# LEWIS COUNTY, IDAHO

# MULTI-HAZARD MITIGATION PLAN

AUGUST 2011

Prepared By

Northwest Management, Inc.

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# Foreword

"Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs."[1]

The **Lewis County Multi - Hazard Mitigation Plan** was updated in 2010 by the Lewis County Multi-Hazard Mitigation Plan committee with assistance from Northwest Management, Inc. of Moscow, Idaho. Two bound documents have been produced as part of this planning effort. They include:

- Lewis County Multi-Hazard Mitigation Plan
  - Lewis County Multi-Hazard Mitigation Plan Terrorism and Civil Unrest Supplement (limited distribution)

This Plan satisfies the requirements for a local multi-hazard mitigation plan and a flood mitigation plan under 44 CFR Part 201.6 and 79.6.

[1] Federal Emergency Management Agency. "Local Multi-Hazard Mitigation Planning Guidance." July 1, 2008.

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U.S. Department of Homeland Security
Region X
130 228th Street, SW
Bothell, WA 98021-9796

FEMA

August 5, 2011

Honorable Carroll A. Keith
Chair, Lewis County Commissioners
510 Oak Street, Room #1
Nezperce, Idaho 83543

Dear Chair Keith:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***Lewis County Multi-Hazard Mitigation Plan*** as a multi-jurisdictional local plan as outlined in 44 CFR Part 201. With approval of this plan, the following entities are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through August 5, 2016:

| | | |
|---|---|---|
| **Lewis County** | **City of Reubens** | **City of Kamiah** |
| **City of Craigmont** | **City of Winchester** | **City of Nezperce** |

The plan's approval provides the above jurisdictions eligibility to apply for hazard mitigation projects through your State. All requests for funding will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted. For example, a specific mitigation activity or project identified in the plan may not meet the eligibility requirements for FEMA funding, and even eligible mitigation activities are not automatically approved 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). Additional information regarding the CRS can be found at www.fema.gov/business/nfip/crs.shtm or through your local floodplain manager.

Over the next five years, we encourage your communities to follow the plan's schedule for its monitoring and updating, and to develop further mitigation actions. The plan must be reviewed, revised as appropriate, and resubmitted for approval within five years in order to continue project grant eligibility.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact our State counterpart, Idaho Bureau of Homeland Security, which coordinates and administers these efforts for local entities.

Sincerely,

Mark Carey, Director
Mitigation Division

Enclosure

cc: David Jackson, Idaho Bureau of Homeland Security

BH:bb

www.fema.gov

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# Table of Contents


***Foreword*** ..... ***ii***

***Chapter 1 – Plan Overview*** ..... ***2***

***Overview of this Plan and its Development*** ..... ***2***

Phase I Hazard Assessment ..... 2

Goals and Guiding Principles ..... 4

***Chapter 2 – Planning Process*** ..... ***10***

***Documenting the Planning Process*** ..... ***10***

Description of the Planning Process ..... 10

The Planning Team ..... 10

Planning Committee Meetings ..... 12

Public Involvement ..... 13

Documented Review Process ..... 16

Plan Monitoring and Maintenance ..... 16

***Chapter 3 – Community Profile*** ..... ***20***

***Lewis County Characteristics*** ..... ***20***

Geography and Climate ..... 20

Demographics ..... 20

Socioeconomics ..... 21

Natural Resources ..... 23

Development Trends ..... 27

Overview of Emergency Response System ..... 27

Regional Hazard Profile ..... 28

***Chapter 4 – Hazard Profiles*** ..... ***32***

***Regional and Local Hazard Profiles*** ..... ***32***

Flood ..... 32

Landslide ..... 38

Severe Weather ..... 41

Earthquake ..... 46

Wildland Fire ..... 52

***Chapter 5 – Hazard Assessments*** ..... ***60***

***Jurisdictional Risk and Vulnerability Assessments*** ..... ***60***

Lewis County Annex ..... 61

City of Kamiah Annex ..... 87

City of Craigmont Annex ..... 99

City of Nezperce Annex ..... 107

City of Winchester Annex ..... 117

City of Reubens Annex ..... 123

***Chapter 6 – Mitigation Strategy ..... 130***

***Administration and Implementation of Action Items ..... 130***

Incorporation into Existing Planning Mechanisms ..... 130
Prioritization of Action Items ..... 131

***Jurisdictional Mitigation Strategies ..... 136***

Lewis County Annex ..... 137
City of Kamiah Annex ..... 145
City of Craigmont Annex ..... 153
City of Nezperce Annex ..... 155
City of Winchester Annex ..... 159
City of Reubens Annex ..... 161

***Chapter 7 – Appendices ..... 164***

***Supporting Information ..... 164***

List of Tables ..... 164
List of Figures ..... 165
Local Resolutions of Adoption ..... 166
Planning Committee Minutes ..... 172
Summary of 2011 Revisions ..... 175
Public Meeting Slideshow ..... 177
Potential Funding Sources ..... 180

# Chapter 1

## Plan Overview



IN THIS SECTION:

- Planning Participants
- Phase I Hazard Assessment
- Goals and Guiding Principles
- Integration with Other Planning Mechanisms

# Chapter 1 – Plan Overview

## Overview of this Plan and its Development

This Multi - Hazard Mitigation Plan is the result of analyses, professional cooperation and collaboration, assessments of hazard risks and other factors considered with the intent to reduce the potential for hazards to threaten people, structures, infrastructure, and unique ecosystems in Lewis County, Idaho. The planning team responsible for implementing this project was led by the Lewis County Hazard Mitigation Planning Committee. Agencies and organizations that participated in the planning process included:

- Lewis County Commissioners and County Departments
- City of Kamiah
- City of Nezperce
- City of Winchester
- City of Craigmont
- City of Reubens
- Kamiah Highway District
- Kamiah School District
- Nez Perce Tribe
- Idaho Department of Lands
- Idaho Transportation Department
- Amateur Radio Emergency Service
- National Weather Service
- Idaho Public Health
- Idaho Bureau of Homeland Security
- Northwest Management, Inc.

In the spring of 2010, Lewis County Emergency Management hired Northwest Management, Inc. to provide the service of reviewing the assessments, developing new data, and updating the Lewis County Multi - Hazard Mitigation Plan.

### *Phase I Hazard Assessment*

The Multi - Hazard Mitigation Plan is developed in accordance with the Federal Emergency Management Agency's (FEMA) and Idaho Bureau of Homeland Security requirements for a county level pre-disaster

mitigation plan. Based on the hazards included in the 2005 document and funding availability, the planning committee in Lewis County updated or developed annexes for the following hazards:

Updated Hazards:

- Flood
- Landslide
- Severe Weather
- Earthquake
- Wildland Fire
- Terrorism/Civil Unrest

Additional hazard annexes may be added to this Plan as funding allows. Currently, drought is discussed in the severe weather annexes; however, due the prevalence of this type of hazard and the potential impacts to Lewis County, the planning committee would like to consider drought as a stand-along hazard in future updates of this Plan.

The highest priority hazards to be considered for future evaluation are:

- Drought
- Hazardous Materials
- Crop Loss
- Volcano
- Technological Hazards
- Pandemic
- Extended Power Outage

A Phase I Assessment was facilitated with the Lewis County planning committee to determine the relative frequency of a hazard's occurrence and the potential impact a hazard event will have on people, property, infrastructure, and the economy based on local knowledge of past occurrences. A matrix system with hazard magnitude on the x axis and frequency on the y axis was used to score each hazard.

| **Magnitude of Hazards** | | | | | | |
|---|---|---|---|---|---|---|
| **Value** | **Reconstruction Assistance From** | **Geography (Area) Affected** | **Expected Bodily Harm** | **Loss Estimate Range** | **Population Sheltering Required** | **Warning Lead Times** |
| **1** | Family | Parcel | Little to No Injury / No Death | $1000s | No Sheltering | Months |
| **2** | City | Block or Group of Parcels | Multiple Injuries with Little to No Medical Care / No Death | $10,000s | Little Sheltering | Weeks |
| **2** | County | Section or Numerous Parcels | Major Medical Care Required / Minimal Death | $100,000s | Sheltering Required Neighboring Counties Help | Days |
| **4** | State | Multiple Sections | Major Injuries / Requires Help from Outside County / A Few Deaths | $1,000,000s | Long Term Sheltering Effort | Hours |
| **8** | Federal | Countywide | Massive Casualties / Catastrophic | $10,000,000s | Relocation Required | Minutes |

A scoring system (shown above) was also used to categorize the relative magnitude each hazard may have on the community. Frequency was rated as "High" for hazards occurring multiple times per year in a 5 year

period, “Medium” for hazards occurring every 5 to 25 years, or “Low” for hazards occurring more than 25 years apart.[2]

The following tables summarize the Phase I Hazard Assessments for Lewis County.

**Lewis County Phase I Risk Assessment:**

| | | Magnitude | | |
|---|---|---|---|---|
| | | Low | Medium | High |
| Frequency | Low | **Terrorism/Civil Unrest** | | **Earthquake** |
| | Medium | | **Flood** | |
| | High | | **Severe Weather**<br>**Landslide**<br>**Wildland Fire** | |

The inclusion of additional hazards was considered; however, due to funding limitations, participating jurisdictions chose not to assess technological, volcano, pandemic, power outage, or other hazards until additional funding becomes available.

## *Goals and Guiding Principles*

### *Federal Emergency Management Agency Philosophy*

Effective November 1, 2004, a Multi - 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 programs provide funding, through state emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

The new local Multi - Hazard Mitigation Plan requirements for HMGP and PDM eligibility is based on the Disaster Mitigation Act of 2000, which amended the Stafford Disaster Relief Act to promote an integrated, cost effective approach to mitigation. Local Multi - 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.

In order to be eligible for project funds under the Flood Mitigation Assistance (FMA) program, communities are required under 44 CFR Part 79.6(d)(1) to have a mitigation plan that addresses flood hazards. On October 31st, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Reg. 61720 to

[2] Custer County, Idaho. Scoring system partially adapted from the Custer County Multi-Jurisdiction Multi-Hazard Mitigation Plan. 2008. Pp 165-168.

incorporated mitigation planning requirements for the FMA program (44 CFR Part 201.6). The revised Local Mitigation Plan Review Crosswalk (July 2008) used by FEMA to evaluate local hazard mitigation plans is consistent with the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by Section 322 of the Disaster Mitigation Act of 2000, the National Flood Insurance Act of 1968, as amended by the National Flood Insurance Reform Act of 2004 and 44 Code of Federal Regulations (CFR) Part 201 – Mitigation Planning, inclusive of all amendments through October 31, 2007 was used as the official guide for development of a FEMA-compatible Lewis County Local Multi-Hazard Mitigation Plan. [3]

FEMA will only review a local Multi - Hazard Mitigation Plan submitted through the appropriate State Hazard Mitigation Officer (SHMO). Draft versions of local Multi - Hazard Mitigation Plans will not be reviewed by FEMA. FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA will be unable to approve it prior to adoption.

In Idaho the SHMO is:

Idaho Bureau of Homeland Security
4040 Guard Street, Bldg 600
Boise, ID 83705

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

[3] Federal Emergency Management Agency. "Local Multi-Hazard Mitigation Planning Guidance." July 1, 2008.

## *Planning Philosophy and Goals*

### Lewis County Planning Philosophy

This effort will utilize the best and most appropriate science from all partners and will integrate local and regional knowledge about natural hazards while meeting the needs of local citizens and the regional economy.

**Mission Statement**

To make residents, communities, state agencies, local governments, and businesses less vulnerable to the effects of hazards through the effective administration of hazard mitigation grant programs, hazard risk assessments, wise and efficient infrastructure hardening, and a coordinated approach to mitigation policy through federal, state, regional, and local planning efforts. Our combined priorities 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.

### Jurisdictional Planning and Mitigation Goals

**Lewis County:**

1. *Planning* - To reduce the area of land damaged and losses experienced because of hazards where these risks threaten communities in the county.
2. *Mitigation* - 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.
3. *Planning* - Educate communities about the unique challenges of pre-disaster hazard mitigation and post-disaster response.
4. *Mitigation* - Establish mitigation priorities and develop mitigation strategies.
5. *Mitigation* - Strategically locate, plan, and implement hazard reduction projects.
6. *Planning* - Provide recommendations for alternative treatment methods that can impact the exposure to multiple hazards at one time.
7. *Planning* - Meet or exceed the requirements of FEMA for a county level Multi-Hazard Mitigation Plan.
8. *Planning* - Encourage the creation of rural fire districts covering the area surrounding Craigmont and the Central Ridge and Mohler areas.

**City of Craigmont:**

1. *Planning* – Continue the education of city residents and the surrounding community regarding natural hazard preparedness.
2. *Mitigation* - Reduce the impacts of a hazard event including potential losses incurred by both public and private properties.
3. *Planning* - Develop land use policies to alleviate potential hazard risks.
4. *Planning* - Establish mitigation priorities and develop mitigation strategies.

5. *Planning* - Continue to address and strengthen emergency operations plans.

**City of Kamiah:**

1. *Planning* - Through mitigation due diligence, protect Kamiah's people, structures, infrastructure, and unique ecosystems to preserve our way of life as we move toward local and regional economic stability.
2. *Planning* - Identify all past, present, and future hazards.
3. *Mitigation* - Develop mitigation plans and actions and implement necessary solutions.

**City of Reubens:**

1. *Planning* – Improve emergency services' response capabilities.
2. *Mitigation* – Protect public and private property from the impacts of severe weather events.
3. *Mitigation* - Establish mitigation priorities and develop mitigation strategies.

**City of Winchester:**

1. *Planning* - 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.
2. *Planning* - Reduce the impact of hazard events and potential losses incurred by both public and private residents and entities.
3. *Planning* - Develop land use policies to alleviate potential hazard risks and impacts for future development.
4. *Mitigation* - Establish mitigation priorities and develop mitigation strategies.
5. *Planning* - Strengthen emergency operations plans and procedures by increasing collaboration among public agencies, non-profit organizations, businesses, federal, state, tribal, county, and local governments.
6. *Planning* - Seek opportunities to protect, enhance, and integrate emergency and essential services.
7. *Mitigation* - Work towards identifying and implementing increased security measures for all of the City's water wells and storage tanks in order to reduce asset accessibility.

**City of Nezperce:**

1. *Planning* – Improve emergency services' response capabilities.
2. *Mitigation* – Protect public and private property from the impacts of severe weather events.
3. *Mitigation* – Improve the stormwater drainage system.
4. *Planning* - Reduce the area of land damaged and losses experienced as a result of hazard events.

## Integration with Other Local Planning Documents

During the development of this Multi - Hazard Mitigation Plan several planning and management documents were reviewed in order to avoid conflicting goals and objectives. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the hazard mitigation objectives outlined in this document.

**Lewis County Comprehensive Plan**

The purpose of the Lewis County Comprehensive Plan[4] is to legally protect the land and individual citizens' rights, retain the good qualities of the County, and strive to assist those areas in which improvement is needed. The Plan guides growth and development decisions of the elected officials in the direction the citizens have outlined.

**Lewis County Emergency Operations Plan**

The Lewis County Emergency Operations Plan and Response Plan[5] provides the framework of responsibilities for response and recovery operations from emerging or potential threats (emergencies) and disasters. The Plan describes the methods the county will utilize to receive and issue notifications, coordinate resources, handle requests for, and provide assistance. Each incorporated city in Lewis County also adopted a similar version of the Lewis County Emergency Operations Plan.

[4] Lewis County, Idaho. 2009. Lewis County Comprehensive Plan. Nezperce, Idaho.

[5] Lewis County, Idaho. 2004. Lewis County Emergency Operations and Response Plan. Lewis County Office of Emergency Management. Nezperce, Idaho.

# Chapter 2

## Planning Process

IN THIS SECTION:

- Description of the Planning Process
- The Planning Team
- Planning Committee Meetings
- Public Involvement
- Plan Monitoring and Maintenance

# Chapter 2 – Planning Process

## 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.

### *Description of the Planning Process*

The Lewis County Multi - Hazard Mitigation Plan was developed through a collaborative process involving all of the organizations and agencies detailed in Chapter 1 of this document. The planning process included five distinct phases which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 4 completed throughout the process):

1. **Collection of Data** about the extent and periodicity of hazards to ensure a robust dataset for making inferences about hazards in and around Lewis County.

2. **Field Observations and Estimations** about risks, juxtaposition of structures and infrastructure to risk areas, access, and potential mitigation projects.

3. **Mapping** of data relevant to pre-disaster mitigation control and mitigation, structures, resource values, infrastructure, risk assessments, and related data.

4. **Facilitation of Public Involvement** from the formation of the planning committee to news releases, public meetings, public review of draft documents, and acknowledgement 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 signing of the final document.

### *The Planning Team*

Leading the planning effort from Lewis County was Dave Hasz, the Lewis County Emergency Management Coordinator. Additional partners included local communities, fire departments, law enforcement, federal and state agencies, various county departments, and others. Northwest Management, Inc. Project Co-Managers were Tera R. King and Vaiden Bloch.

The planning committee met with many residents of the County during the risk assessments and at public meetings. Additionally, the press releases encouraged interested citizens to contact their elected officials or attend planning committee meetings to ensure that all issues, potential solutions, and ongoing efforts

were thoroughly discussed and considered by the committee. 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.

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.

### *Multi Jurisdictional Participation*

CFR requirement §201.6(a)(3) calls for multi-jurisdictional planning in the development of hazard mitigation plans which impact multiple jurisdictions. This Multi-Hazard Mitigation Plan is applicable to the following Jurisdictions:

- Lewis County
- City of Craigmont
- City of Kamiah
- City of Nezperce
- City of Winchester
- City of Reubens

All of the jurisdictions that participated in the original 2005 planning process met the requirements for participating jurisdictions during the 2011 revision of the Multi-Hazard Mitigation Plan. No additional jurisdictions participated in the 2011 revision.

These jurisdictions were represented on the planning committee, in public meetings, and participated in the development of hazard profiles, risk assessments, and mitigation measures. In order to be included as a participating and adopting jurisdiction, planning committee leadership required that each jurisdiction submit a goals statement and develop a mitigation strategy including at least one action item.

The monthly planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in a combination of the following ways:

- Planning committee leadership visits to local government meetings where planning updates were provided and information was exchanged – regular updates were provided by Lewis County Emergency Management at County Board of Commissioners meetings. Additionally, representatives on the planning committee periodically attended municipality meetings to provide council members with updates on the project and request reviews of draft material.

- Planning committee leadership also attended a Local Emergency Planning Committee meeting in Winchester to discuss the Plan with members of the committee as well as to seek input on specific sections of the document. Representatives from each city council in Lewis County attended this meeting and provided feedback and revisions on the draft plan.

- One-on-one correspondence and discussions between the planning committee leadership and the representatives of the municipalities and special districts was facilitated as needed to ensure understanding of process, collect data and other information, and develop specific mitigation strategies. Both Northwest Management, Inc. and Lewis County Emergency Management spent one-on-one time with representatives from the cities of Kamiah and Nezperce to develop accurate risk assessments and draft and prioritize a mitigation strategy.

