitigation Action Progress Report located in Appendix G should be used at the commencement, major milestones, and successful or unsuccessful completion of all mitigation-related projects implemented in the county. The annual compilation of these reports will then provide the foundation for the mitigation review and update in 2022.

7.3 Monitoring, Evaluation, & Updating

Required by FEMA, monitoring, evaluating, and updating the HMP throughout its five-year lifecycle is important in maintaining the plan's relevance to Owyhee County. Often, HMPs are left unmaintained until after the mandatory five-year update deadline, at which point the county and the incorporated cities that adopted the plan become ineligible for further pre-disaster and recovery funding assistance from federal entities. To avoid loss of potential funding, the 2017 plan will be engaged on an annual basis until it's the following update in 2022. This monitoring, evaluation, and plan update process applies to the county and all adopting jurisdictions, including the City of Homedale when the City is able to participate and adopt the HMP.

The governing body of the 2017 plan update are the County Commissioners, who will designate the Owyhee County Emergency Manager and planning committee to monitor, evaluate, and update the plan over its five-year lifecycle. To maintain the HMP throughout its lifecycle, the planning committee will assess hazard occurrence, mitigation action progress and implementation, updates to growth management strategies incorporating hazard mitigation, and changes in risk perception and/or mitigation priorities on an annual basis. An annual meeting will be held at an agreed-upon date, time, and location, and provide the opportunity for additional stakeholder and neighboring community engagement. The annual review will consider changes or additional county, state, and federal laws.

Members of the planning committee can engage in email or phone correspondence between annual meetings if the need arises.

The Owyhee County Emergency Manager or a person as designated by the County Commission is responsible for the scheduling, publicizing, and leadership of the annual review meeting. During this meeting, participating jurisdictions will report on their respective projects and identify needed changes and updates to the existing plan. Maintenance to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the Multi-Hazard Mitigation Plan. Re-evaluation of this plan should be made before the 5th anniversary of its acceptance, and every 5-year period following.

The emergency manager and planning committee will also re-evaluate the plan after any losses are incurred after a hazard event. Losses incurred during and after a disaster provide the opportunity to assess vulnerabilities, potential future issues, and needed mitigation actions to reduce future loss of life and property. If the need arises, the planning committee will initiate a plan update before the required five-year update, with focus on the risk assessment and mitigation strategy.

In order to provide a comprehensive evaluation, the Owyhee County Emergency Manager and planning committee will distribute the Internal Capabilities Assessment Form located in Appendix G to all organizations with technological and human resources able to respond to and recover from a disaster. The bi-annual compilation of these reports provide an avenue for assessing the county's equipment and human resource needs, and can form the basis of the capabilities section in the 2022 plan update while providing additional mitigation actions.

Updates or modifications of the HMP during the five-year period will require a public notice and meeting prior to submitting the revisions to the adopting communities. The revised plan will be posted in public meeting spaces (such as the County Administration Building) and online, and comments and feedback will be solicited. This feedback will be incorporated into the revised plan before final submission.

7.3.1 Annual Review

The focus of the planning committee at the annual review meeting should include the following topics:

- Update historical events record based on any events in the past year.
- Review county profile and individual community assessments for each hazard and note any major changes or mitigation projects that have altered the vulnerability of each entity.
- Update the Resources and Capabilities information as necessary for each fire department.
- Add a section to note accomplishments or current mitigation projects.

- All action items in Chapter 8 of Volume I and Chapter 5 of Wildfire Mitigation Plan will need to be updated as projects are completed and as new needs come up. Action items will also need updated in the Prioritization Worksheet (Excel file).
- Address Emergency Operations Plan – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate the EOP into the action items for the MHMP?
- Address County Comprehensive Plan – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate the Comprehensive Plan into the action items for the MHMP?
- Incorporate additional hazard chapters as funding allows.

All meeting minutes, press releases, and other documentation of revisions should be kept on record by the Owyhee County emergency manager.

7.3.2 Five Year Review

The focus of the planning committee at the five-year review should include all of the topics suggested for the annual review in addition to the following items:

- Update County demographic and socioeconomic data.
- Address any new planning documents, ordinances, codes, etc. that have been developed by the County or cities.
- Review listed communication sites.
- Review municipal water sources, particularly those in the floodplain or landslide impact areas.
- Redo all risk analysis models incorporating new information such as an updated County parcel master database, new construction projects, development trends, population vulnerabilities, changing risk potential, etc.
- Update county risk profiles and individual community assessments based on new information reflected in the updated models.

All meeting minutes, press releases, and other documentation of revisions should be kept on record by the Owyhee County Emergency Manager.

7.4 Continued Public Participation

Owyhee County and the adopting jurisdictions will continue public participation throughout the plan’s five-year lifecycle using the same process. The county emergency manager and representatives from the jurisdictions will be responsible for scheduling and facilitating public meetings when deemed necessary. These meetings will provide the public of all jurisdictions the opportunity to review proposed plan revisions and updates, changes in hazards and risk, and progress in the implementation of the mitigation strategy. These meetings will also provide a forum for the public to express concerns, perspectives, alternatives, and information that can be included in the plan. The Owyhee County emergency manager, members of the planning committee, and/or representatives and officials from the adopting jurisdictions will be responsible for publicizing the public meetings and maintaining public involvement.

To further facilitate continued public involvement, the adopting jurisdictions will ensure that:

- Copies of the plan will be maintained for public review in the Office of the Owyhee County Clerk.
- Public outreach is conducted following a disaster to enhance risk awareness, remind the public of the importance of hazard mitigation, and to solicit mitigation ideas.

7.5 Implementation through Existing Plans & Programs

7.5.1 Overview

For a community to succeed in reducing risks in the long term, the information and recommendations of the mitigation plan should be integrated throughout government operations. This section describes the community’s process to integrate the data, analysis, and mitigation goals and actions into other planning mechanisms. The City of Homedale is currently not adopting the plan however, planning mechanisms are provided for how the city may implement hazard mitigation actions with participation and adoption in future HMP updates.

Table 79 Hazard Mitigation Implementation through community planning mechanisms

Jurisdiction	Planning Mechanism (s)	Hazard Mitigation Implementation
Owyhee County	<ul style="list-style-type: none">• Comprehensive Plan• Zoning & Land Use Ordinance• Building Codes• Board of Commissioners	<ul style="list-style-type: none">• Mitigation actions implemented through policies in the “Hazardous Areas” section in Comp Plan• Development and Infrastructure related mitigation actions implemented through

	<ul style="list-style-type: none"> • LEPC • CWPP 	<p>Building Codes and Development Standards in Land Use, Subdivision & PUD Ordinances</p> <ul style="list-style-type: none"> • Hazard mitigation actions can be implemented by Board of Commissioners action • Wildfire mitigation actions can be implemented by being added as a project in the CWPP
City of Marsing	<ul style="list-style-type: none"> • Comprehensive Plan • Zoning & Land Use Ordinance 	<ul style="list-style-type: none"> • Mitigation actions implemented through policies in the “Hazardous Areas” section in Comp Plan • Development and Infrastructure related mitigation actions implemented through Building Codes and Development Standards in Land Use Ordinance
City of Grand View	<ul style="list-style-type: none"> • Comprehensive Plan • Zoning & Land Use Ordinance 	<ul style="list-style-type: none"> • Mitigation actions implemented through policies in the “Hazardous Areas” section in Comp Plan (also see 7.4.2) • Development and Infrastructure related mitigation actions implemented through Building Codes and Development Standards in Land Use Ordinance
City of Homedale	<ul style="list-style-type: none"> • Comprehensive Plan • Zoning & Land Use Ordinance • NFIP 	<ul style="list-style-type: none"> • Mitigation actions implemented through policies in the “Hazardous Areas” section in Comp Plan (also see 7.4.2) • Development and Infrastructure related mitigation actions implemented through Building Codes and Development Standards in Land Use Ordinance • Continue participation in the National Food Insurance Program

7.6 Examples of Regional Best Practices

Including hazard mitigation policies within a community’s comprehensive plan is a vital step towards reducing hazard risk and vulnerability. These policies can then be implemented through regulatory

growth management strategies. This section provides “best practice” examples of integrating hazard mitigation policies into comprehensive plans from communities in Idaho and the States of Oregon and Washington.

7.6.1 City of Driggs, Idaho

The City of Driggs is located in the Teton Valley between the Teton and Big Hole Mountains in eastern Idaho. The city is at risk to hazards such as drought, winter storms, flooding, earthquakes, and wildfire. The city includes not only the Idaho LLUPA-mandated hazardous area chapter in its comprehensive plan, but also includes a recommended future land use map that designates the floodplain as preferred open space and wetlands. The hazardous area chapter of the comprehensive plan includes a goal, objective, and detailed actions aiming to reduce hazard vulnerability. The overall goal for the hazardous area chapter in the City of Driggs Comprehensive Plan is to “minimize risk or damage or injury from known hazards.” In order to achieve this goal, the city proposed detailed actions that can be implemented through the state’s growth management strategies. These actions (which are often one of the weakest components of hazardous area chapters around the state) include the following:

- Developing a floodplain ordinance
- Requiring PUDs to place all building envelopes outside of the 100-year floodplain and providing incentives for this option
- Continuing to work with county, state, and federal agencies, and other organizations on a restoration plan for Teton Creek
- Continuing to adopt the most recent International Building Code
- Enforcing the business license requirements for inspections of potential hazards prior to allowing occupancy for new uses
- Working with the Teton County Fire District and other emergency management officials to assess zoning and development regulations for potential hazardous uses
- Using pamphlets and a website to educate the public on the risks of radon, testing services, and mitigation systems

7.6.2 City of Albany, Oregon

The City of Albany, Oregon is located between the Cascade and Coast mountain ranges at the confluence of the Willamette and Calapooia rivers. The city is at risk to flooding, windstorms, severe weather, earthquakes, wildfires, and volcanic eruption. The State of Oregon requires each city and county to adopt a comprehensive plan and the corresponding zoning and land-division ordinances needed to put the plan into effect. Within a city or county comprehensive plan, 19 statutory goals need

to be addressed. The City of Albany Comprehensive Plan includes the mandatory hazardous area goal, hazard maps, hazard mitigation policies addressing flood events and steep slopes, and specific implementation methods for these policies. Going above and beyond the minimum requirement of including the mandated hazardous area goal within its comprehensive plan, the City of Albany is a noteworthy success due to its integration of hazard mitigation into the required housing goal. Often, hazardous area components are standalone chapters and rarely integrated into other community goals and policies. However, the City of Albany addressed hazards within their future housing projections. The city calculated projected housing needs using various growth rate scenarios and then compared the results to the buildable land, which excludes floodplains, wetlands, and slopes. This example is a proactive, long-term growth management success as the city successfully analyzed and determined that there was enough buildable land to meet the projected community's housing needs until 2025.

7.6.3 Kittitas County, Washington

Kittitas County is located in the center of Washington State, starting in the high Cascade Mountains and extending east to the Columbia River. The county is at risk to severe weather, earthquake, flood, avalanche, landslide, and wildfire. The State of Washington adopted the Growth Management Act (GMA), which provides various tools and strategies to manage growth, protect rural character, protect critical areas, and conserve natural resources. The GMA's detailed policy framework requires fast-growing cities and counties to address 14 goals within their comprehensive plan. These goals include housing; capital facilities; utilities; transportation; rural lands (for counties); and shoreline chapters (if applicable). Also required by the GMA is the designation and protection of critical areas and the designation of natural resource lands. By adopting the local HMP by reference within the comprehensive plan, Kittitas County goes above the minimum requirements to provide information, goals, and policies related to frequently flooded areas and geologically hazardous areas. Kittitas County's adoption of the HMP is noteworthy as comprehensive plans often omit HMP references and only provide general information relating to hazards, making it difficult to plan for growth while simultaneously attempting to reduce the risk from hazard events.

7.7 Recommendations for Implementation & Updates

7.7.1 Future Acquisitions Map

Idaho's LLUPA presents the authority to cities and counties to adopt, amend, appeal, or repeal a future acquisitions map in accordance with the notice and hearing procedures provided in section 67-6509, Idaho Code. The map shall designate land proposed for acquisition by a public agency for a maximum of 20 years. Lands that may be designated on this acquisition map include:

- Streets, roads, other public ways, or transportation facilities proposed for construction or alteration
- Proposed schools, airports, or other public buildings
- Proposed parks or other open space
- Lands for other public purposes

Owyhee County can utilize the risk assessment and partner with local, state, or federal agencies (e.g., USFS, BLM, Parks & Recreation, etc.) to identify hazardous areas and designate them on a Future Acquisitions Map. Mapping hazard areas on a future acquisitions map can help recognize the linkages between conservation of open space and risk reduction to property and life. Areas to potentially identify in plan maps include:

- Steep slopes
- Flood hazard areas
- Wildland-urban interface
- Subsidence zones
- Avalanche paths
- Unstable soils
- Other geologic hazard areas

7.7.2 Flood Control District

Inherent in the roles of local government is protecting citizens and property from injury and damage by natural hazards. In order to carry out this role, Owyhee County and its incorporated cities have the power to implement a Flood Control District that provides funding and policy oversight for flood protection projects and programs.

Funding for a flood district can come from a property levy tax, an amount determined by each community, per \$1,000 assessed value. This funding can be put towards projects including but not limited to:

- Mitigation projects identified in HMPs
- Flood containment levees and bank stabilization projects
- Providing for a regional flood warning center and emergency response
- Flood facility maintenance
- Public education and outreach
- Mapping and technical studies, and
- Mechanisms for citizen inquiry and public response

A Flood Control District can act as an independent special purpose government and should consist of a Board of Supervisors responsible for developing a plan for funding maintenance and repairs of flood

control facilities. Other committees should include an Executive Committee that meets monthly, develops policy recommendations, and oversees the day-to-day business of the District; an Advisory Committee that makes annual recommendations to the Board of Supervisors related to the annual budget; and a Watershed Technical Committee that ensures that watershed-scale issues and technical information are factored into the decision-making of the flood district.

7.7.3 Funding Opportunities

The costs of mitigation actions and projects can vary from minimal to many millions of dollars. Structural and critical infrastructure projects in particular often require financial assistance. However, funding is often cited as the limiting factor in the successful implementation or completion of a risk-reducing action. Departmental and agency funds can be limited and pre-allocated to non-mitigation activities, while grants and other sources of funding are ignored or unknown.

Therefore, it is important that the communities within Owyhee County coordinate and actively seek financial assistance for mitigation actions. This assistance can come in the form of grants, loans, technical assistance, or in-kind contributions. Given the complexity of financial assistance, it is recommended that the communities within Owyhee County designate a point of contact or committee for seeking out, applying, and distributing grants and other funds. Such designation or committee should work across local, state, and federal institutions, and keep a shared calendar of important dates for grants and other sources of funding. Likewise, this position can help communities identify any initiatives or activities that can be accomplished using existing programs or budgets.

7.7.4 Communicate Mitigation Successes

Communicating successfully completed mitigation actions and projects can help garner further support for continuing mitigation efforts. Communicating successes through public service announcements, newspaper and website articles, social media, and other avenues helps inform the general public of the risks in their community and the efforts undertaken to mitigate such risks. Likewise, communicating these successes can help garner institutional support by highlighting cost-effective and resource-efficient actions with the potential to reduce the monetary costs of hazards. It is recommended the communities within Owyhee County cooperatively develop a county-wide public outreach strategy and regularly communicate mitigation successes. Example outreach methods include the following:

- Participating in community events
- Interviews
- News media, including radio, newspaper, and television
- Presentations to governing bodies
- Social media

- Community-specific meetings
- Website

7.7.5 Comprehensive Socioeconomic Vulnerability Assessment

Socioeconomic vulnerability is the predisposition of an individual or population to be negatively impacted by a hazard due to existing socioeconomic or demographic characteristics. For example, elderly populations are often more vulnerable to hazards due to challenged mobility, requiring additional evacuation time and special care. Likewise, female populations are more vulnerable than male populations to disasters due to family responsibilities and lower average incomes, making it more difficult for female populations (notably single parent female head of households with children) to recover. Understanding socioeconomic vulnerability is crucial in mitigation planning, yet is often omitted in both risk assessments and mitigation strategies.

When socioeconomic vulnerability is accounted for, the model employed often lacks the sophistication to produce an accurate measure of vulnerability. These traditional models produce results at resolutions too coarse for sub-county mitigation efforts. Although appropriate for studies or plans written at the state- or nation-wide scale, these models are inappropriate for county- or regional planning and analysis. Likewise, traditional vulnerability models are often generalized and do not consider the distinct local characteristics of a community, relying on general statistical analyses of demographic data collected in the decadal census. Finally, these models are often statistically incorrect, and do not account for the spatial patterns and relationships of the indicators used as proxy measures of vulnerability.

To overcome these limitations, the SERV model was developed by Dr. Tim Frazier at HazCIRC. This model addressed these limitations by accounting for local community characteristics, incorporating advanced spatial analysis and statistics, and producing sub-county results. The SERV model accounts for a community's ability to overcome stressors, its sensitivity to stressors, and the population exposed to various magnitudes of a hazard to produce a comprehensive vulnerability score. The SERV model was employed in this 2017 HMP Risk Assessment to identify areas at greater risk to loss of lives and property from various hazards. However, a more comprehensive and targeted vulnerability assessment should be undertaken to identify the underlying factors amplifying vulnerability.

The targeted socioeconomic vulnerability assessment should employ the Geographically-Weighted Spatially Explicit Resilience-Vulnerability (GWSERV) model (Figure 46). The GWSERV is an improvement on the SERV model, and is the most advanced socioeconomic vulnerability model to date. The GWSERV employs geographically-weighted factor analysis to provide high-resolution localized analyses and results. The GWSERV does not simply produce a measure of vulnerability, but provides stakeholders and decision makers with the primary underlying socioeconomic and demographic indicators driving vulnerability (Figure 46). This knowledge and information is vital to best target mitigation efforts, and to reduce community vulnerability and enhance community resilience.

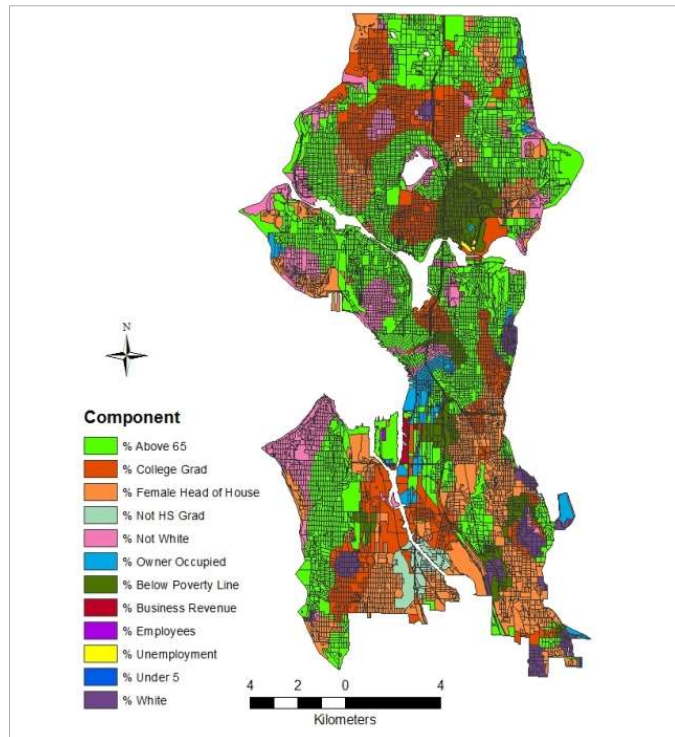


Figure 46. Example GWSERV results

7.7.6 Improved GIS Mapping & Data Management

GIS mapping and data management are foundational in understanding risk, effectively targeting mitigation efforts, managing development for sustainability, and ultimately enhancing community resilience to hazards. GIS maps in combination with high-quality data provide the means to visualize the extent and magnitude of hazards, the potential losses if a disaster were to occur, and the location of vulnerable populations. GIS analyses can help improve the understanding of hazard impacts and expose areas or populations of concern that might otherwise stay hidden. Such maps and data help identify and prioritize mitigation areas, and can likewise be used to assess mitigation areas of effect.

Given the utility of GIS maps and data, it is recommended that the communities within the Owyhee County maintain comprehensive and high-quality GIS data. Examples of data include but are not limited to the following:

- Building stock (with hazard-specific attributes)
- Historical hazard occurrences
- Future hazard probabilities
- Critical facilities and infrastructure data
- Land use and zoning
- Areas of city impact and future development

- Socioeconomic vulnerability
- Community assets
- High potential loss facilities
- Geo-coding of mitigation actions

Such data provides a foundation on which to build a comprehensive GIS program to reduce community vulnerability and enhance resilience. For example, developing a building stock dataset with hazard-specific attributes allows for the creation of User-Defined Facilities (UDF) for use in Hazus-MH loss estimations. The inclusion of UDFs produces more accurate results than the general building stock included in the software. However, like all modeling, the output and results of Hazus-MH loss estimations and other GIS models are dependent on the quality of the input dataset. Therefore, it is important to build datasets with appropriate levels of detail and accuracy. Building and using data that captures real-world conditions greatly increases its reliability and usability.

To maintain high-quality data, communities within the watershed can standardize and share data collection and archiving. Likewise, the counties and communities can format all newly-permitted construction records and assess existing construction records to create an accurate and standardized dataset of structures.

7.7.7 Develop a Post-Disaster Recovery Plan

Although mitigation is vital to reducing community vulnerability and enhancing community resiliency, it is only one aspect of the disaster continuum. Another aspect that should be considered through the planning process is recovery following a disaster. Disaster recovery is defined by FEMA as a return of community systems and structures to a “normal state”, which is usually held as the pre-disaster state of the community. Together, planning for both mitigation and recovery allows communities a more holistic approach to hazards and risk, and ultimately facilitate greater community resiliency.

To produce a holistic mitigation strategy, Owyhee County and a cooperative county-wide group should prepare post-disaster recovery plans (PDRPs). The PDPR is the means to identify and plan for issues a community is likely to face after a disaster. The primary goals of a PDRP are to identify and prioritize key issues; establish partnerships within the community, with neighboring communities, and state and federal agencies; develop a recovery strategy implementable immediately following an event; and more effectively and efficiently allocate resources. Through the PDPR planning process, communities can also identify pre-disaster mitigation projects and enhance response and preparedness capabilities. Undertaken at the county scale, PDRPs can greatly enhance the resiliency of the Owyhee County through a bioregional approach by building relationships vital in both the pre-, during-, and post-disaster periods, illuminating region-wide issues that may arise in the post-disaster period, and instituting a plan to seize the short-yet-vital window in the post-disaster period to enhance resiliency across multiple spatial scales.

To best formulate the PDRPs, the following strategies (but not limited to) should be included in the PDRPs:

- Post-disaster recovery plans
- Recovery ordinances
- Business and government continuity plans
- Post-disaster buildable lands inventories
- Utility recovery and reconstruction plans
- Temporary shelter, housing plans, and business plans
- Establishment of a coordinating organization and guiding principles for reconstruction

7.7.8 Appreciative Inquiry: Asset Based Workshop during next HMP Update Process

In order to maintain eligibility for FEMA mitigation grant funds, HMPs must be updated every five years. This update process must include an open public involvement process constituting a more comprehensive approach to reducing the effects of natural hazards. However, due to the complex and technical nature of hazards planning, participation is often low in communities. This presents opportunity to implement the “Appreciative Inquiry Approach” developed by Freitag et. al 2014, in which the goal is to highlight local assets that promote well-being and adaptive capacities for recovery after an imagined disaster with a focus on non-hazard community factors.

This approach could be adapted and used for Owyhee County during their next HMP update in order to prioritize mitigation actions and increase public support and participation. This process entails holding community workshops where the public would participate in two mapping exercises. The first of the two mapping exercises prompt the public to identify community assets that are important to their wellbeing during everyday life. The second of the two mapping exercises prompts the public to identify community assets that they feel are important during a disaster scenario. After the completion of these two mapping exercises, local officials and stakeholders can identify the overlapping areas and assets in the two maps and consider them to be Areas of Mitigation Interest (AOMI) in the HMP.

APPENDICES

The following appendices contain documentation related to the HMP, to be used in future updates, or collects the documentation of the planning process.

Contents

Appendix A. Official Documentation & Resolutions

Appendix B. Plan & Policy Evaluations

Appendix C. Meeting Documentation

Appendix D. Disaster Declarations

Appendix E. Hazus-MH Summary Reports

Appendix F. Survey & Responses

Appendix G. Forms & Templates

Appendix H. Community Wildfire Protection Plan

Appendix I. Capability Assessments

Appendix J. Hazard Profiles

APPENDIX A. OFFICIAL DOCUMENTATION & RESOLUTIONS

This appendix contains scans and copies of all official documents, signed resolutions, and promulgations pertaining to the 2016 plan update.

Contents

1. Owyhee County match and support letter
2. City of Grand View Letter of Intent to participate and adopt
3. City of Homedale Letter of Intent to participate and adopt
4. City of Marsing Letter of Intent to participate and adopt



OWYHEE COUNTY BOARD OF COMMISSIONERS
COURTHOUSE P.O. BOX 128 MURPHY, ID 83650-0128
TELEPHONE (208) 495-2421

District 1 –Jerry Hoagland-P O Box 128, Murphy, ID 83650 318-8308
District 2 –Kelly Aberasturi-P O Box 128, Murphy, ID 83650 249-4405
District 3 –Chairman - Joe Merrick-P O Box 128, Murphy ID 83650 250-9005

July 7, 2014

Mark L. Stephensen, CFM
Mitigation Section Chief
State Hazard Mitigation Officer
Idaho Bureau of Homeland Security

Re: Owyhee County Match Letter and Letters of Intent from Jurisdictions in Support of
Hazard Mitigation Assistance (HMA) Subgrant Application

This document will be delivered electronically to mstephensen@bhs.idaho.gov and by US Mail to the addressee.

Dear Mr. Stephensen:

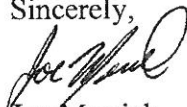
Owyhee County acknowledges and will provide match for the Hazard Mitigation Subgrant in the amount of \$10,417. Our match will be the participation, expertise, and involvement of county and city staff and emergency responder participants

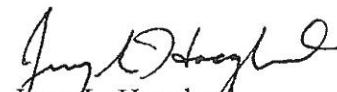
We have enclosed Letters of Intent from the Cities of Grand View, Homedale, and Marsing.

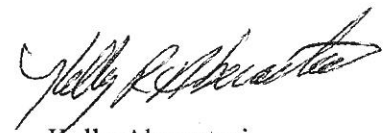
In keeping with the importance of revising and updating our All Hazard Mitigation Plan, we will also engage the first responders in our county to ensure their participation in the same fashion as we did in creating our original AHMP in 2009. In that planning effort we engaged the various separate organizations in our county who provide emergency response.

We look forward to participation in this important planning effort.

Sincerely,


Joe Merrick
Chairman


Jerry L. Hoagland
Commissioner


Kelly Aberasturi
Commissioner

3 Encl:
Grand View Letter of Intent
Homedale Letter of Intent
Marsing Letter of Intent



P.O BOX 69
GRAND VIEW, ID 83624



HUNT FISH CAMP BIKE WATER SPORTS & MORE TO EXPLORE

Mayor: Franklin Hart

City Council Members:

Donald "Bill" Mead, President
Jim Burnett
Linda Araujo
Marie Hipwell

July 2nd, 2014

Chairman Joe Merrick
Owyhee County Commissioners
P.O. Box 128
Murphy, ID 83650

Re: Participation in and Support of Revision of the Owyhee County All Hazards
Mitigation Plan

Dear Chairman Merrick:

The City of Grand View would like to participate in the Owyhee County All Hazards Mitigation Plan work group, being convened to revise and update the Owyhee County Plan as part of a Federal Emergency Management Agency (FEMA) Group Grant, which will be submitted by the Idaho Bureau of Homeland Security (BHS).

Upon completion of the plan revision and adoption by the County Commission, our City will recognize the Owyhee County All Hazard Mitigation Plan as the official plan of record for Owyhee County.

Sincerely,

A handwritten signature in black ink, appearing to read "Franklin D. Hart".

Franklin D. Hart
Mayor

Gheen Christoffersen
Mayor

Alice E. Pegram
City Clerk-Treasurer



City of Homedale

PO Box 757
Homedale, Idaho 83628

cityofhomedale@cableone.net

Phone 208-337-4641
Fax 208-337-5904

July 1, 2014

Chairman Joe Merrick
Owyhee County Board of County Commissioners
PO Box 128
Murphy, ID 83650

Re: Participation in and Support of Revision of the Owyhee County All Hazards
Mitigation Plan

Dear Chairman Merrick:

The City of Homedale would like to participate in the work group which will be formed to revise and update the Owyhee County All Hazards Mitigation Plan as part of a FEMA Group Grant which is being submitted by Idaho BHS.

Upon completion of the plan revision and adoption by the County Commission, our City will recognize the plan as the Owyhee County All Hazard Mitigation Plan.

Sincerely,



Gheen Christoffersen
Mayor
City of Homedale

City of Marsing

Keith D. Green ~ Mayor Janice C. Bicandi ~ City Clerk-Treasurer

July 7, 2014

Chairman Joe Merrick
Owyhee County Board of County Commissioners
P.O. Box 128
Murphy, ID 83650

Re: Participation in and Support of Revision of the Owyhee County All Hazards Mitigation Plan

Dear Chairman Merrick:

The City of Marsing would like to participate in the work group which will be formed to revise and update the Owyhee County All Hazards Mitigation Plan as part of a FEMA Group Grant which is being submitted by Idaho BHS.

Upon Completion of the plan revision and adoption by the County Commission, our City will adopt the plan as our All Hazard Mitigation Plan, if agreed by the City Council.

Sincerely,



Keith D. Green
Mayor



APPENDIX B. PLAN & POLICY EVALUATIONS

This appendix contains plan and policy evaluations, including the former plan evaluation, the comprehensive plan evaluation, and the local plan review tool used to assess the plan's compliance.

Content

1. Owyhee County HMP evaluation
2. Owyhee County Comprehensive Plan evaluation

Local Hazard Mitigation Plan Evaluation Matrix

Plan Title	Owyhee County, Idaho Multi-Hazard Mitigation Plan Volume 1
Jurisdictions Included	Owyhee County, Cities of Homedale, Marsing, and Grand View
Evaluation Date	17-Oct-15
Edition (1st, 2nd, etc.)	1st
Preparer	Michelle Ritchie

Scoring Methods:

Ordinal Scale: Indicators measured from 0 to 3;

0 = not identified,

1 = suggested or identified but not detailed,

2 = detailed

3 = comprehensive detail

Clarity of purpose, issues, solid fact basis, integration, linkage of land use and emergency management efforts, internal consistency and comprehensible organization, assigned responsibility for implementation, monitoring and updating

*Binary Scale: Indicators measured from 0 to 1;

0 = not identified/addressed,

1 = identified/addressed

*Use Ordinal Scale unless otherwise indicated

FEMA Requirements

HMPS MUST PASS THE FOLLOWING BASE LEVEL REQUIREMENTS TO QUALIFY FOR FEMA MITIGATION GRANT FUNDING

Element A. Planning Process

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
A1. Does the Plan document the planning processes, including how it was prepared and who was involved in the process for each jurisdiction?	Ordinal	2	12-27	Narrative provided details of the planning processes, including records of the planning team and the meetings held throughout the process.
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process?	Ordinal	1	12-27	Representatives were named in meeting descriptions.
A3. Does the Plan document how the public was involved in the planning process during the drafting stage?	Ordinal	2	20-27	Public involved through news releases, public meetings, surveys, etc., but can be improved with more detailed narrative, inclusion of meeting minutes, pictures, etc.
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information?	Ordinal	2	7-10	Number of plans and policies reviewed, including school district and reservation plans. Recommend including more detailed information and citations.
A5. Is there discussion on how the community(ies) will continue public participation in the plain maintenance process?	Ordinal	2	25, 175	Continued public involvement described, but can be improved by including specific citizen monitoring/evaluation metrics (such as worksheets/feedback forms).
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)?	Ordinal	1	175-181	Plan describes annual and 5-year updates to plan, including monitoring and evaluating, but needs explicit provisions for evaluating success/failure of mitigation actions.

Element B. Hazard Identification and Risk Assessment

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction?	Ordinal	2	57-173	Plan details a number of hazards, and includes a good baseline analysis of type, location, and extent. Plan can be improved by including additional hazards.
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction?	Ordinal	2	57-173	Previous occurrences highly detailed, but lacks more advanced future projections (e.g., future fire regimes).
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction?	Ordinal	1	57-173	Detailed qualitative descriptions of historical impacts and hazard impact areas, and includes basic vulnerability measure.
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods?	Ordinal	3	63	No repetitive losses in County; however, County does not participate in NFIP.

Element C. Mitigation Strategy

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
C1. Does the Plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs?	Ordinal	3	41-51	Legal frameworks identified, statement that existing plans/authorities/etc. were reviewed, but does not include detailed capabilities assessment.
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate?	Ordinal	3	63-64	Owyhee County not participating; recommended NFIP participation as mitigation action.
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards?	Ordinal	2	181-187	Goals comprehensive and covers range of vulnerabilities; recommend specific actions to achieve goals.
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure?	Ordinal	2	181-187	Plan identifies, prioritizes, and analyses broad range of mitigation actions and projects.
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction?	Ordinal	2	181-187	Prioritizes actions using cost-benefit analysis. Implementation measures identified through responsible parties; recommend template to be filled out by authorities throughout process.
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate?	Ordinal	2	181-187	Goals and actions to integrate HMP into additional plans, including County Comprehensive Plan.

Element D. Plan Review, Evaluation, and Implementation (applicable to plan updates only)

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
D1. Was the Plan revised to reflect changes in development?	Ordinal	NA	NA	NA
D2. Was the Plan revised to reflect progress in local mitigation efforts?	Ordinal	NA	NA	NA
D3. Was the Plan revised to reflect changes in priorities?	Ordinal	NA	NA	NA

Element E. Plan Adoption

E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval?	Ordinal	1	202-206	Signature pages included but not signed.
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption?	Ordinal	1	202-206	See above.

FEMA Requirements Scores and Notes

Element	Possible Score	Plan Score	Notes
Element A. Planning Process	18	10	Plan provides extensive narrative of planning process and public participation, but falls short when describing integration of other plans/policies/etc. Recommend specific monitoring, evaluation, and updating metrics.
Element B. Hazard Identification and Risk Assessment	12	8	Plan provides extensive detailed historical occurrences of a wide range of hazards, but lacks comprehensive risk and vulnerability assessments.
Element C. Mitigation Strategy	18	14	Plan presents both general goals/strategies/policies/projects throughout hazard profiles and in separate table with prioritization. Extensive list of funding sources provides for potential financial assistance. Plan excels in capabilities assessment.
Element D. Plan Review, Evaluation, and Implement	NA	NA	NA: Applicable to Plan updates only.
Element E. Plan Adoption	6	2	Plan includes resolutions but does not have signatures.
Total	45	34	Plan presents a strong foundation that can be improved upon through the update process. As it stands, the Plan passes all baseline FEMA requirements except Element E.

Internal Plan Recommended and Supplemental Targets

FEMA RECOMMENDATIONS AND RECOMMENDATIONS BASED ON LITERATURE AND INTERVIEWS WITH COUNTY PERSONNEL

Fact-Based Hazard Assessment

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Which hazards are addressed?	Seismic/Earthquake	Binary	1	99-114	
	Severe Storm	Binary	1	115-128	
	Flood	Binary	1	57-81	
	Landslide/Ground Failures	Binary	1	83-97	
	Volcanic Eruption	Binary	0	83	Mentioned but not specifically addressed.
	Wildfire	Binary	1	129-174	
	Tsunami	Binary	n/a		
	Drought	Binary	1	118, 122-123	
	Avalanche	Binary	0	44, 57, 68, 96	Mentioned but not specifically addressed.
	Sea Level Rise	Binary	n/a		
	Coastal Erosion	Binary	n/a		
	Dam Safety/Failure	Binary	0	2, 4	Mentioned but not specifically addressed.
	Human-Caused	Binary	0		
	Pandemic	Binary	0	5	Mentioned but not spec. addressed, though its importance is highlighted.
	Other	Binary	n/a	118	Hazardous material transport mentioned but not addressed, wind storms and tornadoes also.

Fact-Based Hazard Assessment (Continued)

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Hazard identification assessment	Are the hazards prioritized in the Plan?	Ordinal	2	2, 176-181	
	Are the factors used in prioritizing hazards identified (intensity, frequency, geographic distribution, mitigation potential, past losses)? Was a systematic procedure used in prioritizing hazards?	Ordinal	2	2, 176-181	
	Does the plan include delineation of the probability of future events occurring?	Ordinal	1	180	Potential for repetitive loss mentioned.
	Does the plan include an analysis of future and current conditions to include population, economy, etc. (with explanation of reasoning)?	Ordinal	2	29-38	Demographics, socioeconomics, and county description included for current but not future.
	Does the Plan include climate change when considering future events?	Ordinal	1	83	Mentioned in reference to landslides only.
	Does the plan include maps and other visuals (tables, charts) that are clear and unambiguous and support reasoning? Do the maps delineate the location and magnitude of hazards?	Ordinal	2		Maps and visuals clear, understandable, and appropriate.

Vulnerability Assessment

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	Is there an assessment of the number of people exposed to hazards?	Ordinal	1	29-30, 51	Current populations and past hazard events listed, but not assessed for exposure. Each hazard chapter also has a small section "community risk assessment" but this focuses on structures more than people.
	Is there an assessment of disadvantaged/vulnerable pops exposed (# of people, demographic groups, locations)?	Ordinal	1	30	Socioeconomic and demographic status of population recognized.
	Does the plan include an assessment of number of state facilities exposed to hazards?	Ordinal	1	112, 141	Each chapter has a small section "value of resource at risk" where building values are estimated in which some state facilities are mentioned.
	Does the plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located/exposed in the identified hazard areas?	Ordinal	2	112, 141, 179	Same as above.
	Does the plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?	Ordinal	0	NA	
	Does the plan analyze existing capacity and future demand for public infrastructure?	Ordinal	0	NA	

Vulnerability Assessment (Continued)

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	Analyzing Development Trends: Does the plan describe land uses and development trends?	Ordinal	1	7, 8, 38, 72, 77, etc.	Land use is mentioned in several areas of the document but does not have its own section.
	Estimating Potential Losses: Does the plan describe the methodology used to prepare the estimate?	Ordinal	1	122-125	Some methods mentioned, for example in storm damage section, but no clear single methodology.
	Does the plan include an assessment of danger from a multiple hazard event?	Ordinal	0	92	Mentioned when assessing wildfires, but not in depth.
	Does the plan include an assessment of the danger of hazardous facilities or materials in the hazard area?	Ordinal	1	2, 4	Mentioned but not addressed.
	Does the plan address the state of natural environment resources and constraints?	Ordinal	2	34-40	Description of county characteristics and natural resources exists, less info on constraints.
	Does the plan include an assessment of the environmental impacts of a disaster?	Ordinal	1	177	Mentioned but not addressed.

Risk Analysis

Risk Analysis					
Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Incorporates estimates of the probability of various levels of injury and damage from a full range of possible hazards in a geographic area.	Does the plan include a probability assessment of the various intensities of a hazard?	Ordinal	0	NA	
	Does the plan include a probability assessment of the impacts on structures and populations in the event of a hazard?	Ordinal	0	NA	Past events mentioned and areas of exposure but no probability assessment.
	Does the plan address the magnitude of possible losses?	Ordinal	2	73-81, 89-96, 112, 122, 127, 144-172	"Community risk assessment" sections.
	Does the plan address the probabilities of losses for the range of possible hazard events?	Ordinal	0	NA	
	Does the plan call for probability mapping?	Ordinal	0	NA	
	Does the plan include a systematic risk assessment, combining the probability of hazard events with the likely expected losses from those events?	Ordinal	1		Implicitly, yes. Probability of hazards is lacking but expected losses is generally strong.

Mitigation Strategies					
Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Identifies goals, state and local policies, programs and capabilities; mitigation actions; and funding sources. Represents general community/jurisdiction goals, problem alleviations, and needs based on assumed shared local values.	Are the goals included in the plan reflective of public values?	Binary	1	20-27	Public is closely involved.
	Include statements of future desired conditions?	Binary	1	p. 4-6	General plan goals.
	Include a general economic goal (i.e. minimize fiscal impacts of disasters)?	Binary	1	4-6, 191-192	
	Include a goal to reduce damage or vulnerability of property?	Binary	1	p. 6-7	
	Include a goal to protect safety of the population?	Binary	1	p. 6-7	
	Include a goal to recognize and improve conditions of marginalized populations?	Binary	0	NA	
	Include a general environmental quality goal?	Binary	1	p. 6-7	
	Include a goal to increase coordination of mitigation efforts of state and local governments	Binary	0	NA	
	Include a goal to increase coordination of mitigation efforts on a regional scale?	Binary	1	p.6-7	Incorporating NFIP
	Include a goal to increase availability of relevant mitigation information	Binary	2	p.6-7	Educating communities.
	Include a goal to increase resiliency	Binary	0	NA	
	Include a goal to promote sustainable development	Binary	1	p.6-7	
	Are goals based on measurable objectives?	Ordinal	2		

Capabilities Assessment

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Federal Capabilities (programs, policies, laws or actions)	Ordinal	2	41-51	
State Capabilities	Ordinal	2	45-51	
Local Capabilities	Ordinal	2	41-45	
Does the plan Identify policies and programs that increase and decrease vulnerability?	Ordinal	3	7	Policies and planning/management documents were reviewed to avoid conflicting goals. Brief descriptions given of each.
Identifies changes needed in policies and programs	Ordinal	0		

Mitigation Actions and Policies

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Information dissemination and increasing awareness: Does the plan include the following:	Educational awareness: public information regarding hazards and methods of mitigation through pamphlets, lectures, media.	Ordinal	2	144, 147, 148, 150, etc.	Campaigns mentioned to increase public awareness, plan available in multiple places.
	Hazard Warning Signage	Ordinal	2	98	Flash flood signs.
	Technical assistance for developers, property owners and other members of the public.	Ordinal	1		
	Does the plan provide for technical assistance for local officials?	Ordinal	2	195-201	Potential funding sources listed.
	Does the plan provide for disaster warning and response programs?	Ordinal	3	41-51	Discusses management resources/capabilities.
	Does the plan encourage purchase of flood or earthquake insurance?	Ordinal	2	62, 72	Encourages participation in NFIP, no earthquake insurance mentioned.
	Does the plan call for conducting research to improve knowledge, develop standards and identify and map hazards?	Ordinal	0	NA	Research mentioned but not called for.
	Does the plan include Capital Improvement projects?	Ordinal	1	129	

Mitigation Actions and Policies (Continued)

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Financial Assistance Control of Hazards	Description of possible revenue sources for mitigation planning and projects?	Ordinal	1	195-200	Funding sources listed, not revenue.
	Description of mitigation financing through federal and state grants?	Ordinal	3	195-200	Funding sources listed.
Control of New Development/Development Management Tools	Subdivision regulations, storm water management and other standards regulating design of new development?	Ordinal	2	38	Building codes, also mentioned in goals.
	Cluster development, Density bonus	Ordinal	0	NA	
	Setbacks or buffer zones near hazard areas?	Ordinal	0	NA	
	Laws to protect natural mitigation features (wetlands...)?	Ordinal	1	59	Importance of wetlands mentioned but no laws addressed.
	Building Standards to make structures less susceptible to hazards?	Ordinal	2	72-73, 77, 80-81, 101, 108, 114	Building codes.
	Tax incentives or disincentives, impact taxes, risk-based taxes?	Ordinal	0	NA	
	Land or structure acquisition, TDR?	Ordinal	0	NA	
	Removal of property from market/direct development away from hazardous areas?	Ordinal	0	34	Rural lifestyle sought by many.

Mitigation Actions and Policies (Continued)

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Control of Hazards Recovery Measures	Physical structures to lessen impacts (levees, seawalls...)?	Ordinal	3	60-61, 71, 77, 81	Levees mentioned often.
	Stormwater controls: drainage systems, culverts, retention ponds...?	Ordinal	2	185	Development of storm water retention swales is a goal.
	Maintenance of structures?	Ordinal	2	63, 163	Mentioned as needing improvement.
Recovery Measures, Emergency Preparedness and Response	Land-use Change	Ordinal	1	92	Mentioned with reference to landslide susceptibility.
	Building Design Change	Ordinal	0		Building codes mentioned but no specs given.
	Moratorium	Ordinal	2	123	On new wells.
	Recovery Organization	Ordinal	1	97	Burned Area Emergency Recovery (BAER) plan. Recovery not focused on.
	Post disaster adjustments to community facilities and public infrastructure	Ordinal	0	NA	
	Financing Recovery	Ordinal	2	195-200	Funding sources listed.
Emergency Preparedness and Response	Preparedness plan/program	Ordinal	0	NA	
	Evacuation plan/program	Ordinal	2	8, 44, 72, 77	Evacuation for schools mentioned, general evac plan recognized as being needed for flood prone areas.
	Emergency shelter	Ordinal	3	80, 122, 126, 183	Sheltering for flooding and winter storms.
	Emergency response plan for organizations other than local governments (hospitals, nursing homes...)	Ordinal	3	9-Aug	Response programs for schools integrated.

Monitoring and Implementation

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Does the plan include provisions for monitoring hazards?	Ordinal	1		Annual assessments.
Does the plan include provisions for updating baseline Hazard Identification/risk assessment data?	Ordinal	0	NA	
Are there indicators of objectives to assess progress?	Ordinal	0	181-187	No specific indicators given just goals.
Does the plan include a timelines for implementing actions?	Ordinal	1	181-187	Hazard mitigation activities include "low, medium, high" priority but no timeline.
Does the plan include provisions for monitoring the progress of implementation?	Ordinal	0	NA	
Schedule for monitoring of hazards and implementation and evaluation of measures?	Ordinal	1		Annual assessments.
Is citizen participation in the monitoring, evaluating and updating process included in the plan?	Ordinal	1		Annual assessments.
Does the plan include provisions for evaluating success/failure of mitigation action items?	Ordinal	1	126-130	Some objectives can be evaluated on a binary scale; others need to have provisions for evaluation.

Monitoring and Implementation (Continued)

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Does the plan identify organizations responsible for Implementation?	Ordinal	3	181-187	Responsible party listed.
Are Implementation costs identified in the plan?	Ordinal	0	181	Not accompanied by cost estimates.
Does the plan identify sources of funding to implement mitigation activities identified?	Ordinal	3	195-200	List of funding sources, though not specifically tied
Does the plan include an assessment of obstacles in implementation?	Ordinal	2	178-180	Includes a cost/benefit analysis which also has project feasibility incorporated.
Does the plan identify sources to implement mitigation activities?	Ordinal	3	195-200	Funding list.
Does the plan identify current sources of technical assistance to implement mitigation activities?	Ordinal	2	207-109	Data sources listed in end.
Does the plan include provisions for plan maintenance, to include responsible party, funding, timeline?	Ordinal	1	210	Northwest Management, Inc. and Owyhee County Commissioners, could better identify other agencies roles.
Does the plan assess those losses avoided following disasters?	Ordinal	0	NA	
Does the plan include provision for mediation to resolve conflicts that may arise during implementation?	Ordinal	0	NA	

Internal Plan Characteristics				
Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Does the plan include a description of community needs, assets, trends, future vision of what the community wants to be?	Ordinal	1	20-27, 177	Community needs mentioned throughout, public involved in plan, no trends or future visions.
Policies/Policy Framework				
Are policies sufficiently specific to be tied to definite actions?	Ordinal	1	p. 7-10	Could use more detail.
Do policies include special designs to accommodate future growth?	Ordinal	1	38, 48, 81	Mentioned in transportation and mitigation activities.
Internal Consistency				
Are the policies clearly linked to the goals and implementation actions?	Ordinal	1		Mainly implicitly linked.
Does the monitoring process include indicators to measure goal achievement and effectiveness of policies?	Ordinal	1	175-176	Monitoring annually with goals but does not include specific indicators.
Data Assessment				
Are data sources identified?	Ordinal	3	51, 207-209	
Does the plan include an assessment of the quality of data about the hazards?	Ordinal	0		

Internal Plan Recommended and Supplemental Targets Score

Element	Possible Score	Plan Score	Notes
Fact-Based Hazard Assessment	27	16	Plan is based on extensive hazard assessment, but can better delineate future events.
Vulnerability Assessment	36	11	Plan does not include socioeconomic vulnerability measure.
Risk Analysis	18	3	Risk assessment is well-grounded, but lacks comprehensive methodology. Various intensities and potential losses should be included for each hazard.
Mitigation Strategies	15	12	Mitigation strategies included both general and specific goals and actions. Need update from County on which projects/actions were completed/in progress/unsuccessful.
Capabilities Assessment	15	9	Plan lacks comprehensive capabilities assessment that can help identify resources pre- and post-disaster.
Mitigation Actions and Policies	93	43	Specific mitigation actions are strong, but better integration of land use, development, public outreach, technical assistance, etc. can strengthen the Plan.
Monitoring and Implementation	51	19	Plan should include specific monitoring and evaluation metrics. Recommend including template to be filled out by appropriate authority.
Internal Plan Characteristics	3	1	Community needs mentioned throughout Plan, but lacks visions and future desired conditions.
Policies/Policy Framework	6	2	Inclusion of future growth considerations can help strengthen the Plan. Recommend including more detail on inclusion of other plans/policies, notably state and federal agencies.
Internal Consistency	6	2	More comprehensive monitoring metrics in addition to more explicit linkages with community goals and values can help strengthen the Plan.
Data Assessment	6	3	Plan lists data sources but lacks quality assessment.
Total	276	121	Though the Plan meets the baseline FEMA requirements, the Plan can be improved through comprehensive risk and vulnerability assessments.

External Plan Recommended and Supplemental Targets

FEMA RECOMMENDATIONS AND RECOMMENDATIONS BASED ON LITERATURE AND INTERVIEWS WITH COUNTY PERSONNEL

Planning Process

Content		Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Organizational Involvement, Coordination and Integration	Federal Agencies	Binary	1	p. 12-20	Representatives were named in meeting descriptions.
	State Agencies	Binary	1	p. 12-20	Representatives were named in meeting descriptions.
	Local and Regional Agencies	Binary	1	p. 12-20	Representatives were named in meeting descriptions.
	Non-Profit/Non-Governmental	Binary	1	p. 12-20	Representatives were named in meeting descriptions.
	Explanation of why the organizations identified in the plan were involved?	Ordinal	0	NA	
	Identification of those involved in the update process not originally involved?	Ordinal	NA	NA	
	Indication of coordination among agencies and changes between original plan and updated plan?	Ordinal	NA	NA	
	Identification of which agencies/organizations provide data in the plan?	Ordinal	2	207-109	Data sources listed in end.
	Identification of which agencies provide technical assistance in preparation?	Ordinal	1	210	Northwest Management, Inc. and Owyhee County Commissioners, could better identify other agencies roles.

Coordination of Local Hazard Mitigation Planning

Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Does the plan describe integration with other plans (or policies of public and private parties)?	Ordinal	3	p. 7-10	Combined info from school district and Indian reservation plans, though copy of plan not included.
Is there vertical coordination with plans or policies of federal, state and regional parties?	Ordinal	2	p. 9-10	Coordination of Indian reservation multi-hazard plan and trial emergency response commission, though copy of plan not included.
Is there horizontal coordination with plans or policies of other local parties within or outside local jurisdictions	Ordinal	0	NA	
Does the plan discuss integration of mitigation action items and other plan elements into local comprehensive plans?	Ordinal	2	p. 7-10	Integration into county and local plans mentioned, especially "regarding future land use and development".

Public/Community Involvement				
Content	Method	Score	Page No.	Strengths, Weaknesses, Recommendations, and Notes
Public Notices	Binary	1	20-21	News releases, flyers, email lists to get word out.
Public meetings/workshops	Binary	1	23-27	3 public meetings held.
Focus groups, surveys or questionnaires	Binary	1	21-23	Public mail survey.
Website	Binary	0	NA	Not included.
Newsletter, brochures	Binary	0	NA	Not included.
Media	Binary	1		Email only.
Organization and Presentation				
Table of contents	Binary	1	ii-vi	
Glossary	Binary	0	NA	
Executive Summary	Ordinal	0	NA	
Cross-referencing of issues, visions, goals and policies	Ordinal	0	NA	
Clear visuals and supporting documents	Ordinal	2		Good visuals when included, could use more.

External Plan Recommended and Supplemental Targets Score

Element	Possible Score	Plan Score	Notes
Planning Process	13	7	Plan's baseline narrative of the planning process is comprehensive, but can be strengthened with explanations of why individual stakeholders were involved and their role through the process.
Coordination of Local Hazard Mitigation Planning	12	7	Better description of Plan's integration of other plans/policies/etc. in addition to vertical and horizontal coordination with other agencies can improve the Plan.
Public/Community Involvement	6	4	Public involvement commendable; recommend documentation of participation such as meeting minutes, pictures, etc.
Organization and Presentation	11	3	Plan is organized, follows a logical progression, and is visually appealing. Recommend cross-referencing mitigation goals and specific policies in hazard profiles. Include glossary and executive summary.
Total	42	21	The Plan's strength lie in its planning narrative, extensive hazards profiles, and capabilities assessments. Plan can be improved by focusing on mitigation actions and additional risk and vulnerability assessments.

Comprehensive Plan Score			
COMPREHENSIVE SCORE INTEGRATES FEMA REQUIREMENTS, RECOMMENDATIONS, AND EXPANDED TARGETS			
Element	Possible Score	Plan Score	Notes
FEMA Requirements	45	34	
Internal Plan Recommended and Supplemental Targets	276	121	
External Plan Recommended and Supplemental Targets	42	21	
Total	363	176	

Comprehensive Plan Evaluation for HMP Integration		
County Name: Owyhee County		
Comprehensive Plan Component	Yes	No
General Comprehensive Plan		
1. What are the goals for this Comprehensive Plan? (if applicable)	-	-
Comments: "The Plan, and the process of implementation of the Plan is to: Protect property rights and enhance property values; ensure adequate public facilities and services at a reasonable cost; protect and enhance the economy of the county; ensure protection of important environmental features, protect prime agricultural lands and mineral resources, encourage urban development within and near cities; ensure development consistent with the land's physical character, protect fish, wildlife and recreational resources' and to avoid water and air pollution."		
2. Do the overall Comprehensive Plan goals relate to Hazard Mitigation Plan goals? (if applicable)	X	
Comments: Some overlap of Comprehensive Goals relate to the The Hazard Mitigation Plan (HMP) goals, which are as follows and can be incorporated further into the plan: "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 natural hazard preparedness in the county. Reduce the impact of hazard events and potential losses incurred by both public and private residents and entities. Develop land use policies to alleviate potential hazard risks and impacts for future		
3. What year has the Comprehensive Plan been most recently updated?	-	-
Comments: The Comprehensive Plan was most recently updated on August 9th, 2010. It was originally drafted and adopted in February, 2002.		
4. Does the plan mention when the next update will be? If so, when?		X
Comments: The plan does not state when the next update will be, but does state that "1) The plan may only be amended once every six months; 2) Upon any request to amend or repeal the plan, the Planning and Zoning Commission shall hold a public hearing giving at least 15 days public notice in the newspaper designated by the Board of County Commissioners for publication of legal notices, with notices provided also by posting at various locations throughout the county and in notices to newspapers and radio stations and mailed notices to all taxing districts within the County; 3) After the public hearing, the Planning and Zoning Commission will make its		
5. Does the plan have an overall implementation strategy?		X
Comments: No overall implementation strategies are listed in the Comprehensive Plan, though many of its components have strategies listed within them.		
Hazardous Areas		
1. What are the goals for this component? (if applicable)	-	-
Comments: "The County Building Official and the Planning and Zoning Administrator will work with state, federal, and local authorities to work toward identifying and mapping areas of the County known to be hazardous and on which development might need to be restricted. Currently existing hazardous waste sites will be identified on the County zoning map."		
2. Does the component provide a map that clearly identifies natural hazard areas?		X
Comments: No maps are provided, though it does state that existing hazardous waste sites will be identified on the county zoning map. This can also be integrated from the HMP and its most recent update.		
extent, etc.)		X
Comments: No profile of each applicable natural hazard is present in the plan. Opportunity exists to improve this section by integrating specific hazard details, figures, and maps from the most recent HMP update.		
4. Does the component provide a profile for human-caused or technological hazards?		X
Comments: No profile for human-caused or technological hazards is present in the plan. This can be integrated from the HMP and its most recent update. Incorporation of human-caused hazards such as hazardous materials and terrorism will help strengthen the Comprehensive Plan in preventing disasters beyond natural hazards.		
are vulnerable to hazards?		X

Comments: No list or description of assets that are vulnerable to hazards is present in the plan. The only item included which can aid in satisfying this component is a map of the power system within the county. A list or map can be integrated from the HMP and its most recent update. This information may be especially useful when planning for wildfire or flooding events by quickly identifying populations which may be at risk.		
to hazards?		X
Comments: Population levels are listed but no socioeconomic list or description in relation to hazards is present. This can be incorporated from the HMP and its socio-economic vulnerability assessment to help identify populations at increased risk.		
assessment) for each applicable hazard?		X
Comments: No overall risk assessment for each applicable hazard is present in the plan. This can be integrated from the HMP and its most recent update. Community risk assessments are found on page 148 of the HMP.		
8. Are policies designed to enact specific hazard mitigation activities/projects?		X
Comments: No policies designed to enact specific hazard mitigation activities/projects are present in the plan. This can be integrated from the HMP and its most recent update along with sources of funding, specific ordinances for carrying out policy, and identification of who is responsible.		
9. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies are present in the plan. This can be integrated from the HMP and its most recent update.		
Land Use		
1. What are the goals for this component? (if applicable)	-	-
Comments: Goals for this component are subdivided within various categories such as 'Agricultural Land Use' and 'Multi-use Land Use'. Goals include protecting agricultural uses, ensuring use in areas of impact should allow for the mixture of larger and smaller agricultural parcels for other development, ensuring subdivisions within the impact area are controlled as specified in City Impact Agreements, preserving and protecting the decreasing supply of agricultural lands, and controlling the infiltration of urban development into agricultural areas.		
2. Does the future land-use map clearly identify natural hazard areas?		X
Comments: "The official land use map is color coded to indicate the following land uses: agricultural, commercial, industrial, residential, multi-use, and historical. A legal description of the boundaries of each new or modified land use zone will be provided and adopted along with the land use map so that landowners and users can determine with specificity the zone in which their land lies." The map itself is not included within the plan. By integrating this map and overlaying it on natural hazard areas, this section will be satisfied and will allow for more informed land-use decisions.		
3. Are policies designed to discourage development or redevelopment within natural hazard areas?	X	
Comments: Some objectives designed to discourage development or redevelopment within natural hazard areas are as follows: "Discourage commercial or any other development that may have an adverse effect on historic districts and sites. Discourage, through the Zoning Ordinance, the mixing of incompatible uses that may be detrimental to surrounding properties or uses. Discourage development in areas of the County that are remote from County services and public facilities. Discourage development in areas of the county that are remote from Emergency, and county services. Discourage development in areas that do not have an adequate or		
natural hazard areas?		X
Comments: Growth is mentioned in multiple components and it is state that the District watches the employment patterns of the Greater Treasure Valley, agriculture trends, and other business for future growth. There is a potential to locate future development policies and regulations based on the hazard maps from the most recent HMP update to ensure that construction occurs in areas located outside of natural hazard areas.		
5. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies are present in the plan. These strategies can be integrated from the HMP and its most recent update. For example, an applicable project may be to discourage development within or near areas which are exposed to frequent flooding.		
Transportation		
1. What are the goals for this component? (if applicable)	-	-
Comments: "a. To maintain, protect and enhance the transportation system. b. To require that an applicant for a land use change assess the impact that such change would have upon the transportation system and present such information to the Planning Commission with the application. Mitigation for such impact may be required."		
2. Are policies aimed at limiting access to hazard areas?		X

Comments: No policies aimed at limiting access to hazard areas exist at this time. If some are already within the most recent HMP update, these policies can be transferred into this component of the comprehensive plan. For example, signs can be put in place to warn people of hazardous areas and certain roads can be blocked off in anticipation of a severe weather event.		
3. Are policies used to guide growth to safe locations?		X
Comments: No policies to guide growth to safe locations exist at this time. It does mention, however, that the District is concerned with growth in northern Lincoln County. If policies are already within the most recent HMP update, these can be transferred into this component of the Comprehensive Plan. Policies can also be enforced through zoning and land use ordinances to prevent growth from spreading to unsafe locations.		
4. Are policies aimed at having facilities designed to function under disaster conditions (e.g., evacuation)?		X
Comments: No policies are aimed at having facilities designed to function under disaster conditions such as during an evacuation. Integration of these policies would greatly increase safety levels. Potential also exists to integrate this information from the HMP and it's most recent update. For example, having evacuation plans in place can aid in the prevention of loss of life.		
infrastructure failure?		X
Comments: No policies are aimed at having contingencies in place in case of bridge or other transportation infrastructure failure. Potential also exists to integrate this information from the HMP and it's most recent update. Incorporating this would greatly enhance the safety of the county, particularly if a major road connecting critical services to the greater community were cut off due to a disaster.		
6. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies currently exist. These can potentially be integrated from the HMP and its most recent update. For example, more description on who is responsible for road maintenance and potential sources for funding improvement projects would greatly enhance this component.		
Property Rights		
1. What are the goals for this component? (if applicable)	-	-
Comments: "The Planning and Zoning Commission will coordinate its activities with the Owyhee County Natural Resources Committee to ensure proper planning for the entire County and the protection of private property rights which are critical to the custom, culture, and economic stability of Owyhee County; To protect, enhance and insure private property values and rights within the national, state, and local laws."		
2. Are policies designed to balance private property rights and hazard mitigation?		X
Comments: No policies are designed to balance private property rights and hazard mitigation. Potential exists to integrate this information from the HMP and its most recent updates. Such policy language can also be integrated into any existing building codes or ordinances.		
governments for use of land for hazard mitigation?		X
Comments: There are no policies aimed at making partnerships and/or agreements between landowners and local governments for use of land for hazard mitigation. Potential exists to integrate ideas for policy creation from within the HMP and its most recent update. Policies can be based on and incorporated into acts such as the Idaho Local Land Use Planning Act of 1975 as amended, the Attorney General's Regulatory Takings Act guidelines, and Owyhee County planning and zoning ordinances.		
4. Are policies designed to reduce conflict or provide mediation?		X
Comments: No policies exist to reduce conflict or provide mediation. This can be integrated by taking information from within the HMP and its most recent update and by incorporating mediation strategies into existing policies. A plan of action for mediation should be incorporated in case conflict should occur.		
5. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: Implementation strategies do not exist but can be integrated from the HMP and its most recent update.		
Natural Resources/Environment		
1. What are the goals for this component? (if applicable)	-	-
Comments: "To protect and preserve the natural resources of the County by managing development and the use of those natural resources as necessary components of agricultural, commercial and recreational activities; Avoid unsuitable remote rural development by maintaining open space and access to natural resources through coordination of this Plan with the Owyhee County Land Use and Management Plan for Federal and State Land."		
hazards?		X

Comments: The Omnibus Public Lands Management Act (P.L. 111-111) designated 316 miles of southern Idaho waterways as Wild and Scenic Rivers under the Wild and Scenic Rivers Act. This resource and others can be combined into a complete list and/or map of environmental systems that protect development from hazards. For example, a riparian habitat along a river may protect nearby development from flooding events.		
3. Are policies designed to maintain and restore protective ecosystems?	X	
Comments: Certain rivers with natural, cultural, and recreational values which are free-flowing for the enjoyment of present and future generations are designated as wild. This can be improved by incorporating protection for other types of ecosystems and by implementing watershed standards to protect water quality, for example.		
4. Are policies aimed at providing incentives for development located outside protective ecosystems?		X
Comments: Potential exists to create these policies. Incorporation of information from the HMP and its most recent update will help to satisfy this component. However, a good starting point is made within the plan when it is stated that there is a need to, "carefully weigh the effect on natural resources from pollution or detrimental impacts before approving development or changes of historic use." Ensuring development is located outside protective ecosystems will help maintain the beneficial functions these resources provide.		
5. Are policies designed to limit development in flood prone areas?		X
Comments: No policies are mentioned, however the dam is mentioned as the County's major flood control structure. If development continues to occur along such flood-prone areas, potential for flood damage will increase. A flood hazard area has been mapped along the Snake River by the Federal Insurance Administration of HUD for the Federal Flood Insurance Program, though there is potential to incorporate information from the most recent HMP update here.		
and environmental protection?		X
Comments: Potential exists to create these policies, which are in line with goals such as: "Ensure development [is] consistent with the land's physical character, protect fish, wildlife and recreational resources' and to avoid water and air pollution. To protect and maintain soil, water, air, wildlife and other natural environmental and scenic qualities so that they may be utilized now and in the future." Any existing policies from the United States Forest Service or Idaho Department of Fish and Game should also be explicitly mentioned and incorporated into the Comprehensive Plan.		
likelihood of landslides?		X
Comments: No policies designed to preserve natural vegetation and woodlands on steep slopes to reduce the likelihood of landslides exists. Potential is present to integrate this information from the HMP and its most recent update, particularly from within the 'Landslides' section.		
wildfires?		X
Comments: No policies are designed to conserve woodlands without development to reduce building exposure to wildfires. Maintaining a boundary between woodlands and development will greatly decrease exposure to wildfires. Policy language can be drawn in from the HMP and its most recent update here.		
9. Are environmental policies (i.e., clean air, clean water, endangered species) coupled with hazard		X
Comments: No environmental policies are coupled with hazard mitigation policies. Many miles of river are designated as wild and can serve as a great starting point for developing these coupled policies by including information on how this may help mitigation efforts. Language may be drawn in from the HMP and its most recent update here.		
10. Are watershed management policies coupled with hazard mitigation policies?		X
Comments: There are no implementation strategies within the section, though many policies are present. Information for this section can be integrated from the HMP and its most recent HMP. For example, discouraging development in floodplains in accordance with the NFP is a good start and can be expanded to incorporate other watershed management and hazard mitigation policies such as adopting standards to prevent unsafe pollution levels.		
11. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: There are no implementation strategies within the section. Information for this section can be integrated from the HMP and its most recent HMP. For example, an implementation strategy may support a policy's efforts to encourage the prevention of contamination to groundwater through land use planning and development guidelines by creating a timeline and assigning responsibility to potential agencies and seeking funding.		
Recreation/Open Space/Trails		
1. What are the goals for this component? (if applicable)	-	-
Comments: "Encourage preservation of the recreational, architectural, and cultural history of the county; Create awareness of and encourage appreciation for Owyhee County's history and historic resources; Encourage new development to incorporate pathways for non-motorized use and connectivity throughout the community; Improve awareness of all recreation opportunities Owyhee County has to offer."		
or other hazards into open space or recreational areas to minimize damage to life and property?		X

Comments: No policies are designed to convert or contain floodplain land, steep slope, and areas vulnerable to wildfire or other hazards into open space or recreational areas to minimize damage to life and property. This information can be taken in from the 'Wildfire Mitigation Plan' of the HMP. For example, areas vulnerable to wildfire or other hazards with repeated occurrences can be transformed into recreational areas.		
3. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: This component includes objectives that can be expanded upon to become implementation strategies to support policy. For example, "reviewing ordinances to update development design standards" can be expanded to include information regarding responsibilities, funding sources, and a timeline for implementation.		
Economic Development		
1. What are the goals for this component? (if applicable)	-	-
Comments: "Stimulate and encourage commercial, industrial, other uses, activities and developments that will provide employment for Owyhee County residents."		
2. Does this component provide a list or map of business locations that are within hazardous areas?		X
Comments: While this component provides a table indicating the number of jobs within particular sectors, no list or map of business locations exist. Once this is created it can be overlaid on top of a map describing hazardous areas to highlight which businesses may be at an increased risk to hazardous events. This information can be incorporated from the HMP and its most recent update.		
natural hazard areas?		X
Comments: Potential exists to create these policies. Incorporation of information from the HMP and its most recent update will help to satisfy this component. This may be especially helpful as agriculture is the main source of employment and faces many hazards such as flooding, storm conditions, and drought. In addition, by guiding growth to safe locations it will prevent damages and loss of life.		
4. Are policies designed to aid economic recovery post disaster?		X
Comments: Potential exists to create these policies. Such a policy would prove beneficial to the county to maintain a stable and resilient economy.		
5. Are policies designed to educate business owners about hazards?		X
Comments: Potential exists to create these policies. Information can be incorporated from the HMP and its most recent update. Educating business owners will help ensure more self-sufficiency and reduce the burden placed on the county when disaster strikes.		
6. Are policies designed to assist business owners with hazard mitigation and preparedness?		X
Comments: No policies are designed to assist business owners with hazard mitigation and preparedness. Information can be incorporated from the HMP and its most recent update. Assisting business owners with hazard mitigation and preparedness will ensure they are using a set of best practices and increase their levels of safety and security.		
area?		X
Comments: Potential exists to create these policies based on information from the HMP and its most recent update. By highlighting low crime levels and aiming policies towards improving the community's safety, it may attract potential new businesses to the area and may provide an economic boost to supplement the leading agricultural sector and help develop a more diversified economic base.		
8. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: While no implementation strategies exist, objectives may lead to the creation of implementation strategies. For example, encouraging and protecting the agricultural economic base, creating conditions that will encourage new commercial and industrial uses, and cooperating with the cities and Chambers of Commerce to expand retail business can be transformed into implementation strategies by developing specific timelines, identifying responsible agencies, and seeking funding.		
Population		
1. What are the goals for this component? (if applicable)	-	-
Comments: There are no goals within this component.		
2. Does the component provide a list or map of populations within hazardous areas?		X

Comments: This component provides a description of the current population levels within households but does not include a list or map of populations within hazardous areas. This can be drawn in from the HMP and its most recent update to visualize the potential impacts their placement may have and to develop ideas for how to mitigate impacts.		
vulnerable?		X
Comments: This component does not provide a list or description of populations that are socio-economically vulnerable. This information can be drawn in from the socio-economic vulnerability assessment of the most recent HMP update.		
4. Are policies designed to educate the public about hazards?		X
Comments: No policies are designed to educate the public about hazards. This can be integrated from within the HMP and its most recent update. Educating the general public can also help improve their level of knowledge and aid them in making better decisions within their family groups. For example, families may feel encouraged to create individual evacuation kits and routes, install storm windows, or elevate their homes.		
5. Are policies designed to assist the public with hazard mitigation and preparedness?		X
Comments: No policies are designed to assist the public with hazard mitigation and preparedness. Potential exists to integrate this into the plan from the HMP and its most recent update. Potential policy may include providing the public with information regarding hazard mitigation annually through a county website, mail-out, or information booth at a local event.		
6. Are policies designed to aid the public with recovery post disaster?		X
Comments: Potential exists to create policies designed to aid the public with recovery post disaster. For example, improvements with communication services (such as phone lines, radios), continued road maintenance, and family preparedness education can all help accomplish this. Potential funding sources for family recovery post disaster may exist, or families can be encouraged to set aside an emergency fund along with basic necessities and first aid supplies.		
7. Are policies aimed towards protecting the public from risk of natural hazard events?		X
Comments: No policies are aimed towards protecting the public from risk of natural hazard events, though an objective includes this in terms of housing conditions. Policies can be incorporated from the HMP and its most recent update. For example, policy may include adding warning signs to hazardous areas such as roads that are prone to flooding during storms or to landslide-prone areas.		
8. Are policies designed to develop response plans for natural hazards?		X
Comments: There are no policies designed to develop response plans for natural hazards. Potential exists to integrate this using information from the HMP and its most recent update. Developing response plans should be encouraged at the household level to encourage families to prepare for their safety.		
9. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: Potential for implementation strategies exist based on existing goals of the Comprehensive Plan. Integration of mitigation strategies related to educating the public, providing warning signs, and discouraging development or recreation in landslide-prone areas can be included along with potential funding sources and responsible governing agencies.		
School Facilities and Transportation		
1. What are the goals for this component? (if applicable)	-	-
Comments: "Administer land use planning process in a manner which can assist the school districts in maintaining, protecting, and enhancing school facilities and transportation system; To require that an applicant for a land use change assess the impact that such change would have upon the school facilities and transportation systems and present such information to the Planning Commission with the application; Mitigation for such impact may be required."		
2. Does the component provide a list or map of school facilities within hazardous areas?		X
Comments: This component describes the various school districts but does not provide a list or map of school facilities. Doing so will help satisfy this element when overlaid on a map of hazardous areas to highlight facilities at risk to particular hazards. This may be integrated from the HMP and its most recent update.		
3. Are policies aimed so that school facilities are designed to function under disaster conditions?		X
Comments: Concerns about educational facilities should be taken seriously and may be incorporated into this section by making policies aimed at increasing the functioning of school facilities under disaster conditions. For example, regular fire drills can be conducted and improvements to telecommunication systems can be made to ensure the safety of students and faculty. Schools should also be protected from incompatible adjacent land uses whenever possible.		
4. Are policies aimed towards utilizing school facilities in safe areas as emergency shelters?		X

Comments: No policies are aimed towards utilizing school facilities in safe areas as emergency shelter. This may be done by mapping the school facilities and road networks, then overlapping the two on a hazardous areas map to identify suitable locations. This information may also be drawn from the HMP and its most recent update.		
infrastructure failure?		X
Comments: No policies are aimed at having contingencies in place in case of school facility or transportation infrastructure failure. This information may be drawn in from the HMP and its most recent update. The creation of these contingencies would greatly increase the safety of staff, teachers, bus drivers, and students alike. For example, a special fund for grants to schools to reduce nonstructural seismic hazards can be implemented. The creation of this and related policies will help prevent losses to life should a school facility or transportation infrastructure failure occur.		
6. Are policies designed for the safe location of future facilities outside hazardous areas?		X
Comments: Policies are not currently designed for the safe location of future facilities outside of hazardous areas. The plan does state, however, that, "for new development and redevelopment within two miles of an existing or planned school facility that will serve students, the County may require the installation of sidewalks within or adjacent to the rights-of-way of any public or private road within or abutting the site, so that a complete, unobstructed, continuous route with a minimum width of four feet paved to County specifications is provided along said roadways." This is a good starting point to incorporate more policy initiatives. Additionally, a map		
7. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies exist for this section but may be integrated from the HMP and its most recent update. Additional language can be drawn in from the School District's Emergency Response Plans along with assigning a responsible party, securing funds, and creating a timeline.		
Public Services, Facilities, and Utilities		
1. What are the goals for this component? (if applicable)	-	-
Comments: "To maintain, protect and enhance public services and facilities; To require that an applicant for a land use change assess the impact that such change would have upon the public services and facilities and present such information to the planning Commission with the application. Mitigation for such impact may be required; To be consistent with the Owyhee County Multi Hazard Mitigation Plan, and the Owyhee County Emergency Operations Plan where applicable to land use."		
2. Does the component provide a list or map of public facilities within hazardous areas?		X
Comments: This component does not provide a list or map of public facilities within hazardous areas. It does mention various public services, facilities, and utilities. These can be easily integrated into a list or drawn in from the HMP and its most recent update. This is important to do because it will allow planners, local officials, and others to see how a hazard might affect the facilities that the greater community depends on. Recognizing these vulnerabilities can also improve public risk perception and create greater demand for mitigation activities.		
areas?		X
Comments: Potential exists to create policies aimed at limiting public expenditure for infrastructure and public facilities in high-hazard areas. If already within the most recent HMP update, they can be transferred into this component of the comprehensive plan. These policies can also be incorporated into existing building and development standards.		
and solid waste with hazard mitigation?		X
Comments: There are no policies aimed at linking water treatment facilities, stormwater management, and sewerage and solid waste with hazard mitigation. Policy ideas may be drawn in from the HMP and its most recent update. For example, an ordinance may aid in development of controls for managing stormwater, a common concern during flooding events.		
order to reduce vulnerability when failures occur?		X
Comments: Potential exists to create these policies to allow more than one route to any point in order to reduce vulnerability when failures occur. Policies may be drawn in from the HMP.		
6. Are capital improvement policies aimed towards steering development away from hazardous areas?		X
Comments: The Plan mentions the need to ensure that capital improvements are planned and budgeted in order to have adequate infrastructure in place. A capital improvement program was pursued in order to properly identify and budget for expected necessary capital infrastructure, as Owyhee County's population is growing. The Plan also mentioned the possibility of implementing impact fees for new development as a means to, "maintain the current level of service provided." This can be further improved by including language which steers development away from hazardous areas.		
areas?		X
Comments: Potential exists for the creation of policies designed for the safe location of critical facilities outside hazardous areas. Ideas can be drawn upon from within the HMP and its most recent update. For example, preventing critical facilities from being constructed in a floodplain and enforcing up-to-date building codes can help accomplish this.		
8. Are policies aimed at facilities designed to function under disaster conditions?		X

Comments: Potential exists to create policies aimed at designing facilities to function under disaster conditions. For example, having a backup generator can improve a facility's functionality under disaster conditions. Additional ideas may be drawn in from the HMP.		
9. Are policies aimed towards utilizing other major facilities in safe areas as emergency shelters?		X
Comments: No policies are aimed toward utilizing other major facilities in safe areas as emergency shelters. This can be incorporated by creating a map overlaying major facilities and hazardous areas in order to identify those facilities located in safe areas. This may be especially important for those located out of dense population centers. This information can also be drawn in from the HMP and its most recent update.		
10. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies exist for policies. Implementation strategies can be pulled from within the HMP and its most recent update. Incorporation of implementation strategies will ensure policies are implemented in a timely manner.		
Special Areas or Sites		
1. What are the goals for this component? (if applicable)	-	-
Comments: "Encourage preservation of the recreational, architectural, and cultural history of the county; Create awareness of and encourage appreciation for Owyhee County's history and historic resources; Encourage new development to incorporate pathways for non-motorized use and connectivity throughout the community; Improve awareness of all recreation opportunities Owyhee County has to offer."		
2. Does the component provide a list or map of special sites or areas within hazardous areas?		X
Comments: The component provides information on some of the special sites or areas within the county but can be better included in list and map format which can then be overlaid on top of hazardous areas. This can potentially be integrated from within the HMP and its most recent update. Doing so will highlight which sites may need hazard mitigation to reduce potential damages from hazardous events such as severe weather.		
other special site structures from hazardous areas?		X
Comments: No policies are aimed at using appropriate hazard retrofitting techniques or standards to protect historic or other special site structures from hazardous areas. These policies may be able to be drawn in from the HMP and its most recent update. For example, appropriate hazard retrofitting may be needed in historic or other special site structures to properly protect it from hazardous events. An older structure may also not be properly equipped to handle the effects of an earthquake or may be more prone to foundation leaks during a flood.		
wildlife refuges, wetlands)?	X	
Comments: One policy aimed towards protecting special areas or sites that may double as hazard mitigation is as follows: "Portions of the Bruneau River and Owyhee River are designated as wild and/or scenic." While this does not mention hazard mitigation, setting aside land as wild along a river will help minimize flooding, assist in maintaining pollution levels, and improve ecosystem functioning.		
5. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?	X	
Comments: Two implementation strategies consist of reviewing ordinances to update development design standards to encourage incorporation non-motorized pathways and encouraging the County Commissioners to support the development of a community calendar. These can be improved by adding more details and a timeline for implementation to support policy.		
Housing		
1. What are the goals for this component? (if applicable)	-	-
Comments: "To create an environment for housing and its growth that allows for adequate and acceptable shelter to all segments of our county populace without prejudice."		
2. Does the component provide a list or map of housing development within hazardous areas?		X
Comments: Potential exists to create a formal list and/or map of housing development within hazardous areas by overlaying current population information on hazardous areas. This information can be drawn in from the most recent HMP update. It is important to create such maps to better understand which areas of the community may face greater threats to particular hazards so that appropriate measures may be taken to secure structural stability and prevent loss of life.		
future housing located within hazardous areas?		X
Comments: No policies are aimed at using appropriate hazard retrofitting techniques or standards to protect historic or other special site structures from hazardous areas. These policies can be made through the creation of capital improvement projects, zoning ordinances which prevent new construction in hazardous zones, and development restrictions. Creating such policies will prevent any future housing from being constructed in an unsafe manner and may also aid in minimizing losses to existing construction.		
4. Are policies aimed at discouraging housing development or redevelopment within hazardous areas?	X	

Comments: Housing construction is made after identifying known areas of the county which may contain hazardous elements and discussing these things with home builders on how the hazards can be mitigated. This can be expanded upon by drawing in and implementing policy from the NFIP.		
5. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?	X	
Comments: Objectives are included and can be expanded upon to properly incorporate implementation strategies. For example, management of natural resources through development standards can be expanded upon by incorporating a responsible party, seeking funding sources, constructing a timeline, etc.		
Community Design		
1. What are the goals for this component? (if applicable)	-	-
Comments: "Encourage development within appropriate zones; Encourage preservation of cultural resources; Encourage preservation of open rangeland; Encourage preservation of recreation lands; Encourage preservation of open spaces; Coordination of land management objectives with federal agencies; Encourage new development to incorporate a reasonable measure of rural atmosphere, county life style and open space; Encourage compatible new development."		
within hazardous areas?		X
Comments: Policies can be created which aim to improve development standards appropriate for housing located within hazardous areas. For example, the Wildland Urban Interface (WUI) provides guidelines in the development near wildfires and the Flood Damage Prevention Ordinance prevents development of flood hazards.		
3. Are policies designed to discourage development or redevelopment within hazardous areas?		X
Comments: This component states that, "development will be encouraged to incorporate a reasonable measure of rural atmosphere, country life style and open space." This can be expanded upon to better design policy to discourage development or redevelopment within hazardous areas. For instance, development can be discouraged through improvements to land-use policy and zoning ordinances to minimize potential damages from diaster events.		
4. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: No implementation strategies are included. An objective, to work toward the development and implementation of a sign ordinance, can be better acheived through the creation of an implementation strategy which specifies a timeline, responsible agency, and potential funding sources.		
Agriculture		
1. What are the goals for this component? (if applicable)	-	-
Comments: "The purpose of the agricultural zone is to preserve and protect the decreasing supply of agricultural land, and to control the infiltration of urban development into agricultural areas which will adversely impact agricultural operations and will result in an adverse impact on the county's tax base and economy."		
reduce the risk of impacts from natural hazards?		X
Comments: No policies are aimed at utilizing the adoption of agricultural techniques to help reduce the risk of impacts from natural hazards. Since agriculture is highly valued by the residents of Owyhee County, this may be an ideal sector to produce policy regarding natural hazards. This section can be improved by incorporating policies aimed at reducing the risk of impacts from natural hazards such as storms, floods, wildfire, and insect infestations.		
3. Are policies designed to aid the agricultural sector with recovery post disaster?		X
Comments: No policies are designed to aid the agricultreual sector with recovery post disaster. This may be especially important due to large economic base it provides. As such, policies designed to aid the agricultural sector with recovery post disaster will help maintain the security of this economic asset and way of life. Ideas can be drawn in from the HMP and its most recent update.		
4. Are policies designed to educate the agricultural sector about hazards?		X
Comments: No policies are designed to educate the agricultural sector about hazards. Education outreach, material handouts, and a website FAQ may aid in completing this component. Other ideas can be drawn in from the HMP.		
5. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: There is potential to create these implementation strategies. Implementation strategies will ensure policies are followed and should include information concerning funding and sponsor information and a timeline for implementation.		
National Interest Electric Transmission Corridor (if applicable)		

1. What are the goals for this component? (if applicable)	-	-
Comments: N/A		
2. Does the component provide a list or map of current transmission corridors within hazardous areas?	N/A	N/A
Comments: N/A		
3. Are policies designed for the location of future transmission corridors outside of hazardous areas?	N/A	N/A
Comments: N/A		
4. Are policies aimed at having current facilities designed to function under disaster conditions?	N/A	N/A
Comments: N/A		
failure?	N/A	N/A
Comments: N/A		
6. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?	N/A	N/A
Comments: N/A		
Public Airport Facilities (if applicable)		
1. What are the goals for this component? (if applicable)	-	-
Comments: This component does not include any goals.		
2. Does the component provide a list or map of current airport facilities within hazardous areas?		X
Comments: No list or map of current airport facilities within hazardous areas exists. There are four public airports in the County: Homedale Municipal, Murphy, Grasmere, and Murphy Hot Springs in addition to several private and emergency strips. This may be drawn in from the most recent HMP update.		
adhere to multi-hazard building codes?		X
Comments: Currently no policies exist. These can be integrated to ensure multi-hazard building codes are met in the future to aid in mitigating damages and preventing loss of life due to hazardous events.		
disaster event (e.g., earthquake leading to fuel spills)?		X
Comments: Currently no policies exist. However, policies can be integrated to prevent loss of life through the use of emergency response plans during a disaster event (e.g. evacuation procedures).		
5. Are policies aimed towards utilizing airport facilities in safe areas as emergency shelters?		X
Comments: Currently, no policies exist. This can be incorporated by overlaying airport location on hazardous areas to determine suitable emergency shelter locations.		
6. Are policies aimed at having current facilities designed to function under disaster conditions?		X

Comments: There are no policies mentioned in detail, though the plan does mention that several emergency strips exist. Incorporating policies aimed at having current facilities designed to function under disaster conditions will greatly improve the safety of the community and those working there and may provide as a location for emergency medical support to come and go.		
7. Are policies aimed at having contingencies in place in case of airport facility infrastructure failure?		X
Comments: Currently, no policies are aimed at having contingencies in place in case of an airport facility infrastructure failure. Policy can be incorporated to ensure a plan is in place to minimize damages and loss of life. This may be especially important as emergency services may not be available in a timely manner if transportation lines or telecommunication systems are not operational.		
8. Are implementation strategies (e.g., who is responsible, funding, etc.) for policies provided?		X
Comments: Based on policy needs, implementation strategies will help to establish responsibility and funding. Implementation strategies can be drawn in from the most recent HMP and updates.		

References

LLUPA of Idaho (2015)

FEMA Integrating the Local Hazard Mitigation Plan into a Community's Comprehensive Plan (2013)

FEMA's Safe Growth Audit (2013)

<http://www.burnsmcd.com/insightsnews/insights/aviation-special-report/2011/natural-disaster-vulnerability>

Agriculture and Food Security and Nutrition (May 2015)

APPENDIX C. MEETING DOCUMENTATION

Appendix C collects all planning and public meeting-related documentation, including sign-in sheets, minutes, and presentations.

Contents:

1. 2015 Kick-off meeting presentation
2. October 2015 planning meeting sign-in sheet
3. October 2015 planning meeting presentation
4. February 2016 planning meeting sign-in sheet
5. February 2016 planning meeting presentation
6. April 2016 planning meeting sign-in sheet
7. April 2016 planning meeting presentation
8. July 2016 public meeting presentation

Pre-disaster Mitigation Grant for 10 Idaho Counties – University of Idaho

Counties Included

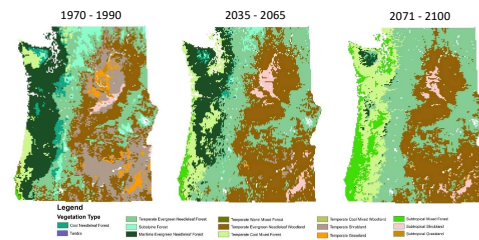
- Bear Lake
- Boise
- Bonner
- Cassia
- Caribou
- Franklin
- Minidoka
- Owyhee
- Lincoln
- Shoshone

Hazards to be Addressed

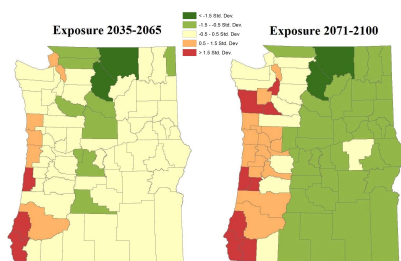
- Will be specific to the geographic area
- Examples
 - Severe storms
 - Windstorms
 - Dam/Levee break
 - Earthquake
 - Mud/Landslide
 - Fire
 - Drought



Climate Change Vulnerability



Climate Change Vulnerability

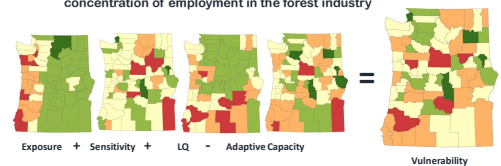


Climate Change Vulnerability

- Modified Vulnerability Equation

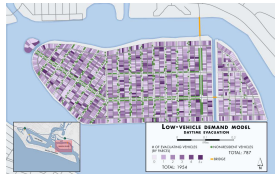
$$\text{Vulnerability} = \frac{[\text{Exposure} + \text{Sensitivity} + \text{Location Quotient}]}{\text{Adaptive Capacity}}$$

Location Quotient – Provides a measure of relative concentration of employment in the forest industry



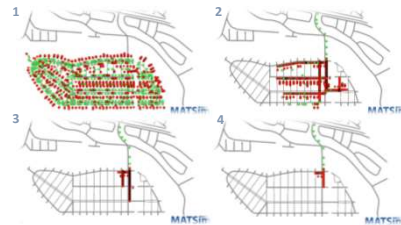
Multi-modal Evacuation Model

- Developed to integrate under-addressed concepts
 - Failure to do so can underestimate evacuation time
- Custom travel demand model
 - Identifies evacuees based on variety of data
 - Can be altered to match assumptions



Multi-modal Evacuation Model

- Evacuation simulation using MATSim
 - Open-source, easily accessible
 - Low computational requirements



Process

- Evaluate current plans
 - Base on the FEMA crosswalk – Match to local hazard
 - Determine if they include a full socioeconomic risk/vulnerability assessment
 - Use hazard mitigation plan (HMP) evaluation protocol that holds HMPs to a more stringent standard than exists within FEMA's crosswalk

Mitigation & Adaptation Plan Analysis

LOCAL MITIGATION PLAN REVIEW CROSSWALK

LOCAL MITIGATION PLAN REVIEW SUMMARY

The plan is used for approval of the plan by the local government. Each mitigation measure is evaluated against the criteria. The plan is used for approval of the plan by the local government. The plan is used for approval of the plan by the local government.

1. Mitigation Measure (2017-2021)

2. Mitigation Measure (2017-2021)

3. Mitigation Measure (2017-2021)

4. Mitigation Measure (2017-2021)

5. Mitigation Measure (2017-2021)

6. Mitigation Measure (2017-2021)

7. Mitigation Measure (2017-2021)

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11. Mitigation Measure (2017-2021)

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72. Mitigation Measure (2017-2021)

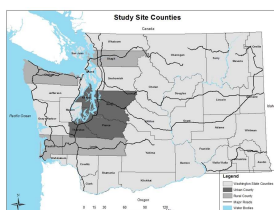
73. Mitigation Measure (2017-2021)

74. Mitigation Measure (2017-2021)

75. Mitigation Measure (2017-2021)

Mitigation & Adaptation Plan Analysis

- Wanted to look at quality of hazard mitigation plans
- Plan comprised of pre-disaster measures aimed at minimizing or preventing losses to communities
- Minimal standards focus on physical exposure

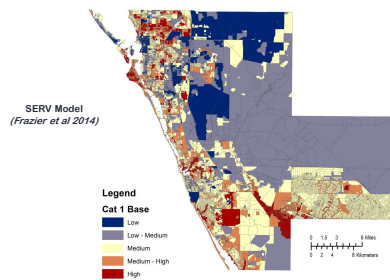


Mitigation & Adaptation Plan Analysis

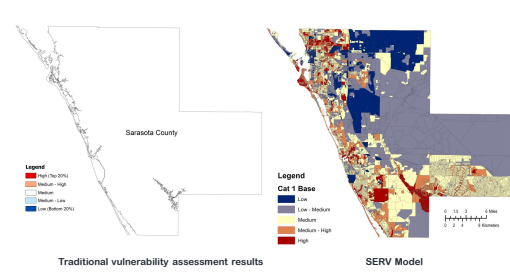
- Not consider probabilistic mapping & socioeconomic analysis
- Can result in plans not specific to local hazards
- Counties & suggested mitigation strategies
- Data problems



SERV Results - Vulnerability



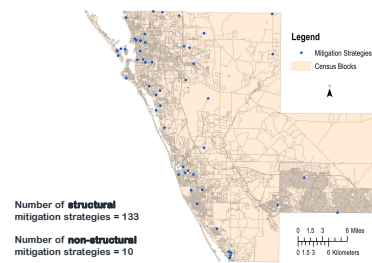
SERV Results - Vulnerability



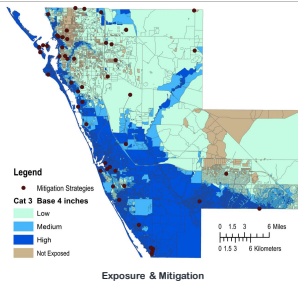
Application of SERV Model

- Determine location of existing mitigation strategies implemented by Sarasota County's Unified Local Mitigation Strategy (ULMS) plan
- Determine where mitigation strategies are most likely to be targeted
 - Are mitigation strategies focused in areas of high vulnerability or high hazard exposure? (Pelling 1999)
 - What types of mitigation strategies are most commonly implemented: structural (Levee) or non-structural (enhancement of social capital)

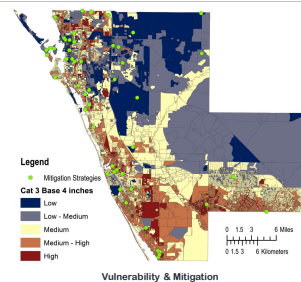
Geocoded Mitigation Strategies



Mitigation Strategies with Exposure



Mitigation Strategies with SERV Vulnerability



Process (continued)

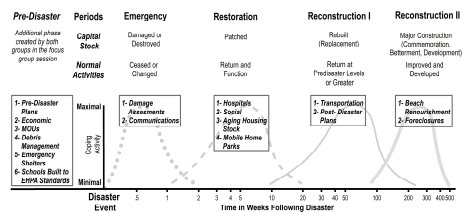
- Integrate with various aspects of community planning, better coordination, and more extensive public participation
 - In-person, online, and/or focus group meetings as well as phone interviews
 - Community partners and state agencies will help gather data

Evaluate Mitigation & Adaptation Strategies

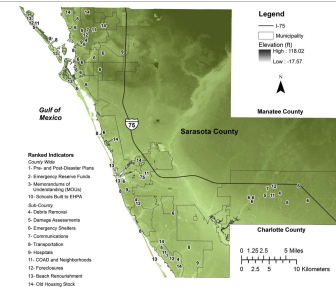
- Working more with locally stakeholders
- Focus group with 20 county stakeholders
- Given background information on resilience & resilience indicators
- List resilience indicators important to county
- Identify & rank resilience indicators & temporally along a disaster recovery timeline (DRT)



Sample of DRT Indicator Placement Results



Hazard Mitigation & Adaptation Planning



Adaptation Planning

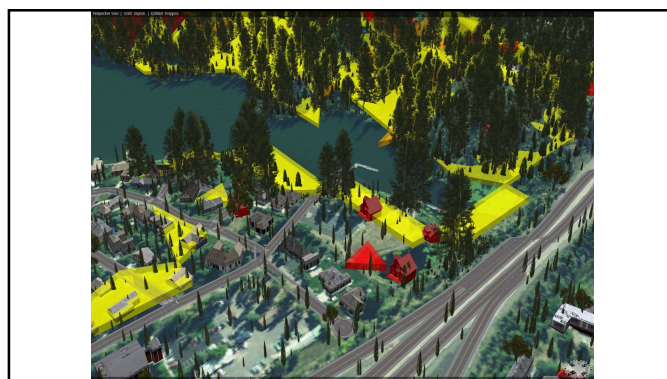
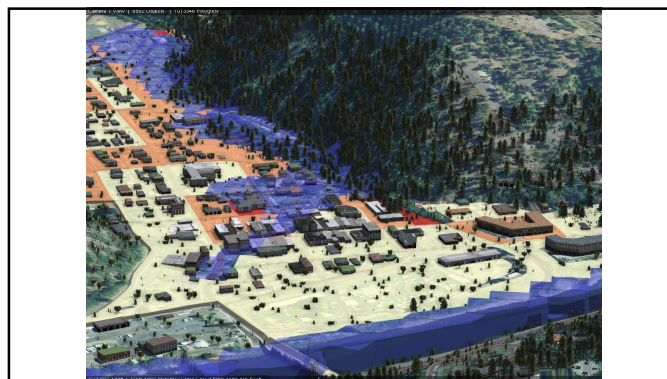


Adaptation Planning



Linking Policy & Practice

- Even when vulnerability is measured correctly mitigation & adaptation strategies are difficult to implement
- This is often due to competing interests
- Uncertainty in the hazard models & Indicators used
- Political environment
- Need more research with stakeholders to select & rank mitigation strategies to help facilitate implementation (Frazier et al., 2013)



Process (continued)

- A plan will be developed for each county
 - Probabilistic risk assessment, vulnerability assessment, hazard mitigation summaries and strategies, and benefit-cost analysis
 - Identify risk and hazards
 - Demonstrate societal exposure
 - Offer mitigation strategies
- End product is a FEMA-certified hazard mitigation plan

Time Line Activities and Participants

- Months 1-12:
 - Pre-disaster mitigation community plan update support
 - Research team
- Month 1:
 - Develop community work plans
 - Research team + Local communities
- Months 2-4:
 - Identify and compile best available hazard data
 - Research team + Agency partners

Time Line (Continued) Activities and Participants

- Months 2-10:
 - Conduct risk analysis
 - Research team
- Months 2-11:
 - Conduct community planning meetings, assess existing plans/policies, and update community profiles
 - Research team + Local communities

Time Line (Continued) Activities and Participants

- Months 10-17:
 - Draft plan preparation support and internal review
 - Research team + Local communities
- Months 18-24:
 - State and FEMA review, County adoptions, and closeout
 - Research team + Agency participants + Local communities



Owyhee County HMP Evaluation & Update



Grant Overview

- Pre-Disaster Mitigation Community Plan Update
- Develop community work plans
- Identify and compile best available hazard data
- Conduct risk analysis and sub-county vulnerability assessment
- Conduct community planning meetings, assess existing plans and policies and update community profile
- Draft plan preparation support and internal review
- State and FEMA review, county adoptions and closeouts

Introduction Scope of Work Evaluation Updates

Scope of Work

Goals and End Product

- Update HMPs to ensure eligibility for hazard mitigation assistance.
- Update HMPs to reduce risk and enhance community resilience.
- End product: FEMA-certified HMP including probabilistic risk assessments, vulnerability assessments, hazard mitigation summaries and strategies, and cost-benefit analysis.

Introduction Scope of Work Evaluation Updates

Evaluations

Evaluation Matrix

- Most HMPs aim to meet minimum requirements but lack comprehensive consideration of factors surrounding hazards.
- Evaluations identify weaknesses which can be targeted in the update process.
- HMPs evaluated on the FEMA Crosswalk requirements and comprehensive criteria.
- Comprehensive criteria based on pre- and post-disaster experiences and knowledge, interviews, and scientific literature.
- FEMA Crosswalk 4 pages vs. Comprehensive Criteria 25 pages.

Introduction Scope of Work Evaluation Updates

FEMA Requirements Scores and Notes			
Element	Possible Score	Plan Score	Notes
Element A: Planning Process	18	10	Plan provides extensive narrative of planning process and public participation, but falls short when describing integration of other plans/policies/etc. Recommend specific monitoring, evaluation, and updating metrics.
Element B: Hazard Identification and Risk Assessment	12	8	Plan provides extensive detailed historical occurrences of a wide range of hazards, but lacks comprehensive risk and vulnerability assessments.
Element C: Mitigation Strategy	18	14	Plan presents both general goals/strategies/policies/projects throughout hazard profile and in separate table with prioritization. Extensive list of funding sources provided for potential financial assistance. Plan results in capabilities assessment.
Element D: Plan Review, Evaluation, and Implementation	N/A	N/A	N/A. Applicable to Plan update only.
Element E: Plan Adoption	6	2	Plan includes resolutions but does not have signatures.
Total	45	34	Plan presents a strong foundation that can be improved upon through the update process. As it stands, the Plan passes all baseline FEMA requirements except Element E.

Internal Plan Recommended and Supplemental Targets Score			
Element	Possible Score	Plan Score	Notes
Fact Based Hazard Assessment	27	17	Plan is based on extensive hazard assessment, but can better delineate future events.
Vulnerability Assessment	36	11	Plan does not include socioeconomic vulnerability measures.
Risk Analysis	18	3	Risk assessment is well grounded, but lacks comprehensive methodology. Various intensities and potential losses should be included for each hazard.
Mitigation Strategies	15	18	Mitigation strategies included both general and specific goals and actions. Need update from County on which projects/actions were completed in progress/completed.
Capabilities Assessment	15	9	Plan lacks comprehensive capabilities assessment that can help identify resources pre- and post disaster.
Mitigation Actions and Policies	93	43	Specific mitigation actions are strong, but better integration of land use, development, public outreach, technical assistance, etc. can strengthen the Plan.
Monitoring and Implementation	51	19	Plan should include specific monitoring and evaluation metrics. Recommend including template to be filled out by appropriate authority.
Internal Plan Characteristics	3	1	Community needs mentioned throughout Plan, but lacks vision and future desired conditions.
Policies/Policy Framework	6	2	Inclusion of future growth considerations can help strengthen the Plan. Recommend including more detail on inclusion of other plans/policies, notify state and federal agencies.
Internal Consistency	6	2	More comprehensive monitoring metrics in addition to more explicit linkages with community goals and values can help strengthen the Plan.
Data Assessment	6	3	Plan lists data sources but lacks quality assessment.
Total	276	128	Though the Plan meets the baseline FEMA requirements, the Plan can be improved through comprehensive risk and vulnerability assessments.

External Plan Recommended and Supplemental Targets Score			
Element	Possible Score	Plan Score	Notes
Planning Process	13	7	Plan's baseline narrative of the planning process is comprehensive, but can be strengthened with representation of why individual stakeholders were involved and their role through the process.
Coordination of Local Hazard Mitigation Planning	12	7	Better description of Plan's integration of other plans/policies/etc. in addition to vertical and horizontal coordination with other agencies can improve the Plan.
Public/Community Involvement	6	4	Public involvement commendable; recommend documentation of participation such as meeting minutes, pictures, etc.
Organization and Presentation	11	3	Plan is organized, follows a logical progression, and is visually appealing. Recommend cross-referencing mitigation goals and specific policies to hazard profiles. Include glossary and executive summary.
Total	42	21	The Plan's strength lie in its planning narrative, extensive hazards profiles, and capabilities assessment. Plan can be improved by focusing on mitigation actions and additional risk and vulnerability assessments.

Comprehensive Plan Score			
COMPREHENSIVE SCORE INTEGRATES FEMA REQUIREMENTS, DISSEMINATION, AND EXPANDED TABLETS			
Element	Possible Score	Plan Score	Notes
FEMA Requirements	45	34	
Internal Plan Recommended and Supplemental Targets	276	138	
External Plan Recommended and Supplemental Targets	42	21	
Total	363	193	

Plan Updates & Improvements

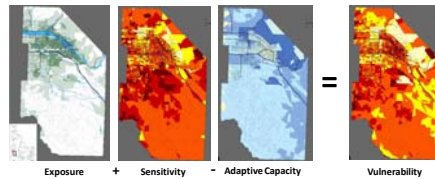
- Systematic risk assessment employing best-available data.
- Holistic sub-county vulnerability assessment.
- Mitigation actions and projects.
- Capabilities, resources, and needs assessment.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

SERV Model

- Social vulnerability defined as the susceptibility of social groups to potential losses from hazard events.



Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Evacuation Modeling

- First-in, first-out evacuation modeling.
- Designed for smaller towns or specific neighborhoods (additional network analysis techniques for larger rural areas).



Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

ESRI CityEngine

- Visualize hazard risk in 3D.



Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Mitigation Mapping

- Map potential area of effect of mitigation measures.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Idaho JRA

- Integrate public health and natural hazards risk assessment.
- Pandemic Influenza and hazardous materials incidents modeling.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Other

- Data Inventory
 - What we have, what we need from you or external sources, what you think we're missing.
- Web Portal
 - Expand on current version by including HMP components.
 - Useable by both County and public.
- Hazus Level II
 - Incorporate user-defined facilities if available.
 - Satisfies FEMA, but potential for improvements.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Mitigation

- 5+ years after HMP adoption; mitigation metrics need to be updated.
 - Need local input and direction regarding estimated timelines, costs, responsible organization, etc.
- Resources, Capabilities, and Needs assessment.
- Monitoring and evaluation metrics.
- Mitigation ranking method and feedback form/survey will be developed and sent out.
- Meeting with County to discuss mitigation metrics in January/February.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

6. Resources, Capabilities, and Needs Summary

The Emergency Manager for Shoshone County completed Resource, Capabilities, and Needs Summary as part of the analysis. The analysis results are presented here with the final plan recommendations and actions to be taken.

6.1 Shoshone County

The Emergency Manager for Shoshone County completed Resource, Capabilities, and Needs Summary as part of the analysis. The analysis results are presented here with the final plan recommendations and actions to be taken.

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

PLAN MAINTENANCE

Mitigation Project Progress Report

Progress Report Period From (date): To (date):

Project Title and Project ID:

Description of Project:

Implementing Agency:

Contact Name:

Contact E-mail and Number:

Grant/Finance Administration:

Total Project Cost:

Anticipated Cost Overrun/Underrun:

Date of Project Approval:

Project Start Date:

Anticipated Completion Date:

Summary of Progress of Project for this Reporting Period

1. What was accomplished during this reporting period?

2. What obstacles, problems, or delays did the project encounter, if any? How were the problems resolved?

Introduction Scope of Work Evaluations Updates

Plan Updates & Improvements

Short-term Timeline

- Week of Oct. 26th-30th:
 - Deliver HMP evaluations and PowerPoint slides in PDF format.
 - Make data inventory available online.
- Week of Nov. 2nd-6th:
 - Deliver capabilities, resources, and needs assessment.
 - Deliver mitigation monitoring and evaluation templates.
 - Deliver plan review templates (gov't and public).
- Week of Nov. 9th-13th:
 - Deliver detailed action plan and schedule for risk and vulnerability assessments.
 - Begin planning public meetings in early/mid Spring.

Introduction Scope of Work Evaluations **Updates**

Plan Updates & Improvements

Long-term Timeline

- November through March:
 - SERV modeling.
 - MATSim evacuation modeling.
 - CityEngine visualization.
 - Mitigation mapping.
- February through March:
 - Begin drafting plan updates and finalizing figures for review by County.
- Meeting in January/February to discuss mitigation projects in detail.

Introduction Scope of Work Evaluations **Updates**

Plan Updates & Improvements

Public Meetings

- Aim for early to mid-Spring for community review on mitigation measures and rankings, figures and draft.
- County-led meetings to better engage community.
- Meeting itinerary will be developed along with mitigation discussion and modeling.

Introduction Scope of Work Evaluations **Updates**

Plan Updates & Improvements

What we need from you

- Any missing data you feel we need to incorporate.
- CAD files, user-defined facilities, and parcel data.
- Status on mitigation actions using progress template.
- Feedback/survey on future mitigation measures.

Introduction Scope of Work Evaluations **Updates**

HMP meeting Owyhee county sign-in sheet

October 21st, 2015
 start: 9am
 end: 11am

Name	Signature	position + agency	email/phone #
Michelle Ritchie	<i>Michelle Ritchie</i>		
Susan Cleverley	<i>Susan Cleverley</i>	IBHS Mitigation Planner	208-258-6545 scleverley@bhs.idaho.gov
Mark Stephensen	<i>Mark Stephensen</i>	IBHS- SHAW	mstephensen@bhs.idaho.gov
MARY MOTT	<i>Mary Mott</i>	IBHS- MITIGATION ASSISTANT	mmott@contractor.bhsidaho.gov
Karen Humes	<i>Karen Humes</i>	Univ of Idaho	kahumes@uidaho.edu
Alexander Peterson	<i>Alexander Peterson</i>	research assistant	alexander.peterson@gmail.com
Tim Frazier	<i>Tim Frazier</i>	BH	tfrazier@bhsidaho.gov
Jim Desmond	<i>Jim Desmond</i>	Owyhee County	OWREDIR@aol.com

Owyhee County HMP Update Planning Committee Meeting February 23, 2016

**BINGHAMTON
UNIVERSITY**
STATE UNIVERSITY OF NEW YORK

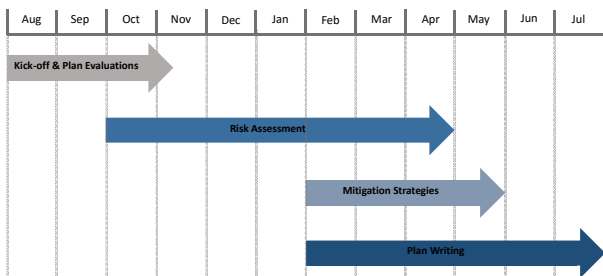


**University
of Idaho**

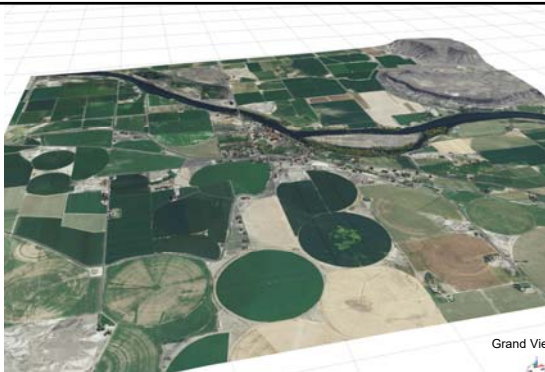
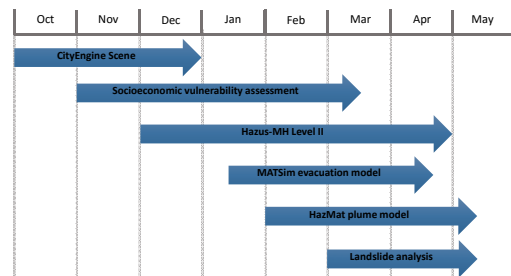
Meeting Agenda

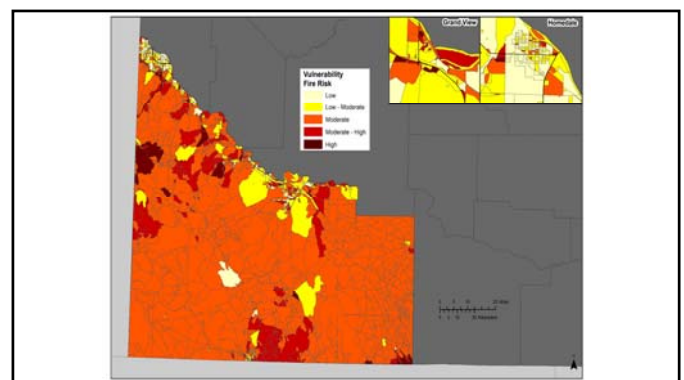
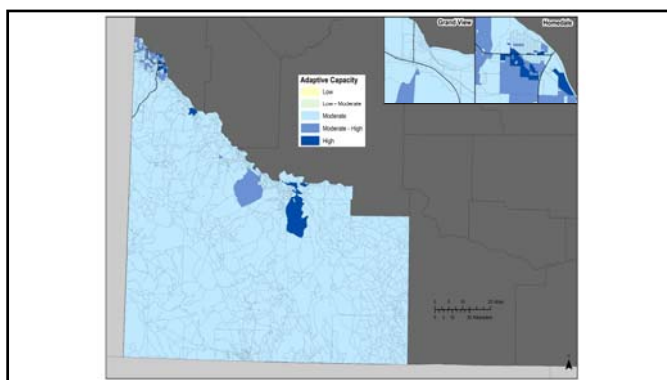
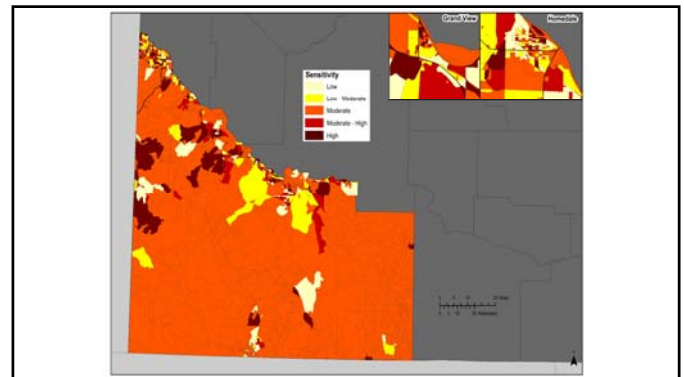
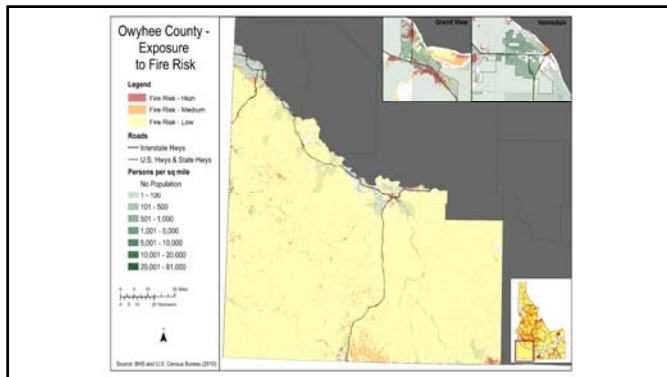
- Introductions & meeting overview
- HMP update progress (10 minutes)
- Mitigation strategies review (1-2 hours)
- Templates & forms (10 minutes)
- Future meetings (10 minutes)

HMP Update

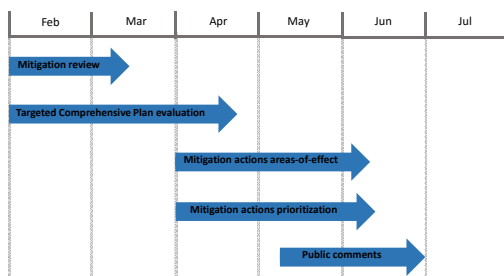


HMP Update – Risk Assessment

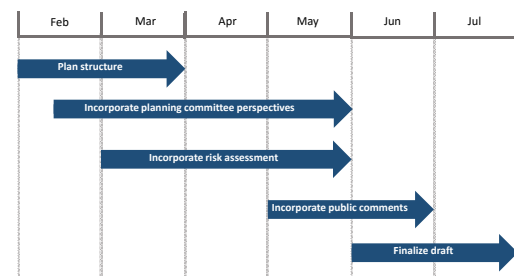




HMP Update – Mitigation Strategies



HMP Update – Plan Writing



Mitigation Strategies Review

- Examine progress made towards implementing mitigation actions.
- FEMA mandated in the update process.
- Provides baseline for updating mitigation strategies.

Mitigation Strategies Review (1-2 Hours)

- Work through the *Mitigation Strategy Review* form.
 - Mark status Complete, Progress, or No Progress.
 - Mark if action item is iterative – undertaken continuously.
 - Mark if committee wants to carry mitigation action forward.
 - Estimate percent complete.
 - Estimate timeline to finish or interval if iterative action item.

Mitigation Strategies Review (Continued)

- Work through the *Mitigation Strategy Review* form (continued):
 - Mark responsible agency, challenges to completion, and priority if applicable.
 - Use notes area to list point of contact if known or any other relevant information.
- Focus on reviewing the mitigation strategies.
 - New strategies are focus of April's planning meeting.

Templates & Forms

- Soliciting feedback on:
 - Capabilities Assessment Template
 - Mitigation Monitoring Template
- Need completed:
 - Stakeholder Involvement Form
 - FEMA Capabilities Assessment Form

Future Meetings

- April Planning Meeting
 - Present risk assessment
 - Continue mitigation strategy update
 - Prepare for public meeting
- May Public Meeting
 - Present HMP update
 - Solicit comments
 - Participatory mapping exercises

Map Exercises (1 Hour)

- Two map exercises to gather committee perspectives and information.
 - Included in HMP.
 - Informs mitigation strategies and prioritization.
- Mark up the maps however you see fit.
- Will modify future participatory maps based on feedback.

Exercise 1

- Locate the following places on the provided map:
 - Future land use and development within the county.
 - Recent or repeatedly damaged places.

Exercise 2

- Locate the following places on the provided map:
 - Community assets (such as historical places, places of cultural value, natural resources and recreation, etc.).
 - Vital facilities (both hazard- and non-hazard related).

HMP Update Progress to Date

- HMP kick-off and evaluation
- Risk assessment data collection
- CityEngine scene development
- Socioeconomic vulnerability assessment
- HazMat plume modeling
- County Comprehensive Plan evaluation matrix

Planning Committee Meeting Sign-In Sheet

County: Owyhee

Date: Feb. 23, 2016

Time: 1:00pm

Name	Signature	Position & Agency	Email Address	Phone Number
TERRI A. GEIS		GEN MGR. USEI	terry.geis@usecology.com	208 834 2275
Josh Bolinger		Health/Safety Coordinator USEI	josh.bolinger@usecology.com	208-624-9048
Jim Desmond		Owyhee County	owrcdier@adrian	208 249-0571
Nas Anderson		Chief MFR Fire Co 45C, Home Owners Assoc	chief@mfrfire.org	208-590-9447
Jim Hyslop		Chief Silver City Fire Rescue Commissioner	jimhyslop123@gmail.com	208-890-6718
B, II Statham		Chair Historic Preservation Owyhee County	silvercityfire@gmail.com	208 830-7486
Mary Huff		Planning Director Owyhee County	mhu@eco.owhee.id.us	208-495-2075
Jim Morton		Installation Emergency Manager - MTHAFB	james.morton.7@USAF.mil	208-828-6673
Casper Urbank		Fire Warden - 1st Southwest Sup. Area	curbanek.e.idl.idaho.gov	208-334-3488
Christine Ballard		911 Coordinator Owyhee Co. Sheriff	cballard@co.owhee.id.us	208 495-1154 ext 10
Doug Thurman		PRCO + G.V. City	dthurman@idaho.gov	208 388-6921
Deann Wilson		Superintendent Rural/Grandview Schals	dwilson@SD365.us	208-834-2260
Don Best		Owyhee County 4th Dist	dbest@co.owhee.id.us	834 2012
Phil Rittenhouse		Owyhee County 4th Dist	prittenhouse@co.owhee.id.us	208-495-1170
Susan Cleverley		Mitigation, IBHS	scleverley@bhs.idaho.gov	208-258-6545
DALE WARDER		IBHS	warder@co.owhee.id.us	208-258-6542

Kenny Kershner
Tanel Richards

Kenny Kershner
Tanel Richards

DRFB
Owyhee Cattlemen

richards@idaho.gov
richards@idaho.gov

208-495-2455
208-585-3553

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Owyhee County HMP Update Planning Meeting

April 26, 2016



Progress Overview

- Updated previous mitigation actions.
- Preliminary risk assessment results.
- Public outreach.
- County profile text and figures.

Intro

Mitigation

Mapping
Exercise

Risk
Results

Conclusion

Mitigation Strategy Update

- Opportunity to add needed mitigation actions into HMP.
- Previous actions marked for revision and re-evaluation.
- Start prioritizing actions that can be implemented over the next 5 years.
 - 23 actions previously marked as priority.
 - New actions to be marked as priority.
 - Focus on top 5-10 priority actions.

Intro

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Mitigation Strategy Update

- Consider actions both specific to hazards and hazard-agnostic.
- Recently experienced hazards.
- Repeatedly damaged places, or repeated maintenance costs that can be mitigated.
- FEMA's focus now on climate impacts and green infrastructure.
- Cyber security and infrastructure.

Intro

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Mitigation Strategy Update

- Hazards with mitigation actions in previous plan:
 - Flood
 - Fire
 - Earthquake
 - Avalanche
 - Winter Weather
- Majority are fire and flood.
- General and resource-oriented actions in previous plan.

Intro

Mitigation

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Exercise

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Mitigation Strategy Update

- Drought
- Severe storms, including hail, wind, and winter storms.
- Extreme temperatures
- Landslide
- Wildfire
- Hazardous materials
- Resource & capability enhancements
- Natural systems protection
- Flood
- Earthquake
- Erosion & land subsidence
- Cyber hazards
- Communicable diseases
- Civil unrest & terrorism
- Safety & policy
- Infrastructure
- People & structures

Intro

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Mitigation Strategy Update

- Committee to agree on mitigation actions to be included.
- Use provided forms to list proposed mitigation actions.
- For those agreed upon, use the Mitigation Actions Implementation Form to provide greater detail.
- As a committee, select the top 5-10 priority mitigation actions.
 - Priority actions can be both current but incomplete and new.

Intro Mitigation Mapping Exercise Risk Results Conclusion

Mapping Mitigation Areas of Effects

- Map top priority mitigation actions.
- Focus on areas of effects, not just points.
 - Which areas do they protect or impact?

Intro Mitigation Mapping Exercise Risk Results Conclusion

Break

- 5-10 minutes.

Intro Mitigation Mapping Exercise Risk Results Conclusion

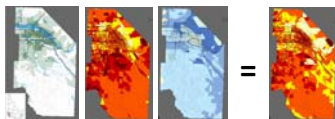
Preliminary Risk Assessment Results

- Hazard events since 2008:
 - Severe Weather
 - Winter Weather
 - Wind
 - Flooding
 - Wildfire
- Heavy Snow:
 - No recorded property damage
- Wildfire:
 - \$217,132
- Wind:
 - \$36,782
- Flash Flood:
 - No recorded property damage
 - 1 fatality
- Total losses:
 - \$253,914 (2008-2014)

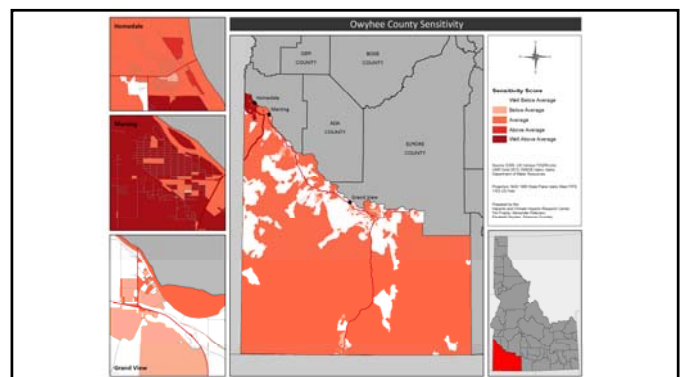
Intro Mitigation Mapping Exercise Risk Results Conclusion

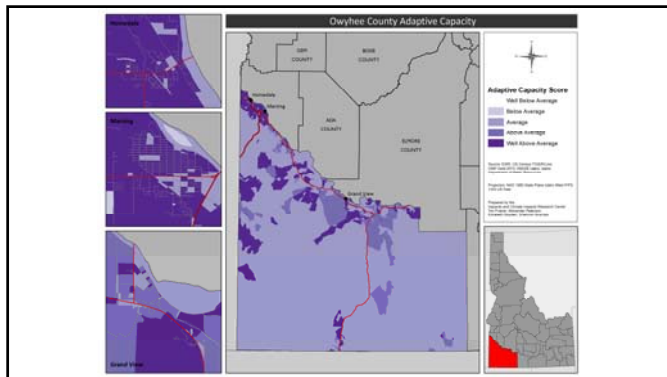
Preliminary Vulnerability Results

- Social vulnerability defined as the susceptibility of social groups to potential losses from hazard events.
- Considers sensitivity, adaptive capacity, and exposure.



Intro Mitigation Mapping Exercise Risk Results Conclusion





Hazard-Specific Results

- Hazards of focus:
 - Flood
 - Earthquake
 - Wildfire
 - Hazardous Materials
 - Pandemic Influenza
 - Landslide
 - Severe Weather
- Loss estimation for flood and earthquake.
- Assessor overlay for all others.

Intro Mitigation Mapping Exercise **Risk Results** Conclusion

Flood

Date	Hazard	Property Damage
6/6/2009	Flash Flooding	\$0 recorded losses 1 fatality
Total Occurrences (2009-2014)		Total
1		\$0 recorded losses 1 fatality

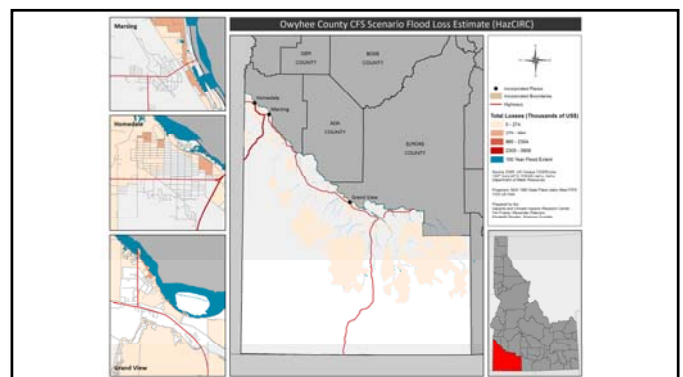
Hazus Flood Loss Estimation

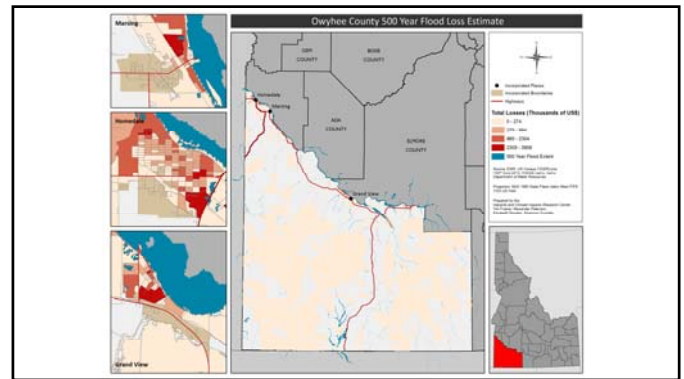
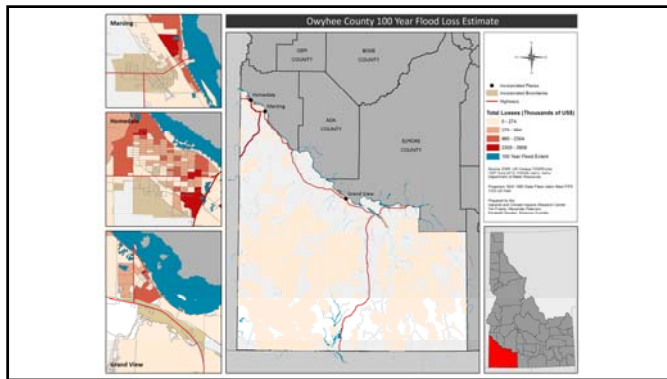
- Updated critical facilities using HSIP Gold, Infogroup data, and State data.
- Data validation of facility and transportation infrastructure.
- Hazus Scenarios:
 - 100 Year Return Interval
 - HazCIRC depth grids (6,860 cfs scenario on the Snake River)
 - FEMA non-regulatory depth grids
 - 500 Year Return Interval
 - FEMA non-regulatory depth grids

Intro Mitigation Mapping Exercise **Risk Results** Conclusion

Hazus Flood Loss Estimation

	6,860 cfs SR (HazCIRC)	100 Year (FEMA)	500 Year (FEMA)
Displaced Households & Sheltered Individuals	330 households 300 individuals	1,000 households 1,500 individuals	1,000 households 1,700 individuals
Debris	2,000 tons 80 truckloads	27,000 tons 1000 truckloads	35,000 tons 1,400 truckloads
At Least Moderate Damage to Essential Facilities	0 fire stations 0 medical care 0 police stations 1 school (loss of use)	1 fire station (loss of use) 1 medical care (loss of use) 0 police stations 2 schools (3 loss of use)	1 fire stations 1 medical care 0 police stations 2 schools • 1 substantial damage • 3 loss of use
Economic Losses	\$15 million structural \$0.02 million business interruption	\$160 million structural \$0.5 million business interruption	\$200 million structural \$0.5 business interruption

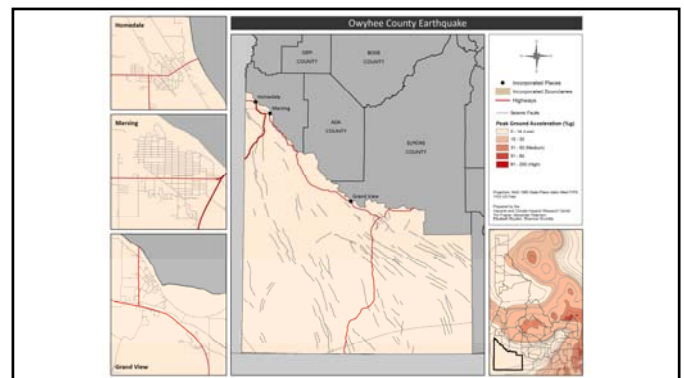




Earthquake

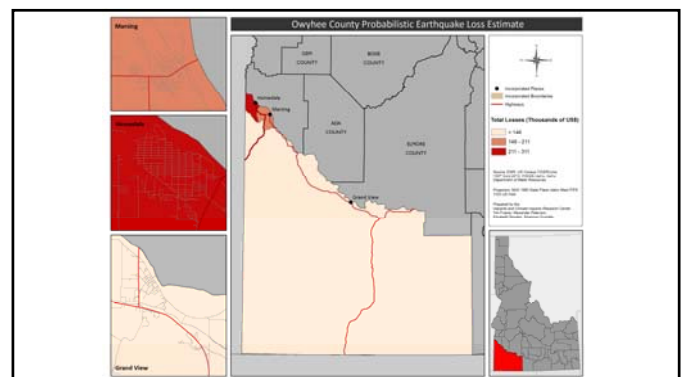
- Updated critical facilities using HSIP Gold, Infogroup data, and State data.
- Data validation of facility and transportation infrastructure.
- Hazus Scenarios:
 - Probabilistic
 - 1000 year return interval
 - 7.0 magnitude

Intro Mitigation Mapping Exercise **Risk Results** Conclusion



Hazus Earthquake Loss Estimation

	Probabilistic
Casualties	1 at 2am 1 at 2pm 1 at 5pm
Displaced Households & Sheltered Individuals	0 displaced 0 sheltered
Debris	No debris
Damage to Essential Facilities	No damage
Building-Related Losses	\$4 million
Income Losses	\$6 million
Transportation Losses	\$1 million
Utility Losses	\$3 million



Wildfire

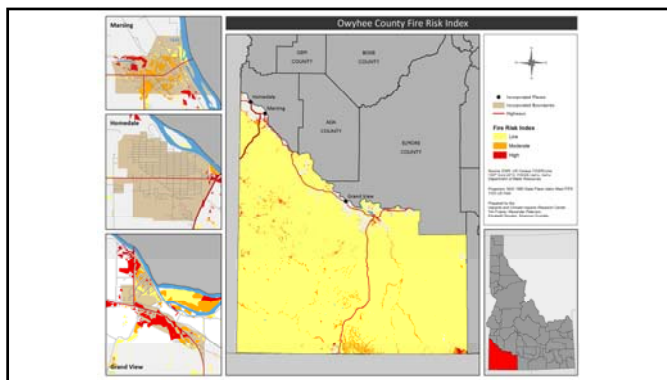
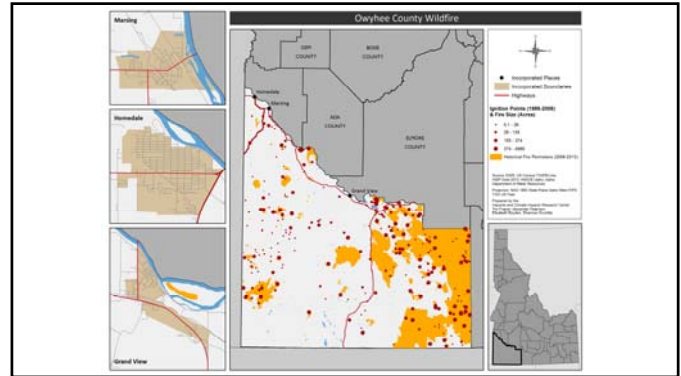
- Primary hazard affecting the county.
- Soda Fire burned more than 270,000 acres in 2015.
- Potential cascading hazards (e.g., flash floods).

Intro

Mitigation

Mapping
ExerciseRisk
Results

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Hazardous Materials

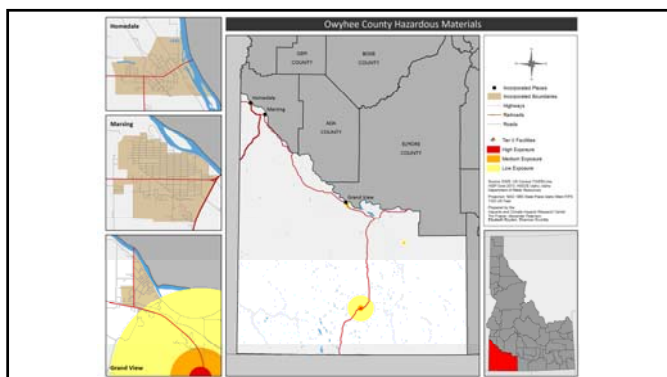
- 1 Hazardous Material Incident 2009 - present
- 2 Injuries
- Incident involved aircraft fuel

Intro

Mitigation

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Communicable Disease

- 15 reported communicable disease incidents (2008 - 2012):
 - Novel Influenza A Virus Infections (5)
 - Campylobacteriosis (4)
 - Cryptosporidiosis (2)
 - West Nile Fever (1)
 - Salmonellosis (1)
 - Pertussis (1)
 - Shiga toxin-producing Escherichia coli (STEC) (1)

Intro

Mitigation

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ExerciseRisk
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Pandemic Influenza

		1918 Strain			1968 Strain		
		15%	25%	35%	15%	25%	35%
Total Hospital Admissions	Minimum	55	92	129	6	11	15
	Most Likely	159	264	370	14	24	33
	Maximum	320	534	747	19	32	45
Total Deaths	Minimum	20	33	46	2	3	5
	Most Likely	48	80	112	3	5	7
	Maximum	92	153	214	5	8	11

Intro

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Landslide

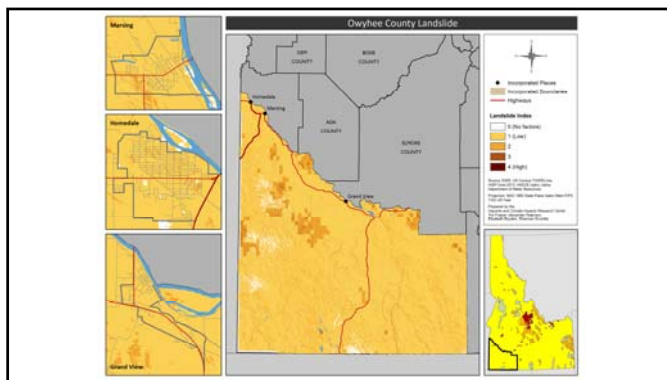
- 0 reported landslides

Intro

Mitigation

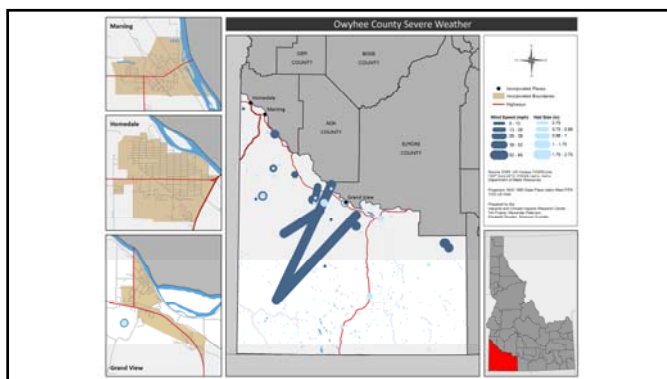
Mapping
ExerciseRisk
Results

Conclusion



Severe Weather

Date	Hazard	Property Damage
3/29/2009	Wind	\$36,782
12/7/2013	Winter Weather	\$0 recorded
Total Occurrences (2009-2014)		Total
2		\$36,782



Conclusion

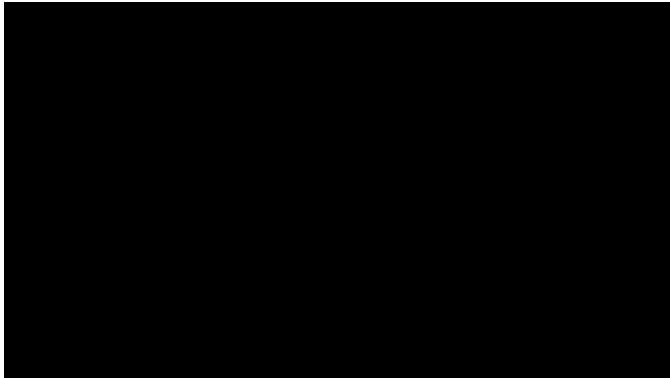
- Upcoming tasks:
 - Digitize mitigation areas of effects.
 - Finalize risk assessment.
 - Finalize text and figures.
 - Score and detail mitigation actions.
- Set public meeting dates.

Intro

Mitigation

Mapping
ExerciseRisk
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Conclusion



Participatory Mapping

- Important to include committee perspectives in HMP to help guide mitigation.
- Exercise 1: Everyday Assets & Development
 - Not hazard or disaster focused.
- Exercise 2: Vital Facilities & Damaged Places
 - Hazard and disaster focused.
- Exercise 3: Mitigation Areas of Effects



Intro Map 1 Map 2 Mitigation Map 3 Risk Results Conclusion

Map Exercise 1: Part A

- Individually, list everyday assets that are meaningful and contribute to your quality of life (5-10 minutes).
- As a committee, select the top 5-10 assets in the county (10-15 minutes).

Intro Map 1 Map 2 Mitigation Map 3 Risk Results Conclusion

Map Exercise 1: Part A

- | | |
|-----------------------------------|------------------------|
| • Agriculture | • Sense of Place |
| • Natural Resources & Environment | • Water |
| • Historical & Cultural | • Economy |
| • Recreation | • Built Infrastructure |
| • Parks & Protected Areas | |

Intro Map 1 Map 2 Mitigation Map 3 Risk Results Conclusion

Map Exercise 1: Part B

- Map selected assets (5-10 minutes).
- Map future development areas in the next 5-10 years (5 minutes).
- Use different colors and labels to differentiate assets – use provided form to create a legend.

Intro Map 1 Risk Results Map 2 Mitigation Map 3 Conclusion

Map Exercise 2: Part A

- Individually, list facilities and places vital to the county if a disaster were to happen (5-10 minutes)
- As a committee, select the top 5-10 facilities and places (10-15 minutes).

Intro Map 1 Map 2 Mitigation Map 3 Risk Results Conclusion

Map Exercise 2: Part A

- Natural Resources & Environment
- Parks & Protected Areas
- Built Infrastructure
- Public Health & Safety
- Shelters
- Recovery
- Response
- Supplies

Intro Map 1 **Map 2** Mitigation Map 3 Risk Results Conclusion














Map Exercise 2: Part B

- Map selected facilities and places (5-10 minutes).
- Map repeatedly damaged places, or places of repeated concern (5 minutes).
- Use different colors and labels to differentiate facilities and places – use provided form to create a legend.

Intro Map 1 **Map 2** Mitigation Map 3 Risk Results Conclusion

Planning Committee Meeting Sign-In Sheet

County: Owyhee	Date: April 26, 2016	Time: 1:00 pm
----------------	----------------------	---------------

Name	Signature	Position & Agency	Email Address	Phone Number
Gus Brackett		34 th Ave Breck RFPA	gusbrackett@rtkinc.net	(208) 308-4962
Susan Chavertley		Mitigation Section Chief IBHS	sleeverley@bhsz.idaho.gov	(208) 258-6545
Mary Huff		Planning Director Co Owyhee	m.huff@co.owyhee.id.us	208 495-2095
Doug Thurman		FPCC	dthurman@idaho.gov	208-388-6921
Don Best		Owyhee R&B III	dbest@co.owyhee.id.us	834-2012
Robert L. Scaryes		City Sept	—	834-2700
Phil Rittenhouse		Owyhee County R&B #1	pr.rittenhouse@co.owyhee.id.us	495-1170
TERRY A. GEIS		GEN MGR USECOWAGY	terry.geis@usecology.com	208 834 2275
Bill Statham		Chair - Historic Preservation Commission	silvers@tytete@gmail.com	208 830-7486
DALE WAREZ		AFO - IBHS	DALEWAREZ@IBHS.TENNESSEE	208-830-8059
Ben Roebel		Mitigation/ANR IBHS	BRoebel@BHS.idaho.gov	208-621-1111
Tim Desmond		Owyhee City	DCNRDIR@idaho.gov	208 249-0571
Jim Hyslop		Silver City Fibre Rescue		

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Owyhee County 2016 Hazard Mitigation Plan Update

July 27, 2016



Dr. Tim Frazier
Executive Director
Emergency & Disaster Management Program
Georgetown University

Alexander Peterson
Graduate Research Assistant
Emergency & Disaster Management Program
Georgetown University



Introduction

- What is mitigation?
 - Mitigation are actions taken to reduce hazard risks to life and property.
- Without mitigation, communities and individuals are more vulnerable to loss.
- Examples include:
 - Education and awareness programs.
 - Structural protection.
 - Land use and zoning policies.

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Why Mitigate?

- For every \$1 spent on mitigation, \$4 saved in recovery.
- Efficient allocation of resources and efforts.
- Opportunity to build local partnerships.
- Increases awareness of hazards.
- Align risk reduction with objectives.
- Safe, resilient, and sustainable communities.



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Hazard Mitigation Plans

- Hazard Mitigation Plans (HMPs) identify risks and mitigation actions to reduce risks.
- Authorized by the Disaster Management Act of 2000.
 - Plans required by FEMA for funds and resources.
 - Plans expire 5 years after adoption.
- What happens if the HMP is expired?
 - County not eligible for pre- and post-disaster assistance.
 - Pre-Disaster Mitigation funds or Hazard Mitigation Grant Program funds.

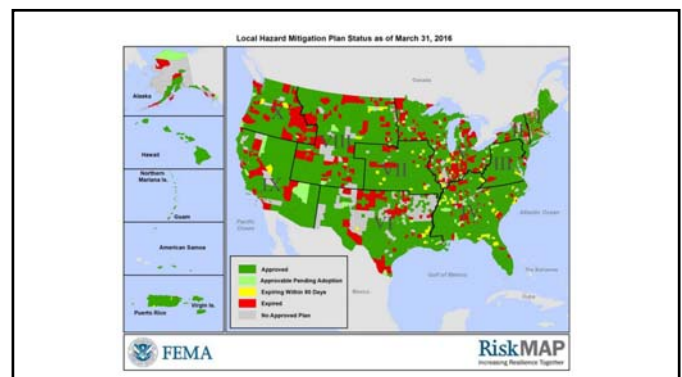
Intro

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Hazard Mitigation Plans

- Supported by federal grant with 9 other counties.
 - Cooperative effort between state and counties.
 - Reduced cost and burden on the county.
- HazCIRC goals:
 - Comprehensive update to reduce risk and enhance community resilience.
 - Update plan to ensure eligibility for federal assistance.
- End product: FEMA-certified plan.



Intro Plans Process Risk Conclusion

Hazard Mitigation Plans

- Other benefits to the county:
 - Comprehensive Plan evaluation and integration to guide land use policies.
 - Data useable by the communities and agencies.
 - Preparedness website useable over the plan's lifecycle.
 - Recommended update process for 2021.

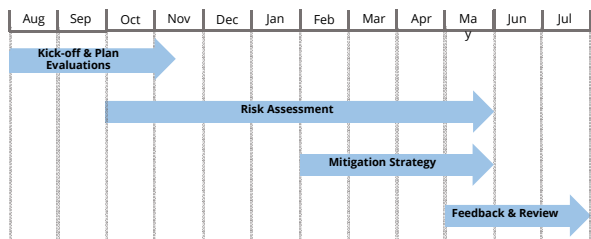
Intro Plans Process Risk Conclusion

Community Wildfire Protection Plan Integration

- Wildfire-specific plan overseen by Idaho Dept. of Lands.
- CWPPs address wildfire response, mitigation, community preparedness, structure protection.
- The CWPP & HMP share similar requirements and structures.
 - Agreement between IOEM & IDL allows plan integration.
- Strengthens both plans, opens additional funding avenues, standardizes planning process.

Intro Plans Process Risk Conclusion

Hazard Mitigation Planning Process



Intro Plans Process Risk Conclusion

Hazard Mitigation Plan Process

- Community Participation:
 - Owyhee County
 - Grandview
 - Marsing
 - Homedale
 - Silver City
 - Road & Bridge
 - Fire Protection Associations
 - Sheriff's Office
 - School Districts
- Stakeholders:
 - Office of Emergency Management
 - Bureau of Land Management
 - US Ecology
 - Idaho Power
 - Mountain Home Airforce Base
 - Idaho Dept. of Lands

Intro Plans Process Risk Conclusion

Hazard Mitigation Plan Process

- Risk assessment incorporated best available data and modeling.
- Sub-county socioeconomic vulnerability assessment.
- Loss estimation for flood and earthquake.
- Evacuation model.
- CityEngine 3D scene.



Intro Plans Process Risk Conclusion

Hazard Mitigation Plan Process

- Updated hazards:
 - Flood
 - Landslide
 - Wildfire
 - Earthquake
 - Severe Weather
 - Civil Unrest & Terrorism
- Additional hazards:
 - Avalanche
 - Communicable Disease
 - Cyber Hazards
 - Drought
 - Hazardous Materials
 - Transportation Accidents & Incidents
 - Volcanic Eruption
 - Food Shortages
 - Power Outages
 - Air Quality
 - Source Water Protection

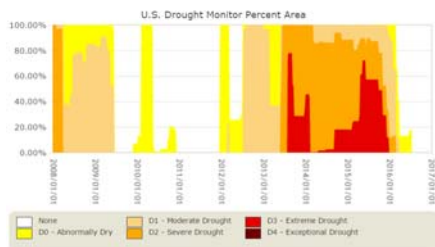
Intro Plans **Process** Risk Conclusion

Hazard Events Overview

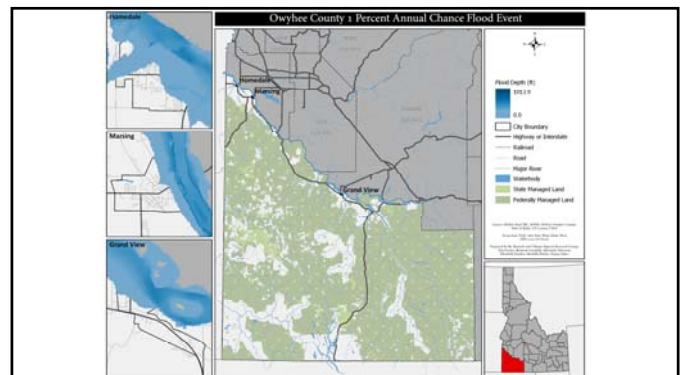
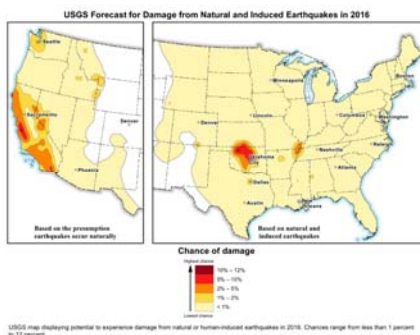
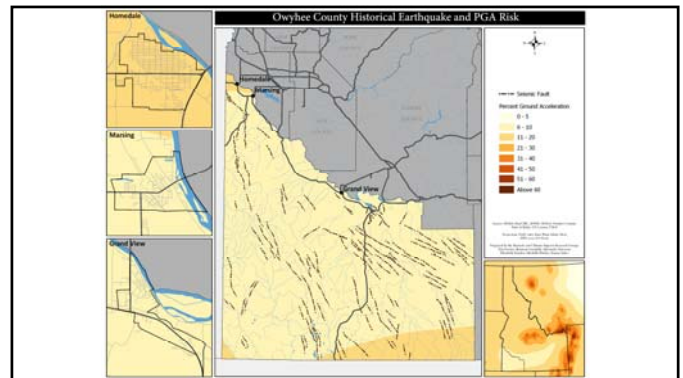
Hazard	Number of Events	Source	Losses
Communicable Disease	353 Recorded	IDHW	-
Drought	1 Decl., 4 Yrs 100% Area	IDWR	-
Earthquake	2 Recorded	USGS	-
Flood	1 Recorded	SHELDUS	1 Fatality
Hazardous Materials	1 Recorded	NRC	2 Injuries
Severe Weather	2 Recorded	SHELDUS	> \$30,000 Property
Transportation	769 Recorded	IDT	15 Fatalities; 267 Injuries
Wildfire	311 Recorded	LANDFIRE	>\$210k Property; >900k Acres

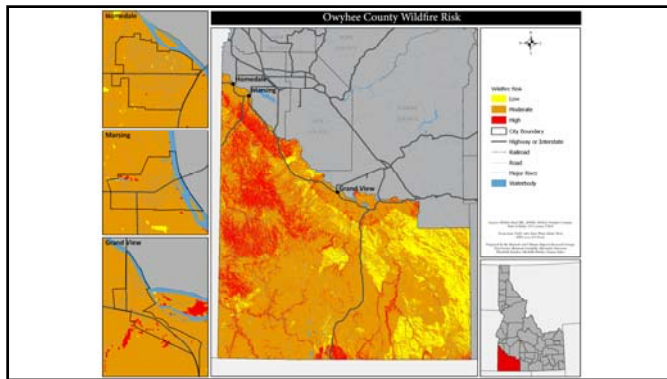
Intro Plans Process **Risk** Conclusion

Drought



Intro Plans Process **Risk** Conclusion





Pandemic Influenza

		1918 Strain			1968 Strain		
Total Hospital Admissions	Minimum	55	92	129	6	11	15
	Most Likely	159	264	370	14	24	33
	Maximum	320	534	747	19	32	45
Total Deaths	Minimum	20	33	46	2	3	5
	Most Likely	48	80	112	3	5	7
	Maximum	92	153	214	5	8	11

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Loss Estimates

- Employed FEMA loss estimate software for flood and earthquake.
- Scenarios:
 - 1 Percent Annual Chance Flood
 - 0.2 Percent Annual Chance Flood
 - Probabilistic 1,000 Year 7.0 Magnitude Earthquake
- Data validation of critical facilities.

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Earthquake Loss Estimates

	Probabilistic
Casualties	1 at 2am 1 at 2pm 1 at 5pm
Building-Related Losses	\$4 million
Income Losses	\$6 million
Transportation Losses	\$1 million
Utility Losses	\$3 million

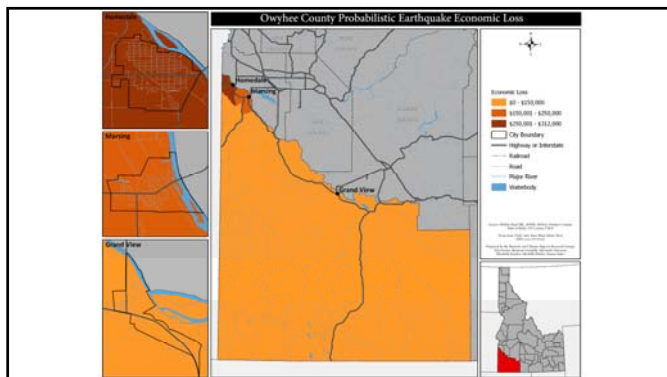
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Flood Loss Estimates

	1 Percent Annual	0.2 Percent Annual
Displaced Households & Sheltered Individuals	1,000 households 1,500 individuals	1,000 households 1,700 individuals
Debris	27,000 tons 1000 truckloads	35,000 tons 1,400 truckloads
At Least Moderate Damage to Essential Facilities	1 fire station (loss of use) 1 medical care (loss of use) 2 schools (3 loss of use)	1 fire stations 1 medical care 2 schools • 1 substantial damage • 3 loss of use
Economic Losses	\$160 million structural \$0.5 million business interruption	\$200 million structural \$0.5 business interruption

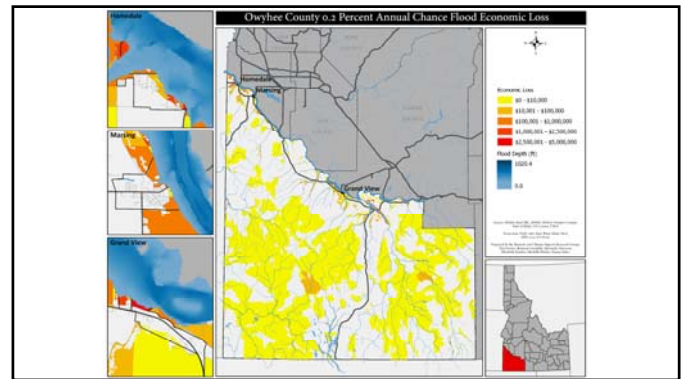
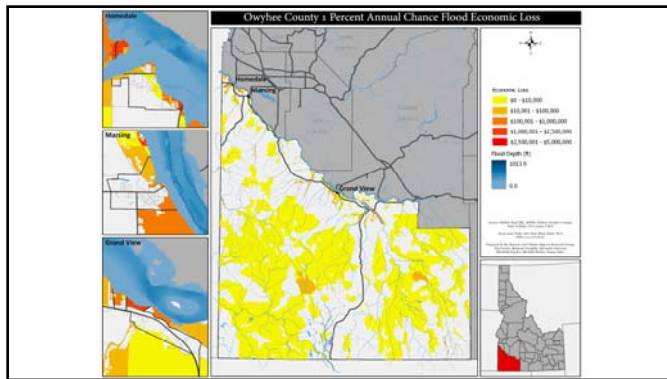
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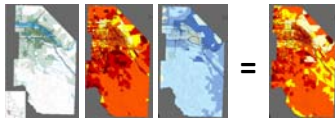
Risk

Conclusion



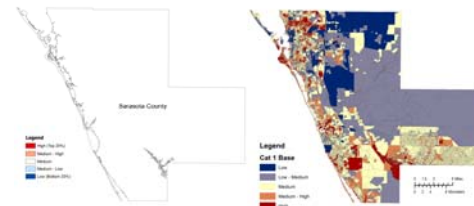
Socioeconomic Vulnerability

- Defined as the susceptibility of social groups to potential losses from hazards.
- Employed the Spatially Explicit Resilience-Vulnerability (SERV) model developed by Dr. Frazier.



Intro Plans Process Risk Conclusion

Socioeconomic Vulnerability



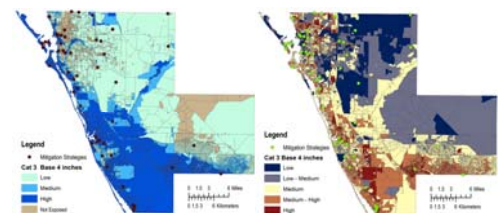
Intro Plans Process Risk Conclusion

Socioeconomic Vulnerability

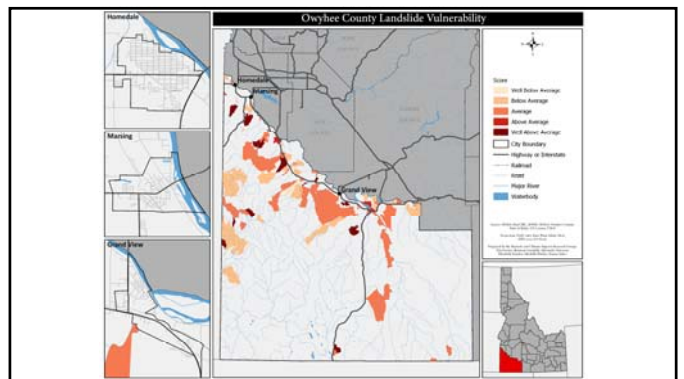
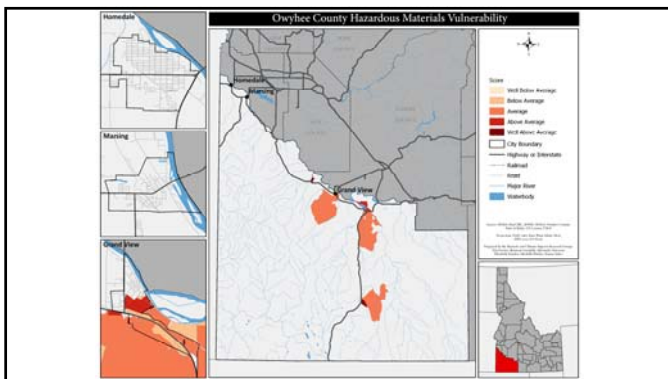
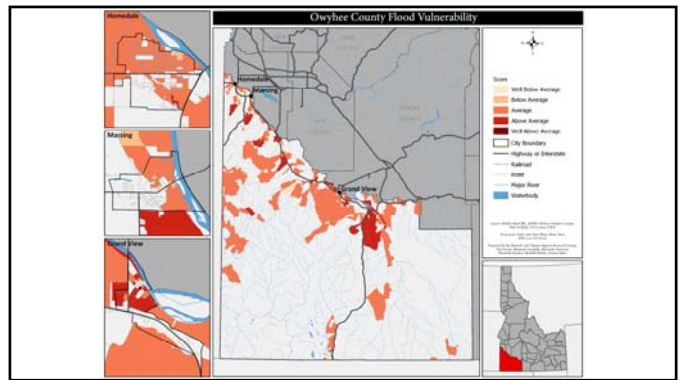
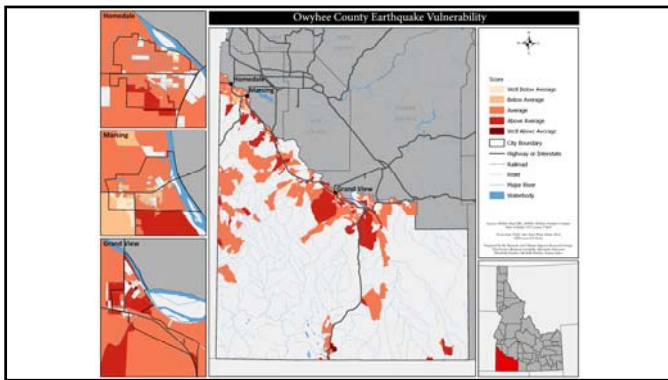
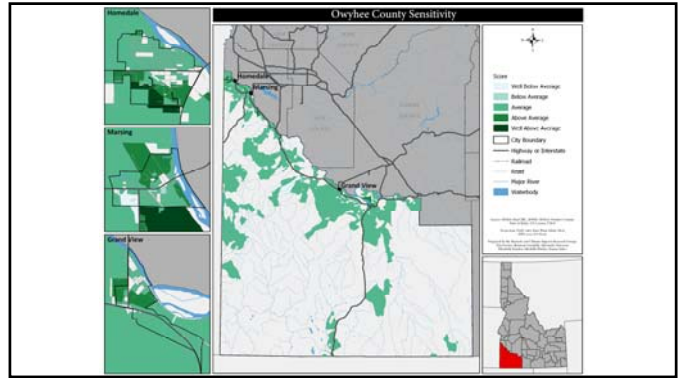
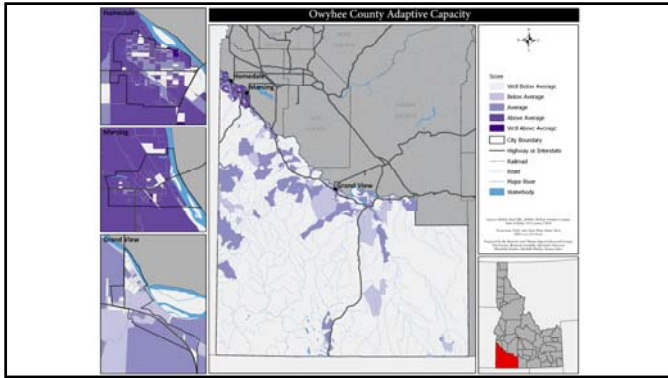
Adaptive Capacity	Sensitivity
No High School Diploma	Pop Female
College	Pop Below Poverty
Age Dependent	Race White
Owner Occupied Households	Race Minority
Female Head of Households	Disability
Not Single Sector Employment	Age Dependent
Sales Volume	Renter Occupied Households
Employee Number	Female Head of Households
Pop Below Pov	Critical Facilities
Health Insurance	Essential Facilities
Labor Force	Dependent Population Locations
Female Employees	Public Venues
Critical Facilities	Overnight Venues
Essential Facilities	Sales Volume
	Employee Number

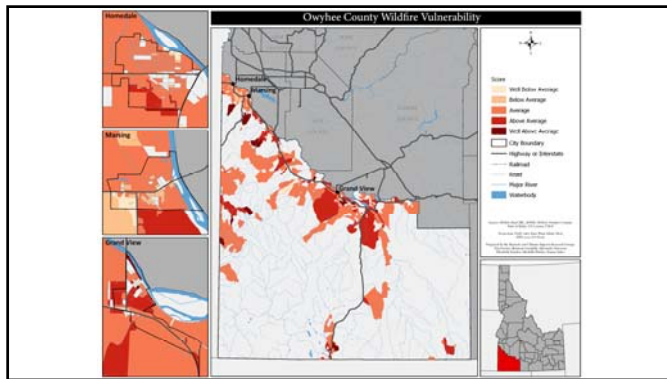
Intro Plans Process Risk Conclusion

Socioeconomic Vulnerability



Intro Plans Process Risk Conclusion





Hazard Mitigation Plan Process

- Reviewed 48 actions.
 - 8 completed
 - 36 in progress or ongoing
 - 4 pending review.
- Highlights:
 - Incorporation of the HMP into the comprehensive plan.
 - Replaced 3rd St Bridge in Silver City.
 - Developed public education programs on hazard mitigation.
 - Assessed and hardwired of shelters for use with a portable generator.

Intro Plans **Process** Risk Conclusion

Proposed Mitigation

- Wildfire fuels reduction and defensible space.
- Continued and additional hazard and mitigation awareness programs.
- Improve roads and bridges around Tarbridge Rivers and East Fork of the Bruneau.
- Designate community shelters for severe storm events.
- Assess communication system redundancy.
- Reduce fir and juniper near Silver City and encourage aspen growth.
- Bury propane tanks at Idaho Hotel and Drug Store in Silver City.
- Assess drought-affected timber ignition risk.
- Develop ingress and egress plans for county and Silver City.
- Assess power hookup and generator for Three Creek well.

Intro Plans Process **Risk** Conclusion

Conclusion

- First draft uploaded online at <http://hazcirc.org/hazard-mitigation-plans/owyhee-county>
- Second draft will incorporate comments, more detailed profiles, risk rankings, and mitigation prioritization.
- Comments and inquiries can be emailed to alexander@hazcirc.org

Intro Plans Process Risk **Conclusion**

Conclusion

- Open discussion on risk and mitigation:
 - What community assets are most important to you?
 - Where do you see the highest risk?
 - What do you want to see protected?
 - Where do you think mitigation should occur?

Intro Plans Process Risk **Conclusion**

APPENDIX D. DISASTER DECLARATIONS

This appendix contains the disaster declarations for the county.

Contents

1. 2006 Federal Disaster Declaration
2. 2003 Idaho Department of Water Resources Drought Declaration
3. 2007 Idaho Department of Water Resources Drought Declaration
4. 2012 Idaho Department of Water Resources Drought Declaration

DECLARED FEBRUARY 27, 2006

SUMMARY

In the event of a declaration, the following information applies:

STATE: Idaho
NUMBER: FEMA-1630-DR
INCIDENT: Severe Storms and Flooding
INCIDENT PERIOD: December 30, 2005, through and including January 4, 2006
DATE REQUESTED BY GOVERNOR: January 24, 2006
FEDERAL COORDINATING OFFICER: Dennis Hunsinger

DESIGNATIONS AND TYPES OF ASSISTANCE:

INDIVIDUAL ASSISTANCE (Assistance to individuals and households):

None.

PUBLIC ASSISTANCE (Assistance to State and local governments and certain private nonprofit organizations for emergency work and the repair or replacement of disaster-damaged facilities):

Owyhee County.

HAZARD MITIGATION GRANT PROGRAM (Assistance to State and local governments and certain private nonprofit organizations for actions taken to prevent or reduce long term risk to life and property from natural hazards):

All counties in the State of Idaho are eligible to apply for assistance under the Hazard Mitigation Grant Program.

OTHER: Additional designations may be made at a later date after further evaluation.

THE WHITE HOUSE
WASHINGTON

February 27, 2006

The Honorable R. David Paulison
Acting Director
Federal Emergency Management Agency
Washington, D.C. 20472

Dear Mr. Paulison:

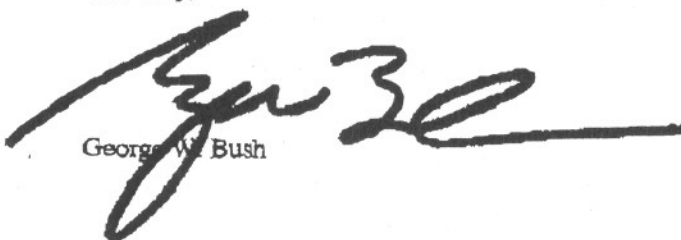
I have determined that the damage in certain areas of the State of Idaho resulting from severe storms and flooding from December 30, 2005, through and including January 4, 2006, is of sufficient severity and magnitude to warrant a major disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (the Stafford Act). Therefore, I declare that such a major disaster exists in the State of Idaho.

In order to provide Federal assistance, you are hereby authorized to allocate from funds available for these purposes such amounts as you find necessary for Federal disaster assistance and administrative expenses.

You are authorized to provide Public Assistance in the designated areas and Hazard Mitigation throughout the State, and any other forms of assistance under the Stafford Act you may deem appropriate. Consistent with the requirement that Federal assistance be supplemental, any Federal funds provided under the Stafford Act for Public Assistance and Hazard Mitigation will be limited to 75 percent of the total eligible costs. If Other Needs Assistance under Section 408 of the Stafford Act is later requested and warranted, Federal funding under that program will also be limited to 75 percent of the total eligible costs.

Further, you are authorized to make changes to this declaration to the extent allowable under the Stafford Act.

Sincerely,



George W. Bush

02/27/2006 02:19PM

THE WHITE HOUSE
WASHINGTON

February 27, 2006

The Honorable Dirk Kempthorne
Governor of Idaho
State Capitol
Boise, Idaho 83720

Dear Governor Kempthorne:

I have declared a major disaster under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (the Stafford Act), for the State of Idaho due to damage resulting from severe storms and flooding from December 30, 2005, through and including January 4, 2006. I have authorized Federal relief and recovery assistance in the affected area.

Public Assistance and Hazard Mitigation will be provided. Consistent with the requirement that Federal assistance be supplemental, any Federal funds provided under the Stafford Act for Public Assistance and Hazard Mitigation will be limited to 75 percent of the total eligible costs in the designated areas.

The Department of Homeland Security, Federal Emergency Management Agency (FEMA), will coordinate Federal assistance efforts and designate specific areas eligible for such assistance. The Federal Coordinating Officer will be Mr. Dennis Hunsinger of FEMA. He will consult with you and assist in the execution of the FEMA-State Agreement for disaster assistance governing the expenditure of Federal funds.

Sincerely,



George W. Bush

02/27/2006 02:19PM

**BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO**

IN THE MATTER OF A DECLARATION)
OF DROUGHT EMERGENCY FOR)
OWYHEE COUNTY)
_____)

**ORDER DECLARING
DROUGHT EMERGENCY**

WHEREAS, Owyhee County is one of the most drought affected areas in Idaho and is experiencing severely restricted water supplies available for the current irrigation season, as demonstrated by forecast inflow to Owyhee Reservoir at 30 per cent of average; and

WHEREAS, the Owyhee County Commissioners have requested declaration of a drought emergency to allow administrative actions to lessen the severe impacts of the drought conditions in the county; and

WHEREAS, section 42-222A, Idaho Code, provides that upon declaration of a drought emergency for an area designated by the Director of the Department of Water Resources ("Director") and approved by the Governor, the Director is authorized to allow temporary changes in the point of diversion, the place of use, and the purpose of use for valid existing water rights and temporary exchanges of water rights when the Director determines that such changes can be accomplished in accordance with the provisions of section 42-222A, Idaho Code; and

NOW, THEREFORE, IT IS HEREBY ORDERED that pursuant to the authority of the Director provided in section 42-222A, Idaho Code, a drought emergency for purposes of section 42-222A, Idaho Code, is hereby declared for Owyhee County, Idaho.