- Public meeting hosted by the County and involving elected officials, municipality representatives, local volunteers, business community representatives, and local citizenry.

- Written correspondence was provided at least monthly between the planning committee leadership and each participating jurisdiction updating the cooperators progress, making requests for information, and facilitating feedback. All of the participating jurisdictions provided comments to the draft document during the data gathering phase as well as during the various committee and public review processes.

- At the request of planning committee leadership, participating jurisdictions hosted copies of the draft Lewis County Multi-Hazard Mitigation Plan and provided staff to be on hand to answer any questions during the public review phase of the planning process.

Like other areas of rural Idaho and the United States, Lewis County's human resources have many demands placed on them in terms of time and availability. A few of the elected officials (county commissioners and city mayors) do not serve in a full-time capacity; some of them have other employment and serve the community through a convention of community service. Recognizing this and other time constraints, many of the jurisdictions decided to identify a representative to cooperate on the planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction.

## *Planning Committee Meetings*

The following people participated in planning committee meetings, volunteered time, or responded to elements of the Lewis County Multi – Hazard Mitigation Plan's preparation. Many participants served on the committee as dual representatives of more than one jurisdiction.

**Lewis County Participants:**
*Indicates Adopting Jurisdiction

- *Brian Brokop ..... Lewis County Sheriff's Office (Sheriff)
- Butch Renshaw ..... Kamiah Highway District
- *Carroll Keith ..... Lewis County Board of Commissioners
- *Chuck Doty..... Lewis County Board of Commissioners
- *Dale Schneider..... City of Kamiah (Mayor)
- *Dave Hasz ..... Lewis County Emergency Management
- *Debbie Evans ..... City of Kamiah

- *Don Davis ..... Lewis County Board of Commissioners
- *Julia Stapleton ..... Lewis County Emergency Management
- *Kimron Torgerson ..... Lewis County Prosecutor's Office
- *Lalisa Thomason ..... City of Craigmont
- *Leslie Snyder ..... Lewis County Assessor's Office (Assessor)
- *Pauline K. Malone ..... Lewis County Treasurer
- *Shelley Ponozzo ..... Lewis County Planning and Zoning Department (Coordinator)
- Brady Woodbury..... Idaho Public Health
- Debi Ruppe ..... Idaho Bureau of Homeland Security
- Matthew Dudley ..... Idaho Public Health
- Tera King ..... Northwest Management, Inc.
- Vaiden Bloch ..... Northwest Management, Inc.
- *Alesia Winner ..... Lewis County Sheriff's Office
- *LeAnn Trautman ..... City of Winchester
- Vickie Jackson ..... Kamiah School District
- Katherine Rawden ..... National Weather Service
- Jim Pratt..... Idaho Transportation Department
- *Rick Lamb..... Lewis County Planning and Zoning
- Ryan Riggle ..... Idaho Public Health
- Tim Tevebaugh ..... Idaho Department of Lands
- Jeff Handel ..... Nez Perce Tribe
- Richard Broncheau ..... Nez Perce Tribe
- Alan Justeson ..... Amateur Radio Emergency Service
- *Kathy Jackson ..... City of Reubens
- David Justeson ..... Amateur Radio Emergency Service
- *Randy Moore ..... Winchester City and Rural Fire Department

### *Committee Meeting Minutes*

Regular committee meetings began in July of 2010 and continued through August 2010. The minutes of each planning committee meeting are included in Chapter 7.

## *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.

## *News Releases*

Under the auspices of the Lewis County Multi-Hazard Mitigation Planning Committee, news releases were submitted to area newspapers including the *Lewis County Herald* and the *Clearwater Progress*. The first press release informed the public that the Multi-Hazard Mitigation Plan process was taking place, who was involved, why it was important to Lewis County, and who to contact for more information. The second press release was in the form of a flyer announcing the public meeting dates and venues, which was submitted to the newspapers as well as distributed to local businesses by committee members. The third press release provided information regarding the public comment period including where hardcopies of the draft could be viewed and instructions on how to submit comments. The following is an example of one of the announcements that ran in the local newspaper.

**Figure 2.1. Press Release #1.**

**LEWIS COUNTY SET TO UPDATE HAZARD RISK PLAN**

Nezperce, Idaho – Lewis County has launched a project to update the Lewis County Multi-Hazard Mitigation Plan. Local agencies and organizations in Lewis County have created a committee to complete the required 5-year update of the document as part of the FEMA Pre-Disaster Mitigation program.

The planning update will include risk analyses, vulnerability assessments, and mitigation recommendations for the hazards of flood, landslide, severe weather, wildland fire, earthquake, and terrorism/civil unrest.

Northwest Management, Inc. has been retained by Lewis County to provide risk assessments, hazard mapping, field inspections, interviews, and to collaborate with the planning committee to update the Plans. The committee includes representatives from local communities, rural and wildland fire districts, state and federal agencies, highway districts, private landowners, area businesses, various Lewis County departments, and others. One of the goals the planning process will be to increase the participating jurisdictions' eligibility for additional grants that will help minimize the risk and potential impact of disaster events. The planning team will be conducting a public meeting to discuss preliminary findings and to seek public input on the Plans' recommendations. This public meeting will be held on August 16, 2010, at 3:00p.m. in the District Courtroom at the Lewis County Courthouse, 510 Oak Street, Nezperce, Idaho.

Once completed, the updated draft Plans will be available at http://www.lewiscountyid.us/ for public review and comment. The completed document can also be accessed or comments can be submitted by contacting Dave Hasz, Lewis County Emergency Management Coordinator, at (208) 937-2380 or by email at dhasz@lewiscountyid.org.

## *Public Meetings*

A public meeting was scheduled at the County Courthouse during the hazard assessment phase of the planning process. The meeting focused on sharing information regarding the planning process, presenting

details of the preliminary risk and vulnerability assessments, and discussing potential mitigation strategies. The public meeting announcement was sent to the local newspapers and distributed by committee members. A sample of the flyer is included below in Figure 2.2.

**Figure 2.2. Public Meeting Flyer.**

**Lewis County**

**Multi - Hazard Mitigation Plan**

**Public Meeting!**

**August 16th: Lewis County Courthouse at 3pm**
**Nezperce, Idaho**

These public meetings will address the **Multi - Hazard Mitigation Plan** being updated for Lewis County, which is required every 5 years. These meetings are open to the public and will include a slideshow presentation from Northwest Management, Inc and the planning team on the identified hazards and potential risk reduction projects in Lewis County. Public input is being sought in order to better frame the region's efforts for hazard reduction projects, wildland fire protection, resource enhancements, and emergency preparedness.

Each meeting will last approximately 1 hour.

Learn about the assessments for flood, landslides, severe weather, wildland fire, earthquake, and terrorism or civil unrest.

Discuss *YOUR* priorities for how local communities can best reduce the impacts of these events.

*Flood damage on Mission Creek - Spring 2010*

*Church Canyon Fire - Summer 2006*

For more information on the Lewis County Multi-Hazard Mitigation Plan, please contact Lewis County Emergency Manager, Dave Hasz, at 208-937-2380.

The slideshow presentation used during the public meetings is included in Chapter 7.

## *Public Comment Period*

A public comment period was conducted from January 12th thru January 31st, 2011 to allow members of the general public an opportunity to view the full draft plan and submit comments and any other input to the committee for consideration. A press release was submitted to the local media outlets announcing the comment period, the location of Plan for review, and instructions on how to submit comments. Hardcopy drafts were printed and made available at the Lewis County Courthouse and city halls in Nezperce, Craigmont, Kamiah, Winchester, and Reubens. Each hardcopy was accompanied by a letter of instruction for submitting comments to the planning committee. Most of these communities retained the hardcopy draft well beyond the actual comment period with the anticipation that anyone coming into their offices would have the opportunity to ask questions regarding the Plan or provide input.

### Web Posting

The draft plan was also posted for public review on the Lewis County website homepage during the official public comment period. Instructions for submitting public input as well as local project contact numbers were also provided on the webpage.

### *Continued Public Involvement*

Lewis County is dedicated to involving the public directly in review and updates of this Multi - Hazard Mitigation Plan. The Lewis County Commissioners, through the planning committee, are responsible for the annual review and update of the plan as recommended in the Chapter 6, "Mitigation Strategy" section of this document.

The public will have the opportunity to provide feedback about the Plan annually on the anniversary of the adoption at a meeting of the County Board of Commissioners. Copies of the Plan will be kept at the County Courthouse. The Plan also includes contact information for Lewis County Emergency Management, which is responsible for keeping track of public comments.

A public meeting will also be held as part of each annual evaluation or when deemed necessary by the planning committees. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the Plan. The County Commissioner's Offices will be responsible for using County resources to publicize the annual meetings and maintain public involvement through the Counties' webpage and local newspapers.

## *Documented Review Process*

Review and comment on this Plan has been provided through a number of avenues for the committee members as well as for members of the general public.

During regularly scheduled committee meetings, the committee met to discuss findings, review mapping and analysis, and provide written comments on draft sections of the document. During the public meetings attendees observed map analyses, photographic collections, discussed general findings from the community assessments, and made recommendations on potential project areas.

Sections of the draft Plan were delivered to the planning committee members during the regularly scheduled committee meetings and emailed to the committee the following day. The completed first draft of the document was presented to the committee during the August 2010 planning committee meeting for full committee review. The committee spent several weeks proofreading and editing sections of the draft. Once the committee's review was completed, the draft document was released for public review on January 12th, 2011. The public review period remained open until January 31st, 2011.

## *Plan Monitoring and Maintenance*

As part of the policy of Lewis County, in relation to this planning document, this entire Multi - Hazard Mitigation Plan should be reviewed annually (from date of adoption) at a special meeting of a joint planning committee, open to the public and involving all jurisdictions, where action items, priorities, budgets, and

modifications can be made or confirmed. Lewis County Emergency Management (or an official designee) 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.

Complete re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following. The documented 5-year updates must be submitted to the State Hazard Mitigation Officer at the Idaho Bureau of Homeland Security for official review and FEMA approval.

### *Annual Review Agenda*

The focus of the planning committee at the annual review meeting should include at least 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 emergency response organization.
- Add a section to note accomplishments or current mitigation projects.
- All action items in Chapter 6 will need updated as projects are completed and as new needs or issues are identified.
- Address Emergency Operations Plans – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate the County's EOP into the action items for the regional MHMP?
- Address Updated County Comprehensive Land Use Plans – how can we dovetail the two plans to make them work for each other? Specifically, how do we incorporate Lewis County's revised Comprehensive Plan into the action items for the regional MHMP?
- Incorporate additional hazard chapters as funding allows.

All meeting minutes, press releases, and other documentation of revisions should be kept on record by Lewis County Emergency Management.

### *Five Year Re-evaluation Agenda*

FEMA requires that this Plan be updated every 5 years. The planning process associated with the update should mirror the original process including documentation of the planning committee activities, evaluation of participating jurisdictions, provisions for public involvement, and a formal draft review process at the committee, local, State, and FEMA levels. The updated draft Plan must be submitted to the State Hazard Mitigation Officer with all of the requirements in the FEMA Local Hazard Mitigation Plan Crosswalk completed.

The focus of the planning committee at the five year re-evaluation 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 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 Lewis County Emergency Management.

# Chapter 3

## Community Profile

IN THIS SECTION:

- Community Characteristics
- Overview of Emergency Management System
- Regional Hazard Profile

# Chapter 3 – Community Profile

## Lewis County Characteristics

Lewis County was established on March 3, 1911 with its county seat at Nezperce. Lewis County, Idaho is in the southwestern part of the Idaho Panhandle and borders Nez Perce, Clearwater, and Idaho Counties. Major population centers in the area are Craigmont, Kamiah, Nezperce, Reubens and, Winchester. Lewis County is located primarily on the Camas Prairie and thus contains highly productive agricultural lands. A large part of the area found within Lewis County is cultivated with the main crops being wheat, barley, and peas. Woodland areas are mostly in the higher rainfall zones and on the steep canyon slopes that drain into the Clearwater River. Rangeland predominates on the flat benches that overlook the Clearwater canyon in the northern portion of the county and throughout the more gentle topography found throughout the southern portion of the County. Elevation ranges from about 1,183 feet above sea level near Kamiah to approximately 4,700 feet near the Hoover Point area.

### *Geography and Climate*

The geography, topography, climate, and other natural attributes such as vegetation vary significantly across Lewis County. The geographic diversity of Lewis County is an important factor to consider in multi-hazard mitigation planning.

The climate in Lewis County is moderate. The highest average daily temperature occurs in July and is approximately 74 degrees Fahrenheit (F) in Kamiah and near 61 degrees on the Camas Prairie. The lowest average daily temperature occurs in January and is approximately 15degrees (F) on the Camas Prairie and near 34 degrees in Kamiah. The average annual rainfall ranges from 21 to 24 inches. Average monthly precipitation varies from about 1 inch in July and August to approximately 2.8 inches in March, April and May. Average annual snowfall ranges from about 16 inches in Kamiah to approximately 96 inches in Winchester.

### *Demographics*

Lewis County reported a total population of 3,747 in 2000 with approximately 1,795 housing units. Lewis County has five incorporated communities; Craigmont (pop. 540), Winchester (pop. 302), Nezperce (pop. 504), Reubens (pop. 72), and part of Kamiah (pop. 1,160). The Kamiah Airport lies in Idaho County, Idaho, but the rest of the population and city limits of Kamiah are in Lewis County. The total population for the county increased 6.6% from 1990 to 2000. The total land area of the county is roughly 479.81 square miles (306,624 acres).

Lewis County was established March 3, 1911, with its county seat at Nezperce, where it remains to this day. Lewis County was named after Meriwether Lewis of the Lewis and Clark Expedition. This area was home to the Nez Perce Indians for many centuries prior to the discovery of gold. The Dawes General Allotment Act was enacted by the U.S. Congress and signed into law on February 8, 1887. The Dawes

Act had an emphasis of individual land ownership on reservations, creating the "checkerboard pattern" of ownership seen on the Nez Perce Reservation today; thus, having a negative impact on the unity, self government, and culture of the Nez Perce Tribe. Table 3.1 summarizes some relevant demographic statistics for Lewis County.

**Table 3.1. Selected Demographic Statistics.**

| Subject | Number | Percent |
|---|---|---|
| Total population | 3,747 | 100.0 |
| | | |
| **SEX AND AGE** | | |
| **Male** | 1,891 | 50.5 |
| **Female** | 1,856 | 49.5 |
| **Median age (years)** | 42.5 | (X) |
| | | |
| **RELATIONSHIP** | | |
| **In households** | 3,713 | 99.1 |
| **Householder** | 1,554 | 41.5 |
| **Spouse** | 898 | 24.0 |
| **Child** | 1,013 | 27.0 |
| **Under 18 years** | 55 | 1.5 |
| **Non-relatives** | 138 | 3.7 |
| | | |
| **HOUSEHOLDS BY TYPE** | | |
| **Households** | 1,554 | 100.0 |
| **Family households (families)** | 1,050 | 67.6 |
| **With own children under 18 years** | 428 | 27.5 |
| **Married-couple family** | 898 | 57.8 |
| **Average household size** | 2.39 | (X) |
| **Average family size** | 2.92 | (X) |

## *Socioeconomics*

Lewis County had a total of 1,795 housing units and a population density of 7.8 persons per square mile reported in the 2000 Census. Ethnicity in Lewis County is distributed: white 92.2%, black or African American 0.3%, American Indian or Alaskan Native 3.8%, Hispanic or Latino 1.9%, or some other race 1.8%.

Specific economic data for individual communities is collected by the US Census; in Lewis County this includes Craigmont, Nezperce, Reubens, Winchester and the part of Kamiah in Lewis County. The community of Kamiah is shared between Lewis and Idaho Counties, although the main city center and the majority of residences are within Lewis County. Lewis County households earn a median income of $31,413 annually. In 2000, Craigmont, Nezperce, and Winchester had median household incomes of $33,333, $37,697, and $35,875, respectively, which were all above the County median income during the same period. The city of Kamiah (within Lewis County) had a median household income of $26,000

in 2000, which is approximately 17% below the Lewis County median income during the same period. No income information was available for the community of Reubens.

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 Lewis County, a significant number of families are at or below the poverty level. Approximately 8.7% of Lewis County families are below poverty level.[6]

**Table 3.2. Poverty Status Statistics in 1999.**

| | Number | Percent |
|---|---|---|
| **Families** | 93 | (X) |
| **Percent below poverty level** | (X) | 8.7 |
| **With related children under 18 years** | 67 | (X) |
| **Percent below poverty level** | (X) | 14 |
| | | |
| **Individuals** | 447 | (X) |
| **Percent below poverty level** | (X) | 12.0 |
| **18 years and over** | 320 | (X) |
| **Percent below poverty level** | (X) | 11.4 |
| **65 years and over** | 62 | (X) |
| **Percent below poverty level** | (X) | 9.0 |
| **Related children under 18 years** | 119 | (X) |
| **Percent below poverty level** | (X) | 12.9 |

The unemployment rate was 4.9% in Lewis County in 1999, compared to 4.4% nationally during the same period. Approximately 15.5% of the Lewis County employed population worked in natural resources with much of the indirect employment relying on the employment created through these natural resource occupations. Approximately 61% of Lewis County's employed persons are private wage and salary workers, while around 22% are government workers.[7]

[6] U.S. Census Bureau. 2000. American Fact Finder. Available online at http://factfinder.census.gov/home/saff/main.html?_lang=en.

[7] U.S. Census Bureau. 2000. American Fact Finder. Available online at http://factfinder.census.gov/home/saff/main.html?_lang=en.

| Table 3.3. Occupation and Industry | | |
|---|---|---|
| | Number | Percent |
| **OCCUPATION** | | |
| **Management, professional, and related occupations** | 438 | 28.9 |
| **Service occupations** | 285 | 18.8 |
| **Sales and office occupations** | 272 | 18.0 |
| **Farming, fishing, and forestry occupations** | 81 | 5.4 |
| **Construction, extraction, and maintenance occupations** | 154 | 10.2 |
| **Production, transportation, and material moving occupations** | 284 | 18.8 |
| | | |
| **INDUSTRY** | | |
| **Agriculture, forestry, fishing and hunting, and mining** | 234 | 15.5 |
| **Construction** | 99 | 6.5 |
| **Manufacturing** | 189 | 12.5 |
| **Wholesale trade** | 70 | 4.6 |
| **Retail trade** | 160 | 10.6 |
| **Transportation and warehousing, and utilities** | 71 | 4.7 |
| **Information** | 20 | 1.3 |
| **Finance, insurance, real estate, and rental and leasing** | 54 | 3.6 |
| **Professional, scientific, management, administrative, and waste management services** | 59 | 3.9 |
| **Educational, health and social services** | 260 | 17.2 |
| **Arts, entertainment, recreation, accommodation and food services** | 112 | 7.4 |
| **Other services (except public administration)** | 77 | 5.1 |
| **Public administration** | 109 | 7.2 |

## *Natural Resources*

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

### Biota

Fish and Wildlife – Lewis County is home to a diverse array of fish and wildlife species. Lewis County streams provide habitat for salmon and steelhead, including populations that are listed as threatened

under the federal Endangered Species Act.  Forestlands and interface areas are important habitat for many species of birds and mammals.

Vegetation - In the early 1800s (pre-European settlement), the landscape in Lewis County was strikingly different than that which is seen today. Conditions mirrored those found throughout the Palouse region and northern Idaho. At that time the major vegetation types which occurred in the area were prairie grasslands, meadows, riparian forest and wetlands, open woodland and upland forest. Open grasslands dominated the vegetation throughout portions of Lewis County.  Isolated groves of trees within this area were primarily ponderosa pine and Douglas-fir. Throughout the central portion of the County forested lands intermingled with meadows and prairies ultimately giving way to a forest dominated landscape throughout the eastern portion of the County.  The forested areas contained a wide diversity of tree species the most predominant of which were ponderosa pine, Douglas-fir, lodgepole pine, western larch, western white pine, grand fir, and western red cedar.

Vegetation in Lewis County is a mix of forestland, riparian, and agricultural ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The most represented vegetated cover type is agricultural land at approximately 46.6% of the total area. The next most common vegetation cover type represented is ponderosa pine forest at 12.4%. Mixed xeric forests and foothills grasslands each represent approximately 5.9% and 5.2% respectively

| Table 3.4. Vegetative Cover Types. | | |
|---|---|---|
| | Acres | Percent of Area |
| Agricultural land | 184,552 | 46.6% |
| Ponderosa Pine | 48,911 | 12.4% |
| Mixed Xeric Forest | 23,484 | 5.9% |
| Foothills Grassland | 20,539 | 5.2% |
| Douglas-fir | 17,249 | 4.4% |
| Warm Mesic Shrubs | 15,418 | 3.9% |
| Mixed Mesic Forest | 15,288 | 3.9% |
| Exposed Rock | 12,520 | 3.2% |
| Douglas-fir/Grand Fir | 12,318 | 3.1% |
| Western Red Cedar/Grand Fir Forest | 8,500 | 2.1% |
| Montane Parklands and Subalpine Meadow | 7,902 | 2.0% |
| Western Red Cedar | 7,557 | 1.9% |
| Shrub Dominated Riparian | 4,574 | 1.2% |
| Maple | 3,237 | 0.8% |
| Grand Fir | 3,007 | 0.8% |
| Graminoid or Forb Dominated Riparian | 2,710 | 0.7% |
| Disturbed Grassland | 1,897 | 0.5% |
| Needleleaf/Broadleaf Dominated Riparian | 1,756 | 0.4% |
| Water | 1,641 | 0.4% |
| Urban | 1,075 | 0.3% |
| Curlleaf Mountain Mahogany | 989 | 0.3% |
| Needleleaf Dominated Riparian | 478 | 0.1% |
| Mixed Barren Land | 21 | 0.0% |
| Cloud Cover, actual not determined | 8 | 0.0% |

## Hydrology

Lewis County is located in one of Idaho's fastest growing regions and depends heavily on groundwater for private wells, public drinking water, irrigation, industrial operations, and other beneficial uses.

The Idaho Water Resource Board (IWRB) 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.[8] The Idaho Department of Water Resources has prepared General Lithologies of the Major Ground Water Flow Systems in Idaho. The majority of Lewis County has not been designated by the IWRB as a ground water system. 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.

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

**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.[9]

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the Organization for Air Quality Protection Standards (OAQPS) is responsible for setting the NAAQS standards 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.[10] In Lewis County, air quality and smoke management is regulated with permits being administered by the Nez Perce Tribe's Environmental Restoration and Waste Management Division and Air Quality Program on the Reservation and by the Idaho Department of Environmental Quality outside of the Reservation.

Smoke emissions from fires potentially affect an area and the airsheds that surround it. Climatic conditions affecting air quality in 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. 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. In Lewis County, winds are generally from a southwesterly direction throughout the year. Air quality in the area and surrounding airshed is generally good to excellent. However, locally adverse conditions can result from occasional wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months.

Air quality measurement stations juxtaposed near Lewis County include Kamiah, Grangeville (16 miles to the southeast), Moscow (31 miles to the northwest), and Lewiston (13 miles to the northwest).

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

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

## *Development Trends*

Lewis County, a predominantly agriculture-based economy, has shown a long-term population trend downward. Factors that have contributed to population decline include agricultural mechanization and modernization and access to education and employment opportunities. Down from 6,000 residents in 1920, the population estimate for 2005 is 3,600. Lewis County is the 7th least populated county in the state. Shorter term cycles since 1970 have seen a fluctuation in population. Like most rural communities in Idaho, Lewis County lost substantial population in the 1980's with the statewide recession and subsequent out-migration of younger, working-age people. While the population projections during the 1990's indicated an overall population recovery, the actual Census Bureau count of 2000 showed that the population decline in Lewis County had continued.[11]

The two largest communities, Craigmont and Kamiah, only had moderate population growths of 2.6% and 0.3% respectively between 1990 and 2000. On the other hand, the population of the more rural communities of Nezperce, Reubens, and Winchester, grew by 15.5%, 56.5%, and 16.6%, respectively (Census 2000). This may suggest that people immigrating to Lewis County or current residents moving within the county are choosing to establish homes in the smaller, more rural localities.

## *Overview of Emergency Response System*

Lewis County has a broad base of emergency response organizations and personnel. In many cases, the Lewis County Sheriff, local police in Kamiah, fire departments, and ambulance services are the first to respond to an incident; however, there are a variety of other agencies and organizations that are available to assist during a hazard event. In most cases, an extended disaster event will require coordination with all of the available resources. .

Emergency medical services, fire, and all law enforcement is dispatched through the Lewis County Sheriff's Office. The county is in the process of changing its basic 911 service to Enhanced 911. Subsequent updates to the 911 system will include Phase I, Phase II, and eventually Next Generation 911. This will be used for all emergency communications. Lewis County is also in the process of updating and creating a broadband network within the county for Web EOC, video conferencing, and other broadband uses.

The Lewis County Sheriff's Office, the Kamiah Marshal's Office, and Nez Perce Tribal Police currently provide law enforcement in Lewis County with occasional assistance from the FBI, Idaho State Police, and Idaho Fish and Game. The Kamiah Rural Fire District, Nezperce Rural Fire District, Idaho Department of Lands, and the Bureau of Land Management provide fire protection services. Additionally, each community maintains a resident volunteer fire department. The Nezperce Ambulance and Kamiah Ambulance provide Advanced EMT services. Quick response units are located in Craigmont and Winchester. Life Flight (Lewiston), Med Star ( Spokane), and Back Country Rescue (Orofino) provide helicopter ambulance services. Lewis County also has a Search and Rescue Team.

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[11] Lewis County, Idaho. 2009. Lewis County Comprehensive Plan. Nezperce, Idaho.

Mutual aid agreements have been made between each of the local fire districts and the Idaho Department of Lands to supplement resources of a fire agency or district during a time of critical need. Mutual aid is given only when equipment and resources are available.

## *Regional Hazard Profile*

Data was collected from a variety of sources for developing Lewis County's hazard profile. SHELDUS is a county-level hazard data set for the U.S. for 18 different natural hazard event types such thunderstorms, hurricanes, floods, wildfires, and tornados. For each event, the database includes the beginning date, location (county and state), property losses, crop losses, injuries, and fatalities that affected each county.

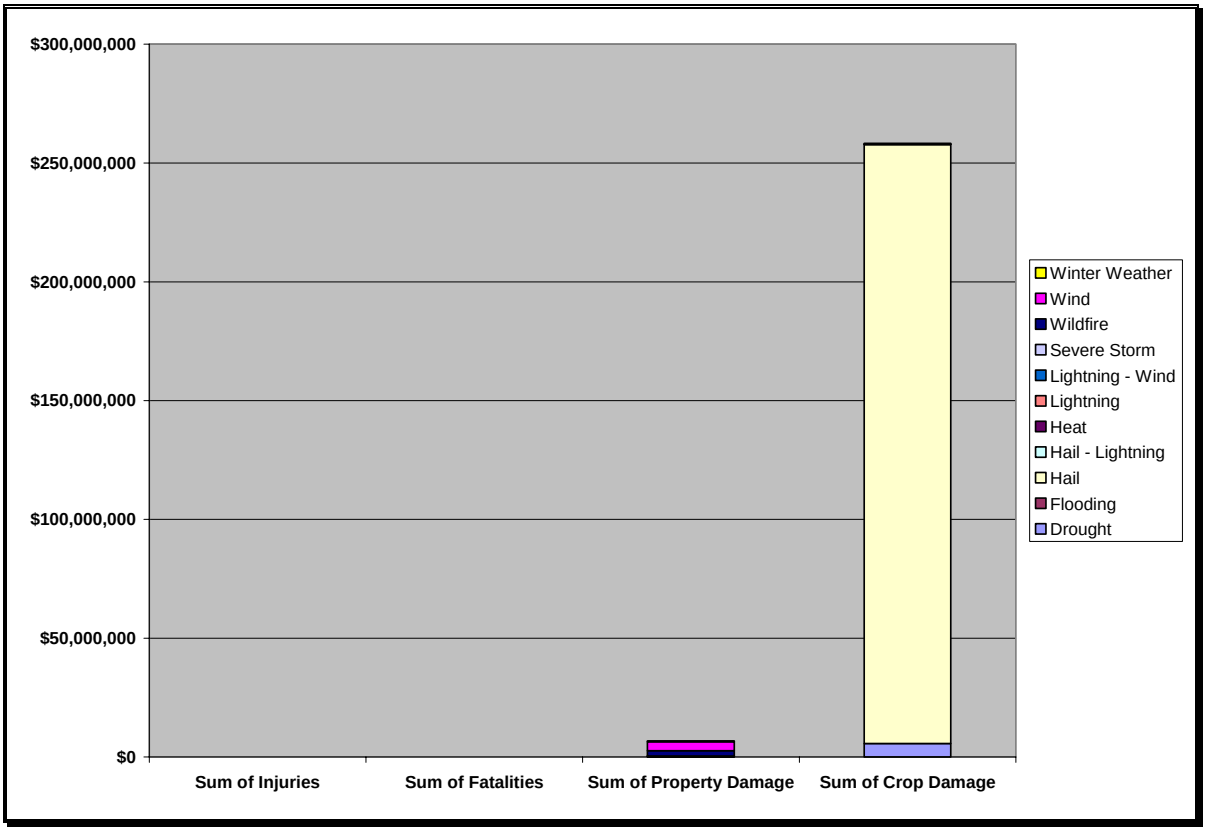
The data were derived from several existing national data sources such as National Climatic Data Center's monthly Storm Data publications and NGDC's Tsunami Event Database. With the release of SHELDUS 7.0, the database includes every loss causing and/or deadly event between 1960 through 1975 and from 1995 onward. Between 1976 and 1995, SHELDUS reflects only events that caused at least one fatality or more than $50,000 in property or crop damages.

Prior to 2001, property and crop losses occurring on the same day within the same geography (i.e. county) are aggregated by hazard type. For events that covered multiple counties, the dollar losses, deaths, and injuries were equally divided among the counties (e.g. if 4 counties were affected, then each was given 1/4 of the dollar loss, injuries and deaths). Where dollar loss estimates were provided in ranges (e.g. $50,000 - 100,000) - such as in NCDC Storm data until 1995 - the lowest value in the range of the category was used. This results in the most conservative estimate of losses during the time period of 1960-1995. Since 1995 all events that were reported by the National Climatic Data Center (NCDC) with a specific dollar amount included in the database.[12]

It is important to keep in mind that the SHELDUS database does not include every hazard event that occurred within an area. Only those events that met a specific reporting criterion as explained above are listed. This means that many local events are not included in this database. Some of the missing events are considered to be major local hazard events such as the 1996 and 1997 flood events that caused some of the worst damages in decades and was declared a State Disaster.

[12] HVRI. Natural Hazards Losses 1960-2008 (SHELDUS). Hazards &Vulnerability Research Institute. University of South Carolina. Columbia, South Carolina. Available online at http://webra.cas.sc.edu/hvri/. February 2010.

**Figure 3.1. Summary of SHELDUS Hazard Profile.**



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# Chapter 4

## Hazard Profiles

IN THIS SECTION:

- Flood Annex
- Earthquake
- Landslide Annex
- Severe Weather Annex
- Wildland Fire Annex

# Chapter 4 – Hazard Profiles

## Regional and Local Hazard Profiles

### *Flood*

Floods have been a serious and costly natural hazard affecting Lewis County. Floods damage roads, farmlands, and structures, often disrupting lives and businesses. Simply put, flooding occurs when water leaves the river channels, lakes, ponds, and other confinements where we expect it to stay. Flood-related disasters occur when human property and lives are impacted by flood waters. An understanding of the role of weather, runoff, landscape, and human development in the floodplain is therefore the key to understanding and controlling flood-related disasters. Presidential Disaster declarations related to flooding were made for Idaho in 1956, 1957, 1961, 1962, 1963, 1964, 1972, 1974, 1984, 1996, 1997, 2005, 2006, and 2008.

Natural flood events are grouped into three general categories:

**Riverine flooding** includes those events that are classically thought of as flooding; i.e., a gradual rise of volume of a stream until that stream exceeds its normal channel and spills onto adjacent lands. Such events are generally associated with major meteorological events: spring runoff, winter rain/snowmelt events, and ice jams. Riverine floods typically have low velocities, affect large land areas, and persist for a prolonged period.

In contrast, **flash floods** may have a higher velocity in a smaller area and may recede relatively quickly. Such floods are caused by the introduction of a large amount of water into a limited area (e.g., extreme precipitation events in watersheds less than 50 square miles), crest quickly (e.g., eight hours or less), and generally occur in hilly or otherwise confined terrain. Steep mountainous terrain in Idaho is particularly susceptible to flash floods and debris flows which can occur within thirty (30) minutes of the onset of heavy rain. Flash floods occur in both urban and rural settings, principally along smaller rivers and drainage ways that do not typically carry large amounts of water.

Occasionally, floating ice or debris can accumulate at a natural or man-made obstruction and restrict the flow of water. **Ice and debris jams** can result in two types of flooding:

- Water held back by the ice jam or debris dam can cause flooding upstream, inundating a large area and often depositing ice or other debris which remains after the waters have receded. This inundation may occur well outside of the normal floodplain.
- High velocity flooding can occur downstream when the jam breaks. These flood waters can have additional destructive potential due to the ice and debris load that they may carry.[13]

[13] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

The most commonly reported flood magnitude measure is the "base flood." This is the magnitude of a flood having a one-percent chance of being equaled or exceeded in any given year. Although unlikely, "base floods" can occur in any year, even successive ones. This magnitude is also referred to as the "100-year Flood" or "Regulatory Flood" by State government. Floods are usually described in terms of their statistical frequency. A "100-year flood" or "100-year floodplain" describes an event or an area subject to a 1% probability of a certain size flood occurring in any given year. This concept does not mean such a flood will occur only once in one hundred years. Whether or not it occurs in a given year has no bearing on the fact that there is still a 1% chance of a similar occurrence in the following year. Since floodplains can be mapped, the boundary of the 100-year flood is commonly used in floodplain mitigation programs to identify areas where the risk of flooding is significant. Any other statistical frequency of a flood event may be chosen depending on the degree of risk that is selected for evaluation, e.g., 5-year, 20-year, 50-year, 500-year floodplain.

The areas adjacent to the channel that normally carry water are referred to as the floodplain. In practical terms, the floodplain is the area that is inundated by flood waters. In regulatory terms, the floodplain is the area that is under the control of floodplain regulations and programs (such as the National Flood Insurance Program which publishes the FIRM maps). The floodplain is often defined as:

*"That land that has been or may be covered by floodwaters, or is surrounded by floodwater and inaccessible, during the occurrence of the regulatory flood."*[14]

Winter weather conditions are the main driving force in determining where and when base floods will occur. The type of precipitation that a winter storm produces is dependent on the vertical temperature profile of the atmosphere over a given area. Lewis County experiences riverine flooding from two distinct types of meteorological events; spring runoff and winter rain-on-snow events.

The major source of flood waters in Lewis County is normal spring snow melt. As spring melt is a "natural" condition, the stream channel is defined by the features established during the average spring high flow (bank-full width). Small flow peaks exceeding this level and the stream's occupation of the floodplain are common events.

Unusually heavy snow packs or unusual spring temperature regimes (e.g. prolonged warmth) may result in the generation of runoff volumes significantly greater than can be conveyed by the confines of the stream and river channels. Such floods are often the ones that lead to widespread damage and disasters. Floods caused by spring snow melt tend to last for a period of several days to several weeks, longer than the floods caused by other meteorological sources.

Floods that result from rainfall on frozen ground in the winter, or rainfall associated with a warm, regional frontal system that rapidly melts snow at low and intermediate altitudes (rain-on-snow) can be the most severe. Both of these situations quickly introduce large quantities of water into the stream channel system, easily overloading its capacity.

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[14] FEMA. Federal Emergency Management Agency. National Flood Insurance Program. Washington D.C. Available online at www.fema.gov.

On small drainages, the most severe floods are usually a result of rainfall on frozen ground but with moderate quantities of warm rainfall on a snow pack, especially for one or more days, can also result in rapid runoff and flooding in streams and small rivers. Although meteorological conditions favorable for short-duration warm rainfall are common, conditions for long-duration warm rainfall are relatively rare. Occasionally, however, the polar front becomes situated along a line from Hawaii through Oregon, and warm, moist, unstable air moves into the region.

In general, the meteorological factors leading to flooding are well understood. They are also out of human control, so flood mitigation must address the other contributing factors.

The nature and extent of a flood event is the result of the hydrologic response of the landscape. Factors that affect this hydrologic response include soil texture and permeability, land cover and vegetation, land use and land management practices. Precipitation and snow melt, known collectively as runoff, follow one of three paths, or a combination of these paths, from the point of origin to a stream or depression: overland flow, shallow subsurface flow, or deep subsurface ("ground water") flow. Each of these paths delivers water in differing quantities and rates. The character of the landscape will influence the relative allocation of the runoff and will, accordingly, affect the hydrologic response.

Unlike precipitation and ice formation, steps can be taken to mitigate flooding through manipulation or maintenance of the floodplain. Insufficient natural water storage capacity and changes to the landscape can be offset through water storage and conveyance systems that run the gamut from highly engineered structures to constructed wetlands.

Careful planning of land use can build on the natural strengths of the hydrologic response. Re-vegetation of burned slopes diverts overland flow (fast and flood producing) to subsurface flow (slower and flood moderating). Details on rehabilitating burned areas to reduce flash floods, debris flows and landslides can be found in the Landslide chapter of this document.