IT IS FURTHER HEREBY ORDERED that pursuant to this declared drought emergency and the provisions of section 42-222A, Idaho Code, the following procedures and requirements shall apply to the filing, processing, and approval of any application for a temporary change to an existing water right within Owyhee County during the pendency of this declared drought emergency:

1. An application for a temporary change to an existing water right shall be made upon forms provided by the department and shall be accompanied by an application fee of fifty dollars (\$50.00) per application.

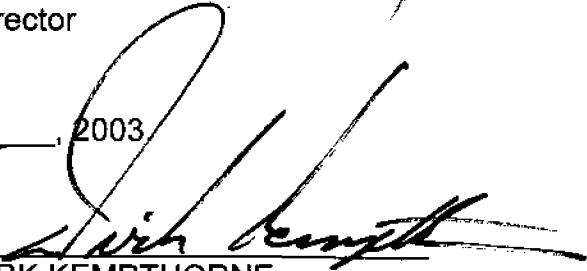
2. The Director is not required to publish notice of the proposed change pursuant to the provisions of section 42-211, 42-222(1) or 42-240, Idaho Code, and is not required to make findings as provided in said sections. A temporary change may be approved upon completion of the application form, payment of the filing fee, and a determination by the Director that the proposed change can be properly administered and there is no information that the change will injure any other water right. If the right to be changed is administered by a watermaster within a water district, the Director shall obtain and consider the recommendations of the watermaster before approving the temporary change application.
3. All temporary changes approved pursuant to the provisions of this order shall expire on the date shown in the approval which shall not be later than December 31, 2003, and thereafter, the water right shall revert to the point of diversion and place of use existing prior to the temporary change. Nothing herein shall be construed as approval to authorize construction of a new well as a new point of diversion or to alter a stream channel.
4. The recipient of an approved temporary change issued pursuant to this order shall assume all risk of curtailment or mitigation should the diversion and use of water under the temporary change cause injury to other water rights or result in an enlargement in use of the original right.
5. Temporary changes shall only be approved for the purpose of providing a replacement water supply to lands or other uses that normally have a full water supply, except for the drought condition. Temporary changes may not be approved to provide water for new development or to allow expansion of the use of water under existing water rights. If the right to use the water is represented by shares of stock in a corporation, or if the diversion works or delivery system for such right is owned or managed by an irrigation district, no change in point of diversion, place or nature of use of such water shall be made or allowed without the written consent of such corporation or irrigation district.
6. Any applicant for a temporary change who is aggrieved by a denial of the Director for a temporary change pursuant to this order and the provisions of section 42-222A, Idaho Code, may request a hearing pursuant to section 42-1701A(3), Idaho Code, and may seek judicial review of the final order of the Director pursuant to the provisions of section 42-1701A(4), Idaho Code.

IT IS FURTHER HEREBY ORDERED that this order is effective upon approval of the Governor and expires on December 31, 2003, unless extended or terminated by order of the Director.

DATED this 23rd day of June, 2003.


for KARL J. DREHER
Director

APPROVED this 24 day of June, 2003.


DIRK KEMPTHORNE
Governor

**BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO**

IN THE MATTER OF A DECLARATION)
OF DROUGHT EMERGENCY FOR)
OWYHEE COUNTY)
_____)

**ORDER DECLARING
DROUGHT EMERGENCY**

WHEREAS, the Owyhee County Board of Commissioners requested that the Director of the Idaho Department of Water Resources and the Governor declare a drought emergency for Owyhee County to allow administrative actions to lessen the severe impacts of the drought conditions in the county; and

WHEREAS, the county's accumulated precipitation at the Mud Flat Snotel site for the water year 2007 shows precipitation is currently about 5 inches below normal, with very little precipitation in the last three months; and

WHEREAS, the below normal precipitation coupled with the hottest July on record has led to extremely dry conditions for rangeland vegetation, reducing forage for livestock and making fire dangers extremely high; and

WHEREAS, water sources for livestock have dried up, and will continue to do so, forcing individuals to haul water or move their animals off of allotments early; and

WHEREAS, the Owyhee Reservoir is a major source of water supply for the county. The June through September inflows for the Owyhee Reservoir are forecasted to be less than 30 percent of average, the inflows coupled with storage available on June 1, yield a total water supply that is below normal; and

WHEREAS, section 42-222A, Idaho Code, provides that upon declaration of a drought emergency for an area designated by the Director of the Department of Water Resources ("Director") and approved by the Governor, the Director is authorized to allow temporary changes in the point of diversion, the place of use, and the purpose of use for valid existing water rights and temporary exchanges of water rights when the Director determines that such changes can be accomplished in accordance with the provisions of section 42-222A, Idaho Code; and

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3. All temporary changes approved pursuant to the provisions of this order shall expire on the date shown in the approval which shall not be later than December 31, 2007, and thereafter, the water right shall revert to the point of diversion and place of use existing prior to the temporary change. Nothing herein shall be construed as approval to authorize construction of a new well as a new point of diversion or to alter a stream channel.
4. The recipient of an approved temporary change issued pursuant to this order shall assume all risk of curtailment or mitigation should the diversion and use of water under the temporary change cause injury to other water rights or result in an enlargement in use of the original right.
5. Temporary changes shall only be approved for the purpose of providing a replacement water supply to lands or other uses that normally have a full water supply, except for the drought condition. Temporary changes may not be approved to provide water for new development or to allow expansion of the use of water under existing water rights. If the right to use the water is represented by shares of stock in a corporation, or if the diversion works or delivery system for such right is owned or managed by an irrigation district, no change in point of diversion, place or nature of use of such water shall be made or allowed without the written consent of such corporation or irrigation district.

6. Any applicant for a temporary change who is aggrieved by a denial of the Director for a temporary change pursuant to this order and the provisions of section 42-222A, Idaho Code, may request a hearing pursuant to section 42-1701A(3), Idaho Code, and may seek judicial review of the final order of the Director pursuant to the provisions of section 42-1701A(4), Idaho Code.

IT IS FURTHER HEREBY ORDERED that this order is effective upon approval of the Governor and expires on December 31, 2007, unless extended or terminated by order of the Director

DATED this 9th day of August, 2007.


for : DAVID R. TUTHILL, JR.
Director

APPROVED this 13th day of August, 2007.


C.L. "BUTCH" OTTER
Governor

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF A DECLARATION)	
OF DROUGHT EMERGENCY FOR)	ORDER DECLARING
OWYHEE COUNTY)	DROUGHT EMERGENCY
_____)	

WHEREAS, the Board of County Commissioners for Owyhee County has requested that the Governor and the Director of the Idaho Department of Water Resources declare a drought emergency for Owyhee County to allow administrative actions to lessen the impacts of drought conditions in the county; and

WHEREAS, Owyhee County is located within the Owyhee and Bruneau River basins;
and

WHEREAS, the United States Drought Monitor Index places Owyhee County in the category of moderate drought; and

WHEREAS, drainages in and around Owyhee County are experiencing abnormally dry conditions with the year's snow water and precipitation levels being below normal. Specifically, snow water content for the Owyhee basin peaked at 61 percent of average and snow melted out more than a month earlier than normal. Current year to date precipitation in the basin is 78 percent of average. Snow water content in the Bruneau basin peaked at 71 percent of average and melted out a month earlier than normal. Total accumulated year to date precipitation for the Bruneau basin is 77 percent of average. Additionally, stream flows within the county are below normal and have been below normal since April; and

WHEREAS, section 42-222A, Idaho Code, provides that upon declaration of a drought emergency for an area designated by the Director of the Department of Water Resources ("Director") and approved by the Governor, the Director is authorized to allow temporary changes in the point of diversion, the place of use, and the purpose of use for valid existing water rights and temporary exchanges of water rights when the Director determines that such changes can be accomplished in accordance with the provisions of section 42-222A, Idaho Code; and

NOW, THEREFORE, IT IS HEREBY ORDERED that pursuant to the authority of the Director provided in section 42-222A, Idaho Code, a drought emergency for purposes of section 42-222A, Idaho Code, is hereby declared for Owyhee County, Idaho.

IT IS FURTHER HEREBY ORDERED that pursuant to this declared drought emergency and the provisions of section 42-222A, Idaho Code, the following procedures and requirements shall apply to the filing, processing, and approval of any application for a temporary change to an

existing water right within Owyhee County during the pendency of this declared drought emergency:

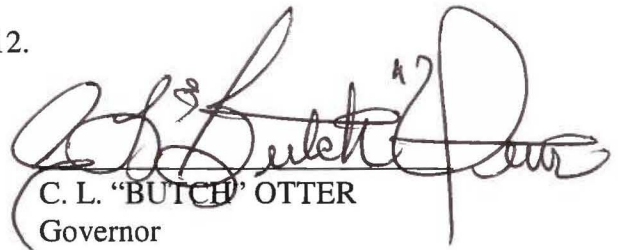
1. An application for a temporary change to an existing water right shall be made upon forms provided by the department and shall be accompanied by an application fee of fifty dollars (\$50.00) per application.
2. The Director is not required to publish notice of the proposed change pursuant to the provisions of section 42-211, 42-222(1) or 42-240, Idaho Code, and is not required to make findings as provided in said sections. A temporary change may be approved upon completion of the application form, payment of the filing fee, and a determination by the Director that the proposed change can be properly administered and there is no information that the change will injure any other water right. If the right to be changed is administered by a watermaster within a water district, the Director shall obtain and consider the recommendations of the watermaster before approving the temporary change application.
3. All temporary changes approved pursuant to the provisions of this order shall expire on the date shown in the approval which shall not be later than December 31, 2012, and thereafter, the water right shall revert to the point of diversion and place of use existing prior to the temporary change. Nothing herein shall be construed as approval to authorize construction of a new well as a new point of diversion or to alter a stream channel.
4. The recipient of an approved temporary change issued pursuant to this order shall assume all risk of curtailment or mitigation should the diversion and use of water under the temporary change cause injury to other water rights or result in an enlargement in use of the original right.
5. Temporary changes shall only be approved for the purpose of providing a replacement water supply to lands or other uses that normally have a full water supply, except for the drought condition. Temporary changes may not be approved to provide water for new development or to allow expansion of the use of water under existing water rights. If the right to use the water is represented by shares of stock in a corporation, or if the diversion works or delivery system for such right is owned or managed by an irrigation district, no change in point of diversion, place or nature of use of such water shall be made or allowed without the written consent of such corporation or irrigation district.
6. Any applicant for a temporary change who is aggrieved by a denial of the Director for a temporary change pursuant to this order and the provisions of section 42-222A, Idaho Code, may request a hearing pursuant to section 42-1701A(3), Idaho Code, and may seek judicial review of the final order of the Director pursuant to the provisions of section 42-1701A(4), Idaho Code.

IT IS FURTHER HEREBY ORDERED that this order is effective upon approval of the Governor and expires on December 31, 2012, unless extended or terminated by order of the Director.

DATED this 10th day of September, 2012.


GARY SPACKMAN
Interim Director

APPROVED this 11th day of September, 2012.


C. L. "BUTCH" OTTER
Governor



State of Idaho

DEPARTMENT OF WATER RESOURCES

322 East Front Street, P.O. Box 83720, Boise, Idaho 83720-0098

Phone: (208) 287-4800 FAX: (208) 287-6700 www.idwr.idaho.gov

MEMO

To: Jeff Peppersack

From: Liz Cresto *LC*

Date: September 6, 2012

Subject: Hydrologic Data for Owyhee County

According to the USDA Drought Monitor, Owyhee County is experiencing moderate drought conditions. Figure 1 below shows Owyhee County classified as D1 or a moderate drought.

Owyhee County encompasses parts of both the Owyhee and Bruneau Basins. There are seven SNOTEL stations within the Owyhee Basin that measures the snowpack. Figure 2 below illustrates that the Snow Water Equivalent¹ in the Owyhee Basin peaked at 61% of average. In addition the snow melted over a month earlier than normal. The current year to date precipitation within the basin is 78% of average. There are five SNOTEL sites within the Bruneau Basin. Figure 3 below illustrates that the snowpack peaked at 71% of average and melted out a month earlier than normal. Total accumulated precipitation within the Bruneau Basin is currently at 77% of average.

Current stream flows within the county are below normal and have been below normal since April. As illustrated by figure 4, the flows on the Bruneau River near Hot Spring, ID are below the median. Likewise the current flows on the Owyhee River are below the median flow and have been since April (figure 5).

¹ The Snow Water Equivalent percent of average represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day.

U.S. Drought Monitor

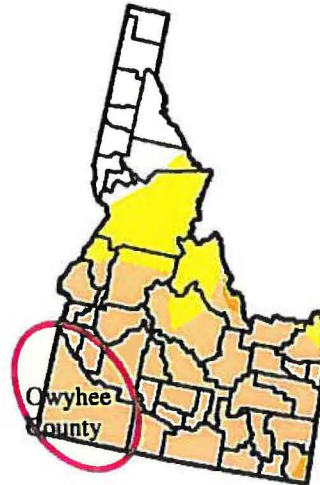
Idaho

September 4, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	15.72	84.28	66.17	1.33	0.00	0.00
Last Week (08/28/2012 map)	15.69	84.31	66.10	1.20	0.00	0.00
3 Months Ago (06/05/2012 map)	89.57	10.43	0.01	0.00	0.00	0.00
Start of Calendar Year (12/27/2011 map)	48.80	51.10	0.00	0.00	0.00	0.00
Start of Water Year (09/27/2011 map)	86.56	13.44	0.00	0.00	0.00	0.00
One Year Ago (08/30/2011 map)	100.00	0.00	0.00	0.00	0.00	0.00

Intensity:

D0 Abnormally Dry
 D1 Drought - Moderate
 D2 Drought - Severe
 D3 Drought - Extreme
 D4 Drought - Exceptional



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://droughtmonitor.unl.edu>



Released Thursday, September 6, 2012
Brian Fuchs, National Drought Mitigation Center

Figure 1: USDA Drought Monitor, September 4, 2012.

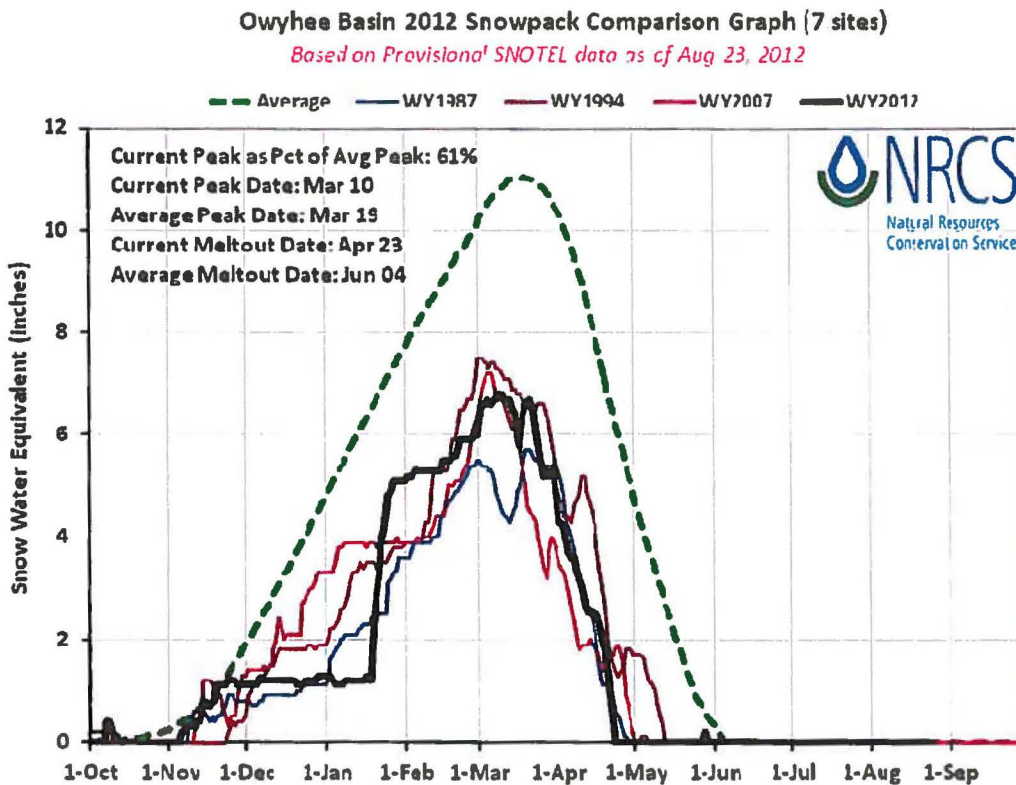


Figure 2: A compilation of seven SNOTEL sites within the Owyhee Basin for water year 2012.

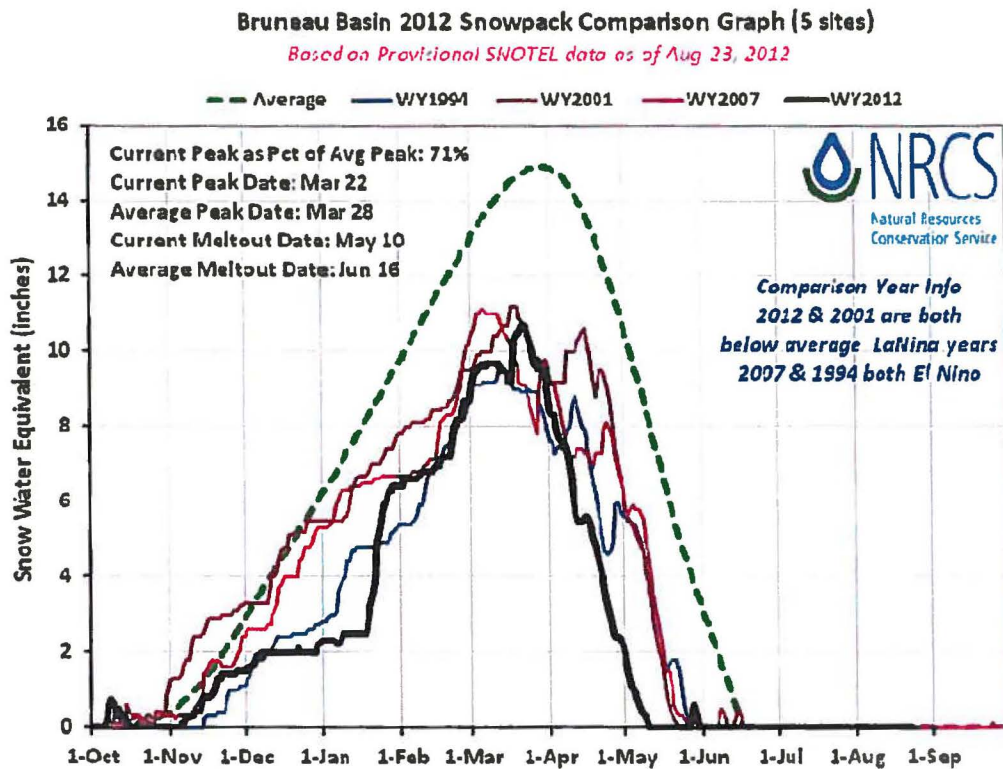


Figure 3: A compilation of five SNOTEL sites within the Bruneau Basin for water year 2012.

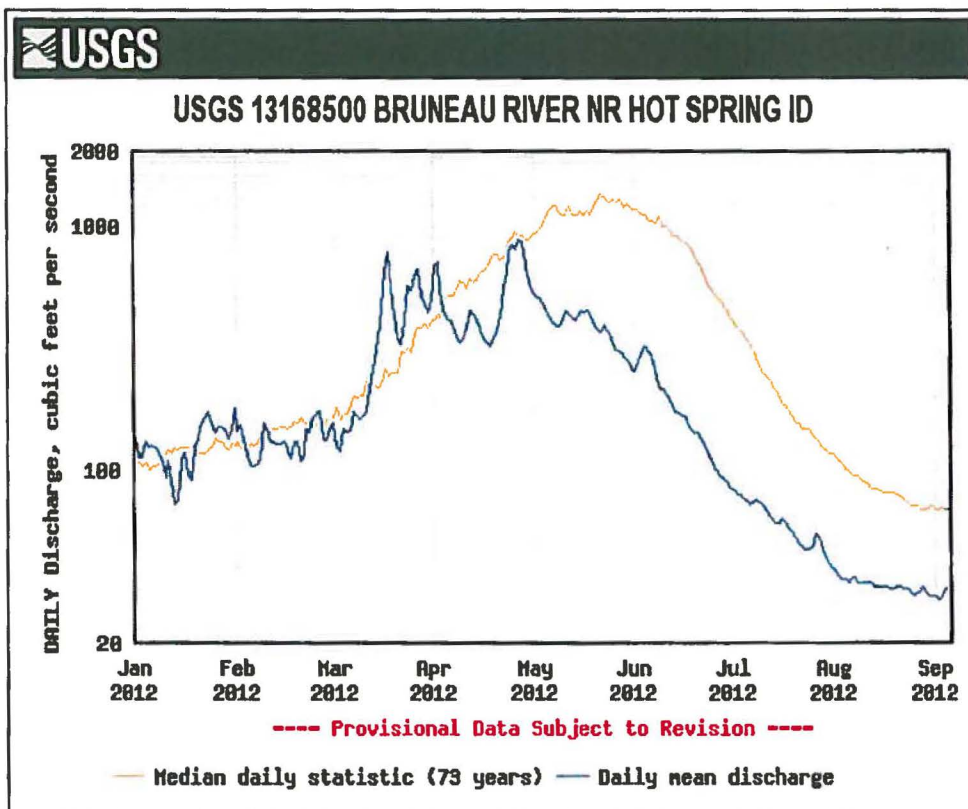


Figure 4: Discharge Bruneau River near Hot Spring, ID, 2012.

USGS 13181000 OWYHEE RIVER NR ROME OR

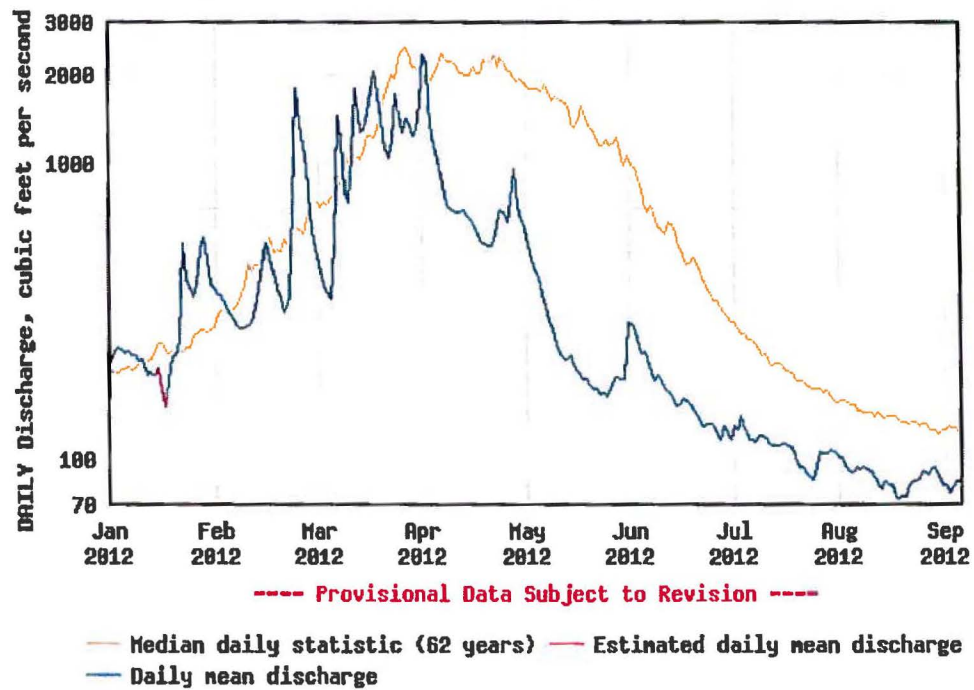


Figure 5: Discharge Owyhee River near Rome, OR, 2012.

APPENDIX E. HAZUS-MH SUMMARY REPORTS

This appendix contains the summary reports generated by Hazus-MH. A total of seven Hazus-MH loss estimates were conducted for the 2016 plan update.

Contents:

1. FEMA non-regulatory 100-year flood event
2. FEMA non-regulatory 500-year flood event
3. HazCIRC-produced 6,800 cfs flood event
4. HazCIRC-produced 44,000 cfs flood event
5. HazCIRC-produced 47,300 cfs flood event
6. HazCIRC-produced combined cfs flood event
7. Probabilistic 7.0 magnitude earthquake

Hazus-MH: Flood Event Report

Region Name: OwyheeCountyFL

Flood Scenario: Owyhee County 100 Year Flood Event AAL

Print Date: Monday, April 18, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	393,812	79.3%
Commercial	53,499	10.8%
Industrial	8,175	1.6%
Agricultural	12,901	2.6%
Religion	8,808	1.8%
Government	3,986	0.8%
Education	15,467	3.1%
Total	496,648	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCountyFL
Scenario Name:	Owyhee County 100 Year Flood Event AAL
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 344 buildings will be at least moderately damaged. This is over 24% of the total number of buildings in the scenario. There are an estimated 182 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	5	83.33	0	0.00	0	0.00	0	0.00	1	16.67
Education	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
Government	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00
Religion	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	3	0.90	44	13.13	29	8.66	45	13.43	35	10.45	179	53.43
Total	4		52		29		45		36		182	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	51	100.00
Masonry	0	0.00	3	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	3	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	3	1.06	44	15.55	29	10.25	45	15.90	34	12.01	128	45.23

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	1	0	1
Hospitals	0	0	0	0
Police Stations	2	1	0	1
Schools	10	2	0	3

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 26,687 tons of debris will be generated. Of the total amount, Finishes comprises 29% of the total, Structure comprises 33% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 1,067 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,020 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,447 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 164.29 million dollars, which represents 33.08 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 163.85 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 64.07% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	69.64	8.64	2.33	5.99	86.60
	Content	35.55	21.10	5.23	13.69	75.57
	Inventory	0.00	0.61	0.65	0.42	1.67
	Subtotal	105.19	30.34	8.21	20.10	163.85
<u>Business Interruption</u>						
	Income	0.00	0.07	0.00	0.02	0.10
	Relocation	0.04	0.00	0.00	0.01	0.06
	Rental Income	0.01	0.00	0.00	0.00	0.01
	Wage	0.01	0.09	0.00	0.18	0.28
	Subtotal	0.06	0.17	0.00	0.22	0.45
ALL	Total	105.26	30.52	8.21	20.31	164.29

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Flood Event Report

Region Name: OwyheeCountyFL

Flood Scenario: Owyhee County 500 Year Flood Event AAL

Print Date: Monday, April 18, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	400,966	79.0%
Commercial	54,668	10.8%
Industrial	8,250	1.6%
Agricultural	13,096	2.6%
Religion	10,286	2.0%
Government	3,997	0.8%
Education	16,038	3.2%
Total	507,301	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCountyFL
Scenario Name:	Owyhee County 500 Year Flood Event AAL
Return Period Analyzed:	500
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 440 buildings will be at least moderately damaged. This is over 15% of the total number of buildings in the scenario. There are an estimated 305 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00
Commercial	0	0.00	1	12.50	4	50.00	0	0.00	0	0.00	3	37.50
Education	1	33.33	1	33.33	0	0.00	0	0.00	0	0.00	1	33.33
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	5	1.16	21	4.88	31	7.21	28	6.51	47	10.93	298	69.30
Total	6		25		35		28		47		305	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	1	33.33	1	33.33	0	0.00	0	0.00	1	33.33
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	66	100.00
Masonry	0	0.00	2	50.00	1	25.00	0	0.00	0	0.00	1	25.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Wood	5	1.38	21	5.79	31	8.54	28	7.71	47	12.95	231	63.64

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	1	0	1
Hospitals	0	0	0	0
Police Stations	2	1	0	1
Schools	10	2	1	3

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 34,221 tons of debris will be generated. Of the total amount, Finishes comprises 28% of the total, Structure comprises 34% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 1,369 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1,171 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1,710 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 208.14 million dollars, which represents 41.03 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 207.61 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 66.30% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	91.25	10.83	2.72	7.23	112.03
	Content	46.66	25.00	5.99	16.04	93.68
	Inventory	0.00	0.73	0.73	0.44	1.90
	Subtotal	137.91	36.56	9.43	23.71	207.61
<u>Business Interruption</u>						
	Income	0.00	0.08	0.00	0.03	0.11
	Relocation	0.06	0.01	0.00	0.01	0.08
	Rental Income	0.01	0.00	0.00	0.00	0.01
	Wage	0.02	0.10	0.00	0.20	0.32
	Subtotal	0.09	0.19	0.00	0.25	0.53
ALL	Total	138.00	36.76	9.43	23.96	208.14

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Flood Event Report

Region Name: OwyheeCnty_FL

Flood Scenario: Owyhee County Flood Event 6860 cfs Brun

Print Date: Tuesday, July 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	11,427	66.7%
Commercial	1,610	9.4%
Industrial	0	0.0%
Agricultural	619	3.6%
Religion	0	0.0%
Government	860	5.0%
Education	2,625	15.3%
Total	17,141	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCnty_FL
Scenario Name:	Owyhee County Flood Event 6860 cfs Brun
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	0		0		0		0		0		0	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 57 tons of debris will be generated. Of the total amount, Finishes comprises 44% of the total, Structure comprises 18% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 5 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 1 person (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 0.39 million dollars, which represents 2.29 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.39 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 50.64% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	0.14	0.02	0.00	0.02	0.17
	Content	0.06	0.07	0.00	0.09	0.22
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.20	0.09	0.00	0.11	0.39
<u>Business Interruption</u>						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00
ALL	Total	0.20	0.09	0.00	0.11	0.39

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Flood Event Report

Region Name: OwyheeCnty_FL

Flood Scenario: Owyhee County Flood Event 44,000 cfs Sn

Print Date: Monday, July 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	3,733	100.0%
Commercial	0	0.0%
Industrial	0	0.0%
Agricultural	0	0.0%
Religion	0	0.0%
Government	0	0.0%
Education	0	0.0%
Total	3,733	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCnty_FL
Scenario Name:	Owyhee County Flood Event 44,000 cfs Sn
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 0 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the scenario. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	0		0		0		0		0		0	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 17 tons of debris will be generated. Of the total amount, Finishes comprises 34% of the total, Structure comprises 22% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 1 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 1 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 0 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 0.04 million dollars, which represents 1.15 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 0.04 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 100.00% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	0.03	0.00	0.00	0.00	0.03
	Content	0.01	0.00	0.00	0.00	0.01
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.04	0.00	0.00	0.00	0.04
<u>Business Interruption</u>						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.00	0.00	0.00	0.00	0.00
<u>ALL</u>	Total	0.04	0.00	0.00	0.00	0.04

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Flood Event Report

Region Name: OwyheeCnty_FL

Flood Scenario: Owyhee County Flood Event 47,300 cfs Sn

Print Date: Monday, July 11, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	133,049	85.7%
Commercial	10,622	6.8%
Industrial	3,297	2.1%
Agricultural	2,668	1.7%
Religion	71	0.0%
Government	2,262	1.5%
Education	3,194	2.1%
Total	155,163	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCnty_FL
Scenario Name:	Owyhee County Flood Event 47,300 cfs Sn
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 26 buildings will be at least moderately damaged. This is over 47% of the total number of buildings in the scenario. There are an estimated 11 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	3	11.11	6	22.22	3	11.11	3	11.11	1	3.70	11	40.74
Total	3		8		3		3		1		11	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	6	100.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2	10.00	6	30.00	3	15.00	3	15.00	1	5.00	5	25.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,090 tons of debris will be generated. Of the total amount, Finishes comprises 37% of the total, Structure comprises 27% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 124 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 166 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 150 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 25.37 million dollars, which represents 16.35 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.27 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 52.53% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	8.89	1.37	0.39	0.77	11.42
	Content	4.43	4.67	0.94	3.38	13.41
	Inventory	0.00	0.16	0.11	0.17	0.44
	Subtotal	13.32	6.19	1.44	4.32	25.27
<u>Business Interruption</u>						
	Income	0.00	0.01	0.00	0.01	0.02
	Relocation	0.01	0.00	0.00	0.00	0.01
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.02	0.00	0.05	0.07
	Subtotal	0.01	0.04	0.00	0.06	0.10
ALL	Total	13.33	6.23	1.44	4.38	25.37

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Flood Event Report

Region Name: OwyheeCnty_FL

Flood Scenario: Owyhee County Flood Event Combined cfs

Print Date: Tuesday, July 12, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Flood. These results can be improved by using enhanced inventory data and flood hazard information.

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General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region .

The geographical size of the region is 7,697 square miles and contains 4,122 census blocks. The region contains over 4 thousand households and has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 4,916 buildings in the region with a total building replacement value (excluding contents) of 795 million dollars (2010 dollars). Approximately 93.84% of the buildings (and 81.73% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 4,916 buildings in the region which have an aggregate total replacement value of 795 million (2010 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	650,109	81.7%
Commercial	70,210	8.8%
Industrial	15,971	2.0%
Agricultural	21,665	2.7%
Religion	14,311	1.8%
Government	6,385	0.8%
Education	16,817	2.1%
Total	795,468	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	148,209	84.2%
Commercial	12,232	6.9%
Industrial	3,297	1.9%
Agricultural	3,287	1.9%
Religion	71	0.0%
Government	3,122	1.8%
Education	5,819	3.3%
Total	176,037	100.00%

Essential Facility Inventory

For essential facilities, there are no hospitals in the region with a total bed capacity of no beds. There are 10 schools, 3 fire stations, 2 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	OwyheeCnty_FL
Scenario Name:	Owyhee County Flood Event Combined cfs
Return Period Analyzed:	Mix0
Analysis Options Analyzed:	No What-Ifs

General Building Stock Damage

Hazus estimates that about 26 buildings will be at least moderately damaged. This is over 47% of the total number of buildings in the scenario. There are an estimated 11 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus Flood Technical Manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	3	11.11	6	22.22	3	11.11	3	11.11	1	3.70	11	40.74
Total	3		8		3		3		1		11	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	6	100.00
Masonry	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	2	10.00	6	30.00	3	15.00	3	15.00	1	5.00	5	25.00

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 0 hospital beds available for use. On the day of the scenario flood event, the model estimates that 0 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	3	0	0	0
Hospitals	0	0	0	0
Police Stations	2	0	0	0
Schools	10	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 3,164 tons of debris will be generated. Of the total amount, Finishes comprises 37% of the total, Structure comprises 27% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 127 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 173 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 151 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 25.80 million dollars, which represents 14.66 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 25.70 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 52.59% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	9.06	1.38	0.39	0.79	11.62
	Content	4.50	4.73	0.94	3.47	13.64
	Inventory	0.00	0.16	0.11	0.17	0.45
	Subtotal	13.56	6.28	1.44	4.43	25.70
<u>Business Interruption</u>						
	Income	0.00	0.01	0.00	0.01	0.02
	Relocation	0.01	0.00	0.00	0.00	0.01
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.02	0.00	0.05	0.07
	Subtotal	0.01	0.04	0.00	0.06	0.10
ALL	Total	13.57	6.31	1.44	4.48	25.80

Appendix A: County Listing for the Region

Idaho

- Owyhee

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Idaho				
Owyhee	11,526	650,109	145,359	795,468
Total	11,526	650,109	145,359	795,468
Total Study Region	11,526	650,109	145,359	795,468

Hazus-MH: Earthquake Event Report

Region Name: OwyheeCountyEQ

Earthquake Scenario: Owyhee County 1000 year Probabilistic 7

Print Date: April 18, 2016

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Idaho

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 7,694.63 square miles and contains 3 census tracts. There are over 4 thousand households in the region which has a total population of 11,526 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 4 thousand buildings in the region with a total building replacement value (excluding contents) of 795 (millions of dollars). Approximately 94.00 % of the buildings (and 82.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,868 and 134 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 4 thousand buildings in the region which have an aggregate total replacement value of 795 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 67% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 10 schools, 3 fire stations, 2 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 124 dams identified within the region. Of these, 40 of the dams are classified as 'high hazard'. The inventory also includes 10 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 2,002.00 (millions of dollars). This inventory includes over 349 kilometers of highways, 36 bridges, 957 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	36	150.60
	Segments	22	1,717.60
	Tunnels	0	0.00
	Subtotal		1,868.20
Railways	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
	Subtotal		0.00
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
	Subtotal		0.00
Bus	Facilities	0	0.00
	Subtotal		0.00
Ferry	Facilities	0	0.00
	Subtotal		0.00
Port	Facilities	0	0.00
	Subtotal		0.00
Airport	Facilities	1	0.00
	Runways	6	0.10
	Subtotal		0.10
		Total	1,868.30

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	9.60
	Facilities	0	0.00
	Pipelines	0	0.00
	Subtotal		9.60
Waste Water	Distribution Lines	NA	5.70
	Facilities	2	133.20
	Pipelines	0	0.00
	Subtotal		138.90
Natural Gas	Distribution Lines	NA	3.80
	Facilities	1	1.10
	Pipelines	0	0.00
	Subtotal		4.90
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
	Subtotal		0.00
Electrical Power	Facilities	1	0.00
	Subtotal		0.00
Communication	Facilities	2	0.20
	Subtotal		0.20
		Total	153.60

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Owyhee County 1000 year Probabilistic 7
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	1,000.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	7.00
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 117 buildings will be at least moderately damaged. This is over 2.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	31	0.70	2	0.58	1	0.70	0	1.35	0	1.26
Commercial	165	3.68	11	3.34	5	4.28	1	8.08	0	9.61
Education	18	0.39	1	0.28	0	0.34	0	0.55	0	0.65
Government	8	0.19	0	0.13	0	0.15	0	0.23	0	0.22
Industrial	32	0.72	2	0.73	1	1.11	0	2.20	0	2.26
Other Residential	1,054	23.51	129	40.85	69	63.74	6	61.26	0	47.82
Religion	22	0.49	1	0.43	1	0.55	0	0.95	0	1.41
Single Family	3,151	70.31	170	53.66	32	29.13	2	25.39	0	36.77
Total	4,481		317		108		9		0	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	3,102	69.21	169	53.23	28	26.15	2	18.14	0	31.74
Steel	69	1.53	5	1.48	2	2.21	0	3.94	0	6.06
Concrete	54	1.21	3	1.01	1	1.16	0	1.76	0	0.59
Precast	31	0.69	2	0.66	1	1.37	0	3.43	0	2.39
RM	188	4.19	7	2.33	5	4.68	1	10.36	0	1.50
URM	46	1.03	5	1.53	2	1.47	0	2.08	0	11.07
MH	992	22.14	126	39.76	68	62.97	6	60.28	0	46.64
Total	4,481		317		108		9		0	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	10	0	0	10
EOCs	0	0	0	0
PoliceStations	2	0	0	2
FireStations	3	0	0	3

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations_				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	22	0	0	22	22
	Bridges	36	0	0	36	36
	Tunnels	0	0	0	0	0
Railways	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	1	0	0	1	1
	Runways	6	0	0	6	6

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	0	0	0	0	0
Waste Water	2	0	0	2	2
Natural Gas	1	0	0	1	1
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	0	0
Communication	2	0	0	2	2

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	479	0	0
Waste Water	287	0	0
Natural Gas	191	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	0	0	0	0	0	0
Electric Power		0	0	0	0	0

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 57.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 40 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the earthquake. Of these, 0 people (out of a total population of 11,526) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	1	0	0	0
	Single Family	1	0	0	0
	Total	1	0	0	0
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	1	0	0	0
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	1	0	0	0

Economic Loss

The total economic loss estimated for the earthquake is 7.83 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 4.33 (millions of dollars); 14 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 71 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.01	0.06	0.00	0.01	0.08
	Capital-Related	0.00	0.00	0.06	0.00	0.00	0.07
	Rental	0.04	0.02	0.04	0.00	0.00	0.11
	Relocation	0.14	0.10	0.06	0.01	0.04	0.34
	Subtotal	0.18	0.14	0.22	0.01	0.05	0.60
Capital Stock Losses							
	Structural	0.31	0.16	0.09	0.02	0.08	0.67
	Non_Structural	1.42	0.48	0.26	0.07	0.17	2.39
	Content	0.36	0.06	0.12	0.04	0.08	0.66
	Inventory	0.00	0.00	0.01	0.01	0.00	0.02
	Subtotal	2.09	0.69	0.47	0.14	0.34	3.73
	Total	2.26	0.83	0.69	0.15	0.39	4.33

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1,717.62	\$0.00	0.00
	Bridges	150.57	\$0.90	0.60
	Tunnels	0.00	\$0.00	0.00
	Subtotal	1868.20	0.90	
Railways	Segments	0.00	\$0.00	0.00
	Bridges	0.00	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Light Rail	Segments	0.00	\$0.00	0.00
	Bridges	0.00	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Bus	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Ferry	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Port	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Airport	Facilities	0.01	\$0.00	6.00
	Runways	0.13	\$0.00	0.00
	Subtotal	0.10	0.00	
	Total	1868.30	0.90	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Distribution Lines	9.60	\$0.00	0.00
	Subtotal	9.57	\$0.00	
Waste Water	Pipelines	0.00	\$0.00	0.00
	Facilities	133.20	\$2.59	1.95
	Distribution Lines	5.70	\$0.00	0.00
	Subtotal	138.94	\$2.59	
Natural Gas	Pipelines	0.00	\$0.00	0.00
	Facilities	1.10	\$0.01	1.07
	Distribution Lines	3.80	\$0.00	0.00
	Subtotal	4.92	\$0.01	
Oil Systems	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	\$0.00	
Electrical Power	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	\$0.00	
Communication	Facilities	0.20	\$0.00	0.00
	Subtotal	0.20	\$0.00	
	Total	153.63	\$2.60	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of \$)

LOSS	Total	%

Appendix A: County Listing for the Region

Owyhee, ID

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Idaho	Owyhee	11,526	650	145	795
Total State		11,526	650	145	795
Total Region		11,526	650	145	795

APPENDIX F. SURVEY & RESPONSES

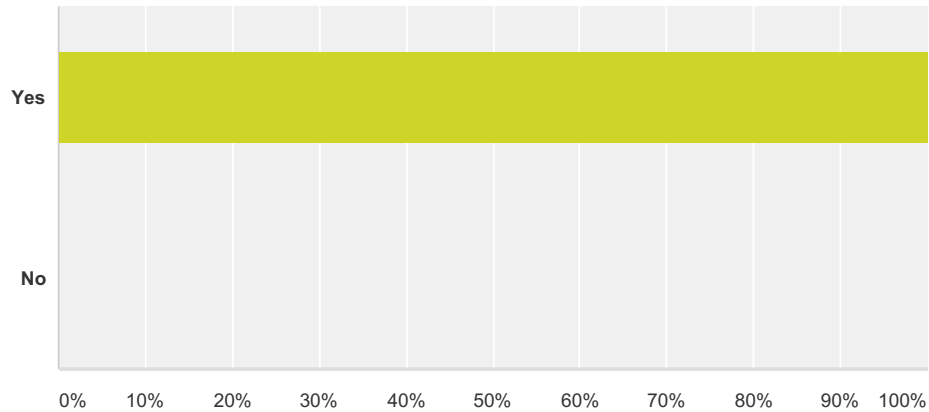
This appendix contains the survey distributed to the planning committee, stakeholders, and public.

Contents:

1. Survey results

Q1 During the past five years in OwyheeCounty, have you or someone in your household directly experienced a hazardsuch as a severe windstorm, flood, wildfire or other type of hazard?

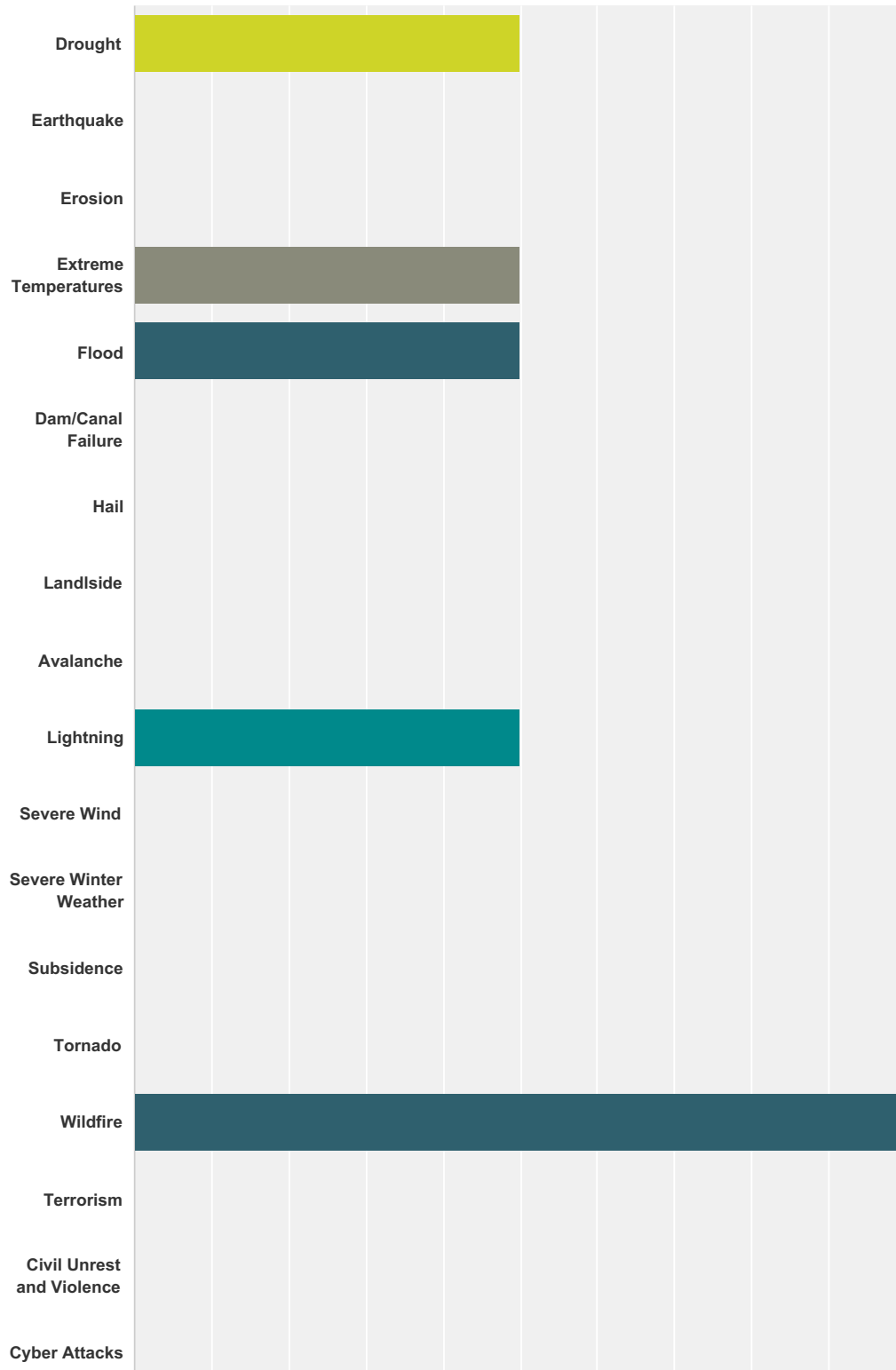
Answered: 2 Skipped: 0



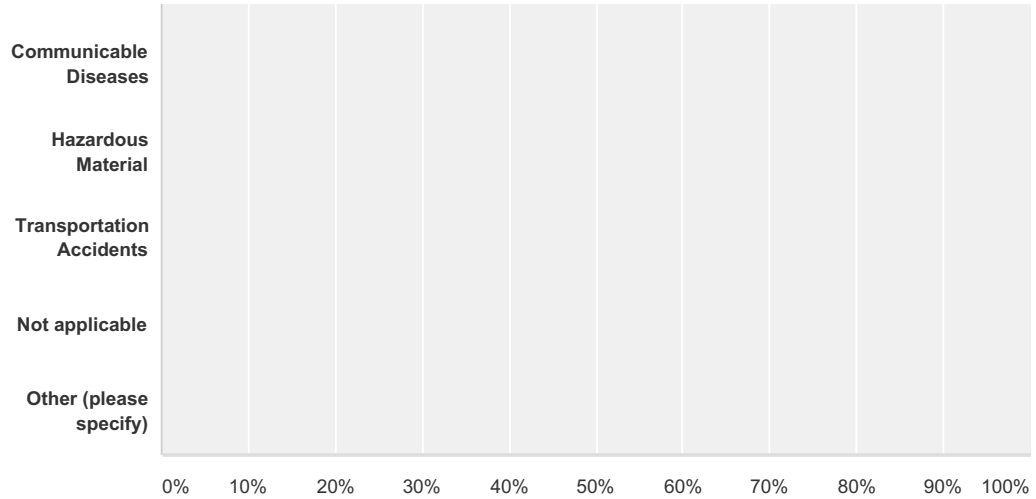
Answer Choices	Responses	
Yes	100.00%	2
No	0.00%	0
Total		2

Q2 If you responded yes to the previous question, which of these hazards have you or someone in your household experienced in the past five years? Please check all that apply.

Answered: 2 Skipped: 0



Owyhee County Mitigation Public Survey Opinion



Answer Choices	Responses	
Drought	50.00%	1
Earthquake	0.00%	0
Erosion	0.00%	0
Extreme Temperatures	50.00%	1
Flood	50.00%	1
Dam/Canal Failure	0.00%	0
Hail	0.00%	0
Landslide	0.00%	0
Avalanche	0.00%	0
Lightning	50.00%	1
Severe Wind	0.00%	0
Severe Winter Weather	0.00%	0
Subsidence	0.00%	0
Tornado	0.00%	0
Wildfire	100.00%	2
Terrorism	0.00%	0
Civil Unrest and Violence	0.00%	0
Cyber Attacks	0.00%	0
Communicable Diseases	0.00%	0
Hazardous Material	0.00%	0
Transportation Accidents	0.00%	0
Not applicable	0.00%	0
Other (please specify)	0.00%	0

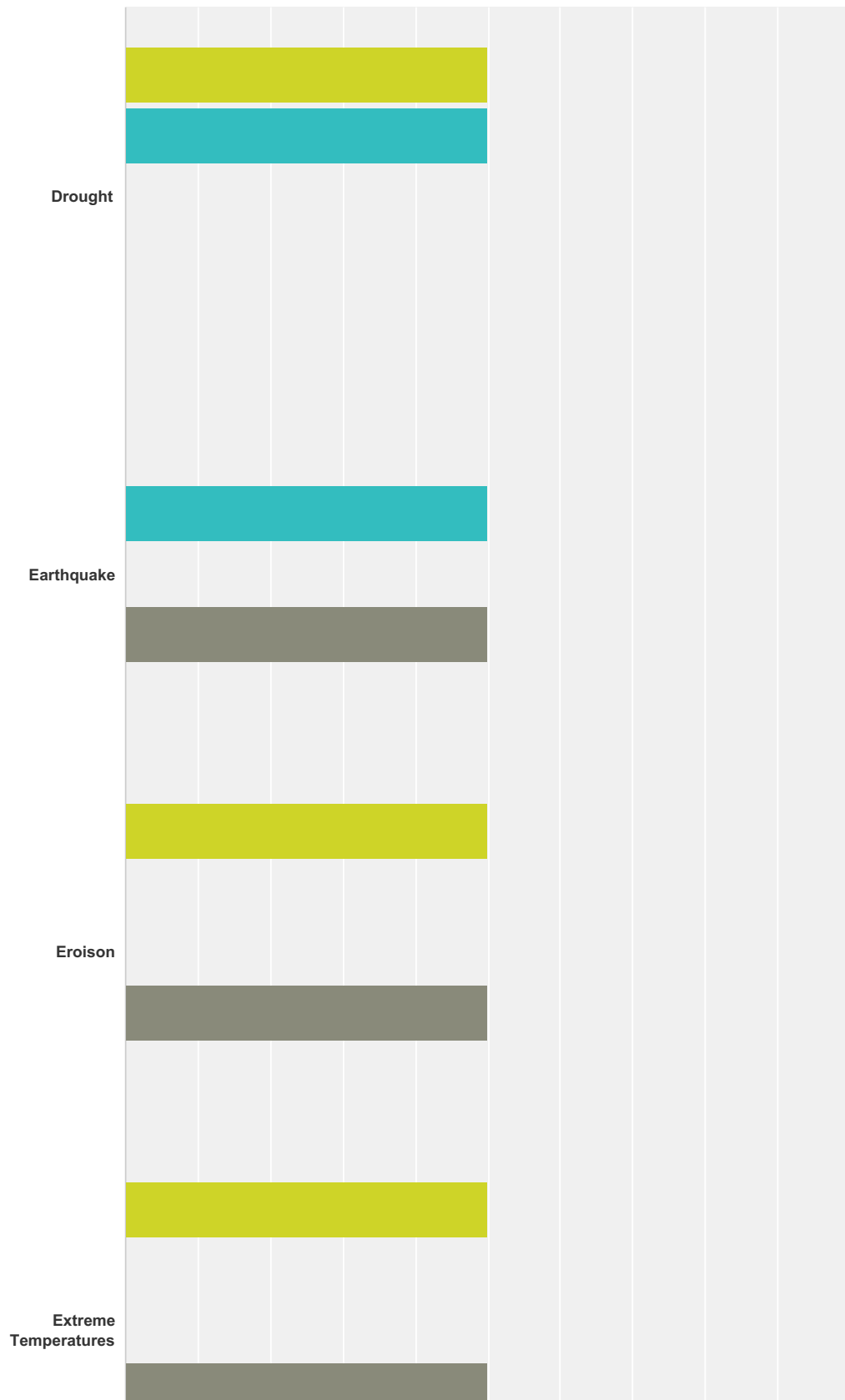
Owyhee County Mitigation Public Survey Opinion

Total Respondents: 2

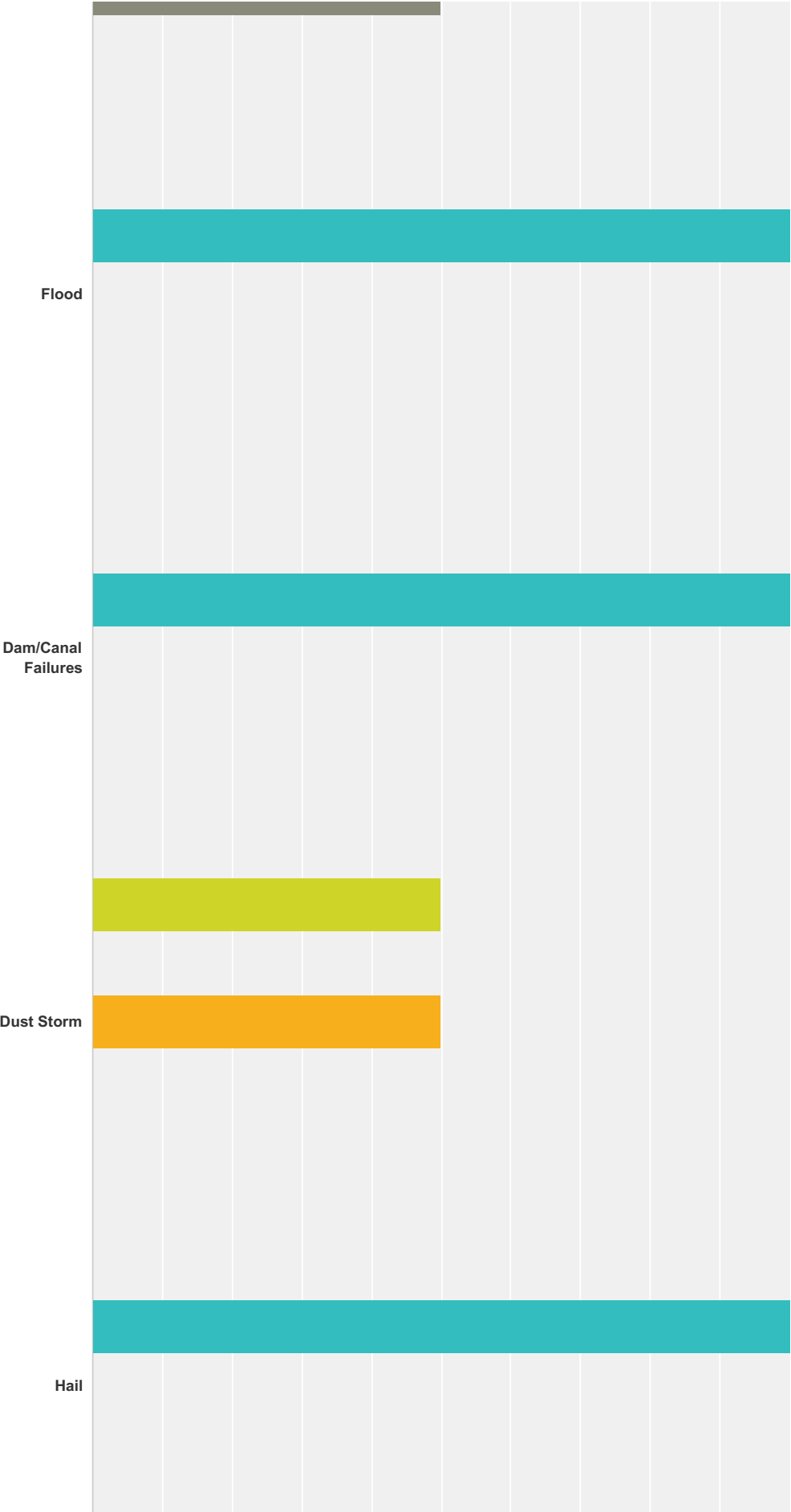
#	Other (please specify)	Date
	There are no responses.	

Q3 How concerned are you about the following hazards affecting Owyhee County?

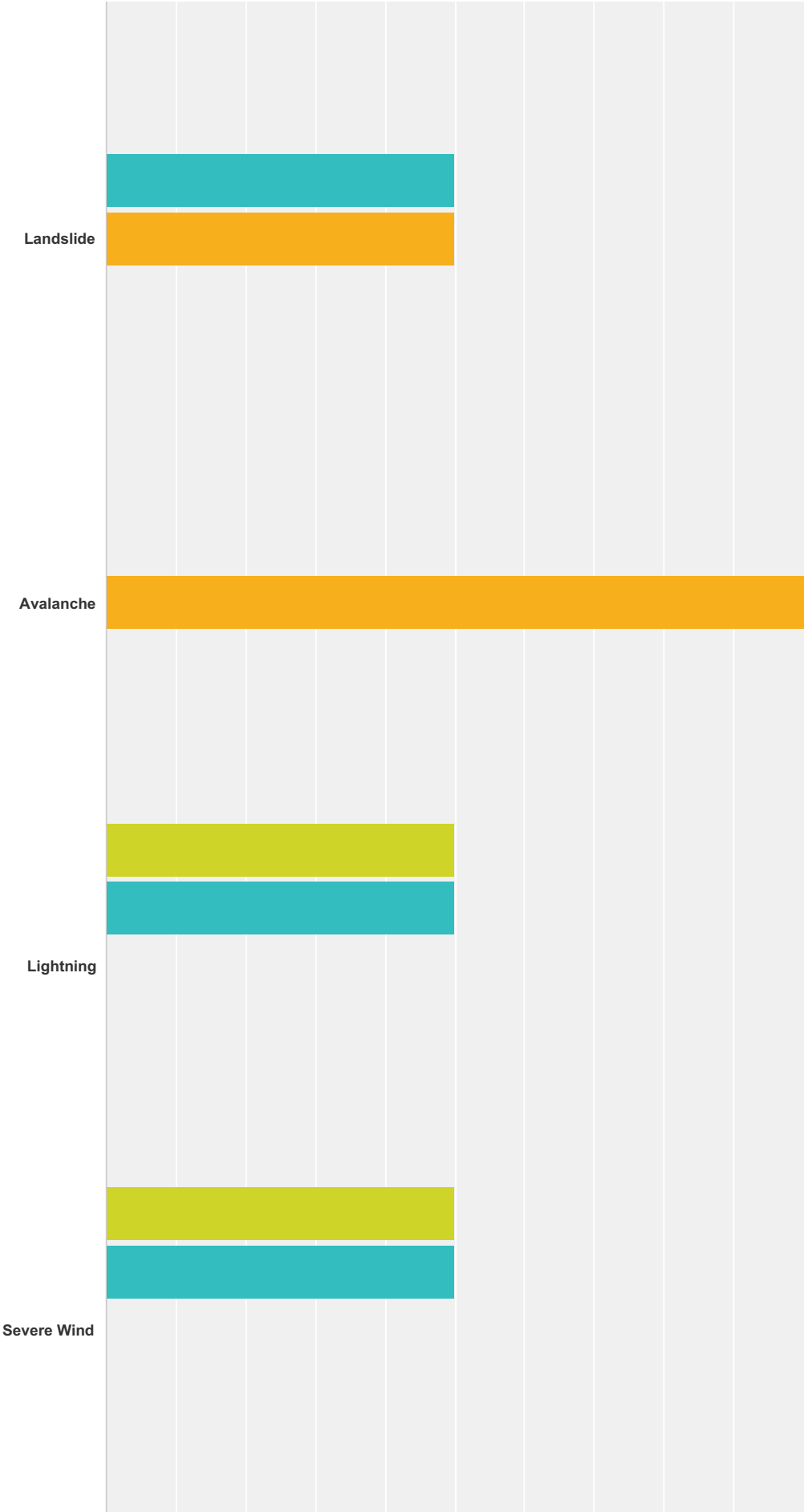
Answered: 2 Skipped: 0



Owyhee County Mitigation Public Survey Opinion



Owyhee County Mitigation Public Survey Opinion



Owyhee County Mitigation Public Survey Opinion

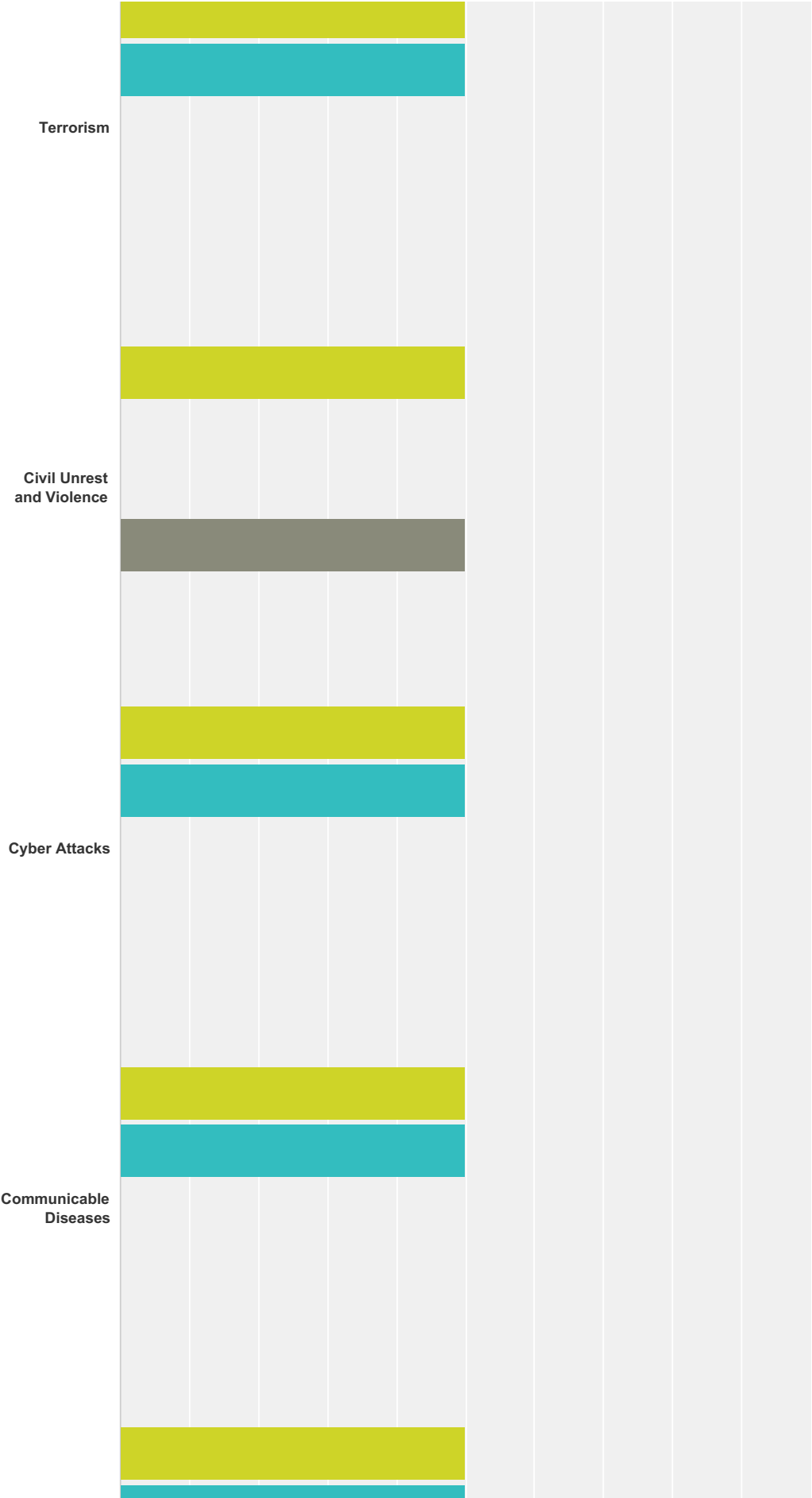
Severe Winter
Weather

Subsidence

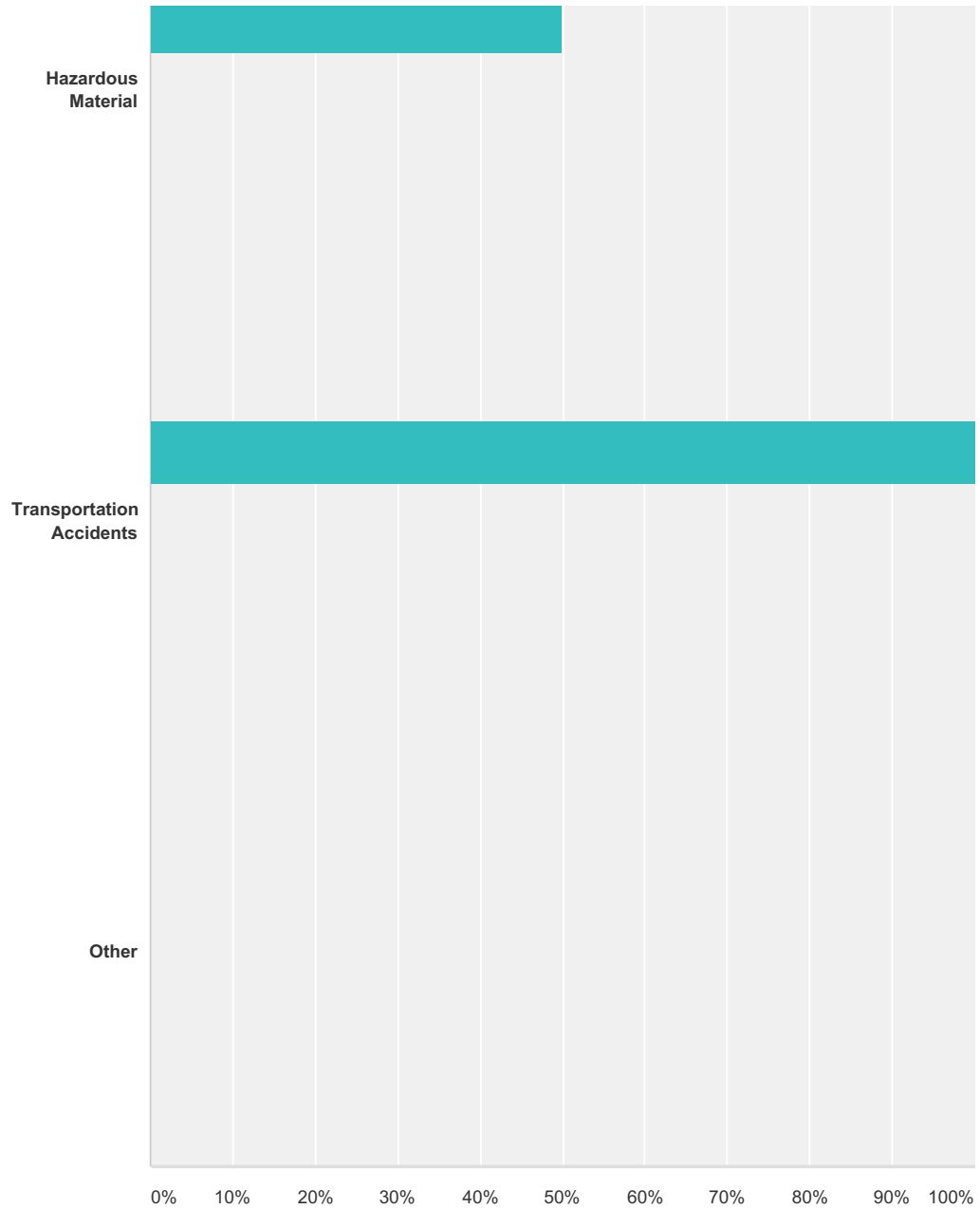
Tornado

Wildfire

Owyhee County Mitigation Public Survey Opinion



Owyhee County Mitigation Public Survey Opinion



■ Very Concerned
 ■ Somewhat Concerned
 ■ Neutral
 ■ Not Very Concerned
 ■ Not Concerned

	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned	Total Respondents
Drought	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Earthquake	0.00% 0	50.00% 1	0.00% 0	50.00% 1	0.00% 0	2
Eroison	50.00% 1	0.00% 0	0.00% 0	50.00% 1	0.00% 0	2
Extreme Temperatures	50.00% 1	0.00% 0	0.00% 0	50.00% 1	0.00% 0	2

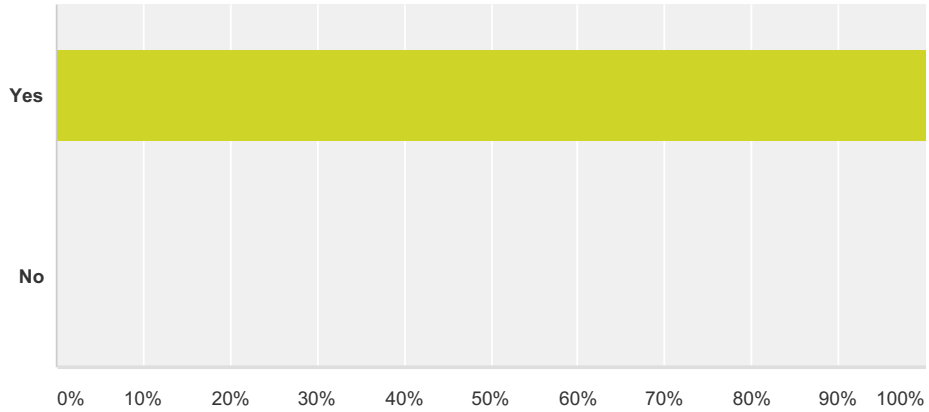
Owyhee County Mitigation Public Survey Opinion

Flood	0.00% 0	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2
Dam/Canal Failures	0.00% 0	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2
Dust Storm	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2
Hail	0.00% 0	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2
Landslide	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2
Avalanche	0.00% 0	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2
Lightning	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Severe Wind	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Severe Winter Weather	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2
Subsidence	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2
Tornado	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2
Wildfire	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2
Terrorism	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Civil Unrest and Violence	50.00% 1	0.00% 0	0.00% 0	50.00% 1	0.00% 0	2
Cyber Attacks	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Communicable Diseases	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Hazardous Material	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2
Transportation Accidents	0.00% 0	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2
Other	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0

#	Other (please specify)	Date
	There are no responses.	

Q4 Have you ever received information about how to make members of your household and your home safer from hazards?

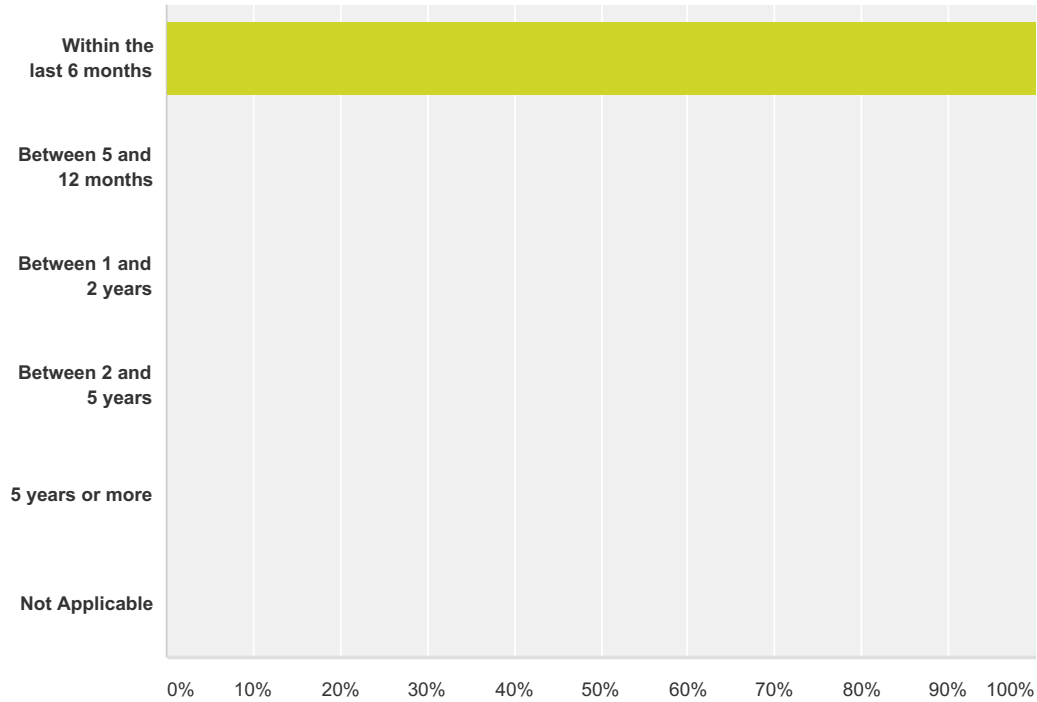
Answered: 2 Skipped: 0



Answer Choices	Responses
Yes	100.00%2
No	0.00%0
Total	2

Q5 If you answered yes to the previous question, please specify how recently you received safety information

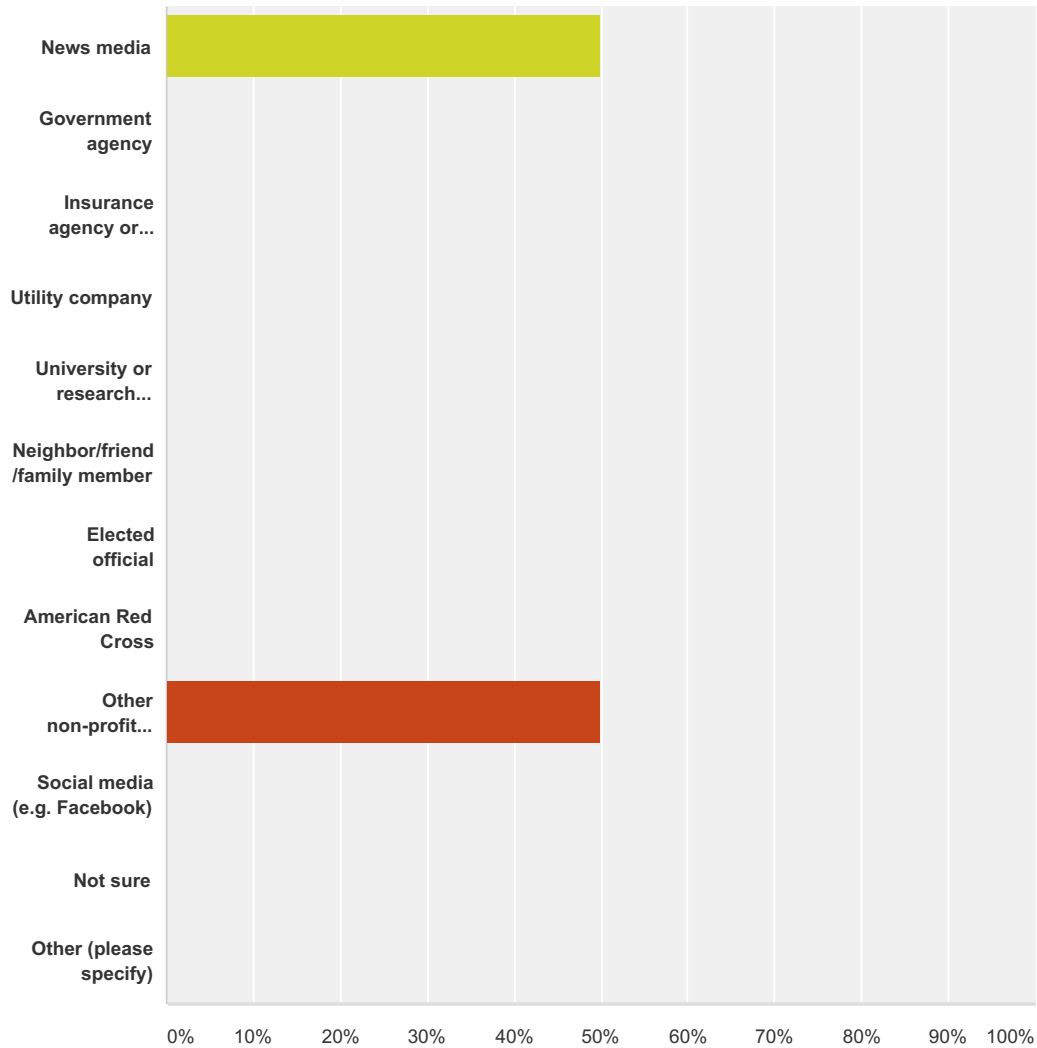
Answered: 2 Skipped: 0



Answer Choices	Responses	
Within the last 6 months	100.00%	2
Between 5 and 12 months	0.00%	0
Between 1 and 2 years	0.00%	0
Between 2 and 5 years	0.00%	0
5 years or more	0.00%	0
Not Applicable	0.00%	0
Total		2

Q6 From whom did you last receive information about how to make members of your household and your home safer from hazards?

Answered: 2 Skipped: 0



Answer Choices	Responses	
News media	50.00%	1
Government agency	0.00%	0
Insurance agency or company	0.00%	0
Utility company	0.00%	0
University or research institution	0.00%	0
Neighbor/friend/family member	0.00%	0
Elected official	0.00%	0

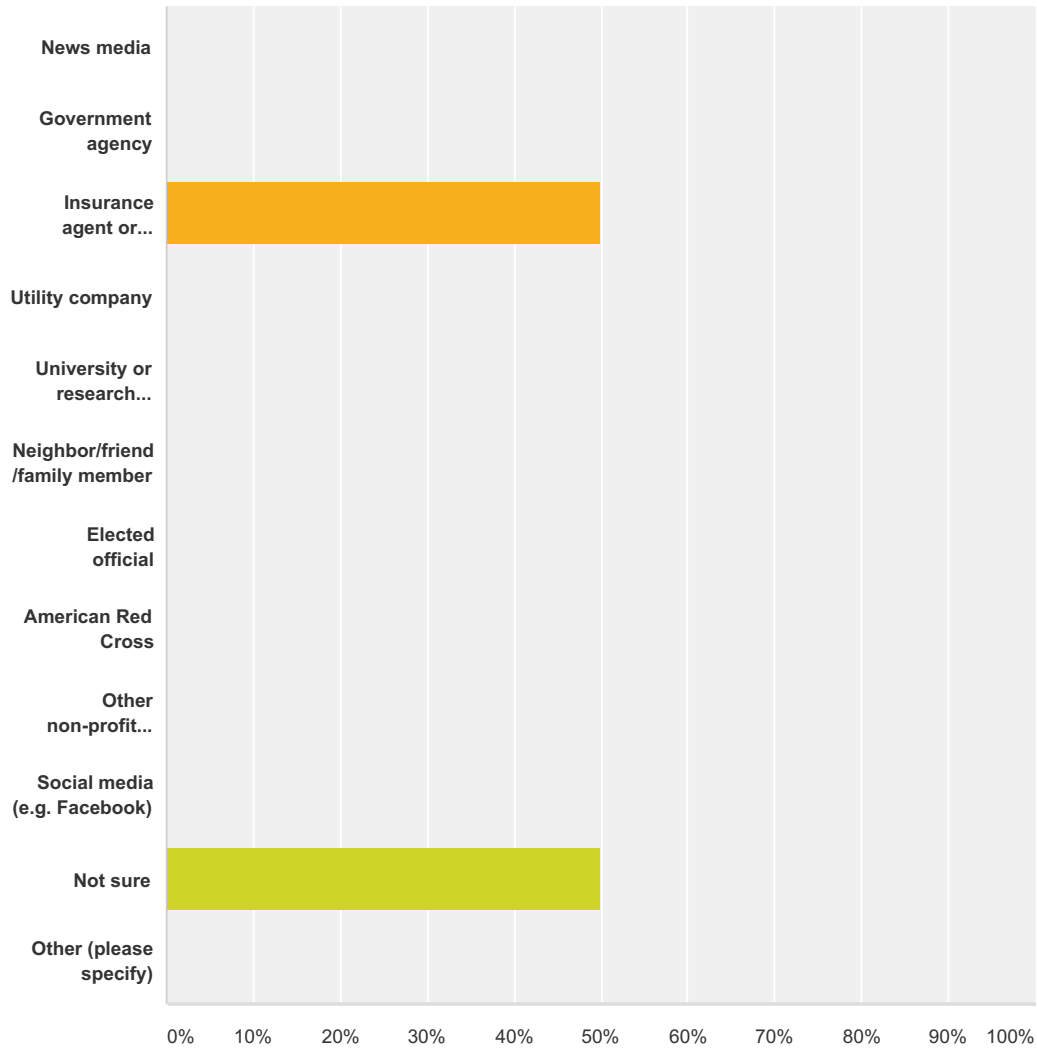
Owyhee County Mitigation Public Survey Opinion

American Red Cross	0.00%	0
Other non-profit organization	50.00%	1
Social media (e.g. Facebook)	0.00%	0
Not sure	0.00%	0
Other (please specify)	0.00%	0
Total		2

#	Other (please specify)	Date
	There are no responses.	

**Q7 Who do you most trust to provide you with information about how to make your household and home safer from hazards?
Select up to three**

Answered: 2 Skipped: 0



Answer Choices	Responses	
News media	0.00%	0
Government agency	0.00%	0
Insurance agent or company	50.00%	1
Utility company	0.00%	0
University or research institution	0.00%	0
Neighbor/friend/family member	0.00%	0
Elected official	0.00%	0

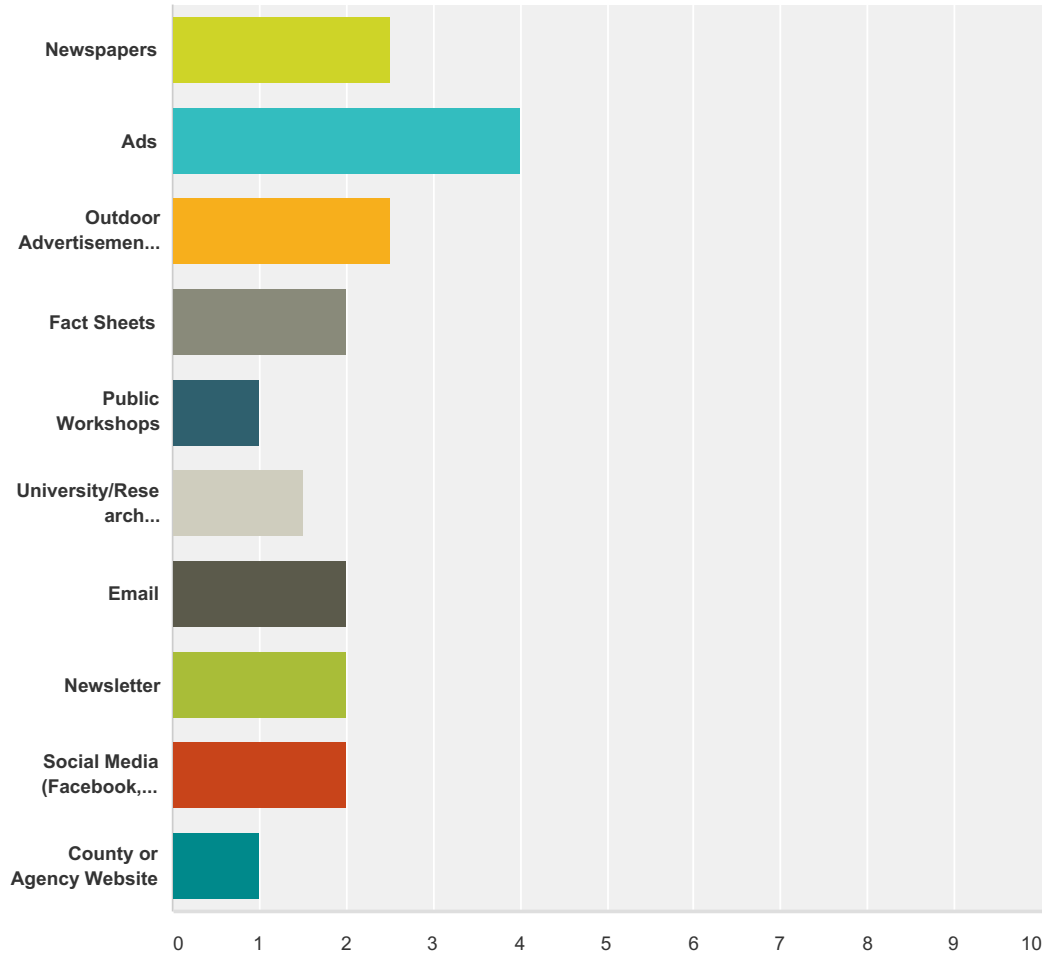
Owyhee County Mitigation Public Survey Opinion

American Red Cross	0.00%	0
Other non-profit organization	0.00%	0
Social media (e.g. Facebook)	0.00%	0
Not sure	50.00%	1
Other (please specify)	0.00%	0
Total Respondents: 2		

#	Other (please specify)	Date
	There are no responses.	

Q8 What is the most effective way for you to receive information about how to make your household and home safer from hazards?