Floods generally come with warnings and flood waters rarely go where they are totally unexpected by experts. Those warnings are not always heeded, though, and despite the predictability, flood damage continues.

The failure to recognize or acknowledge the extent of the natural hydrologic forces in an area has led to development and occupation of areas that can clearly be expected to flood on a regular basis. Despite this, communities are often surprised when the stream leaves its channel to occupy its floodplain. A past reliance on structural means to control floodwaters and "reclaim" portions of the floodplain has also contributed to inappropriate development and continued flood-related damages.

Unlike the weather and the landscape, this flood-contributing factor can be controlled. Development and occupation of the floodplain places individuals and property at risk. Such use can also increase the probability and severity of flood events (and consequent damage) downstream by reducing the water storage capacity of the floodplain, or by pushing the water further from the channel or in larger quantities downstream.

There are three types of flash flooding:

- Extreme precipitation and runoff events
- Inadequate urban drainage systems overwhelmed by small intense rainstorms
- Dam failures

***Debris flows*** are hazards that are closely related to flash floods, triggered by heavy rainfall, are more commonly considered as a type of earth movement (a —geological hazard).

***Extreme Precipitation and Runoff Events:*** Events that may lead to flash flooding include:

- Significant rainfall and/or snowmelt on frozen ground in the winter and early spring months.
- High intensity thunderstorms, usually during the summer months.
- Rainfall onto burn areas (such as those affected by wildfire) where high heat has caused the soil to become hydrophobic or water repellent which dramatically increases runoff potential during rain. The 2007 fire season saw approximately 2 million acres burn in Idaho. Much of the burned terrain will have water repellent soils for the next 2 to 4 years and higher probability of experiencing flash floods and debris flows than it normally would.

Flash floods from thunderstorms do not occur as frequently as those from general rain and snowmelt conditions but are far more severe. The onset of these flash floods varies from slow to very quick and is dependent on the intensity and duration of the precipitation and the soil types, vegetation, topography, and slope of the basin. When intensive rainfall occurs immediately above developed areas, the flooding may occur in a matter of minutes. Sandy soils and sparse vegetation, especially recently burned areas, are conducive to flash flooding. Mountainous areas are especially susceptible to damaging flash floods, as steep topography may stall thunderstorms in a limited area and may also funnel runoff into narrow canyons, intensifying flow. A flash flood can, however, occur on any terrain when extreme amounts of precipitation accumulate more rapidly than the terrain can allow runoff. Flash floods are most common in Idaho in the spring and summer months due to thunderstorm activity.[15]

Flooding from ice jams is relatively common in Idaho. Ice jam formation depends on air temperature and physical conditions in the river channel. Ice cover on a river (a precursor to the ice jam) is formed when water reaches the freezing point and air temperature is sub-freezing; large quantities of ice are produced, flow downstream, and consolidate.

An ice jam is a stationary accumulation of ice that restricts flow. Ice jams can cause considerable increases in upstream water levels, while at the same time downstream water levels may drop, exposing water intakes for power plants or municipal water supplies. Types of ice jams include freezeup jams, made primarily of frazil ice; breakup jams, made primarily of fragmented ice pieces; and combinations of both.

River geometries, weather characteristics, and floodplain land-use practices contribute to the ice jam flooding threat at a particular location. Ice jams initiate at a location in the river where the ice transport capacity or ice conveyance of the river is exceeded by the ice transported to that location by the river's flow.

[15] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

***Change in Slope:*** The most common location for an ice jam to form is in an area where the river slope changes from relatively steep to mild. Since gravity is the driving force for an ice run, when the ice reaches the milder slope, it loses its momentum and can stall or arch across the river and initiate an ice jam. Water levels in reservoirs often affect the locations of ice jams upstream as a result of a change in water slope where reservoir water backs up into the river. Islands, sandbars, and gravel deposits often form at a change in water slope for the same reasons that ice tends to slow and stop. Because such deposits form in areas conducive to ice jamming, they are often mistakenly identified as the cause of ice jams. While these deposits may affect the river hydraulics enough to cause or exacerbate an ice jam, the presence of gravel deposits is usually an indication that the transport capacity of the river is reduced for both ice and sediment. Ice jams located near gravel deposits should be carefully studied to determine whether the gravel deposit is the cause of the jam or a symptom of the actual cause.

***Confluences:*** Ice jams also commonly form where a tributary stream enters a larger river, lake, or reservoir. Smaller rivers normally respond to increased runoff more quickly than larger rivers, and their ice covers may break up sooner as a result of more rapid increases in water stage. Ice covers on smaller rivers will typically break up and run until the broken ice reaches the strong, intact ice cover on the larger river or lake, where the slope is generally milder. The ice run stalls at the confluence, forming a jam, and backing up water and ice on the tributary stream.

***Channel Features:*** Natural and constructed features in a river channel may play a role in the locations of ice jams. River bends are frequently cited as ice jam instigators. While river bends may contribute to jamming by forcing the moving ice to change its direction and by causing the ice to hit the outer shoreline, water slope is often a factor in these jams as well. Obstructions to ice movement, such as closely spaced bridge or dam piers, can cause ice jams. In high runoff situations, a partially submerged bridge superstructure obstructs ice movement and may initiate a jam. In smaller rivers, trees along the bank sometimes fall across the river causing an ice jam. Removing or building a dam may cause problems. In many parts of the country, small dams that once functioned for hydropower have fallen into disrepair. Communities may remove them as part of a beautification scheme or to improve fish habitat. However, the effects of an existing dam on ice conditions should be considered before removing or substantially altering it. It is possible that the old dams control ice by delaying ice breakup or by providing storage for ice debris. Dam construction can also affect ice conditions in a river by creating a jam initiation point. On the other hand, the presence of a dam and its pool may be beneficial if frazil ice production and transport decrease as a result of ice cover growth on the pool.[16]

The magnitude of most floods in Lewis County depend on the particular combinations of intensity and duration of rainfall, pre-existing soil conditions, area of a basin, elevation of the rain or snow level, and amount of snow pack. Man-made changes to a basin also can affect the size of floods. Although floods can happen at any time during the year, there are typical seasonal patterns for flooding in Lewis County, based on the variety of natural processes that cause floods:

[16] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

- Heavy rainfall on wet or frozen ground, before a snow pack has accumulated, typically cause fall and early winter floods
- Rainfall combined with melting of the low elevation snow pack typically cause winter and early spring floods
- Late spring floods in Lewis County result primarily from melting of the snow pack
- Spring and summer flooding resulting from heavy thunderstorms and large accumulations of water in short periods of time

## *Landslide*

Landslide is a general term for a wide variety of down slope movements of earth materials that result in the perceptible downward and outward movement of soil, rock, and vegetation under the influence of gravity. The materials may move by falling, toppling, sliding, spreading, or flowing. Some landslides are rapid, occurring in seconds, whereas others may take hours, weeks, or even longer to develop. Although landslides usually occur on steep slopes, they also can occur in areas of low relief. Landslides can occur as ground failure of river bluffs, cut and-fill failures that may accompany highway and building excavations, collapse of mine-waste piles, and slope failures associated with quarries and open-pit mines. While gravity is the primary reason for landslides, there can be other contributing factors, including:

- Saturation, by snowmelt or heavy rains, that weaken rock or soils on slopes
- Erosion by rivers, glaciers, or ocean waves that create over-steepened slopes
- Topography of slope – its shape, size, degree of slope and drainage
- Stress from earthquakes magnitude 4.0 and greater can cause weak slopes to fail
- Volcanic eruptions that produce loose ash deposits and debris flows
- Excess weight, from accumulation of rain or snow, from stockpiling of rock or ore, from waste piles, or from manmade structures, may stress weak slopes to failure
- Human action, such as construction, logging or road building that disturbs soils and slopes

Determining probability of future landslide events in specific locations is difficult because so many factors can contribute to the cause of a landslide or ground failure. Landslides typically occur on slopes and in areas where they have taken place before. Idaho's geology, landscape, climate, soils, and other factors are locally conducive to landslide activity and numerous landslides occur each year in Idaho. Many of these, though, are small events whose impacts are not well documented. The Idaho Geological Survey has identified and plotted over 3,000 major landslides in the state. Landslides are also included on local and regional geologic maps and other geologic sources.

There is no reliable estimate of total landslide costs and losses in Idaho, but these events are costly. For example, ongoing landslide problems magnify the challenges of maintaining U.S. 95, the primary north-south transportation link in the Panhandle region. It is often impossible to redirect traffic on this heavily traveled road as alternate routes do not exist and detours in steep terrain are difficult or impossible to construct. Landslides here disrupt emergency functions and commerce, as well as personal lives. Some of these impacts can be quantitatively measured (e.g. lost business) while others, such as disruption of families, is impossible to quantify.

Significant landslide events (those resulting in disasters) are rarer but several have been recorded in the State. Prior to 1976, major events had a significant impact on transportation, communities, and natural resources in 1919, 1934, 1948, 1964, 1968, and 1974.

**Figure 4.1. State Landslide Disaster Declarations 1976-2000.**

| Year | Month | Federal | Counties Affected |
|---|---|---|---|
| 1982 | July | | Boise |
| 1986 | February | | Boise |
| 1986 | March | | Boise, Elmore, Lewis, Nez Perce, Owyhee |
| 1991 | April | | Bonner |
| 1996-1997 | November - January | X | Adams, Benewah, Boise, Bonner, Boundary, Clearwater, Elmore, Gem, Idaho, Kootenai, Latah, Nez Perce, Owyhee, Payette, Shoshone, Valley, Washington |
| 1997 | March – June | X | Benewah, Bonner, Boundary, Kootenai, Shoshone* |
| 1998 | May | | Lemhi, Nez Perce, Washington |
| | October | | Boundary |
| 2000 | June** | | Kootenai |

Landslides range from shallow debris flows to deep-seated slumps. They destroy homes, businesses, and public buildings, undermine bridges, derail railroad cars, interrupt transportation infrastructure, damage utilities, and take lives. Sinkholes affect roads and utilities. Losses often go unrecorded because insurance claims are not filed, no report is made to emergency management, there is no media coverage, or the transportation damages are recorded as regular maintenance.

Land stability cannot be absolutely predicted with current technology. The best design and construction measures are still vulnerable to slope failure. The amount of protection, usually correlated to cost, is proportional to the level of risk reduction. Debris and vegetation management is integral to prevent landslide damages. Corrective measures help, but can often leave the property vulnerable to risk.

These are characteristics that may be indicative of a landside hazard area:

- Bluff retreat caused by sloughing of bluff sediments, resulting in a vertical bluff face with little vegetation.
- Pre-existing landside area.
- Tension or ground cracks along or near the edge of the top of a bluff.
- Structural damage caused by settling and cracking of building foundations and separation of steps from the main structure.
- Toppling bowed or jack sawed trees.
- Gullying and surface erosion.
- Mid-slope ground water seepage from a bluff face.

By studying the effects of landslides in slide prone areas we can plan for the future. More needs to be done to educate the public and to prevent development in vulnerable areas. Some hazards can be mitigated by engineering, design, or construction so that risks are acceptable. When technology cannot reduce the risk to acceptable levels, building in hazardous areas should be avoided.

The primary factors that increase landslide risk are slope and certain soil characteristics. In general, the potential for landslide occurrence intensifies as slope increases on all soil types and across a wide range of geological formations. Landslide may occur on slopes steepened by man during construction, or on natural ground never disturbed. However, most slides occur in areas that have had sliding in the past. All landslides are initiated by factors such as weaknesses in the rock and soil, earthquake activity, the occurrence of heavy snow or rainfall, or construction activity that changes a critical factor involved with maintaining stability of the soil or geology of the area. A prime example of this includes previously stable slopes where home construction utilizing independent septic systems are added. The increased moisture in the ground, when coupled with an impermeable layer below the septic systems has led to surface soil movements and mass wasting.

Landslides can be triggered by natural changes in the environment or by human activities. Inherent weaknesses in the rock or soil often combine with one or more triggering events, such as heavy rain, snowmelt, or changes in ground water level. Late spring-early summer is slide season, particularly after days and weeks of greater than normal precipitation. Long-term climate change may result in an increase in precipitation and ground saturation and a rise in ground-water level, reducing the shear strength and increasing the weight of the soil.

Stream and riverbank erosion, road building or other excavation can remove the toe or lateral slope and exacerbate landslides. Seismic or volcanic activity often triggers landslides as well. Urban and rural living with excavations, roads, drainage ways, landscape watering, logging, and agricultural irrigation may also disturb the solidity of landforms, triggering landslides. In general, any land use changes that affects drainage patterns or that increase erosion or change ground-water levels can augment the potential for landslide activity.

Landslides are a recurrent menace to waterways and highways and a threat to homes, schools, businesses, and other facilities. The unimpeded movement over roads—whether for commerce, public utilities, school, emergencies, police, recreation, or tourism—is essential to a normally functioning of Lewis County. The steep walls of the Clearwater River drainage pose special problems to Highway 12, the major travel route along the Clearwater River. The disruption and dislocation of this or any other routes in the canyon caused by landslides can quickly jeopardize travel and vital services.

## *Severe Weather*

Severe storms are a serious hazard that can and do affect Idaho on a regular basis. Severe storms affect the entire state with varying degrees, due to the complex landscape and the influence from the Pacific Ocean. Although Idaho's climate sees relatively few damaging storms in comparison with the rest of the nation, it still poses a significant hazard to the state and local communities. Storm-related Presidential Disaster declarations were made for Idaho in 1964, 1972, 1974, 1996, 1997, 2005, and 2006. Most of these storms resulted in flood damages.

Idaho lies entirely west of the Continental Divide, which forms its boundary for some distance westward from Yellowstone National Park. The northern part of the State averages lower elevations than the much larger central and southern portions, where numerous mountain ranges form barriers to the free flow of air from all points of the compass.

In the Idaho Panhandle, the main barrier is the rugged chain of Bitterroot Mountains forming much of the boundary between Idaho and Montana. The extreme range of elevation in the State is from 738 feet of the confluence of the Clearwater and Snake Rivers to 12,655 feet at Mt. Borah in Custer County. Comprising rugged mountain ranges, canyons, high grassy valleys, arid plains, and fertile lowlands, the State reflects in its topography and vegetation a wide range of climates. Located some 300 miles from the Pacific Ocean, Idaho is, nevertheless, influenced by maritime air borne eastward on the prevailing westerly winds. Particularly in winter, the maritime influences are noticeable in the greater average cloudiness, greater frequency of precipitation, and mean temperatures, which are above those at the same latitude and altitude in mid-continent. This maritime influence is most marked in the northern part of the State, where the air arrives via the Columbia River Gorge with a greater burden of moisture than at lower latitudes.

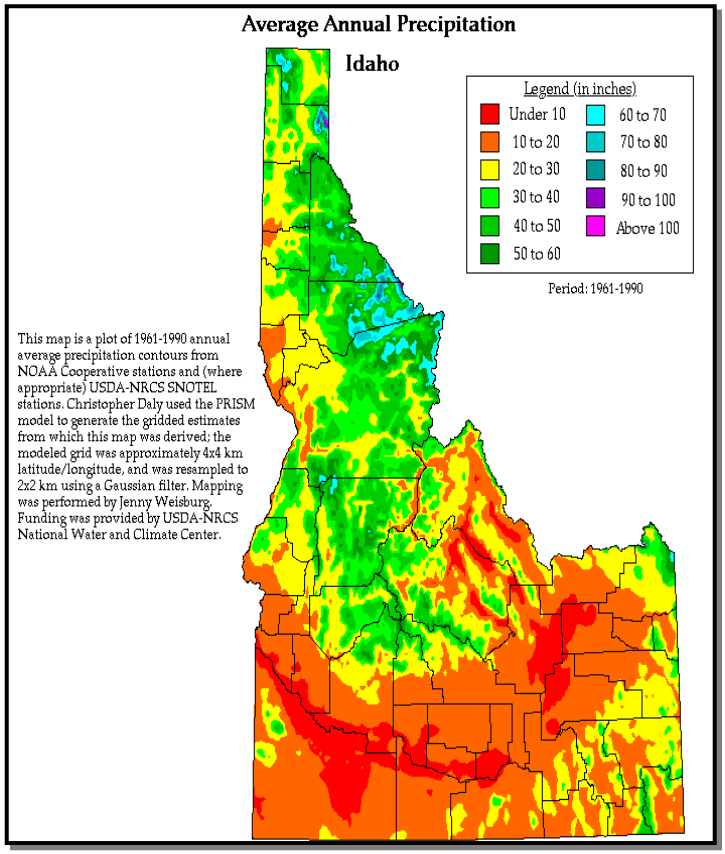
The pattern of average annual temperatures for the State indicates the effect both of latitude and altitude. The highest annual averages are found in the lower elevations of the Clearwater and Little Salmon River Basins, and in the stretch of the Snake River Valley from the vicinity of Bliss downstream to Lewiston, including the open valleys of the Boise, Payette, and Weiser Rivers. The range between the mean temperature of the coldest and warmest months of the year varies from less than 40° F at a number of northern stations, to well over 50° F at stations in the higher elevation of the central and eastern parts of the State. In general, it can be said that monthly means are 32° F or lower at stations above 5,000 feet from November through March; between 4,000 and 5,000 feet, November through February; 3,000 to 4,000 feet, December through February; and 2,000 to 3,000 feet, only one or two months. In summer, periods of extreme heat extending beyond a week are quite rare and the same can be said of periods of extremely low temperatures in winter. In both cases the normal progress of weather systems across the State usually results in a change at rather frequent intervals. In the realm of extremely low temperatures, two winters stand out in the records for the State: 1937-38 and 1948-49. The lowest monthly mean temperatures on record occurred throughout the State in January 1949 and many stations registered the absolute lowest temperature on record during that month.

To a large extent the source of moisture for precipitation in Idaho is the Pacific Ocean. In summer there are some exceptions to this when moisture-laden air is brought in from the south at high levels to produce thunderstorm activity, particularly in the eastern part of Idaho. The source of this moisture from the south

is apparently the Gulf of Mexico and Caribbean region. The average precipitation map for Idaho is as complex as the physiographic representation of the State. Partly because of the greater moisture supply in the west winds over the northern part of the State, (less formidable barriers to the west) and partly because of the greater frequency of cyclonic activity in the north, the average valley precipitation is considerably greater than in southern sections.

Thunderstorms do occur within Idaho affecting almost all counties, including Lewis County, but usually are localized events. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. Thunderstorms are emphasized within the flood chapter of this Multi-Hazard Mitigation Plan.