Answered: 2 Skipped: 0



	Very Effective	Somewhat Effective	Neutral	Not Effective	Total	Weighted Average
Newspapers	0.00% 0	50.00% 1	50.00% 1	0.00% 0	2	2.50
Ads	0.00% 0	0.00% 0	0.00% 0	100.00% 2	2	4.00
Outdoor Advertisements (Billboards)	0.00% 0	50.00% 1	50.00% 1	0.00% 0	2	2.50
Fact Sheets	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2	2.00
Public Workshops	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2	1.00
University/Research Institution Outreach	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2	1.50
Email	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2	2.00

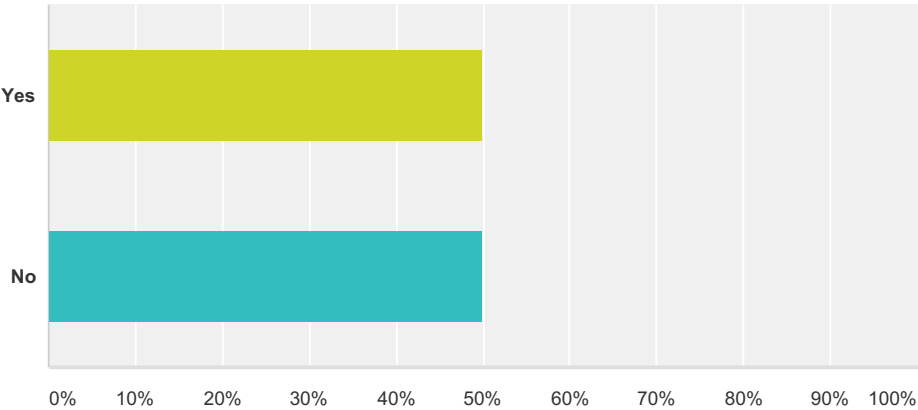
Owyhee County Mitigation Public Survey Opinion

Newsletter	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2	2.00
Social Media (Facebook, Twitter)	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2	2.00
County or Agency Website	100.00% 2	0.00% 0	0.00% 0	0.00% 0	2	1.00

#	Other (please specify)	Date
	There are no responses.	

Q9 Prior to receiving this survey, were you aware of OwyheeCounty's Hazard Mitigation Plan (HMP)

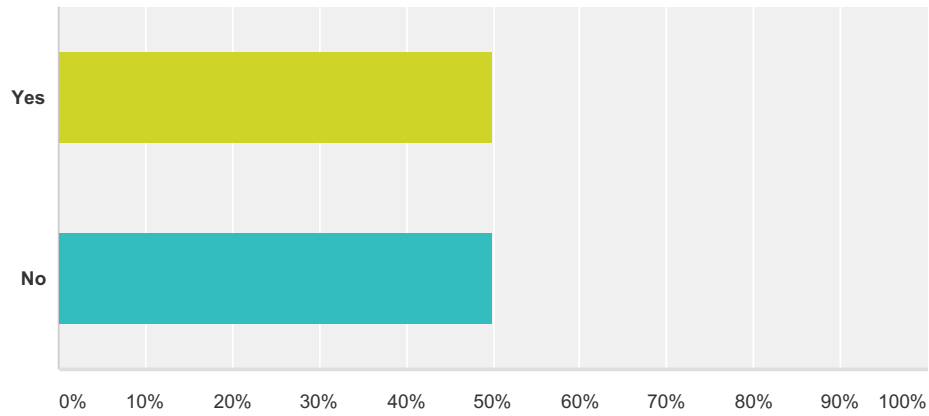
Answered: 2 Skipped: 0



Answer Choices	Responses	
Yes	50.00%	1
No	50.00%	1
Total		2

Q10 Prior to receiving this survey, were you aware that the HMP was being updated?

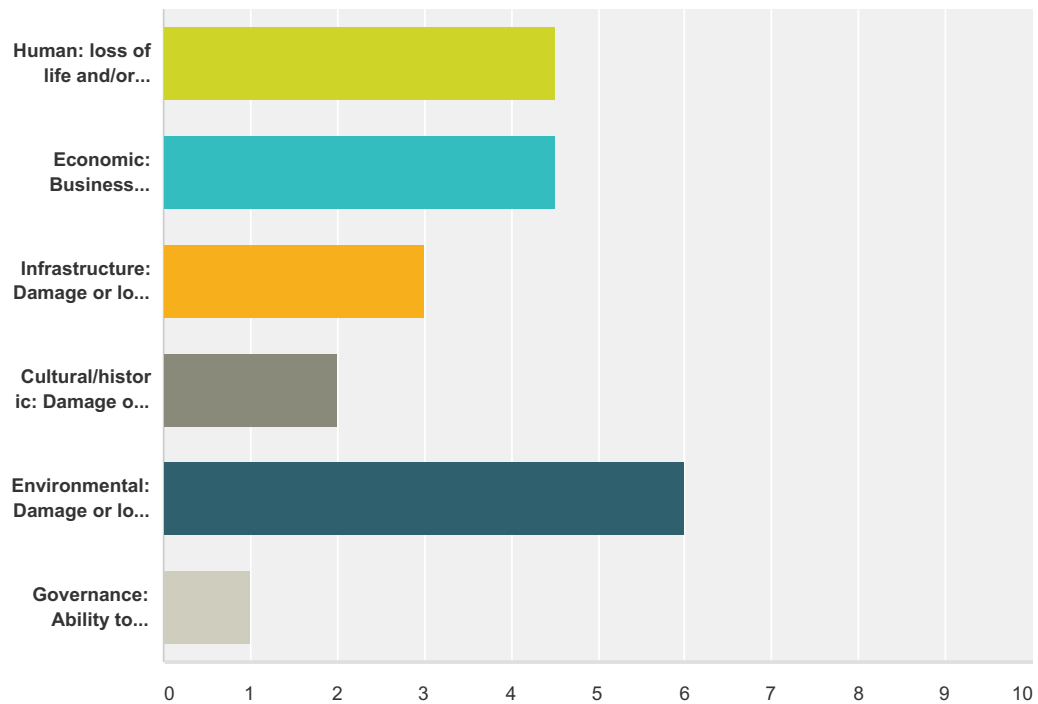
Answered: 2 Skipped: 0



Answer Choices	Responses	
Yes	50.00%	1
No	50.00%	1
Total		2

Q11 Community assets are features, characteristics, or resources that either make a community unique or allow the community to function. In your opinion, which of the following categories are most susceptible to the impacts caused by hazards in your community. Please rank from 1-6

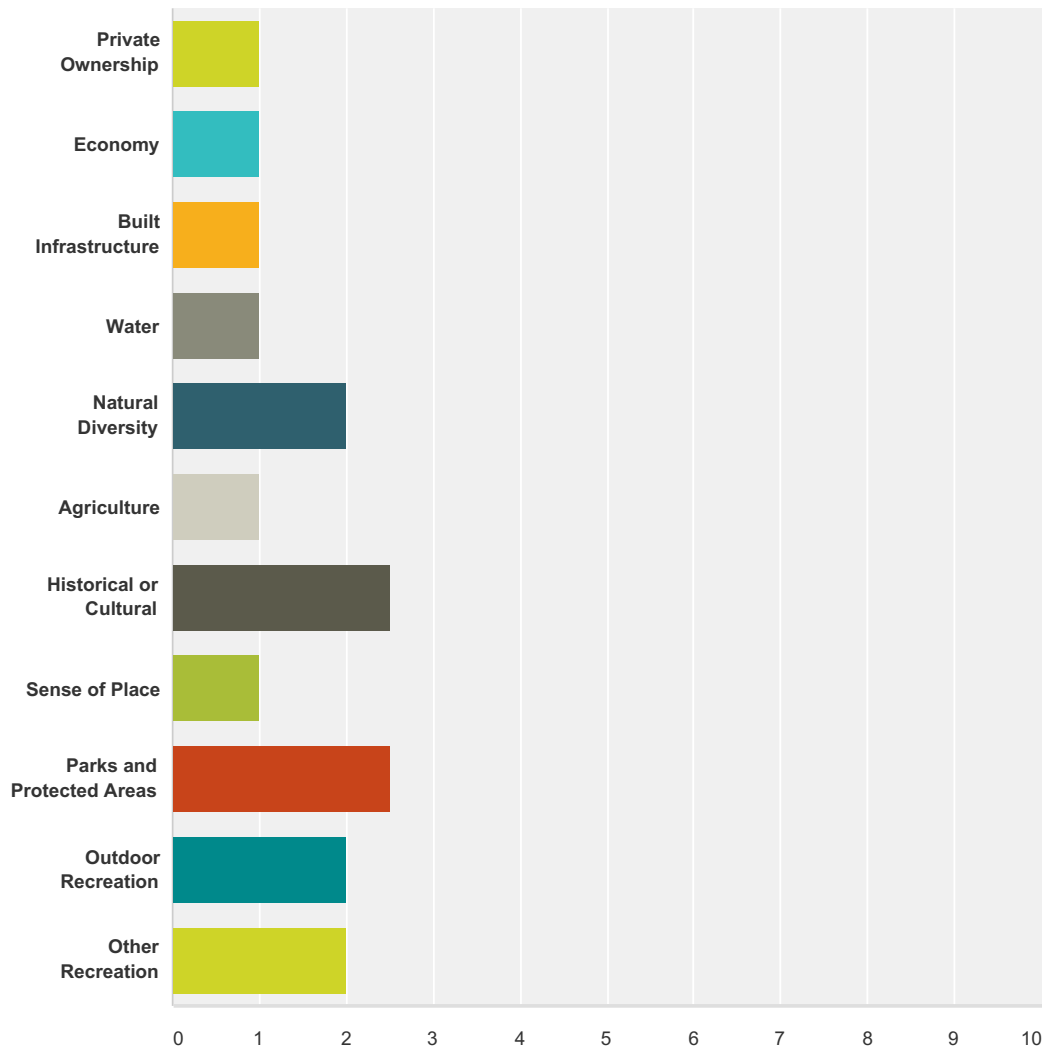
Answered: 2 Skipped: 0



	1	2	3	4	5	6	Total	Score
Human: loss of life and/or injuries	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2	4.50
Economic: Business closures and/or job losses	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2	4.50
Infrastructure: Damage or loss of bridges, utilities, schools, etc.	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	0.00% 0	2	3.00
Cultural/historic: Damage or loss of libraries, museums, fairgrounds, etc.	0.00% 0	0.00% 0	0.00% 0	0.00% 0	100.00% 2	0.00% 0	2	2.00
Environmental: Damage or loss of forests, rangeland, waterways, etc.	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	6.00
Governance: Ability to maintain order and/or provide public amenities and services	0.00% 0	0.00% 0	0.00% 0	0.00% 0	0.00% 0	100.00% 2	2	1.00

Q12 Next we would like to know what specific types of community assets are most important to you. Please reference definitions of each community asset that were defined on the first page of this section.

Answered: 2 Skipped: 0



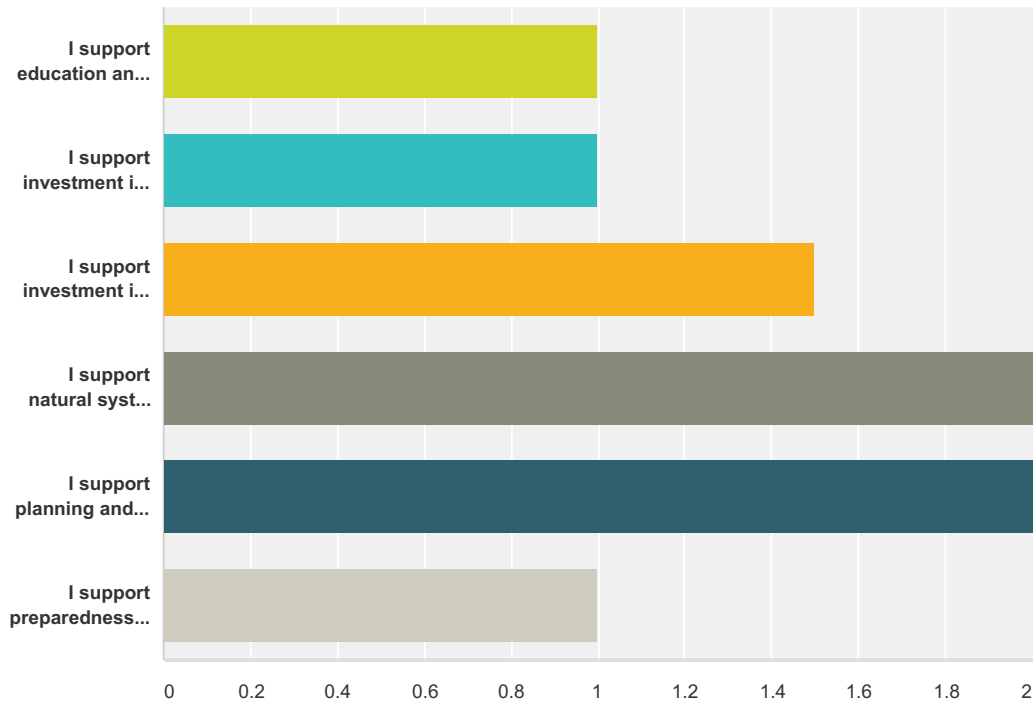
	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total	Weighted Average
Private Ownership	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
Economy	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
Built Infrastructure	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
Water	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00

Owyhee County Mitigation Public Survey Opinion

Natural Diversity	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2	2.00
Agriculture	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
Historical or Cultural	0.00% 0	50.00% 1	50.00% 1	0.00% 0	0.00% 0	2	2.50
Sense of Place	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
Parks and Protected Areas	50.00% 1	0.00% 0	0.00% 0	50.00% 1	0.00% 0	2	2.50
Outdoor Recreation	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2	2.00
Other Recreation	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2	2.00

Q13 A number of activities can reduce your community's risk from hazards. These activities can be both regulatory and non-regulatory. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with hazards.

Answered: 2 Skipped: 0



	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total	Weighted Average
I support education and awareness programs (e.g., websites with maps and information, mailings to neighborhoods, Firewise, Stormready, etc.)	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
I support investment in structural measures(e.g. dams, levees, Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard-resistance and resilience in structures or systems)	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
I support investment in non-structural measures(building codes, land use planning laws, research and assessment, public awareness programs, etc.)	50.00% 1	50.00% 1	0.00% 0	0.00% 0	0.00% 0	2	1.50
I support natural systems protection (e.g., sediment and erosion control, stream corridor restoration)	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2	2.00
I support planning and regulation (e.g., comprehensive plans, land use ordinances, subdivision regulation, development review, cyber security plans)	50.00% 1	0.00% 0	50.00% 1	0.00% 0	0.00% 0	2	2.00

Owyhee County Mitigation Public Survey Opinion

I support preparedness and response actions (e.g., creating mutual aid agreements with neighboring communities, purchasing radio communication equipment, developing procedures for notifying citizens of available shelter locations)	100.00% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	2	1.00
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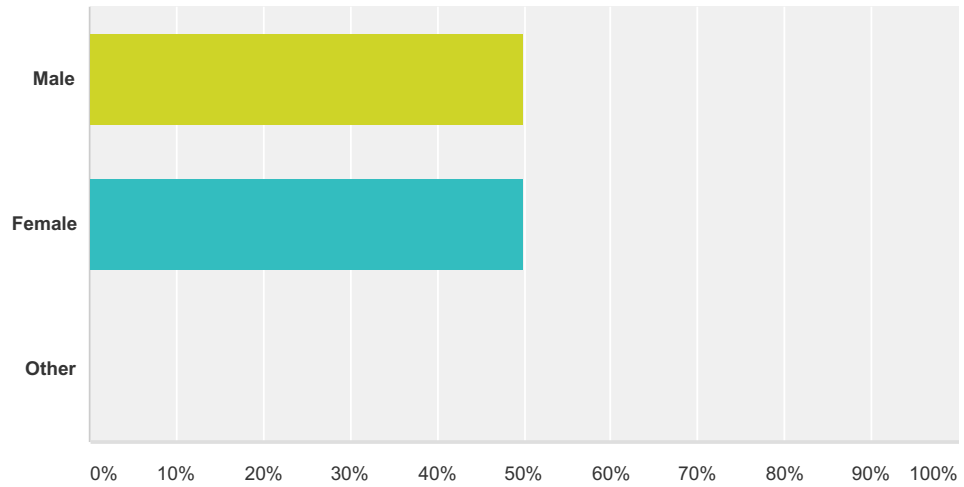
Q14 Please indicate your age

Answered: 2 Skipped: 0

#	Responses	Date
1	39	7/3/2016 8:18 PM
2	68	6/30/2016 1:11 PM

Q15 Gender

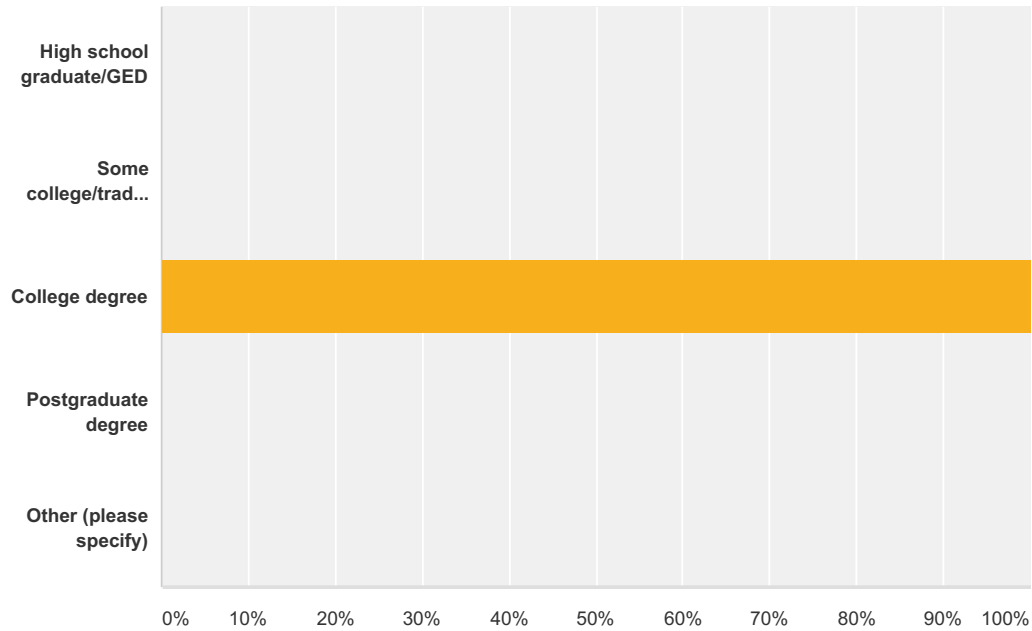
Answered: 2 Skipped: 0



Answer Choices	Responses	
Male	50.00%	1
Female	50.00%	1
Other	0.00%	0
Total		2

Q16 Please indicate your level of education

Answered: 2 Skipped: 0

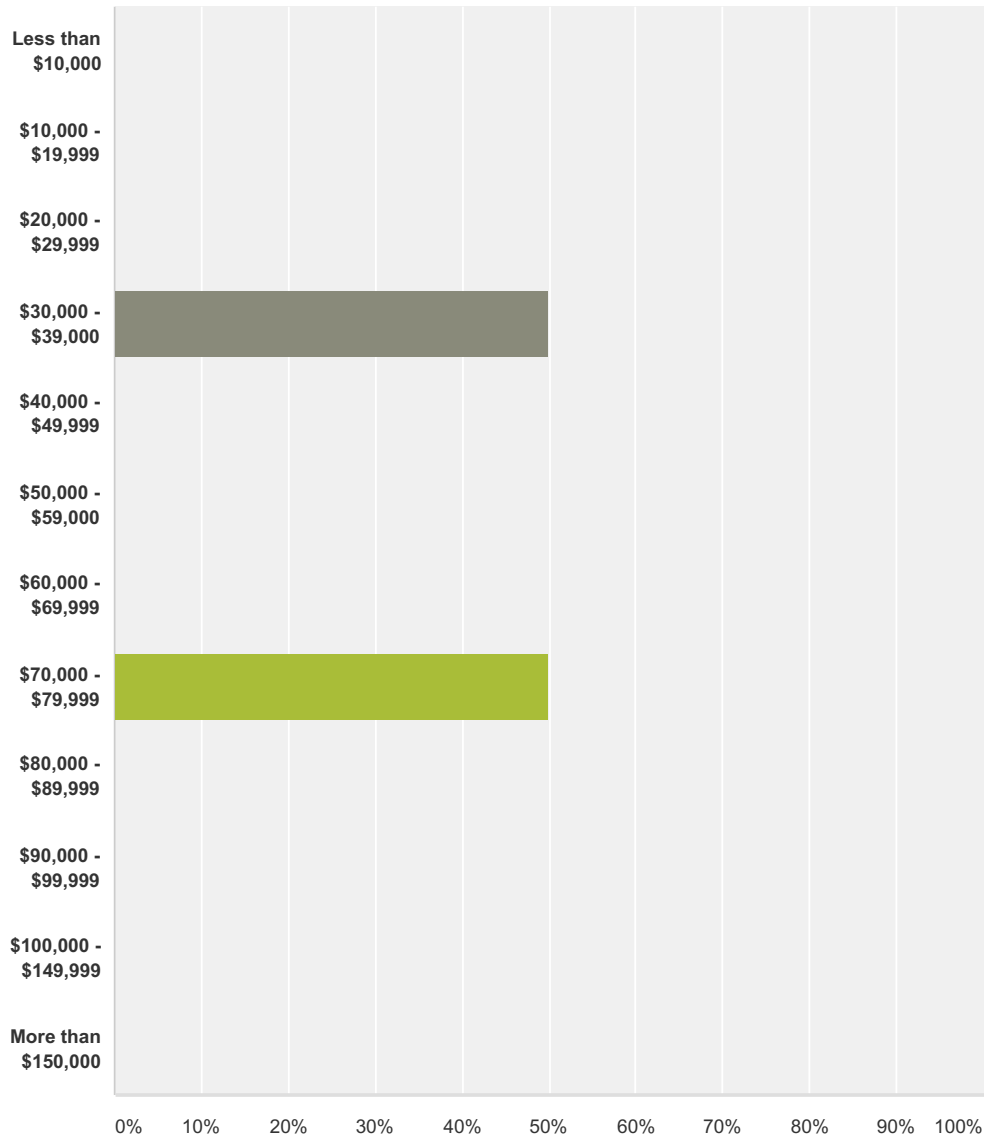


Answer Choices	Responses
High school graduate/GED	0.00% 0
Some college/trade school	0.00% 0
College degree	100.00% 2
Postgraduate degree	0.00% 0
Other (please specify)	0.00% 0
Total	2

#	Other (please specify)	Date
	There are no responses.	

Q17 What is your total household income?

Answered: 2 Skipped: 0



Answer Choices	Responses
Less than \$10,000	0.00% 0
\$10,000 - \$19,999	0.00% 0
\$20,000 - \$29,999	0.00% 0
\$30,000 - \$39,000	50.00% 1
\$40,000 - \$49,999	0.00% 0
\$50,000 - \$59,000	0.00% 0
\$60,000 - \$69,999	0.00% 0
\$70,000 - \$79,999	50.00% 1

Owyhee County Mitigation Public Survey Opinion

\$80,000 - \$89,999	0.00%	0
\$90,000 - \$99,999	0.00%	0
\$100,000 - \$149,999	0.00%	0
More than \$150,000	0.00%	0
Total		2

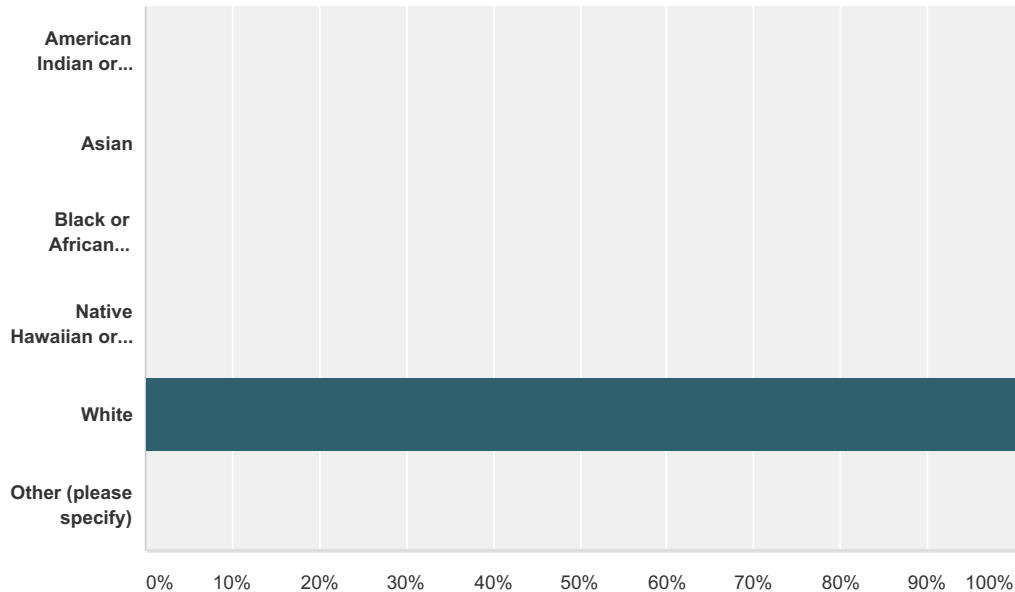
Q18 Zip code (optional)

Answered: 2 Skipped: 0

#	Responses	Date
1	83639	7/3/2016 8:18 PM
2	83650	6/30/2016 1:11 PM

Q19 Please specify your race

Answered: 2 Skipped: 0

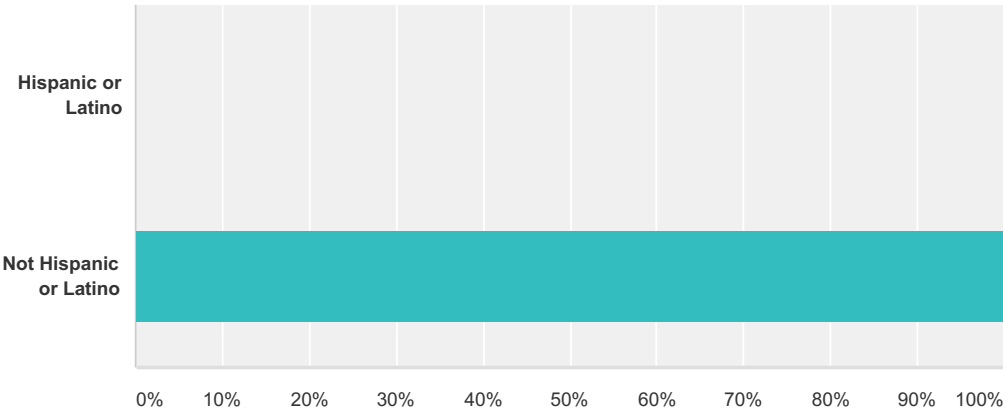


Answer Choices	Responses
American Indian or Alaska Native	0.00%0
Asian	0.00%0
Black or African American	0.00%0
Native Hawaiian or Other Pacific Islander	0.00%0
White	100.00%2
Other (please specify)	0.00%0
Total	2

#	Other (please specify)	Date
	There are no responses.	

Q20 Please specify your ethnicity

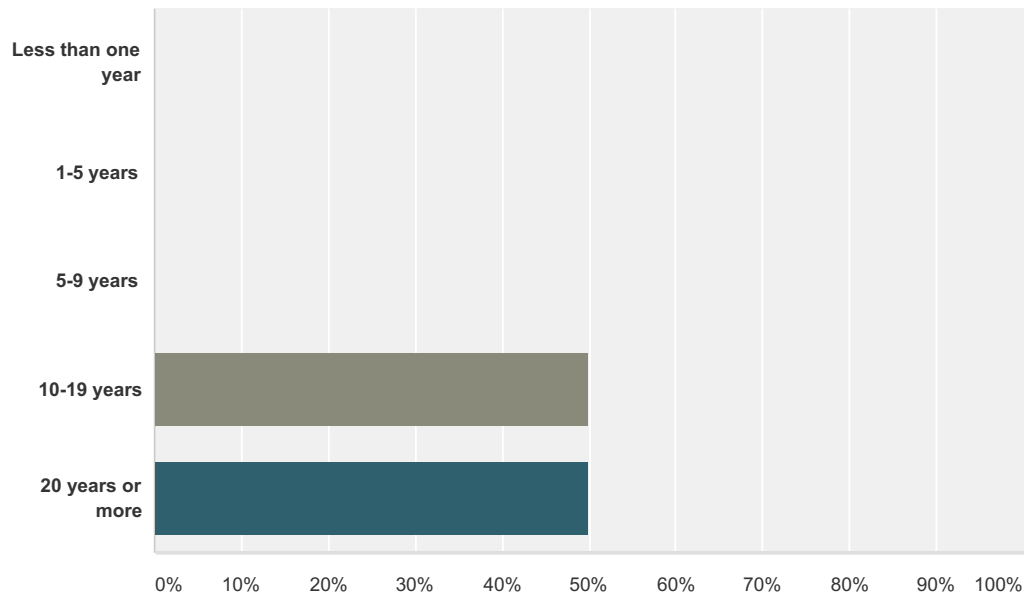
Answered: 2 Skipped: 0



Answer Choices	Responses	
Hispanic or Latino	0.00%	0
Not Hispanic or Latino	100.00%	2
Total		2

Q21 How long have you lived in OwyheeCounty?

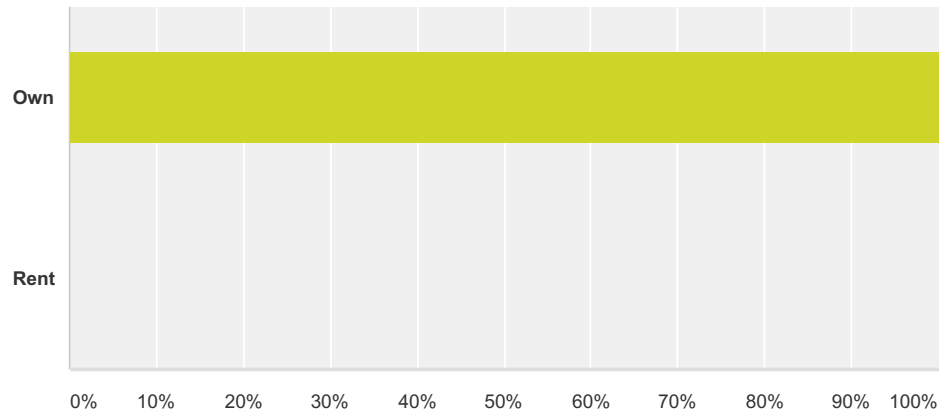
Answered: 2 Skipped: 0



Answer Choices	Responses
Less than one year	0.00% 0
1-5 years	0.00% 0
5-9 years	0.00% 0
10-19 years	50.00% 1
20 years or more	50.00% 1
Total	2

Q22 Do you own or rent your home?

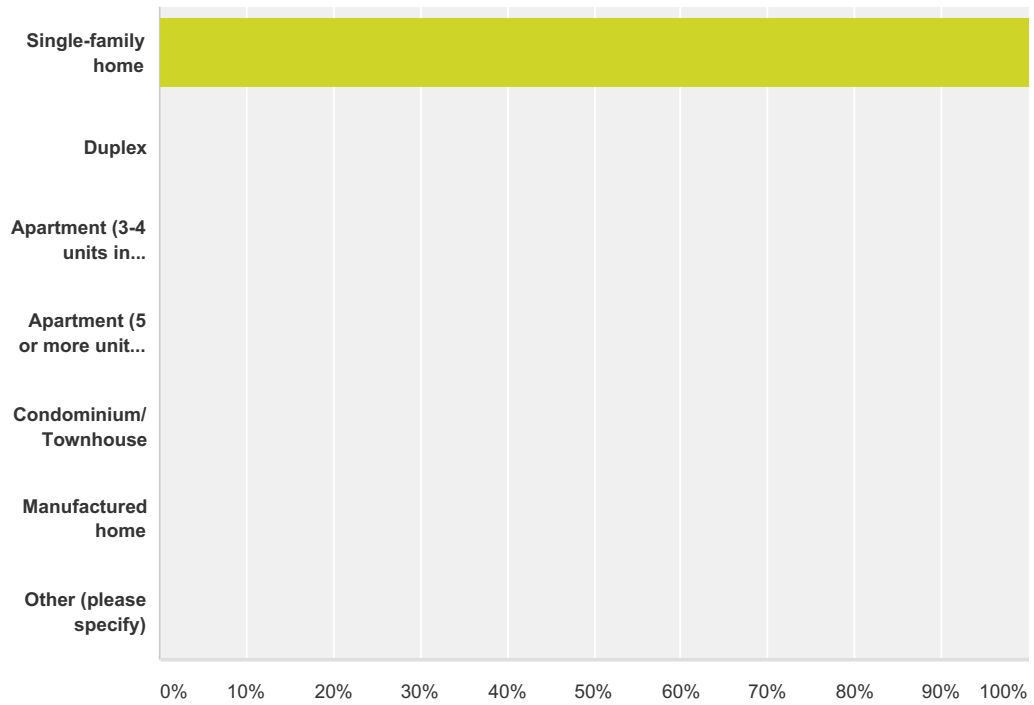
Answered: 2 Skipped: 0



Answer Choices	Responses	
Own	100.00%	2
Rent	0.00%	0
Total		2

Q23 Do you own/rent a

Answered: 2 Skipped: 0



Answer Choices	Responses
Single-family home	100.00% 2
Duplex	0.00% 0
Apartment (3-4 units in structure)	0.00% 0
Apartment (5 or more units in structure)	0.00% 0
Condominium/ Townhouse	0.00% 0
Manufactured home	0.00% 0
Other (please specify)	0.00% 0
Total	2

#	Other (please specify)	Date
	There are no responses.	

Q24 Please feel free to provide any additional comments in the space provided:

Answered: 0 Skipped: 2

#	Responses	Date
	There are no responses.	

APPENDIX G. FORMS & TEMPLATES

Appendix G collects various forms and templates. These forms and templates are designed to help update the plan throughout its five-year lifecycle.

Contents:

1. FEMA capabilities assessment template
2. Mitigation actions worksheet
3. Human and technological capabilities assessment template
4. Mitigation actions monitoring template

FEMA Capabilities Assessment Template

The goal of this template is to summarize the existing authorities, policies, programs, and additional resources that reduce hazard impacts or that can be used to implement hazard mitigation strategies.

FEMA Capabilities Assessment & Summary

Jurisdiction(s)	
-----------------	--

Planning and Regulatory

Planning and regulatory capabilities are the plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. Please indicate which of the following your jurisdiction has in place.

Plans	Yes/No Year Pertinent Jurisdictions	Does the plan address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan		
Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan		

Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan		
Community Wildfire Protection Plan		
Other special plans (e.g., brownfields redevelopment, disaster recovery, climate change adaptation)		
Building Code, Permitting, and Inspections	Yes/No	Are codes adequately enforced?
Building Code		Version/Year:
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating		Rating:
Site plan review requirements		

Land Use Planning and Ordinances	Yes/No	<p>Is the ordinance an effective measure for reducing hazard impacts?</p> <p>Is the ordinance adequately administered and enforced?</p>
Zoning ordinance		
Subdivision ordinance		
Floodplain ordinance		
Natural hazard specific ordinance (e.g., stormwater, wildfire, etc.)		
Flood insurance rate maps		
Acquisition of land for open space and public recreation use		
Other		
<p>How can these capabilities be expanded and improved to reduce risk?</p>		

Administrative and Technical

Identify whether your jurisdiction has the following administrative and technical capabilities. These include staff, skills, and tools that can be used for mitigation planning and to implement specific actions. For smaller jurisdictions without local staff resources, indicate available public resources at the next level of government.

Administration	Yes/No	Describe capability Is coordination effective?
Planning Commission		
Mitigation Planning Committee		

Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems, etc.)		
Mutual aid agreements		
Staff	Yes/No & FT/PT	<p>Is staffing adequate to enforce regulations?</p> <p>Is staff trained on hazards and mitigations?</p> <p>Is coordination between agencies and staff effective?</p>
Chief Building Official		
Floodplain Administrator		
Emergency Manager		
Community Planner		
Civil Engineer		
GIS Coordinator		
Other		

Technical	Yes/No	Describe capability Has capability been used to assess/mitigate risk in the past?
Warning systems/services (e.g., reverse 911, outdoor warning signals)		
Hazard data and information		
Grant writing		
Hazus analysis		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Financial

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Funding Resource	Access/Eligibility (Yes/No)	Has the funding resource been used in the past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding		
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Stormwater utility fee		
Incur debt through general obligation bonds and/or special tax bonds		
Incur debt through private activities		
Community Development Block Grant		
Other federal funding programs		

State funding programs		
Other		
How can these capabilities be expanded and improved to reduce risk?		

Education and Outreach

Identify whether your jurisdiction has access to or is eligible to use the following funding resources for hazard mitigation.

Program/Organization	Yes/No	Describe the program/organization its relation to resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, functional needs populations, etc.		
Ongoing public education or information program (e.g., responsible water use, fire safety, environmental education, etc.)		

Natural disaster or safety related school programs		
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		
How can these capabilities be expanded and improved to reduce risk?		

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	
Local address and telephone	
Service area	
Describe your services and organization goals in overview	
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

Mitigation Action Scoring

Mitigation Action/Project Title	
Lead & Supporting Jurisdiction(s)/Agency(ies)	
Hazard(s) Addressed	
Potential Funding Source	
Cost Estimate	
Benefits & Avoided Losses	
Timeline Estimate	

Hazard Magnitude & Frequency

The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500- year event that causes minimal damage. For a ranking of 10, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

Potential for Repetitive Loss Reduction

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 10. Those that do not address repetitive losses receive a rating of 1.

Benefit/Cost

The analysis process will include summaries as appropriate for each project, but will include benefit /cost analysis results. Projects with a negative benefit /cost analysis result will be ranked as a 0. Projects with a positive benefit /cost analysis will receive a score equal to the projects benefit /cost analysis results divided by 10. Therefore, a project with a BC ratio of 50:1 would receive 5 points; a project with a BC ratio of 100:1 (or higher) would receive the maximum points of 10.

Vulnerability of the Community

A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote participation by the smaller or less vulnerable communities in the County, the score will be based on the relationship to other communities being considered. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

Population Benefit

Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (county, city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

Property Benefit

Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save \$1,000,000 or more in losses. Property benefit of less than \$1,000,000 will receive a score of the benefit divided by \$1,000,000 (a ratio below \$1 million). Therefore, a property benefit of \$300,000 would receive a score of 3. In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

Economic Benefit

Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 5 would prevent a total economic collapse, a ranking of 3 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

Project Feasibility (Environmentally, Politically, & Socially)

Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

Potential to Mitigate Hazards to Future Development

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the County will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

Potential Project Effectiveness & Sustainability

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

Mitigation Monitoring Template

The goal of utilizing this template is to create a uniform compilation of progress reports to ensure that monitoring of the various County mitigation action projects are being carried out and reported on in a uniform manner throughout the project's life cycle. Please feel free to use more than this single page.

Mitigation Project Progress Report

Progress Report Period (From Date - To Date)	
Project Title (and Project ID, if any)	
Description of Project	
Implementing Agency	
Contact Name	
Contact E-mail and Phone Number	
Grant/Finance Administrator	
Total Project Cost (can be estimate)	
Anticipated Cost Overrun/Underrun	
Date of Project Approval	
Project Start Date	
Anticipated Completion Date	

What was accomplished during this reporting period?

What obstacles, problems, or delays did the project encounter, if any? How were the problems resolved?

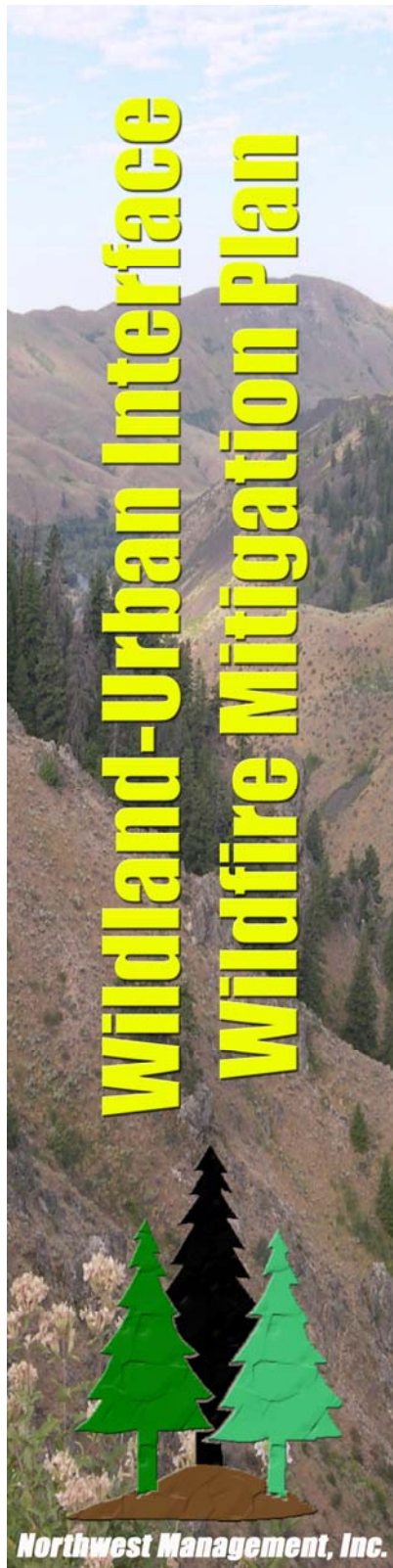
Other Comments:

APPENDIX H. COMMUNITY WILDFIRE PROTECTION PLAN

This appendix contains the Owyhee County Community Wildfire Protection Plan (also called the Wildland-Urban Interface Wildfire Mitigation Plan) and all appendices and addendums to the CWPP.

Contents

1. Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan 2005
2. Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan Appendices



Owyhee County, Idaho Wildland-Urban Interface Wildfire Mitigation Plan

Main Document

March 10, 2005

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



Acknowledgments

This Wildland-Urban Interface Wildfire Mitigation Plan represents the commitment, efforts and cooperation of a number of organizations and agencies working together to improve suppression capabilities while the potential for destructive wildland fire.



Owyhee County Commissioners
and the employees of Owyhee County



Southwest Idaho Resource Conservation and
Development Council, Inc.



USDI Bureau of Land Management



USDA Forest Service



Idaho Department of Homeland Security



Federal Emergency Management Agency

Homedale Rural Fire Department
Marsing Rural Fire Department
Murphy-Reynolds-Wilson Rural Fire
Department

Shoshone-Paiute Tribes Fire Management
Grand View Rural Fire Department
Bruneau Rural Fire Department
Mountain Home Air Force Base Fire
Department

&

Citizens of Owyhee County



Idaho Department of Lands

To obtain copies of this plan contact:

Owyhee County Commissioners Office

Owyhee County Courthouse
P.O. BOX 128
Murphy, ID 83650-0128
Telephone (208) 495-2421

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Chapter I: Overview of this Plan and its Development

1 Introduction

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

- USDI Bureau of Land Management
- Idaho Department of Lands
- Southwest Idaho Resource Conservation and Development Council
- Shoshone-Paiute Tribes
- Homedale Rural Fire Department
- Marsing Rural Fire Department
- Murphy-Reynolds-Wilson Rural Fire Department
- Grand View Rural Fire Department
- Bruneau Rural Fire Department
- Mountain Home Air Force Base Fire Department
- Owyhee County Assessors Office
- Owyhee County Natural Resource Committee
- Owyhee County Sheriffs Office
- Northwest Management, Inc.

The Owyhee County Commissioners selected Northwest Management, Inc., to provide the service of leading the assessment and writing the **Owyhee County Wildland-Urban Interface Wildland Fire Mitigation Plan**. 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 provides 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 are 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 cover 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 Department of Homeland Security
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 Owyhee 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, local, and tribal agencies.

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

- Firefighter and public safety continuing as the highest priority.
- A sustained, long-term and cost-effective investment of resources by all public and private parties, recognizing overall budget parameters affecting Federal, State, Tribal, and local governments.
- A unified effort to implement the collaborative framework called for in the Strategy in a manner that ensures timely decisions at each level.
- Accountability for measuring and monitoring performance and outcomes, and a commitment to factoring findings into future decision making activities.

- The achievement of national goals through action at the local level with particular attention on the unique needs of cross-boundary efforts and the importance of funding on-the-ground activities.
- Communities and individuals in the wildland-urban interface to initiate personal stewardship and volunteer actions that will reduce wildland fire risks.
- Management activities, both in the wildland-urban interface and in at-risk areas across the broader landscape.
- Active forestland and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal and utilization, prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives.

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

1.1.2.2 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 a selection, as appropriate for the specific county, of representatives from the below listed groups 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 Homeland Security
- 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. The decision authority regarding projects rests with the body designated to make such decisions under the Idaho Code. If the proposed project is within the county, then the Board of County Commissioners is the deciding entity, except for those projects within the area controlled by a city council, fire district, or separate road district commissioners. Recommendations made by ad hoc groups with expertise in the subject in question are generally carefully considered; however, the final decision must be made by the entity authorized by the Idaho Code.

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 or rangelands).
 - **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 Owyhee 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 (Bureau of Land Management, US Bureau of Reclamation, and US Fish and Wildlife Service) with implementing

wildfire mitigation projects in Owyhee 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 Sage Grouse Management Plan

Adopted in June 2000 and amended and updated in August 2004, the Owyhee County Sage Grouse Management Plan was developed by a local working group with extensive knowledge of the local area and the localized threats to the species. The plan was developed to serve as a long-term collaborative management plan to utilize local input and knowledge to develop a long-term collaborative management plan which would provide the framework for sage grouse management in conjunction with federal, state and Owyhee County land management plans and actions. This plan provides guidance to resource and land management agencies as well as to Owyhee County on dealing with issues that directly or indirectly affects the Local Working Group's goal of conserving and properly managing Sage Grouse within Owyhee County. While the initial version proposed a number of action items, its primary emphasis was to acquire sound scientific data on sage grouse and sage grouse habitat in Owyhee County. Through the August 2004 amendment and update, the local working group modified the plan to ensure it was PECE (Policy for Evaluating Conservation Efforts) compliant as the PECE conditions had not been in existence at the time of development of the original plan. The update was also used to ensure that the emphasis of the plan's action projects was appropriately balanced between conservation projects and the continuation of needed research into sage grouse populations and habitat.

Fire is the greatest single factor responsible for the loss of Sage Grouse habitat in southeastern Owyhee County. Many of the fires occurred in the more arid Wyoming big-sagebrush habitat type, covered large areas and were often followed by increases in annual grasses, especially cheatgrass. There is very limited opportunity to restore these areas to their former state and they essentially represent a stable state that will not change without substantial human intervention. The increase in fine fuel in the form of cheatgrass has made these habitats more prone to fire and increased fire frequencies that result in loss of shrubs, especially sagebrush. Sagebrush seed is wind-dispersed and 95% is deposited within 30 feet of the parent plant, which largely precludes natural reseeding of large complete burns.

At the same time, areas that have not had wildfire recurrence for 15 to 20 years typically show substantial sagebrush recruitment, especially at the higher elevation range for Wyoming big-sagebrush and natural Mountain big-sagebrush communities. In addition, Mountain big-sagebrush typically re-established rather rapidly and such habitats may be fully occupied by big-sagebrush in 20 to 30 years.

Action plan activities identified in the Sage Grouse Management plan include:

1. **Grazing Management.** Sage grouse habitat condition will be assessed through quantitative assessments conducted in accordance with the SAGE GROUSE HABITAT INVENTORY ACTION PLAN on state and private land.
2. **Develop maps that identify sage grouse habitat for high priority protection from wildfire.** Using current information, provide maps to the fire management staff of all groups that fight fires in Owyhee County outlining critical sage grouse habitat in the county. Initial maps will be developed for the 2000 fire season and updated annually thereafter. (Lead: BLM). (Initial maps completed in 2001 and updates are ongoing).

3. **Fire Rehabilitation.** The sites of all future wildfires in high priority sage grouse habitat identified in Section C will, regardless of potential for natural recovery, be reseeded with sagebrush and, when needed, grasses and forbs best adapted to the site to hasten recovery of the habitat. This policy should be instituted immediately. (Lead: Appropriate land management agency or private landowner). (The action has been carried out since 2000 and is ongoing).
4. **Sagebrush Restoration.** Implement sagebrush restoration projects in historic sage grouse habitat where historic fires have removed sagebrush cover. A minimum of 1,000 acres of combined federal, state, and private lands shall be targeted for restoration annually with seed mixtures that are best for sage grouse and adapted to the site. (Lead: Appropriate land management agency or private landowner) (One project has been proposed and is being pursued but none completed).
5. **Juniper Encroachment.** Using the maps created by the Habitat Inventory Action Plan, identify existing and potential loss of sage grouse habitat due to juniper encroachment. The areas of greatest benefit to sage grouse will be prioritized so that juniper control activities can be scheduled. Suitable methods of juniper eradication such as prescribed burning, chemical control, woodland harvest, chaining, and other mechanical means should be evaluated and employed where appropriate. Treat and eradicate juniper on a minimum of 500 acres of state land (IDL Plan) and 12,000 acres of federal land (Owyhee RMP) annually to enhance sage grouse habitat by restoring healthy sagebrush-grassland communities. (Lead: Appropriate land management agency/authority). (Two projects have been completed and planning is in progress throughout the Juniper encroachment zone)

The Owyhee County Sage Grouse Management Plan has been adopted by the Sage Grouse Local Work Group and represents the guiding policy for the County in relationship to the management of Sage Grouse and impacted land management activities. This Wildland-Urban Interface Wildfire Mitigation Plan adopts, and will adhere to, the policies and intentions of the Sage Grouse Management Plan during its implementation to insure the listed goals and action plans are consistent and targeted at uniform implementation.

1.1.3.2 Owyhee County Comprehensive Growth and Development Plan

The Owyhee County Comprehensive Growth and Development Plan (February 11, 2002) is a guide that establishes goals and objectives to help the County grow and develop. The Owyhee County Comprehensive Plan includes a forecast of conditions that are anticipated to occur within the next twenty-five-year period, 2000 to 2025. The Plan addresses and includes all 14 comprehensive planning components of the "Idaho Local Planning Act of 1975" as supplemented and amended.

Planning is an ongoing process. Conditions and priorities change; consequently the plan will be reviewed regularly and revised when necessary. The 14 planning components included in the Owyhee County Comprehensive Growth and Development Plan include:

1. Population
2. Private Property Rights
3. School Facilities and Transportation
4. Economic Development
5. Land Use
6. Transportation
7. Public Services, Facilities, and Utilities
8. Housing

9. Recreation and Tourism
10. Natural Resources
11. Hazardous Areas
12. Special Areas or Sites
13. Community Design
14. Implementation

Within each chapter of the comprehensive plan are goals and objectives, which help establish development guidelines and public policy. Goals are defined as statements, which indicate a general aim or purpose to be achieved. Goals reflect countywide values. Objectives are defined as guidelines, which establish a definite course to guide present and future decisions. The Owyhee County Comprehensive Plan is directed toward all land within the county including federal, state, public and private lands.

This Wildland-Urban Interface Wildfire Mitigation Plan will “dove-tail” with the County’s Comprehensive Plan during its development and implementation to insure that the goals and objectives of each are integrated together. In many sections of this document, direct reference will be made to specific recommendations of the county plan that are amplified or enhanced in this document.

1.1.3.3 Owyhee County Code and Zoning Ordinance

The lands within Owyhee County which produce the natural resources vital to the local economy are either managed by federal or state agencies or are critically affected by lands managed by such agencies. All private property and county or municipally owned property lying within the County is effected by federal and/or state management practices. Such practices have the potential to, and often do, adversely impact the continuation of the culture, custom and economic stability of the County. By resolution, the Owyhee County Board of Commissioners has previously established a land use planning committee which has served as an advisory committee to the Board regarding planning for and implementation of plans for the federally and state managed lands lying within Owyhee County. That committee has assisted the Board with the development of a land use plan for the federally and state managed lands, and it has become clear that the planning process for such lands must be a long-term undertaking if the custom, culture and economic stability of Owyhee County is to be preserved. The purpose of the Zoning Ordinance is to provide for the land use committee as a standing advisory committee to continue advising the Board regarding the management of the federally and state managed lands lying within Owyhee County and the relationship of that management to continuation of the custom, culture and economic stability of the County.

This Ordinance is authorized by Article 12, Section 2 of the Idaho Constitution, Idaho Code Section §31-714, 31-828, 31-4408, and 31-4504 and is mandated by Idaho Code Section §67-6511 which provides that each board of county commissioners “shall” establish a land use district or districts within the unincorporated area of the county. This zoning ordinance is designed to, and enacted to, protect the public health, safety and welfare by implementing the Owyhee County Comprehensive Plan, and accomplish the following purposes:

- Protect and conserve the historic customs, traditions and way of life unique to Owyhee County, consistent with a reasonable and orderly rate of growth and development and protection of private property rights;
- Protect and conserve the agricultural and range uses which form the primary base of the County’s economy;

- Provide for reasonable and sound land development, a safe and healthy environment, and a successful economic climate;
- Require the coordination by the Planning and Zoning Commission with the Owyhee County Natural Resources Committee to achieve coordinated planning for the entire County and protection of private property rights which are critical to economic stability of the County and to the maintenance of a healthy environment;
- Protect and enhance private property rights and property values consistent with the County's responsibility to protect public health, safety and welfare;
- Minimize infiltration into agricultural land areas of those elements of urban development which will adversely impact agricultural operations;
- Provide a process for negotiating and developing Areas of City Impact.
- Designate land use districts (zoning districts) appropriate for uses that meet the needs of the County's citizens by providing for growth compatible with protection of soil, water, air, wildlife and other natural environmental and scientific qualities;
- Preserve the recreational, archeological, architectural and cultural history of the County and its historic resources;
- Protect and conserve the natural resources in the County by considering the impact on such resources of proposed land uses;
- Maintain, protect, and enhance the County's transportation system;
- Provide a means for administering the land use planning process in a manner which can assist school districts to maintain, protect and enhance school facilities and school transportation systems;
- Provide a means for administering the land use planning process in a manner that can assist providing public services at reasonable cost and avoid adverse impact of land use growth on the County's taxpayers;
- Provide an administrative process to effectively implement the Comprehensive Plan and this implementing ordinance.

1.1.3.4 Owyhee County Land Use and Management Plan for Federal and State Managed Lands

This Plan provides a positive guide for the Land Use Committee and the Board to coordinate their efforts with federal and state land management agencies in the development and implementation of land use plans and management actions which are compatible with the best interests of Owyhee County and its citizens. The Plan is designed to facilitate continued and revitalized multiple use of federally and state managed lands in the County.

The Land Use Committee, the Board, and the citizens of Owyhee County recognize that federal law mandates multiple use of federally managed lands and they positively support multiple use. Maintenance of such multiple use necessarily includes continued maintenance of the historic and traditional economic uses which have been made of federally managed and state managed lands in the County. It is therefore the policy of Owyhee County that the Land Use Committee and the Board work constantly to assure that federal and state agencies shall inform the Board of all pending or proposed actions affecting local communities and citizens and coordinate with the Board in the planning and implementation of those actions.

Owyhee County has previously developed its Comprehensive Plan related to privately owned lands in the County. This Land Use Plan is now directed toward management of federally and state managed lands. With adoption of this Plan the County puts in place a "Comprehensive Plan" which includes "all land within the jurisdiction of the governing Board" as directed by the legislature. Idaho Code § 67-6528 provides that "the state of Idaho, and all its agencies, Boards, departments, institutions, and local special purpose districts, shall comply with all plans and ordinances adopted under the Local Planning Act." These statements of purpose, of duty to plan, and duties of state agencies to comply with plans adopted under the Local Planning Act certainly contemplate coordination by state agencies of their planning efforts with the local planning efforts of Owyhee County.

Through the land use planning process Owyhee County commits itself to attempting to assure that all natural resource decisions affecting the County shall be guided by the principles of maintaining and revitalizing multiple use of federally managed and state managed lands, protection of private property rights and private property interests including investment backed expectations, protection of local historical custom and culture, protection of the traditional economic structures in the County which form the base for economic stability for the County, the opening of new economic opportunities through reliance on free markets, and protection of the right of the enjoyment of the natural resources of the County by all citizens of the County and those communities utilizing those natural resources within the County. Owyhee County is convinced that resource and land use management decisions made in a coordinated manner by federal management agencies, state management agencies and county officials will not only firmly maintain and revitalize multiple use of federally and state managed lands in Owyhee County but will enhance environmental quality throughout the County.

1.1.3.5 Owyhee Resource Management Plan

The Owyhee Resource Management Plan (RMP) was prepared to provide the Bureau of Land Management, Lower Snake River District with a comprehensive framework for managing public lands administered by the Owyhee Resource Area. The purpose of the RMP is to ensure public land use is planned for and managed on the basis of multiple-use and sustained yield in accordance with the Federal Land Policy and Management Act of 1976 (FLPMA).

The Owyhee Resource Area encompasses 1,779,492 acres. This total includes the following:

- 1,320,032 acres administered by BLM, Idaho
- 136,936 acres administered by the State of Idaho
- 319,777 acres of private lands
- 2,747 acres of water, primarily the Snake River

The area is bounded on the west by Oregon, on the south by Nevada, on the north by the Snake River and on the east by Castle Creek, Deep Creek, the Owyhee River, and the Duck Valley Indian Reservation. Most of the public lands are contiguous with only a few scattered or isolated parcels.

The resource area contains the northern extent of the Owyhee Mountain Range and lies within what is often referred to as the Columbia Plateau. The Columbia Plateau is an elevated plateau with mountains which are separated by canyons draining to the Pacific Ocean via the Snake and Columbia Rivers. This broad regional landform and vegetative classification is known as the Intermountain Sagebrush Province/Sagebrush Steppe Ecosystem.

The Sagebrush Steppe Ecosystem is widespread over much of southern Idaho, eastern Oregon and Washington, and portions of northern Nevada, California, and Utah. This ecosystem contains a large diversity in landform and vegetation types ranging from vast expanses of flat

sagebrush covered plateaus to rugged mountains blanketed with juniper woodlands and grasslands.

BLM has three primary levels of land use planning decisions; the RMP level, the activity level and the site specific level. This RMP focuses mostly on broad resource objectives and direction. However, it also provides some activity level guidance and includes some site specific decisions. Several existing activity level plans are referenced in this RMP. They will be updated or modified, as necessary, to include current information and be in conformance with the RMP. These plans include, but are not limited to, the Owyhee Off-Road Vehicle Management Plan, the Wild Horse Herd Management Plan, the Lower Snake River District Fire Management Plan, the Owyhee Juniper Woodland Harvest Management Plan, the Snake River Birds of Prey National Conservation Area Management Plan, the Owyhee River Recreation Management Plan and several livestock grazing allotment management plans. Subsequent activity level and site specific level planning processes will include appropriate public participation opportunities and NEPA compliance.

1.1.3.6 Owyhee 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.

1.1.3.6.1 Mission Statement

To make Owyhee 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.

1.1.3.6.2 Vision Statement

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

1.1.3.6.3 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 Owyhee County

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

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 Owyhee 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 Owyhee County. This included an area encompassing Ada, Canyon, Elmore, and Twin Falls to insure a robust dataset for making inferences about fires in Owyhee County specifically; this included a wildfire extent and ignition profile.
2. **Field Observations and Estimations** about wildfire risks including fuels assessments, juxtaposition of structures and infrastructure to wildland fuels, access, and potential treatments by trained wildfire specialists.
3. **Mapping** of data relevant to wildfire control and treatments, structures, resource values, infrastructure, fire prone landscapes, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning committee, to a public mail survey, news releases, public meetings, public review of draft documents, and acceptance of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, providing ample review and integration of committee and public input, followed by acceptance of the final document.

Planning efforts were led by the Project Director, Dr. William E. Schlosser, of Northwest Management, Inc. 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 Leader, Mr. Toby R. Brown, holds a B.S. degree in natural resource management. 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 Owyhee County Wildland-Urban Interface Wildfire Mitigation Planning Committee, news releases were submitted to area news papers.

2.2.1.1 Newspaper Articles

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

Owyhee County Plans to Mitigate Wildfire Risk

The Owyhee County Commissioners have created a Wildfire Mitigation Plan Committee to complete a Wildfire Mitigation Plan for Owyhee County as part of the National Fire Plan authorized by Congress and the Whitehouse. The Owyhee County Wildfire Mitigation Plans will include risk analysis at the community level with predictive models for where fires are likely to ignite and where they are likely to spread rapidly once ignited. Northwest Management, Inc. has been retained by Owyhee County to provide wildfire risk assessments, mapping, field inspections, and interviews, and to collaborate with the committee to prepare the plan. The committee includes rural and wildland fire districts, land managers, elected officials, agency representatives, and others. Northwest Management, Inc. specialists are conducting analyses of fire prone landscapes and making recommendations for potential treatments. Specific activities for homes, structures, infrastructure, and resource capabilities will be proposed as part of the analysis.

One of the most important steps in gathering information about fire risk in Owyhee County is to conduct a homeowner's survey. Northwest Management, Inc., in cooperation with local fire officials, will mail a brief survey to randomly selected homeowners in the county seeking details about home construction materials, proximity to water sources, and other risk factors surrounding homes. This survey is very important to the success of the plan. Those homes that receive a survey are asked to please take the time to complete it, thereby benefiting the community overall.

The planning team will be conducting Public Meetings to discuss preliminary findings and to seek public involvement in the planning process in October. A notice on the date

and location of these meetings will be posted in local newspapers.

For more information on the Fire Mitigation Plan projects in Owyhee County contact your County Commissioner, or William Schlosser at the Northwest Management, Inc. office in Moscow, Idaho at 208-883-4488.

2.2.2 Public Mail Survey

In order to collect a broad base of perceptions about wildland fire and individual risk factors to homeowners in Owyhee County, a mail survey was conducted. Using a state and county database of landowners in Owyhee 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 Owyhee County, as well as a mailing address in Owyhee County. This database created a list of 1,874 unique names to which were affixed a random number that contributed to the probability of being selected for the public mail survey. A total of 244 residents 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 IV.

The first in the series of mailing was sent September 21, 2004, and included a cover letter, a survey, and an offer of receiving a custom GIS map of the area of their selection in Owyhee 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 October 2, 2004, encouraging their response. A final mailing, with a revised cover letter pleading with them to participate, was sent to non-respondents on October 19, 2004.

Surveys were returned during the months of September, October, and November. A total of 71 residents responded to the survey out of 244. No surveys were returned as undeliverable. The effective response rate for this survey was 34%. Statistically, this response rate allows the interpretation of all of the response variables significantly at the 95% confidence level. This data will be updated until the final plan.

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.

All of the respondents to the survey have a home in Owyhee County, and 97% consider this their primary residence. About 33% of the respondents were from the Homedale area, 32% were from the Marsing area, 14% were from the Bruneau area, 6% from Murphy, 4% from Oreana, 1% from Eagle View with the remainder from other areas in the County.

Only 91% of the respondents identified that they have emergency telephone 911 services in their area. The entire county is covered with 911 service so almost 1 in 10 residents did not know they had 911 service. Their ability to correctly identify if they are covered by a rural fire district was 94%. Of the respondents, 98% correctly identified they live in an area protected by a rural or city fire district. Only 2% responded they do not have a fire district covering their home,

when in fact they do. Approximately 4% of the respondents indicated that they were inside of a fire protection district when in reality they are outside of a protection district.

Respondents were asked to indicate the type of roofing material covering the main structure of their home. Approximately 63% of respondents indicated their homes were covered with a composite material (asphalt shingles). About 21% indicated their home were covered with a metal (eg., aluminum, tin) roofing material. Roughly 16% of the respondents indicated they have a wooden roofing material such as shakes or shingles. The remaining 5% of respondents had a variety of combustible and non-combustible materials indicated.

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

Table 2.1. Vegetation characteristics around homes.

Height of Vegetation	Within 75 feet of your home
None	16%
0-2 feet	36%
2-5 feet	16%
Greater than 5 feet	33%

Approximately 83% of those returning the survey indicated they have a lawn surrounding their home. Of these individual homesites, 98% indicated they keep this lawn green through the fire season. 42% of respondents indicated that they had brush within 75 feet of their homes and 59% had some kind of tree or trees within 75 feet of their home.

The average driveway length of the respondents was approximately 974 feet long (.18 mile), from their main road to their parking area. The longest reported driveway was 3 miles long. Only 39% of the driveways had turnouts allowing two vehicles to pass each other in the case of an emergency. 14% of the driveways were of native dirt, 77% were graveled or rocked and 9% paved. Respondents were asked if they had an alternative vehicle escape route from their property, 67% indicated that they did, with 37% having no alternative escape route.

Roughly 14% of the respondents in Owyhee County indicated they have someone in their household trained in wildland fire fighting. Approximately 19% indicated someone in the household had been trained in structural fire fighting. Roughly 18% had Emergency Medical Technician training and 71 % basic CPR/First Aid training. 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 series of questions was asked regarding the availability of a variety of fire fighting resources that were around the respondents property; 97% had hand tools appropriate for fighting wildfire, 12% had a portable water tank and 9% had a stationary water tank, while 39% had a pond, lake or stream on their property. The ability to pump water was on 13% of the properties and 33% had some type of mechanical equipment that could be used to fight wildland fires.

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 2.2).

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

Table 2.2. Fuel Hazard Rating Worksheet		Rating	Results
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	1	86%
	Medium size fuels (brush, large shrubs, small trees)	2	13%
	Heavy, large fuels (woodlands, timber, heavy brush)	3	1%
Slope Hazard	Mild slopes (0-5%)	1	83%
	Moderate slope (6-20%)	2	13%
	Steep Slopes (21-40%)	3	4%
	Extreme slopes (41% and greater)	4	0%
Structure Hazard	Noncombustible roof and noncombustible siding materials	1	23%
	Noncombustible roof and combustible siding material	3	20%
	Combustible roof and noncombustible siding material	7	17%
	Combustible roof and combustible siding materials	10	40%
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.

$$\begin{array}{rcl}
 \text{Fuel hazard} & \underline{1.6} & \times \text{Slope Hazard } \underline{1.2} = \underline{2.11} \\
 \text{Structural hazard} & + & \underline{6.3} \\
 \text{Additional factors} & (+ \text{ or } -) & \underline{-2.3} \\
 \text{Total Hazard Points} & = & \underline{6.11}
 \end{array}$$

Table 2.3. Percent of respondents in each risk category as determined by the survey respondents.

00% – Extreme Risk = 26 + points
03% – High Risk = 16–25 points
35% – Moderate Risk = 6–15 points
62% – Low Risk = 6 or less points

Maximum household rating score was 17 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”. Anecdotal evidence would indicate that Owyhee County landowners involved in this survey have a more realistic view of wildfire risk than the landowners in other Idaho counties where these questions have been asked.

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?” 42% 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 2.4. 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	26%	21%	53%
Community Defensibility Projects	45%	45%	10%
Infrastructure Projects Roads, Bridges, Power Lines, Etc.	62%	21%	16%

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 Owyhee County Wildland-Urban Interface Wildfire Mitigation Plan’s preparation.

- Jim Desmond Owyhee County Natural Resources Committee Director
- Andy Ogden Idaho Dept Fish and Game
- Brett Endicott Owyhee County Assessor
- Richard Freund Owyhee County Sheriffs office
- Kay Kelly Owyhee County Planning and Zoning
- Kevin Staebler Mountain Home AFB Fire Chief
- Carrie Bilbao BLM Fire Investigation
- Joe-Riley Epps BLM Fire Management Officer
- Toby R. Brown Northwest Management Inc.
- William Schlosser Northwest Management Inc.
- Brent Hunter Sho-Pai Fire Management
- Jerry Hoagland Owyhee County Natural Resource Committee
- Larry Howard County Emergency Management Coordinator
- Shirley Fuchs Owyhee County Assessors Office
- Rosey Thomas Bureau of Land Management
- Tom Benson Fire District Commissioner MRW

Committee Meetings were scheduled and held on the following dates:

September 21, 2004

Bill Schlosser began by giving the committee an introductory presentation of what was expected of each party and what materials they would need to provide in order to make a successful plan. He went over each of the major points of the final document to make sure the committee understood the scope of the project. He also provided some background information on NMI and the history of the fire mitigation program. Several preliminary maps were displayed showing some of the fire-related characteristics in the county.

After the presentation, the committee had a general discussion about some of the major issues in the county including the Silver City area, the sage grouse, juniper encroachment, current treatments, and past fires.

Bill discussed the draft document of the community assessments and asked the committee if there were any additional communities they would like included. Dynamac Corporation has already completed an assessment and mitigation plan for the Silver City area and the committee would like this document used in addition to NMI's assessments.

The committee discussed the different fire districts within the county at length including the Jordan Valley Department, which crosses the county border. A fire department has also been proposed in Silver City.

A tentative schedule was discussed. The committee would like the public meetings on November 3rd and 4th in Marsing, Grandview, and Murphy.

October 13, 2004

The committee began the meeting by reviewing the maps provided by Northwest Management, Inc. Toby handed out the draft version of the community assessments for the committee members to review and provide comments to at the next meeting or via email. Toby also went over the information needed to complete the assessments for the final document. Public meeting dates were set for November 3rd, 4th, and 5th.

The committee also discussed potential mitigation activities for the Silver City area, which is one of the county's higher risk areas. Suggestions included: water storage tanks at the town site, bigger waterlines, and a helipad.

November 29, 2004

A short committee meeting was held to go deliver the draft document and go over any changes. Members were asked to review the draft and email or fax any changes to NMI.

2.2.4 Public Meetings

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

Formal public meetings were scheduled on November 3 & 4, 2004, in Grandview, Marsing, and Murphy, Idaho. The purpose of the meetings was to share information on the planning process with a broadly representative cross section of Owyhee County landowners. The meetings had wall maps posted in the meeting rooms with many of the analysis results summarized specifically for the risk assessments, location of structures, fire protection, and related information. The formal portion of the presentations included a PowerPoint presentation made by Project Co-Leader, Toby R. Brown. During his presentation, comments from committee members, fire chiefs, and others were encouraged in an effort to engage the audience in a discussion.

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

The formal presentations lasted approximately 1 hour and included many questions and comments from the audience. Following the meeting, many discussions continued with the committee members and the general public discussing specific areas, potential treatments, the risk analysis, and other topics.

Committee meetings were scheduled and held on the following dates:

November 3, 2004 – Marsing

Toby Brown of Northwest Management, Inc. made the presentation and then opened the floor for discussion. Topics discussed included:

- There are some additional areas within the county that need to be covered by a rural fire district.
- Need wildfire training to come to the firefighters during their regular training times.
- Need more wildfire education throughout the county.
- Need minimum road specifications for private roads and driveways. Also need a method of enforcement.
- There needs to be a way for the BLM to notify fire districts when fires enter their jurisdiction.
- Need to incorporate islands of non-coverage into local fire districts.

November 4, 2004 – Murphy

Toby Brown of Northwest Management, Inc. made the presentation and then opened the floor for discussion. Topics discussed included:

- Silver City would be trapped in the event of a wildfire; thus, the back road out of the area needs improvement.
- Grazing in the valley and along roads has been beneficial.
- Need to address the juniper encroachment issue.
- Need to improve communication capabilities, structures, and training for fire districts.
- Need to fill in gaps between fire districts.
- Need to upgrade to narrow band radios and alleviate communication dead spots throughout the county.
- BLM field stations to place fire crews throughout the county would improve response.
- Create new district for the Pleasant Valley and Cliffs area.
- Need to map and locate water sources including drafting sites.
- Need to rock roads in WUI due to dust problems.
- Develop a safety zone near Silver City.

November 3, 2004 – Grandview

There was no presentation in Grandview because no one attended.

2.2.4.1 Meeting Notices

Public notices of these meetings were printed in the **Idaho Press and Owyhee Avalanche** the week of October 24, 2004.



Owyhee County, Idaho Wildland-Urban Interface Wildfire Mitigation Plan

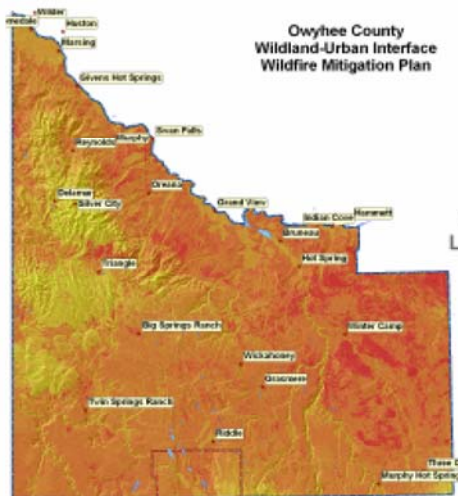


Southwest
Idaho RC&D

Public Meetings!

- **Marsing:** November 3rd, at 12:00 noon at the Marsing Community Center, 126 N. Bruneau Hwy
- **Grandview:** November 3rd, at 7:00 PM at the Eastern Owyhee County Library, 520 Boise Ave
- **Murphy:** November 4th, at 7:00 pm at the Courthouse, Highway 78

Public meetings are scheduled in Marsing, Grandview, and Murphy, November 3 & 4, to address Wildfire risks around our communities. These meetings are open to the public and will include presentations from wildfire mitigation specialists working on the Owyhee County Wildfire Mitigation Plan. Public input is being sought in order to better frame the County's efforts of fuels treatments, fire fighting resource enhancements, and public land management.



Learn about the assessments of risk (Fire Prone Landscapes - above, left) and the Wildland-Urban Interface of Owyhee County (above, right). Discuss YOUR priorities for how Owyhee County can best mitigate wildland fire risks around your community. **JOIN US!**

Each meeting will last for approximately 1.5 hours and include refreshments, a slideshow, information on the planning process, and schedules for completion.

For more information on Wildfire Mitigation Plan projects in Owyhee County, contact your County Commissioners, Bill Moore with the Southwest Idaho RC&D office at 208-888-1890 ext. 4, or Dr. William Schlosser at the Northwest Management, Inc. office in Moscow, Idaho at 208-883-4488.

2.3 Review of the WUI Wildfire Mitigation Plan

Review of sections of this document was conducted by the planning committee during the planning process as maps, summaries, and written assessments were completed. These planning committee members included fire mitigation specialists, fire fighters, planners, elected officials, and others involved in the coordination process. Preliminary findings were discussed at the public meetings, where comments were collected and facilitated.

The results of these formal and informal reviews were integrated into a DRAFT Wildland-Urban Interface Wildfire Mitigation Plan. This plan was given to members of the planning committee on November 29, 2004. The committee review process lasted from November 29 through December 31, 2004. Once changes were made, a public review version of the plan was posted at local libraries, the county courthouse, and other locations (accompanied by a press release detailing the public review process and plan availability). The public review period was open from January 15, 2005, through February 25, 2005.

Comments from the public review process were integrated into the final plan and submitted to the County Commissioners for a final review. Adoption of the plan by the county and local municipalities was completed in March 2005.

Chapter 3: County Characteristics & Risk Assessment

3 Background and Area Description

3.1 Demographics

Owyhee County experienced a total population increase from 8,392 in 1990 to 10,644 in 2000 with approximately 4,452 housing units. Owyhee County has three incorporated communities, Grand View (pop. 461), Marsing (pop. 915), and Homedale (pop. 2,552). The total land area of the county is roughly 7,696.71 square miles (4,925,894.4 acres).

Table 3.1 summarizes some relevant demographic statistics for Owyhee County.

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

Subject	Number	Percent
Total population	10,644	100.0
SEX AND AGE		
Male	5,588	52.5
Female	5,056	47.5
Under 5 years	816	7.7
5 to 9 years	934	8.8
10 to 14 years	1,013	9.5
15 to 19 years	874	8.2
20 to 24 years	635	6.0
25 to 34 years	1,276	12.0
35 to 44 years	1,557	14.6
45 to 54 years	1,285	12.1
55 to 59 years	476	4.5
60 to 64 years	466	4.4
65 to 74 years	718	6.7
75 to 84 years	455	4.3
85 years and over	139	1.3
Median age (years)	33.5	(X)
18 years and over	7,309	68.7
Male	3,817	35.9
Female	3,492	32.8
21 years and over	6,904	64.9
62 years and over	1,549	14.6
65 years and over	1,312	12.3
Male	608	5.7
Female	704	6.6
RELATIONSHIP		

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

Subject	Number	Percent
Population	10,644	100.0
In households	10,575	99.4
Householder	3,736	35.1
Spouse	2,346	22.0
Child	3,630	34.1
Own child under 18 years	3,065	28.8
Other relatives	547	5.1
Under 18 years	232	2.2
Nonrelatives	316	3.0
Unmarried partner	117	1.1
In group quarters	69	0.6
Institutionalized population	61	0.6
Noninstitutionalized population	8	0.1
HOUSEHOLDS BY TYPE		
Households	3,736	100.0
Family households (families)	2,789	74.7
With own children under 18 years	1,426	38.2
Married-couple family	2,367	63.4
With own children under 18 years	1,163	31.1
Female householder, no husband present	281	7.5
With own children under 18 years	184	4.9
Nonfamily households	947	25.3
Householder living alone	818	21.9
Householder 65 years and over	361	9.7
Households with individuals under 18 years	1,551	41.5
Households with individuals 65 years and over	1,273	34.1
Average household size	2.83	(X)
Average family size	3.34	(X)
HOUSING TENURE		
Occupied housing units	3,710	100.0
Owner-occupied housing units	2,585	69.7
Renter-occupied housing units	1,125	30.3
Average household size of owner-occupied unit	2.85	(X)
Average household size of renter-occupied unit	2.84	(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, P17, P18, P19, P20, P23, P27, P28, P33, PCT5, PCT8, PCT11, PCT15, H1, H3, H4, H5, H11, and H12.

3.2 Socioeconomics

Owyhee County had a total of 4,452 housing units (3,710 occupied) and a population density of 1.4 persons per square mile reported in the 2000 Census. Ethnicity in Owyhee County is distributed: white 76.9%, black or African American 0.2%, American Indian or Alaskan Native 3.2 %, Asian 0.5%, Hispanic or Latino 23.1%, and some other race 16.5%.

Specific economic data for individual communities is collected by the US Census; in Owyhee County this includes Grand View, Marsing, and Homedale. Grand View households earn a median income of \$21,417 annually, Marsing has a median income of \$27,639, and Homedale reported a median income of \$24,196, all of which compares to the Owyhee County median income during the same period of \$28,339. Table 3.2 shows the dispersal of households in various income categories in Owyhee County.

Table 3.2 Income in 1999.	Owyhee County	
	Number	Percent
Households	3,736	100.0
Less than \$10,000	435	11.6
\$10,000 to \$14,999	406	10.9
\$15,000 to \$24,999	771	20.6
\$25,000 to \$34,999	632	16.9
\$35,000 to \$49,999	665	17.8
\$50,000 to \$74,999	471	12.6
\$75,000 to \$99,999	181	4.8
\$100,000 to \$149,999	115	3.1
\$150,000 to \$199,999	30	0.8
\$200,000 or more	30	0.8
Median household income (dollars)	28,339	(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 Owyhee County, a significant number, 14.2%, of families are at or below the poverty level (Table 3.3).

Table 3.3 Poverty status in 1999 (below poverty level).	Owyhee County	
	Number	Percent
Families	395	(X)
Percent below poverty level	(X)	14.2
With related children under 18 years	296	(X)
Percent below poverty level	(X)	19.3
With related children under 5 years	151	(X)
Percent below poverty level	(X)	25.2
Families with female householder, no husband present	106	(X)
Percent below poverty level	(X)	37.7
With related children under 18 years	77	(X)
Percent below poverty level	(X)	35.0
With related children under 5 years	33	(X)
Percent below poverty level	(X)	54.1

Table 3.3 Poverty status in 1999 (below poverty level).		Owyhee County	
		Number	Percent
Individuals		1,781	(X)
Percent below poverty level		(X)	16.9
18 years and over		1,083	(X)
Percent below poverty level		(X)	14.9
65 years and over		154	(X)
Percent below poverty level		(X)	12.1
Related children under 18 years		687	(X)
Percent below poverty level		(X)	20.8
Related children 5 to 17 years		473	(X)
Percent below poverty level		(X)	19.0
Unrelated individuals 15 years and over		331	(X)
Percent below poverty level		(X)	26.4

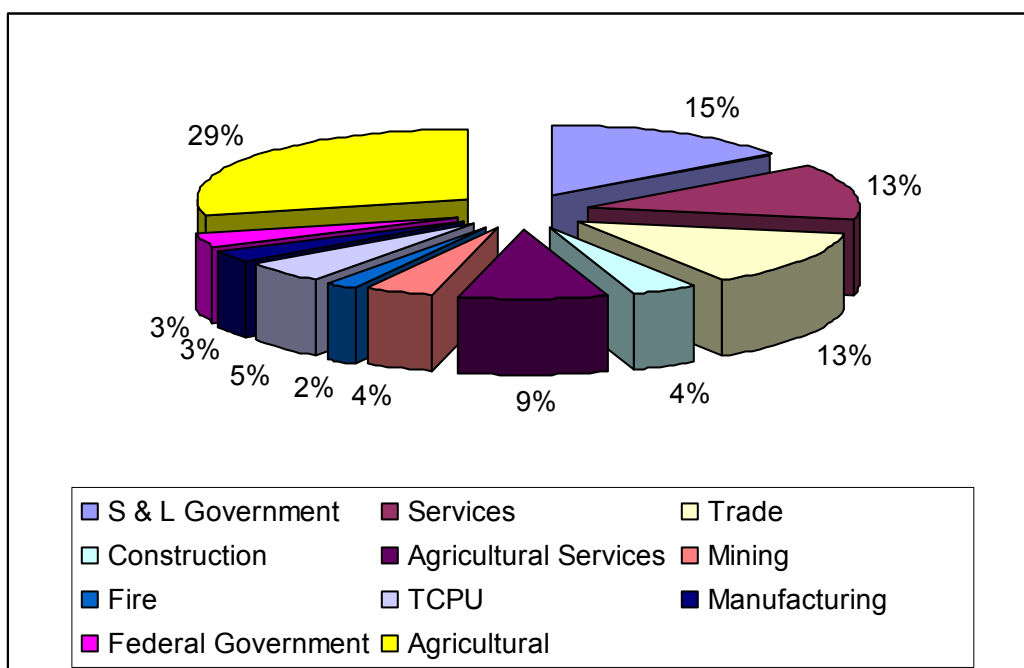
(Census 2000)

The unemployment rate was 4.2% in Owyhee County in 1999, compared to 4.4% nationally during the same period. Approximately 25.5% of the Owyhee 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 (Regional Economic Impact Model of Owyhee County, Idaho and the Four County Area Including Ada, Canyon, Elmore, and Owyhee Counties 2003).