**Figure 4.2. Average Annual Precipitation in Idaho from 1961 to 1990.**[17]

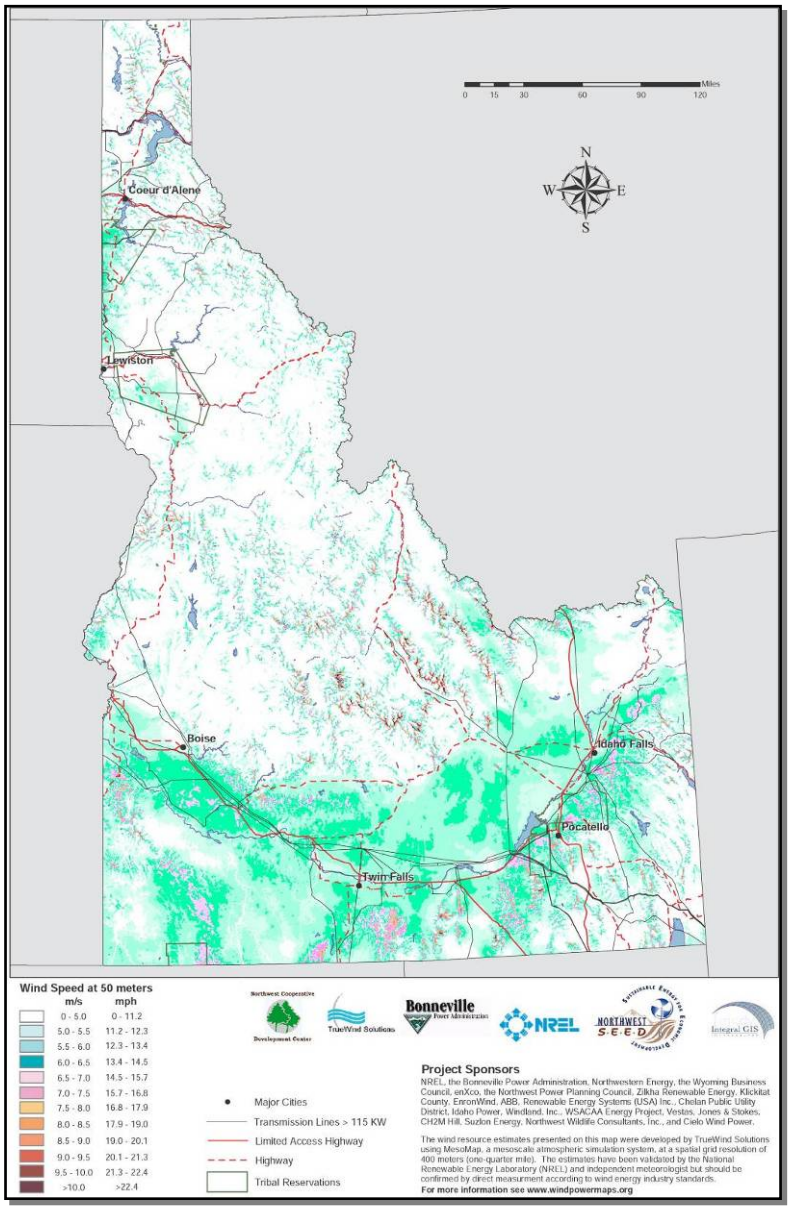



Snowfall distribution is affected both by availability of moisture and by elevation. Annual snowfall totals in Shoshone County have reached nearly 500 inches. The greatest long-term (1942-56) seasonal average was 182 inches at Mullan Pass, while the greatest snow depth (also 182 inches) was recorded at that station on February 20, 1954. The major mountain ranges of the State accumulate a deep snow cover during the winter months, and the release of water from the melting snow-pack in late spring furnishes irrigation water for more than two million acres, mainly within the Snake River Basin above Weiser. Irrigation water supplies are nearly always plentiful, except on some of the smaller projects where storage facilities are inadequate. Electric power is generated by the waters of the many rivers of the State.

Winter storms are a part of life in Idaho. They vary in degree and intensity and can occur at anytime but are especially probable between September and May. These storms could be localized or could affect the entire state. They can last a matter of minutes or many days. Typically, winter storms are measured by the amounts of snow which accumulated during any given storm. Additionally, these storms could be measured by the accompanied wind or temperatures associated with each storm.

[17] Western Regional Climate Center. Historical Climate Information. Precipitation Maps: 1961-1990. Available online at http://www.wrcc.dri.edu/pcpn/id.gif.

**Figure 4.3. Idaho Average Wind Speed Map.**[18]




Windstorms are not uncommon in Idaho, but the State has no destructive storms such as hurricanes, and an extremely small incidence of tornadoes. Windstorms associated with cyclonic systems, and their cold fronts, do some damage to trees each year, often causing temporary disruption of power and communication facilities, but only minor damage to structures in most instances. Storms of this type may occur at any time from October into July, while during the summer months strong winds almost invariably come with thunderstorms. Hail damage in Idaho is very small in comparison with damage in areas of the central part of the United States. Often the hail that occurs does not grow to a size larger than one-half inch in diameter, and the areas affected are usually small. Quite often hail comes during early spring storms, when it is mostly of the small, soft variety with a limited damaging effect. Later when crops are more mature and more susceptible to serious damage, hail occurs in widely scattered spots in connection with summer thunderstorms. The incidence of summer thunderstorms is greatest in mountainous areas, where lightning often causes serious forest and range fires.

Past weather patterns show that severe weather conditions are likely to happen in any part of Lewis County in any given year. The topographical features of the county contribute greatly to the various weather conditions that occur. The following table lists the average weather/climate within Lewis County:

[18] True Wind Solutions. 2002. Map of approximate wind speeds in Idaho. Available online at www.windpowermaps.org.

| Table 4.1. Weather and Climate for Lewis County, Idaho. | | | |
|---|---|---|---|
| Temperature | | Degrees | Month |
| | Lowest Average Daily Mi**nimum Temperature** | 34 in Kamiah<br>15 on Camas Prairie | December |
| | Highest Average Daily Maximum Temperature | 74 in Kamiah<br>61 on Camas Prairie | August |
| | Hottest Month | | August |
| | Coldest Month | | December |
| Precipitation | Average Annual Total Precipitation | 21-24 inches | |
| | Average Annual Snowfall | 16 inches in Kamiah<br>96 inches on Camas Prairie | |
| Humidity | Average July Afternoon Humidity | | |
| | Average January Afternoon Humidity | | |
| Elevation | 1,183 Feet (Kamiah)<br>4,700 Feet (Winchester) | | |

Storms are naturally occurring atmospheric disturbances manifested in strong winds accompanied by rain, snow, or other precipitation, and often by thunder or lightning. All areas within this region are vulnerable to severe local storms. The affects are generally transportation problems and loss of utilities. When transportation accidents occur, motorists are stranded and schools and businesses close. The affects vary with the intensity of the storm, the level of preparation by local jurisdictions and residents, and the equipment and staff available to perform tasks to lessen the effects of severe local storms. There is no way to prevent severe storms. The weather forces and topography of Lewis County will always dictate when and where severe storms will occur.

Drought is an expected phase in the climactic cycle of almost any geographical region. Objective, quantitative definitions for drought exist but most authorities agree that, because of the many factors contributing to it and because its onset and relief are slow and indistinct, none is entirely satisfactory. According to the National Drought Mitigation Center, drought originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. What is clear is that a condition perceived as “drought” in a given location is the result of a significant decrease in water supply relative to what is “normal” in that area.

It should be noted that water supply is not only controlled by precipitation (amount, frequency, and intensity), but also by other factors including evaporation (which is increased by higher than normal heat and winds), transpiration, and human use. Drought in Idaho is generally associated with a sustained period of low winter snowfall. This results from a temporary, yet significant, change in the large-scale weather patterns in the western U.S. The limited snow packs result in reduced stream flows and ground water recharge. Idaho’s system of reservoirs and natural storage can buffer the effects of minor events over a few years, but a series of dry winters (or an especially pronounced single low snowfall event) will result in a

shortage of available water. Extended periods of above-average temperatures during the spring and summer can increase the impacts of low snow packs.

Idaho Department of Water Resources reports that meteorological drought conditions (a period of low precipitation) existed in the State approximately 30% of the time during the period 1931-1982. Principal drought in Idaho, indicated by stream flow records, occurred during 1929-41, 1944-45, 1959-61, 1977, and 1987-92.

Hazard management of drought involves the long-term reduction of the probable gap between water supply and demand. Supply can be addressed through the development of storage and delivery capacity (construction of reservoirs and associated facilities), improved operation of existing facilities, and weather modification. Demand can be addressed through various forms of conservation.[19]

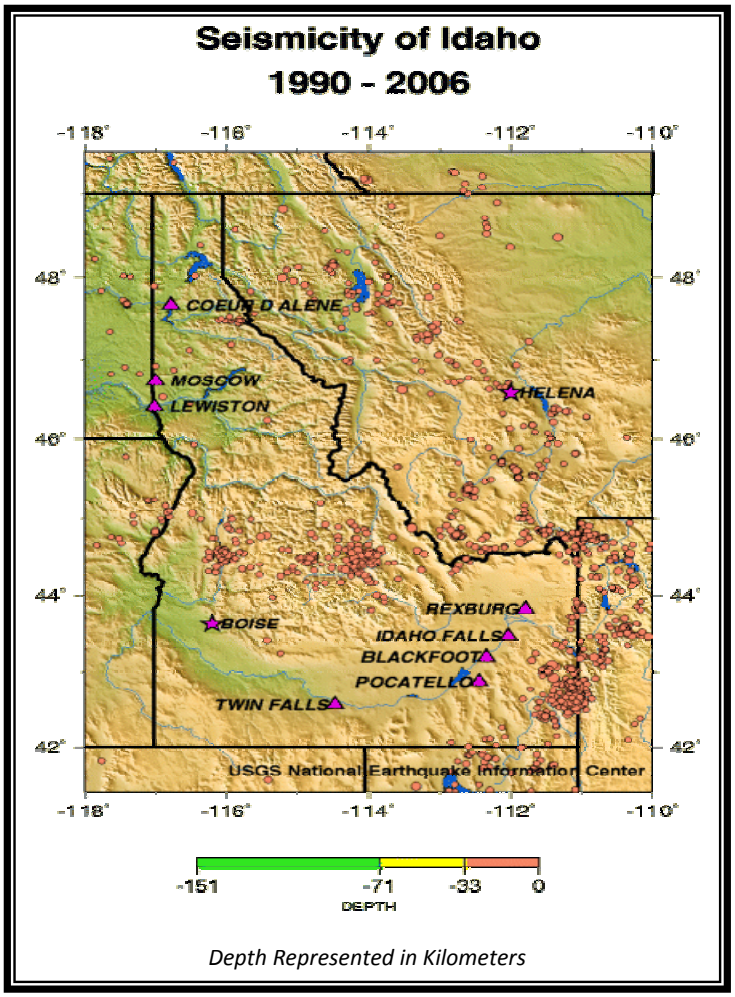
[19] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

## *Earthquake*

An earthquake is trembling of the ground resulting from the sudden shifting of rock beneath the earth's crust. Earthquakes may cause landslides and rupture dams. Severe earthquakes destroy power and telephone lines, gas, sewer, or water mains, which, in turn, may set off fires and/or hinder firefighting or rescue efforts. Earthquakes also may cause buildings and bridges to collapse.

By far, earthquakes pose the largest single natural hazard exposure faced by Idaho. They may affect large areas, cause great damage to structures, cause injury, loss of life and alter the socioeconomic functioning of the communities involved. The hazard of earthquakes varies from place to place, dependent upon the regional and local geology.

**Figure 4.4. Seismicity of Idaho from 1990-2006.**




Earthquakes occur along faults, which are fractures or fracture zones in the earth across which there may be relative motion. If the rocks across a fault are forced to slide past one another, they do so in a *stick-slip* fashion; that is, they accumulate strain energy for centuries or millennia, and then release it almost instantaneously. The energy released radiates outward from the source, or focus, as a series of waves - an earthquake. The primary hazards of earthquakes are ground breaking, as the rocks slide past one another, and ground shaking by seismic waves. Secondary earthquake hazards result from distortion of the surface materials such as water, soil, or structures.

Ground shaking may affect areas 65 miles or more from the epicenter (the point on the ground surface above the focus). As such, it is the greatest primary earthquake hazard. Ground shaking may cause seiche, the rhythmic sloshing of water in lakes or bays. It may also trigger the failure of snow (avalanche) or earth materials (landslide). Ground shaking can change the mechanical properties of some fine grained, saturated soils, whereupon they *liquefy* and act as a fluid (liquefaction). The dramatic reduction in bearing strength of such soils can cause buried utilities to rupture and otherwise undamaged buildings to collapse.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, or trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

Aftershocks are smaller earthquakes that follow the main shock and can cause further damage to weakened buildings. Aftershocks can occur in the first hours, days, weeks, or even months after the quake. Be aware that some earthquakes are actually foreshocks, and a larger earthquake might occur.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking.[20]

Damaging Pacific Northwest earthquakes can arise from three distinct source zones:

- Deep earthquakes beneath the Puget Sound have damaged Seattle and Olympia
- Shallow faults can cause intense local shaking – urban areas are especially vulnerable
- An offshore subduction zone fault can cause strong shaking across the entire region.[21]

Geological and seismological studies show that earthquakes are likely to happen in any of several active zones in Idaho and adjacent states. Idaho is ranked fifth highest in the nation for earthquake hazard. Only California, Nevada, Utah, and Alaska have a greater overall hazard. Idaho has experienced several earthquakes over the last 100+ years. Two of the larger earthquakes were the 1959 Hebgen Lake earthquake (M7.5) and the 1983 Borah Peak earthquake (M7.3). Both tremors caused fatalities and millions of dollars in damage.

Earth scientists believe that most earthquakes are caused by slow movements inside the Earth that push against the Earth's brittle, relatively thin outer layer, causing the rocks to break suddenly. This outer layer is fragmented into a number of pieces, called plates. Most earthquakes occur at the boundaries of these plates.

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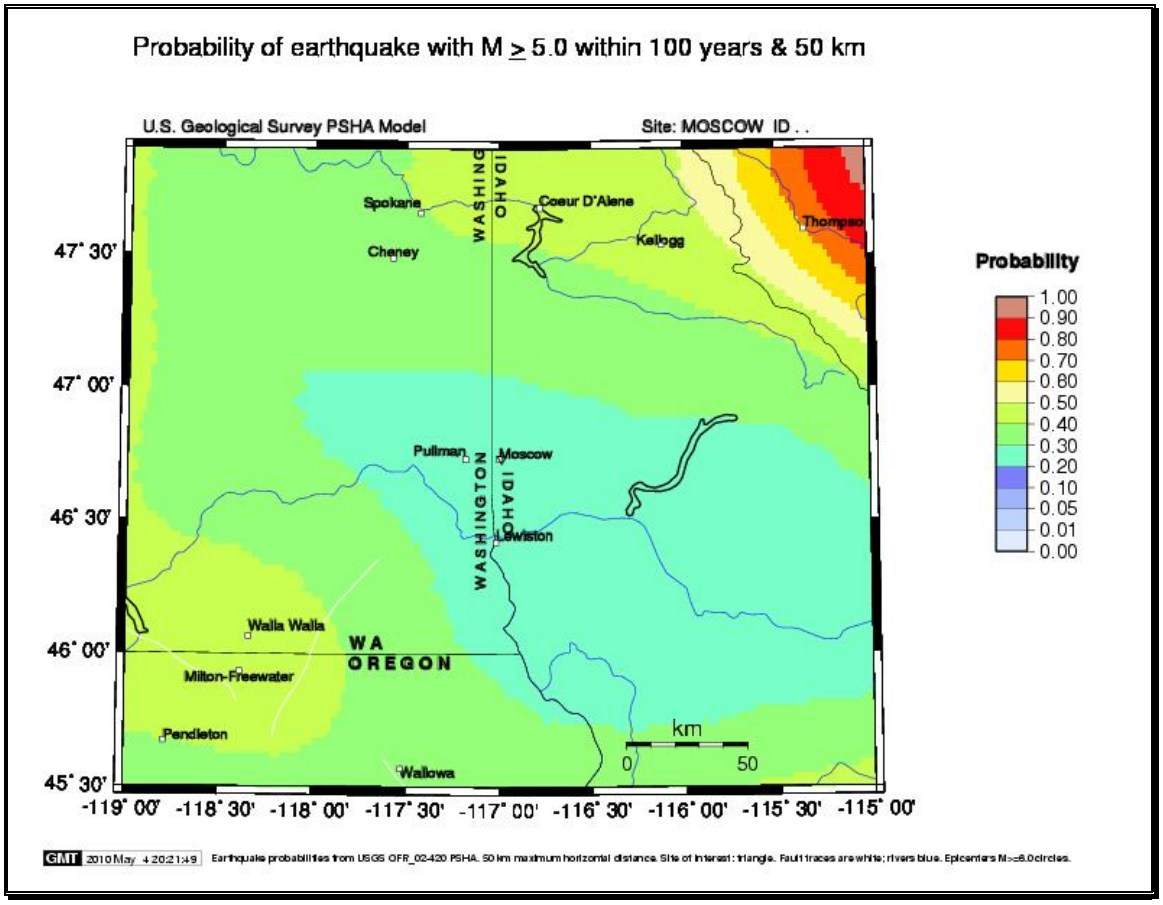
[20] FEMA. Federal Emergency Management Agency. Available online at www.fema.gov. September 2007.

[21] USGS. "Earthquake Hazards in Washington and Oregon Three Source Zones." U.S. Geological Survey. The Pacific Northwest Seismic Network. Available online at http://www.geophys.washington.edu/SEIS/PNSN/. August 2008.

**Figure 4.5. Earthquake Magnitude Probability Model.**




The majority of earthquakes in Idaho today are a result of Basin and Range extension and volcanism associated with the Yellowstone Hot Spot. The Lost River Range is one of several northwest trending mountain ranges in east central Idaho where the topography is typical of the Basin and Range Province. Ranges are separated by broad sediment filled valleys, and have range-front faults on their southwest flanks. There is also a zone of seismic activity that surrounds the fringes of the Yellowstone Hot Spot track, which for Idaho is another major cause for earthquakes.

Scientists cannot predict precisely where, when, and how large the next destructive earthquake will be in Idaho, but seismological and geological evidence does support a 20% possibility that a magnitude 5.0 (or greater) earthquake could occur in central Idaho within the next 100 years.

On average, approximately 33 earthquakes occur each year in Idaho. Within Lewis County, historical earthquake activity is significantly below the Idaho state average, and is 82% lower than the overall U.S. average.

The largest earthquake now considered a possibility in the Pacific Northwest is a shallow subduction-style earthquake similar to recent destructive earthquakes in Alaska and Mexico, which had magnitudes greater than 8. An earthquake this large would be expected to occur along the coast of Washington or Oregon. Although we have no record of such large earthquakes in the Pacific Northwest within the last 150 years, some scientists believe that rocks and sediments exposed along the coasts of Washington and Oregon show

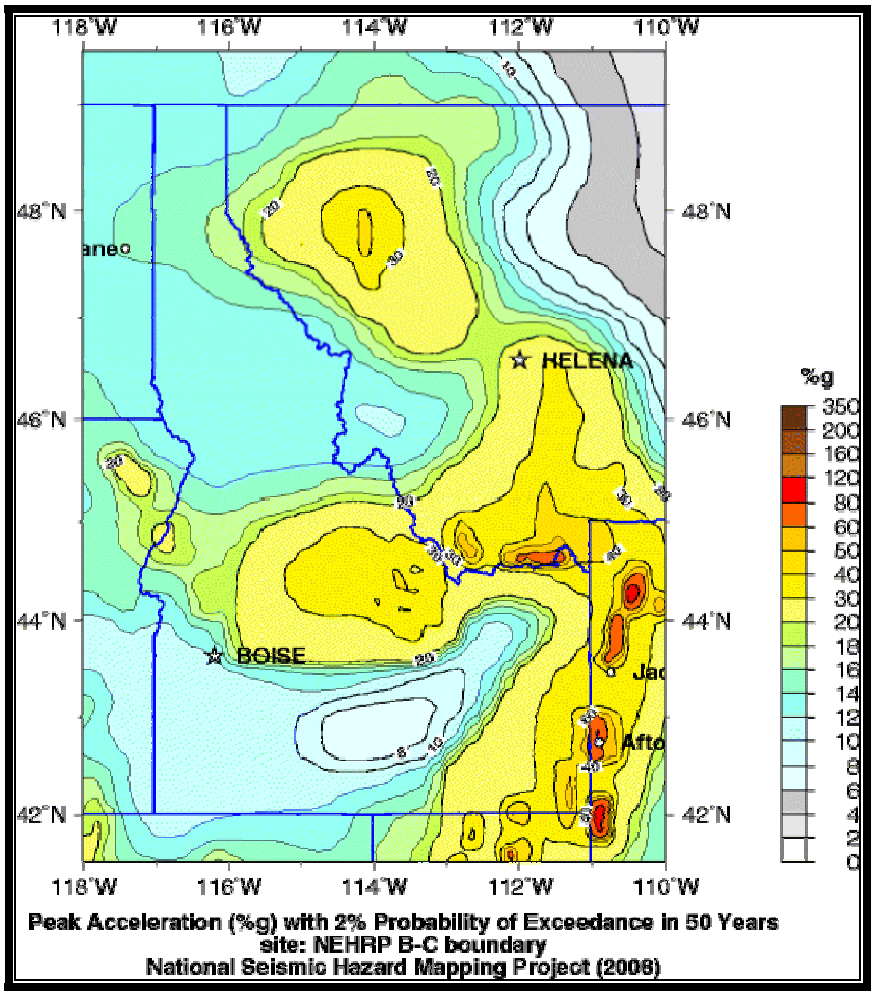
evidence that as many as eight such earthquakes have occurred in the last several thousand years. This evidence indicates an average interval of time between subduction earthquakes of several hundred years. A magnitude 8 subduction earthquake would not only cause widespread dangerous ground shaking, but would also likely produce water waves capable of inundating coastal areas in a matter of minutes.

Earthquake damage is primarily caused by ground shaking. However, wood frame houses, well attached to their foundations and built on firm ground, generally sustain little structural damage during earthquakes. In contrast, unreinforced brick buildings commonly suffer severe damage. Ground shaking may also displace and distort the non-structural parts of a building including windows, ceiling tiles, partitions and furniture-producing property damage and endangering life. Other hazards such as ground liquefaction are commonly triggered by strong ground shaking.

The U.S. Geological Survey has gathered data and produced maps of the nation, depicting earthquake shaking hazards. This information is essential for creating and updating seismic design provisions of building codes in the United States. The USGS Shaking Hazard maps for the United States are based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from quake sources. The values shown on the map are "peak ground acceleration (PGA) in percent of g with 2% probability of exceedance in 50 years". Therefore, the map represents longer-term likelihood of ground accelerations. The "2% probability of exceedance in 50 years" refers to the fact that earthquakes are somewhat random in occurrence. One can not predict exactly whether an earthquake of a given size will or will not occur in the next 50 years. The map takes the random nature of earthquakes into account. It was constructed so that there is a 2% chance (2 chances in 100) that the ground acceleration values shown on the map will be exceeded in a 50 year time period. This map is based on seismic activity and fault-slip rates and takes into account the frequency of occurrence of earthquakes of various magnitudes.[22] Locally, this hazard may be greater than that shown, because site geology may amplify ground motions.

[22] Qamar, Anthony. “Earthquake Hazards in the Pacific Northwest.” Cascadia Region Earthquake Workgroup. University of Washington Geophysics. January 2008.

**Figure 4.6. Earthquake Peak Acceleration Model.**




The 1991 Uniform Building Code (UBC), a nationwide industry standard, sets construction standards for different seismic zones in the nation. UBC seismic zone rankings for Idaho are among the highest in the nation. When buildings are built to these standards they have a better chance to withstand earthquakes. In 2002 the International Building Code (IBC) adopted the 1991 UBC earthquake standards. Lewis County and all of the cities within the county operate under the UBC and IBC, which requires structural earthquake protection for areas designated as “Zone D”. For the counties risk level this is adequate protection for all new construction.

Studies of ground shaking in Idaho during previous earthquakes have led to better interpretations of the seismic threat to buildings. In areas of severe seismic shaking hazard, older buildings are especially vulnerable to damage. Older buildings are at risk even if their foundations are on solid bedrock. Areas shown on the map with high seismic shaking hazard can experience earthquakes with intensity VII where weaker soils exist. Most populated areas in Idaho are located on or near alluvial deposits which provide

poorer building site conditions during earthquakes. Older buildings may suffer damage even in areas of moderate ground shaking hazards.[23]

Structures that are in compliance with the 1970 Uniform Building Codes (UBC), which are now replaced by the International Building Code, are generally less vulnerable to seismic damages because that was when the UBC started including seismic construction standards to be applied based on regional location. This stipulated that all structures be constructed to at least seismic risk Zone 2 Standards. The State of Idaho adopted the UBC as its state building code in the early 1970s, so it is assumed that buildings built after that date were built in conformance with UBC seismic standards and have a lesser degree of vulnerability. Obviously, issues such as code enforcement and code compliance are factors that could impact this assumption. However, for planning purposes, establishing this line of demarcation can be an effective tool for estimating vulnerability.

Future injuries and property losses from earthquake hazards can be reduced by considering these hazards when making decisions about land use, by designing structures that can undergo ground shaking without collapse, by securely attaching the non-structural elements of a building, and by educating the public about what to do before, during, and after an earthquake to protect life and property.

[23] Idaho Geological Society. 2004. Information available online at http://www.idahogeology.com/Services/GeologicHazards/Earthquakes/.

## *Wildland Fire*

The original Lewis County Wildfire Mitigation Plan was completed and adopted in June of 2005 with a subsequent update, the Lewis County Wildland Urban Interface Wildfire Mitigation Plan Update Addendum, being adopted in August of 2007. Lewis County has hired a Wildland Urban Interface Coordinator that regularly reviews and updates the information in the Wildfire Mitigation Plan. This section is an adaptation of the more comprehensive Lewis County Wildfire Mitigation Plan.

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, 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; 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.

**Weather**

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

**Topography**

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

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

**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 buildings 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, 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 (fire carried from tree crown to tree crown). 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, some of the principles that govern fire behavior have been identified and are recognized.

## *Wildfire Hazard Assessment*

Lewis County, Idaho was analyzed using a variety of models, managed on a Geographic Information System (GIS) system. Physical features of the region including roads, streams, soils, elevation, and remotely sensed images were represented by data layers. Field visits were conducted by specialists from Northwest Management, Inc. and others. Discussions with area residents and local fire suppression professionals augmented field visits and provided insights into forest health issues and treatment options. This information was analyzed and combined to develop an objective assessment of wildland fire risk in the region. A full assessment of the wildland fire hazard can be found in the Lewis County Wildland Urban Interface Wildfire Mitigation Plan.[24]

[24] Lewis County. 2005. Lewis County Wildland Urban Interface Wildfire Mitigation Plan. Northwest Management, Inc.. Amended 2007. Available online at http://www.idl.idaho.gov/nat_fire_plan/county_wui_plans/lewis/lewis.html.

### Fire Regime Condition Class

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.[25, 26] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[27] and Schmidt et al[28] and interpreted for fire and fuels management by Hann and Bunnell.

A fire regime condition class (FRCC) is a classification of the amount of departure from the historic regime.[29] 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.[30,31] 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.

An analysis of Fire Regime Condition Classes in Lewis County shows that a significant portion of the county that is not in agriculture is highly departed (25%) from its historic fire regime and associated vegetation and fuel characteristics. In most scenarios, the more departed an area is from its natural fire regime, the higher the wildfire potential; however, this is not true 100% of the time.

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[25] Agee, J. K. Fire Ecology of the Pacific Northwest forests. Oregon: Island Press. 1993.

[26] Brown. J. K. "Fire regimes and their relevance to ecosystem management." *Proceedings of Society of American Foresters National Convention*. Society of American Foresters. Washington, D.C. 1995. Pp 171-178.

[27] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.

[28] Schmidt, K. M., et al. *"Development of coarse scale spatial data for wildland fire and fuel management."* General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

[29] Hann, W. J. and D. L. Bunnell. "Fire and land management planning and implementation across multiple scales." International Journal of Wildland Fire. 2001. Pp 389-403.

[30] Hardy, C. C., et al. *"Spatial data for national fire planning and fuel management."* International Journal of Wildland Fire. 2001. Pp 353-372.

[31] Schmidt, K. M., et al. *"Development of coarse scale spatial data for wildland fire and fuel management."* General Technical Report, RMRS-GTR-87. U.S. Department of Agriculture, Forest Service. Rocky Mountain Research Station. Fort Collins, Colorado. 2002.

| Table 4.2. Fire Regime Condition Classes in Lewis County. | | |
|---|---|---|
| Condition Class | Acres | Percent of Area |
| Fire Regime Condition Class I | 25,368 | 6.4% |
| Fire Regime Condition Class II | 28,568 | 7.2% |
| Fire **Regime Condition Class III** | 99,377 | 25.1% |
| Agriculture | 32,337 | 8.2% |
| Rock/barren | 191,537 | 48.4% |
| Urban | 15,278 | 3.9% |
| Water | 1,209 | 0.3% |
| No information | 1,919 | 0.5% |

Most of the forestlands in Lewis County are in Condition Class III likely due to aggressive fire suppression activities since the early 1900s.

## *Wildland Urban Interface*

The wildland-urban interface (WUI) has gained attention through efforts targeted at wildfire mitigation; however, this analysis technique is also useful when considering other hazards because the concept looks at where people and structures are concentrated in any particular region.

A key component in meeting the underlying need for protection of people and structures is the protection and treatment of hazards 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. The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography. Reducing the hazard in the wildland-urban interface requires the efforts of federal, state, tribal, and local agencies and private individuals.[32] The role of most federal agencies in the wildland-urban interface includes wildland firefighting, 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 local governments. Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible/survivable space around them and taking other measures to minimize the risks to their structures.[33] With fuel treatments, a wildland-urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend communities against other hazard risks. In addition, a wildland-urban interface that is properly treated will be less likely to sustain a crown fire that enters or originates within it. [34]

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

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

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

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

- minimizing the potential of high-severity ground or crown fires entering or leaving the area;
- reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior;[35]
- improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Three wildland-urban interface conditions have been identified (Federal Register 66(3), January 4, 2001) for use in wildfire control efforts. These include the Interface Condition, Intermix Condition, and Occluded 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; and
- **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.

In addition to these classifications detailed in the Federal Register, four additional classifications of population density have been included to augment these categories:

- **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 condition of the WUI connects these clusters into a relatively homogenous area.
- **High Density Urban Areas** – those areas generally identified by the population density consistent with the location of larger incorporated cities, however, the boundary is not necessarily set by the location of city boundaries: it is set by very high population densities (more than 7-10 structures per acre or more).
- **Infrastructure Area WUI** – those locations where critical and identified infrastructure are located outside of populated regions and may include high tension power line corridors, critical escape or

[35] McCoy, L. K., et all. Cerro Grand Fire Behavior Narrative. 2001.

primary access corridors, municipal watersheds, areas immediately adjacent to facilities in the wildland such as radio repeater towers or fire lookouts. These are identified by county or reservation level core teams.

- **Non-WUI Condition** - a situation where the above definitions do not apply because of a lack of structures in an area or the absence of critical infrastructure crossing these unpopulated regions. This classification is not WUI.

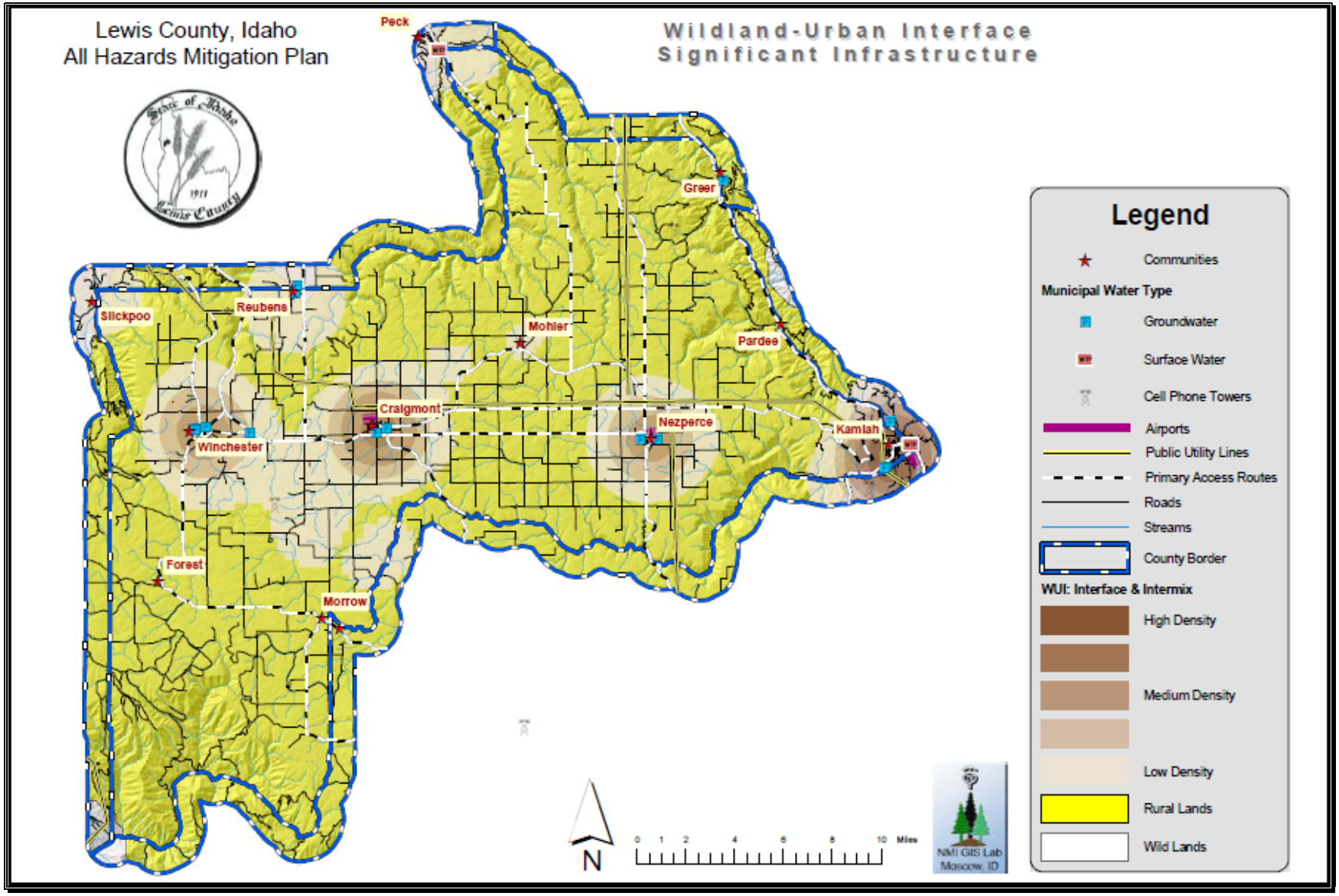
Lewis County's wildland-urban interface (WUI) is based on population density. Relative population density across the county was estimated using a GIS based kernel density population model that uses object locations to produce, through statistical analysis, concentric rings or areas of consistent density. To graphically identify relative population density across the county, structure locations are used as an estimate of population density. Aerial photography was used to identify structure locations in 2005. The resulting output identified the extent and level of population density throughout the county.

By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as rural condition WUI (as defined above). This portion of the analysis allows us to "see" where the highest concentrations of structures are located in reference to relatively high risk landscapes, limiting infrastructure, and other points of concern.

The WUI, as defined here, is unbiased and consistent, allows for edge matching with other counties, and most importantly – it addresses all of the county, not just federally identified communities at risk. It is a planning tool showing where homes and businesses are located and the density of those structures leading to identified WUI categories. It can be determined again in the future, using the same criteria, to show how the WUI has changed in response to increasing population densities. It uses a repeatable and reliable analysis process that is unbiased.

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Wildfire Mitigation Plan is in place. It further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes. The Lewis County Wildfire Mitigation planning committee evaluated a variety of different approaches to determining the WUI for the county and selected this approach and has adopted it for these purposes. In addition to a formal WUI map for use with the federal agencies, it is hoped that it will serve as a planning tool for the county, the Idaho Department of Lands, and local fire districts.

**Figure 4.7 Wildland Urban Interface in Lewis County, Idaho.**



# Chapter 5

## Jurisdictional Vulnerability Assessments



IN THIS SECTION:

- Jurisdictional Risk and Vulnerability Assessments
    - Lewis County Annex
    - City of Craigmont Annex
    - City of Kamiah Annex
    - City of Nezperce Annex
    - City of Winchester Annex
    - City of Reubens Annex

# Chapter 5 – Hazard Assessments

## Jurisdictional Risk and Vulnerability Assessments

The Lewis County MHMP planning committee reviewed many of the natural and man-made hazards that have affected or pose a potential risk to people or property throughout the County. The committee agreed that the natural hazards of flood, earthquake, landslide, severe weather, and wildland fire should be included in the risk assessment for each jurisdiction. The planning committee recognizes that there are additional hazards, particularly man-made hazards, which may also affect Lewis County. These types of additional hazards will be reviewed for inclusion during the subsequent annual and 5-year evaluations of the MHMP.

As part of the risk and vulnerability assessment, each member of the planning committee was asked to fill out a critical infrastructure worksheet identifying and locating all structures, infrastructure, and culturally significant sites that the loss or damage of which would have a significant impact on the community. This exercise also included all communication, hazardous materials storage, transportation, and emergency response infrastructure. The list from each member was compiled and added to a GIS database. The critical infrastructure database was used to develop maps and address each type of hazard risk in each jurisdiction.

Furthermore, Lewis County's existing parcel master listing has been converted to an accessible GIS database. This database allowed the planning committee to map every parcel within the County and city jurisdictions. This data was combined with the hazard vulnerability models to develop the risk assessments and loss estimations for each jurisdiction.