Table 3.4 Output, Employment, and Personal Income in 2000.

Sector	Employment	Output	Personal Income
1 Dairy Farm Products	76	\$23,194,383	\$4,010,796
2 Misc. Livestock	28	\$2,784,633	\$458,498
3 Range Cattle	235	\$23,308,481	\$5,429,547
4 Cattle Feedlots	20	\$7,715,005	\$2,210,728
5 Grains	51	\$5,964,599	\$984,891
6 Forage Crops	494	\$26,895,789	\$4,572,562
7 Misc. Crops	151	\$17,511,735	\$5,250,088
8 Sugar Beets	63	\$7,167,485	\$1,250,225
9 Ag Services	227	\$6,501,637	\$2,836,301
10 Mining	4	\$479,972	\$82,029
11 Construction	251	\$28,547,230	\$12,293,300
12 Manufacturing	156	\$45,730,615	\$6,626,364
13 Transportation and Communication	120	\$12,261,124	\$2,277,678
14 Gas and Electric Services	15	\$10,485,643	\$1,381,683
15 Irrigation, Sanitation, and Water Serv.	72	\$18,896,515	\$3,466,995
16 Wholesale Trade	48	\$3,080,621	\$1,257,856
17 Retail Trade	76	\$1,667,722	\$741,160
18 Food Stores	156	\$7,324,724	\$3,937,894
19 Automotive Dealers & Service Stations	69	\$2,877,000	\$1,160,671

Figure 3.1. Employment by Sector, 1995.



Source: 1998 Bureau of Economic Analysis, U.S. Department of Commerce

Approximately 70.7% of Owyhee County's employed persons are private wage and salary workers, while around 14.5% are government workers (Table 3.5).

Table 3.5 Class of worker.	Owyhee County	
	Number	Percent
Private wage and salary workers	3,101	70.7
Government workers	637	14.5
Self-employed workers in own not incorporated business	612	13.9
Unpaid family workers	39	0.9

(Census 2000)

3.2.1 European Settlement of Owyhee County

Information summarized from <http://owyheecounty.net/profile/>.

On December 31, 1863, Owyhee became the first county created by the newly-formed Idaho territorial legislature. Owyhee is the second largest county in Idaho.

The name, Owyhee, comes from early fur trappers. In 1819, three natives from Hawaii, part of Donald McKenzie's fur-trapping expedition, were sent to trap a large stream that emptied into the Snake River. When they did not return, McKenzie investigated and found one man murdered in camp and no sign of the others. The stream was named in their honor. "Owyhee" is an early spelling for the word Hawaii.

The Oregon Trail, the earliest road in the area, was used by emigrants for over 30 years on their long trip to the Oregon country. The part of the Trail in Owyhee County was known as the South Alternate Route or "dry route". The Owyhee road was shorter but much harder than the main trail.

Gold was discovered in rich placer deposits in the Owyhee Mountains in May, 1863. A search for the source of the gold led to quartz ledges on War Eagle Mountain. Before the fall of 1863 several hard-rock mines were being developed. Three towns grew to supply the miner's needs.

Booneville, Ruby City and Silver City were the first three settlements in the county. Only Silver City still stands, its well-preserved buildings a silent testimonial to the lively mining days. The beautiful ruby silver ore and the wealth of gold taken from the mountains made the mining district world famous.

While Ruby City was named the first county seat, its population and businesses soon moved to a better location two miles upstream on February 1, 1867. Silver City was closer to most of the mining operations and had a better winter location. In 1934, after the decline of mining, the county government was moved to Murphy, more central to the livestock and agricultural sections of the country. The first large cattle drive into Idaho came into the Bruneau Valley in Owyhee County in the fall of 1869. It took almost a year for several Owyhee County men to bring 1,400 head of Texas cattle up from the Brazos. These Durham cattle along with a few Texas Longhorns formed the nucleus of the County's beef industry. At one time 100,000 head roamed the Owyhee hills.

About the first day of May, 1863, a party of 29 men led by Michael Jordan left Placerville on a prospecting tour of the tributaries of the Owyhee and Snake Rivers. They crossed the Snake River at the mouth of the Boise River. A stream near their first camp was named Reynolds Creek to honor the party's "laziest man." While camped at Reynolds Creek, two of the men climbed the divide southwest of camp on a tour of observation. On the other side they discovered a large stream surrounded by timber-covered hills.

The next morning the entire group headed in the direction of the reported stream. They reached it late in the afternoon of May 18th, at a point they named Discovery Bar about ten miles below the later site of Dewey.

Dr. Rudd, not waiting to unpack his mule, took his shovel and scooped some loose gravel from the creek bank. He "panned it out," recovering about a hundred "colors." Each man followed suit, finding prospects of 25¢ to 50¢ to a pan. The excitement that followed can be better imagined than described.

3.3 Description of Owyhee County

Owyhee County lies in the southwestern corner of Idaho and is the second largest county in the state. It is bounded on the north by Canyon, Ada, and Elmore Counties, on the west by Oregon State, on the south by Nevada State, and on the east by Twin Falls County.

Owyhee is a large county covering approximately 7,700 square miles. Eighty-four percent of that land is federally owned with the majority managed by the BLM. There are currently 190,500 total acres (4% of the total area of the County) used for agricultural production.

The topography generally slopes from the southwest to the Snake River in the northeast. The greatest elevations occur in the Owyhee Mountains with Hayden Peak at 8,401 feet being the highest point. The lowest elevations are found along the Snake with Homedale at 2,210 feet and Marsing 2,230 feet. The geographic center of Owyhee County averages about 5,000 feet with Grasmere and Triangle at 5,126 feet and 5,280 feet, respectively.

Owyhee County has a semi-arid, mild climate; rainfall varies from four to eighteen inches a year. Farming is almost exclusively through irrigation. Approximately 80,000 acres receive one or more irrigations per year. The climate and soil conditions are suitable for the production of a

variety of crops, including alfalfa seed, hay, sugar beets, potatoes, onions, corn and mixed grain.

The core of the Owyhee County economy is the cattle industry. The majority of the crops grown in Owyhee County are located near the river systems due to the xeric climate and include sugar beets, alfalfa seed, grains, hay, onions, and a few orchard crops. There are several feedlots operating in the county and three large dairies that have recently moved into the area.

3.3.1 Highways

The main highways weaving through the county are U.S. 95 and State Routes 51 and 78. U.S. Highway 95 bisects the northwestern corner Owyhee County near Homedale and Marsing. U.S. 95 is the sole route connecting northern and southern Idaho. State highways serve to connect the more rural areas to main transportation routes in neighboring counties. Highways 78 and 55 are also the only paved routes connecting the small rural communities in the eastern and southern portions of the county to more populated areas to the northwest. Heavy recreational and large truck traffic is particularly intense during the summer and fall and the harvest season.

3.3.2 Rivers

The three major rivers in the county are the Snake River, the Bruneau River, and the Owyhee River. These waterways were historically, and are still today, important aspects of the farming and ranching operations which are the most significant elements in the County economy. Other important bodies of water of importance to agriculture and ranching in the county are C.J. Strike Reservoir and numerous canals and ditches, all of which provide water for agricultural purposes. In addition to the agricultural value of the waters in C.J. Strike, the waters there also serve in the production of electric power via a generating plant operated by Idaho Power.

3.3.3 Recreation

The federally and state managed lands within the county allow for a wide variety of recreational activities ranging from jet boating to remote area camping to off-highway vehicle activities. Hunting and fishing are also popular on the lands and waters of the county. The Silver City Historic District is popular for both recreational activities as well as for the historical experience of visiting the preserved townsite. While recreational activity in Owyhee County is producing some economic benefits to the state economy, it is, unfortunately, not benefiting the economy of Owyhee County.

The lands and waters in Owyhee County are dangerous and unforgiving of the unprepared or careless. Because of the large land area and sparse population, help is not nearly as readily available as it would be in many other southern Idaho counties. Caution should be exercised by anyone recreating and adventuring in Owyhee County.

3.3.3.1 Boating

Rafting and kayaking are popular activities on the Bruneau River and Owyhee River drainages. Jet boating is also enjoyed, particularly on the Snake River. There are several boat ramps or put-in areas along both waterways; however, some of these sites present difficult or hazardous conditions. Tight corners, swift water, and lack of immediately accessible tie-up locations could lead to a potentially unsafe situation.

3.3.3.2 Camping

Camping is another popular activity enjoyed by the residents of Owyhee County. There are several developed sites along the Snake River as well as one near Silver City. The North Fork Owyhee River Crossing campground is also very popular recreation destination. There are also many undeveloped sites suited primarily for tent or small trailer camping.

3.3.3.3 Fishing and Hunting

Fishing and hunting is important to Owyhee County both from a recreational standpoint and as an economic resource. There are several sportsman access sites along the Snake River that allow for fishing, hunting, and wildlife viewing access. Wild birds, such as pheasant, quail, partridge, chukar, grouse, wild duck, geese, and doves, are found in abundance. Fishing on both the Snake River and the Bruneau River has become a very popular pastime for residents and tourists alike. Big game hunting is also popular across Owyhee County, particularly the Owyhee Mountains. The C.J. Strike Wildlife Management Area near Bruneau also allows regulated hunting.

3.3.4 Resource Dependency

Owyhee County's economy depends mainly on agriculture and grazing. Low commodity and cattle prices coupled with increased costs of production have placed a strain on the economic conditions of the producers and of the county. When these conditions will improve is entirely speculative. The closure of the Kinross Delamar Mine has affected employment and tax revenues in the county. Environmental regulations, particularly water quality regulations, may have an impact on irrigated agriculture and dairy operations. More CAFO's may seek to locate in Owyhee County but there may be problems associated with sufficient quality and quantity of water, waste disposal and conflict with residential uses. County Planning and Zoning rules and regulations currently in place adequately address these issues.

There will be continued interest in rural residential development as people who work in Ada and Canyon Counties seek a rural lifestyle. Property values on land suitable for residential development will probably gradually increase. Changing commodity prices and increases in development pressures will place additional pressure on farmers to consider subdividing their farms.

The new Middle School at Homedale may also tend to draw more people to the area from Canyon County. Retail opportunities may increase in Homedale and Marsing. Homedale will have a new retail building products store associated with the lumber products mill.

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

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

- Grand ViewAgriculture Only
- MarsingAgriculture Only
- HomedaleAgriculture and Mining

Harris *et al.* (2003) further evaluated Idaho communities based on their level of direct employment in several industrial sectors. Their findings for communities in Owyhee County are summarized in Table 3.6.

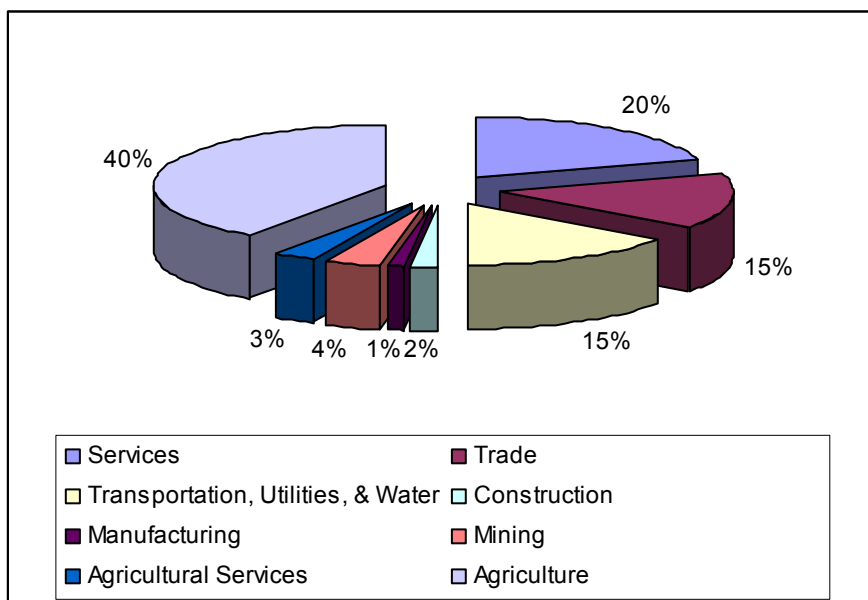
Table 3.6. Levels of direct employment by industrial sector

Community	Economic Diversity Index	Agriculture	Timber	Travel and Tourism	State / Local Gov.	Federal Gov.	Mining and Minerals
Grand View	Med. Low	High	Low	Med. Low	Med. High	Med. Low	Low
Marsing	Med. High	High	Low	Low	Med. High	Med. Low	Low
Homedale	High	Med. High	Low	Low	Med. High	Low	Med. High

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

Figure 3.2. Owyhee County Economy Value Added 1995.



Source: UI Owyhee County Economic Model

3.4 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 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.

The Duck Valley Indian Reservation is home to the Shoshone and Paiute Tribes. The Duck Valley Indian Reservation is partially located in Owyhee County, and partially in Nevada. The Duck Valley Reservation Wildland-Urban Interface Wildfire Management Plan was completed in 2004 and provides guidance for fire management activities on the Reservation.

3.4.1 National Register of Historic Places

The National Park Service maintains the National Register of Historical Places as a repository of information on significant cultural locale. These may be buildings, roads or trails, places where historical events took place, or other noteworthy sites. The NPS has recorded sites in its database. These sites are summarized in Tables 3.8.

Table 3.7. National Register of Historic Places in Owyhee County, Idaho.					
Item	Resource Name	Address	City	Listed	Architect or Builder
1	Bernard's Ferry	N of Murphy off ID 78	Murphy	1978	
2	Bruneau Episcopal Church	Off ID 51	Bruneau	1982	Tourtellotte & Hummel
3	Camas and Pole Creeks Archeological District		Wagon Box Basin	1986	
4	Camp Lyon Site	1 mi. E of U.S. 95	Jordan Valley	1972	
5	Camp Three Forks	S of Jordan Valley	Silver City	1972	
6	Delamar Historic District	6 mi. W of Silver City	Silver City	1976	
7	Guffey Butte--Black Butte Archeological District			1978	
8	Gusman, James E., and Emma, Ranch	South Mountain Rd	Jordan Valley	1999	
9	Noble Horse Barn	Reynolds Cr. 12 mi. SW of Murphy	Murphy	1991	
10	Our Lady, Queen of Heaven Church		Oreana	1980	Pierson, John, Kelly, Jim
11	Owyhee County Courthouse	ID 78	Murphy	1982	Tourtellotte & Hummel
12	Poison Creek Stage Station	S of Homedale off Jump Creek Rd	Homedale	1978	Proud, Matt C.
13	Silver City Historic District	Silver City and its environs	Silver City	1972	
14	Wickahoney Post Office and Stage Station	Wickahoney Creek	Wickahoney	1982	Dunning, Dow

(NRHP 2003)

Fire mitigation activities in and around these sites has the potential to affect historic places. In all cases, the fire mitigation work will be intended to reduce the potential of damaging the site due to wildfire. Areas where ground disturbance will occur will need to be inventoried depending on the location. Such actions may include, but are not limited to, constructed firelines (handline, mechanical line, etc.), new roads to creeks to fill water tankers, mechanical treatments, etc. Only those burn acres that may impact cultural resources that are sensitive to burning (i.e., buildings, peeled bark trees, etc.) would be examined. Burns over lithic sites are not expected to have an impact on those sites, as long as the fire is of low intensity and short duration. Some areas with heavy vegetation may need to be examined after the burn to locate and record any cultural resources although this is expected to be minimal. Traditional Cultural Properties (TCPs) will also need to be identified. Potential impact to TCPs will depend on what values make the property important and will be assessed on an individual basis.

3.5 Transportation

The primary access route connecting rural communities in Owyhee County is State Route 78. This is a two lane highway that enters the county near Indian Cove on the eastern side, travels through the communities of Indian Cove, Bruneau, Grand View, Murphy, Guffy, Wilson, Givens Hot Springs, and Marsing. US Highway 95, a two-lane route, bisects the northwestern corner of the county before crossing into Oregon. This access is the only primary route connecting north and south Idaho. State Highway 51 serves as a connection route between Mountain Home in neighboring Elmore County and Nevada. All major roadways in Owyhee County are relatively level and well-maintained with good width and access and exit points.

Smaller roads maintained by the County and the BLM, or private entities provide access to the adjoining areas within the county, including recreational areas and rural agricultural hubs. A variety of unimproved roads are found throughout the publicly owned BLM lands.

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

The Land Use Planning Act located in Title 67, requires Idaho Counties to address transportation in the individual Comprehensive Plans. It requires an analysis, prepared in coordination with the local jurisdiction(s) having authority over the public highways and streets, showing the general locations and traffic ways, and of streets and the recommended treatment thereof. This component may also make recommendations on building line setbacks, control or access, street naming and numbering, and proposes a system of public and other transit lines and related facilities including rights-of-ways, terminals, future corridors, viaducts and grade separations. The component may also include port, harbor, aviation and other related transportation facilities.

3.6 Vegetation & Climate

Vegetation in Owyhee County is a mix of rangeland, agriculture, and forestland ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the 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 3.9.

The most represented vegetated cover type is a Basin & Wyoming Big Sagebrush type at approximately 48% of the County's total area (2.3 million acres). The next most common vegetation cover type represented is Perennial Grassland, at 11% of the total area. Low Sagebrush is the third most common plant cover type at just under 11% of the total area (Table 3.8).

Table 3.8. Cover Types in Owyhee County		Percent of County's Total Area
	Acres	
Basin & Wyoming Big Sagebrush	2,373,941	48.2%
Perennial Grassland	547,044	11.1%
Low Sagebrush	533,170	10.8%
Western Juniper	408,399	8.3%
Salt-desert Shrub	290,419	5.9%

Table 3.8. Cover Types in Owyhee County		Percent of County's Total Area
	Acres	
Shrub/Steppe Annual Grass-Forb	221,488	4.5%
Agricultural Land	190,500	3.9%
Bitterbrush	71,335	1.4%
Mountain Big Sagebrush	67,236	1.4%
Warm Mesic Shrubs	48,172	1.0%
Curleaf Mountain Mahogany	46,617	0.9%
Douglas-fir	23,595	0.5%
Shrub Dominated Riparian	22,375	0.5%
Rabbitbrush	19,552	0.4%
Water	10,003	0.2%
Perennial Grass Slope	8,970	0.2%
Aspen	6,910	0.1%
Foothills Grassland	5,988	0.1%
Broadleaf Dominated Riparian	4,579	0.1%
Exposed Rock	3,780	0.1%
Vegetated Sand Dune	3,721	0.1%
Shallow Marsh	2,879	0.1%
Mixed Barren Land	1,853	0.0%
Graminoid or Forb Dominated Riparian	1,616	0.0%
Deep Marsh	1,296	0.0%
Subalpine Fir	1,168	0.0%
High Intensity Urban	1,054	0.0%
Sand Dune	656	0.0%
Disturbed, Low	640	0.0%
Low Intensity Urban	470	0.0%
Mountain Low Sagebrush	401	0.0%
Needleleaf Dominated Riparian	279	0.0%
Disturbed, High	115	0.0%
Total Area	4,920,220	

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 environment.

3.6.1 Monthly Climate Summaries In or Near Owyhee County

3.6.1.1 Reynolds, Idaho

Period of Record Monthly Climate Summary
 Period of Record : 12/1/1961 to 6/30/2004

Table 3.9 Climate records for Reynolds, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	38.7	43.7	51.0	58.3	67.6	76.5	86.1	85.4	75.4	63.6	48.6	39.6	61.2
Average Min.	20.2	23.6	27.8	32.5	39.6	46.2	52.3	51.2	42.4	33.0	25.9	19.9	34.6

Table 3.9 Climate records for Reynolds, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Temperature (F)													
Average Total Precipitation (in.)	1.20	0.78	0.96	0.99	1.21	1.12	0.34	0.51	0.52	0.74	1.10	1.12	10.59
Average Total SnowFall (in.)	2.6	2.3	0.9	0.6	0.0	0.0	0.0	0.0	0.0	0.2	0.9	2.5	10.1
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 98.6% Min. Temp.: 98.6% Precipitation: 98.9%
Snowfall: 90.6% Snow Depth: 88.3%

3.6.1.2 Silver City, Idaho

Period of Record Monthly Climate Summary

Period of Record : 11/1/1978 to 6/30/2004

Table 3.10 Climate records for Silver City, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	35.7	37.8	45.0	52.1	61.0	70.2	80.3	80.1	70.6	58.3	41.7	35.6	55.7
Average Min. Temperature (F)	20.3	20.8	26.9	31.4	40.3	46.6	55.1	54.8	46.2	37.0	25.3	20.2	35.4
Average Total Precipitation (in.)	3.04	2.19	2.24	2.33	2.28	1.32	0.63	0.55	0.83	1.33	2.18	2.02	20.93
Average Total SnowFall (in.)	21.1	12.9	10.3	5.7	2.1	0.1	0.0	0.0	0.2	2.1	11.1	15.4	80.9
Average Snow Depth (in.)	22	27	20	6	0	0	0	0	0	0	3	13	7

Percent of possible observations for period of record. Max. Temp.: 86.8% Min. Temp.: 86.3% Precipitation: 89.6%
Snowfall: 90.3% Snow Depth: 82%

3.6.1.3 Grand View, Idaho

Period of Record Monthly Climate Summary

Period of Record : 4/ 1/1933 to 6/30/2004

Table 3.11 Climate records for Grand View, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	39.7	48.1	58.4	67.6	76.5	84.6	94.2	92.4	81.8	68.6	51.7	41.3	67.1
Average Min. Temperature (F)	20.4	25.0	29.6	36.5	44.2	51.3	56.4	53.6	44.1	34.9	26.8	21.7	37.0
Average Total Precipitation (in.)	0.71	0.53	0.70	0.67	0.89	0.78	0.20	0.20	0.42	0.45	0.70	0.61	6.86
Average Total SnowFall (in.)	2.6	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.9	5.6
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 95.4% Min. Temp.: 95% Precipitation: 93.6%
Snowfall: 92.8% Snow Depth: 86.6%

3.6.1.4 Bruneau, Idaho

Period of Record Monthly Climate Summary

Period of Record : 6/ 1/1962 to 6/30/2004

Table 3.12 Climate records for Bruneau, Owyhee County, Idaho.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	40.5	48.3	58.2	66.1	75.5	84.6	93.3	91.8	81.6	68.7	51.6	40.5	66.7
Average Min. Temperature (F)	23.2	26.6	31.1	36.5	44.3	51.5	56.8	55.1	45.9	36.7	29.5	22.9	38.3
Average Total Precipitation (in.)	0.87	0.53	0.68	0.73	0.72	0.78	0.17	0.26	0.46	0.47	0.96	0.73	7.37
Average Total SnowFall (in.)	1.6	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.3	4.3
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record. Max. Temp.: 97% Min. Temp.: 95.8% Precipitation: 96.2% Snowfall: 92.5% Snow Depth: 88.2%

3.7 Wildfire Hazard Profiles

3.7.1 Wildfire Ignition & Extent Profile

In Mountain big-sagebrush habitats, normal fire frequency is estimated to have been estimated to be 15 to 25 years in southwest Idaho (in some instances as short as 3 to 7 years), and 12 to 15 years in south central Oregon. In Wyoming big-sagebrush habitats fire return intervals have been estimated at 50 to 120 years. Because of increased fine fuel from exotic annual grasses and more human-caused wildfires, fire frequencies are now as little as 5 years in some low-elevation habitats. Management strategies to decrease wildfire in these areas include increased fire suppression efforts, focused protection of key habitat areas during a wildfire, aggressive reseeding of sagebrush and where needed perennial grasses in burned areas, and developing greenstrips (strips of fire-resistant vegetation planted to slow wildfires) and other fuel breaks.

Detailed records of fire ignition and extent have been compiled by the USDI Bureau of Land Management. Using this data on past fire extents and fire ignition data, the occurrence of wildland fires in the region of Owyhee County has been evaluated. Many fires have burned in the region of Owyhee County. Figure 3.3 summarizes wildfire ignitions and acres burned each year from 1957 through 2002 with projections for the 1950s and the remainder of the 2000 decade based on current trends. Approximately 38,800 acres burn annually in Owyhee County based on this data, Figure 3.3. Each decade approximately 350,000 acres burn in wildfire events in Owyhee County. The most acres burned in any one decade was the 1980's when approximately 622,000 acres burned (Figure 3.3).

Unfortunately, detailed records on fire cause have not been maintained for wildfires in Owyhee County. In other counties of Idaho, wildfire occurrence is recorded by a variety of sources, including the Idaho Department of Lands. The IDL database of wildfire ignitions lacks the GIS association allowing analysts to map their ignition data, but it does contain detailed information on fire cause, costs, and other relevant information. The database analyzed for this planning effort contained detailed information on fire extent and included a GIS element allowing mapping of this data. It is strongly recommended that the BLM and Owyhee County cooperate on collecting additional data on ignition cause as well as current extent mapping as time goes on.

Figure 3.3. Owyhee County Wildfire Extent Profile

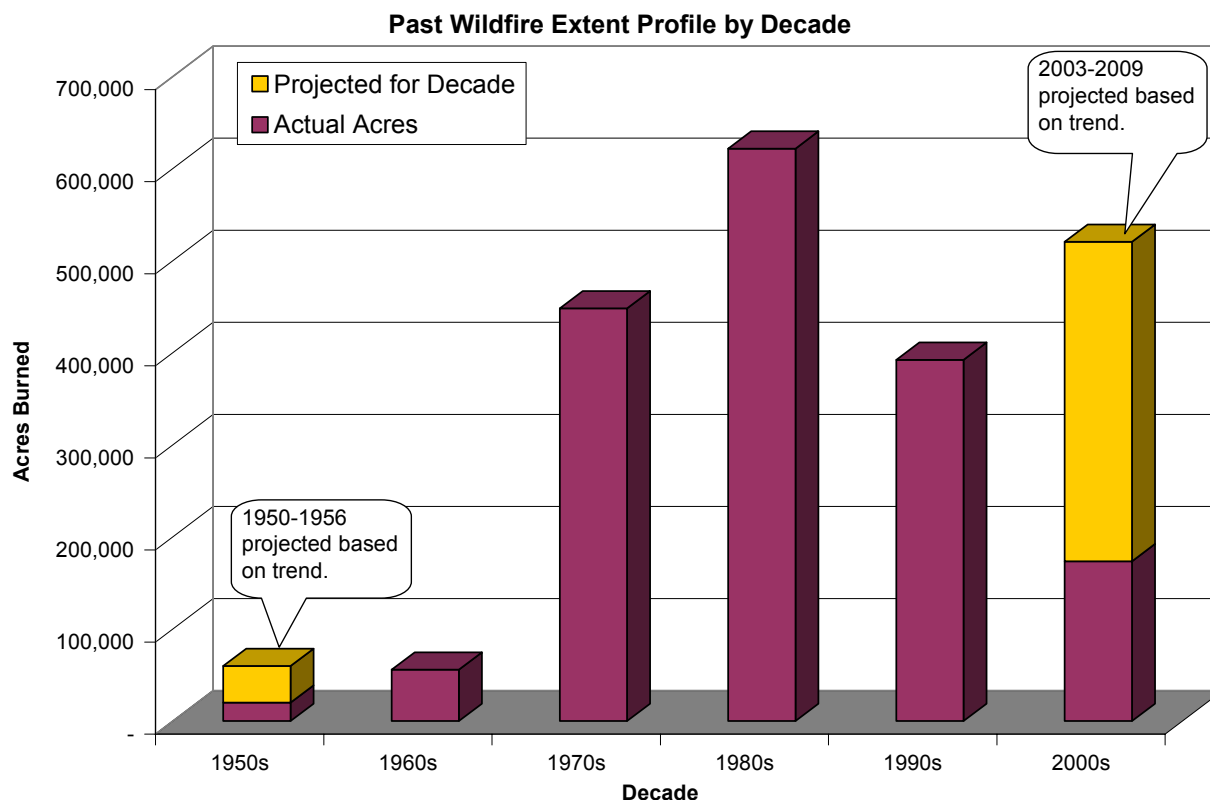


Table 3.13. Wildfire Extent Profile in Owyhee County.

Decade	Acres burned each decade
1950s	59,938
1960s	55,808
1970s	448,218
1980s	621,712
1990s	392,286
2000s	520,464

3.7.2 Wildfire Extent on the Saylor Creek Range

The Mountain Home Air Force Base manages the Saylor Creek Range located within the Northeast corner of Owyhee County. The Air Force uses the range as a training area, primarily as a bombing range. The detonation of explosives and use of various training aids are often the source points for fire ignitions. The Air Force provided records going back to 1996 regarding the number, cause and extent of fires on the Saylor Creek Range. Table 3.14 summarize the information provided.

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
6-96	75	Bomb	6-96	300	Controlled Burn
6-96	50	Not Listed	6-96	50	Smokey SAM
8-96	1	Smokey SAM	10-96	2	Smokey SAM
10-96	.5	Smokey SAM	6-97	1	Not Listed
6-97	1	Not Listed	6-97	1	Not Listed
6-97	50	Controlled Burn	6-97	3	Not Listed
6-97	10	Not Listed	6-97	1	Smokey SAM
6-97	1	Smokey SAM	6-97	20	Controlled Burn
6-97	50	Controlled Burn	6-97	10	Not Listed
6-97	50	Controlled Burn	6-97	15	Not Listed
7-97	1	Smokey SAM	7-97	1	Smokey SAM
7-97	2	Not Listed	8-97	1	Smokey SAM
8-97	1	Smokey SAM	8-97	2	Smokey SAM
8-97	1	Smokey SAM	8-97	1	Smokey SAM
8-97	1	Smokey SAM	8-97	.5	Smokey SAM
8-97	.5	Smokey SAM	8-97	1	Smokey SAM
8-97	.5	Smokey SAM	8-97	.5	Smokey SAM
8-97	1	Smokey SAM	6-98	.5	BDU-33
6-98	.5	BDU-33	6-98	.5	BDU-33
6-98	6	BDU-33	6-98	1	BDU-33
6-98	.5	BDU-33	6-98	.25	BDU-33
6-98	.25	BDU-33	6-98	1	BDU-33
6-98	4	BDU-33	6-98	3	BDU-33
7-98	1	BDU-33	7-98	5	BDU-33
7-98	10	BDU-33	7-98	25	BDU-33
7-98	2	BDU-33	7-98	.5	BDU-33
7-98	20	Smokey SAM	7-98	2	BDU-33
7-98	.25	Smokey SAM	7-98	.5	Smokey SAM
7-98	1	Smokey SAM	9-98	1	Smokey SAM
9-98	2	Smokey SAM	5-99	5	Bomb
5-99	4	Bomb	5-99	9	Bomb
5-99	1	Bomb	5-99	1	Bomb
6-99	5	Bomb	6-99	2	Bomb
6-99	1	Bomb	6-99	2	Bomb
6-99	75	Controlled Burn	6-99	50	Controlled Burn
6-99	1	Controlled Burn	6-99	1	Controlled Burn
7-99	4	Smokey SAM	7-99	5	Bomb
7-99	10	Bomb	7-99	2	Smokey SAM
8-99	15	Bomb	9-99	3	Smokey SAM
10-99	2	Bomb	10-99	2	Bomb
10-99	4	Bomb	10-99	2	Bomb
5-00	.15	BDU-33	5-00	.15	BDU-33
5-00	20	BDU-33	5-00	.5	BDU-33
5-00	250	BDU-33	5-00	.15	BDU-33

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
5-00	1	BDU-33	5-00	10	BDU-33
5-00	.15	BDU-33	5-00	.25	BDU-33
5-00	20	BDU-33	5-00	5	BDU-33
6-00	250	BDU-33	6-00	150	BDU-33
6-00	225	BDU-33	6-00	15	BDU-33
6-00	25	BDU-33	6-00	300	BDU-33
6-00	300	BDU-33	6-00	5	BDU-33
6-00	5	BDU-33	6-00	20	BDU-33
6-00	2	BDU-33	6-00	2	BDU-33
6-00	150	BDU-33	7-00	2	BDU-33
7-00	.25	Smokey SAM	7-00	.25	Smokey SAM
9-00	25	BDU-33	9-00	2	BDU-33
9-00	2	Smokey SAM	9-00	4	BDU-33
9-00	1	Smokey SAM	9-00	20	BDU-33
5-01	.15	Smokey Sam	5-01	3	Bomb
5-01	.07	Smokey SAM	5-01	1	Bomb
5-01	.25	Smokey SAM	5-01	.25	Bomb
5-01	5	Bomb	5-01	.07	Bomb
5-01	500	Unknown	6-01	100	Bomb
6-01	250	Smokey SAM	6-01	175	Bomb
6-01	100	Bomb	6-01	5	Bomb
6-01	400	Bomb	6-01	100	Bomb/Flare
6-01	150	Bomb	6-01	20	Flare
6-01	.25	Smokey SAM	6-01	1000	Bomb
6-01	500	Bomb	6-01	200	Bomb
7-01	20	Bomb	7-01	150	Bomb
7-01	50	Bomb	7-01	3	Smokey SAM
7-01	1	Smokey Gun	7-01	1	Smokey Gun
8-01	.5	Smokey Gun	8-01	1000	Smokey Gun
9-01	.07	Smokey Gun	10-01	1	Bomb
10-01	1	Bomb	10-01	1	Bomb
2-02	.5	Smokey SAM	4-02	.5	Smokey SAM
6-02	1	BDU-33	6-02	2	BDU-33
7-02	3	Smokey SAM	8-02	2	BDU-33
9-02	1	BDU-33	9-02	1	BDU-33
9-02	2	BDU-33	10-02	1	BDU-33
5-03	.5	Bomb	5-03	.25	Smokey Gun
5-03	4	Bomb	5-03	2	Bomb
6-03	7	Bomb	6-03	.5	Smokey Gun
6-03	.5	Bomb	6-03	.5	Bomb
6-03	.5	Smokey Gun	6-03	.5	Bomb
6-03	.5	Bomb	6-03	.5	Bomb
6-03	1	Bomb	6-03	.5	Bomb
6-03	3	Bomb	6-03	4	Bomb

Table 3.14. Wildfire Extents on the Saylor Creek Firing Range.

Month and Year	Size (ac)	Cause	Month and Year	Size(ac)	Cause
6-03	1	Bomb	6-03	3	Bomb
6-03	4	Bomb	7-03	2	Bomb
9-03	.5	Bomb	9-03	.5	Bomb
9-03	1	Bomb	9-03	1	Bomb
10-03	1	Bomb	10-03	.5	Bomb
10-03	.5	Bomb	10-03	.5	Bomb
10-03	.5	Bomb	6-04	2	Bomb
6-04	2	Bomb	6-04	.5	Bomb
6-04	.5	Bomb	6-04	.07	Bomb
6-04	.07	Smokey SAM	7-04	10	EOD
7-04	150	Bomb	7-04	250	Bomb
7-04	.25	Bomb	7-04	.25	Bomb

3.7.3 Regional and National Wildfire Profile

Across the west, wildfires have been increasing in extent and cost of control. The National Interagency Fire Center (2003) reports nearly 88,500 wildfires in 2002 burned a total of nearly 7 million acres and cost \$1.6 billion (Table 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
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 Owyhee County.

Table 3.16. Total Fires and Acres 1960 - 2002 Nationally.

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

Table 3.16. Total Fires and Acres 1960 - 2002 Nationally.

Year	Fires	Acres	Year	Fires	Acres
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 in the Southwest Idaho Region, which Owyhee County is a part, actual fires in this county have usually been controlled at 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 Bureau of Land Management provides primary wildfire protection in Owyhee County. Rural and city fire districts augment these services with home protection and related services.

3.8 Analysis Tools and Techniques to Assess Fire Risk

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

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

3.8.1 Fire Prone Landscapes

Schlosser *et al.* 2002, developed a methodology to assess the location of fire prone landscapes on forested and non-forested ecosystems in the western US. Working under an agreement with the Clearwater Resource Conservation and Development Council, Inc., (RC&D), Northwest Management, Inc., completed a similar assessment for five counties in the north central Idaho area including Clearwater County, Idaho County, Latah County, Lewis County, and Nez Perce County. In a separate project, also funded by the Bureau of Land Management working in cooperation with Ada, Canyon, and Elmore Counties, through the Southwest Idaho RC&D Area, Northwest Management, Inc., completed a Fire Prone Landscapes assessments on those listed areas. Additional assessments of Fire Prone Landscapes were completed for approximately 20 additional counties in Montana and Idaho.

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).

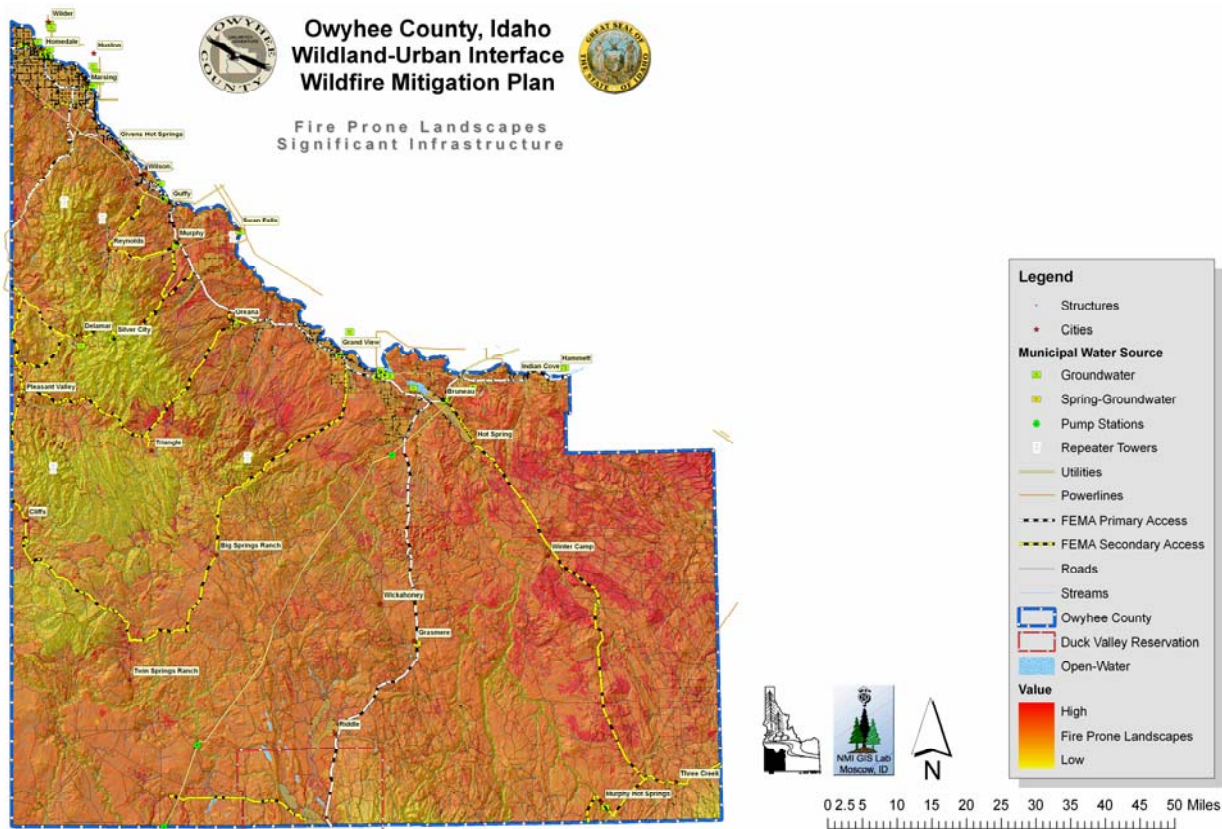
Riparian Zones: Riparian zones were derived from stream layers created during the Interior Columbia Basin Ecosystem Management Project (Quigley *et al.* 2001).

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 south west Idaho area including 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 Owyhee County was 90 with a low of 8.

Figure 3.4. Fire Prone Landscapes in Owyhee County.



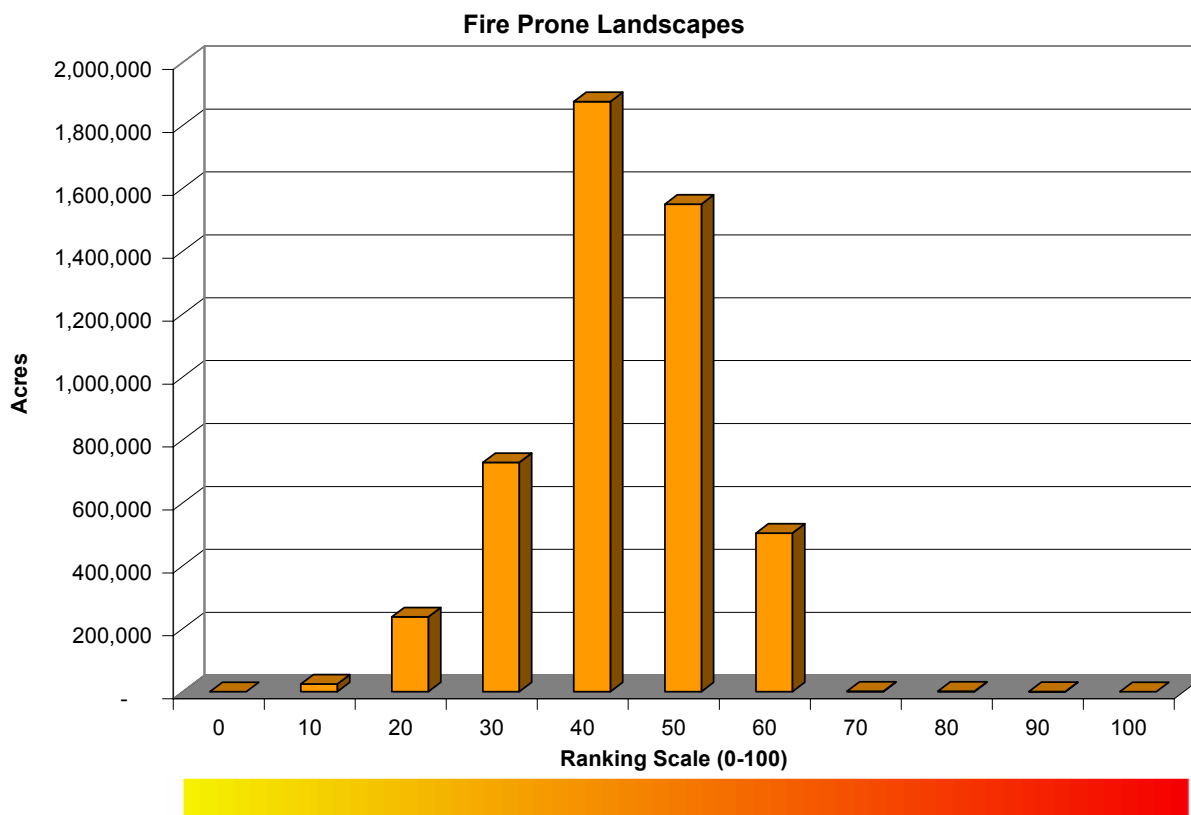
This map is presented for reference in this section of the plan. This map, and additional maps are detailed in Appendix I.

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 (12 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 associated acres in each category for Owyhee County.

Color Code	Value	Total	Percent of Total Area
	0	7	0%
	10	24,083	0%
	20	237,515	5%
	30	728,263	15%
	40	1,875,965	38%
	50	1,549,590	31%
	60	503,764	10%
	70	1,093	0%
	80	986	0%
	90	392	0%
	100	-	0%

Figure 3.5. 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.

3.8.2 Historic Fire Regime

In the fire-adapted ecosystems of Idaho, fire is undoubtedly the dominant process in terrestrial systems that constrains vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes (that is, fire frequency and fire severity prior to settlement by Euro-Americans) to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Obviously, historical fire regimes are a critical component for characterizing the historical range of variability in the fire-adapted

ecosystems of Idaho. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

A database of fire history studies in the region was used to develop modeling rules for predicting historical fire regimes (HFRs). Tabular fire-history data and spatial data was stratified into ecoregions, potential natural vegetation types (PNVs), slope classes, and aspect classes to derive rule sets which were then modeled spatially. Expert opinion was substituted for a stratum when empirical data was not available.

Fire is the dominant disturbance process that manipulates vegetation patterns in Idaho. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales. The HFR theme was derived specifically to estimate an index of the relative change of a disturbance process, and the subsequent patterns of vegetation composition and structure.

3.8.2.1 General Limitations

These data were derived using fire history data from a variety of different sources. These data were designed to characterize broad scale patterns of historical fire regimes 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 HFR theme is 30 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).

Figure 3.6. Natural Historic Fire Regimes in Owyhee County, Idaho.

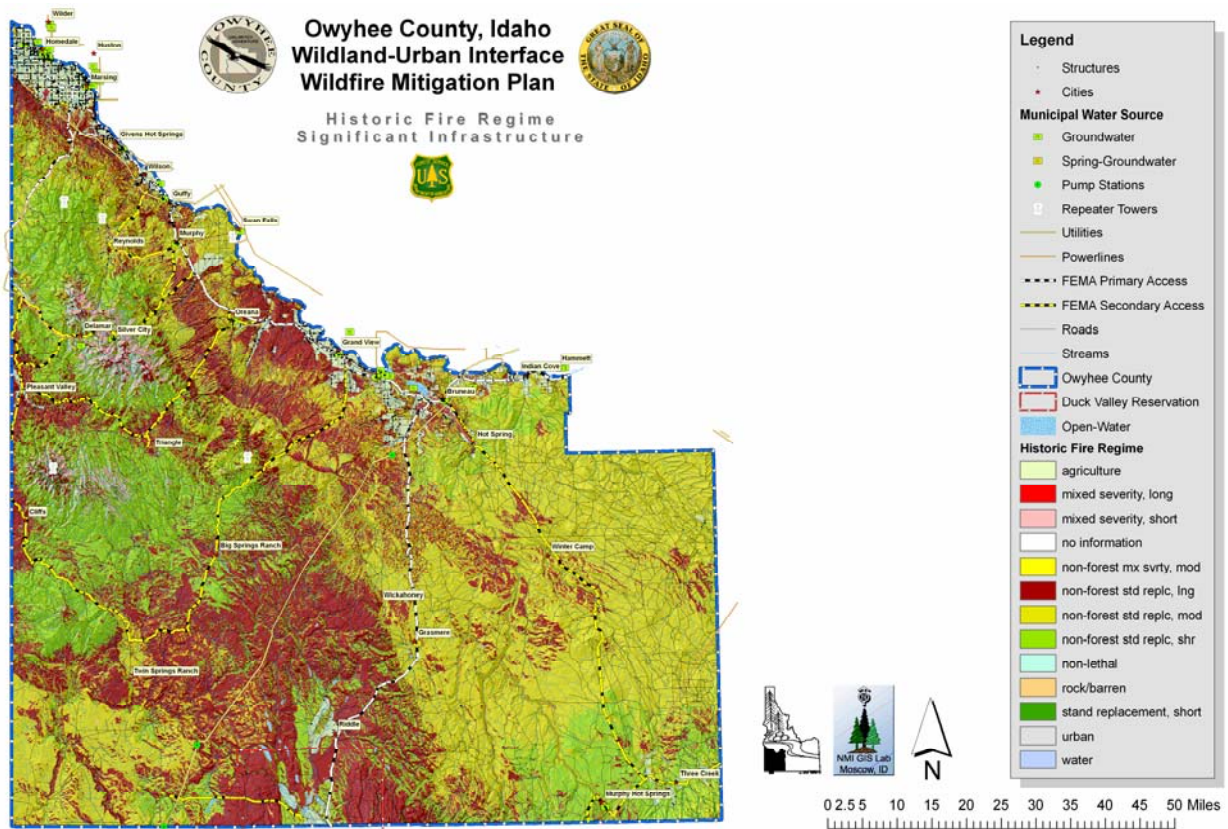


Table 3.19. Natural Historic Fire Regimes in Owyhee County, Idaho.

Natural Historic Fire Regime	Acres	Percent of Area
Non-lethal Fires	36,941	1%
Mixed severity, short return interval	53,231	1%
Mixed severity, long return interval	11,717	0%
Stand replacement, short return interval	8,893	0%
Non-forest stand replacement, short return interval	1,171,533	24%
Non-forest mixed severity, moderate return interval	34,159	1%
Non-forest stand replacement, moderate return interval	1,946,605	40%
Non-forest stand replacement, long return interval	1,463,458	30%
Agriculture	158,625	3%
Rock / barren	10,985	0%
Urban	1,095	0%
Water	10,388	0%
No Information	11,529	0%

3.8.3 Fire Regime Condition Class

The US Forest Service has provided their assessment of Fire Regime Condition Class for the lands of Owyhee 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). 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 maintains 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 3.20. Maps depicting Fire Regime and Condition Class are presented in Appendix I.

Table 3.20. 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 Owyhee County shows that approximately 81% of the County is in Condition Class 2 (moderate departure), just about 9% is in Condition Class 3 (high departure), with the remaining area in Condition Class 1-low departure (Table 3.21).

Table 3.21. Fire Regime Condition Class by area in Owyhee County.

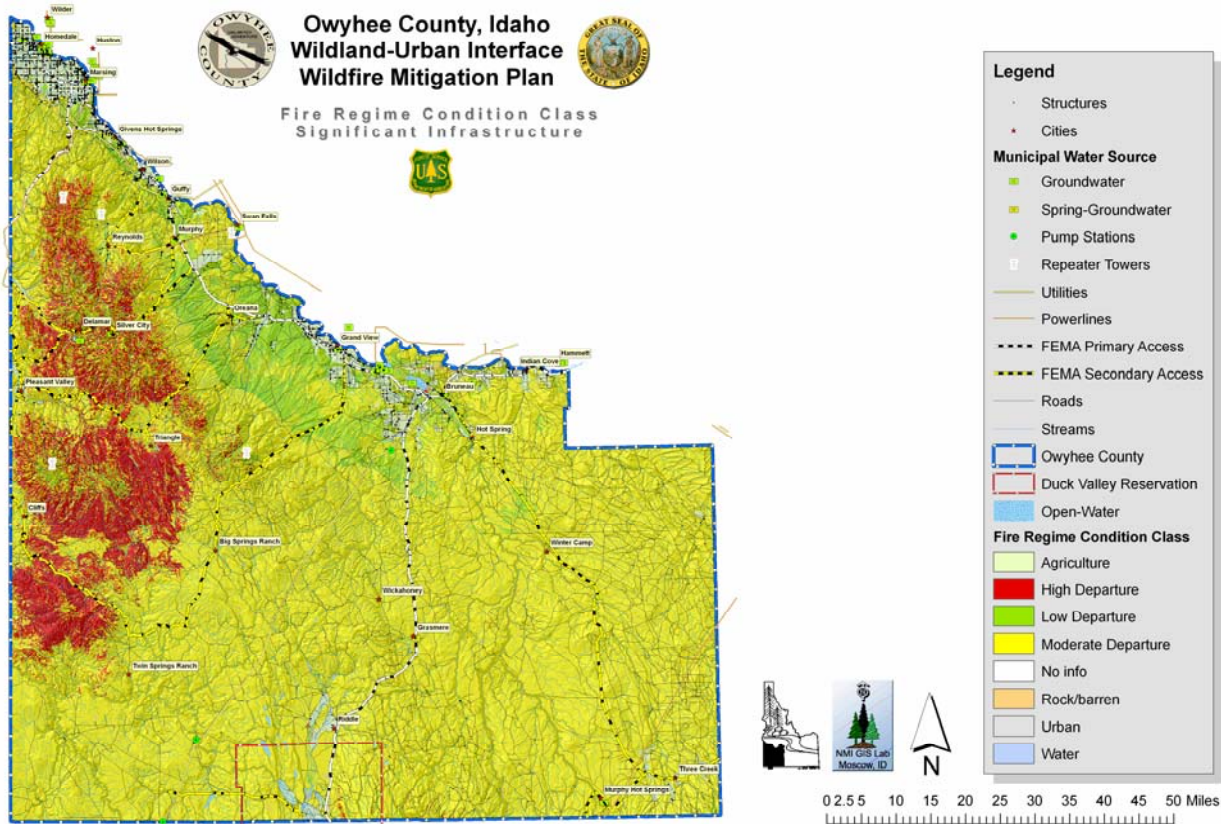
	Condition Class	Acres	Percent of Area
1	Low departure	335,805	7%
2	Moderate departure	3,965,170	81%
3	High departure	425,562	9%
4	Agriculture	158,625	3%
5	Rock / barren	10,985	0%

Table 3.21. Fire Regime Condition Class by area in Owyhee County.

	Condition Class	Acres	Percent of Area
7	Urban	1,095	0%
8	Water	10,388	0%
9	No info	11,529	0%

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

Figure 3.7. Fire Regime Condition Class in Owyhee County, Idaho.



3.8.4 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. Conversely, fires would likely burn more severely within cover types comprised by species having a low tolerance to fire. Data assignments were based upon 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).

3.8.4.1 Purpose

Fire is a dominant disturbance process in the Southwest Idaho. 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 timber harvest has 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).

3.8.4.2 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).

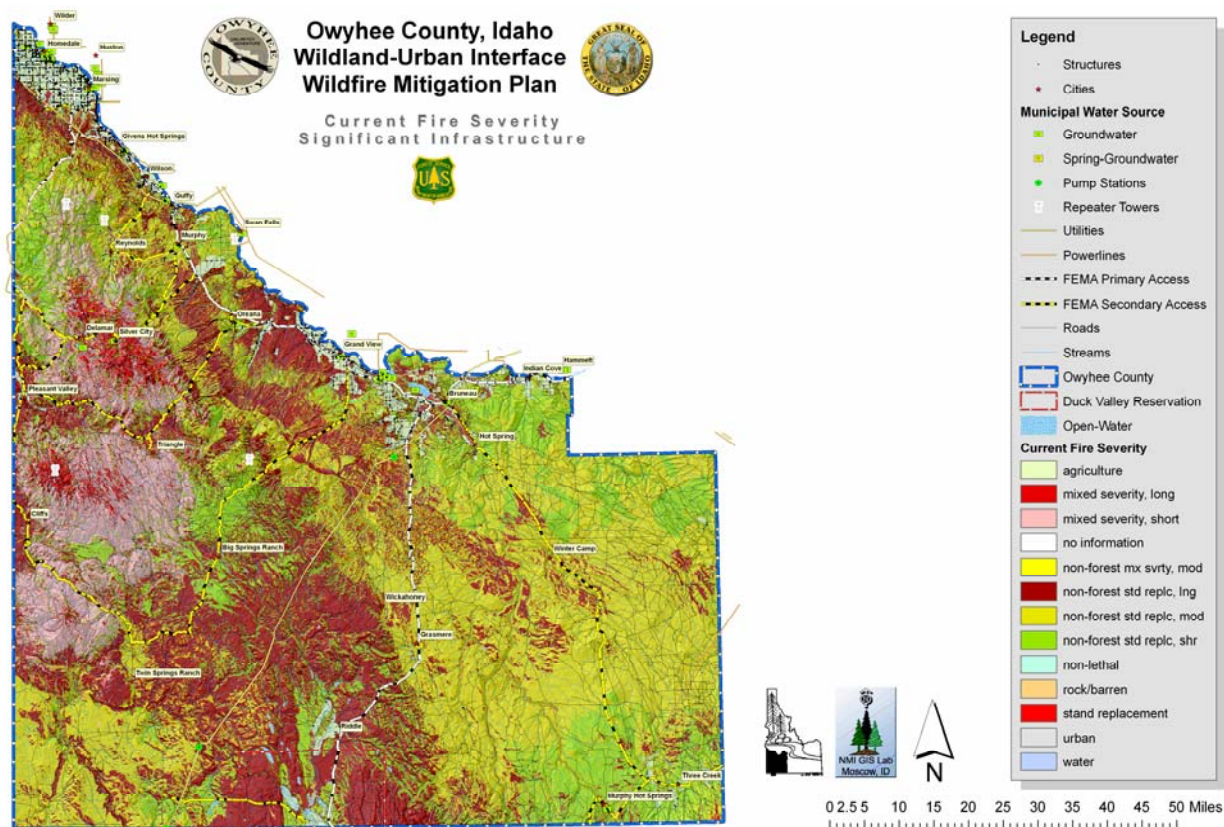
Current fire severity rule-set was developed for an "average burn day" for the specific vegetation types in our area. Any user of these data should familiarize themselves with the rule sets to better understand our estimate of current fire severity.

Table 3.22. Predicted Fire Severity by area in Owyhee County.

	Predicted Fire Severity	Acres	Percent of Area
1	Non-lethal	12,910	0%
2	Mixed severity, short return interval	401,758	8%
3	Mixed severity, long return interval	56,524	1%
5	Stand replacement fire	23,792	0%
6	Non-forest stand replacement, short return interval	1,005,260	20%
7	Non-forest mixed severity, moderate return interval	34,159	1%
8	Non-forest stand replacement, moderate return interval	1,731,980	35%
9	Non-forest stand replacement, long return interval	1,460,153	30%
10	Agriculture	158,625	3%
11	Rock / barren	10,985	0%
13	Urban	1,095	0%
14	Water	10,388	0%
15	No information	11,529	0%

See Appendix I for a map of Predicted Fire Severity.

Figure 3.8. Current Fire Severity in Owyhee County, Idaho.



3.8.5 On-Site Evaluations

Fire control and evaluation specialists as well as hazard mitigation consultants evaluated the communities of Owyhee 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.

3.8.6 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 Owyhee County have all been intricately involved in wildland fire fighting and the incident command system. They made ocular estimates of fuel models they observed. In an intense evaluation, actual sampling would have been employed to determine

fuel models and fuel loading. The estimations presented in this document (Chapter 3) are estimates based on observations to better understand the conditions observed.

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

3.8.6.1 Grass Group

3.8.6.1.1 Fire Behavior Fuel Model 1

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

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

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

Fuel model values for estimating fire behavior

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

3.8.6.1.2 Fire Behavior Fuel Model 2

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

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

Fuel model values for estimating fire behavior

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

3.8.6.1.3 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, 1/4-inch, tons/acre	3.0
Live fuel load, foliage tons/acre	0
Fuel bed depth, feet	2.5

3.8.6.2 Shrub Group

3.8.6.2.1 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, 1/4-inch, tons/acre	5.0
Live fuel load, foliage, tons/acre	5.0
Fuel bed depth, feet	6.0

3.8.6.2.2 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, 1/4-inch, tons/acre	1.0
Live fuel load, foliage, tons/acre	2.0
Fuel bed depth, feet	2.0

3.8.6.2.3 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

3.8.6.2.4 Fire Behavior Fuel Model 7

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

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

Fuel model values for estimating fire behavior

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

3.8.6.3 Timber Group

3.8.6.3.1 Fire Behavior Fuel Model 8

Slow-burning ground fires with low flame lengths are generally the case, although the fire may encounter an occasional “jackpot” or heavy fuel concentration that can flare up. Only under severe weather conditions involving high temperatures, low humidities, and high winds do the fuels pose fire hazards. Closed canopy stands of short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer. This layer is mainly needles, leaves, and occasionally twigs because little undergrowth is present in the stand. Representative conifer types are white pine, and lodgepole pine, spruce, fir and larch

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

Fuel model values for estimating fire behavior

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

3.8.6.3.2 Fire Behavior Fuel Model 9

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

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

Fuel model values for estimating fire behavior

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

3.8.6.3.3 Fire Behavior Fuel Model 10

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

The 1978 NFDRS fuel model G is represented.

Fuel model values for estimating fire behavior

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

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

Table 3.23. Comparative Fire Intensities and Rates of Spread in Timber Fuel Models.

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

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

3.8.6.4 Logging Slash Group

3.8.6.4.1 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

3.8.6.4.2 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

3.8.6.4.3 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-than-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 this 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, 1/4-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 3.24.

Table 3.24. Comparative Fire Intensities and Rates of Spread in Slash Fuel Models.

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

3.9 Wildland-Urban Interface

3.9.1 People and Structures

A key component in meeting the underlying need is the protection and treatment of fire hazard in the wildland-urban interface. The wildland-urban interface refers to areas where wildland vegetation meets urban developments, or where forest fuels meet urban fuels (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to a risk to urban developments. Reducing the fire hazard in the wildland urban interface requires the efforts of federal, state, local agencies, and private individuals (Norton 2002). “The role of [most] federal agencies in the wildland urban interface includes wildland fire fighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildfire] in the wildland urban interface is [largely] the responsibility of tribal, state, federal, and local governments” (USFS 2001). Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures (USFS 2001). With treatment, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities. In addition, a wildland urban interface that is properly thinned will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

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

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

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

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

The location of structures in Owyhee County has been mapped and are presented on a variety of maps in this analysis document; specifically in Appendix I. The location of all structures was determined by examining two sets of remotely sensed images. The more detailed information was garnered from digital ortho-photos at a resolution of 1 meter (from 1998). For those areas not covered by the 1 meter DOQQ images, SPOT satellite imagery at a resolution of 10 meters was used (from 2002). These records were augmented with data collected on hand-held GPS receivers to record the location of structures, especially in areas where new housing developments were seen.

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

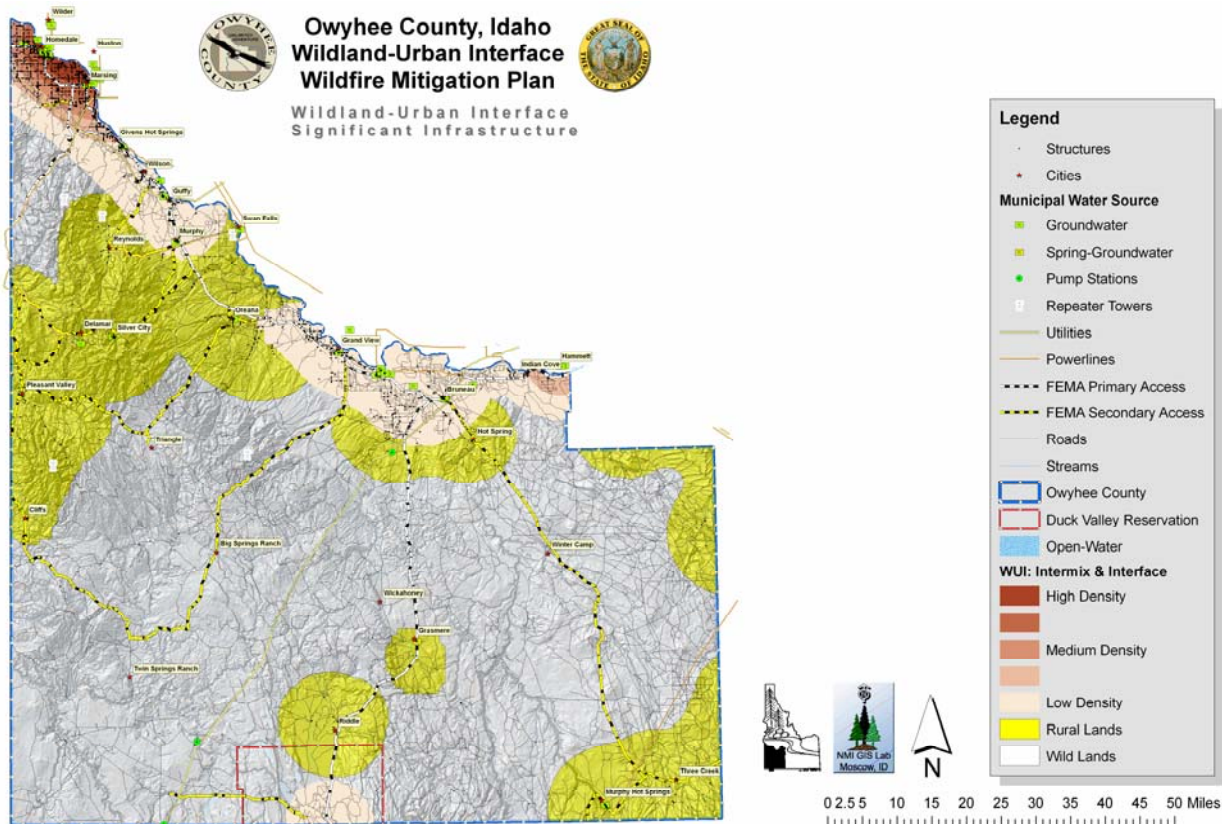
By evaluating this structure density, we can define WUI areas on maps by using mathematical formulae and population density indexes to define the WUI based on where structures are located. The resulting population density indexes create concentric circles showing high density

areas of Interface and Intermix WUI, as well as Rural WUI. 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.

The WUI interface areas as defined here are presented in map form in Appendix I.

Figure 3.9. Wildland-Urban Interface of Owyhee County.



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

3.9.2 Infrastructure

Owyhee County has both significant infrastructure and unique ecosystems within its boundaries. Of note for this WUI Fire Mitigation Plan is the existence of highway routes (eg., State Highways 51 and 78 and U.S. 95), and the presence of high tension power lines and pipe lines supplying surrounding counties. These resources will be considered in the protection of infrastructural resources for Owyhee County and to the larger extent of this region, and the rest of Idaho.

High Tension Power Lines have been mapped and are presented in Appendix I. Protection of these lines from loss during a wildfire is paramount in as much as the electrical power they provide serves not only the communities of Owyhee County but of surrounding counties and nearby communities in Oregon. The protection of these lines allows for community

sustainability, support of the economic viability of Owyhee County, and the protection of people who rely on that power. Fuels mitigation under power lines has received considerable attention in forested ecosystems as timber is thinned and heavy accumulations of brush are managed. This practice should be mandated into the future. However, the importance of management of rangeland ecosystems under high tension power lines should not be overlooked. Brush intermixed with grasses and other species, during extreme fire weather events, coupled with steep slopes can produce considerable heat and particulate matter. When this occurs under power lines, the result can be arching between lines and even failure of the electrical media itself. Fuel mitigation treatments in high risk areas, especially where multiple lines are co-located, will be recommended.

3.9.3 Ecosystems

Owyhee County contains many diverse ecosystems with a complex array of vegetation, wildlife, and fisheries that have developed with, and adapted to fire as a natural disturbance process. A century of wildland fire suppression coupled with past land-use practices (primarily agriculture and livestock grazing) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. In some cases this has resulted in lower fuel loads, grazing/agriculture, and in others an increase in fuel loads, juniper encroachment. As a result of juniper encroachment, rangelands in Owyhee 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. High-intensity fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large high intensity fires throughout the nation's rangelands, has resulted in significant safety risks to firefighters and higher costs for fire suppression (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

Juniper invasion of the shrub-steppe and aspen ecosystems in Owyhee County has become a major concern. Fire exclusion in these areas has led to widespread expansion of western juniper, and subsequent loss of shrub-steppe and aspen communities. Active management of the encroaching juniper through prescribed burning and other treatments will increase the shrub and herbaceous plant communities, which will help maintain watershed function and stability, and reduce erosion potential. In addition, re-establishment of the native ecosystem will improve habitat for sagegrouse, pygmy rabbits, elk, mule deer, antelope, migratory birds, small mammals, amphibians, and reptiles by creating and maintaining vegetative mosaics.

The creation of the Reynolds Creek Experimental Watershed by the Reynolds Creek USDA_ARS Unit has allowed researchers to conduct prescribed fire studies in order to learn more about the effects of fire on the ecosystem. Reintroducing low intensity fires to rangeland ecosystems typically helps reduce the occurrence and expansion of invasive species and maintain the healthy growth of native species. If projects on the Reynolds Creek Experimental Watershed show positive results, controlled burning may be reintroduced elsewhere in Owyhee County.

3.10 Soils

Our 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 consequently high severity fires can cause soils to become water repellent (hydrophobic), and thus greatly increases the potential for overland flow during intense rains. Soils 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.

The Owyhee soils tend to be calcareous and alkaline, well drained and have salt and water problems in the lower valleys. However, some areas adjacent to the Snake River are very sandy with a high level of permeability and without layers of clay or other substrata which would protect the aquifer from agricultural or animal nutrients.

The Snake River soils are generally silty and clayey with somewhat restricted subsoil and substrata permeability formed in stratified sediments on terraces, basins and hilly uplands.

The Owyhee Mountains, Owyhee Range and highland area of the County have soils which are generally silty, formed in materials mired with rocky residuum-colluvium from basic rock types on plateaus, canyons and mountains.

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 sandy 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 a large portion of Owyhee County in detail. Please refer the Owyhee County NRCS Soil Survey Report to view each soil unit in the County and the associated characteristics relating to the effects of wildland fire.

3.10.1 Fire Mitigation Practices to Maintain Soil Processes

Firelines constructed by hand or with the use of machinery will have varying impacts, depending upon construction techniques. If only the surface litter is removed in the fireline construction, minor increases to soil erosion may occur. If trenches are dug which channelize runoff down steep slopes, heavy rilling or gullying could occur depending upon rock content of surface layers exposed. Jackpot burning and, to a greater extent, pile burning 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.

Indirect effects of prescribed burning to slope stability are highly variable in the soil types found in Owyhee County. Vegetation structure, including root strength after burning, is maintained from three to fifteen years following low to moderate intensity burns and therefore soil saturation potential is not greatly altered. Re-vegetation of burned areas within this time frame will be a critical component to maintaining soil resources and pre-empting noxious weeds and invasive species from occupying the site. Locale experiencing high intensity burns will need to be evaluated immediately for mechanical erosion control followed by re-vegetation efforts. Holding

soils in place will be a difficult challenge in many locations, especially on moderate to steep slopes.

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. Grazing across Owyhee County was observed to be maintained in a sustainable manner without the overgrazing found in other areas of the region.

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

To avoid potential impacts, wherever possible firelines should be located outside of highly erosive areas, steep slopes, intermittent streams, and riparian and other sensitive areas. Following prescribed fire or fire suppression activities, firelines should be rehabilitated.

3.11 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).

The geology and soils of this region lead to rapid to moderate moisture infiltration. Slopes are moderate to steep, however, headwater characteristics of the watersheds in the south end of the county lead to a high degree of infiltration as opposed to a propensity for overland flow. Thus sediment delivery efficiency of first and third order streams is fairly low. The bedrock is typically well fractured and moderately soft. This fracturing allows excessive soil moisture to

rapidly infiltrate into the rock and thus surface runoff is rare. Natural mass stability hazards associated with slides are low. Natural sediment yields are low for these watersheds. However, disrupted vegetation patterns from farming along the Snake River (soil compaction) and wildland fire (especially hot fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

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

The Owyhee County Comprehensive Plan addresses Streams, Rivers, and Wetland pollution issues specifically. The following is an excerpt from that planning process:

“Safeguards should be considered and implemented to protect against soil, silt, stream, river and ground water pollutions. Pollution could be chemical, biological, sediment or any known substance which could be of risk to health or environment.”

Of critical importance to Owyhee County will be the maintenance of the domestic watershed supplies.

3.11.1 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 enhancement, protection, and maintenance of old growth and riparian areas. 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.

In Owyhee County, juniper invasion of the shrub-steppe and aspen ecosystems has become a major concern. Fire exclusion in these areas has led to wide spread expansion of western juniper, and subsequent loss of shrub-steppe and aspen communities. Active management of the encroaching juniper through prescribed burning will increase the shrub and diverse herbaceous plant communities, which will help maintain watershed function and stability, and reduce accelerated erosion. Prescribed burning will also help reduce the severe fire potential by reducing hazardous fuel loads and returning the landscape to a more natural state.

A large, high intensity fire could have negative effects on watershed conditions, thus affecting both fish and habitat in streams. 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, stand-replacing fire. Potential short-term effects to streams and fish include increased risk of landslides, mass movement and debris torrents, increases in surface sediment erosion, possible reduction in streamside vegetation resulting in changes within management areas, and possible increases in water yield depending on the amount and severity of the vegetation burned. Long-term effects include increases in nutrient delivery, possible increases in woody debris in streams, and possible increases in stream temperature if shading is significantly reduced. 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.

3.12 Air Quality

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

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in the Southwest 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 Owyhee County, winds are predominantly from the southwest but occasionally blow from the west to northwest. Air quality in the area and surrounding airshed is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the

summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect all communities in Owyhee County.

Smoke management in Owyhee County is managed by the Idaho/Montana Airshed Group. Much of the county is in Airshed Units 22 and 23. The Boise Impact Zone lies directly north of Owyhee County near the Oregon border (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 Hell's Canyon, Sawtooth, and Craters of the Moon Class I areas may be affected by burning in Owyhee County.

All of the communities within Owyhee 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). There are no monitoring sites within the county. The nearest monitoring sites are in the Canyon and Ada counties to the north.

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).

3.12.1 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. The combination of light fuels and dry sites lead to fires that typically display the highest rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moistures, and lightest fuels. These slopes also tend to be on the windward side of mountains. Thus these slopes tend to be “available to burn” a greater portion of the year.

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

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

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

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

4.2 Owyhee County Conditions

Owyhee County is characterized by relatively mild winters and hot, dry summers. Although infrequent, fires in the rangeland fuel types present much of the County with the potential of large, intense and damaging fires. Forest type fuels in the Owyhee Mountains also present a significant wildland fire hazard; however, there are fewer structures or permanent residents in these remote mountainous areas.

Owyhee County has been experiencing steady growth, particularly around the communities in the northwestern corner of the county (Owyhee County Comprehensive Plan 2002). At the same time, the number and value of resources at risk is on the increase, as more and more homes are built in the midst of fire prone fuels. Human use is strongly correlated with fire frequency, with increasing numbers of fires as use increases. The combination of frequent ignitions and flammable vegetation has greatly increased the probability that incendiary devices will find a receptive fuel bed, resulting in increased fire frequency. Discarded cigarettes, tire fires, hot catalytic converters, careless use of fireworks, and debris burning have all contributed to the potential ignition sources in the area.

Fire departments within Owyhee County have reported a general increase in the number of fires within the county. Although there have been few homes lost to wildland fires in the recent past, the potential is growing. Fire departments feel as though pure luck has been on the side of many homeowners, as more and more fires seem to be controlled at the doorstep of residents' homes. It is quite probable that homes will eventually be lost to wildland fire. However, there are

a number of actions that can be taken now that can decrease the probability that these events will occur.

4.2.1 County Wide Potential Mitigation Activities

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

- Prevention
- Education/ Mitigation
- Readiness
- Building Codes

4.2.1.1 Prevention

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

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

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

Burn Permits: The state of Idaho recognizes a closed burning season between May 10 and October 20, during which, anyone wishing to burn slash, stubble, yard waste, or other debris must obtain a burn permit. Idaho Code 38-115 states: *“During the closed season it shall be unlawful for any person to set or cause to be set a fire in any slashing area, or a fire to any stump or stumps, log or logs, down or standing timber or to set or cause to be set, a fire on any forest or range lands (bold emphasis added by me) or dangerously near thereto, or in any field in any forest protective district, without having first procured a permit from the fire warden of the district...”*

The Fire Warden for the Southwest Idaho Supervisory Area, Southwest Idaho Forest Protective District can be reached at: Idaho Department of Lands, 8355 West State Street, Boise, ID 83703, phone: 208 334-3488.

The burning permit specified in Idaho Code 38-115 and the Uniform Fire Code shall be used to protect public health, safety, and welfare. The permit shall be subject to the following conditions:

- a. Permits issued for open fires shall be required from May 10 to October 20, inclusive, of each year and be limited to that period of time needed to accomplish the permitted burning; provided, however, in no event shall such permit be issued to cover a period of more than ten (10) days.
- b. This permit does not relieve permittee from responsibility of fire damage and suppression costs as a result of fire escaping from prepared permit area.”

(From Idaho Code 38-115) “It shall be the duty of the director of the department of lands to prepare the proper form of permit to be used in carrying out the provisions of the section. The fire wardens shall at all times have authority to refuse permits and/or to revoke the same and to postpone their use when issued, when they shall deem it necessary to do in the interest of public safety...”

4.2.1.2 Education

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.

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

However, knowledge is no good unless acted upon. Education needs to be followed up by action. Any education programs should include an implementation plan. Ideally, funds would be made available to financially assist the landowner making the necessary changes to the home. The survey of the public conducted during the preparation of this WUI Fire Mitigation Plan indicated that approximately 59% of the respondents are interested in participating in this type of an activity.

4.2.1.3 Readiness

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

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

4.2.1.4 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. Some of these issues have already been addressed in the Owyhee County Comprehensive Plan (2002) and Owyhee County Code (2003). Additional codes or changes to the code are periodically considered by the County.

4.3 Owyhee 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. Owyhee County Communities

Community Name	Planning Description	Vegetative Community	National Register Community At Risk? ¹
Bruneau	Community	Rangeland	Yes
Cliffs	Community	Rangeland	No
Givens Hot Springs	Community	Rangeland	Yes
Grand View	Community	Rangeland	Yes
Grasmere	Community	Rangeland	Yes
Guffy	Community	Rangeland	No
Homedale	Community	Rangeland	Yes
Hot Springs	Community	Rangeland	No
Indian Cove	Community	Rangeland	No
Marsing	Community	Rangeland	Yes
Murphy	Community	Rangeland	Yes
Murphy Hot Springs	Community	Rangeland	No
Oreana	Community	Rangeland	Yes
Pleasant Valley	Community	Rangeland	No
Reynolds	Community	Rangeland	Yes
Riddle	Community	Rangeland	Yes
Silver City	Community	Forestland	Yes
Three Creek	Community	Rangeland	Yes
Triangle	Community	Forestland	Yes
Wilson	Community	Rangeland	No

¹Those 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.

4.3.1 Mitigation Activities Applicable to all Communities

4.3.1.1 Homesite Evaluations and Creation of Defensible Space

Individual homesite 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.

4.3.1.2 Travel Corridor Fire Breaks

Ignition points are likely to continue to be concentrated along the roads and highways 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, fire lines 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.

4.3.1.3 Power Line Corridor Fire Breaks

The treatment opportunities specified for travel corridor fire breaks apply equally for power line corridors. The obvious difference between the two is that the focus area is not an area parallel to and adjacent to the road, but instead focuses on the area immediately below the infrastructure element. Protection under the high tension power lines is strongly recommended. This may be an opportunity for intensive livestock grazing practices as a tool for reducing fine fuels around significant infrastructure.

4.4 Communities in Owyhee County

4.4.1 Vegetative Associations

The vast majority of land within the valley bottoms has been converted to irrigated cropland, with few patches of native vegetation remaining. One notable exception is the C.J. Strike Wildlife Management Area, near Bruneau. This area is managed to sustain a native vegetative ecosystem for the preservation of wildlife.

Agricultural practices have created a patchwork of green, lush vegetation and cured rangeland. This patchwork helps to break the continuity of fuels that are available to burn. Damaging fires in agricultural lands are infrequent; however, these fuel types could potentially support a very fast-moving albeit, low intensity, fire. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period.

In contrast, the Owyhee Mountains in the western portion of the county are characterized by scattered juniper woodlands with patches of Douglas-fir and quaking aspen. These fuels are capable of supporting large and intense wildland fires. The xeric vegetation and hot, dry and windy conditions as well as steeper slopes increase the potential for severe fires.

The last few decades has seen the proliferation of Cheatgrass throughout the county, an exotic grass species that is able to out compete native bunchgrasses. Cheatgrass responds well to soil disturbance and is found in abundance along roadsides, driveways, new construction areas,

and in recently burned areas. Over time, vegetative species composition in unmanaged or non-irrigated land has shifted toward fire prone species, particularly in high use areas where disturbance is common. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period.

4.4.2 Overall Fuels Assessment

Fuels throughout the upland areas of Owyhee County are quite consistent, dominated by grasslands and sage. Areas dominated by grass with scattered sage can be described as Fuel Models 1 and 2 (FM1 and FM2). Fires in these fuel types tend to be spread rapidly, but burn at relatively low intensity. Where grasses become less consistent, wind is needed to push fires through the bunchgrass. Sage-dominated fuel complexes can be described as FM6. Typically, fires in this fuel type require a moderate wind in order to push the fire through the fuels. Without wind, the fire will drop to the ground. In the absence of fine fuels, fire spread will stop. However, wind driven fires in any of these fuel types can burn significant acreage in a short period of time. During an August day with 20 mile an hour winds, fires in these fuel types can burn over 3,000 acres in a single hour, with flame lengths of over 20 feet.

Fires in juniper/Douglas-fir forest habitat types generally occur very infrequently, but are typically stand replacing. Low branches can act as ladder fuels, which may lead to extensive torching or crown fires. Slow buildup of fuels in the understory is common due to extremely slow rates of decomposition in the arid environment. Due to the patchiness of this fuel type, wildland fire in one stand would not likely result in destruction of the entire forest community. However, they could act as a catalyst for fire spread. Quaking aspen communities are less prone to fire because of their preference for cool, moist draws. Fires in these stands would be very slow burning under normal weather conditions. Nevertheless, aspen communities are dependent on periodic low intensity fires to invigorate new stands.

Over time, vegetative species composition in unmanaged or non-irrigated land has shifted toward fire prone species, particularly in high use areas where disturbance is common. Cheatgrass invasion has been prolific throughout many areas within the Great Basin. Cheatgrass is an exotic grass species that is able to out compete native bunchgrasses. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period. The fine structure and its ability to completely dominate disturbed sites provide a dry, consistent fuel bed for fire. Where the exotic has encroached in sagebrush stands, it now provides a consistent bed of fine fuels that actively carries fire without the effect wind. Because of these characteristics, cheatgrass will support fire during times of the year and under conditions which native vegetation would not sustain a wildland fire. After fire disturbance, native species are often replaced by monocultures of cheatgrass. Because of the grasses ability to dominate disturbed sites and its propensity to burn, cheatgrass has the ability to remain dominant once a site is disturbed.

4.4.2.1 Ignition Sources

Natural ignition sources from summertime lightning storms are quite common in Owyhee County. Lightning strikes in light grass fuels such as those in the eastern and southern portions of the county are quickly extinguished if any precipitation accompanies the storm. Natural ignitions are more common in areas with abundant sage, where woody fuels are able to sustain fire during precipitation events, emerging when surface fuels dry. However during dry lightning events, storm cells can ignite dozens of fires throughout wildland areas.

Human caused fires contribute to the probability of fires in this area. 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 line fires resulting from tree contact can also spark fires, especially during windy conditions.

The abundance of human and natural ignition sources and the dry nature of fuels in the area increase the probability of wildland fire. Fire characteristics will depend on fuels type and fuel moisture as well as on weather conditions at the time of ignition. Fires during periods of drought with high temperatures, low humidity and strong winds can quickly lead to fast-moving, destructive wildfires in any fuel type.

4.4.3 Overall Community Assessments

The majority of homes and structures within Owyhee County are at low risk of loss to wildland fire. The prevalence of irrigated cropland throughout the Snake River and Bruneau River valleys bottom effectively reduce the potential for loss to wildland fire in the majority of areas.

Homes within the light grass and sage fuels are at an increased risk to wildland fire, as fire typically spreads very rapidly, leaving little time to prepare a home in advance of a fire. There are a number of individual homes that are at significant risk to wildland fire loss in the area, largely due to use of highly ignitable materials in home construction, or by lack of defensible space surrounding the home. Considering the high spread rates typical in these fuel types, homes need to be protected prior to fire ignitions, as there is little time to defend a home in advance of a grass and range fire.

Homes and other structures surrounded by the forest type fuels in the Owyhee Mountains, have a moderate to high fire risk. Fires in these fuels tend to be much more intense with higher flame lengths increasing the potential for torching or crowning. Home and landowners in these areas should take considerable precautions to protect their property from wildfire. Using fire-resistant building materials and maintaining a defensible space will drastically increase survivability. Access into these more remote areas is also an issue. The lack of a safe alternate escape routes increases the potential for entrapment.