In order to be eligible for project funds under the Flood Mitigation Assistance (FMA) program authorized by the National Flood Insurance Act of 1968, as amended, communities are required under 44 CFR 79.6(d)(1) to have a mitigation plan that addresses flood hazards. On October 31, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Register 61720 to incorporate mitigation planning requirements for the FMA program, which combined the Local Mitigation Plan requirement for all hazard mitigation assistances programs under 44 CFR 201.6 to include the FMA as well as the HMGP, PDM, and SRL programs thus eliminating duplicative mitigation planning regulations. The purpose of the flood sections in the following annexes is to fulfill the requirements for both the FMA program and the Local Hazard Mitigation Plan.

# *Lewis County Annex*

## *Flood*

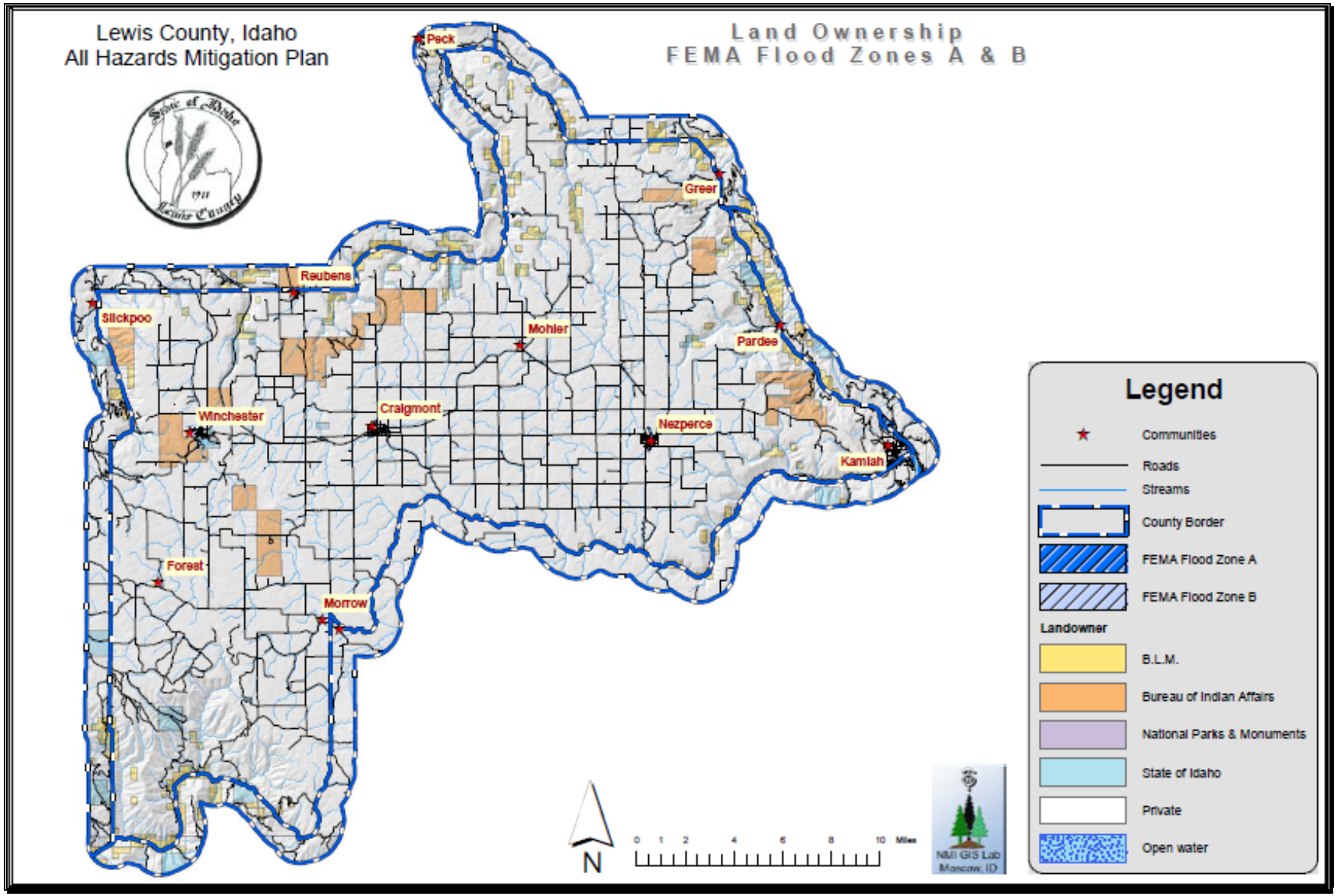
Lewis County has experienced a long history of high magnitude floods since first recorded in the early 1900s, typically by “50 and 100-year” levels. The diverse landscape and weather patterns within Lewis County are the triggers for those high magnitude floods. Rain on snow events and above normal high spring temperatures are very typical throughout the county in the fall, winter and spring.

All three types of flood events occur in Lewis County. Riverine flooding occurs along all tributaries of the Clearwater River. The mountainous terrain within this region creates a flood-prone environment. 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 the Clearwater River and most of its major tributaries in the county. In general these flood events can be predicted 24 to 72 hours in advance of the rising waters. Emergency plans that are in place can be executed, before flood waters overtop the river channel, minimizing loss of life, and business disruption.

The Camas Prairie is mostly a cultivated plateau in a narrow elevation band. When rain-on-snow events occur on this plateau the runoff tends to come off the entire watershed at the same time, quickly filling all channels that flow off the prairie.

On the Camas Prairie, 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 fairly flat terrain found on the prairie these localized flooding from thunderstorms tend 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.

**Figure 5.1. Lewis County FEMA Floodplains.**



The FEMA developed FIRM maps for Lewis County were digitized for assessing how many acres in the County are within FEMA Flood Zones. FEMA has developed the Flood Zone A and Flood Zone B categories of flood zones in Lewis County. The FEMA Flood Zone A (also call the 100-year flood zone) encompasses approximately 788 acres (319 ha) in Lewis County. FEMA Flood Zone B (also called the 500-year flood zone) encompasses an additional 79 acres (32 ha). Due to migration of the stream channel on Lawyers Creek, the existing FIRM maps are not accurately depicting the current floodplain. Additionally, the original stream channel was used to delineate the boundary between Idaho and Lewis County. Migration of the channel over time has caused some conflicts over the responsibility of the floodplain in this area.

Most of the structures in the FEMA-identified floodplain for unincorporated areas of Lewis County are located along the Clearwater River near the northern county boundary. The Clearwater River drainage is a collector watershed for the northern Rocky Mountains. In addition, numerous small tributaries originating in and around Lewis County drain into the Clearwater River. Three of these tributaries contributing to the floodplain include Long Hollow Creek, Six Mile Creek and Lawyer Creek. These drainages are most heavily influenced by rain-on-snow events and due to their large, higher-elevation drainage areas; however, several flash floods have also been recorded.

The Kamiah Highway District is currently working on a project to replace a large culvert on Miller Road, which is in the floodplain and the sole access route for numerous homes. The existing culvert was installed in 1946 and is badly deteriorated and undersized for the drainage area (3,706 acres). The Highway District has plans to replace the culvert with a much larger structure that would not only bring it up to 100-year flood standards, but also raise the roadway 10 feet, widen the travel surface, allow for slope stabilization and installation of guardrails, and align the road for paving in the future.

A high level of sediment is prevalent during periods of runoff primarily from the abundance of agricultural fields. This sediment tends to cause a deteriorating condition in channel beds through erosion and deposition. Natural obstructions to flood waters include trees, brush, and other vegetation along the stream banks in the floodplain area. Debris can plug culverts and accumulate on bridge abutments at several locations. Several streets and road shoulders are prone to erosion during flood events. Many secondary routes are not paved, which results in gravel washing down-slope potentially clogging drainage systems or directing water to places that were not intended. Sedimentation and accumulated debris and vegetation are significantly increasing the flood risk throughout Lewis County. Debris jams during high water events have caused considerable flood damage to adjacent properties.

Ice/debris flows occur as part of riverine and flash flooding, usually exacerbating the effects of those types of flood events. Summer thunderstorms on recently burned over areas, particularly in the canyonlands, is the most likely cause of debris flows in Lewis county. Details on reducing the effects of these types of debris flows can be found in the landslide chapter.

Lewis County participates in the National Flood Insurance Program and has developed local ordinances to better regulate and direct development in flood plain areas. These local ordinances regulate planning, construction, operation, and maintenance of any works, structures, and improvements. Lewis County's ordinances also help ensure that activities in the floodplain are properly planned, constructed, and maintained to avoid adversely influencing the stream or other body of water and the security of life, health, and property against damage by floodwater.

Participation in the National Flood Insurance Program (NFIP) and subsequent adoption of the Uniform Building Codes, or more stringent local building codes, provide basic guidelines to communities on how to regulate development. When a county participates in the NFIP it enables property owners in the county to insure against flood losses. By employing wise floodplain management, a participating county can protect its citizens against much of the devastating financial loss resulting from flood disasters. Careful local management of development in the floodplains results in construction practices that can reduce flood losses and the high costs associated with flood disasters to all levels of government.

**Table 5.1. Communities Participating in NFIP.**[36]

| CID# | Community | Date of Entry | Current Effective Map Date | Floodplain Ordinance/ Manager |
|---|---|---|---|---|
| 160215 | Lewis Co* | 1/20/1982 | NSFHA** | Yes/Yes |
| 160163 | Craigmont | 2/5/1986 | 2/5/1986 | Yes/Yes |
| 160255 | Nezperce | 8/3/1989 | 8/3/1989 | Yes/Yes |
| 160094 | Kamiah | 8/19/1985 | 8/19/1985 | No/Yes |

**Unincorporated areas only.*
***No Special Flood Hazard Area*

Lewis County has no communities with identified special flood hazard areas that are not participating in the NFIP. An important part of being an NFIP community is the availability of low cost flood insurance for those homes and businesses within designated flood plains or in areas that are subject to flooding, but that are not designated as Special Flood Hazard Areas.

Participation by individuals and business within each community for 2010 is shown in the Table 5..[37]

**Table 5.2. NFIP Policy Statistics As of 3/31/2010 in Lewis County.**

| Community Name | Policies In-Force in 2010 (2003) | Insurance In-Force | Written Premium In-Force | CRS Ranking |
|---|---|---|---|---|
| Lewis County* | 2 (2) | $420,000 | 618 | NA |
| Craigmont | 1 (0) | $144,000 | 1,453 | NA |
| Kamiah | 13 (15) | $1,572,300 | 6,988 | NA |
| Nezperce | 7 (0) | $480,100 | 4,231 | NA |

*does not include policies in incorporated areas.

Overall participation by individuals and business in the NFIP appears to be low. Potential reasons are:

- A lack of knowledge about the existence of the availability of low cost flood insurance.

[36] Idaho Department of Water Resources. 2010. Floodplain Management. "Federal Emergency Management Agency Community Status Book Report. Available online at http://www.idwr.idaho.gov/WaterManagement/FloodPlainMgmt/PDFs/ID.pdf.

[37] Federal Emergency Management Agency. 2010. National Flood Insurance Policy Statistics Country-Wide as of 03/31/2010. Available online at http://bsa.nfipstat.com/reports/1011.htm#IDT.

- Home and business owners unaware of their vulnerability to flood events.
- Current cost of insurance is prohibitive.

The first two reasons can be addressed through public education. The third could be addressed by all communities in the county taking advantage of the Community Rating System (CRS). To encourage communities to go beyond the minimum requirements and further prevent and protect against flood damage, the NFIP established the Community Rating System (CRS). To qualify for CRS, communities can do things like make building codes more rigorous, maintain drainage systems, and inform residents of flood risk. In exchange for becoming more flood-ready, the CRS community's residents are offered discounted premium rates. Based on your community's CRS ratings, you can qualify for up to a 45% discount of your annual flood insurance premium. Of the Lewis County communities that participate in the NFIP, no community has earned a discount on their flood insurance rates through the Community Rating System (CRS). Participation is relatively simple, and with the planning work all ready in place within the county little to no additional work would have to be done to start receiving discounted insurance rates.

In June, 1994, Lewis County adopted their *Flood Damage Prevention ordinance #1995-3.* This ordinance is more stringent than the minimum standards set by NFIP and the International Building Code. Lewis County is currently working with the Department of Ecology to update this ordinance to reflect changes in the building codes as well as changing conditions in Lewis County.

### Local Event History

**December 1996** - heavy winter snow-pack and ice build-ups in streams were suddenly thawed, accompanied by heavy rains, created stream flows in Lewis County 10 to 15 times greater than normal years. This water had such a force associated with it, that it carried millions of pounds of rock, sediment, and debris down-slope quickly exceeding the normal capabilities of the stream banks and retention systems.

**June 2010 Flooding** – Heavy rainfall flooded already swollen rivers, washing out roads and bridges, and flooding some homes in central Idaho. State and Federal Disaster declarations were made to assist the Counties of Adams, Gem, Idaho, Lewis, Payette, Valley, and Washington. In Lewis County, the current damage estimate is approximately $104,000.

### Probability of Future Occurrence

The probability of flood events occurring in Lewis County is high. Locations labeled as Flood Zone A in Figure 5.1 are areas that will be subject to a 1% probability of a certain size flood occurring in any given year (100-year flood). Flood Zone B represents areas between the limits of the base flood and the .2% annual chance (500 year flood).

Low magnitude flood events can be expected several times each year. However, due to the flat topography and drainage infrastructure, the impacts of these events are slight and usually amount to minor and temporary traffic issues throughout the County. Minor flash flood events are expected annually most likely as a result of summer thunderstorms or rain-on-snow events. Larger magnitude and high impact flood events have occurred repeatedly in the Lawyers Creek and Mission Creek drainages. These types of flood events have the highest probability of occurrence in the winter or early spring.

There are currently no repetitive loss properties in Lewis County. Properties receiving two or more claim payments of more than $1,000 from the National Flood Insurance Program within any rolling 10-year period are considered repetitive loss properties by FEMA.[38]

### Value of Resources at Risk

According the Lewis County's Assessor's parcel data, there are approximately 52 structures within the FEMA-identified floodplains (100- and 500-year) in unincorporated areas of Lewis County, yielding a total average value of $3.4 million (based on $65,000 average structure value). The average damage to structures was estimated based on the parcel's location as either completely within or out of the flood zone. The estimated value of contents is ½ the value of the improvements equating to an additional $1.7 million in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation.

Many of the floodplains affecting residences and infrastructure in Lewis County have received mitigation measures in the past such as dikes, water diversion projects, and levies to mitigated potential flooding damages. However, most of the natural areas remain in the flood zones unimpeded. Within Lewis County a number of structures and significant infrastructure components are found in the FEMA Flood Zones.

**Table 5.3. Significant assets and infrastructure in Lewis County Flood Zones.**

| Item | Flood Zone A | Additional Structures in Flood Zone B |
|---|---|---|
| Structures | 290 | 55 |
| Municipal Water Intakes | 2 (Axtel Addition)<br>City of Kamiah-Surface water | 0 |
| High Tension Power Lines | 1 crossing<br>0.144 miles | 1 crossing<br>0.13**8 miles** |
| Railroads | 16 segments<br>2.227 miles | 2 segments<br>1.635 miles |
| Primary Access Roads | 12 segments<br>0.830 miles | 4 segments<br>0.112 miles |
| Roads (general) | 120 segments<br>7.653 miles | 88 segments<br>7.350 miles |
| Airports | Kamiah Airport – 0.476 miles<br>Nezperce Airport **– 0.328 miles** | Kamiah Airport – 0.027 miles |

## *Landslide*

To date, there is very little recorded history of major landslides occurring in Lewis County. Nevertheless, there are some areas in Lewis County that have specific landslide concerns. Areas that are generally prone to landslides are:

[38] Washington Military Department Emergency Management Division. Washington State Enhanced Hazard Mitigation Plan. Available online at http://www.emd.wa.gov/plans/washington_state_hazard_mitigation_plan.shtml. January 2008.

- On existing landslides, old or recent
- On or at the base or top of slopes
- In or at the base of minor drainage hollows
- At the base or top of an old fill slope
- At the base or top of a steep cut slope

During flood events, small landslides and road slumps are common throughout Lewis County.

Lewis County is characterized by rolling basalt plateaus dissected by deep canyons. The plateaus are mantled with deposits of loess that are tens of feet thick in places. The deep canyons draining east toward the Clearwater River cut through the basalt flows that underlie the Camas Prairie. These flows are interbedded with loose, unstable sedimentary layers that are exposed in the deeply incised canyons. The exposure of this unconsolidated sedimentary layer increases landslide potential wherever these deposits are present on steep slopes. Weathering and climatic events lead to landslide activity, with the scale of the event largely dependent on the environmental conditions leading up to the event. Highway 12 and structures along the Clearwater River are most likely to be affected by landslide activity due to the steep walls of the Clearwater Canyon. Roads and structures in Lawyers Creek, Six Mile Creek, and the Greer Grade are also at increased risk.

Much of the populated areas in Lewis County are at risk to flooding, which often results in damaging landslides. Flash floods typically carry large amounts of debris, silt, and rocks that are deposited in downstream floodplains. Additionally, soil saturation ensuing from prolonged periods of rain or flooding can lead to slope instability. Cut and fill slopes, even those well outside of the floodplain, are particularly at risk to slides and/or slumping as a result of soil saturation.

The largest landslides typically occur where human development or disturbance 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 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.[39]

Wildfires could 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 and rivers 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.

[39] Weisz, D.W., et al. 2003. Surficial Geological Map of the Payette Quadrangle. Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

### Local Event History

**April 2011** - Prolonged rainfall in the late winter and early spring of 2011 throughout central Idaho resulted in flooding activity and subsequent landslides. In the first week of April 2011, numerous local rivers and streams reached flood stage due to prolonged rainfall and rain-on-snow causing rapid melt off. Damages to culverts and other drainage structures were widespread. Furthermore, the April rain also resulted in saturated soils that eventually led to landslides and slumps. Most of the landslide damages occurred along existing roadways. Lewis County incurred minor damages from roadside slumps and high water, but was not among the hardest hit. A presidential disaster declaration was issued on May 20, 2011 for the flooding, landslides, and mudslides that occurred in Clearwater, Bonner, Idaho, Nez Perce, and Shoshone Counties and that affected the Nez Perce Tribe.

### Probability of Future Occurrences

There is a moderate probability of small slides occurring on slopes ranging from 5-35%, particularly in the Clearwater River corridor and its many tributary drainages as well as the U.S. Highway 95 corridor in Lapwai Creek Canyon where the soil types are also more prone to sliding. This type of slide is common on the eyebrows of hills, especially where there has been soil disturbance, and along roads. Generally, low angle slides will have a low velocity and will not impact structures or infrastructure. Home and business development in the County has been mainly on lands not at significant risk to landslides.