The greatest resources threatened in Owyhee County are the range resources on the private and public lands in the upland areas of the county. Owyhee County supports a significant ranching economy that is dependant on grazing of these arid lands. Large fires can significantly impact grazing resources; thus, having a significant detrimental effect on the local cattle industry.

4.4.3.1 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving a passing fire front 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 survivability can be greatly enhanced by following a few simple guidelines that reduce the ignitability of the home.

“Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Owyhee County should be encouraged to work with local fire departments and fire management

agencies within the county to complete individual homesite evaluations. Home defensibility steps should be enacted based on the results of these evaluations.

4.4.4 Individual Community Assessments

4.4.4.1 Bruneau and Hot Springs Area

The community of Bruneau is situated between the Bruneau Sand Dunes and the southeastern end of the C. J. Strike Reservoir approximately 4 miles south of the Snake River and Owyhee-Elmore County line. The community center and many Bruneau residents are located in the more fertile flatlands known as the Bruneau Valley. This watershed drains the Bruneau River along with a multitude of smaller tributaries and springs. Near the southern end of the Bruneau Valley is the small population center of Hot Springs. Residents of Hot Springs are primarily farmers and ranchers from the surrounding area. The Bruneau Valley and much of the area on the southeastern end of the C.J. Strike Reservoir has been developed for irrigated pastureland or crops. Extensive irrigation systems have been developed to provide irrigation to the valley and upland areas around Bruneau. These systems are dependent upon a steady electrical power source that is brought to the pumps via overhead power lines. The vegetation along the rim of the valley and beyond consists of sagebrush and other vegetation typical of the xeric climatic conditions.

The southeastern extent of the Bruneau River arm of the C. J. Strike Reservoir lies within 2 miles of Bruneau. The landscape surrounding the Reservoir is highly valued for its excellent fishing, boating, camping, hunting, and other recreational opportunities. Much of the area surrounding the Reservoir is administered by the Bureau of Land Management, Idaho Fish and Game, or Idaho Power.

4.4.4.1.1 Fire Potential

Fuels Assessment

Fuels surrounding Bruneau, the Bruneau Valley, and Hot Springs are primarily dominated by grass and sagebrush plant communities. Agriculture and ranching activities are dominant within the Bruneau Valley resulting in a discontinuous pattern of native fuels. A wind-driven fire in the dry native fuel complexes would produce a rapidly advancing, but variable intensity fire. In areas dominated by mature sage stands, larger flame lengths and increased intensities would be expected. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Nevertheless, many homeowners maintain groomed yards or are surrounded by agricultural fields; thus, decreasing the risk of a wildland fire threatening structures. Grazing on BLM public lands surrounding the communities helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the fine, flashy fuel component of sagebrush-steppe ecosystem.

Ignition Profile

Although lightning events are common in Owyhee County, the communities of Bruneau and Hot Springs are more prone to man-caused ignitions than lightning strikes due to the flatter topography and agricultural development. 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.

Stubble fires seldom escape landowner's boundaries; however, there are a few incidents throughout the County each year. These fires are generally easily suppressed by modifying the vegetation and homes are rarely threatened. Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Grain trucks, ATV's, and pick ups are used regularly for recreational purposes and farming operations. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels. High tension power lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.1.2 Ingress-Egress

The primary access into Bruneau is via either State Highway 51 from the north and south or State Highway 78 from the northeast. Both roadways are well-maintained, paved, two lane highways. Hot Springs can be accessed from the north via either Hot Springs Road or Hot Creek Road. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural fields. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Clover-Three Creek Road, Grasmere Road and the Oregon Trail Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.1.3 Infrastructure

Residents of Bruneau and Hot Springs are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

High tension power lines pass within one mile of the Bruneau community center. These and the other public transmission lines strung to homes throughout the Bruneau Valley and Hot Springs area are at low to moderate risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is some potential for ignition.

4.4.4.1.4 Fire Protection

The Bruneau Rural Fire Department provides structural fire protection for the communities of Bruneau and Hot Springs. They also have a mutual aid agreement with the community of Grand View. Additionally, the Bureau of Land Management and the Idaho Fish and Game provide wildland fire protection. Developed access to drafting or dipping sites along the Bruneau River or at the C. J. Strike Reservoir significantly increase the ability of emergency response to effectively control a wildland fire.

4.4.4.1.5 Community Risk Assessment

Residents of Bruneau and Hot Springs have low to moderate risk of experiencing a wildland fire due to the communities' location in a valley bottom and their nearby access to water resources. However, intense recreational activities throughout the area increase the risk of a man-caused

wildfire spreading to the communities. The receptive nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving rangeland fire. Therefore, it is important that homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds. Community defensible space is also maintained by livestock grazing. A planned, integrated grazing system around the community could help enhance the fire reduction benefits derived from grazing.

4.4.4.1.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

For the community as a whole, a reduction in fuel loads and development of fuel breaks and access to water for firefighting would enhance the survivability of the community.

4.4.4.2 Givens Hot Springs

The community of Givens Hot Springs lies on the southern bank of the Snake River between Wilson and Marsing along State Highway 78. Much of this area is relatively flat; however, the foothills of the Owyhee Mountains begin to rise along the southwestern edge of the community. The flatlands between the Owyhees and the Snake River have been heavily developed as irrigated farms and ranches. Native vegetation including sagebrush and sparse grasses dominate the lower slopes of the Owyhee Mountains and non-irrigated areas. The economy in Givens Hot Springs is based primarily on agriculture interspersed with commercial uses and cottage industry.

4.4.4.2.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Givens Hot Springs are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and the open rangelands of the lower Owyhee Mountains. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk

agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Givens Hot Springs is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.2.2 Ingress-Egress

The primary access into Givens Hot Springs is State Highway 78. This is a paved, well-maintained, two-lane route. This travel corridor is typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. State Highway 78 near Givens Hot Springs is not at significant risk of closure due to wildland fire.

Most of the secondary roads in the Givens Hot Springs area are privately owned and typically dead end; therefore, there is a limited access to alternate escape routes. Loop roads off Highway 78 or other thru roads should be signed as potential escape routes.

4.4.4.2.3 Infrastructure

Residents of Givens Hot Springs are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.2.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the community of Givens Hot Springs; however, there is no fire fighting equipment currently located in Givens Hot Springs. The Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.2.5 Community Risk Assessment

Residents of Givens Hot Springs are at low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area, particularly in the nearby Owyhee

Mountains, increase the risk of a man-caused wildfire spreading to the community. Additionally, the lack of readily available alternate escape routes increases the risk to residents in the event of a wildland fire. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.2.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Land has been purchased for the development of a fire house in Givens Hot Springs. In order for the local fire district to save money and become more efficient, a joint ownership of the facility with the Bureau of Land Management is being discussed. Currently, BLM fire resources must travel from Boise to fight incidents occurring in western Owyhee County including the Silver City area. Having both the local structural and wildland fire equipment and resources housed at the same facility saves both entities money and increases the effectiveness of the response.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be well signed and maintained for emergency use in the event that Highway 78 becomes compromised.

4.4.4.3 Grand View

The community of Grand View lies on the southern bank of the Snake River near the junction of the State Highway 67 (from Mountain Home) and State Highway 78. This area is characterized by sparse xeric climate vegetation including sagebrush and low growing grasses. Additionally, there is an abundance of both native and non-native trees and shrubs along the riverbank and scattered throughout the community. Soils in this area have a high sand content, which limits water retention and therefore the establishment of larger vegetation or abundant grass. Much of the area has been converted to pasture or agricultural crops as a result of the extensive development of irrigation canals.

4.4.4.3.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Grand View are typically sparse grasses and scattered sagebrush broken by irrigated pasture or cropland. Due to the sandy soils and discontinuous fuel bed, wind would likely be needed to spread fire throughout the area. More densely vegetated areas near the Snake River or along other waterways may burn more intensely. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands surrounding the community helps decrease build up of fine fuel loads and therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Grand View is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.3.2 Ingress-Egress

The primary access into Grand View is via State Highway 78. This is a paved, well-maintained two-lane route. State Highway 67 from Mountain Home offers an alternative paved escape route. The bridge spanning the Snake River between Grand View and the Chatten Hills area is at low fire risk due to the urban development and lack of wildland fuels. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including River Road and Mud Flat Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.3.3 Infrastructure

Residents of Grand View are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.3.4 Fire Protection

The Grand View City Fire Department provides structural fire protection for the community of Grand View. The Grand View Rural Fire Department provides structural fire protection for the greater Grand View area and residents of the Chattin Hills area in Elmore County. The rural department also has mutual aid agreements with the communities of Bruneau and Mountain Home. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or in other waterways would be crucial in the event of a fire.

4.4.4.3.5 Community Risk Assessment

Residents of Grand View have low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The Grand View area also experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.3.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.4 Homedale

The community of Homedale lies on the southern bank of the Snake River at the junction of U.S. Highway 95 and State Highway 19. This area is relatively flat and well irrigated by resources drawn from the Snake River and the Owyhee River. A few rolling hills and gullies are created by the numerous streams and canals crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated pastures, on untillable hillsides, empty lots, and along roadways. The economy in Homedale is based on agriculture.

4.4.4.4.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Homedale are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated areas and distant rangelands. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Homedale is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.4.2 Ingress-Egress

The primary access into Homedale is either State Highway 19 from the west or U.S. Highway 95 from the north or south. These are both paved, well-maintained, two-lane routes. The bridge spanning the Snake River at Homedale is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Homedale Road and Johnstone Road, are also located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.4.3 Infrastructure

Residents of Homedale are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources would not likely be seriously affected by a rangeland fire.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.4.4 Fire Protection

The Homedale City Fire Department provides structural fire protection for residents within the Homedale city limits. The Homedale Rural Fire District provides structural fire protection for the greater Homedale area. The rural department also has mutual aid agreements with the communities of Caldwell, Wilder, and Marsing. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.4.5 Community Risk Assessment

Residents of Homedale have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.4.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.5 Indian Cove

The small community of Indian Cove lies on the southern bank of the Snake River east of Bruneau along State Highway 78. This area is relatively flat and well irrigated by resources drawn from the Snake River. A few rolling hills and gullies are created by Browns Creek and the numerous other streams crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated areas and along roadways. The Saylor Creek Air Force Range lies only about 3 miles to the south of the community center.

4.4.4.5.1 Fire Potential

Fuels Assessment

Native fuels in the Indian Cove area are typically very sparse grasses and scattered sagebrush broken by relatively small expanses of irrigated agricultural fields. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Homeowners generally maintain an adequate defensible space around structures.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Indian Cove are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of hazardous vegetation. Residential living and agricultural activities 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. Activities and off-road vehicle use on the Saylor Creek Air Force Range may be a potential cause of an ignition.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.5.2 Ingress-Egress

The primary route through the Indian Cove area is State Highway 78. This is a well-maintained, paved, two-lane road. There are only a few alternate secondary routes throughout the area, most of which travel into the higher risk rangeland areas to the south or access private property. Although the community would benefit from an additional alternate escape route, Highway 78 is at low risk of wildfire due to the lack of fuels bordering the roadway and the abundance of nearby water resources.

4.4.4.5.3 Infrastructure

Residents of Indian Cove have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.5.4 Fire Protection

Currently, there is no formal structural fire protection for residents of Indian Cove. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or dipping sites on the Snake River may become imperative in the event of a wildland fire.

4.4.4.5.5 Community Risk Assessment

Residents of Indian Cove have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational, military, and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds. The lack of a safe alternate escape route heightens the risk to residents in the event that a wildfire threatens the community.

4.4.4.5.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be developed, maintained, and signed for emergency use in the event that Highway 78 becomes compromised.

4.4.4.6 Marsing

The community of Marsing lies on the southern bank of the Snake River near the junction of State Highway 78 and State Highway 55. This area is relatively flat and well irrigated by resources drawn from the Snake River and the Owyhee River. A few rolling hills and gullies are created by the numerous streams and canals crisscrossing the landscape. Native vegetation including sagebrush and sparse grasses can be found in non-irrigated pastures, on untillable hillsides, empty lots, and along roadways. The economy in Marsing is based on agriculture.

4.4.4.6.1 Fire Potential

Fuels Assessment

The fuels surrounding the community of Marsing are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and distant rangelands. More densely vegetated areas near the Snake River or along other waterways may burn more

intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands south of the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Marsing is more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.6.2 Ingress-Egress

The primary access into Marsing is either State Highway 55 or State Highway 78. These are both paved, well-maintained, two-lane routes. The bridge spanning the Snake River at Marsing is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. There are also a few areas void of any vegetation where sand and rock abut the roadway. These access routes are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Marsing Road, Edison Road, and Pershall Road, are also located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels.

4.4.4.6.3 Infrastructure

Residents of Marsing are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.6.4 Fire Protection

The Marsing City Fire Department provides structural fire protection for residents within the Marsing city limits. The Marsing Rural Fire Department provides structural fire protection for the greater Marsing area. The rural department also has a mutual aid agreement set up with the Murphy/Reynolds/Wilson Fire District and the communities of Caldwell and Homedale. Additionally, the Bureau of Land Management provides wildland fire protection. The availability

of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.6.5 Community Risk Assessment

Residents of Marsing have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area increase the risk of a man-caused wildfire spreading to the community. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.6.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.7 Murphy

Murphy, the county seat of Owyhee County, is located at the junction of the Reynolds Creek Stage Road and State Highway 78 approximately 6 miles south of the Owyhee-Canyon County border and the Snake River. Much of the area is characterized by gently rolling lowlands defined by what is known as Striker Basin. A low rising plateau extends along the length of the basin to the east of the community. Sagebrush dominates the vegetative community for several miles surrounding the town site. There is very little occurrence of grass or other native species, except in yards or other developed areas. Although there is evidence of past irrigation attempts, current agricultural development is very limited.

4.4.4.7.1 Fire Potential

Fuels Assessment

The native fuels surrounding the community of Murphy are primarily limited to sagebrush with varying densities depending on the availability of soil, topography, and the amount of

development. Due to the high sand content in the soils, fire spread in more sparsely vegetated areas would be limited. In mature, more dense stands of sagebrush larger flame lengths and higher intensity fires would be expected. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Grazing on BLM public lands surrounding the community helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the community of Murphy is more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of continuous fuel bed. Residential living presents innumerable ignition sources. Debris burning, discarded cigarettes, children playing with matches, fireworks, and roadway fires are just a few of the countless potential human ignition sources in the area.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.7.2 Ingress-Egress

The primary access to Murphy is via State Highway 78. This is a paved, well-maintained two-lane route. The Rabbit Creek Road from the small community of Reynolds offers an alternative escape route; however, this path is not a direct route out of the high fire risk area. Both of these routes are bordered by sparse desert climate vegetation. There are also large areas void of any vegetation where sand and rock abut the roadway. These access routes can be affected by wildland fire. The Rabbit Creek Fire affected traffic flow between Reynolds and Murphy in 1997.

4.4.4.7.3 Infrastructure

Residents of Murphy are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.7.4 Fire Protection

The Murphy/Reynolds/Wilson Volunteer Fire Department provides structural fire protection for the community of Murphy. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of developed drafting or dipping sites along the Snake River or in other waterways would be crucial in the event of a fire. In areas farther away from the rivers and waterways, local station houses, canals, impoundments and perennial streams are important water sources. The Guffy subdivision several miles northwest of Murphy has several well houses that are capable of replenishing district fire trucks.

4.4.4.7.5 Community Risk Assessment

Residents of Murphy have low risk of experiencing a wildland fire due to the lack of heavy fuels surrounding most structures and their nearby access to water resources. Nevertheless, the Murphy area experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. Most homeowners maintain an adequate defensible space around structures. It is important that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event.

The Eagle View subdivision, located northwest of Murphy off State Route 78, has moderate risk of experiencing a wildfire. Fuels in this area are sparse and would likely need strong winds to carry a fire; however, the subdivision has other problems that may hinder fire fighting capabilities. Wells in the area frequently run dry; thus, immediate access to water resources from hydrants or other sources may be delayed. Access roads were also poorly planned with several dead ends and narrow turn around areas.

4.4.4.7.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

The Eagle View subdivision would benefit from the development of deeper wells to service fire hydrants and other fire-related water resources. Also, continuing construction on access roads to create loops or larger diameter culdesacs would improve the effectiveness and safety of fire response personnel. Implementing county-wide building codes to prevent the development of subdivisions that impede fire response capabilities would reduce the fire risk to residents.

4.4.4.8 Murphy Hot Springs

The primarily seasonal community of Murphy Hot Springs sits at the bottom of the steep sided and narrow canyon created by the East Fork of Jarbridge River. Homes in Murphy Hot Springs are packed fairly tightly into the small floodplain of the river. The canyon walls are very steep and rocky. Sagebrush and sparse grasses are dominant on the slopes and the canyon rim; however, black cottonwood and other hardwoods grow along the river bottom.

4.4.4.8.1 Fire Potential

Fuels Assessment

Native fuels in the Murphy Hot Springs area are typically very sparse grasses and scattered sagebrush broken by rock outcroppings along the canyon slopes. Although possible, it is unlikely that a fire would be able to back down these steep slopes and enter the community from above. However, a fire down canyon would likely funnel hot gases, fumes, and smoke directly towards the community. The increased density of vegetation along the river would support a higher intensity and rapidly moving wildfire that could easily ignite fuels on both sides of the canyon.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Murphy Hot Springs are more prone to man-caused ignitions than lightning strikes due to its location in the canyon and the abundance of recreational activities in the area. Residential living and recreational activities 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry rangeland vegetation or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.8.2 Ingress-Egress

The only route in and out of Murphy Hot Springs is Three Creek Road. This is a one lane dirt and gravel road. Three Creek Road traveling up and out of the canyon to the east involves a short, but steep climb up a narrow grade to the flatter rangelands above. This road continues along the canyon bottom about 15 miles to Jarbridge, Nevada. This route is very narrow and would not facilitate safe emergency travel.

4.4.4.8.3 Infrastructure

Residents of Murphy Hot Springs have drilled domestic wells. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.8.4 Fire Protection

There is no structural fire protection for residents of Murphy Hot Springs. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.8.5 Community Risk Assessment

Residents of Murphy Hot Springs have a moderate to high risk of wildland fire due its location in the canyon amongst heavier riparian fuels. Additionally, the remoteness of the community will

significantly increase the response times of emergency personnel and fire suppression equipment, which may exacerbate the situation. Access into the community may also create problems not only for evacuation purposes, but it may also be dangerous for firefighters to enter the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Currently, there is very little defensible space between homes. The lack of a safe alternate escape route greatly heightens the risk to residents in the event that a wildfire threatens the community. There are also very few places within the town in which a large vehicle could be turned around easily.

4.4.4.8.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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. Homes' survivability in Murphy Hot Springs can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning the main road through town and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. It is also important for alternative escape routes to be developed, maintained, and signed for emergency use in the event that Three Creek Road becomes compromised.

4.4.4.9 Oreana

The community of Oreana is located on Oreana Road approximately one mile south of State Highway 78. Although an old church marks the community center, there are currently only a few larger ranches and scattered homes remaining in the area. Much of the area is characterized by very sandy soils and exposed rock and sand plateaus both of which lack viable vegetation. Scattered sagebrush and sparse grasses are found intermittently throughout the area, particularly in shallow drainages. There are several small streams stemming from the foothills of the Silver City Range southwest of Oreana; however, these channels carry very little water during the summer months.

4.4.4.9.1 Fire Potential

Fuels Assessment

Native fuels in the Oreana area are typically very sparse grasses and scattered sagebrush broken by expanses of pure sand and rock. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Under extreme weather conditions, particularly high winds, there is a high potential for a

rapidly advancing rangeland fire. Homeowners in the area generally maintain an adequate defensible space around structures. Grazing is an integral part of the economic basis of Oreana. Livestock grazing results in lower fine fuel loads, which decreases the fire potential throughout the area.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Oreana are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of vegetation. Residential living presents 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.9.2 Ingress-Egress

The primary route through the Oreana area is the Short Cut Road and Oreana Loop Road and the Bachman Grade Road, which connects on both ends to State Highway 78. The loop road is a paved, mostly one-lane access route. There are several secondary routes that can also be used to reach Highway 78 in an emergency situation. For the most part, these travel corridors are bordered by low risk xeric climate vegetation or sand and rock; however, there are a few sections along the loop road that exhibit slightly more dense riparian-type vegetation, particularly near the site of Foremans Reservoir, that may elevate the fire risk somewhat.

4.4.4.9.3 Infrastructure

Residents of Oreana are either connected to a municipal well or have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.9.4 Fire Protection

There are only a few permanent residents of Oreana; thus, there is no significant need for an organized fire department; however, many ranchers have water trucks and pumps to combat wildfire in an emergency situation. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.9.5 Community Risk Assessment

Residents of Oreana have a low risk of experiencing a wildland fire due to the lack of vegetation surrounding most structures. Nevertheless, the Grand View area experiences frequent winds, which generally increase the rate of fire spread and intensity of rangeland fires. Most

homeowners maintain an adequate defensible space around structures. The lack of a readily available water source during the summer fire season may reduce the ability of fire suppression services to effectively fight a wildland fire.

4.4.4.9.6 Mitigation Activities

Oreana residence should remain aware of the potential for wildland fire in this xeric environment. Maintaining a defensible space is imperative to the survival of the structure. Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.10 Pleasant Valley and Cliffs

The communities of Pleasant Valley and Cliffs are small agriculturally based population centers. Pleasant Valley refers to the valley created by the Jordan Creek drainage and is located just east of the Idaho-Oregon border near Jordan Valley, Oregon. Irrigated fields and pasture dominate the flatter valley, but native rangeland fuels including sagebrush and grasses are found along the valley rim and beyond. The Owyhee Mountains lie to the east. Cliffs is located along Juniper Mountain Road south of Pleasant Valley between Dougal Reservoir and Forster Reservoir. There are only a few residents in this area, many of which are large ranch and farm owners. Small flatland areas have been irrigated to provide feed for livestock, but much of the landscape is dominated by sagebrush and native grasses. Juniper is rapidly invading the Owyhee Mountains to the east.

4.4.4.10.1 Fire Potential

Fuels Assessment

The fuels surrounding the Pleasant Valley and Cliffs areas are dominated by native rangeland fuels intermixed with irrigated pasture and cropland. Native fuels are typically grasses and scattered sagebrush that would be expected to burn at variable intensities and move very quickly. More densely vegetated areas along creek beds and canals may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands surrounding both communities helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Pleasant Valley and Cliffs are at risk from both natural and man-caused fire ignitions. Lightning events are common throughout the Owyhee Mountains. Ignitions due to lightning strikes could occur within or spread to the lower elevations under severe weather conditions; however, it is more likely that fire spread would be predominantly upslope to the east due to the prevailing winds. The communities of Pleasant Valley and Cliffs are also prone to man-caused ignitions due to the relatively high density of recreational and agricultural activity. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential

ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.10.2 Ingress-Egress

The primary access into Pleasant Valley is Pleasant Valley Road. Pleasant Valley Road is partially paved through much of the valley, but turns to a well-maintained two lane gravel route near the south end. Cliffs is reached via Juniper Mountain Road from either the north or the south. This is also a one or two lane gravel route. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. These roads are at moderate fire risk; however, it is unlikely that fuels along these routes would sustain a fire for a significant amount of time.

There are a few other potential escape routes into Jordan Valley from Pleasant Valley. These are typically one-lane, gravel roads that are at low to moderate fire risk. Residents of Cliffs lack an alternative escape route; thus, it is important that either another road be constructed for this purpose or fuel treatments and regular maintenance occur annually along Juniper Mountain Road to insure this escape route is not compromised by wildfire.

4.4.4.10.3 Infrastructure

Residents of Pleasant Valley and Cliffs have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the Pleasant Valley area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition. Cliffs and more remote ranches and farms rely on propane for heat, cooking, and lights.

4.4.4.10.4 Fire Protection

The Jordan Valley Fire Department provides structural fire protection for the communities of Pleasant Valley and Cliffs. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites at Dougal Reservoir or along streams or irrigation canals would be crucial in the event of a fire.

4.4.4.10.5 Community Risk Assessment

Residents of Pleasant Valley and Cliffs have a moderate risk of experiencing a wildland fire. Due to their remote location, response time by emergency and fire suppression vehicles will be greatly extended. Additionally, there is an abundance of native fuels intermixed throughout the patches of irrigated vegetation. Although this breaks up the continuity of wildland fuels and may slow the spread, it also provides a pathway to structures or other valued resources. Nevertheless, the nearby water resources, particularly the Dougal Reservoir and Jordan Creek, will allow more effective and efficient fire suppression operations. Recreational and agricultural activities throughout the area, particularly in the nearby Owyhee Mountains, increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most

homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.10.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

The Jordan Valley Fire Department responds to fire emergencies in the Pleasant Valley and Cliffs area; however, this area is not within their jurisdiction. Additionally, they do not receive compensation for the services they provide to these residents. Due to the small population in this area, constructing a fire department and obtaining the necessary equipment is not fiscally possible. However, legally forming a fire district and contracting the services of the Jordan Valley Fire Department may be more within the residents' means.

4.4.4.11 Reynolds

The small community of Reynolds lies in the Reynolds Creek valley between two major ridges of the Owyhee Mountains. Black Mountain, Rooster Comb Peak, and Whiskey Mountain overlook the basin. The majority of the permanent residents of Reynolds are ranchers and their associated employees or supporting businesses.

Several smaller tributaries drain into Reynolds Creek, which flows directly through the community. Small marshes and ponds have been established in lower areas. A large portion of the valley bottom is dominated by thick grasses, willows, wildflowers, and a multitude of other riparian vegetation. The slopes of the surrounding mountains are primarily administered by the Bureau of Land Management and are typically blanketed by sagebrush. The greater Reynolds area, especially towards Silver City, has a rich mining history, the remains of which attract many curious recreators each year. There are several nearby trails that are open to foot traffic or off-road vehicles.

4.4.4.11.1 Fire Potential

Fuels Assessment

Fuels near Reynolds Creek or one of its tributaries are primarily dominated by medium to tall grasses, brush species, and forbs. Due to the availability of moisture, these fuels are less likely to burn; however, if ignited, flames would spread very rapidly and burn with relatively high intensities and large flame lengths. Many of the structures in this area are surrounded by yards or pastureland, which serves to break the continuity of the fuels and create a defensible space.

The expansive sagebrush stands extending to the north and east from the more fertile basin are more prone to wildland fire. There is very little grass or other understory vegetation; thus, fire spread may be limited to areas with a continuous fuel bed. Under the influence of wind, fires in this type of fuels have the potential to move very rapidly; however actual burn time may be short. Grazing on private lands and BLM public lands surrounding the community helps decrease build up of fine fuel loads. Livestock grazing can be an effective tool to reduce the primary fuel load component of the sagebrush-steppe ecosystem.

Douglas-fir stands, juniper and mountain mahogany woodlands, aspen, and mountain shrub communities are the more dominant on the higher elevation slopes to the south and west of Reynolds. Western juniper and curleaf mountain mahogany are common on the dryer mid-elevation slopes, with Douglas-fir, subalpine fir and aspen at the higher elevations. Aspen, choke cherry, and other riparian species also occur draws and other more mesic sites. Mountain shrubs, such as mountain big sagebrush, snowbrush ceanothus, and snowberry are also common.

Ignition Profile

The higher ridges defining the Reynolds Creek drainage are of particular concern for lightning caused ignitions near the community of Reynolds. The receptive nature of the desert fuels could easily carry a rapidly advancing rangeland fire to the community. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving on unimproved trails. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.11.2 Ingress-Egress

The primary access into the Reynolds is via either the Rabbit Creek Road from Murphy or the Reynolds Creek Road from the State Highway 78-State Highway 45 junction. The Reynolds Creek Road is primarily a paved, one lane road, while the Rabbit Creek Road is a well-maintained, one-lane, graveled route. Both of these roads are bordered by fairly low risk sagebrush. There are also large sections where sand and rock, void of vegetation, abut the roadway. These access routes are not at significant risk of closure due to wildland fire; however, the windiness and sheer distance to the community may impede the response of additional fire suppression resources.

There are no other direct routes accessing the area; therefore, it is imperative that Rabbit Creek Road and Reynolds Creek Road remain in good condition and clear of hazardous fuels in order to function as safe evacuation routes.

4.4.4.11.3 Infrastructure

Residents of Reynolds have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for irrigation or livestock. These water resources would not likely be seriously affected by a rangeland fire.

Public transmission lines strung to homes throughout the area are at low to moderate risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is some potential for ignition.

4.4.4.11.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the community and outlying area. A 1,000 gallon, year-around tank is located in the Reynolds fire station. A 10,000 gallon tank is available during the fire season at the local USDA station. The ZX Ranch has installed a 10,000 gallon underground tank that is also available to the fire district. Additionally, the Bureau of Land Management provides wildland fire protection. Developed access to drafting sites along Reynolds Creek would significantly increase the ability of emergency response to effectively control a wildland fire. Reynolds Creek often goes dry in the summer months, thus, drafting sites would have to be of sufficient depth to access the subsurface flow.

4.4.4.11.5 Community Risk Assessment

Residents of Reynolds have moderate risk of experiencing a wildland fire due to the community's location in a valley bottom and their nearby access to water resources. However, intense recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The receptive nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving rangeland fire. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.11.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Creating drafting sites or an alternative water resource in addition to the all season firehouse tank, and available ponds, such as underground tanks near the community, will increase the effectiveness and efficiency of emergency response in a wildfire situation. It may also be advantageous to set up a prearranged mutual aid agreement with the Orendorf Ranch for use of the ponds during an emergency fire situation.

4.4.4.12 Silver City

The community of Silver City is located at the confluence of the Long Gulch stream and Jordan Creek approximately 26 miles southwest of Murphy, Idaho, in Owyhee County. The elevation of the town site is 6,100 feet above sea level and is situated in a scenic mountainous valley. The topography slopes gently upward on the east and west before rising sharply to War Eagle Mountain to the east and Florida Mountain to the west.

Silver City is a historic mining town dating back to the 1860's, when gold was discovered in the Owyhee Mountains of southwestern Idaho. Historic buildings, mine shafts, and mining structures characterize the historical mining district. Silver City is composed of approximately 71 historic structures that include homes, a hotel, a church, cemeteries, and a school. The structures are privately owned and many of the owners reside in Silver City during the summer and fall months. During the winter, Silver City Property Owners, Inc. hires a watch person to care for the town. The Deed Covenants and Owyhee County Silver City Preservation Ordinance requires that all structures be maintained to be as historically authentic as possible.

4.4.4.12.1 Fire Potential

Fuels Assessment

The diverse vegetation types throughout the Silver City area provide valuable wildlife cover and habitat. Currently, Douglas-fir stands, juniper and mountain mahogany woodlands, aspen, and mountain shrub communities are the dominant vegetation types. Western juniper and curleaf mountain mahogany are common on the dryer lower elevation slopes, with Douglas-fir, subalpine fir and aspen at the higher elevations. Aspen, choke cherry, and other riparian species occur along the creeks and on mesic sites. Mountain shrubs, such as mountain big sagebrush, snowbrush ceanothus, and snowberry are also common.

Forest health issues in the Silver City area increase the fire risk. Many of the aspen stands are being invaded with late seral Douglas-fir, which is more prone to higher intensity fires. In addition, Douglas-fir and subalpine fir stands throughout the area are dying from tussock moth and bark beetle infestations. The dying trees are widespread and pose a significant fire hazard by increasing the amount of fuels readily available to burn. Dead or dying debris increases forest fuel loads, which not only can create vertical and horizontal continuity of fuels leading to rapid spread and/or torching and crowning, but it can also result in a much higher intensity fire.

Structures within and around Silver City are almost exclusively constructed with wood products gleaned from the surrounding woodlands; thus, many structures have a very high fire risk. Additionally, most of the in-town structures were built in close proximity to one another making the risk of fire jumping from structure to structure more eminent. The contiguous riparian vegetation in the Jordan Creek drainage, which splits the town site nearly in half, has a higher risk of carrying a fire due to the increased fuel loading in the stream bed. Black cottonwoods and other riparian vegetation will support a higher intensity fire than surrounding vegetation. The risk of a fire threatening the community via the Jordan Creek drainage is considerable.

Particularly under the influence of wind, fires in these fuel types have the potential to move very rapidly; however, intensities may be variable depending on the availability of fuel. Grazing on

private lands and BLM public lands surrounding the community helps decrease the build up of fine fuel loads.

Ignition Profile

The likelihood of lightning caused ignitions near the community of Silver City is great. The receptive nature of the fuels could easily carry a rapidly advancing wildland fire to the community. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Due to the remoteness and availability of unimproved roads and trails, Silver City attracts recreators and off-roaders from all disciplines. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving on unimproved trails. Campfires are typically restricted in recreational areas during high fire risk seasons; however, the potential for escape is significant due to the xeric climate and flammability of fuels.

4.4.4.12.2 Ingress-Egress

The primary access into Silver City is via the Silver City Road from Murphy. The majority of this route is a relatively well-maintained one to two-lane gravel road. The Jordan Creek Road from Jordan Valley, Oregon serves as an alternate escape route; however, the section between Delamar and Silver City is limited to vehicles with high ground clearance (four wheel drive would also be necessary during adverse weather conditions. Both of these roads travel through rangeland and timbered areas that are at higher risk of becoming threatened by wildfire. These access routes are at significant risk of closure due to wildland fire. Additionally, the windiness and sheer distance to the community may impede the response of fire suppression resources.

4.4.4.12.3 Infrastructure

Residents of Silver City rely on a community spring and gravity for their water resources. Residents of Silver City have considered augmenting the town water supply with resources from Florida Mountain or other possible sources. The Silver City Property Owners (SCPO) are currently in negotiations concerning water rights in order to improve the community's water supply. Repairs to the Silver City water storage tank or installation of additional storage tanks would increase the city's water holding capacity.

4.4.4.12.4 Fire Protection

There is currently no organized fire district encompassing Silver City. However, the Bureau of Land Management provides wildland fire protection and also parks a fire truck within the community during the fire season. Developed access to drafting sites along Jordan Creek would significantly increase the ability of emergency response to effectively control a wildland fire and protect the historic structures. Other developed water resources, such as water storage tanks or holding ponds, would also be improve firefighting capabilities.

4.4.4.12.5 Community Risk Assessment

Property owners and seasonal residents of Silver City have moderate to high risk of experiencing a wildland fire due to the community's remote location and lack of safe access routes and surplus water resources. Furthermore, intense recreational activities throughout the area increase the risk of a man-caused wildfire spreading to the community. The receptive

nature of fuels increases the likelihood of a fire start. In the event of wildfire, the dry fuels would likely support a very fast-moving fire. Therefore, it is imperative property homeowners implement fire mitigation measures to protect their structures and families prior to such an event. Few property owners maintain an adequate defensible space around structures, which heightens the fire risk.

4.4.4.12.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate property owners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. “Living with Fire, A Guide for the Homeowner” is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

Also of vital importance is the accessibility of the community to emergency apparatus. If the town site cannot be protected safely, firefighting resources will not jeopardize lives to protect the structures. Thus, the fate of the community will largely be determined by property owner actions prior to the event. In many cases, structures' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning roadways and creating turnaround areas for large vehicles. Stationing a BLM fire engine and crew in the Silver City area would reduce response rates and address some of the access issues as well as improve fire protection of citizens.

Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation. Feasibility studies and cost analyses for different alternative water resources would help the community get on the right track to developing these sites. Potential solutions include, but are not limited to: installing a generator in Jordan Creek to pump water into the town water system, pumping water contained in old mine shafts to the town site for use during emergencies, repairing the “Ice Pond” reservoir on Jordan Creek, and developing helicopter dipping sites on Jordan Creek.

Addressing the forest health issues abundant in the Owyhee Mountains surrounding Silver City will also decrease the fire risk. Removing the invasive Douglas-fir trees from the native aspen stands will maintain the valuable aspen component and significantly reduce their fire risk. Thinning dead and dying trees in the Douglas-fir and subalpine fir communities will also drastically reduce the fire potential associated with overcrowded and diseased forest stands. The Bureau of Land Management is addressing this issue by planning and implementing (as funding becomes available) several fuels reduction projects aimed at improved forest health and reduced fire risk in the Silver City area.

4.4.4.13 Three Creek

The small, primarily ranching community of Three Creek is located at the junction of Three Creek Road and Three Creek in the southeastern corner of Owyhee County. Three Creek residents are typically larger ranch owners scattered throughout the small, flat valleys created by Three Creek, Big Flat Creek, and a few other drainages. This area is characterized by gently rolling hills dominated by scattered sagebrush and grasses. A few landowners have developed irrigated hayfields and pasture for livestock.

4.4.4.13.1 Fire Potential

Fuels Assessment

Native fuels in the Three Creek area are typically very sparse grasses and scattered sagebrush broken by relatively small expanses of irrigated agricultural fields. Due to the sandy soils, discontinuous fuel bed, and primarily gentle topography, strong winds would likely be needed to spread fire throughout the area. Homeowners generally maintain an adequate defensible space around structures.

Ignition Profile

Although lightning events are common in Owyhee County, residents of Three Creek are more prone to man-caused ignitions than lightning strikes due to the gentle topography and lack of hazardous vegetation. Residential living and agricultural activities 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.13.2 Ingress-Egress

The primary route through the Three Creek area is Three Creek Road. This is a well-maintained, two-lane road from Rogerson in Twin Falls County to the east. Three Creek Road west of Three Creek slowly deteriorates into a one-lane dirt road, which access Murphy Hot Springs and continues on to Jarbridge, Nevada. There are only a few secondary routes throughout the area, most of which loop back to Three Creek Road or access private property. The Clover Three Creek Road about 4 miles west of the Three Creek town site is a relatively well-traveled dirt road traveling north to Bruneau. For the most part, these travel corridors are bordered by low risk xeric climate vegetation, sand and rock, or agriculture fields.

4.4.4.13.3 Infrastructure

Residents of Three Creek have drilled domestic wells. Supplementary wells have been established throughout the greater area to provide additional water for livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.13.4 Fire Protection

There are only a few permanent residents of Three Creek; thus, there is no significant need for an organized fire department. Wildland fire protection is provided by the Bureau of Land Management. The availability of drafting sites or an alternative source of water may become imperative in the event of a wildland fire.

4.4.4.13.5 Community Risk Assessment

Residents of Three Creek have a low risk of experiencing a wildland fire due to the lack of continuous vegetation surrounding most structures. Additionally, most homeowners maintain an adequate defensible space around structures. Due to the remoteness of the community, response time by emergency personnel and fire suppression equipment will be significantly increased, which may exacerbate the situation. The lack of a readily available water source during the summer fire season may reduce the ability of fire suppression services to effectively fight a wildland fire.

4.4.4.13.6 Mitigation Activities

Three Creek residents should remain aware of the potential for wildland fire in this xeric environment. Maintaining a defensible space is imperative to the survival of the structure. Creating drafting sites or an alternative water resource such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.4.4.14 Wilson and Guffy

The communities of Wilson and Guffy are small agriculturally based population centers. Both lie along the southern bank of the Snake River between Givens Hot Springs and Murphy along State Highway 78. Much of this area is relatively flat; however, the foothills of the Owyhee Mountains begin to rise along the southwestern and western edges of the community. The flatlands between the Owyhees and the Snake River have been heavily developed as irrigated farms and ranches. Other than the Snake River, there are also many small streams and canals that provide additional water resources for irrigation purposes. Native vegetation including sagebrush and sparse grasses dominate the lower slopes of the Owyhee Mountains and non-irrigated areas.

4.4.4.14.1 Fire Potential

Fuels Assessment

The fuels surrounding the Wilson and Guffy areas are dominated by irrigated crops or pastureland. Native fuels are typically sparse grasses and scattered sagebrush, but this type of vegetation is limited to non-irrigated or undeveloped areas and the open rangelands of the lower Owyhee Mountains. More densely vegetated areas near the Snake River or along other waterways may burn more intensely than rangeland fuels. Under extreme weather conditions, particularly high winds, there is a high potential for a rapidly advancing rangeland fire. Many homes in the area maintain watered or well-groomed yards or are surrounded by lower risk agricultural land. Grazing on BLM public lands to the south helps decrease build up of fine fuel loads and, therefore, decreases the fire potential in the wildland urban interface.

Ignition Profile

Although lightning events are common in Owyhee County, the communities of Wilson and Guffy are more prone to man-caused ignitions than lightning strikes due to the gentle topography and irrigated vegetation. 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.

Vehicle use on- and off-road is also a significant source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires may also be started by vehicles driving through dry fields or on unimproved trails. The Hemmingway Butte Trailhead is a very popular motorized recreation area and; thus, should be of particular concern. Public transmission lines in the area also add to potential ignition sources. Sparks from downed lines or arcing during extreme weather conditions could easily ignite dry fuels below.

4.4.4.14.2 Ingress-Egress

The primary access into both Wilson and Guffy is State Highway 78. Both Highways 78 and 45 are paved, well-maintained, two-lane routes. These travel corridors are typically bordered by arid climate vegetation including sagebrush and sparse grasses or agricultural crops. The bridge spanning the Snake River at Walters Ferry is at very little risk of becoming impassable due to a fire on either side of the river due to the agricultural and urban development. There are also a few areas void of any vegetation where sand and rock abut the roadway. State Highways 78 and 45 are not at significant risk of closure due to wildland fire.

Other potential escape routes, including Wilson Creek Road and Reynolds Creek Road, are located in areas that have low to moderate risk of being threatened by wildfire due to the lack of heavy fuels; however, these roads are not direct routes leading out of the area.

4.4.4.14.3 Infrastructure

Residents of Wilson and Guffy have drilled domestic wells. Supplementary wells have also been established throughout the greater area to provide additional water for irrigation or livestock. These water resources could be affected by a rangeland fire if the power lines that serviced the pumps were compromised.

Public transmission lines strung to homes and businesses throughout the area are at fairly low risk of causing a wildfire due to the lack of heavy fuels within the corridor. Nevertheless, under severe wind conditions or in the event of a downed line, there is potential for ignition.

4.4.4.14.4 Fire Protection

The Murphy/Reynolds/Wilson Fire District provides structural fire protection for the communities of Wilson and Guffy. The Wilson Fire Station in Wilson is capable of filling fire trucks and other mobile storage tanks with water. Additionally, the Bureau of Land Management provides wildland fire protection. The availability of drafting or dipping sites along the Snake River or other waterways would be crucial in the event of a fire.

4.4.4.14.5 Community Risk Assessment

Residents of Wilson and Guffy have a low risk of experiencing a wildland fire due to the sparse vegetation surrounding most structures and their nearby access to water resources. However, recreational and agricultural activities throughout the area, particularly in the nearby Owyhee Mountains, increase the risk of a man-caused wildfire spreading to the community. It is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to a wildfire event. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

4.4.4.14.6 Mitigation Activities

Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Owyhee County must be made aware that home defensibility starts with the home. Once a fire has started and is moving toward homes or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space.

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' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles. In Owyhee County, local fire departments give written approval for emergency vehicle access to new construction sites prior to issuance of a building permit.

Maintaining developed drafting sites and mapping alternative water resources such as underground tanks near the community will increase the effectiveness and efficiency of emergency response in a wildfire situation.

4.5 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.*** These summaries indicate their perceptions and information summaries.

4.5.1 Wildland Fire Protection

4.5.1.1 Bureau of Land Management

4.5.1.1.1 Twin Falls 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 Twin Falls 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. Twin Falls District 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
E695	Type 6 Engine	Ford-450 SD	295	90

Table 4.2. Twin Falls District List: Shoshone.

Identifier	Description	Make	Water Capacity	Pump GPM
W24	Type 2 Tender	Freightliner F9000	3500	750
Contract Dozer	Type 2 Dozer	Varies	N/A	N/A

Bellevue**Table 4.3. Twin Falls District 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. Twin Falls District 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. Twin Falls District 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. Twin Falls District List: Almo.**

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. Twin Falls District List: Kimama.**

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. Twin Falls District 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 Twin Falls 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 Twin Falls capable of carrying 800 gallons of retardant during the fire season. There are also 2 SEATS (Air Tracker 802) located in Boise and Pocatello. Mountain Home Air Force Base Saylor Creek Range

Fire Suppression Capabilities:

Suppression equipment on SCR includes tow grades to cut in fire lines, one CASE 256 HP tractor that tows a 20-foot-wide disc, one 2.5-ton pumper truck with a 1,200-gallon tank, two 1-ton trucks with 250-gallon and 350-gallon slip-on tanks, respectively, one 10,000-gallon stationary water tank, one 3,000-gallon mobile water tank, hand tools, and various smaller backpack water sprayers.

Suppression equipment on JBR consists of one 1,200-gallon pumper truck, two 250-gallon slip-ons, one 3,000-gallon tanker truck, one CASE 200-hp tractor that tows a 20-foot wide disc, and one 50,000-gallon water tank at the maintenance facility.

The Air Forces monitors and responds to all fires on the SCR and JBR. Yearly pre-mitigation work is conducted on the range to reduce the number of fire starts. Pre-mitigation work has included controlled burns, spraying to kill vegetation before reseeding (fire prone weeds), mechanical treatment (disking) of fuels, and creation of fire breaks around the ranges.

The Air Force has a very good record of keeping fires limited to the two ranges and of responding quickly and with sufficient equipment and personnel to handle the fires on the ranges.

4.5.1.1.2 Boise District

- Boise BLM Fire Office, 3948 Development Ave., Boise, 83705; 208-394-3400

- Hammett Guard Station, north of Exit 112 on Interstate 84, 208-366-7722
- Bruneau Guard Station, Hot Creek Road, Bruneau, 208-845-2011
- Wild West Guard Station, Exit 13 off I-84, 208-454-0613

The Department of Interior, BLM, provided funding for this Wildland-Urban Interface Wildfire Mitigation Plan. The Boise District BLM has been involved in Owyhee County through assistance to rural fire districts and national fire prevention programs; however, the only wildland fire resources housed within Owyhee County is at the Bruneau Guard Station in Bruneau. Initial attack response for the Jarbridge Resource Area will be shared with the Twin Falls District through an agreement that will allow IA by closest resources. The rest of Owyhee County, the Bruneau Resource Area and the Owyhee Resource Area, are covered by the crews station in Bruneau, Hammett, Boise, and Wild West.

The Boise District BLM encompasses approximately 3.9 million acres of BLM-managed land in southwest Idaho. Through agreements with the Idaho Department of Land and the National Forest Service, the BLM also provides support on IDL and FS lands in some areas within the district boundary. The border of the district extends north from the Nevada border following the Bruneau River fairly closely before heading east along the Saylor Creek Air Force Range boundary to the Elmore County line. Then, it heads north to the confluence of the Snake River. The border follows the Snake River east to the community of King Hill before turning north again following the King Hill Creek drainage to the Township 1S, Range 10E line, where it heads due north to the southwest corner of Section 6. The border, then, stairsteps in a northeasterly direction just past the Elmore County line to the Township 2N, Range 12E line; then heads five miles due west to the Elmore County line. The eastern boundary follows the Elmore County line to where it meets the Blaine County line. The District boundary, then, follows the foothills west and north across the Boise Front; up Highway 55 and includes some scattered areas into the Crouch area; then jogs in a northwesterly direction to the Oregon border west of New Meadows.

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

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

Additionally, the district has out stations at Bruneau, Hammett, and Wild West (at Exit 13 on Interstate 84). Each facility is staffed by one crew, with two to three engines (depending on fire activity and yearly budget), on a 8-hour day, 5-day per week basis (on call 24/7) from mid June to mid September. Bruneau and Hammett will have different days off to provide 7 day coverage between the two guard stations. A dozer has historically been based at Hammett and will be based there when funding is available.

Wild West Guard Station is going to be demolished this spring with plans to build a new station. In the meantime, Wild West will be stationed at the Middleton Station #1 Fire Department in downtown Middleton.

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

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

Personnel: The fire program staff totals 110-135 individuals, including 20 permanent employees, 40 career-seasonal employees who work up to nine months each year, and 75 seasonal employees on staff from roughly June to September. These are all paid staff members trained in wildland fire, but not in structure protection.

Mutual Aid Agreements: The BLM has an interagency working relationship with the US Forest Service (Boise National Forest and Payette National Forest) and the Idaho Department of Lands and the crews are dispatched on a closest-forces concept to public lands. Additionally, the BLM has mutual aid agreements with 37 community fire departments.

Top Resource Priorities:

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

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

Table 4.9 summarizes available equipment.

Table 4.9 Boise District Equipment List for Wildland Fire Protection

Assigned Station	Make/ Model	Capacity (gallons)	Pump capacity (GPM)	Type
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Hammett	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Bruneau	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Wild West (exit 13, I-84)	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Internat'l	Heavy 800 – 1,000	120 GPM	Wildland
Boise	Ford	Light 300	120 GPM	Wildland

- The Boise District has 3 dozers, one of which is stationed in Hammett (may change in 2005); and two in Boise
- The Boise District also has 3, 3,500 gallon water tenders.
- There are 4 Fire Lookouts, one on Squaw Butte, north of Emmett; one on South Mountain, southeast of Jordan Valley; one on Danskin Peak, north of Mountain Home; and one on Bennett Mountain, northeast of Mountain Home.

Additionally, suppression resources include:

- **Helicopter:** The district has an new compact for 2005 helicopter on contract from June to October and an 11 member helitack crew. U.S. Forest Service helitack crews stationed at Lucky Peak and Garden Valley are available for assistance if needed and if they are not assigned elsewhere. Additionally, there are other helicopter resources equipped for fire missions that are available on a call-when-needed (CWN) basis.
- **Fixed-Wing:** The district has a contract AeroCommander 500S fixed-wing aircraft, staffed by a pilot and the air attack supervisor. The air attack supervisor coordinates aerial firefighting resources and serves as an observation and communications platform for firefighters on the ground.
- **Air Tankers:** There are typically two air tankers (fire retardant planes) on contract in Boise during the fire season. However, these aircraft are considered national resources and are assigned where they're needed at any particular time. These tankers have recently been grounded and may or may not be available for use in the future. Other, nearby, air tankers are located in McCall and various locations in Nevada and Oregon. There are also contract single-engine air tankers (SEATS) located in Oregon and Twin Falls, Idaho.

The primary operational challenges facing the district include:

- Continued development of wildland-urban interface areas across the district.
- Communications and coordination with current, new, and developing community fire departments and working with them to stay abreast of communication and technological developments so that we can continue and improve working together effectively at the fire scene.
- Internally, an operational challenge is to have sufficient and appropriate staff available throughout the year to foster partnerships with local departments and facilitate continued and improved coordination, training, communications, and other joint efforts with our partners across the district.

Our effectiveness in addressing these challenges will largely hinge on funding available for the fire program and its various elements.

4.5.1.2 Mountain Home Air Force Base Saylor Creek Range

Fire Suppression Capabilities. Suppression equipment on SCR includes tow grades to cut in fire lines, one CASE 256 HP tractor that tows a 20-foot-wide disc, one 2.5-ton pumper truck with a 1,200-gallon tank, two 1-ton trucks with 250-gallon and 350-gallon slip-on tanks, respectively, one 10,000-gallon stationary water tank, one 3,000-gallon mobile water tank, hand tools, and various smaller backpack water sprayers.

Suppression equipment on JBR consists of one 1,200-gallon pumper truck, two 250-gallon slip-ons, one 3,000-gallon tanker truck, one CASE 200-hp tractor that tows a 20-foot wide disc, and one 50,000-gallon water tank at the maintenance facility.

The Air Forces monitors and responds to all fires on the SCR and JBR. Yearly pre-mitigation work is conducted on the range to reduce the number of fire starts. Pre-mitigation work has included controlled burns, spraying to kill vegetation before reseeding (fire prone weeds), mechanical treatment (disking) of fuels, and creation of fire breaks around the ranges.

The Air Force has a very good record of keeping fires limited to the two ranges and of responding quickly and with sufficient equipment and personnel to handle the fires on the ranges.

4.5.2 City & Rural Fire Districts

4.5.2.1 Grand View Rural Fire Protection

P.O. Box 54
Grand View ID
Cfireman1@wmconnect.com
208-834-2380

Grand View Rural Fire Protection District encompasses 111 sq. miles, including portions of Owyhee County, Elmore County, and the city of Grand View. The department responds to wildland, structural and agricultural fire. Grand View has mutual aid agreements with the surrounding fire protection districts, as well as with the BLM

Personnel: Grand View has a total of ten volunteer positions, including the chief and assistant.

Fire Station: The fire station is a single level, five bay facility.

Equipment:

Wildland Engines

- 1994 Ford F-350, 300 gallon.
- 1995 GMC 3500, 275 gallon with foam capabilities.
- 1978 Ford F-7000, 1,000 gallon.

Structural Engines

- 1961 Howe International, 500 gallon

Water Tenders

- 1984 Kenworth, 3,000 gallons (will be operational in the summer of 2004).

First Aid: Grand View provides Basic Life Support (BLS)

Resource Concerns within the district: In addition to protection of life and homes, Grandview RFD has significant economic resources that are potentially threatened by fire. The majority of the district within Elmore County is owned by Simplot. Much of this land is cultivated hay. Historically, the ridge above the feed lot has experienced a high number of fires, potentially due to the presence of power transmission lines. The hay resources are seen to be at some risk to loss from fires originating from this or some other ignition source.

4.5.2.2 Bruneau Rural Fire Department

PO Box 276
Bruneau, ID 83604
Dispatch: 208-845-2790
Fax: 208-845-2750
Dick Strickland – Chief
Robert Lemieux – Assistant Chief Phone: 208-845-2150

Equipment/personnel/other:

- 1982 GMC 3500 4X4, 250 gal
- 1978 Ford F-700, 450 gal
- 10 personnel
- assist in approximately 10 Federal fires per year
- no local or interagency prevention program participation
- active in RFA

4.5.2.3 Homedale Rural Fire Department

PO Box 608
Homedale, ID 83628
208-337-3000
Scott Salutrequi – Chief Phone: 208-337-3498
Fax: 208-337-3450

4.5.2.4 Marsing Rural Fire Department

308 Main St
Marsing, ID 83639
Dispatch: 208-896-4444
Roman Usabel – Chief Phone: 208-896-4571

Table 4.10. Fire Apparatus for Marsing Rural Fire Department.

Type	Year	Size	Tank Size (gal)	Pump Flow (gpm)
Pumper	2002	5 ton	1250	1250
Tanker	1996	5 ton	3250	500
Pumper	1963	3 ton	800	1000
Pumper	1974	3 ton	1000	1000
Tanker	1972	2 ton	1350	350
Brush truck	1982	1 ton	300	250
Brush truck	1979	2 ton	500	500

4.5.2.5 Murphy-Reynolds-Wilson Fire District

PO Box 82
Murphy, ID 83650
Owyhee County Sheriff: 208-495-1154
Kenneth Good – Chief Phone: 208-495-1267

Murphy Station

Tanker – 3,400 gallon, 300 GPM transfer pump, 3,000 gallon portable tank, 8” dump valve, self-priming refill pump with suction and transfer hoses

Class A pumper – 1,250 GPM 2-stage pump, 500 gallon tank, 1,500 gallon portable tank, 1,100 foot of 5” supply line, 500’ 1 ¾ “ fire hose, foam inducer and nozzle, 3 - 1 ¾” fire fighting nozzles, 2 - 2 ½” fire fighting nozzles, miscellaneous 2 ½” to 1 ¾” “Y” valves, fire extinguishers, SCBA equipment, spare tanks, booster line with 200’ 1” hard line on rewind reel

Reynolds Station

Tanker-Pumper – 1,200 gallon, 300 GPM pump, 300’ 1 ½” fire hose, 200’ 3” supply line, booster line on rewind reel, 200’ 1” hard line and all other pertinent apparatus to be fully operational

Wilson Station

Pumper-Tanker – 1,300 gallons, 300 GPM pump, booster reel, rewind with 200’ 1” hard line, 500’ 1 ½” fire hose, 200’ 3” transfer hose, and all nozzles and miscellaneous equipment to be fully operational

Forest Service Wildland Truck – 4x4, 200 gallons, rewind reel with 200’ ¾” fire hose, 100 GPM engine driven pump, 100’ 1 ½” fire hose with nozzle (fully equipped)

Givens Hot Springs (Sky Park)

BLM Heavy Pumper-Tanker Wildland Truck – 1,000 gallon tank with 100 GPM pump (fully equipped)

Pumper-Tanker – 1,200 gallon, 300 GPM pump (fully equipped)

Currently the Sky Park residents are housing the BLM truck and a 1,200 gallon pumper-tanker in their personal buildings. The Murphy-Reynolds-Wilson Fire Department would like to build a station in Givens Hot Springs large enough to accommodate a BLM satellite wildland crew and equipment.

The Murphy-Reynolds-Wilson Fire Department has three wildfire tank with pumper trailers with hoses and nozzles and additional miscellaneous pumps, hoses, protective clothing, helmets, etc. We also have another Class A pumper under repair and hope to have it on line by late summer of 2005. The MRW Fire Department would also like to enlarge the 3 existing stations.

4.6 Issues Facing Owyhee County Fire Protection

4.6.1 Lack of protection district in Oreana, Indian Cove, Cliffs and Pleasant Valley

The communities of Oreana, Indian Cove, Cliffs and Pleasant Valley do not currently have formal structural protection. Structural fire protection has been provided to these areas on an ad hoc basis by adjoining fire districts. These communities would be better served if they were incorporated into adjoining fire protection districts or looked at forming their own.

4.6.2 Water Supply in the WUI

As growth continues along the edges of the established communities, water for wildland firefighting and structure protection is increasingly difficult to access. Across the county additional accessible water sources are needed.

4.7 Current Wildfire Mitigation Activities in Owyhee County

4.7.1 Mountain Home Air Force Base Saylor Creek Firing Range and Juniper Butte Firing Range

The US Air Force utilizes the Saylor Creek bombing range located in the Northeast corner of the county. The Air Force through the Mountain Home Air Force Base Fire Department actively monitors and suppresses all fires on the Saylor Creek and Juniper Butte bombing range. The majority of fire starts on the range are caused by the activities of the Air Force. They have been very successful in responding to the fires on the range. They have an active program to control vegetation on the range utilizing a variety of methods, spraying, controlled burns, mechanical treatment to reduce the threat of fires. The Mountain Home Air Force Base Fire Department has been very successful in keeping fires contained to the Saylor Bombing Range . Continued active management and vigilance on the part of the Air Force will aid the county in keeping the fire danger in the vicinity of the Saylor bombing range at a minimum.

4.7.2 Grazing

Livestock Grazing in and around the communities of Owyhee County can reduce fine fuels to various levels and have done so in recent times. Domestic livestock graze on grasses, forbs, and certain shrubs in the area. During grazing related activities, some trampling effects may occur at various levels on certain fine fuels in the area. Ranchers tending their herds, or other resource professional in the field may observe wildfire ignition or potentially risk-related activities in and around the communities of the county. Livestock grazing in this region should be considered into the future as a low-cost, positive tool of wildfire mitigation for the wildland-urban interface in this area.

It is the intention of this planning process to make all of the land resource management tools available to resource managers in the management of wildland fire. Livestock grazing and management, coupled with astute land management have the potential to mitigate wildland fires in Owyhee County, as it has done in the past.

4.7.3 Bureau of Land Management

4.7.3.1 Silver City

The BLM has been working in coordination with Silver City community members on fuels reduction projects around the city since July of 2002. One project known as the Silver City Annual Cleanup Day will continue on a yearly basis to assist the citizens in decreasing the threat of wildfire caused by hazardous fuels within the town. The clean up day is also a great tool used to educate the public about Wildland Urban Interface while creating a Firewise community.

Silver City has a moderate to high risk of experiencing a wildland fire due to the community's remote location, lack of safe access routes, and surplus water resources. The Silver City Town Cutting Treatment began in July 2004 by the Boise District BLM and will continue through 2005.

The idea is to reduce the fire hazard by reducing the amount and continuity of hazardous fuels in and near town; provide safe travel corridors to the public and emergency vehicles in the event of a wildfire; and maintain and restore the historic native sagebrush steppe, mountain mahogany, mountain shrub, and aspen communities which are being lost to conifer expansion.

Future fuels reduction treatments in Silver City are expected to begin in 2005 and are expected to continue for the next ten years. These treatments will reduce the potential of crown fires by thinning crowded stands and removing encroaching conifers out which will, in turn, provide survivable space for residents and improve the long-term health of the forest. This may also provide economic opportunities to the community through timber sales and mechanical treatments.

Additionally, the Ten Year Comprehensive Strategy in Idaho identifies training as a need in Silver City to give local citizens fire suppression experience and the knowledge to use fire suppression equipment.

4.7.3.2 Research – Reynolds Creek Experimental Watershed

The USDA Agricultural Service Northwest Watershed Research Center has been conducting hydraulic and rangeland research at the Reynolds Creek Experimental Watershed (RCEW) since 1960. One of the largest research watersheds in the United States, the Reynolds Creek Experimental Watershed is located approximately 50 miles southwest of Boise in the Owyhee Mountains above the community of Reynolds Creek. Four projects have been identified, two of which have been completed, and that will contribute to a longer-term research and management plan under development by NWRD for assessing prescribed fire impacts in the RCEW.

Information gathered through this research could be used for planning future prescribed fire projects and to add to the knowledge base of using prescribed fire to manage intermountain rangelands. Juniper encroachment has become an issue for resource managers who are looking for ways to improve fire prone landscapes and restore fire adapted ecosystems. Historical studies of the area suggest that the natural role of the fire cycle has been interrupted, facilitating juniper encroachment into these sites. Prescribed fire projects have been identified through 2007 after which future projects could occur.

4.7.3.3 Juniper Mountain

Juniper Mountain is located approximately 45 miles southeast of Jordan Valley, Oregon. The desired sagebrush steppe, mountain mahogany, mountain shrub and aspen communities are gradually being lost to juniper expansion. The Juniper Mountain Restoration Project will begin in 2006 and is expected to continue for ten years to follow with various prescribed fire and mechanical treatments to control seral juniper. The object of this project is to restore the natural fire regime sustaining multiple stages of healthy native plant communities for wildlife habitat, livestock forage, and other values provided by these native communities.

4.7.3.4 General Projects

Education

- As the corridor between Marsing and Murphy (*actually that could apply to all new structures throughout Owyhee County*) becomes more developed, there will be a need for more outreach programs to educate homeowners about Firewise which could include distribution of literature door-to-door, personal home assessments, community presentations, more community clean-up days, etc.

- Propose introducing building codes or suggestions on Firewise building materials to use for new construction of homes located within the identified WUI areas.
- The BLM has been active in posting signs in recreational use areas to promote fire prevention activities such as the spark arrestor requirements for off-road motorized dirt bikes, campfire restrictions, and the general "Prevent Range Fires" signs posted along the main highways and roads.
- Continue to provide Public Service Announcements that support fire prevention.
- Maintain patrols in high use recreational areas and provide prevention information as needed.
- Continue to educate the public about the risk of starting fires by using steel and tracer ammunition in popular target practice sites such as Elephant Butte, south of Marsing, and Hemingway Butte, on the road to Reynolds Creek.

Training

- Continue to work with rural fire departments on wildland fire fighter training and notify members of those departments when training opportunities arise.

Rural Fire Assistance

- Continue to work with rural fire departments to improve their own fire fighting capabilities.
- Encourage and support the formation of new fire departments in communities identified in this plan such as Oreana, Indian Valley, Cliffs, and Pleasant Valley.

Infrastructure

- Work with the county and communities to identify and secure adequate water sources
- Support road improvement projects where needed to provide appropriate access and egress to communities and land owners

The Owyhee and Bruneau field offices current projects and descriptions are listed below.

Table 4.11. Owyhee and Bruneau Field Offices Project Development and Implementation Timeframes.

Project name	Planning Time Frame	Implementation Timeframe
<i>Owyhee Field Office</i>		
ARS Reynolds Cr. Research Rx Burns	EA and Decision Record signed in 2002	The Breaks burned in '02, Whiskey Hill burned in '04, Upper Sheep Cr. scheduled for '05, Johnston Draw scheduled for '07. Other future burns may occur within the Reynolds Cr. Watershed.
West Antelope Juniper Cut & Rx Burns	EA and Decision Record signed in 2003	Cutting began in July 2004. Rx burn Chimney Sp. Pasture in 2006, Rx burn 2N Pasture in 2007
Indian Meadows Rx burns	EA and Decision Record signed in 2003	Noon Cr. Scheduled to Rx burn in 2006 Williams Cr. Scheduled for burning in 2007
Boone Peak Juniper Cut	EA and Decision Record signed in 2004	Cutting will begin in 2005
Hart Cr./Box T Juniper Cut & Burns	EA and Decision Record expected in 2005	Cutting will begin in 2005, Rx burns starting in 2006
Flint juniper cutting treatments	Categorical Exclusion expected in 2005	Implementation expected in 2006
Silver City	Categorical Exclusion signed	Implementation began in July 2004 and will continue in

Table 4.11. Owyhee and Bruneau Field Offices Project Development and Implementation Timeframes.

Project name	Planning Time Frame	Implementation Timeframe
Town Cutting Treatments	2004	2005.
Silver City Annual Cleanup Day	Categorical Exclusion signed 2002	Annual event which first occurred in July 2002.
Silver City Area Fuels Reduction Trts.	EA & ROD expected in early 2005	Begin work in mid 2005. Treatments expected for the next 10 years.
Juniper Mountain Restoration Project	EA & Decision Record signed 2005	Begin Rx and mechanical treatments in 2006. Treatments expected for the next 10 years.
<i>Bruneau Field Office</i>		
Flat Broke Reseeding	EA & Decision Record signed 2000	Reseeded in 2003
Pixley Basin Rx Burn & Juniper Cut	EA & Decision Record signed 2002	Cut and burned in 2003. Complete cutting in 2005
Battle Creek Juniper Cut	EA & Decision Record signed 1999	Implementation began in June 2002. Completion expected in 2005
Long Tom Juniper Cut and Rx Burn	EA or Categorical Exclusion expected in 2005	Begin cutting in 2005, burn in 2006

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
<i>Owyhee Field Office Project Descriptions</i>					
ARS Reynolds Creek Research Rx Burns.	Allow ARS to conduct fire related research needed for addressing soil and watershed issues related to juniper expansion and prescribed fire.	Fire and watershed related research beneficial in planning future prescribed fires.	Public and private lands within the Reynolds Creek Experimental Watershed	Conduct four and possibly more prescribed burns within the watershed.	The Breaks 166 ac Whiskey Hill 897 ac U. Sheep Cr. 64 ac Johnston Draw 451 ac
Juniper Mountain Restoration Project		A restored fire regime sustaining multiple seral stages of healthy native plant communities throughout the landscape for wildlife habitat, livestock forage, wildflowers, and other values provided by these native communities.	Juniper Mountain Area	Various prescribed fire and mechanical treatments to control seral juniper over the next 10 years.	Burn up to 12,000 ac per year and mechanically treat up to 2,000 acres per year over the next 10 years within the 280,00 acre project area.
W. Antelope Juniper Cut & Rx Burns	The sagebrush steppe, mt. shrub, mt. mahogany, & aspen communities are gradually being lost to juniper expansion.	Maintained and restored sagebrush steppe, mt. shrub, mt. mahogany, & aspen communities for wildlife habitat, livestock forage, wildflowers, and other values provided by these native plant communities.	Public and private land W. Antelope Allotment	Rx burn the Chimney Sp. Pasture. Cut portions of 2N Pasture followed by Rx burn.	ChimneySp.Past 780 ac 2N Pasture 1,500 ac
Indian Meadows Rx burns		Economic opportunities for using juniper wood products.	Public and state land in the Noon Cr. & Williams Cr. Pastures of the Indian Meadows Allotment. (08S04W33 08S05W03)		Noon Cr. 9,744 ac Williams Cr. 2,442 ac
Boone Peak Juniper Cut			Boone Peak Allotment (05S02W 22)	Thin dense seral juniper stands.	4,212 ac
Hart Cr./Box T Juniper Treatments			Hart Cr. & Box T Allotments (05S01W17)	Various mechanical trts. & Rx burns.	10,000 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Flint juniper cutting treatments	Dense stands of juniper and Douglas fir pose a crown fire threat to the historic mining district of Flint. Additionally, aspen & mountain shrub stands are being replaced by encroaching conifers.	Decreased wild fire threat to life, property and the historic structures, and restoration of aspen and mountain shrub communities in the area.	The historic Flint Mining District (06S04W11)	Mechanically remove seral juniper, <8" DBH fir trees and prune larger trees.	982 ac
Silver City Town Cutting Treatments	Reduce the fire hazard to the Silver City area by reducing the amount and continuity of hazardous fuels in and near the town. Provide safe travel corridors to the public and emergency vehicles in the event of wildfire. Maintain & restore the historic native sagebrush steppe, mt. mahogany, mt. shrub, & aspen communities which are being lost to conifer expansion.	Decreased threat to life, property and the historic mining town.	Public and private lands surrounding the town of Silver City (05S03W06).	Mechanically remove seral juniper, <8" DBH fir trees and prune larger trees.	729 ac
Silver City Annual Cleanup Day	Assist the citizens in decreasing the threat of wildfire caused by hazardous fuels within the town.	Decreased threat of fire originating within the town.	Public and private lands within the town of Silver City (05S03W06).	Remove and haul flammable debris away from town to a burn site.	20 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Silver City Area Fuels Reduction Treatments	<p>Reduce crown fire potential by thinning crowded stands and removing encroaching conifers out of the aspen woodlands.</p> <p>Provide defensible space, safe travel corridors, and safety zones for fire fighters, residents, and visitors.</p> <p>Improve the long-term health of the forest to reduce the risk of catastrophic wildfire.</p> <p>Retain a scenic landscape for the town.</p>	Decrease the risk of a wildland fire burning structures or forest resources. Provide economic opportunities through timber sale/mechanical treatments.	Jordan Creek Watershed (05S03W06)	Reduce crown fire potential by reducing the amount and continuity of the hazardous fuels.	1800 ac
<i>Bruneau Field Office Project Descriptions.</i>					
Flat Broke Reseeding	Convert a flammable cheatgrass dominated site to perennial grasses and shrubs in order to restore resource values and reduce the fire frequency.	Stabilized soil, decreased fire frequency, improved wildlife habitat, and more consistent winter forage for livestock and big game.	Flat Broke Located 10 miles SE of Bruneau	Drill seed perennial grasses & shrubs on a failed fire rehab seeding.	850 ac
Pixley Basin Prescribed Burn & Juniper Cut	Sagebrush steppe, mt. shrub, & aspen communities are being lost to juniper expansion.	Maintain & restore these important native shrub communities which provide important wildlife habitat and forage for grazing animals.	Pixley Basin Pasture of the West Castle Creek Allotment located 12 miles SW of Grandview.	Prescribe burn and cut encroaching juniper.	7,000 ac
Long Tom Juniper Cut and Rx Burn			Mahogany pasture of the West Castle Cr. Allotment, located 25 miles SW of Granview.	Cut dense seral juniper to increase fuel loading, then burn. Remove juniper from mahogany stands.	3,507 ac

Table 4.12. Field Office Project Descriptions.

Project	Summary (Purpose and Need)	Benefits to the Community	Location	Description	Acres
Battle Creek Juniper Cut	Scattered juniper is expanding into the scenic mt. mahogany savannas and will eventually out compete the mahogany if left untreated.	Maintenance of scenic mt. mahogany savanna and the important wildlife habitat it provides.	Summer Pasture of the Battle Cr. Allotment located approx. 30 miles SW of Grandview.	Cut the scattered juniper out of the mahogany stands.	30,000 ac

Chapter 5: Treatment Recommendations

5 Overview

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

Owyhee County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

The federal land management agencies in Owyhee County, specifically the Bureau of Land Management, the Mountain Home Air Force Base, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the state land management agency, the Idaho Department of Lands, are participants in this planning process and have contributed to its development. The Forest Service does not manage any federal property in Owyhee County. The BLM has management responsibility for most federal land in Owyhee County. 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 Owyhee County.

All risk assessments were made based on the conditions existing during 2004-05, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

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

5.1 Annual Prioritization of Activities

The annual prioritization process will include a special emphasis on cost-benefit analysis review. The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by local jurisdictions with overall coordination provided by the Owyhee County Emergency Management Coordinator.

Owyhee County Commissioners and the elected officials of all jurisdictions will evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where

existing funds and resources are available and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal and not tied to a strict benefit-cost model, but rather to a willingness to simply implement hazard mitigation. Often the types of projects that Owyhee County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. Owyhee County will consider all pre-disaster mitigation proposals brought before the county commissioners by county department heads, city officials, fire districts and local civic groups.

When federal or state funding is available for hazard mitigation, there are usually requirements that establish a rigorous benefit-cost analysis as a predominate criteria in establishing project priorities. The county will understand the basic federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects. FEMA's three grant programs (the post-disaster Hazard Mitigation Grant Program, the pre-disaster Flood Mitigation Assistance and Pre-Disaster Mitigation grant programs) that offer federal mitigation funding to state and local governments all include the benefit-cost and repetitive loss selection criteria.

The prioritization of projects will occur annually and be facilitated by the Owyhee County Emergency Management Coordinator to include the County Commissioner's Office, City Mayors and Councils, Fire District Chiefs and Commissioners, agency representatives (BLM, State Lands, etc.). The prioritization of projects will be based on the selection of projects which create a balanced approach to pre-disaster mitigation which recognizes the hierarchy of treating in order (highest first):

- People and Structures
- Infrastructure
- Local and Regional Economy
- Traditional Way of Life
- Ecosystems

While developing and analyzing projects based this hierarchy, specific projects will be evaluated for their intrinsic benefit/cost analysis results, overall benefit to the public good, opportunities for leveraging results from other projects in the county, and coordinating with multi-county activities resulting in specific risk reduction within Owyhee County. The analysis process will include summaries as appropriate for each project, but will include benefit / cost analysis results, which will be one of the criteria for project selection. Projects with a negative benefit / cost analysis result will only be considered in specific circumstances. As a guideline, the decision will be to further consider investments having a B/C Ratio greater than or equal to 1, and reject projects that have a B/C Ratio less than 1. When multiple projects are considered, decision makers will rank by B/C ratio and give the highest ranking projects priority under these criteria. Other criteria will influence final project ranking.

5.2 Possible Fire Mitigation Activities

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

- Homeowner and landowner education
- Building code changes for structures and infrastructure in the WUI

- Homesite defensible zone through fuels modification
- Community defensible zone fuels alteration
- Access improvements
- Access creation
- Emergency response enhancements (training, equipment, locating new fire stations, new fire districts, merging existing districts)
- Regional land management recommendations for private, state, and federal landowners

Maintaining private property rights will continue to be one of the guiding principles of this plan's implementation. Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

5.3 WUI Safety & Policy

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

As part of the Policy of Owyhee 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 Owyhee 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.

Prioritization of activities recommended in this plan should be made by the Owyhee 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 Existing Practices That Should Continue

Owyhee County currently is implementing many projects and activities that, in their absence, could lead to increased wildland fire loss potential. By enumerating some of them here, it is the desire of the authors to point out successful activities.

- Existing rural addressing efforts have aided emergency responses.
- The current 911 service in the county is an excellent service. Activities that build on the rural addressing and current emergency services to develop an Enhanced 911 service would serve the county well.

- Livestock grazing.
- Controlled burning.
- Fire Week Education Program in area schools.

5.3.2 Proposed Activities

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.a: Continue to adopt and/or amend existing building codes and zoning ordinances as necessary to address wildland fire risks for all construction within the county.	Protection of people and structures by applying a standard of road widths, access, and building regulations suitable to insure new homes can be protected while minimizing risks to firefighters. (defensible space, roads and access management, water systems, building codes, signage, and maintenance of private forest and range lands)	County Commissioners in cooperation with Rural Fire Districts and Planning and Zoning.	<ul style="list-style-type: none"> • Year 1 debate and adoption of revised standard (2005). • Review adequacy of changes annually, make changes as needed.
5.1.b: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction	Protection of people and structures by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas.	County Commissioners Office in cooperation with Rural Fire Departments and Planning and Zoning Committee.	Year 1 (2005) activity: Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where juxtaposed near heavy wildland fuels.
5.1.c: Develop a formal WUI Advisory Committee to advise County Commissioners on WUI Issues and Treatments	Protection of people and structures by improving the ability of decision makers to make informed decisions about wildfire issues.	County Commissioners Office	Year 1 (2005) activity: Formalize a committee, its membership and service decided on by the County Commissioners, to collaborate on WUI issues within Owyhee County. Members potentially to include land management organizations and companies, private landowners, and fire protection personnel.
5.1.d: Develop a County Commissioner's Office policy to support the applications for grant monies for projects resulting from recommendations in this plan.	Protection of people and structures by improving the ability of residents and organizations to implement sometimes costly projects.	County Commissioners Office	Ongoing activity: Support grant applications as requested in a manner consistent with applications from residents and organizations in Owyhee County.

5.4 People and Structures

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

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

- Fire District personnel pointed to numerous examples of inadequate access to homes of people who believe they have adequate ingress.

In addition to those items enumerated in Table 5.1, residents and policy makers of Owyhee 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 Owyhee 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 Owyhee County has led to a reduction of many of the fine fuels that would have been found in and around the communities and in the wildlands of Owyhee County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing resource professionals into the forests and rangelands of the area where they may observe ignitions, or potentially risky activities. Livestock grazing in this region should be encouraged into the future as a low cost, positive tool of wildfire mitigation in the Wildland-Urban Interface and in the wildlands.
- **Agriculture** is a significant component of Owyhee County's economy. Much of the northern portion of the county is intermixed with agricultural crops. The original conversion of these lands to agriculture from rangeland, was targeted at the most productive soils and juxtaposition to infrastructure. Many of these productive ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is that much of the rangeland historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Owyhee County is integral to the continued management of wildfire risk in this region.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.a: Youth and Adult Wildfire Educational Programs	Protect people and structures by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk	Cooperative effort including: <ul style="list-style-type: none"> University of Idaho Cooperative Extension Idaho Department of Lands Bureau of Land Management Local School Districts 	To start immediately using existing educational program materials and staffing. Formal needs assessment should be responsibility of University of Idaho Cooperative Extension faculty and include the development of an integrated WUI educational series by year 3 (2007). 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.
5.2.b: Wildfire risk assessments of homes in identified communities	Protect people and structures by increasing awareness of specific risk factors of individual homesites in the at-risk landscapes. Only after these are completed can homesite treatments follow.	To be implemented by County Commissioners Office in cooperation with the Rural Fire Departments . Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	<ul style="list-style-type: none"> • Cost: Approximately \$100 per homesite for inspection, written report, and discussions with the homeowners. • There are approximately 4,450 housing units in Owyhee County, roughly 1,300 of these structures would benefit from a homesite inspection and budget determination for a total cost estimate of \$130,000. • Action Item: Secure funding and contract to complete the inspections during years 1 & 2 (2005-06) • Homesite inspection reports and estimated budget for each homesite's treatments will be a requirement to receive funding for treatments through grants.
5.2.c: Homesite WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Owyhee County	County Commissioners in cooperation with Fire Mitigation Consulting company and Rural Fire Districts <i>Complete concurrently with 5.4.b.</i>	<ul style="list-style-type: none"> • Actual funding level will be based on the outcomes of the homesite assessments and cost estimates • Estimate that treatments will cost approximately \$750 per homesite for a defensible space of roughly 150'. Approximately 1,300 homes in this category for an estimated cost of \$975,000. • Homesite treatments can begin after the securing of funding for the treatments and immediate implementation in 2005 and will continue from year 1 through 5 (2010).

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.d: Community Defensible Zone WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding high risk communities in the WUI of Owyhee County	County Commissioners in cooperation with Fire Mitigation Consultants and Rural Fire Districts	<ul style="list-style-type: none"> • Actual funding level will be based on the outcomes of the homesite assessments and cost estimates. • Years 2-5 (2006-10): Treat high risk wildland fuels from homesite defensible space treatments (5.4.c) to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist. Should link together home treatment areas. Treatments target high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented. • Approximate average cost on a per structure basis is \$650-\$800 depending on extent of home defensibility site treatments, for a cost estimate of \$ 942,500.
5.2.e: Maintenance of Homesite WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Owyhee County	County Commissioners Office in cooperation with Rural Fire Departments and local home owners	<ul style="list-style-type: none"> • Homesite defensibility treatments must be maintained periodically to sustain benefits of the initial treatments. • Each site should be assessed 5 years following initial treatment • Estimated re-inspection cost will be \$50 per homesite on all sites initially treated or recommended for future inspections (\$65,000) • Follow-up inspection reports with treatments as recommended years 5 through 10.
5.2.f: Re-entry of Homesite WUI Treatments	Protect people, structures, and increase fire fighter safety by reducing the risk factors surrounding homes in the WUI of Owyhee County	County Commissioners Office in cooperation with Rural Fire Departments and local home owners	<ul style="list-style-type: none"> • Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.g: Access Improvements of bridges, cattle guards, and limiting road surfaces	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 rangeland owners.	<ul style="list-style-type: none"> • Year 1 (2005): Update existing assessment of travel surfaces, bridges, and cattle guards in Owyhee County as to location. Secure funding for implementation of this project (grants) • Year 2 (2006): 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 (2006): 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 (2007): 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.

5.5 Infrastructure

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

Communication Infrastructure: This component of the WUI seems to be diversified across the county with multiple source and destination points, and a spread-out support network. Although site specific treatments will impact 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 Owyhee County. The major arterials of Owyhee County's transportation network are U.S. 95 and State Routes 51 and 78. These and other specific infrastructure components have been discussed in this plan.

Ignitions along highways are significant and should be addressed as part of the implementation of this plan. Various alternatives from herbicides to intensive livestock grazing coupled with mechanical treatments have been suggested. As part of the multi-agency 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 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 the right-of-way. Some of these road surfaces access remote rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not necessarily the priority for treatments in the county.

Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county. Specific recommendations for these roads are enumerated in Table 5.3.

Energy Transport Supply Systems (gas and power lines): (Owyhee County - Appendix I) A number of power lines crisscross Owyhee County. Unfortunately, many of these power lines cross over rangeland ecosystems. When fires ignite in these vegetation types, the fires tend to be fast moving, but burn at relatively low to moderate intensities. Additionally, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Most power line corridors have been cleared of vegetation both near the wires and from the ground below. Observations across the county of these high tension power lines lead to the conclusion that current conditions coupled with urban developments have mitigated this potential substantially. It is the recommendation of this Wildfire Mitigation Plan that this situation be evaluated annually and monitored but that treatments not be specifically targeted at this time. The use of these areas as "fire breaks" should be evaluated further, especially in light of the treatments enumerated in this plan (eg., intensive livestock grazing, mechanical treatments, and herbicide treatments).

Water Supply: In many of Idaho’s communities, water is derived from surface flow that is treated and piped to homes and businesses. When wildfires burn a region, they threaten these watersheds by the removal of vegetation and creation of ash and sediment. As such, watersheds should be afforded the highest level of protection from catastrophic wildfire impacts. In Owyhee County, water is supplied to many homes by single home or multiple home wells. These ground water resources would not be significantly damaged in the event of a wildland fire.

5.5.1 Proposed Activities

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.a: Post FEMA “Emergency Evacuation Route” signs along the identified Primary and secondary access routes in the county.	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.	<ul style="list-style-type: none"> • Purchase of signs (2005). • Posting roads and make information available to residents of the importance of Emergency Routes
5.3.b: Fuels mitigation of the FEMA “Emergency Evacuation Routes” in the county to insure these routes can be maintained in the case of an emergency.	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.	<ul style="list-style-type: none"> • Full assessment of road defensibility and ownership participation (2005). • Implementation of projects.

5.6 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland fire fighting districts in Owyhee County. All of the needs identified by the districts are in line with increasing the ability to respond to emergencies in the WUI and are fully supported by the planning committee.

Specific reoccurring themes of needed resources and capabilities include:

- More water tenders for Rural Fire Districts with drafting capabilities at unimproved sites
- New or expanded Fire Districts for Oreana, Indian Valley, Cliffs and Pleasant Valley.
- Expand the existing Fire Districts in the county to include growth areas.
- New fire station at Givens Hot Springs

The implementation of each issue will rely on either the isolated efforts of the fire districts or a concerted effort by the county to achieve equitable enhancements across all of the districts. Given historic trends, individual departments competing against neighboring departments for grant monies and equipment will not necessarily achieve county wide equity. However, the West Central Idaho RC&D may be an organization uniquely suited to work with all of the districts in Owyhee County and adjacent counties to assist in the prioritization of needs across district and even county lines. Once prioritized, the RC&D is in a position to assist these districts with identifying, competing for, and obtaining grants and equipment to meet these needs.

Table 5.4. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.a: Enhance radio availability in each district, link into existing dispatch, and improve range within the region, update to new digital, narrow band frequency adopted by feds and state.	Protection of people and structures by direct fire fighting capability enhancements.	BLM in cooperation with rural and wildland fire districts and County Commissioners	<ul style="list-style-type: none"> • Year 1 (2005): Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities. • Year 2 (2006): Acquire and install upgrades as needed. • Year 2-3 (2006-07): Identify opportunities for radio repeater towers located in the region for multi-county benefits.
5.4.b: Retention of Volunteer Fire Fighters	Protection of people and structures by direct fire fighting capability enhancements.	Rural and Wildland Fire Districts working with broad base of county citizenry to identify options, determine plan of action, and implement it.	<ul style="list-style-type: none"> • 5 Year Planning Horizon, extended planning time frame • Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers • Year 1 (2005): Develop incentives program and implement it.
5.4.c: Increased training and capabilities of fire fighters	Protection of people and structures by direct fire fighting capability enhancements.	Rural and Wildland Fire Districts working with the BLM, IDL, and USFS for wildland training opportunities and with the State Fire Marshall's Office for structural fire fighting training.	<ul style="list-style-type: none"> • Year 1 (2005): 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 (2005): Begin implementing training opportunities for volunteers.
5.4.d: Redistricting of Rural Fire Districts	Protection of people and structures by improving response time and capturing the synergies in joint Rural/City operations.	All current Rural Fire Districts, State Fire Marshall, County Commissioners, and City governments.	<p>Year 1 (2005): meet with responsible parties to examine feasibility of redistricting.</p> <p>Year 2 (2006) Implement recommendations reached by responsible parties.</p>
5.4.e: New Fire Station at Givens Hot Springs	Protection of people and structures by direct fire fighting capability enhancements.	Murphy Rural Fire District working with the BLM .	<p>Year 1 (2005): meet with responsible parties to examine feasibility of a joint Rural Fire District/ BLM fir Station.</p> <p>Year 2 (2006) Implement</p>

Table 5.4. WUI Action Items in Fire Fighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
			recommendations reached by responsible parties
5.4.f: Identify areas lacking a sufficient water supply and develop publicly accessible fill sites.	Protection of people and structures by direct fire fighting capability enhancements.	County Commissioners and rural and wildland fire districts.	<ul style="list-style-type: none"> Identify populated areas lacking sufficient water supplies and develop project plans to develop fill or helicopter dipping sites. Implement project plans.
5.4.g: Maintain developed water sources for firefighting purposes.	Protection of people and structures by direct fire fighting capability enhancements.	Rural Fire Districts in cooperation with the BLM.	On going: Annual review of developed water source areas

5.7 Regional Land Management Recommendations

In section 5.3 of this plan, reference was given to the role that grazing and agriculture have in promoting wildfire mitigation services through active management. Owyhee County is dominated by wide expanses of rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn fuels and homes depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the 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.

Chapter 6: Supporting Information

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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

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Jim Desmond	Owyhee County Natural Resources Director	Coordinator, area specialist

6.4 Signature Pages

6.4.1 Representatives of Owyhee County Government

This Wildfire Mitigation Plan and all of its components identified herein were adopted formally through a resolution of the Board of County Commissioners as of _____ 2005, resolution number _____, recorded in the official record of the Owyhee County Commissioners. Departments and employees of the county who participated in this plan can be found in chapter 2.2.3. The County Commissioners, being the duly elected public body, are the legal authority of the entire county and the departments that were involved in the planning process.

By: Harold Tolmie, Chairman
Owyhee County Commissioner

Date

By: Chris Salove
Owyhee County Commissioner

Date

By: Dick Reynolds
Owyhee County Commissioner

Date

6.4.2 Representatives of City Government in Owyhee County

This Wildfire Mitigation Plan and all of its components identified herein were adopted formally through individual resolutions passed by each city government herein listed.

_____ By: Donald Osterhoudt, Mayor City of Marsing	_____ Date	_____ Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____
_____ By: Paul Fink, Mayor City of Homedale	_____ Date	_____ Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____
_____ By: Paul Spang, Mayor City of Grand View	_____ Date	_____ Adopted by Resolution of the City Resolution Number: _____ Adoption Date: _____

6.4.3 Representatives of City and Rural Fire Districts in Owyhee County

This Wildfire Mitigation Plan and all of its components identified herein were developed in close cooperation with the participating fire districts listed herein. Those fire districts which are a City entity have shown their organization's adoption through the formal adoption of the City. Fire protection districts which are independent of a city or the county have indicated their formal adoption of the Wildfire Mitigation Plan below:

By: Bob Maimberg , Chairman Board of FireCommissioners Marsing Fire Protection Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Ted Jayo, Chairman Board of Fire Commissioners Grand View Fire Protection Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Tom Benson, Chairman Board of Fire Commissoners Murphy-Renyolds-Wilson Fire Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Dan Mori, Chairman Board of Fire Commissoners Bruneau Fire Department	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____
By: Fred Degeus, Chairman Board of Fire Commissoners Homedale Fire Protection District	Date	Adopted by Resolution of the Department Resolution Number: _____ Adoption Date: _____

6.4.4 Representatives of Federal and State Agencies, and Companies

This Wildfire Mitigation Plan was developed in cooperation and collaboration with the additionally listed agencies and organizations. These entities listed below are not eligible to “formally adopt” this plan, but will strive to implement its recommendations.

By: Glen Secrist, Boise District Manager
US Department of the Interior, BLM

Date

By: Howard Hedrick, Twin Falls District Manager
US Department of the Interior, BLM

Date

By: Kevin Stabler, Mountain Home Air Force Base Fire Chief
US Air Force

Date

By: Steve Douglas, Area Supervisor
Idaho Department of Lands,
Southwest Supervisory Area

Date

By: Robin Finch, President
Southwest Idaho Resource Conservation and Development
Council, Inc.

Date

By: William E. Schlosser, Ph.D.
Project Co-Manager & Lead Author
Owyhee County WUI Wildfire Mitigation Plan
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.

Fire Warden - has charge of the fire prevention and suppression system in the fire protection district of the warden and such other duties as are required by law.

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 predated resource management objectives in predefined geographic areas outlined in FMP's. Operational management is described in the WFIP. Wildland fire use is not to be confused with "fire use", which is a broader term encompassing more than just wildland fires.

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

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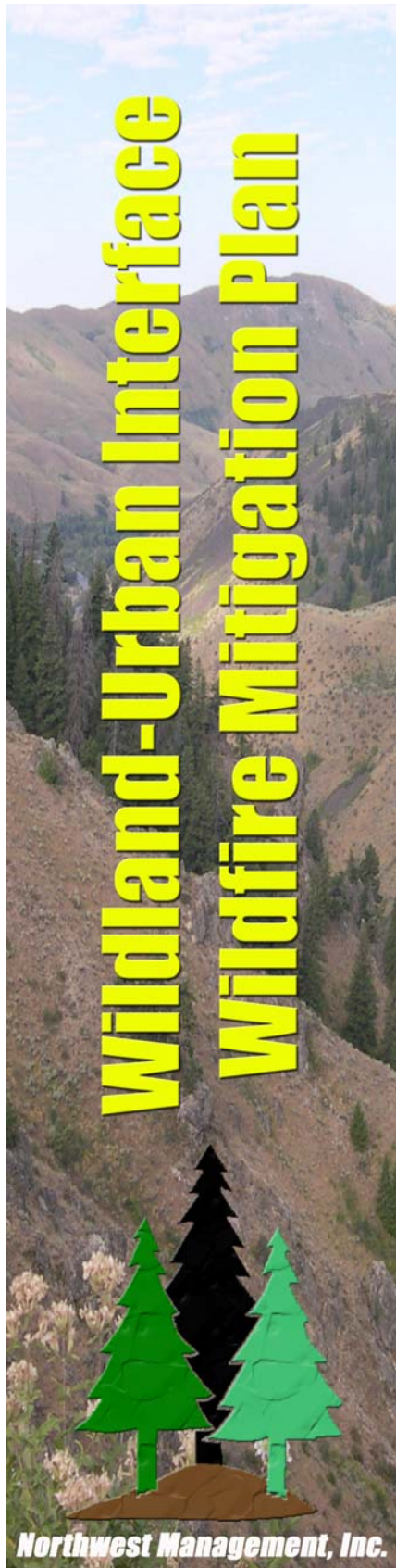
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Owyhee County, Idaho

Wildland-Urban Interface Wildfire Mitigation Plan

Appendices

March 10, 2005

Mission Statement

To make Owyhee 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



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Appendix I: Maps

Map Legend

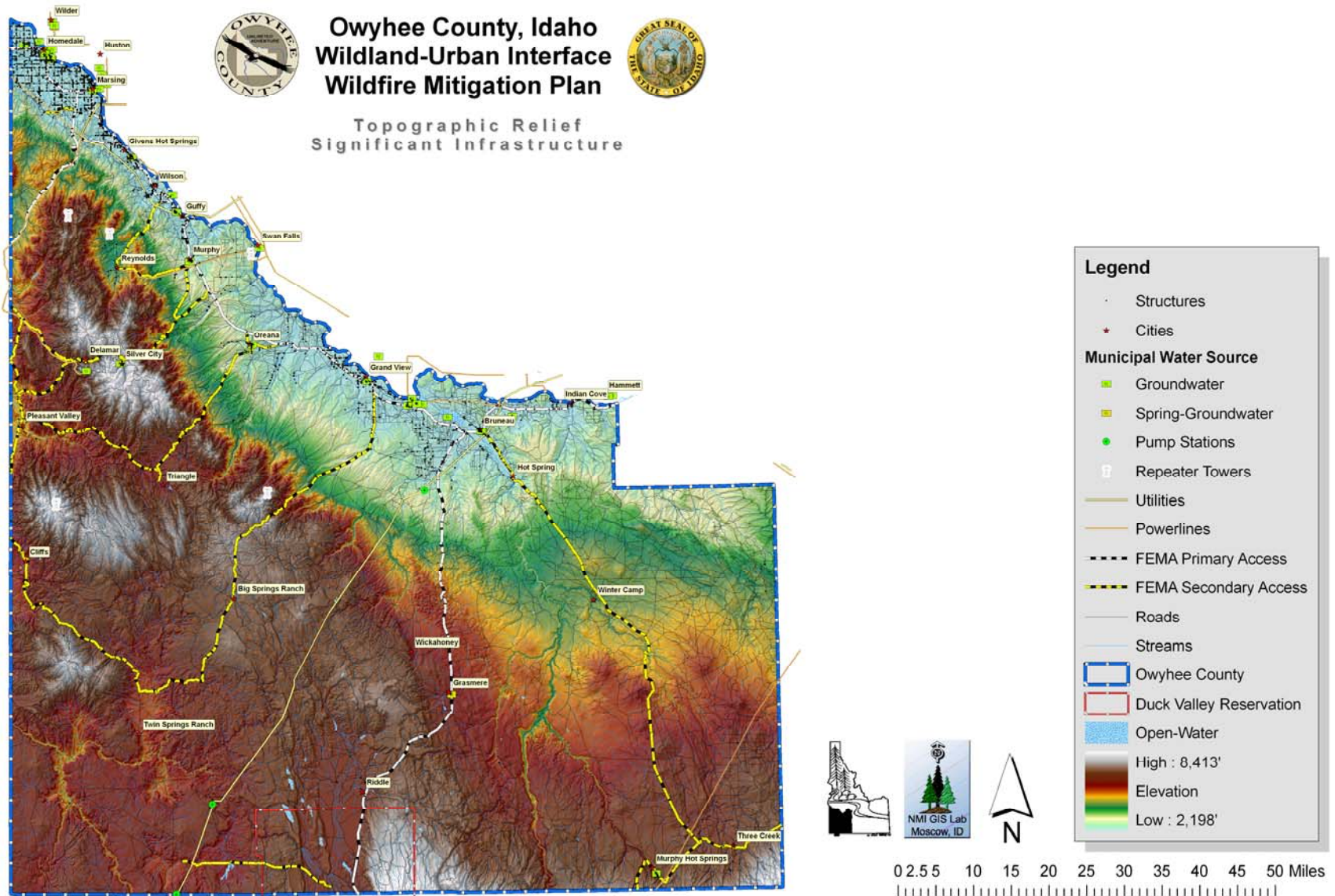


Northwest Management, Inc. Geographical Information Systems Laboratory

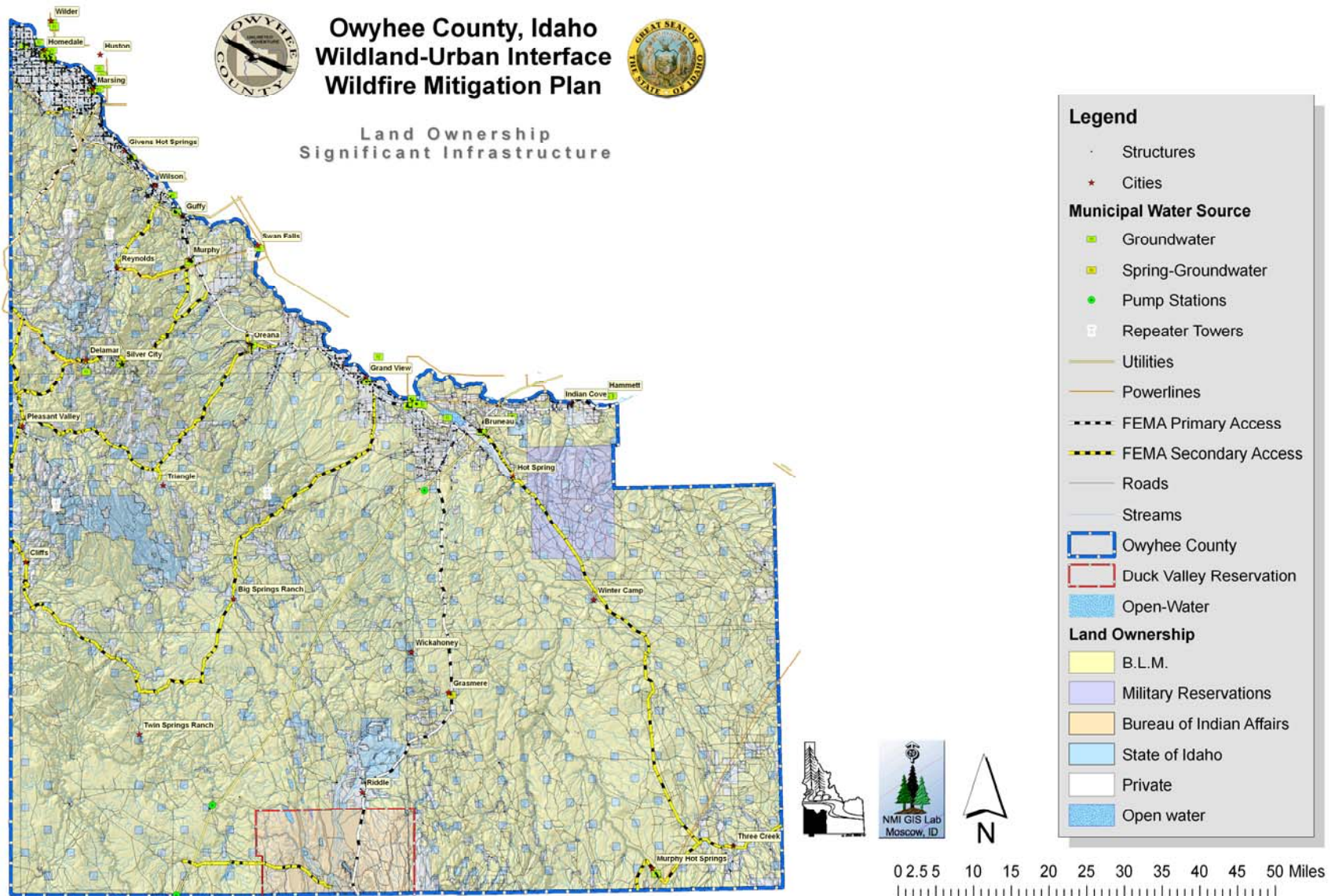
233 East Palouse River Dr., P.O. Box 9748, Moscow, ID 83843 www.Consulting-Foresters.com

The information on the attached maps was derived from digital databases from NMI's GIS lab. Care was taken in the creation of these maps, but all maps are provided "as is" with no warranty or guarantees. Northwest Management, Inc., cannot accept any responsibility for any errors, omissions, or positional accuracy, and therefore, there are no warranties which accompany this product. Although information from Land Surveys may have been used in the creation of this product, in no way does this product represent or constitute a Land Survey. Users are cautioned to field verify information on this product before making any decisions.

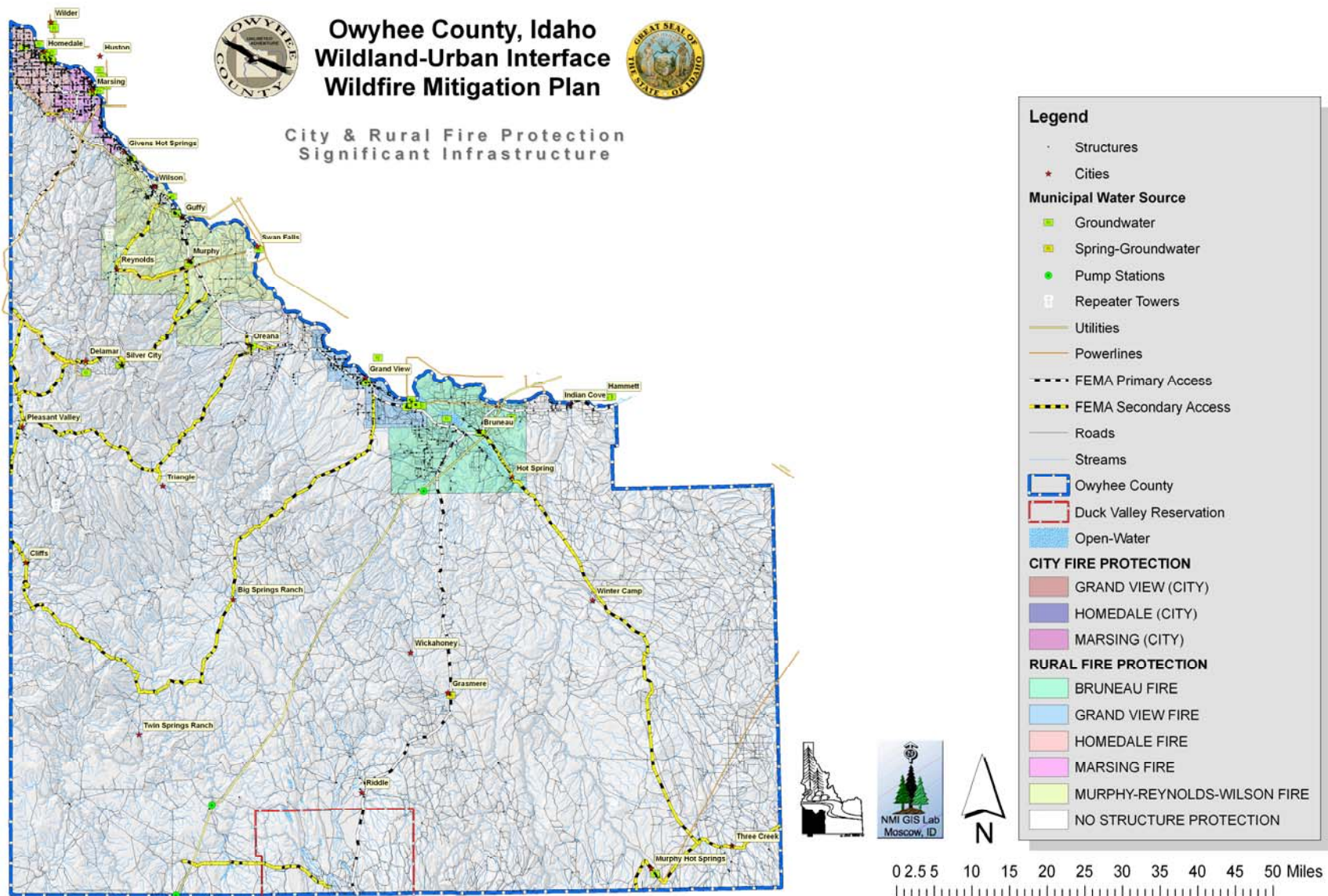
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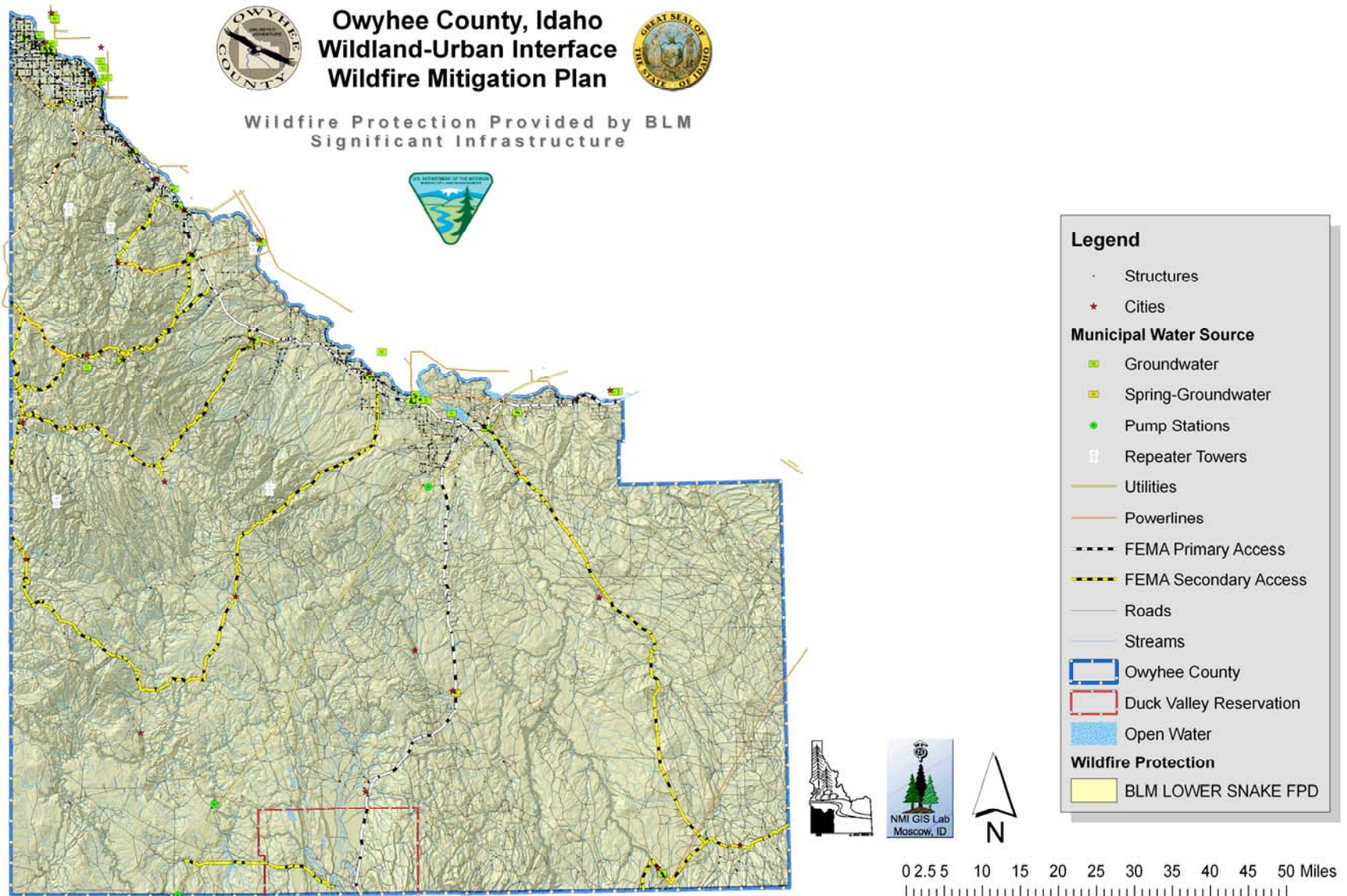
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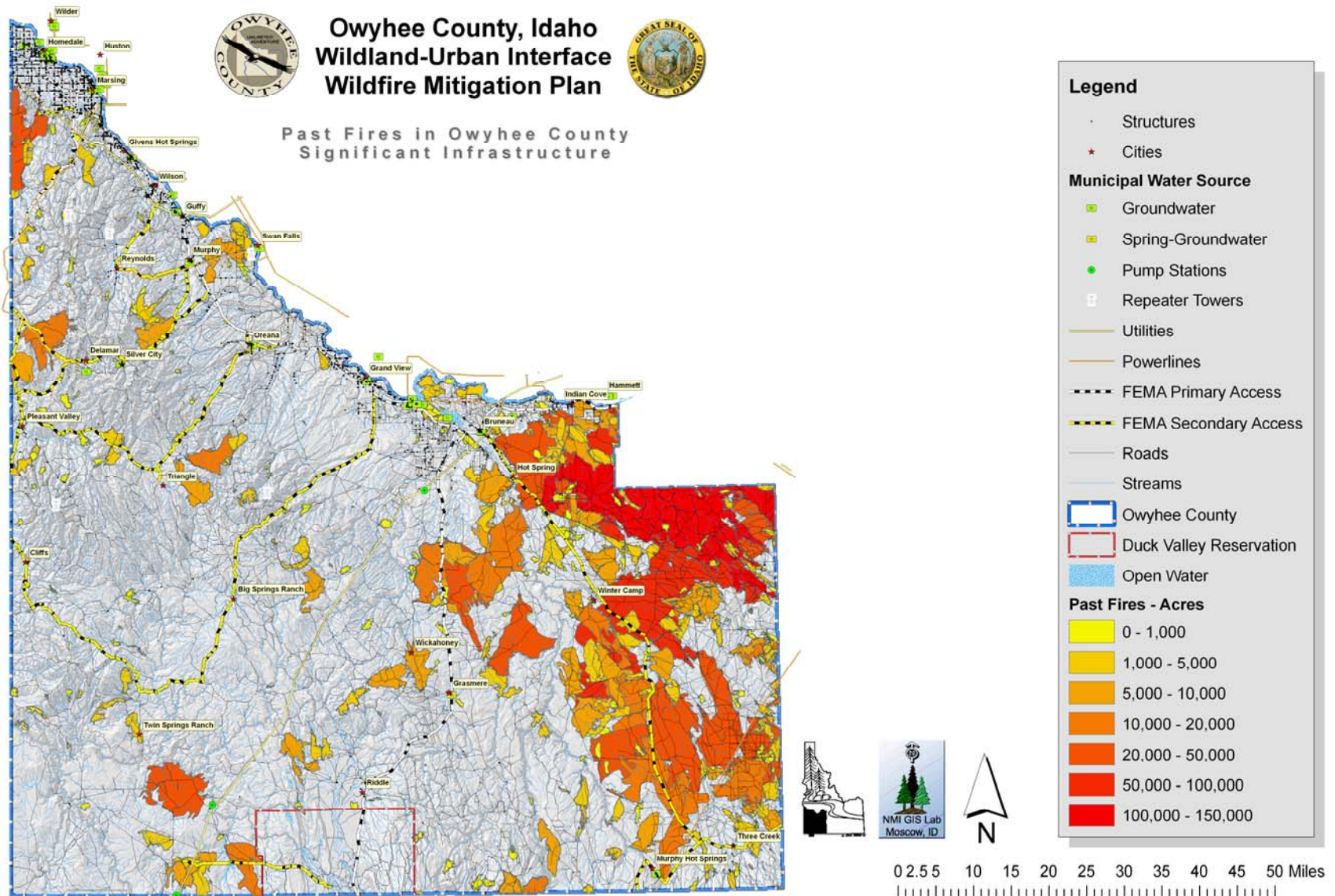
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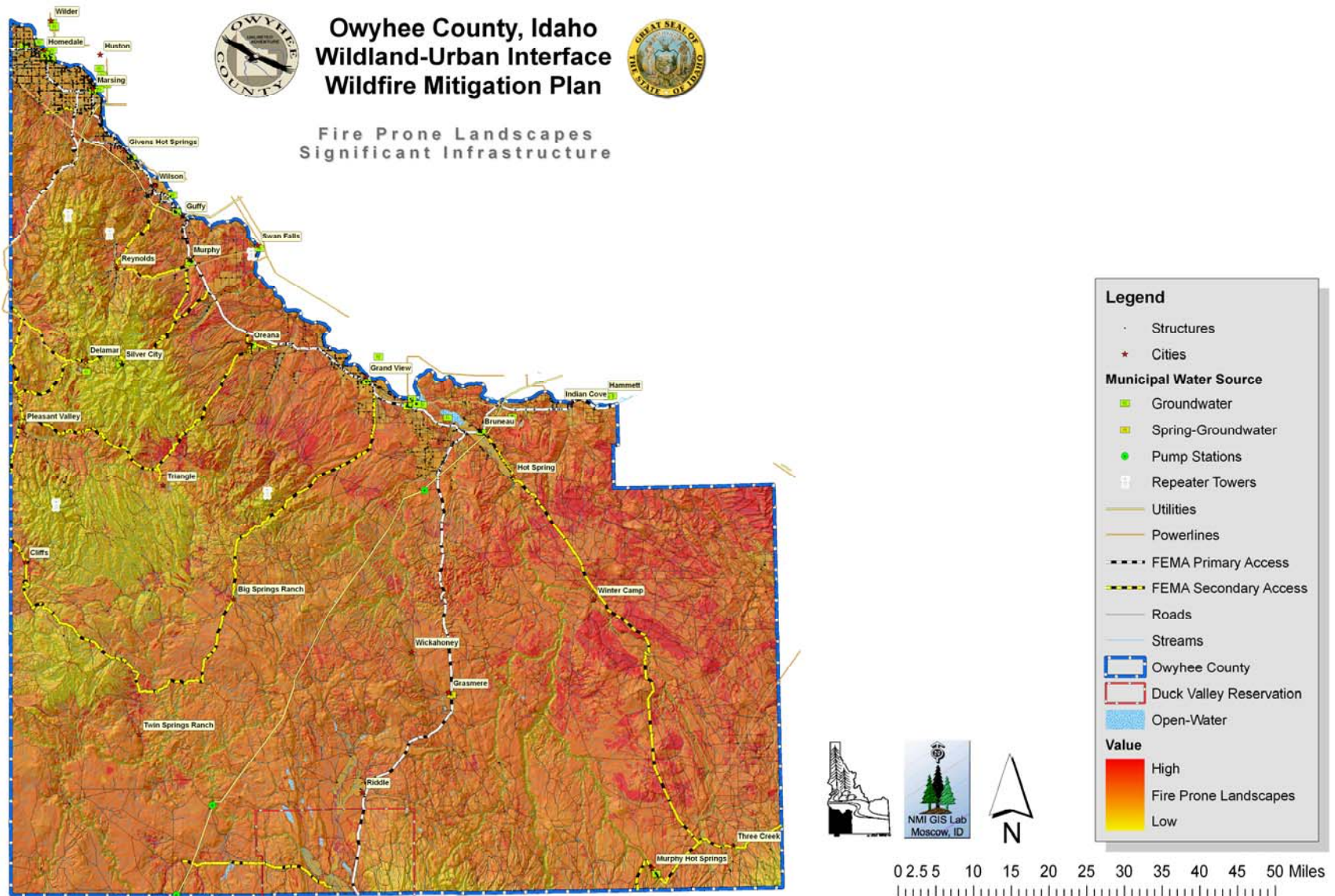
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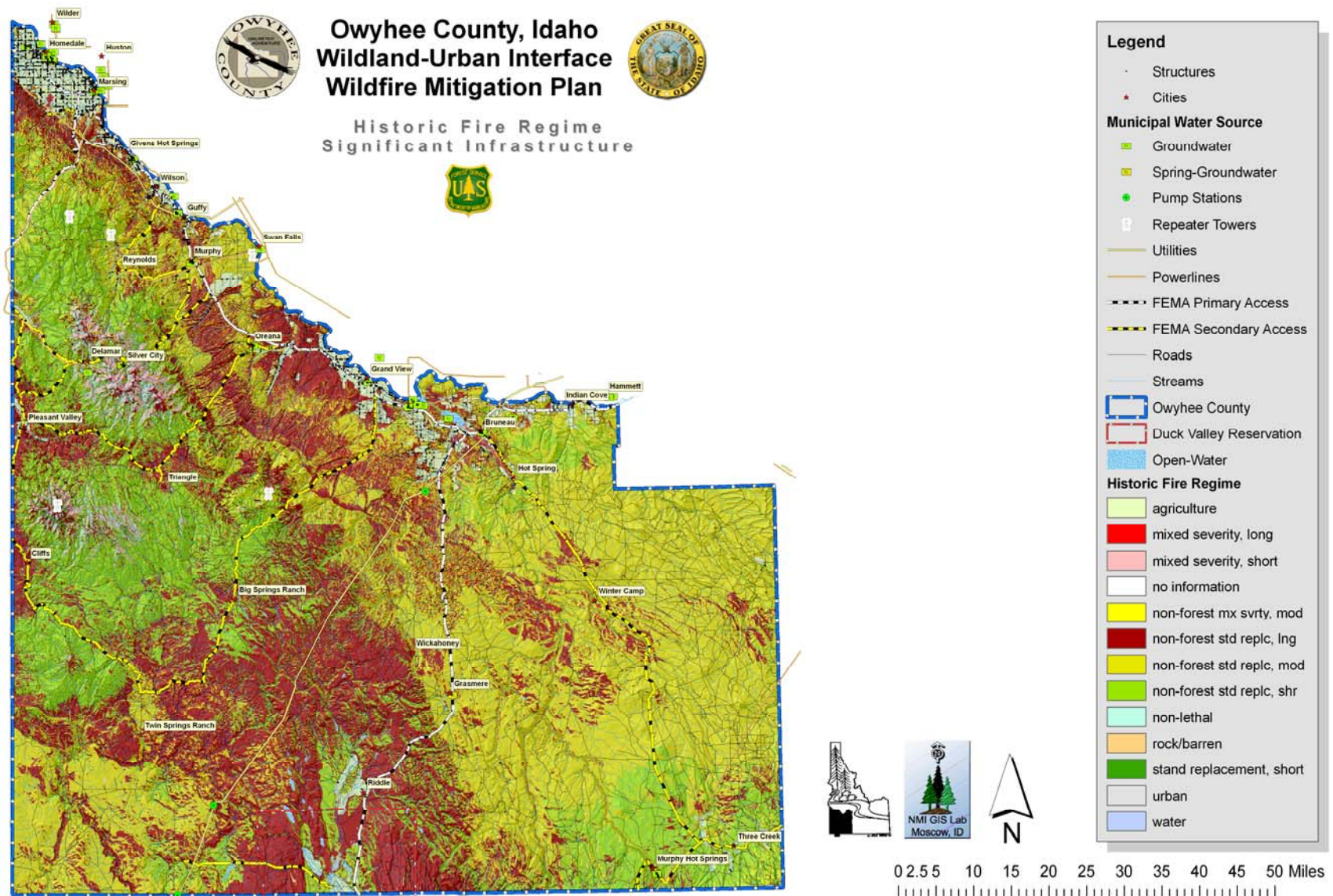
Past Wildfires in Owyhee County



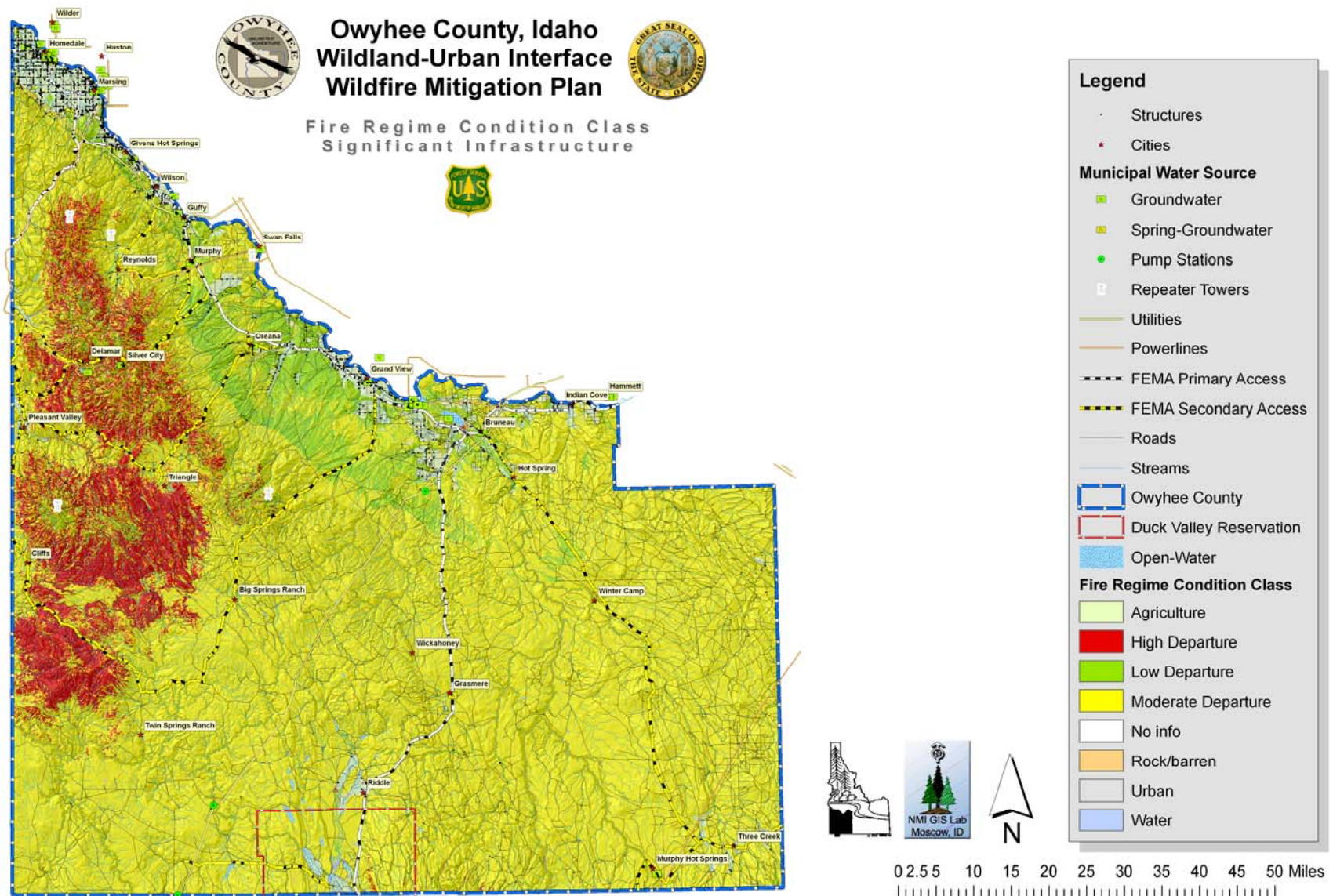
Fire Prone Landscapes in Owyhee County



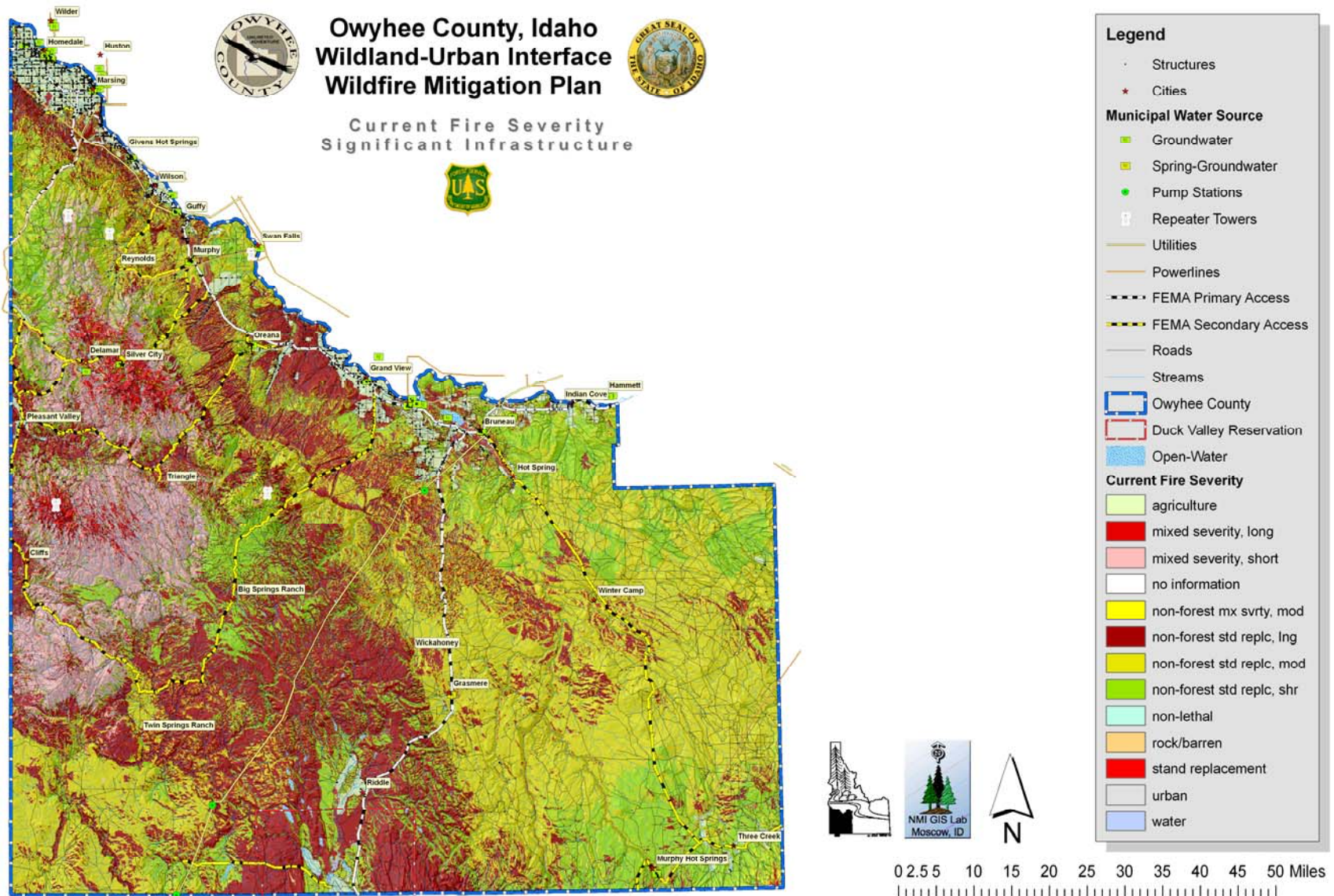
Historic Fire Regime in Owyhee County



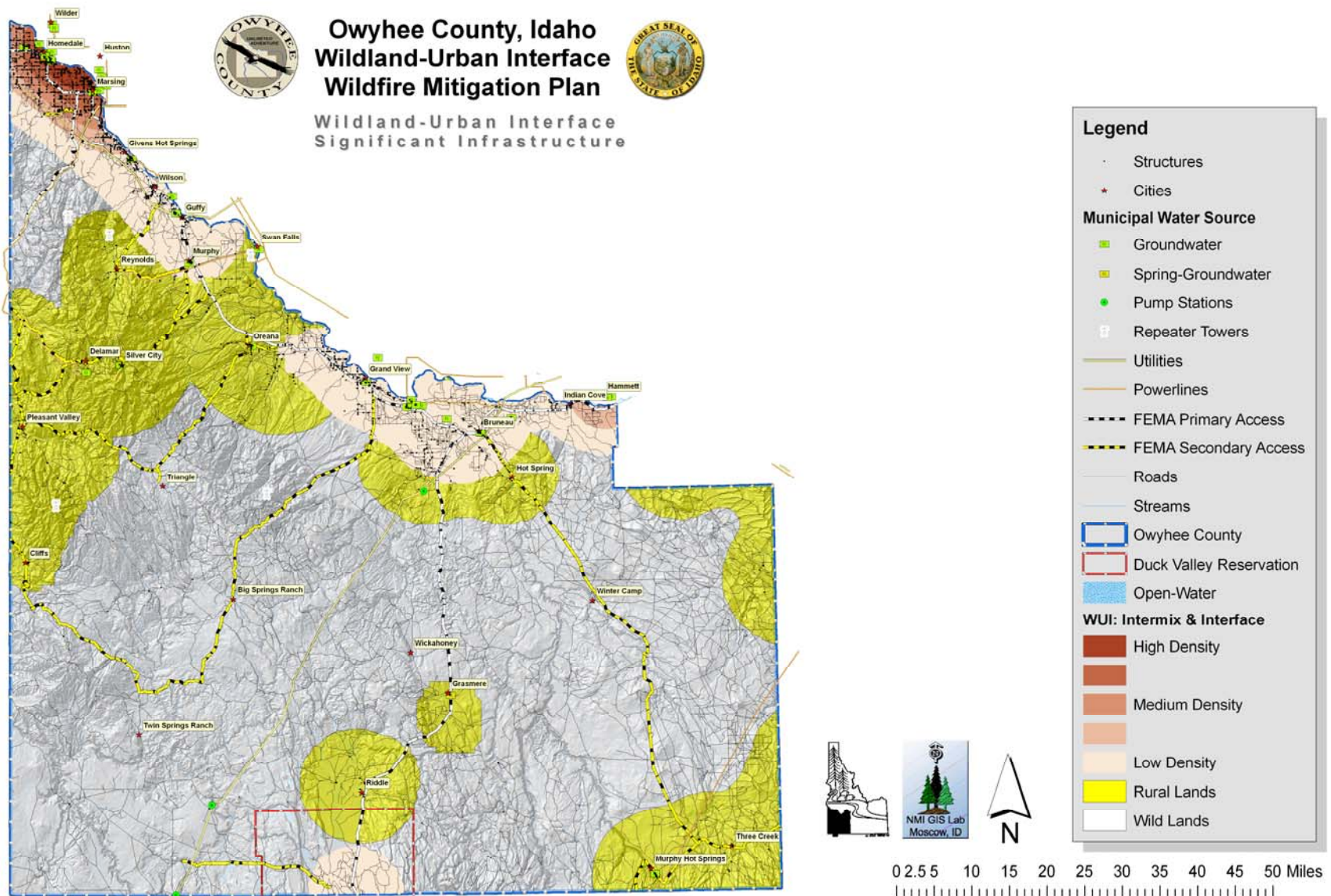
Fire Regime Condition Class in Owyhee County



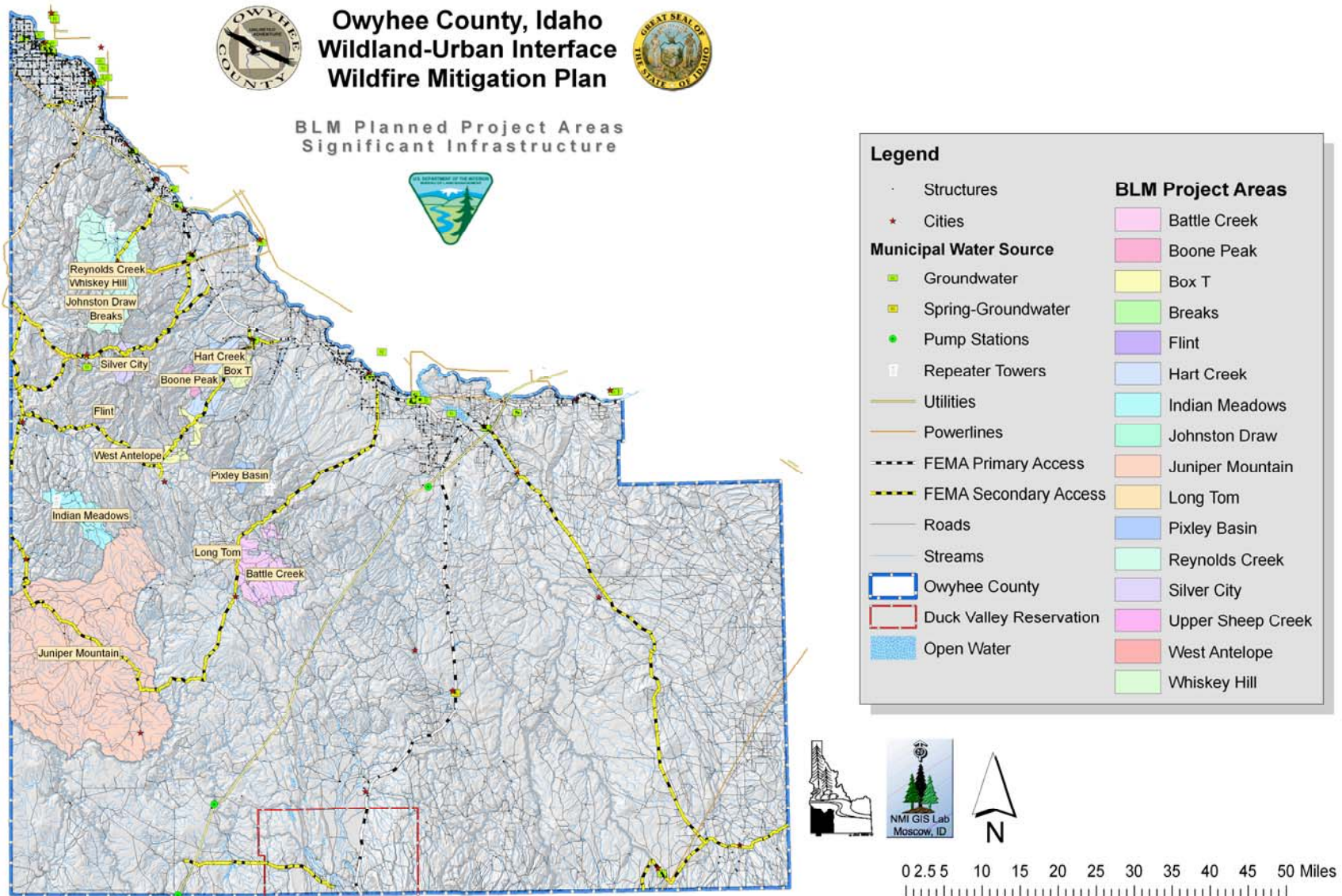
Predicted Fire Severity in Owyhee County



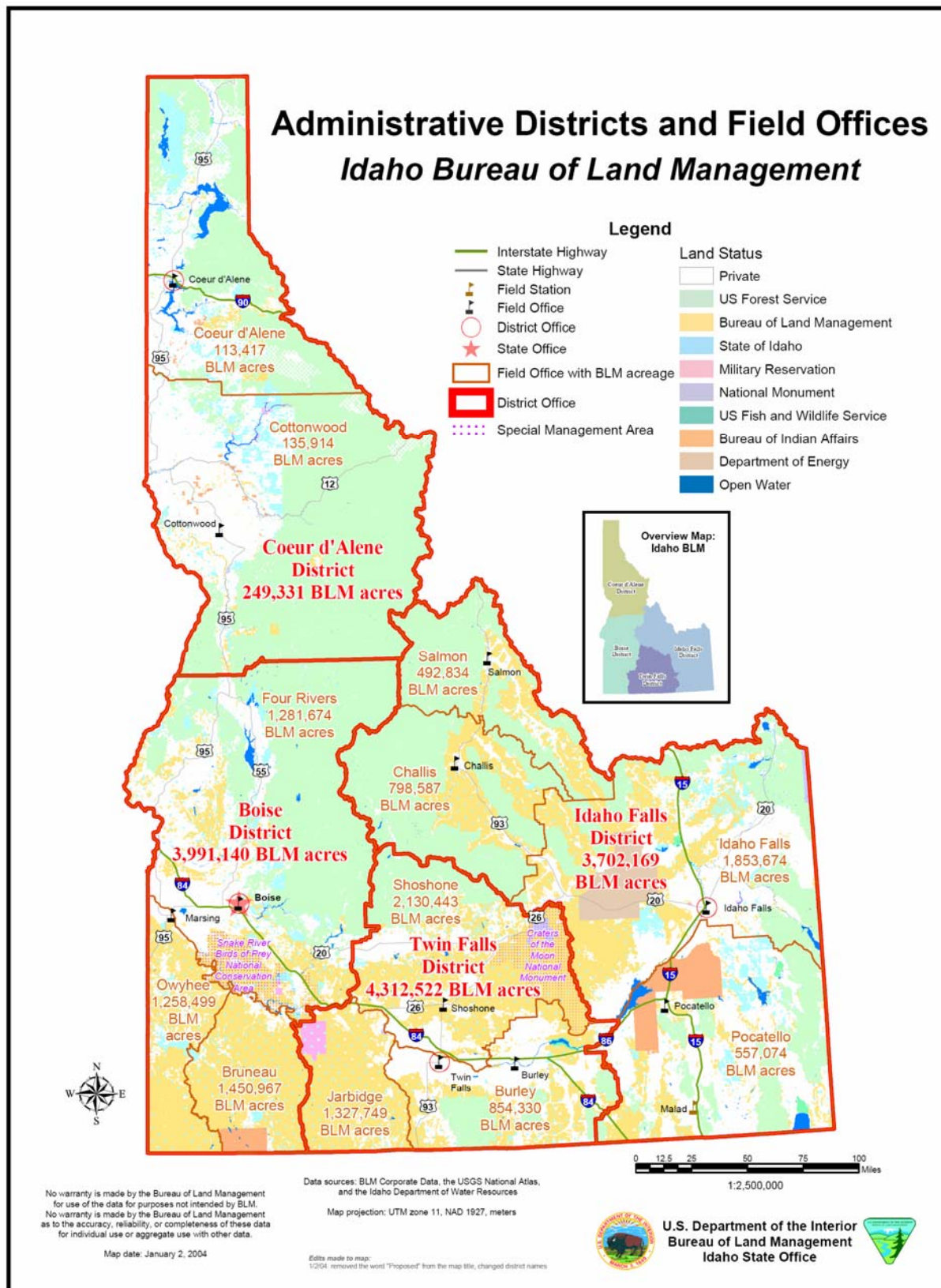
Wildland-Urban Interface and Significant Infrastructure



Planned / Proposed WUI Wildfire Mitigation Treatments by BLM



BLM Administrative Districts Effective September 2004



Appendix II

Public Mail Survey

Public Letter #1

mailed on September 29, 2004



Northwest Management, Inc.
Natural Resources Management

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Providing a Balanced Approach to Natural Resource Management

Owyhee County Wildfire Mitigation Plan Survey

September 29, 2004

Name

Address

City, State Zip

Dear Owyhee County Resident:

Thank you for taking fifteen minutes of your time to read and respond to this short inquiry. We are working with the Owyhee County Commissioners' Office and a host of fire protection and disaster relief organizations in Owyhee County to develop a **Wildland Fire Mitigation Plan** in your area. As an individual who lives in Owyhee County, you know that the urban-rural interface is at very high risk to casualty loss due to wildland fires.

This year we are taking a proactive role in reducing fire starts and mitigating wildland fire-caused casualty loss in your area. We are inviting you to help yourself and your neighbors by taking a proactive role as well by completing and returning the attached survey.

We are developing improved predictive models of where fires are likely to ignite, locating and identifying high risk landscape characteristics, advancing improved land management practices to reduce fire rate-of-spread on forestlands and rangelands, and working with rural landowners to create defensible zones around homes and buildings so that fires are controlled BEFORE they take a landowner's valuable possessions. It is the last of these goals that we need your help with.

We would like you to complete the attached survey about your home's defensible space in the case of wildland fire. Your responses will be kept completely confidential and released only in summative form. This questionnaire will allow us to identify key criteria that may place your home and the homes of your neighbors at the greatest risk. We will use this information to develop mitigation activities that may lead to saving your home and the community you live in. If certain questions are not applicable to your home do not provide an answer and move on to the next question.

We have sent this letter and survey to only a select number of people living in Owyhee County. Because of this, your response is very important to our efforts and the application of our findings to your home and to your community. Please take a few minutes to complete the enclosed survey and return it to us in the self-addressed envelope.

We would like to thank you for your assistance on this project with a small token of appreciation. During the development of this project, we are completing some very advanced mapping of Owyhee County. We have created detailed maps showing roads, rivers, elevation, fire prone landscapes, potential fire ignition locations, plant cover characteristics, and even orthophoto coverage (black and white images taken from high elevation) with features over them. These maps are printed at 8.5" x 11" sizes. If you give us a legal land description, we will make a high resolution map of this property and send it to you. The map might be the locale of your home, your property, or even your favorite recreation spot. When you complete your survey, please mark which map coverage you would like, and we will custom color print this map for you and send it at no charge. It is our way of thanking you for your input to this very important project.

Thank you for your assistance. If you have any questions about this project or this survey please contact me at the Northwest Management, Inc., office in Moscow, Idaho, at 208-883-4488.

Sincerely,



William E. Schlosser, Ph.D.

Project Manager, Owyhee County Wildland Fire Mitigation Plan
Northwest Management, Inc.

**Wildland Fire Mitigation Plan
Public Survey**

1. Do you have a home in Owyhee County?
 - ☐ Yes
 - ☐ No
2. Is this your primary residence?
 - ☐ Yes
 - ☐ No
3. Which community do you live closest to?

4. Does your area have 911 emergency telephone service?
 - ☐ Yes
 - ☐ No
5. Is your home protected by a rural fire department?
 - ☐ Yes
 - ☐ No
6. What type of roof does your home have (please mark one):
 - ☐ Composite
 - ☐ Wooden shake (shingles)
 - ☐ Ceramic tiles
 - ☐ Aluminum, tin, or other metal
 - ☐ Other (please indicate: _____)
7. How tall is the vegetation within 75 of your home?
 - ☐ None
 - ☐ 0ft to 2ft
 - ☐ 2ft to 5ft
 - ☐ More than 5ft
8. What type of vegetation is within 75 feet of your home? Check all that apply
 - ☐ None
 - ☐ Grass
 - ☐ Brush
 - ☐ Trees
9. Do you have a lawn surrounding your home?

- ☐ No
- ☐ Yes, if yes is it kept green and trimmed all summer?
 - ☐ No
 - ☐ Yes

10. How long is your driveway, from the main road to your home parking area? Please indicate distance units in feet or miles.

_____ ☐ Feet
☐ Miles

11. If your driveway is over ½ mile long, does it have turnouts that would allow two trucks to pass each other?

- ☐ No
- ☐ Yes

12. What type of surfacing does your driveway have?

- ☐ Dirt
- ☐ Gravel/rock
- ☐ Paved

13. If the primary access to your home were cut off because of a wildfire, would you have an alternative route to escape through?

- ☐ No
- ☐ Yes

14. Please indicate which of the following items you have available at or near your home that could be used in fighting a wildland fire that threatens your home (mark all that apply)

- ☐ Hand tools (shovel, pualski, etc.)
- ☐ Portable water tank
- ☐ Stationery water tank
- ☐ Pond, lake, or stream water supply close
- ☐ Water pump and fire hose
- ☐ Equipment suitable for creating fire breaks (bulldozer, cat, skidder, etc.)

15. Please indicate any emergency services training anyone in your household has received.

Type of Training	No	Yes
Wildland Fire Fighting	<input type="radio"/>	<input type="radio"/>
City or Rural Fire Fighting	<input type="radio"/>	<input type="radio"/>
EMT (Emergency Medical Technician)	<input type="radio"/>	<input type="radio"/>
Basic First Aid/ CPR	<input type="radio"/>	<input type="radio"/>
Search and Rescue	<input type="radio"/>	<input type="radio"/>

16. Do you conduct a periodic fuels reduction program near your home site such as grass or brush burning?

- ☐ No
- ☐ Yes

17. Do livestock (cattle, horses, sheep) graze the grasses and forbs around your home?

- ☐ No
- ☐ Yes

18. Use this exercise below to assess your home's fire risk rating:
Circle the rating that best describes your home.

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

Fuel Hazard _____ x Slope Hazard _____ = _____
 Structural Hazard _____ + _____
 Additional Factors (+ or -) _____
 Total Hazard Points = _____

Extreme Risk = 26 + points

High Risk = 16–25 points

Moderate Risk = 6–15 points

Low Risk = 6 or less points

19. 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 rural–urban interface how to improve the defensible space surrounding your home and adjacent outbuildings?

- ☐ No
- ☐ Yes

20. How do you feel All Hazard Mitigation projects should be **funded** in the areas surrounding homes, communities, and infrastructure such as power lines and major roads?

	Mark the box that best applies to your preference		
	100% Public Funding	Cost-Share (Public & Private)	Privately Funded (Owner or Company)
Home Defensibility Projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Defensibility Projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infrastructure Projects Roads, Bridges, Power Lines, Etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you very much for completing this survey and sending it back to us. This information will be combined with other data to assess the greatest threats to defending homes and adjacent buildings in the rural–urban interface where Wildland fires are common.

Please place the completed survey and the Map Request Form in the self-addressed envelope and place it in the mail for return to us. Thank you!

Order Your Owyhee County Area Map

FREE

As a token of appreciation for completing and returning this survey, we would like to send you a detailed map of your favorite area. Complete this form and return it to us with your survey and we will custom print a color map of your property and send it to you. Maps are produced by NMI during the winter months of December, January and February. Expect your maps to arrive in the mail during this time.

What is the legal land description of the property you want mapped (must be in Owyhee County).

_____ T _____ N, R _____ E.

or describe the area _____

About how many acres is the parcel you want mapped? _____ acres

What would you like printed as the title of the map? (Five or less words, please print)

Please select which coverage (only one per map) you would like as the primary theme:

- ☐ Land Ownership Categories (over shaded relief map)
- ☐ Ortho photo (limited availability)

Maps may include:

- Roads
- Streams & rivers
- Community locations
- Building locations

Please verify your name and full address here so we can send your map to you:

Our records indicate that your address is:	If this is incorrect please correct it here:
Name	_____
Address	_____
City State Zip	_____

Public Letter #2

sent as a postcard on October 6, 2004

October 6, 2004

Dear Owyhee County Resident:

About a week ago, I mailed you a letter and a brief survey concerning the wildfire situation in your community. That survey is instrumental to the success of the Wildland Fire Mitigation Plan we are developing in conjunction with the Owyhee County Commissioners Office. We have received responses from many families in the area and we wish to extend our thanks and appreciation to everyone who has participated. However, we still have not received completed surveys from many homes in the region. If you have not returned the completed survey to us yet, please take a few minutes to complete the survey and return it in the self-addressed envelope provided with the letter.

Your responses are very important to this effort which will recommend the location and type of wildfire mitigation projects to be implemented in the area of your home. If you have any questions about the survey, please contact me at 208-883-4488. If you did not receive my original letter, or if you misplaced your survey, you can request a new one at the number below or write me requesting another survey.



William E. Schlosser, Ph.D.

Northwest Management, Inc. Natural Resource Management
233 Palouse River Dr., P.O. Box 9748, Moscow ID 83843
Tel: 208-883-4488, Fax 208-883-1098, <http://www.Consulting-Foresters.com/>

Public letter #3

Sent on October 19, 2004, and included a replacement survey (not included here).



Northwest Management, Inc.
Natural Resources Management

233 E. Palouse River Drive
PO Box 9748
Moscow, ID 83843
Tel: 208-883-4488
Fax: 208-883-1098
www.Consulting-Foresters.com

Providing a Balanced Approach to Natural Resource Management

Owyhee County Wildfire Mitigation Plan Survey

October 19, 2004

Name

Address

City, State Zip

Dear Owyhee County Resident:

Thank you for taking some of your time to read and respond to this short inquiry. About two weeks ago, I sent you a letter and package of materials much like this one. In it, I asked if you would please assist our efforts by reading, filling out, and returning a survey concerning a **Wildland Fire Mitigation** plan we are preparing for Owyhee County in cooperation with the Owyhee County Commissioner's Office and a host of fire protection and disaster relief organizations in Owyhee County. While we have received excellent responses from many residents of the area, we have not received them from everyone. **If you have completed and returned your survey, please accept our sincere thanks!** If you have not returned the completed survey, please do so as soon as possible.

As an individual who owns property in Owyhee County, you know that many areas of the county are at high risk to casualty loss due to a wildland fire. You are in a unique situation to provide valuable insights and information concerning the fire risks to your home and property in Owyhee County. Without this information, our recommendations for specific fire risk mitigation activities will not be targeted appropriately to where the risks are located. I have enclosed another survey and return envelope with this letter for you. Please complete it and drop it in the mail so that we can include your input with that from your neighbors. **We need your help.**

Because of catastrophic wildland fires occurring across the west in the past several years, state, federal and local agencies have combined efforts in an attempt to reduce the hazards associated with wildland fire. We are doing more than watching disasters happen around us, we are taking a proactive role in reducing the exposure to hazards in our area. We are inviting you to help yourself and your neighbors by taking a proactive role as well by completing and returning the attached survey.

We are developing improved predictive models of where fires are likely to ignite, locating and identifying high risk landscape characteristics, advancing improved land management

practices to reduce fire rate-of-spread on forestlands and rangelands, and working with rural landowners to create defensible zones around homes and buildings so that fires are controlled BEFORE they take a landowner's valuable possessions. It is the last of these goals that we need your help with.

We would like you to complete the attached survey about your home's defensible space in the case of wildland fire. Your responses will be kept completely confidential and released only in summative form. This questionnaire will allow us to identify key criteria that may place your home and the homes of your neighbors at the greatest risk. We will use this information to develop mitigation activities that may lead to saving your home and the community you live in. If certain questions are not applicable to your home do not provide an answer and move on to the next question.

We have sent this letter and survey to only a select number of people living in Owyhee County. Because of this, your response is very important to our efforts and the application of our findings to your home and to your community. Please take a few minutes to complete the enclosed survey and return it to us in the self-addressed envelope.

We would like to thank you for your assistance on this project with a small token of appreciation. During the development of this project, we are completing some very advanced mapping of Owyhee County. We have created detailed maps showing roads, rivers, elevation, fire prone landscapes, potential fire ignition locations, plant cover characteristics, and even orthophoto coverage (black and white images taken from high elevation) with features over them. These maps are printed at 8.5" x 11" sizes. If you give us a legal land description, we will make a high resolution map of this property and send it to you. The map might be the locale of your home, your property, or even your favorite recreation spot. When you complete your survey, please mark which map coverage you would like, and we will custom color print this map for you and send it at no charge. It is our way of thanking you for your input to this very important project.

Thank you for your assistance. If you have any questions about this project or this survey please contact me at the Northwest Management, Inc., office in Moscow, Idaho, at 208-883-4488.

Sincerely,



William E. Schlosser, Ph.D.
Project Manager, Owyhee County All Hazards Mitigation Plan
Northwest Management, Inc.

Appendix III

Potential Funding Sources

Program:	Rural Fire Assistance
Source:	Bureau of Land Management
Description:	BLM provides funds to rural fire departments for wildfire fighting; also provides wildland fire equipment, training and/or prevention materials.
More info:	Dale Anderson, RFA Coordinator, BLM, 208-373-3861; dale_anderson@blm.gov
Program:	Communities at Risk
Source:	Bureau of Land Management
Description:	Assistance to communities for hazardous fuels reduction projects in the wildland urban interface; includes funding for assessments and mitigation planning.
More info:	Jon Skinner, Idaho BLM, 208-373-3854
Program:	State Fire Assistance
Source:	US Forest Service
Description:	USFS grants to state foresters through state and private grants, under authority of Cooperative Forestry Assistance Act. Grant objectives are to maintain and improve protection efficiency and effectiveness on non-federal lands, training, equipment, preparedness, prevention and education.
More info:	www.fireplan.gov and www2.state.id.us/lands; Brian Shiplett, Idaho Department of Lands 208-666-8650
Program:	State Fire Assistance Hazard Mitigation Program
Source:	National Fire Plan
Description:	These special state Fire Assistance funds are targeted at hazard fuels treatment in the wildland-urban interface. Recipients include state forestry organizations, local fire services, county emergency planning committees and private landowners.
More info:	www.fireplan.gov and www.fs.fed.us/r4 and www2.state.id.us/lands; Jean Kaysen, Idaho Department of Lands 208-769-1525
Program:	Volunteer Fire Assistance
Source:	US Forest Service
Description:	Provides funding and technical assistance to local and volunteer fire departments for organizing, training and equipment to enable them to effectively meet their structure and wildland protection responsibilities. US Forest Service grants provided to state foresters through state and private grants under the authority of Coop Forestry Assistance Act.
More info:	www.fs.fed.us/fire/partners/vfa ; Brian Shiplett, Idaho Department of Lands, 208-666-8650
Program:	Forest Land Enhancement Program
Source:	US Forest Service

Description: The 2002 Farm Bill repealed the Forestry Incentives Program (authorized in 1978) and Stewardship Incentive Program (1990) cost share programs and replaced it with a new Forest Land Enhancement Program (FLEP). FLEP purposes include 1) Enhance the productivity of timber, fish and wildlife habitat, soil and water quality, wetland, recreational resources, and aesthetic values of forest land through landowner cost share assistance, and 2) Establish a coordinated, cooperative federal, state and local sustainable forestry program to establish, manage, maintain, enhance and restore forests on non-industrial private forest land.

More info: www.usda.gov/farmbill

Program: **Federal Excess Property**

Source: US Forest Service

Description: Provides assistance to state, county and local governments by providing excess federal property (equipment, supplies, tools) for wildland and rural community fire response.

More info: www2.state.id.us/lands; George Riffle, Idaho Department of Lands, 208-666-8664

Program: **Economic Action Program**

Source: US Forest Service

Description: A USFS, state and private program with involvement from local Forest Service offices to help identify projects. Addresses long-term economic and social health of rural areas; assists the development of enterprises through diversified uses of forest products, marketing assistance, and utilization of hazardous fuel byproducts.

More info: www.fs.fed.us/r3/spf/community/; Bob Ford, Idaho Department of Commerce, 800-842-5858

Program: **Forest Stewardship Program**

Source: US Forest Service

Description: Funding helps enable preparation of management plans on state, private and tribal lands to ensure effective and efficient hazardous fuel treatment.

More info: www2.state.id.us/lands; G. Kirk David, Idaho Department of Lands, 208-666-8626

Program: **Community Planning**

Source: US Forest Service

Description: USFS provides funds to recipients with involvement of local Forest Service offices for the development of community strategic action and fire risk management plans to increase community resiliency and capacity.

More info: www.idoc.state.id.us; Bob Ford, Idaho Department of Commerce, 800-842-5858

Program: **Firefighters Assistance**

Source: Federal Emergency Management Agency and US Fire Administration Program

Description: Financial assistance to help improve fire-fighting operations, services and provide equipment.

More info: www.usfa.fema.gov

Program: **Pre-Disaster Mitigation Program**

Source: Federal Emergency Management Agency

Description: Emergency management assistance to local governments to develop hazard mitigation plans.

More info: www.usfa.fema.gov; Steven Weiser, Idaho Bureau of Disaster Services, 208-334-3460

Program: **Idaho Forestry Assistance Program**

Source: Idaho Department of Lands

Description: Funding available to assist with organizing, training, and purchasing fire fighting equipment.

More info: www2.state.id.us/lands/Bureau/FireMgt/Fire_assistance.htm; Brian Shiplett, Idaho Department of Lands, 208-666-8650

Program: **Community Facilities Loans and Grants**

Source: Rural Housing Service (RHS) U. S. Dept. of Agriculture

Description: Provides grants (and loans) to cities, counties, states and other public entities to improve community facilities for essential services to rural residents. Projects can include fire and rescue services; funds have been provided to purchase fire-fighting equipment for rural areas. No match is required.

More info: <http://www.rurdev.usda.gov>; or local county Rural Development office.

Program: **Sale of Federal Surplus Personal Property**

Source: General Services Administration

Description: This program sells property no longer needed by the federal government. The program provides individuals, businesses and organizations the opportunity to enter competitive bids for purchase of a wide variety of personal property and equipment. Normally, there is no use restrictions on the property purchased.

More info: www.gsa.gov

Program: **Reimbursement for Firefighting on Federal Property**

Source: U. S. Fire Administration, Federal Emergency Management Agency

Description: Program provides reimbursement to fire service organizations that have engaged in firefighting operations on federal land. Payments can be for direct expenses and direct losses.

More info: www.fema.gov

Program: **Fire Management Assistance Grant Program**

Source: Readiness, Response and Recovery Directorate, FEMA

Description: Program provides grants to states, tribal governments and local governments for the mitigation, management and control of any fire burning on publicly (nonfederal) or privately owned forest or grassland that threatens such destruction as would constitute a major disaster. The grants are made in the form of cost sharing with the federal share being 75 percent of total eligible costs. Grant approvals are made within 1 to 72 hours from time of request.

More info: www.fema.gov

Program: **Hazard Mitigation Grant Program**

Source: Federal Insurance and Mitigation Administration, FEMA

Description: Provides states and local governments with financial assistance to implement measures to reduce or eliminate damage and losses from natural hazards. Funded projects have included vegetation management projects. It is each State's responsibility to identify and select hazard mitigation projects.

More info: www.fema.gov

Program: **Boise State University Wildland Fire Academy.**

Source: Partnership between BSU and SWIFT (Southwest Idaho Fire Training, a group including the BLM, Forest Service, and the Idaho Department of Lands).

Description: Provides a full range of fire training classes during one week in June at the Sella College of Technology on the BSU campus. Tuition is required. Open to federal, state, local fire fighters, contractors, and the public. Housing is available on campus. (Separate from, but in conjunction with, this academy, BSU recently began offering an associate degree program in fire science.)

More info: BLM training officer, 208-384-3403, or BSU's Sella College, 208-426-1974.

Appendix IV

Training Programs

Program: National Fire Academy Educational Program

Source: National Fire Academy, U. S. Fire Administration, FEMA

Description: Provides training to people responsible for fire prevention and control. Training is provided at the resident facility in Emmetsburg, Maryland, and travel stipends are available for attendees. The course is available to any individual who is a member of a fire department; attendees are selected based on need and benefit to be derived by their community.

More info: www.fema.gov

Program: Emergency Management Institute (EMI), Independent Study Program

Source: EMI Readiness, Response and Recovery Directorate, FEMA

Description: The program currently provides 32 courses in emergency management practices to assist fire department managers with response to emergencies and disasters. Several courses could apply to fires in rural interface areas.

More info: www.fema.gov

Research Programs

Program: Forestry Research (Forest and Rangeland Renewable Resources Research Act)

Source: U S Forest Service

Description: Awards grants for research in a wide array of forest-related fields, including forest management and forest fire protection.

Contact: www.fs.fed.us/links/research.html

Private Foundations

Source: Idaho Community Foundation

Description: Provides grants for community development, human services; past grants have been awarded for equipment and an array of firefighting and rescue needs. Grants range from \$250 to \$25,000.

Deadline: Feb 1 for northern region; Nov 1 for statewide cycle

More info: Contact foundation for application information packet: 210 S. State Street, Boise, ID 83702; 208-342-3535; info@idcomfdn.org; www.idcomfdn.org

Source: **The Allstate Foundation**

Description: Provides grants for community development, government/public administration, safety/disasters. Grants average \$1,000 to \$10,000.

Deadline: None

More info: Guidelines available by mail request only: 2775 Sanders Rd., Suite F3, Northbrook, IL 60062-6127; www.allstate.com/foundation/

Source: **Plum Creek Foundation**

Description: Provides grants for community projects in areas of company operations. In 2000, grants were awarded to a volunteer fire department and a county search & rescue unit. An application form is required. Grants average around \$5,000.

Deadline: None

More info: Contact foundation at 999-3rd Ave, Suite 2300, Seattle, WA 98104; 206-467-3600; www.plumcreek.com/company/foundation.cfm; foundation@plumcreek.com

Source: **The Steele-Reese Foundation**

Description: Provides grants for rural development and projects that benefit rural areas; Idaho is one of several areas in which the foundation funds projects. Have funded projects for emergency volunteers and fire protection districts in the past. Grant amounts fall within a wide range. The foundation requires three copies of the request letter; no application form is required.

Deadline: April 1

More info: 32 Washington Square West, New York, NY 10011. Info on Idaho programs: 406-722-4564

Appendix V

Laws Governing Fire Districts in Idaho

In 1943, the Idaho legislature passed, and Governor C.A. Bottolfsen signed, the Idaho Fire Protection District Law. The law specifically recognized the legality of all fire protection districts and the legality of their officers existing prior to its passage. Pre-existing districts were instructed to comply with the provision of the law as soon as they could conveniently do so. Since that time, the law has been amended over two dozen times. The most comprehensive revision of the law occurred in 1994. The 1994 revisions stipulated that all districts created or annexed during the twelve-month period prior to June 1, 1994 were considered to be in full compliance with all applicable laws regardless of prior interpretations.

The basic purpose of the 1994 revisions was to establish procedures for the formation, operation, and dissolution of fire protection districts in the State of Idaho.

What follows is a general description of the steps needed for fire district formation, the expansion of an existing district to take in new territory, and to consolidate two or more districts into one district. Please note that whenever a reference is made to the singular action of one Board of County Commissioner hereafter in this description, it may include joint action taken or required by two or more boards of county commissioners where two or more counties are involved in fire district formation. This also applies to annexation of new territory, or consolidation of two or more fire districts in different counties. Boards of Commissioners in two or more counties are authorized by law to act jointly if a fire district has territory within each county. It is always best to seek competent legal advice if the intent is to form, annex, or consolidate districts.

Additional Information. For additional information regarding fire district officers, duties and responsibilities, operations of the Fire District Board of Commissioners, cooperative arrangements, finance, etc., refer to the Handbook for Idaho Fire Protection Districts.¹

I. Creation of a New Fire Protection District

A fire protection district may be created in any portion of a county that is not already organized into a district. Three steps must be followed to establish a fire protection district:

- 1) The proponents of the new district must file a petition with the Board of County Commissioners;
- 2) The Board of County Commissioner must hold a public hearing before the new district is formed; and
- 3) The qualified electors within the proposed district must approve the district's formation.

1) Filing the Petition: The first step in creating a fire protection district is to draw up a petition requesting its creation. The petition must designate the boundaries of the district, identify the proposed name, and include a map of the district. It must be signed by at least twenty-five property owners in the proposed district whose property holdings total at least 1,000 contiguous acres or

¹ Handbook for Idaho Fire Protection Districts. Bureau of Public Affairs Research. University of Idaho 2002. More information on how to obtain a handbook is found at the website: <http://www.uidaho.edu/bpar/fire.html>

have an assessed value of at least \$500,000 and are not currently included in any existing fire district.

The petition must be presented to the Board of County Commissioners and filed with the Clerk of the Board. The petition and supporting documents must be available for public inspection at the office of the Clerk from the time of filing until the election.

The petitioners must deposit with the Board enough money to cover the costs of advertising and hold the election to create the district. The Board determines the amount required and the funds must be deposited prior to the Board's publishing notice of the hearing for creation of the district. If the district is organized, the petitioners are reimbursed from the first tax money collected by the newly formed district for the advertising and election costs.

Any area within a city may be included within a fire protection district by resolution or ordinance of its governing board.

2) *The Hearing:* The Board of County Commissioners must set a time for a public hearing on the petition between four and six weeks after it has been filed. If the proposed fire protection district is located in two or more counties, the boards of commissioners of the affected counties must coordinate the hearing date and the publication of the hearing notice so that only one hearing is held. The hearing must be held in the county with the largest area in the proposed fire protection district. The boards of county commissioners representing the affected counties are authorized to act in a joint manner.

For three successive weeks prior to the hearing, the Board must publish notice of the hearing in a newspaper of general circulation in which the proposed district is to be located. The notice must include a description of the proposed district and its boundaries, the date of the public hearing, and state that all taxpayers within the proposed district may appear and express their views on the organization of the district and its boundaries. At the hearing, all objections are presented to the Board. After considering all testimony, the Board decides whether to deny the petition, grant it as filed, or grant it with modification. If the petition is granted, the Board of County Commissioners fixes the boundaries of the proposed district and files a map of the district with the Clerk of the Board.

3) *The Election:* After the Board of County Commissioners set the boundaries of the district, the Clerk of the Board must twice publish a notice of the election in a newspaper published within the county or counties affected to determine whether or not the district should be organized. The notice must clearly designate the names and boundaries of the proposed district and require voters to cast ballots containing the words "fire protection district, yes," or "fire protection district, no." The first notice must be published not less than 12 days prior to the election and the second not less than five days prior to the election. If the proposed fire protection district is to be located in two or more counties, the boards of county commissioners will conduct the election on the same day in each county.

Voter qualifications for a fire protection district election are the same as for other state elections: a qualified voter must be United States citizen, be at least 18 years old, and be residents of the state or the county for at least 30 days. The voter must also be a resident of the proposed fire protection district and be registered with the County Clerk.

The Board of County Commissioners creates as many election precincts within the proposed district as it deems necessary, and appoints three election judges for each precinct. The election judges forward the official election results to the Clerk of the Board of County Commissioners. Within ten days of receiving the returns, the Board of County Commissioners must canvass the votes. Where more than one county is involved, the boards of commissioners of the affected counties are to coordinate the canvassing and the announcement of the results.

The Board of County Commissioners in each county approving a newly formed district must provide a copy of the legal description and map, prepared in draftsman-like manner, to the County Assessor and Clerk and Recorder of the county or counties within thirty days of the effective date of district's formation. The fire protection district is responsible for filing the map and legal description with the State Tax Commission.

Initially, any newly created fire district must consist of three commissioners. At the time of establishment of a new fire protection district, the Board of County Commissioners shall divide the district into three subdivisions, as nearly equal in population and territory as possible.

II. Expanding an Existing Fire District

Annexation of territory within the same county. Both contiguous and noncontiguous territory may be annexed by an existing fire protection district; however, any noncontiguous territory to be included must, itself, consist of not less than forty -acre parcels of contiguous territory in order to qualify for annexation. There are two methods for annexing territory in the same county:

- At least 75 percent of the owners or contract purchasers of the land sought to be annexed may petition the fire protection board of commissioners for annexation. After receiving the petition, the fire protection district board must hold a public hearing within ten to thirty days. The fire protection district board must publish notice of the place of the hearing in at least one issue of a newspaper of general circulation within the district. Any person attending the hearing who wishes to express support or opposition must be allowed to speak at the hearing. After the hearing, the fire protection district board either approves or rejects the petition. If the board approves the petition, it makes an order to that effect and sends to the Board of County Commissioners a certified copy of the petition and a legal description of the annexed territory. The Board of County Commissioner enters and records an order of annexation, ensuring that the annexed property will be properly included in the tax rolls for the fire protection district.
- If at least 75 percent of the owners or contract purchasers of the land sought for annexation fail to sign the petition for annexation, or if the petition is denied, the territory may still be annexed by securing an affirmative vote of a majority of the qualified voters residing in the additional territory. The vote may be taken at either a general or special election. Before the annexation election, the inclusion must be approved by resolution of the board of the existing fire protection district and entered in the board minutes. The same procedures described above to create and organize a fire protection district, including petition, hearing, election notice, and an election, are to be followed for the annexation election.
- The Board of County Commissioners must provide a copy of the legal description and map, prepared in draftsman-like manner of the new boundaries to the County Assessor and Clerk and Recorder within 30 days of the effective date of the annexation of the district. The district is responsible for filing the map and legal description with the State Tax Commission.

Annexation of territory in an adjoining county. Contiguous or noncontiguous territory located in an adjoining county may be annexed to an existing fire protection district; however, any such noncontiguous territory proposed to be annexed must consist of at least forty contiguous acres. The procedures are similar to those required for the creation of a fire protection district with the following modifications:

- Two or more property owners of contiguous lands totaling at least 100 acres, or having an assessed value of at least \$125,000 may initiate proceedings.
- A petition describing the territory to be annexed, naming, and describing the fire protection district to which annexation is sought must be filed with the Board of County Commissioners of the county in which the new territory is situated. The petition must be accompanied by a map showing the boundaries of the original district, the territory proposed to be annexed, the location of the intervening county line, and a certified copy of a resolution of the fire district board consenting to the annexation.
- Notice of the hearing on the petition before the Board of County Commissioners must identify the territory proposed to be annexed, the time and place of the hearing, and state that any taxpayer in the territory may appear and present objections.
- After the hearing, if the petition is granted, the Board of County Commissioners enters an order fixing the boundaries of the annexed territory, directing the Clerk of the Board to have a map prepared. Certified copies of the order and the map are then sent to the Clerk of the Board of County Commissioners of the county in which the original fire protection district is situated.
- An election must then be held in the territory desiring annexation. Notice of the election must describe the boundaries of the territory for which annexation is sought. The notice must describe the form of the ballot to be used at the election.
- The territory proposed to be annexed constitutes one election precinct. If a voter is challenged, he/she must swear in addition to the usual elector's oath, "I am a resident within the boundaries of the territory proposed to be annexed to ____ Fire Protection District."
- The Board of County Commissioners canvasses returns of the election. If more than half of the voters support annexation, the Board of County Commissioners by order declares the territory to be annexed to the existing fire protection district. A certified copy of the order is sent to the board of the original fire protection district, to the Board of County Commissioners of the county in which the original district is situated, and to the County Clerk and Recorder of the county in which the newly annexed territory is situated.
- The Board of County Commissioners of the original fire district must provide a copy of the legal description and map showing the new boundaries of the district to the County Assessor and Clerk and Recorder within 30 days of the effective date of its formation. The fire protection district is responsible for filing the map and legal description with the State Tax Commission.
- At the first meeting of the Board of County Commissioners following the annexation, the Board must re-divide the expanded fire protection district into three subdivisions as equal as possible in terms of land area and population. No more than one fire protection district commissioner may reside in each subdistrict. If redistricting results in two commissioners residing in the same subdistricts, they must draw lots to determine who will remain in position. County Commissioners appoint individuals to fill any vacancies resulting from the annexation and the appointed commissioners serve for the remainder of the term to which they are appointed. Certified copies of appointments of the secretary and treasure of the fire district board must be filed with the clerks of the boards of county commissioners of the affected counties and the County Treasurers in which the district is located.

Any area within the boundaries of an incorporated city may, by resolution or ordinance of the governing board, be annexed to a fire protection district.

III. Consolidation of Fire Districts

One or more fire protection districts may consolidate with each other. Consolidation requires consent of all affected fire protection district boards, and under certain circumstances, the voters of the affected districts.

If two or more fire protection district boards determine it would be advantageous to consolidate into one fire protection district, the boards must prepare a consolidation agreement, which agreement must provide:

- The name of the proposed consolidated district;
- That all debts and property of the separate districts will be transferred to the consolidated district;
- The number of commissioners, either 3 or 5, on the new board;
- That all existing commissioners will be commissioners of the consolidated district until the next scheduled election when new commissioners will be elected;
- Employees of the consolidated district shall be chosen from employees of the existing districts, who shall also retain seniority rights under existing employment contracts or agreements.

Each of the fire district boards must approve the agreement. Between 10 and 30 days after approval of the consolidation agreement, each board must also hold a public hearing. Notice of the time and place of hearing must be published in at least one newspaper of general circulation within the proposed consolidated district at least 5 days before the hearing. Any persons attending the hearing must be given the opportunity to support or oppose the agreement. After the hearing, each board votes to approve or reject the proposed consolidation agreement. If each board approves, the agreement becomes effective and the consolidation is effective in 30 days unless a petition of objection is filed.

Consolidation may be initiated by the fire protection district commissioners in the districts affected. An alternative is a signed petition by 10 percent of the electors residing within the districts who voted in the last general election.

Appendix VI

Forming a Not For Profit Fire Service Organization

A non-profit organization is a group organized for purposes other than generating profit and in which no part of the organizations income is distributed to its members, directors, or officers. Some volunteer fire departments are organized as non-profit organizations.

Many -- but not all -- non-profit corporations, depending upon their purposes, can qualify for exemption from federal corporate income taxes. The U.S. Internal Revenue Code contains more than 25 different classifications of tax-exempt groups, including professional associations, charitable organizations, civic leagues, labor unions, fraternal organizations, and social clubs, to name just a few. Depending on the category of the exemption, such groups are entitled to certain privileges and subject to certain reporting and disclosure requirements and limitations on their activities. There are also a number of reporting requirements that must be adhered to after your organization is up and running.

Incorporation as a non-profit organization:

- Incorporation is a good idea if the group plans on being in existence for several years and has the need to raise money through grants and donations that require tax-exempt status.
- Incorporation and the process of seeking tax-exempt status can be costly and time-consuming.
- Liability of leaders and members of the corporation is limited (in other words, the individuals who control the corporation are not responsible, except in unusual situations, for the legal and financial obligations of the organization).
- There is a tax advantage for the financial donor if money is given to a tax-exempt corporation. (Tax-exempt status is defined in section 501 (c) (3) of the IRS Tax Code.) Money can, however, be legally given to any group or individual without tax-exempt status.
- Some foundations will simply not fund groups that do not have final approval from IRS of its tax-exempt application.
- Incorporation requires careful minutes of official organizational meetings and good financial record keeping.
- If the group's budget is more than \$25,000 per year, a tax return needs to be filed.
- Incorporation takes between 6 and 18 months to complete.

Incorporation Process:

- Develop clear and detailed By-laws and Articles of Incorporation
- Incorporation as a not-for-profit corporation within the state (filing with the state includes names and addresses of the first board of directors, etc.)
- File for recognition as tax-exempt with IRS

Estimated Costs for Incorporation . \$2,600

Attorney fees	\$1,000
Accountant fees	\$1,000
Incorporation fees (state)	\$ 50
Nonprofit application (IRS)	\$ 550

Appendix VII

State and Federal Fire Related Codes

This section reviews the state and federal laws, policies, and organizations, which shape the responses to wildland fires that occur in Idaho.

State of Idaho

Federal law grants authority to the federal government and are not allowed to encroach on the constitutional rights afforded to states. Likewise, the state may not make laws that encroach on the powers constitutionally delegated to the federal government.

The State Board of Land Commissioners, all the state-wide elected officials, makes the rules regarding state lands while staying within the bounds of legislated law. The Idaho Department of Lands (IDL) is an extension of the State Board of Land Commissioners (58-101, 58-119 Idaho Code) and, as such, is required to execute the functions of the State Board.

The Idaho Code discusses the responsibility and powers of the State Fire Marshal, an agency of the State Department of Insurance. The Fire Marshal is mandated to carry out the International Fire Code, to prevent fires, to protect life, and to oversee that buildings meet the standards set forth in the International Fire Code (41-253, 41-254, 41-255 Idaho Code). The Fire Marshal is also charged with keeping statistics of all the fires in the state. The agency is authorized by legislation to “Purchase necessary equipment and supplies, and incur any other reasonable and necessary expense in connection with or required for the purpose of carrying out the provisions of this act.” (41-255 Idaho Code)

The State Fire Marshal's power extends to the chief (or his deputy) of each fire department or fire protective district organized under state law. In areas where there is no organized fire department, the county sheriff assumes the role of a deputy fire marshal in carrying out the provisions of the International Fire Code, and any additional regulations set forth by the State Fire Marshal. The International Fire Code prescribes regulations consistent with “recognized good practice for the safeguarding of life and property from hazards of fire and explosion . . . in the use or occupancy of buildings or premises.” (41-253 Idaho Code)

Title 38 of the Idaho State Statutes is devoted to Forestry, Forest Products, and Stumpage Districts. Idaho code allows for agreement between the Idaho Department of Lands (IDL) and federal agencies for the joint exercise of powers pursuant to certain conditions (58-104 Idaho Code). Those conditions (expressed in 67-2328 Idaho Code) overlap with what the federal agencies expect as far as reaching an agreement.

The Idaho Department of Lands is an extension of the State Board of Land Commissioners and has extensive authority in its approach towards wildland fire. The department has created an extensive wildland fire attack organization through out the state. It has the ability and authority to work with other wildfire fighting resources, in the event a fire exceeds the ability of the initial attack crew,² including wildland fire resources under mutual agreements.

The department cooperates with federal and local governments in developing plans for and directing actions relating to the prevention and suppression of wildland fire in the rural areas of the state. The IDL State Forester has the authority to cooperate with private and public landowners,

2 More information regarding state code at the following URL:
<http://www2.state.id.us/adm/adminrules/rules/idapa20/20index.htm>

political subdivisions, private associations, and other agencies to protect forest resources on a statewide basis. At the local level, IDL Area Supervisors and Fire Wardens are empowered to make agreements with federal, city, county and rural fire department resources regarding fire management.

Key Points of Idaho State Policy

- The Fire Warden of each IDL Fire Protection District takes action on all forest and range fires, regardless of land ownership, which jeopardize lands protected by the Department. In doing so, forest and range fires must meet the criteria as set forth in Title 38, Chapter 1, Idaho Code. (IDL, FMH-800: Fire Control Policy; page 2 part b)
- IDL cooperates with federal and local governments in developing plans for, and directing activities relating to, the prevention and control of wildland fires in the rural areas of the state. (IDL, Mobilization Guide; page 2 par. 2)
- The State Forester, under general supervision of the State Board of Land Commissioners, is responsible for the protection of State forest and rangeland and cooperates with landowners, political subdivisions, private associations, and other agencies in protecting other forest and rangeland resources. (IDL, Mobilization Guide; page 2, point A)
- Upon the request of the State Forester, the United States Forest Service and Bureau of Land Management provides assistance under terms of cooperative agreements. Area Supervisors and Fire Wardens of IDL are delegated the authority to make local agreements relating to fire control matters involving USFS and BLM and other federal firefighting resources not already covered by cooperative agreements. (IDL, Mobilization Guide; page 2, point E)
- Area Supervisors and Fire Wardens are delegated the authority to make local agreements relating to fire control matters involving city, county and rural fire department resources. Agreements affecting statewide operations are coordinated through the State Fire Coordinator. (IDL, Mobilization Guide; page 3, point F)
- General guidelines for fire suppression priorities:
 1. Protection of life and property.
 2. Initial attack.
 3. Emerging fires in need of reinforcement to prevent escape.
 4. Large fires with resource values at risk.
 5. Other large fires.(IDL, Mobilization Guide; page 4)
- IDL develops and maintains mutual aid and other cooperative agreements (in writing where possible) with local and adjacent fire suppression agencies and county emergency planning committees, such as Local Emergency Planning Committees. (IDL, Mobilization Guide; page 8, point D)

The Mobilization Guide and other IDL policies and responsibilities are based on state statutory provisions found in Title 38, Chapter 1, of the Idaho Code. A review of that portion of Idaho Code shows that all “forest” and “range” land within the State of Idaho is to be under the protection of either a State Forest Protection District or a Forest Protection Association.

Forest Protection Associations are affiliated or endorsed by IDL. The associations consist of a board of landowners who own forested lands and who agree to protect their own lands using money

from additional property taxes. If a forest landowner does not belong to an association then IDL will assess a tax and assume the responsibility for patrol and suppression of any fires that start on or burn through that owner's property.

Idaho's wildland fire policy has several references to the ability of the state to make agreements with federal and local government fire organizations. The agreements are to be reduced to writing whenever possible. The statutory basis for these agreements makes them legally binding documents. Within these documents, there must be specific roles and duties for each party of involved. The financial arrangements also must be thoroughly documented.

The State's personnel and equipment resources are limited to the nature of their wildland fire training. Lastly, the mobilization guide specifies that the agency provide training to its personnel using the Incident Command System (ICS). ICS is a federal system. This allows the state management teams to operate with their federal counterparts.

The responsibility of suppressing wildland fire on state lands ultimately falls to the IDL. The federal lands that intermingle with Idaho's state lands remain the responsibility of the federal government. However, with mutual aid agreements the IDL may support and work with the federal agencies, provided that the State's resource needs are being met.

The approach towards wildland fire on private forestlands in the state of Idaho is also clear. Private owners are given two choices; they can belong either to a State Forest Protective District or to a Forest Protective Association. This means that the lands are protected by the state or by a state assisted association of trained firefighters.

In the context of statutory language, "forest land" is defined as follows: any land which has upon it sufficient brush or flammable forest growth of any kind or size, living or dead, standing or down, including debris or growth following a fire or removal of forest products, to constitute a fire menace to life (including animal) or property (38-101 Idaho Code). Unfortunately, there is no mention of how a homeowner, whose property does not fit into that definition, will be treated.

The federal wildfire agencies have legal obligations only for federal lands. The state government has legal obligations to state lands, and private lands that are classified as forest or rangelands.

Rural and city fire departments act as extensions of the State Fire Marshal's office. The Fire Marshal provides training for structural and automobile fire protection, as well as medical response duties that are part of emergency services. The Fire Marshal's mission is built around preventing and then fighting structural fires only. Some fire stations have crews that are trained to fight wildland fires, but it is provided through agreements with the Idaho State Department of Lands, not the Fire Marshal's office.

Federal Policy

The Bureau of Land Management, the National Park Service, the Bureau of Indian Affairs, Fish and Wildlife Service, and the US Forest Service are all members of the National Wildfire Coordinating Group (NWCG). This group provides a formalized system of agreement on substantive issues. Any agreed-on policies, standards or procedures are then implemented directly by each agency. In effect, the NWCG is a large umbrella that coordinates wildland fire matters between all members of the group.

The 2001 Federal Wildland Fire Management Policy is in Chapter 3 in a report entitled "Review and Update of the 1995 Federal Wildland Fire Management Policy." The 2001 Wildland Fire Management Policy and the recommended changes in policy were accepted by the US Secretaries of Interior and Agriculture in 2001, bringing policy changes to the local agency level.

The National Fire Policy sets the policy for support among federal agencies for fire management, and encourages coordination with the individual states, tribes, and municipalities. The National Fire Policy places high priority on several other important topics. This interagency policy highlights and

reiterates firefighter and public safety as the number one priority; the policy calls for an assessment of the consequences on safety, property, and cultural resources in choosing the appropriate response to wildland fire.

The National Fire Policy explains the role of federal wildland firefighters (including equipment) as that of only wildland firefighting, and in the special case of the wildland-urban interface use of federal personnel will be limited to exterior structural fire suppression only. The national policy forbids use of wildland firefighters to enter a house (or other structure).

Key Features of the 2001 Wildland Fire Policy:

The 2001 Wildland Fire Policy is the guiding source for how the federal government deals with wildland fire. The document covers a wide variety of issues: safety, protection priorities, planning for possible ignitions, and the use of fire for land management purposes; and communication and education of public and agency personnel.

The 2001 Wildland Fire Policy provides a loose framework that allows agencies at all levels of government (federal to local) to work together. Below are some listed points from the 2001 Wildland Fire Policy that briefly summarize what the document is about, and summarize what applies to the homeowner.

Point 1 - Safety

“Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.”

Point 3 - Response to Wildland Fire

“Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances, under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate management response to the fire.”

Point 6 - Protection Priorities

“The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.”

Point 7 – Wildland-Urban Interface

“The operational roles of federal agencies as partners in the Wildland-Urban Interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding.”

Point 14 - Interagency Cooperation

“Fire management planning, preparedness, prevention, suppression, fire use, restoration, and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.”

Organization

In terms of a firefighting organization, the federal government has come to terms with the challenges of multiple agencies, multiple land ownerships, and multiple objectives. Although each agency views wildland fire differently, through the interagency approach, the federal agencies have managed to establish a strong fire management organization.

The interagency effort has come about because it is difficult for any one agency to fund enough resources to protect all of its lands. By pooling their resources and carefully coordinating their efforts, the agencies can deal with the many fires that burn every year.

On the operational end of the National Wildfire Coordinating Group (NWCG) is the National Interagency Fire Center (NIFC) in Boise, Idaho. NIFC is a complex that houses all of the agencies in one place. NIFC provides safe, effective, and efficient policies and guidance, as well as technical and logistical support to the wildland fire management community.

All of the resources available on the national level are available for fire wildland fire suppression. Through a system of allocation and prioritizing, crews and resources are frequently moved around the United States to provide fire suppression services on federal lands.

The fire teams and crews ultimately carry out the wildland fire policy. These teams have the responsibility of ordering resources, asking for assistance, and for providing the fire suppression. They also determine whose land a fire is on and if it is a threat to people, to homes, or to other property.

The personnel within that fire management organization are wildland fire trained. The rules, regulations, and legal authority of the federal government are for the preservation of federally administered lands. With the exception of government compounds that have firefighters trained to deal with fires inside of buildings and other structures, federal wildland firefighters are not trained to deal with structural fires.

This plan was developed by Northwest Management, Inc., under contract with the Owyhee County Commissioners and the Southwest Idaho Resource Conservation and Development Council, Inc., with funding provided by the USDI Bureau of Land Management and Owyhee County.

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Schlosser, W.E., and T.R. Brown *Lead Auth.* 2005. Owyhee County, Idaho, Wildland-Urban Interface Wildfire Mitigation Plan Appendices. Northwest Management, Inc., Moscow, Idaho. March 10, 2005. Pp. 42.

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APPENDIX I. CAPABILITY ASSESSMENTS

This appendix contains the completed capability assessment worksheets.

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Bruneau Fire Protection District Stacey Buckingham Fire Chief
Local address and telephone	32548 Belle Ave. Bruneau, ID 83604 208-845-2188 or 208-599-4771
Service area	N to Snake River S on Hwy 51 to mile marker 60 W on Hwy 78 almost to Rimrock High School E on Hwy 78 to the Sand Dunes
Describe your services and organization goals in overview	Fire protection for both structure and rangeland fires, and standby or support service to EMS and law enforcement.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Brush Truck 1 Fire Engine (for structure fires) 1 Water Tender (tanker)

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	14 volunteers and 3 commissioners
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	<p>Water Tender – the current one is really old and not in good shape.</p> <p>Light Rescue Vehicle – to assist when responding to accidents or medical emergencies</p> <p>Better Communications Networks – radio repeaters or cell towers, communication is difficult</p>
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	They can always use more training and money for training. Some county-wide training, where everyone can get to know each other and learn who has what resources, would be great.
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Bruneau Quick Response Mary Tindall President
Local address and telephone	32531 Belle Ave. Bruneau, ID 83604 208-845-2821
Service area	N to Snake River S on Hwy 51 to mile marker 30 W on Hwy 78 to Rimrock High School E on Hwy 78 to the Sand Dunes
Describe your services and organization goals in overview	A non-profit volunteer organization licensed as non-transport medical rescue. Provide medical assessment, treatment and preparation for transport (free of charge).
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Non-Transport Medical Rescue Vehicle (an ambulance, but they can't transport) 1 Building – partially equipped to be used as an emergency shelter

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	13 volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	<p>23 Kw Generator – for auxiliary power for the building in case it needs to be used as an emergency shelter</p> <p>Better Dispatch Services –use state communication now which works pretty well. Would like to use Owyhee Sheriff's but there are not enough dispatchers.</p> <p>Better Radio Communications – more repeaters or towers so there are fewer dead spots</p>
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Training is a struggle. Hiring good instructors who are willing to come to Bruneau is difficult.
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Grand View Ambulance Donna Bennett Director
Local address and telephone	520 Roosevelt Grand View, ID 83624 208-834-2398 or 208-250-1918
Service area	To the Nevada Line on Hwy 51 To the Sand Dunes Almost to Murphy on Hwy 78 To Chattin Flats in Elmore County
Describe your services and organization goals in overview	Emergency Medical Transport Unit. One goal is to get more volunteers.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	2 Ambulances 1 Small Backcountry Rescue Unit on a 4WD pickup. 1 Building – equipped to be used as an emergency shelter

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	10 volunteers – they get small stipend per call
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Update Defibrillator Units May need a new Ambulance at some point. Some communication difficulties.
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Volunteers are desperately needed (and money to train volunteers)
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

Grand View Ambulance services part of Elmore County and Elmore County taxes the entire county for EMS services. However, Grand View Ambulance gets none of that money. This needs to be addressed with Elmore County.

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Grand View Fire Department Charles Enszt Fire Chief
Local address and telephone	720 Roosevelt Grand View, ID 83624 208-599-2289 or 208-834-2618
Service area	E to Mormon Blvd. W to ESI Rd. S of Triangle Dairy on the Mud Flat Rd. N on Hwy 167 to Frederick Rd. in Elmore County
Describe your services and organization goals in overview	Fire protection for both structure and rangeland fires, and standby or support service to EMS and law enforcement, including extrication.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	2 Brush Trucks 2 Fire Engine (for structure fires) 2 sets of Extrication Equipment 2 stations (buildings) in Grand View

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	13 volunteers (100% volunteer – no pay of any kind)
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	<p>Command Vehicle – using a person vehicle for this at the moment</p> <p>Water Tender (Tanker)</p> <p>Rangeland Personal Protective Equipment – for fighting wildland fires (they do not have enough for all of their volunteers at the moment)</p> <p>New Radios – the ones they have are outdated</p>
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	<p>More Volunteers</p> <p>Stipend – pay per call would help</p> <p>Certified Instructor to teach Firefighter 1 & 2 – so they could all become 1 & 2 certified</p>
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Homedale Ambulance Lisa Rittenhouse EMS Administrator
Local address and telephone	36 W Colorado Homedale, ID 83628 208-573-1209
Service area	From the Oregon state line to Jump Creek and Poison Creek. Into Canyon County to Charleston on Hoskins Rd. On Hwy 95 to Ustick. South to BLM ground.
Describe your services and organization goals in overview	Emergency Medical Transport Unit and standby services
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	2 Ambulances

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	<p>They are paid during the day and night is volunteer.</p> <p>15 EMTs</p> <p>3 Drivers</p>
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	<p>New EMS Building – they have a very old auto mechanics shop that leaks. No one can stay there. They have land but need funding to build the building.</p> <p>Lucas Device – to provide chest compressions when there aren't enough EMTs and when they get tired.</p>
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	More Volunteers
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Homedale Fire Department Dennis Uria Fire Chief
Local address and telephone	12 W Colorado St. Homedale, ID 83628 208-880-4194
Service area	From the Oregon state line to Jump Creek and Poison Creek. Into Canyon County to Charleston on Hoskins Rd. On Hwy 95 to Ustick. South to BLM ground.
Describe your services and organization goals in overview	Fire protection for both structure and rangeland fires, and standby or support service to EMS and law enforcement, including extrication.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Brush Trucks 2 Fire Engine (for structure fires) 2 Water Tenders (tankers) 3 Portable Tanks with Pumps 2 sets of Extrication Equipment

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	21 Volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Another Brush Truck Infrastructure to be able to hook up to irrigation systems
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Drug Classes – to teach volunteers how to handle those situations (maybe with police/sheriff) Wildland Fire Training
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Homedale Police Department Jeff Eidemiller Police Chief
Local address and telephone	31 W Wyoming St. Homedale, ID 83628 208-573-2984
Service area	The incorporated city limits of Homedale. Also, provide assistance as needed other parts of Owyhee County and Wilder
Describe your services and organization goals in overview	To provide all law enforcement services to the citizens of Homedale and provide for their safety.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 SUV 5 Police Cars 1 Dog Catcher type truck (1 of the vehicles has all basic EMT capabilities and the other 6 have a defibulator)

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	6 full-time 4 volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Mobile Computer Access – for mobile dispatch
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Training is always a must. Firearms, arrest techniques, public relations, hazmat training.
List any other currently available resources for use in responding to emergencies not previously mentioned	The library in the police station could possibly be used as an emergency meeting location.
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Marsing Ambulance Betty Ackerman Director & Lead EMT
Local address and telephone	303 Main St. Marsing, ID 83639 208-896-4562 or 208-407-0300
Service area	From the Snake River to the state line on Hwy 95, and from about Hoag Rd. on Hwy 78 to Jump Creek Rd.
Describe your services and organization goals in overview	And Emergency Medical Transport Unit. One goal is to get more volunteers.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Ambulance with Lucas Device and AED

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	<p>12 EMTs</p> <p>4 Drivers</p> <p>(1 full-time paid position – Betty, and they have started paying someone to be on call from 6 pm to 12 am. The second person on a call gets a stipend)</p>
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	ATV/UTV – properly equipped to be used to get into the back country
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Fully funded staff, additional staff, and training money for new staff
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Marsing Fire Department Brian Showalter Fire Chief
Local address and telephone	303 Main St. Marsing, ID 83639 208-896-4796 or 208-573-2912
Service area	From the Snake River to the state line on Hwy 95, and from about Hoag Rd. on Hwy 78 to Jump Creek Rd.
Describe your services and organization goals in overview	And Emergency Medical Transport Unit. One goal is to get more volunteers.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Ambulance with Lucas Device and AED

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	<p>12 EMTs</p> <p>4 Drivers</p> <p>(1 full-time paid position – Betty, and they have started paying someone to be on call from 6 pm to 12 am. The second person on a call gets a stipend)</p>
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	ATV/UTV – properly equipped to be used to get into the back country
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Fully funded staff, additional staff, and training money for new staff
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

Grand View Ambulance services part of Elmore County and Elmore County taxes the entire county for EMS services. However, Grand View Ambulance gets none of that money. This needs to be addressed with Elmore County.

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Murphy/Reynolds/Wilson Fire and QRU Louis Monson Captain & EMS Supervisor
Local address and telephone	11606 Hwy 78 Givens, ID 83641 208-590-9967 (Wes) or 208-546-2298 (Louis)
Service area	Mile marker 8.5 between Marsing and Givens to mile marker 39. From Snake River to Silver Falcon Mine south of Reynolds
Describe your services and organization goals in overview	Fire protection for both structure and rangeland fires, non-transport emergency medical services, including extrication, and back country rescue.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Non-Transport Ambulance 1 QRU Backcountry Rescue Vehicle – 4x4 dually pickup 4 Brush Trucks 4 Fire Engine (for structure fires) 5 Water Tenders (tankers) 4 Portable Tanks with Pumps 1 set of Extrication Equipment Command Truck (also a QRU) Quick Attack Maintenance Vehicle Cargo Van 4 Stations (buildings)

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	Around 30 Total Volunteers (some are just EMTs, some are just fire fighters, but most are both EMTs and fire fighters)
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	New Extrication Equipment New Radios – ones that they can use to communicate with FEMA ATV/UTV – properly equipped to be used to get into the back country
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Training is always needed.
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Owyhee Rangeland Fire Protection Association Doug Rutan President & Fire Chief
Local address and telephone	PO Box 111 Jordan Valley, OR 97910 208-583-4444
Service area	From the Oregon border to the edge of the city fire districts, down Mud Flat Rd. and Battle Creek
Describe your services and organization goals in overview	Voluntary rangeland suppression/initial attack on rangeland wildfires. The goal is to reduce rangeland losses from wildfires by catching fires early.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	5 Brush Trucks 2 Water Tenders (tankers) 3 or 4 Slip-in Units for pickups 1 D6 Dozer 1 Lowboy Trailer to haul the dozer

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	52 to 55 trained volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	<p>Better Communications Networks – radio repeaters or cell towers, communication is difficult</p> <p>More Brush Trucks</p> <p>Road Grader – for Grand View end (works much better and faster in the dirt over there than a dozer)</p> <p>Truck – to pull the lowboy trailer</p>
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	More Radio Training
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Owyhee County Sheriff's Office Perry Grant Sheriff
Local address and telephone	31 W Wyoming St. Homedale, ID 83628 208-573-2984
Service area	All of Owyhee County
Describe your services and organization goals in overview	To provide all law enforcement services to citizens of the county, including civil service, running a jail, peace officer, search and rescue, safety services, etc.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Toy Hauler Command Trailer 6 ATVs 16 Vehicles (all 4WD) 1 Prisoner Transport Vehicle 5 Snowmobiles

<p>List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)</p>	<p>9 Jailers</p> <p>13 Full-time Peace Officers</p> <p>24 Part-time Peace Officers</p> <p>6 Dispatchers</p> <p>25 Posse Members</p>
<p>List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)</p>	
<p>List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)</p>	<p>Water Rescue Training</p> <p>Snow Rescue Training</p> <p>Fire Rescue Training</p>
<p>List any other currently available resources for use in responding to emergencies not previously mentioned</p>	
<p>List any other resource needs for responding to hazard emergencies not previously mentioned</p>	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Saylor Creek Rangeland Fire Protection Association Darcy Helmick Secretary
Local address and telephone	c/o Darcy Helmick 1301 Hwy 67 Grand View, ID 83624 208-834-5152 or 208-761-9378
Service area	Northern half of the Jarbidge Resource Area of the BLM
Describe your services and organization goals in overview	Voluntary rangeland suppression/initial attack on rangeland wildfires. The goal is to reduce rangeland losses from wildfires by catching fires early.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Brush Truck 4 Slip-in Units for pickups

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	Approximately 70 trained volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Better Communications – updated radios and software to program them properly
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Part-time Paid Office Person – to keep track of everything for the organization (or all three of the RFPAs in the county) More Training
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Silver City Fire and Rescue Jim Hyslop President
Local address and telephone	11618 Emerald Rd. Nampa, ID 83686 208-890-6718
Service area	The Owyhee Mountains
Describe your services and organization goals in overview	Fire protection for both structure and rangeland fires, and back country rescue.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Brush Truck 3 Fire Engines 1 Water Tender (tanker) 3 Small Ditch Pumps 2 Mark 3 Wildland Pumps 1 6,000 gallon helicopter dip tank

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	10 Volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Water Impoundment Structure – to store water in the creek Bury Propane Tanks in Silver City – they are a huge hazard if buildings were to catch fire and fall on them
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	More Volunteers
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

County Capabilities Assessment Template

The goal of this template is to summarize the human and technological services available to citizens of the County including fire protection (structural and wild), highways and roads, sewer and water, administrative services, and any/all other capabilities and resources to better understand the County's ability to respond and cope with hazards. Additionally, this template allows us to evaluate any gaps in the County's capabilities.

Resources, Capabilities, and Needs Summary

Name and position of person preparing this summary	Three Creek Rangeland Fire Protection Association Michael A Guerry Chairman
Local address and telephone	PO Box 687 Castleford, ID 83321 208-731-6653
Service area	Southern half of the Jarbidge Resource Area of the BLM
Describe your services and organization goals in overview	Voluntary rangeland suppression/initial attack on rangeland wildfires. The goal is to reduce rangeland losses from wildfires by catching fires early.
List your currently available technological resources for use in responding to emergencies (e.g. list of fire protection apparatus, snow plows, search and rescue services, etc.)	1 Brush Truck 1 Trailer with Slip-in Tank 3 Discs 2 Slip-in Units for pickups

List your currently available human resources for use in responding to emergencies (e.g. detail staff by position and number, volunteers, etc.)	Approximately 50 trained volunteers
List your technological resource needs for responding to hazard emergencies which are not currently in inventory (e.g. fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Type 6 Brush Truck Type 4 Brush Truck Water Tender Better Communications – updated/bigger radios and software to program them properly
List your human resource needs for responding to hazard emergencies which are not currently utilized (e.g. additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Part-time Paid Office Person – to keep track of everything for the organization (or all three of the RFPAs in the county) More Training
List any other currently available resources for use in responding to emergencies not previously mentioned	
List any other resource needs for responding to hazard emergencies not previously mentioned	

Other Comments:

APPENDIX J. HAZARD PROFILES

This appendix contains complete hazard profiles that did not have associated mitigation actions. These hazard profiles are to be reviewed, evaluated, and updated based on hazard occurrence and risk amplification on a regular basis throughout the plan's life.

Contents

1. Volcanic Eruption
2. Impoundment Structure Failure
3. Transportation Accident & Incidents
4. Civil Disturbance
5. Communicable Disease
6. Cyber Disruption
7. Hazardous Materials
8. Utility Outage

Volcanic Eruption



Overview

Although volcanoes are not a major hazard in Owyhee County, it can be affected by distal effects from one of the many active volcanoes in the region. The 2017 update included a hazard profile for volcanoes, which was omitted in the former plan.

Volcanic eruption summary

	1950-2008	2009-2017	Total
Occurrences	-	-	-
Disaster Declarations	-	-	-
Casualties	-	-	-
Property Damage	-	-	-
Repetitive Losses	-	-	-

Hazard Description

A volcanic eruption is the spewing of lava, gas, and debris from the earth's interior through a vent in the earth's crust. Volcanic eruptions have both proximal and distal impacts, with proximal impacts classified within 30 miles or less of the vent, and distal impacts classified as those impacts affecting areas more than 30 miles away. Distal impacts can be far-ranging, and the most severe eruptions affect global climate patterns and weather. Proximal impacts include the following:

- Lava Flows – Channels of magma that reach the earth's surface, characterized by their flow movement. Lava flows destroy all structures in their paths, and have significant environmental impacts. These flows are known to cause forest fires, render productive and developable lands sterile and unworkable, and cause flood hazards by damming and diverting streams.
- Pyroclastic Flows – Mass movements of gas, ash, and rock down the slopes of a volcano following an explosive eruption or lava dome collapse. The temperature of these flows can reach 1,500 degrees F, moving speeds at up to 100 to 150 mph. Similar to lava flows, pyroclastic flows destroy and incinerate all structures, infrastructure, and vegetation in their paths, though pyroclastic flows tend to follow valleys and channels.
- Lahars & Debris Avalanches – Mud and debris flows composed mostly of volcanic materials occurring on the flanks of volcanos. These flows move at speeds up to 20 to 40 mph, but unlike pyroclastic flows can cover large distances. Debris avalanches are rapid downslope movement of rock, snow, and/or ice, ranging from small movements to massive collapses of the entire summit or side of a volcano.
- Volcanic Gases – Gases emitted before, during, and after an eruption. Although the majority of volcanic gases are water vapor, volcanic gases can be toxic with short- and long-term negative impacts on human populations and the natural environment. Such gases include carbon dioxide, sulfur dioxide, hydrogen sulfide, and fluorine.
- Tephra – Rock fragments (either solid or molten) ejected and falling within some distance of the vent. Tephra ranges in size from over three feet in diameter to fine dust. Deposits of tephra create hazards such as reduced visibility, electrical disruption, and clogging of critical infrastructure. Tephra clouds can also generate lightning, interfering communication and electrical systems, and can start fires. Fine dust tephra creates a respiratory health hazard, especially in small children and the elderly.

Distal impacts include the following:

- Ash – Ash from a volcanic eruption is abrasive, corrosive, and comprised of hard fragments of volcanic glass, minerals, and rock that fall to the surface, known as *ashfall*. The impacts of ashfall are similar to that of tephra (as ash is a form of tephra); however, ashfall can impact communities hundreds of miles away from an eruption, pose serious hazards to aviation; and

can collapse buildings due to the weight of ash deposits. The distribution of ash is a function of weather, particularly wind direction and speed and atmospheric stability, and the duration of the eruption.

- Eruption Columns & Clouds – Small fragments of materials (including volcanic glass, minerals, and rock) are ejected from a volcanic eruption and rise high into the atmosphere. Eruption columns can grow rapidly and reach more than 12 miles above the volcano, forming an eruption cloud that can extend hundreds of miles downwind. Eruption clouds can cause ashfall, and similar to the hazards of ashfall, create aviation hazards, affect local weather conditions, and persist for weeks.

Hazard Extent, Magnitude, & Probability

Owyhee County is proximate to a number of volcanic hazards, including the Craters of the Moon and the Yellowstone Caldera, which overlaps Idaho, Wyoming, and Montana. However, volcanic eruptions are not a major concern in Owyhee County due to the relatively low probability of events in any given year.

The Yellowstone Caldera is formed by a large magma plume below the region (often called a hotspot). Though the area is volcanically active, it is not generally of a hazardous nature. The yearly probability of a catastrophic eruption is approximately 1 in 730,000, which is the average number of years between past events.

Most volcanic activity in the Snake River Plain was confined to volcanic rift zones, which are linear cracks in the earth's crust. Volcanic activity in these areas was characterized by extensive basaltic lava flows, which occurred from eight distinct eruptive periods with an average recurrence interval of 2,000 years. Given that the most recent flows were approximately 2,000 years ago, there is probability that volcanic activity in the region will resume. However, there is no recent evidence of activity.

Hazard Occurrences

There are no recorded instances of impacts from volcanic eruptions in Owyhee County.

Hazard Exposure & Vulnerability

Population, structural, and critical infrastructure exposure and vulnerability to volcanic eruptions is low relative to the other hazards present in the county. In general, Owyhee County would be exposed to distal impacts, such as ashfall. Volcanic activity and eruptions can also produce seismic events,

which could be felt in the county and possibly cause structural damage to unreinforced buildings. No vulnerability assessment was undertaken due to the hazard's low probability and limited impacts.

Land Use & Future Development

Given the distance of Owyhee County to volcanic hazards, it is unlikely that future development and land use will increase the county's exposure or vulnerability to the hazard.

5.18 Impoundment Structure Failure



Overview

Although there have been no significant, recorded dam failures in Owyhee County, the county has experienced threats from impoundment structure failures. The hazard profile for dams from the former plan was restructured to include more detailed hazard descriptions, a review of potential structure failure impacts, and an overall more comprehensive hazard profile.

Impoundment structure failure summary

	Before 2009	2009-2017	Total
Occurrences	-	-	-
Disaster Declarations	-	-	-
Casualties	-	-	-
Property Damage	-	-	-
Repetitive Losses	-	-	-

Hazard Description

Impoundment structures are both human and natural-made structures designed to retain or store water, sediments, and other liquids or non-liquids. This term is applied broadly to include dams, canals, and levees.

- Dams – Defined as an artificial or natural barrier across a watercourse. Often, dams are designed to store, control, or divert water. Other uses include recreation, flood control, irrigation and water supply, hydroelectric generation, industrial and mining use, and to control mine tailings slurry, wastewater, and liquefied industrial or food processing byproduct. Dams are typically constructed of concrete and other earthen material. Dams can be built, owned, and operated by various entities and individuals, such as utility companies, State and Federal government, and private enterprise. The structural integrity of a dam depends on its design, its level of maintenance, weather and drainage, and exogenous factors. Dam failure can result from poor design, inadequate or improper maintenance, streamflow and runoff above design capacity, other hazards (e.g., earthquake and landslide), and through intentional harm. When a dam fails, the sudden surge of water downstream is comparable to riverine or flash flooding. Depending on the storage capacity of the reservoir, inundation can extend for long distances and have significant impacts if population and development are located downstream.
- Levees – Levees prevent flooding of adjacent land to waterways, and be either natural or constructed. Naturally occurring levees are ridges and buildup of sediment deposited by a river and are often relatively low in height, broad at the base with a narrow top, and slopes generally equal to the deposited material's angle of repose. In contrast, constructed levees are structures designed to contain, control, and divert streamflow, often built using soil, rock, or concrete, and can be tall steep or vertical structures. Although levees are constructed to reduce flooding and flood impacts, levees often inadvertently increase flood risk. Increased development proximate to the waterway, poor design, and improper or inadequate maintenance can result in levee failure. Levees can also fail through breaching, overtopping, erosion, and other hazards (e.g., earthquake and landslide).
- Canals – Canals are constructed waterways through which diverted water flows, usually to provide irrigation to agricultural land. There is an increasing awareness of the risk canals pose to development, as canals pose a potential flood risk that is often understudied or unknown. Similar to dams and levees, canals can be breached, overtopped, or break due to poor design and improper maintenance. Often, no regulation dissuades or prevents development adjacent to canals.

Hazard Extent, Magnitude, & Probability

Major water impoundment structures are located in Owyhee County or have the potential to affect the county. The Owyhee County Profile details all the dams in Owyhee County. The three primary factors influencing the potential severity of dam failure include the height of the dam, the amount of water impounded by the structure, and the extent of development and infrastructure located in the downstream inundation area. The US Bureau of Reclamation categorizes dams into three classifications:

- High Hazard Dam – A dam with the potential to cause loss of life and extensive economic losses, property damage, or environmental damage if failure occurs.
- Significant Hazard Dam – A dam not expected to cause loss of life if failure occurs, but with the potential to cause economic losses, property damage, utility loss, or other impact.
- Low Hazard Dam – A dam where failure or misoperation does not result in loss of life and has minimal economic or environmental impact.

The probability of impoundment structure failure is rated as low. However, aging infrastructure coincident with increased precipitation and temperature extremes can increase this probability.

Hazard Occurrences

There have been no reported incidents of dam failure in Owyhee County.

Hazard Exposure & Vulnerability

There are two Idaho Power operated dams on the Snake River on the Owyhee County border: the Swan Falls Dam and C.J. Strike Dam. The Swan Falls Dam is approximately eleven miles east of Murphy. Built in 1901 to provide electricity to nearby mines, it is the oldest hydroelectric generating site on the Snake River. A new power plant was built in the mid-1990's while the old plant was decommissioned and converted into a historical display. The C.J. Strike Dam is approximately 35 miles upriver of the Swan Falls Dam near the community of Grand View. The Strike Reservoir is relatively large extending up the Bruneau River almost to the community of Bruneau. Failure of either of these two dams would be devastating to communities located along the Snake River. Even above normal release of flood waters from these dams could heavily impact the communities of Grand View and Homedale and potentially Marsing and Givens Hot Springs. It is likely that whole communities, structures, and critical infrastructure would be severely damaged or even completely washed away due to this type of disaster.

Land Use & Future Development

As there have been no impoundment failures currently to date, future land use and development impacts are somewhat unknown. However, we can make an assumption that with increased development and more intensive land uses in the near future, the possibility of structural damage and loss of life and property increases.

Transportation Accidents & Incidents

Overview

Transportation accidents and incidents occur every day across the State of Idaho. Transportation accidents and incidents can involve aircraft, cars and trucks, trains, boats, and many other forms of transportation, and can result in injuries and fatalities, road closures and detours, and involve hazardous materials or cause cascading hazards (such as wildland fire). The 2017 plan update included a basic hazard profile that can be updated throughout the plan's lifecycle as data becomes available.

Transportation accidents and incidents summary

	Before 2009	2009-2017	Total
Occurrences	-	769	769
Disaster Declarations	-	-	-
Casualties	-	11 Fatalities; 267 Injuries	11 Fatalities; 267 Injuries
Property Damage	-	-	-
Repetitive Losses	-	-	-

Hazard Description

Transportation accidents and incidents are varied and involve many forms of transportation, such as the following:

- Aviation Transportation – Aviation accidents and incidents occur when the normal operation of an aircraft is disrupted, where an individual or group of people are injured or killed, and/or the aircraft is structurally damaged. Aviation accidents results from multiple causes, including mechanical failure, poor weather conditions, and pilot error.
- Ground Transportation – Accidents and incidents involving motor vehicles such as cars, buses, trucks, and motorcycles, and are the fifth leading cause of death in the US. Ground transportation accidents and incidents result from human error, mechanical failure, and purposeful intention, and can injure and kill those in other vehicles, pedestrians, and those in buildings.
- Rail Transportation – Defined as any collision, derailment, loss of control, or other events involving the operation of on-track equipment whether moving or standing that result in some loss or casualty. Railroad transportation accidents/incidents are only reported for those

events with losses and/or damage above an established threshold, between rail equipment and vehicles and highway users at crossings, and any occurrence of injury or fatality to an individual. For train incidents/accidents (those events with monetary damage to on-track rail equipment), the reporting threshold set by the Federal Railroad Administration is \$8,500.

Hazard Extent, Magnitude, & Probability

Transportation accident and incident severity can range from little to no loss of life or property, to major events with significant casualties and property damage. Owyhee County and its communities are likely to experience multiple transportation-related events each year. Probabilities are higher for high-traffic intersections, railway crossings, and airports.

Hazard Occurrences

Owyhee County regularly experiences ground, aviation, and rail transportation accident and incidents. Due to data limitations, the hazard profile only included ground transportation accidents and incidents from the Idaho Department of Transportation. In spite of the high rate of occurrence, there are no repetitive losses stemming from transportation accidents or incidents in Owyhee County.

Ground transportation accident and incident occurrences

Year	Fatal	Injury	Total
2009	4	46	128
2010	-	46	134
2011	5	41	117
2012	1	48	137
2013	4	45	129
2014	1	41	124
Total	11	267	769

Hazard Exposure & Vulnerability

Exposure to transportation accidents and incidents is limited to the transportation network (see the Owyhee County Profile Transportation section), though aviation accidents and incidents can occur anywhere in the county. Notably, high-traffic intersections, major highways, railway crossings, and

sharp curves exhibit higher exposure to accidents and incidents. Residences and structures along the transportation network are likewise exposed, as are any individuals in vehicles.

Land Use & Future Development

Population growth and development can increase the transportation accidents and incidents. Increased aviation, rail, and road traffic rates growth coincidently with development.

Civil Disturbances

Overview

Civil disturbances can occur in all communities given the myriad of reasons that often drive civil unrest, protest, and terrorism. The 2017 plan update restructured the hazard profile on civil disturbances to better present the county's risk to civil disturbances.

Civil unrest and terrorism summary

	Before 2009	2009-2017	Total
Occurrences	-	-	-
Disaster Declarations	-	-	-
Casualties	-	-	-
Property Damage*	-	-	-
Repetitive Losses	-	-	-

*Statistics not available

Hazard Description

The term 'civil disturbance' includes a number of intentional action designed to disrupt or influence society, government, or the economy. These include terrorism, violence, labor strikes, civil disobedience, demonstrations, riots, and open rebellion. Civil disturbance ranges from localized and small-scale (e.g., domestic violence) to regional or global and large-scale (e.g., mass riots and terrorism).

Civil disturbance is often spontaneous, and can involve large numbers of individuals incited to civil disobedience and protest. Such disturbance is driven by political and socioeconomic marginalization, grievances, conflict, and shortages of food and other vital resources. Planned civil disturbance – such as terrorism – can be but carried out by few individuals driven by more narrow causes (e.g., religion). Uncontrolled, angry or emotion-driven, and non-organized masses of people are often termed a 'mob'. Mobs are typically associated with disorder, and includes riots, lynchings, and vigilante groups.

The following are some of the known causes of civil unrest:

- Abortion
- Government policy, corruption, and action
- Nuclear energy and weapons
- Race and ethnicity
- Civil liberties and human rights

- Gun control
- Immigration
- War and peace movements
- Poverty, homelessness, and inequality
- Trade, globalization, and markets

Hazard Extent, Magnitude, & Probability

It is difficult to identify and quantify the extent, magnitude, and probability of civil disturbance due to the number of activities and actions classified as such, as well as the spontaneous nature of these events. Similarly, the hazard's extent can range from localized and small-scale to far-reaching and large-scale, making it difficult to capture within this plan. Government buildings and entities, transportation facilities, and utility facilities (notably high-potential loss facilities) are often primary targets of civil disturbances.

Civil disturbance is often classified into the following categories:

- Low Severity – Localized civil disturbances, such as property intrusion, that require police dispatch. These incidents sustain little to no property damage and minimal physical harm. These events are high probability (routine disturbance calls).
- Moderate Severity – Civil disturbance resulting in business disruption and property damage but that do not require the use of physical force are classified as moderate severity. Physical harm is more substantive. These events are uncommon to rare, depending on location, culture, and socioeconomic status.
- High Severity – Highly contentious, requires the use of physical or chemical agents to restore order, and endanger the lives of residents and responders. This classification entails significant property damage or business interruption. These events are rare.

Civil disturbances will continue to occur in the future. Often, forewarning and prediction to some level is possible given known catalysts of civil disturbances, such as race riots, demonstrations, and mobs. Other forms of civil disturbance, such as terrorism, are more difficult to predict.

Hazard Occurrences

There are no known recorded instances of civil disturbance in Owyhee County.

Hazard Exposure & Vulnerability

Homes, businesses, and critical facilities can all be exposed to civil disturbances. Essential facilities, such as police stations and courthouses, as well as high-potential loss facilities are often targeted during civil disobedience, riots, and mobs. These locations are also terrorist targets. Businesses – notably those in contentious industries, such as chemical manufacturing and natural resource extraction – are known targets for disruption.

To date, no detailed vulnerability assessment of civil disruption is available in the State of Idaho. A socioeconomic vulnerability assessment employing the SERV model was not conducted, due to the spontaneity and difficulty in modeling civil disruption.

Land Use & Future Development

Although civil disturbance can occur anywhere in the county, it is likely that events will be constrained to populated areas or areas proximate to government, including federal lands, and other critical facilities. Land use and future development is unlikely to directly impact civil disturbances.

Communicable Disease

Overview

Communicable diseases can significantly disrupt Owyhee County's continuity, and understanding the risks and potential impacts are vital to mitigation. The 2017 update incorporated a communicable disease hazard profile that included an overview of communicable diseases, communicable disease modeling, and climate impacts to provide a comprehensive analysis of Shoshone County's communicable disease risk.

Communicable disease summary

	2002-2008	2009-2017	Total
Occurrences	305	316	621
Disaster Declarations	-	-	-
Casualties*	-	-	-
Property Damage	-	-	-
Repetitive Losses	-	-	-

*Mortality statistics not available.

Hazard Description

Communicable diseases – sometimes called infectious diseases – are illnesses caused by organisms such as bacteria, viruses, fungi and parasites. Sometimes the illness is not due to the organism itself, but rather a toxin that the organism produces after it has been introduced into a human host. Communicable diseases are transmitted through various methods, including between people, animal to human, animal to animal, or from an inanimate object (e.g., doorknobs, table tops, etc.) to an individual. An epidemic is a communicable disease affecting a greater-than-average number of people than normal for a locality.

An epidemic poses devastating impacts to the population and economy of Owyhee County. Epidemics often result in hospital admissions and deaths that exceed local capabilities, and can result in quarantines and mass fatalities with the potential to significantly interrupt everyday life in the county. Health care providers, laboratories, and hospital administrators are required by Idaho rules and regulations to report confirmed or suspected communicable diseases and conditions to their local health district or the State of Idaho Office of Epidemiology within three working days of identification or suspicion. The Southwest Public Health District maintains a Public Health Response and Response Plan for communicable disease and pandemic outbreaks.

The following is a list and brief description of communicable diseases that pose a threat:

- Campylobacteriosis – An infectious disease caused by bacteria of the genus *campylobacter*. Most people who become ill with campylobacteriosis get diarrhea, cramping, abdominal pain, and fever within two to five days after exposure to the organism. In persons with compromised immune systems, campylobacter occasionally spreads to the bloodstream and causes a serious life-threatening infection. The vast majority of cases occur as isolated, sporadic events, not as part of recognized outbreaks. Active surveillance indicates that about 13 cases are diagnosed each year for each 100,000 persons. Most cases are associated with eating raw or undercooked poultry meat or from cross-contamination of other foods by these items. Infants may get the infection by contact with poultry packages in shopping carts. Outbreaks of campylobacter are usually associated with unpasteurized milk or contaminated water.
- Cryptosporidium – A diarrheal disease caused by a microscopic parasite, cryptosporidium. The parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine disinfection. While this parasite can be transmitted in several different ways, water is a common method of transmission and cryptosporidium is one of the most frequent causes of waterborne disease (drinking water and recreational water) among humans in the United States. Cryptosporidium can be spread by swallowing water that can be contaminated with sewage or feces from humans or animals, by accidentally swallowing something that has come in contact with the stool of a person or animal infected with cryptosporidium.
- Giardiasis – A diarrheal illness caused by a microscopic parasite, giardia intestinalis. Once a person or animal has been infected with giardia, the parasite lives in the intestine and is passed in feces. Because the parasite is protected by an outer shell, it can survive outside the body and in the environment for long periods of time (i.e., months). During the past two decades, giardia infection has become recognized as a common cause of waterborne disease in humans in the United States. Giardia is found on surfaces or in soil, food, or water that has been contaminated with the feces from infected humans or animals. Infection can occur accidentally swallowing the parasite; you cannot become infected through contact with blood. Giardia infection can cause a variety of intestinal signs or symptoms, which include diarrhea, stomach or abdominal cramps, upset stomach or nausea. These symptoms may lead to weight loss and dehydration.
- HIV & AIDS – Abbreviations for human immunodeficiency virus and acquired immunodeficiency syndrome, respectively. HIV and AIDS weakens an individual's immune system, and are transmitted by sexual intercourse, contaminated blood transfusions, or from infected mother to child during pregnancy or breastfeeding that. This disease is recent compared to other pandemics, and was first recognized by the Centers for Disease Control and Prevention in 1981. No current cure exists although breakthroughs in research are promising.
- Influenza – A serious disease caused by viruses that infect the respiratory tract. Pandemic flu is a virulent human flu that causes a global outbreak, or pandemic, of serious illness. Because there is little natural immunity, the disease can spread easily from person to person. AI (Avian

flu) viruses occur naturally among wild birds. Low pathogenic AI is common in birds and causes few problems. Highly pathogenic form (HPAI) is extremely infectious among humans. The rapid spread of HPAI, with outbreaks occurring at the same time, is of growing concern for human health as well as for animal health. Spanish influenza caused several waves of pandemic in 1918 through 1919, resulting in 20 to 50 million deaths worldwide. Officials reported that in Sandpoint, all public gatherings were prohibited even as the local paper maintained that there was no cause for alarm. The disease simply ran its course, unchecked by actions taken by state, local or federal officials. A pandemic of Asian flu (Influenza A [H2N2]) occurred in 1957-58 where it caused about 70,000 deaths.

- Lyme disease – Caused by the bacterium *borrelia burgdorferi* and is transmitted to humans by the bite of infected blacklegged ticks. Typical symptoms include fever, headache, fatigue, and a characteristic skin rash. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings, and the possibility of exposure to infected ticks; laboratory testing is helpful in the later stages of disease. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics.
- Pertussis – Also known as whooping cough, pertussis is a very contagious disease caused by a type of bacteria called *bordetella pertussis*. Pertussis is one of the most common vaccine-preventable childhood diseases in the US. The disease starts like the common cold, with runny nose or congestion, sneezing, and maybe mild cough or fever. But after one to two weeks, severe coughing begins. Children with the disease cough violently and rapidly, until the air is gone from their lungs and they're forced to inhale with a loud "whooping" sound. People with pertussis usually spread the disease by coughing or sneezing while in close contact with others, who then breathe in the pertussis bacteria.
- Salmonellosis – A group of bacteria that can cause diarrheal illness in humans. Most persons infected with Salmonella develop diarrhea, fever, and abdominal cramps 12 to 72 hours after infection. The illness usually lasts 4 to 7 days, and most persons recover without treatment. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness. Salmonella are usually transmitted to humans by eating foods contaminated with animal feces. Contaminated foods usually look and smell normal. Contaminated foods are often of animal origin, such as beef, poultry, milk, or eggs, but any food, including vegetables, may become contaminated. Thorough cooking kills salmonella. Food may also become contaminated by the hands of an infected food handler who did not wash hands with soap after using the restroom. Salmonella may also be found in the feces of pets with diarrhea, and people can become infected if they do not wash their hands after contact.
- West Nile Virus – Often mosquito-transmitted, West Nile virus can result in minor symptoms to death. West Nile virus is a flavivirus, the same family responsible for dengue and yellow fever. About 80% of individuals infected with West Nile do not show any symptoms, while the 20% develop West Nile fever. Symptoms include fever, headache, fatigue, aches, nausea, and vomiting. Severe symptoms include headache, high fever, stupor, coma, tremors, convulsions, and paralysis. Inflammation of the spinal cord and brain can also develop and cause death.

West Nile is viewed as a seasonal epidemic that flares up in the summer and continues in the fall, coincident with increased mosquito populations and activity.

Understanding and predicting the transmission of communicable diseases coincident with climate change remains a challenge; however, given that many infectious agents (e.g., ticks and mosquitoes) are linked to climate, it is important to acknowledge climate change will drive changes in the distribution and impact of communicable diseases. Certain pathogens and infectious agents will be limited by climate change, while others will find more favorable conditions. The effect climate change will have on communicable disease risk in Owyhee County is dependent on the projected temperature increase, the thermal tolerance of pathogens and infectious agents, and human movement and development patterns. To-date, no conclusive study on the county's risk exists, and further research is needed to assess climate change impacts on communicable diseases in the county.

Hazard Extent, Magnitude, & Probability

The extent and magnitude of communicable diseases ranges widely. Some communicable diseases (e.g., the common cold) can infect a large number of people, while the magnitude of such diseases rank low relative to diseases with more devastating impacts (e.g., Spanish Flu). Given the wide range of communicable diseases, it is difficult to provide measures of extent and magnitude. Future occurrences of epidemics and pandemics are expected to continue and possibly increase in rate of occurrence and infection. Reasons for these increased include the overuse of antibiotics, global travel patterns and population dispersion, and the continual evolution of viruses and bacteria.

Hazard Occurrences

IDHW collects, analyzes, and disseminates health data regarding certain diseases across the state at both the public health district and county level. This data is available between 2002 and 2014. The table below summarizes the reported diseases within the county.

Disease occurrences

	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14
Bld Lead => 10	3	2	2	-	2	-	2	-	-	1	-	1	-
Campylobacteriosis	3	5	4	1	3	3	8	3	12	8	2	1	2
Chlamydia	23	21	13	15	20	24	15	23	23	36	17	21	36
Cryptosporidiosis	-	2	-	-	1	1	4	1	7	6	2	1	2
E. coli O157:H7	-	3	1	1	-	1	-	2	-	-	1	1	-
E. coli, shiga	-	-	-	-	-	1	-	-	1	-	-	1	-

	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14
E. coli Non-O157:H7	-	-	-	1	-	1	-	1	-	-	-	-	-
Giardiasis	-	1	-		1		-	1	1	1	-	-	2
Gonorrhea	-	-	-	-	-	2	-	-	-	1	-	-	-
H. influenza	-	-	1	-	-	-	-	-	-	-	-	-	-
Hemolytic Uremic Syndrome	-	-	-	-	-	-	-	-	-	-	-	1	-
Hepatitis A Acute	-	-	-	1	-	-	-	-	-	-	-	-	-
Hepatitis B AB	-	2	1	-	-	-	-	-	-	-	-	-	-
Hepatitis B Acute	-	-	1	-		-	-	-	-	-	-	-	1
Hepatitis B Chronic	-	-	-	-	1	-	-	-	-	-	-	-	-
Hepatitis C AB	6	5	9	-	-	-	-	-	-	-	-	-	-
Hepatitis C Chronic or resolved	-	-	-	4	8	3	-	-	-	-	-	-	-
HTLV-I	-	-	-	-	-	-	-	-	-	1	-	-	-
N. meningitides, invasive	-	1	-	-	-	-	-	2	-	-	-	1	-
Mumps	-	-	-	-	1	-	-	-	-	-	-	-	-
Norovirus	-	-	-	-	1	-	-	-	-	1	-	-	
Novel influenza A	-	-	-	-	-	-	-	4	-	-	-	-	-
Pertussis	-	-	-	3	1	-	-	-	1	-	1	-	-
Psittacosis	-	1	-	-	-	-	-	-	-	-	-	-	-
Rabies (PEP)	-	-	-	-	-	-	-	-	4	-	-	-	-
Respiratory syncytial virus (RSV)	-	-	-	-	-	-	-	8	13	10	8	17	4
Salmonellosis	-	2	1		3	-	5	-	1	-	-	1	-
S. aureus (MRSA), invasive	-	-	-	-	-	-	1	1	1	2	1	-	1
Shigellosis	-	-	-	-	-	-	-	-	-	-	-	-	2
S. pyogens (Group A strep), invasive	-	-	-	-	-	-	-	-	-	-	-	-	1
Syphilis	1	1	6	1	1	-	1	-	1	-	-	4	-
West Nile Virus	-	-	-	1	32	7	1	1	1	-	-	2	-
Yersiniosis	-	-	-	-	-	-	-	-	-	-	-	1	-
Total	36	46	39	29	75	43	37	47	66	67	32	53	51

Hazard Exposure & Vulnerability

The Centers for Disease Control (CDC)-developed FluSurge model was used to assess the county's risk to pandemic influenza. FluSurge estimates the number of hospitalizations and deaths for a percentage of the county population assumed to become clinically ill over a set duration with influenza during the next pandemic, taking into account susceptible factors such as the age characteristics of the county.

For this risk assessment, 15 percent, 25 percent, and 35 percent of the county's population (referred to as a 15 percent attack rate, 25 percent attack rate, and 35 percent attack rate) was assumed to be infected over a 12-week duration. Three different scenarios are generated to allow for responsive planning: minimum (which estimates the fewest possible number of hospital admissions and deaths); most likely (which estimates the average number of hospital admissions and deaths); and maximum (which estimates the worst case scenario of hospital admissions and deaths). Finally, two pandemic influenza strains were modeled: the 1918 strain (also known as Spanish Flu), and the 1968 strain.

FluSurge model results

			Attack Rate		
			15%	25%	35%
1918 PanFlu	Hospital Admissions	Minimum	55	92	129
		Most Likely	159	264	370
		Maximum	320	534	747
	Deaths	Minimum	20	33	46
		Most Likely	48	80	112
		Maximum	92	153	214
1968 PanFlu	Hospital Admissions	Minimum	6	11	15
		Most Likely	14	24	33
		Maximum	19	32	45
	Deaths	Minimum	2	3	5
		Most Likely	3	5	7
		Maximum	5	8	11

Note that although the number of hospital beds represent the total current capacity, hospital capacity fluctuates and some capacity must always be reserved for patients other than those affected by communicable diseases (e.g., maternity, trauma). Actual capacity will be less than the total capacity, although adjustments through opening emergency or temporary wards can alter capacity.

Critical infrastructure including medical care facilities, hospitals, pharmacies, and ambulatory services can be strained from the impact of a communicable disease on a county and its communities. Emergency rooms and ambulance transport can reach capacity, and social services and support (such as shelters and health departments) can close due to infection of responders and workers or unwilling to expose themselves.

Often, the most vulnerable populations to communicable disease are children, pregnant women, seniors, special needs populations, and predisposed populations (e.g., genetics). Although a socioeconomic vulnerability assessment was not conducted for this hazard given the difficulty in assessing the spatial pattern of spread of the many possible communicable diseases, the sensitivity of the county's population might elucidate those areas more vulnerable to communicable disease.

Land Use & Future Development

There are no foreseen land use impacts associated with communicable diseases. Development can increase the rate of infection of a communicable disease due to the coincident increase in population and population density; however, development in the county is unlikely to significantly impact the rate of infection.

Cyber Disruption

Overview

Cyber disruption includes any hazard posing a threat to cyberinfrastructure, network systems, databases, and all other forms of electronic equipment vital to the everyday functioning of Owyhee County. The former plan did not include cyber hazards, but the increasing reliance on cyberinfrastructure coincident with more frequent and devastating disruptions necessitates its inclusion. The 2017 plan update incorporated a profile on cyber hazards.

Cyber disruption summary

	Before 2009	2009-2017	Total
Occurrences*	-	-	-
Disaster Declarations*	-	-	-
Casualties*	-	-	-
Property Damage*	-	-	-
Repetitive Losses*	-	-	-

*Data not available.

Hazard Description

The everyday operations of communities, critical infrastructure such as power and water, and emergency response are all reliant on cyberinfrastructure. Cyberinfrastructure is composed of the computing systems, data repositories, virtual environments, and all other electronic devices that are linked to create a network. Cyberinfrastructure also entails the people and institutions designed to maintain, update, and advance electronic systems. Due to the relative newness and increasing advancement of cyber infrastructure, cyber hazards are increasingly a threat and risk to even smaller and more rural counties.

Cyber hazards are natural or deliberate action that interrupts cyberinfrastructure, limiting communications, processing, and data storage ability. Cyber hazards are varied and include events such as solar flares, power loss, and cyber threats such as cyber terrorism. Geomagnetic storms are disturbances in the earth's geomagnetic field caused by changes in solar wind. Global Positioning Systems (GPS)-reliant technology, power transformers, and other segments of the power grid can all be affected by geomagnetic storms, including loss of service, signal interruption, and loss of use. Cyber terrorism is an act of computer-to-computer attack with the intention to expose and take advantage of vulnerable digital systems to access confidential records, destabilize digital systems and networks, and cause harm. Cyber disruptions include criminal activity for profit, extortion, and theft. Both state

and non-state actors act to cause cyber disruption, and attacks can be singular in nature or part of a larger network of cyber disruptions. Threat groups include the following:

- Hacktivists – An amalgamation of hacker and activist, hacktivists attempt to further an ideology or political agenda through cyber disruption.
- State Actors – State-sponsored military or intelligence services, groups, and individuals acting on behalf of foreign governments. These actors often pose a threat to law enforcement and critical infrastructure.
- Terrorist Organizations – Non-state terrorist organizations utilize the internet to radicalize, recruit, fundraise, and plan for and conduct deliberate attacks on individuals, agencies, and infrastructure.
- Criminal Organizations – Due to the anonymity of the internet, low physical risk, and global opportunities, criminal organizations utilize the internet to conduct criminal activity. With specific regards to cyberinfrastructure, criminal organizations can ransom vital, private, and valuable data stolen from unprotected or inadequately protected databases, such as medical records, communication logs, and GPS tracks.
- Purposeful or Accidental Insider – Employees, contractors, or other individuals with access to internal systems who purposefully cause harm, or those unaware of damage caused by weak security, victims of social engineering, or phishing.
- Individuals – Acting alone, individuals with skills or access to tools can act as cyber disruptions for personal gain.

Motives behind cyber-attacks vary, and can be any one of the following:

- Disabling websites
- Release information
- Espionage
- Interfere with law enforcement
- Sabotage
- Defacing to cause embarrassment or retaliate
- Retribution
- Profit
- Notoriety
- Disinformation

Previously, cyber security focused on preventing initial entry into computers and networks. Over the past years, this focused shifted to limiting damage once a system was compromised. In Idaho, a state cyber security group is working to address risks to state systems. Centralized systems, such as the Supervisory Control and Data Acquisition (SCADA) that controls infrastructure such as communications, utilities, transportation, medical facilities, law enforcement, and financial systems, are at risk of disruption from cyber disruptions.

Increased loads on energy infrastructure during the winter and summer months due to more extreme temperatures can result in brownouts, and more extreme storms can down powerlines and cause cyber disruptions.

Hazard Extent, Magnitude, & Probability

Any electronic device connected to the internet, operates on radio frequencies, or that an individual can gain unauthorized access to, are vulnerable to hacking.

Hazard Occurrences

Cyber disruptions across the US increased after 2005, notably with regards to cyberattacks on the energy, banking, and finance sectors. In Owyhee County, power outages have resulted in disruption of the county's cyberinfrastructure. There are no reported incidents of malicious cyber disruptions.

Hazard Exposure & Vulnerability

Vulnerabilities within cyberinfrastructure are many. Cyber vulnerabilities include the following:

- Personnel – Employees, contractors, and other individuals are often the greatest vulnerability in terms of cyber hazards. Accidental insiders can cause cyber disruptions through unintentional actions or part of a social engineering scheme. Purposeful insiders intentionally cause cyber disruptions, and can be particularly devastating given advanced levels of internal knowledge regarding cyberinfrastructure.
- Organizational Barriers – Lack of managerial and executive support (notably in law enforcement, medical, and other sensitive fields) can amplify vulnerability to cyber disruption due to lack of resources, training, and policy to train and maintain cyber security. Organizational culture can likewise create cyber vulnerabilities, as organizations with weak cyber culture are likely to lack the technical and administrative agency to institute strong cyber policies. Finally, training and technical personnel are vital to reducing cyber vulnerability.
- Information Networks & Systems – These systems must be proactively secured to reduce cyber threats and vulnerabilities. Without proper and continual security procedures and actions, these networks and systems become vulnerable to both human and natural cyber hazards. Vulnerabilities can be found in systems access, file access, internal and external networks, internet-based storage and processing (e.g., cloud storage), software, and data files.
- Public-Facing Websites – Websites viewable by anybody on the internet are often vulnerable to cyber disruption. Denial of service attacks can overwhelm websites, preventing use by others by taking it offline.

- Data Storage Devices – Devices such as portable USB drives, hard drives, and smartphones can be stolen or compromised.
- Communications Centers, Systems, Equipment, & Applications – Communications are essential in emergency and disaster events, yet are vulnerable to cyber hazards. If emergency personnel are reliant on smartphones for communication, cyber disruptions can severely limit effective response and coordination.
- Facility Systems & Physical Infrastructure – Heating, ventilation, air conditioning, water systems, elevators, parking garages, lighting systems, and more are vulnerable to cyber disruption.

Land Use & Future Development

There are no foreseen land use impacts associated with cyber disruption and hazards. Development, however, can increase the number of targets of cyber terrorism and the impact of cyber disruption.

Hazardous Materials

Overview

Hazardous materials (hazmat) are often an unknown factor in mitigation planning. Transported chemicals pose a risk to individuals and areas adjacent to transportation corridors, and industry and manufacturing plant hazmat accidents can necessitate evacuation of large areas and require significant resources to contain and manage. The 2017 update reorganized the hazardous materials profile, incorporated additional data and modeling, and presented a more comprehensive and cohesive analysis of Owyhee County's hazardous materials risk.



Hazardous materials summary

	Before 2008	2009-2017	Total
Occurrences	7	1	8
Disaster Declarations	-	-	-
Casualties	-	2 Injuries	2 Injuries
Property Damage	-	-	-
Repetitive Losses	-	-	-

Hazard Description

A hazardous material is a substance known to harm humans and other living organisms and damage property. A release of a hazardous material can contaminate the environment and produce a health hazard to the immediate area, downwind, and/or downstream of the release location. Hazardous materials are regulated by the U.S. Environmental Protection Agency (EPA), which lists substances as either hazardous and extremely hazardous. Hazardous substances are those substances that tend to persist for long periods of time and pose long-term health hazards for living organisms, whereas extremely hazardous substances pose acute health hazards and immediate dangers to the lives of living organisms and can cause significant environmental damage. Hazardous materials include wastes, pollutants, and elevated-temperature materials.

A hazardous material can be released from a fixed facility (such as a manufacturing plant) or via transportation through the area. The most likely locations for transportation-related hazardous material release are highways and active railways. Given the non-static nature of transportation and

lack of disclosure by transportation companies, transportation-related releases pose a significant risk to populated areas and water resources.

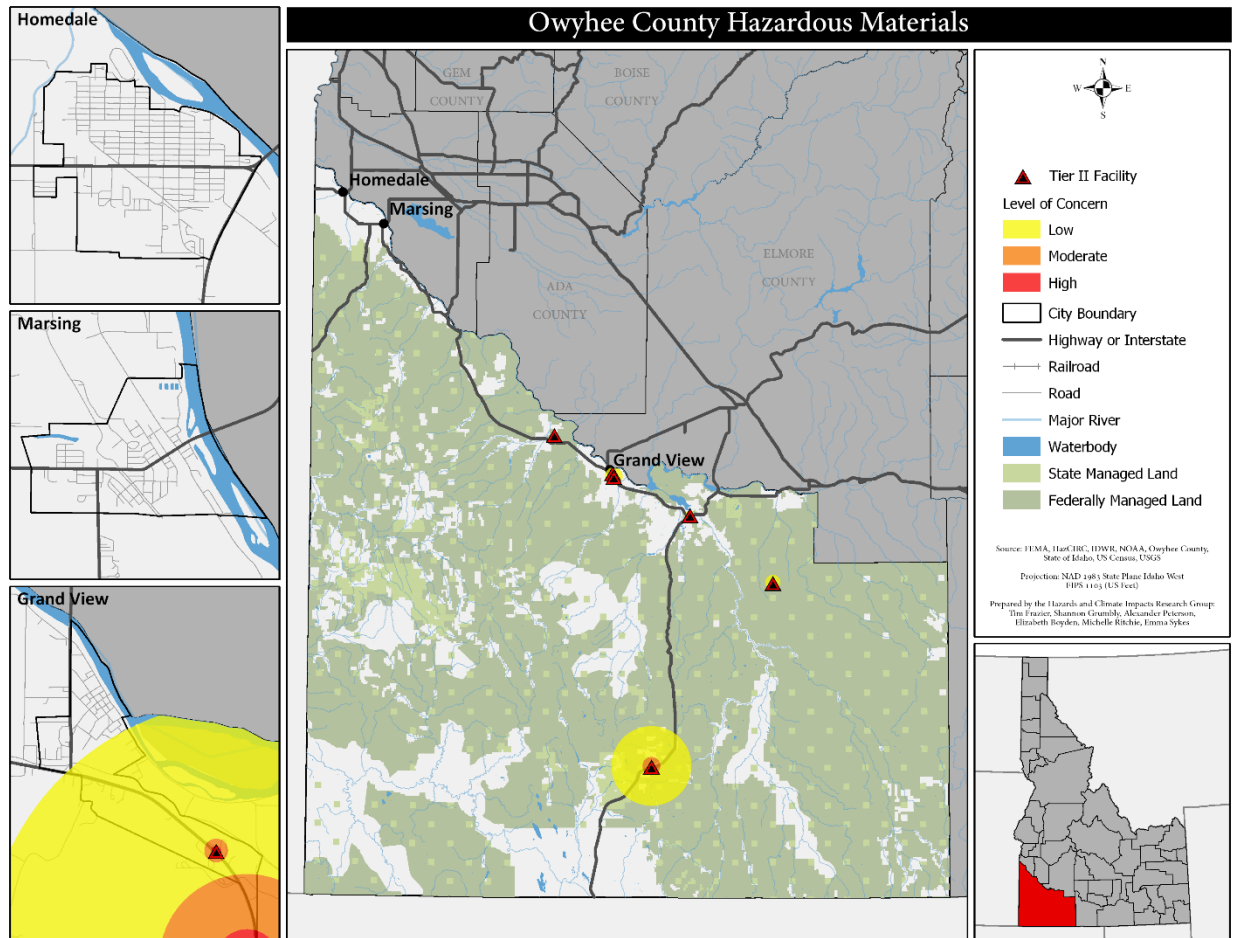
The following are brief descriptions of common hazardous materials:

- Gasoline – Highly flammable, this substance has a high rate of exposure given its use in vehicles.
- Chlorine – An important and common industrial chemical, chlorine is volatile and highly reactive (especially in the proximity to a heat source). Chlorine can severely damage lungs and can kill people.
- Diesel Fuel – Similar to gasoline, diesel fuel has a high rate of exposure. This substance can irritate the eyes, skin, and respiratory systems, and can cause dizziness, headaches, and nausea.
- Propylene – Crucial in the petrochemical industry, propylene is used in the production of films, packaging, and more. This substance poses a fire hazard when handled due to its volatility and flammability.
- Sulfuric Acid – High corrosive, yet common in cleaning agents, fertilizer manufacturing, oil refining, and wastewater processing. If sulfuric acid comes into contact with human skin, it will cause severe burns. Inhaling sulfuric acid can result in serious lung damage.

Hazard Extent, Magnitude, & Probability

The Areal Locations of Hazardous Atmospheres (ALOHA) model developed by the EPA and National Oceanic and Atmospheric Administration (NOAA) was employed to assess the county's risk to hazardous materials incidents. ALOHA models chemical releases and the dispersion of toxic clouds and their areas-of-effect, and is widely used for planning and response to chemical emergencies. The software generates the plume dispersion and threat zone of a chemical based on its properties, amount, storage and containment, and the atmospheric conditions at time of release, and models toxic gas clouds, flammable gas clouds, BLEVEs (Boiling Liquid Expanding Vapor Explosions), jet fires, pool fires, and vapor cloud explosions.

Chemical type, amounts, and locations were collected from the 2015 Tier II reports provided by IOEM. Tier II reports are required to be submitted by facilities storing hazardous materials at or above the threshold planning quantity defined by the EPA, and are designed to facilitate emergency planning.



Tier II chemical facilities and levels of concern

Tier II chemical facility data

Chemical	Amount	Unit	LOC Type
Dimethoate (Dimethoate 400)	2,020	Pounds	PAC
Sulfuric Acid	1,080	Pounds	AEGL
Diesel Fuel	737	Pounds	PAC
Diesel Fuel	8,843	Pounds	PAC
Phorate	1,200	Pounds	AEGL
Diesel Fuel	12,000	Pounds	PAC
Calcined Diatomaceous Earth (Flor-Dri)	350	Pounds	PAC

Source: IOEM

Hazard Occurrences

Although there are no repetitive losses associated with hazmat, Owyhee County has experienced a number of hazmat incidents.

Hazmat incident occurrences

Date	Location	Cause	Casualties	Damage	Material	Amount
5/4/2006	Bruneau	Operator Error	-	-	Diesel Oil	45 Gallons
8/21/2006	Bruneau	-	-	-	Natural Gas	-
8/21/2006	South-Central	-	-	-	Natural Gas	-
8/22/2006		-	-	-	Natural Gas	-
8/30/2006	Bruneau	-	-	-	Natural Gas	-
9/15/2008	Grand View	Transport Accident	-	-	Sodium Hydrosulfide	-
10/3/2008	Jerome	-	-	-	Oil	-
4/23/2011	Marsing	Other	2 Injuries	-	Aircraft Fuel	1 Gallon

Source: NRS

Hazard Exposure & Vulnerability

The few Tier II facilities in Owyhee County result in little population exposure to hazmat, with Grand View the only incorporated area to show population exposure. The structure counts and values show similar results.

Population exposure to hazmat

LOC	Grand View	Homedale	Marsing	Unincorp.
Low	56	-	-	9
Moderate	-	-	-	-
High	-	-	-	-

Structures and structure type exposure to hazmat

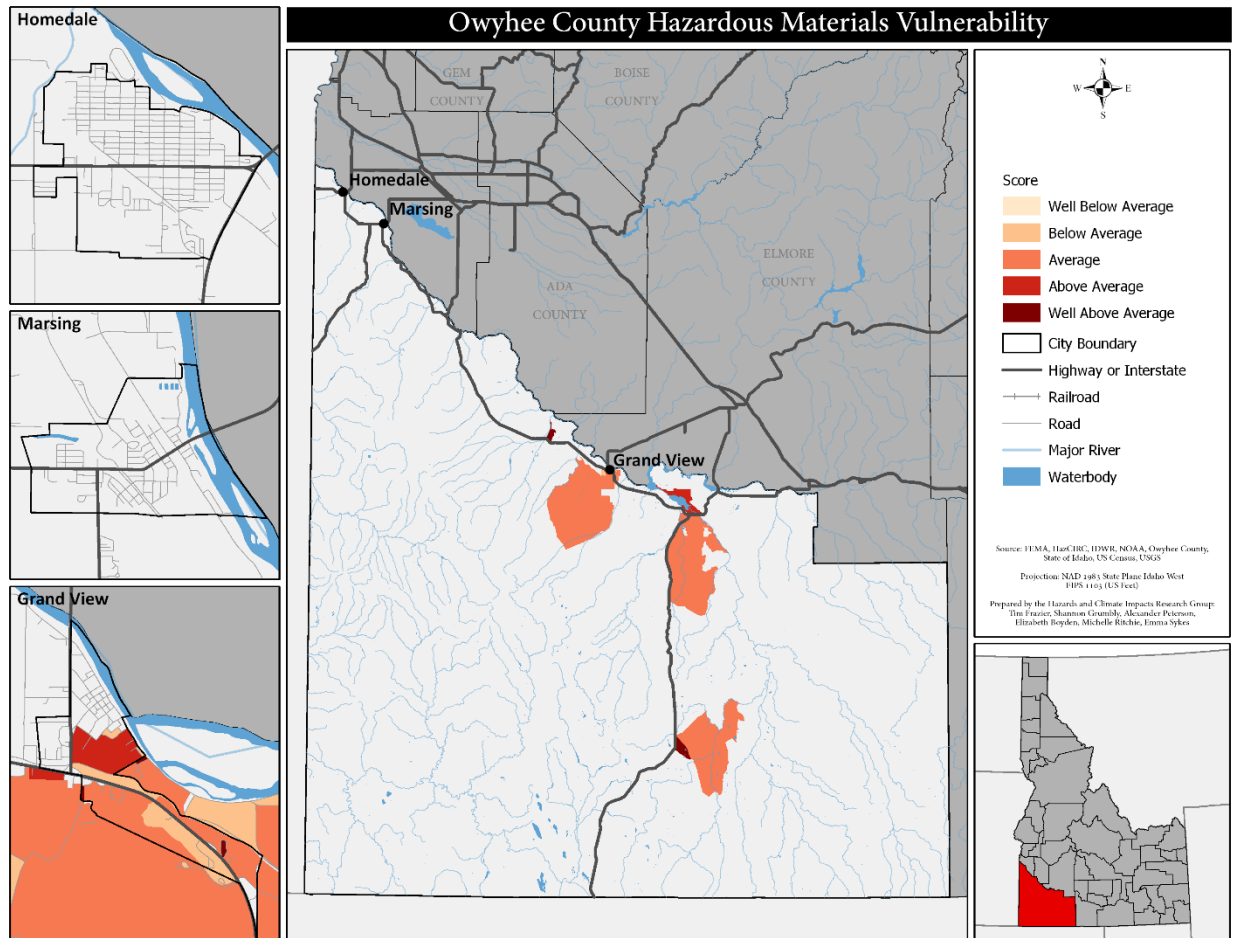
	LOC	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	Low	25	-	-	-	-	-	-

	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Homedale	Low	-	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Marsing	Low	-	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Unincorporated	Low	6	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-

Structure values and structure type exposure to hazmat

	LOC	Res	Com	Ind	Agr	Rel	Gov	Edu
Grand View	Low	\$2,808	-	-	\$49	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Homedale	Low	-	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Marsing	Low	-	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-
Unincorporated	Low	\$702	-	-	-	-	-	-
	Mod	-	-	-	-	-	-	-
	High	-	-	-	-	-	-	-

Vulnerability to hazmat is concentrated around the Tier II Chemical Facilities. Grand View and census blocks in the unincorporated areas showed social vulnerability to hazmat, though only census blocks in and around Grand View showed above average vulnerability.



Socioeconomic vulnerability to hazmat

Land Use & Future Development

The City of Grand View and its surrounding areas are exposed to some level of health risk if a chemical were to be released at a Tier II facility within the respected city limits. With additional development expected in these high-density areas, the number of individuals exposed to potential hazardous material events may potentially increase. Additionally, lands that are zoned industrial in the county, but have yet been developed may potentially increase hazardous material risk if additional chemicals are stored on-site.

Utility Outage

Overview

Utility outages are often considered secondary hazards – hazards resulting from other hazards, such as severe weather. Prolonged power outages can have widespread impacts, and are therefore profiled in the 2017 plan update. Although there are a number of utility outages that can impact Owyhee County, little data is available on the number of utility outages that have occurred. The 2017 update incorporated a general hazard profile to be updated as data becomes available.

Hazard Description

The two primary utility outages include the following:

- Power Outages – The loss of electricity for a period of time is deemed a power outage, and can be caused by hazards, human error, and equipment failure. Power outages have cascading impacts across an area or community, as power outages result in the loss of communications infrastructure, water supplies and distribution, emergency and response capabilities, and more. Often electricity is used to pump wells vital for individual or community continuity, and run heating and cooling systems important to both human comfort and health. Vulnerable populations needing powered medical equipment are especially threatened by long-term power outages.
- Water Outage – Often a result of power outages, both unexpected and scheduled shutdowns of community or well-based water supply systems are considered water outages. More specifically, water outages are a significant or complete reduction in water pressure that impair water-reliant systems, such as fire protection plumbing and heating systems. Such outages can also impact potable water, resulting in a lack of drinking water.

Hazard Extent, Magnitude, & Probability

Utility outages – specifically power outages – are a common hazard. Numerous events can result in utility outages, including scheduled maintenance, unscheduled maintenance, high and severe winds, wildfire, floods, and more. The extent of utility outages can vary from localized events (e.g., a problematic well, to a few houses in the same neighborhood lacking power) to the entire or a majority of the county. Likewise, the magnitude of utility outage can vary between intermittent and prolonged.

Hazard Occurrences

Although there are no recorded repetitive losses from utility outage, Owyhee County has regularly experienced utility outages. Causes of these power outages were attributed to the following:

- Squirrels
- Birds
- Trees
- Snow
- Lightning
- Wind
- Ice
- Vehicle accidents
- Fire
- Poor infrastructure

Hazard Exposure & Vulnerability

Utility outages can impact all of Owyhee County, both in developed and rural areas. Rural areas, however, are more vulnerable to utility outage due to lack of utility redundancy and possible remoteness. Prolonged utility outages can have significant impacts on the county's economic well-being.

Vulnerabilities from utility outages include exposure to extreme temperatures, food poisoning, injury, supply interruption (e.g., food shortage and insecurity), and economic disruption. Special needs populations – such as those on respirators – are especially vulnerable to power outages.

Land Use & Future Development

Future land use and development in Owyhee County could potentially increase the number of structures that lose power during severe weather events, as additional critical infrastructure is provided with the addition of new development.