Soil factors that increase the potential for landslide are soils developed from parent materials high in schist and granite, and soils that are less permeable containing a resistive or hardpan layer. These soils tend to exhibit higher landslide potential under saturated conditions than do well-drained soils. To identify the high-risk soils in Lewis County, the NRCS State Soils Geographic Database (STATSGO) layer was used to identify the location and characteristics of all soils in the County. The specific characteristics of each major soil type within the County were reviewed. Soils with very low permeability that characteristically have developed a hardpan layer or have developed from schist and granite parent material were selected as soils with potentially high landslide risk potential. High-risk soils magnify the effect slope has on landslide potential. Soils identified as having high potential landslide risk are further identified only in areas with slopes between 14° and 30° (25-60%). It is these areas that traditionally exhibit the highest landslide risk due to soil characteristics within a given landscape.

To portray areas of probable landslide risk due to slope related factors, slope models were used to identify areas of low, moderate and high risk. This analysis identified the low risk areas as slopes in the range of 20°-25° (36-46%), moderate as 26°-30° (48-60%) and high risk as slopes in the range of 31°-60° (60-173%). Slopes that exceeded 60° (173%) were considered low risk due to the fact that sliding most likely had already occurred relieving the area of the potential energy needed for a landslide. From the coverage created by these two methods it is possible to depict areas of risk and their proximity to development and human activity. With additional field reconnaissance the areas of high risk were further defined by overlaying additional data points identifying actual slide locations, thus improving the resolution by

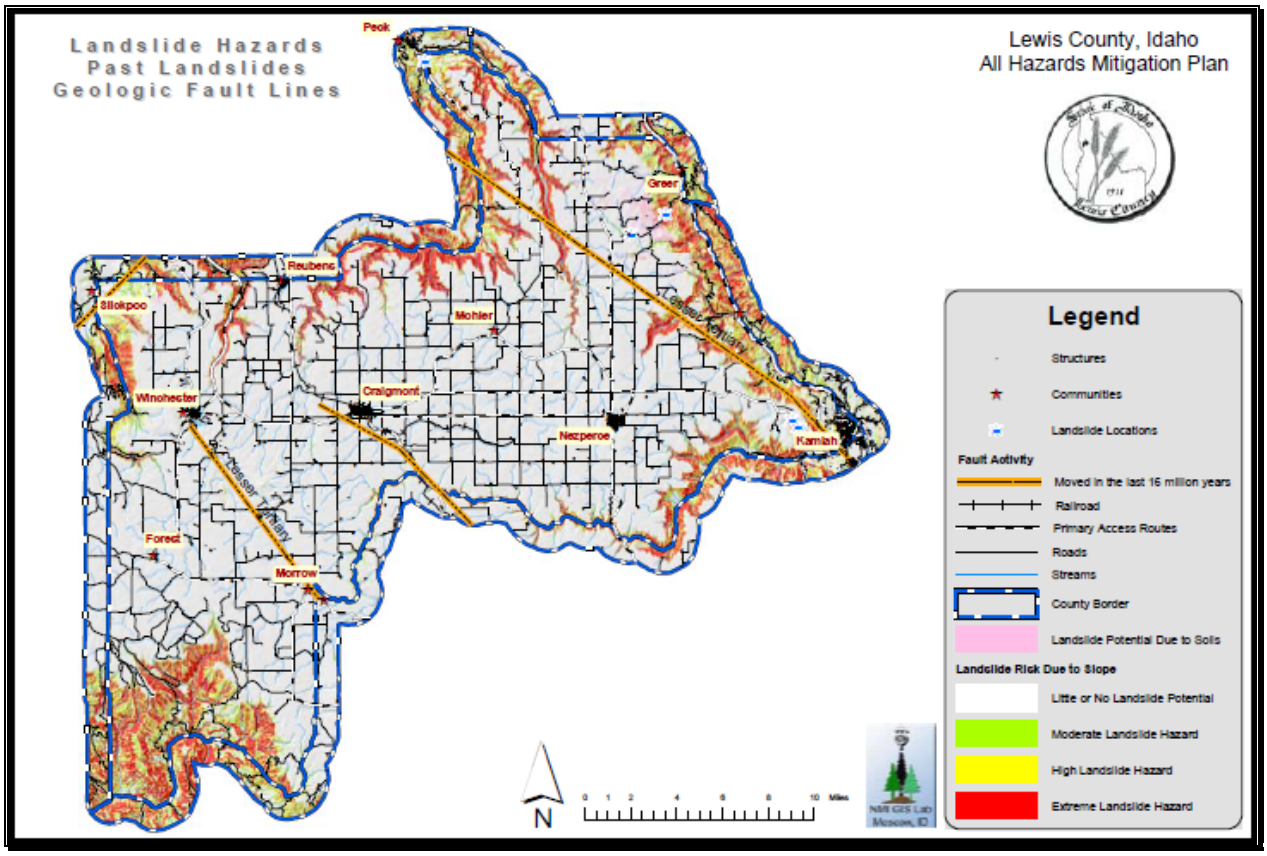
specifically identifying the highest risk areas. This method of analysis is similar to a method developed by the Clearwater National Forest in north central Idaho.[40]

Soil factors, as described above account for additional risks. There are approximately 3,149 acres of soils in this high risk soils category. In order to evaluate the juxtaposition of these soils to the areas at risk from slopes and geology, those areas underlying the areas determined to be at risk due to soil conditions were evaluated, separate from the rest of the County. This analysis reveals that in those areas with high soil risk factors, approximately 65% of that area is at little to no risk due to slope and geological factors, 25% is at Moderate landslide risk, 10% is at High landslide risk, and less than 1% is at Extreme landslide risk. While all areas specified at risk from either assessment should be given consideration for planning, zoning, and determining risks to human development and use, it is the lands that show risk through both assessment strategies that should receive additional attention and mitigation measures, especially where developments already exist.

[40] McClelland, D.E., et al. 1977. Assessment of the 1995 and 1996 floods and landslides on the Clearwater National Forest Part 1: Landslide Assessment. Northern Region U.S. Forest Service. December 1977.

| Table 5.4. Landslide Risk Due to Slopes, Geology, and Soils. | | | |
|---|---|---|---|
| Risk Due to Slopes and Geology | | Acres | Percent |
| | Little or No Landslide Risk | 2,059 | 65% |
| | Moderate Landslide Risk | 801 | 25% |
| | High Landslide Risk | 313 | 10% |
| | Extreme Landslide Risk | 1 | 0% |

**Figure 5.2. Landslide Prone Landscapes in Lewis County.**




## Value of Resources at Risk

Due to the relatively low landslide risk throughout most of Lewis County, no resources are directly at risk at this time. The cost of cleanup and repairs resulting from small slides and slumps along roadways is difficult to estimate due to the variable circumstances with each incident including size of the slide, proximity to a State or County shop, and whether the slide occurred on the cut slope or the fill slope. Other factors that could affect the cost of the damage may include culverts, streams, and removal of debris. This type of information is impossible to anticipate; thus, no repair costs for damaged roadways have been estimated. Small landslide events are cleaned up by the Lewis County Highway Districts with few complications.

## *Severe Weather*

Severe weather in Lewis County ranges from the commonly occurring thunderstorms to hail, tornadoes, high winds, drought, dense fog, lightning, and snow storms. State Disaster declarations were made for

Lewis County in 1894, 1948, 1974, 1977, 1996, 1997, and 2010 as a result of severe weather. The 2010 spring storms and subsequent flooding was also declared a Major Disaster Declaration by President Obama.

All of Lewis County is at risk to severe winter weather events and there is a high probability of their continued occurrence in this area. Due to topography and climatologic conditions, the higher mountainous areas are often the most exposed to the effects of these storms. Normally the mountainous terrain and the north/south orientation of the Cascades tend to isolate severe storms into localized areas of the County. For example, higher elevations on the Camas Prairie will receive snowfall, while the Clearwater River corridor may not. Periodically though, individual storms can generate enough force to impact the entire County at one time. From high winds to ice storms to freezing temperatures, there are all types of winter storms that take place during the course of any given year. Winter conditions can change very rapidly. It is not uncommon to have a snowstorm at night with sunshine the next day. Winter storms with heavy snow, high winds, and/or extreme cold can have a considerable impact on Lewis County; however, most residents are well accustomed to the severe winter conditions in this part of Idaho. Power outages and unplowed roads are a frequent occurrence throughout many parts of the County, but most residents are prepared to handle the temporary inconvenience.

Commonly, heavy snow accumulations cause disruptions to normal commuting activities (delays and inability to plow roads and driveways). When coupled with extreme cold weather, severe winter storms have a detrimental impact on residents in Lewis County, particularly the senior population. Severe winter storms also have the potential to cause large losses among livestock and wildlife. Animal losses are usually the result of dehydration rather than cold or suffocation.

Snow loads on roofs, ice-slides off of roofs onto vehicles or other buildings, and damaged frozen pipes are also potential hazards associated with winter weather. These events represent a significant hazard to public health and safety, a substantial disruption of economic activity, and a constant threat to structures during the winter months. An average of at least two severe storms is anticipated each winter in Lewis County.

Due to their relative frequency and minimal severity, severe thunderstorms are not well documented in Lewis County. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. The secondary impacts of thunderstorms, floods, are emphasized within the flood chapter of this document. Areas most vulnerable to this type of storm are those subject to a strong southwesterly flow of moist, unstable air that generates strong, sometimes violent thunderstorms with one or more of the following characteristics: strong damaging winds, large hail, waterspouts, or tornados.

Hail can occur in any strong thunderstorm, which means hail is a threat everywhere. Hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere. Large hail stones can fall at speeds faster than 100 miles per hour. Hail damage in Idaho is very small in comparison with damage in areas of the central part of the United States. Often the hail that occurs does not grow to a size larger than one-half inch in diameter, and the areas affected are usually small. Quite often hail comes during early spring storms, when it is mostly of the small, soft variety with a limited damaging effect. Later, when crops are more mature and more susceptible to serious damage, hail occurs in widely scattered spots in connection with summer thunderstorms. The potential impacts of a severe hail storm in Lewis County include crop damage, downed power lines, downed or damaged trees,

broken windows, roof damage, and vehicle damage. Hail storms can, in extreme cases, cause death by exposure. The most common direct impact from ice storms to people is traffic accidents. Over 85% of ice storm deaths nationwide are caused by traffic accidents. Hail storms also have the potential to cause losses among livestock. The highest potential damage from hail storms in Lewis County is the economic loss from crop damage. Even small hail can cause significant damage to young and tender plants. Trees can also be severely damaged by hail as was seen in the 1996 ice storm near Spokane, Washington.

Windstorms are frequent in Lewis County, particularly on the Camas Prairie, and they have been known to cause substantial damage. Under most conditions, the County's highest winds come from the south or southwest. Due to the abundance of agricultural development in Lewis County, crop damage due to high winds can have disastrous effects on the local economy. In the case of extremely high winds, some buildings may be damaged or destroyed. Wind damages will generally be categorized into four groups: 1) structure damage to roofs, 2) structure damage from falling trees, 3) damage from wind blown dust on sensitive receptors, or 4) wind driven wildfires. Structural injury from damaged roofs is not uncommon in Lewis County. Structural damage from falling trees is also relatively common. Many homeowners have planted ornamental trees for shade and windbreak protections. However, many of these trees are located near, and upwind of homes putting them at risk to falling trees which could cause substantial structural damage and potentially put lives at risk. Airborne particulate matter increases during high wind events. When this occurs, sensitive receptors including the elderly and those with asthma are at increased risk to complications. The National Weather Service defines high winds as sustained winds of 40 mph or gusts of 58 mph or greater, not caused by thunderstorms, expected to last for an hour or more. Areas most vulnerable to high winds are those affected by a strong pressure difference from deep storms originating over the Pacific Ocean; an outbreak of very cold, Arctic air originating over Canada; or air pressure differences between western Washington and the Idaho Panhandle.

Lewis County and the entire region are at increased risk to wildfires during high wind events. Ignitions can occur from a variety of sources including downed power lines, lightning, or arson. Once ignited, only wildfire mitigation efforts around the community and scattered homes will assist firefighters in controlling a blaze.

A tornado is formed by the turbulent mixing of layers of air with contrasting temperature, moisture, density, and wind flow. This mixing accounts for most tornadoes occurring in April, May, and June, when cold, dry air from the north or northwest meets warm, moister air moving up from the south. If this scenario was to occur and a major tornado was to strike a populated area in Lewis County, damage could be widespread. Businesses could be forced to close for an extended period, and routine services such as telephone or power could be disrupted. The National Weather Service defines a tornado as a violently rotating column of air that contacts the ground; tornados usually develop from severe thunderstorms.

According to the Tornado Project[41] there have been no tornadoes in Lewis County between 1880 and 2000.

[41] Tornado Project. 1999. St. Johnsbury, Vermont. Available online at http://www.tornadoproject.com/alltorns/idtorn.htm.

Drought can have a broad effect on Lewis County as it generally affects the entire county. The region's dependence on agriculture makes it economically vulnerable to drought. The economic impacts from drought may include:

- Losses from crop, livestock, timber, and fishery production and associated businesses.
- Losses from recreation providers and associated businesses.
- Losses from increased costs resulting from increased energy demand and from shortages caused by reduced hydroelectric generation capacity.
- Revenue losses to Federal, State, and local governments from reduced tax base and to financial institutions from defaults and postponed payments.
- Long-term loss of economic growth and development.

Drought in Lewis County can also have significant impacts on the natural environment including:

- Damage to habitat, reduction of feed and drinking water, disease, increased vulnerability to predation for wildlife and fish.
- Wind and water erosion of soils.
- Damage to plant species.
- Reduction of water and air quality.
- Reduction of visual and landscape quality.

Social impacts from drought in Lewis County may include:

- Increased risks to public safety from forest and range fires.
- Increased conflicts between water users.
- Food shortages and increased health concerns.
- Decreased living conditions in rural areas and increased poverty.
- Reduced quality of life and social unrest.
- Increased population migration from rural to urban areas.

Drought emergency declarations are issued by Idaho Department of Water Resources and are approved by the governor. Between 2002 and 2008, Lewis County was issued a Drought Emergency Declaration Order twice (2007 and 2008).[42] According to the State Hazard Mitigation Plan, Lewis County has been included one time (2007) in a drought disaster declaration since their period of record began in 1977.[43]

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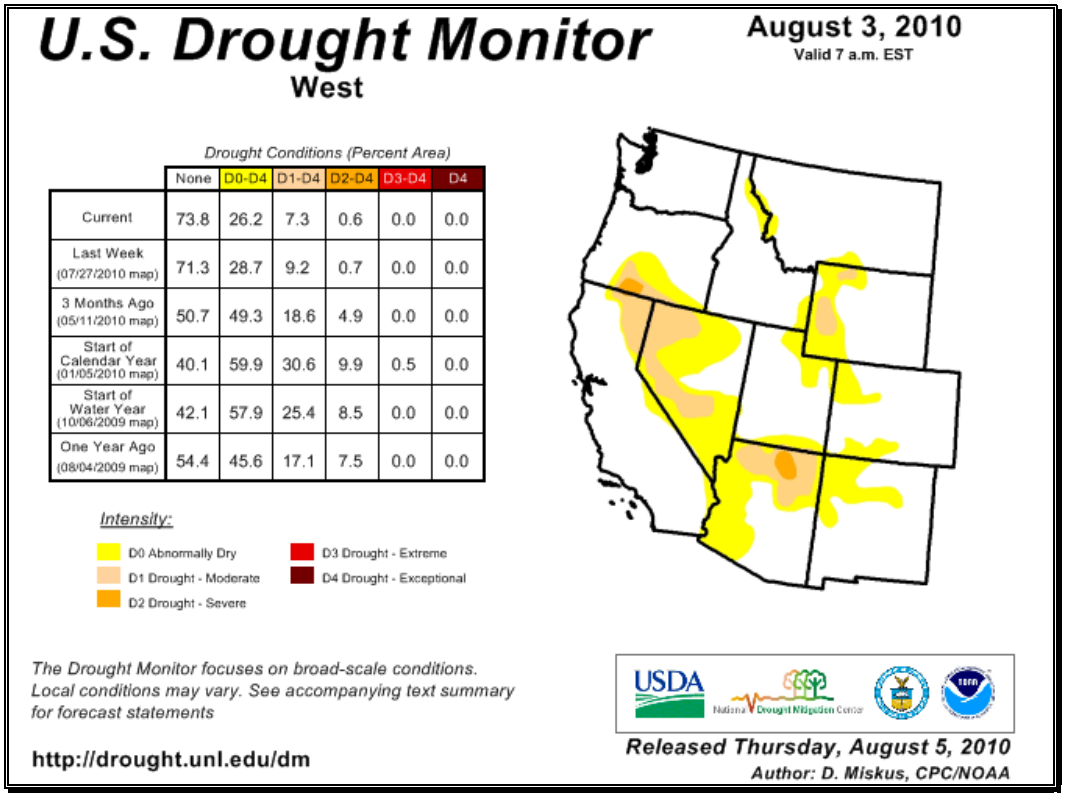
[42] Idaho Department of Water Resources. 2010. Idaho Drought Emergency Declarations. Available online at http://www.idwr.idaho.gov/News/drought/drought.htm.

[43] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

The U.S. Drought Monitor is a synthesis of multiple drought indices and impacts that represent a consensus of federal and academic scientists. As of August 3, 2010, the Drought Monitor showed Lewis County as experiencing no drought conditions on an improving trend since the beginning of the year.[44]

**Figure 5.3. U.S. Drought Monitor for Western Region.**




| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| Current | 73.8 | 26.2 | 7.3 | 0.6 | 0.0 | 0.0 |
| Last Week (07/27/2010 map) | 71.3 | 28.7 | 9.2 | 0.7 | 0.0 | 0.0 |
| 3 Months Ago (05/11/2010 map) | 50.7 | 49.3 | 18.6 | 4.9 | 0.0 | 0.0 |
| Start of Calendar Year (01/05/2010 map) | 40.1 | 59.9 | 30.6 | 9.9 | 0.5 | 0.0 |
| Start of Water Year (10/06/2009 map) | 42.1 | 57.9 | 25.4 | 8.5 | 0.0 | 0.0 |
| One Year Ago (08/04/2009 map) | 54.4 | 45.6 | 17.1 | 7.5 | 0.0 | 0.0 |

## Local Event History

**2008 Snow** – During the winter of 2008-09, Lewis County highway districts received funding from the Idaho Bureau of Homeland Security for help with snow removal. Evergreen Highway District received approximately $45,892 and Central Highway District received about $71,427.

**June 2010 Severe Weather** – Heavy rainfall flooded already swollen rivers, washing out roads and bridges and flooding some homes in central Idaho. State and Federal Disaster declaration were made to assist the Counties of Adams, Gem, Idaho, Lewis, Payette, Valley, and Washington.

**August 2010 Severe Weather** – Although not a designated disaster, a severe storm with high winds, lightning, and hail blew through the area causing significant tree blow down and sparking several small wildfires.

[44] National Oceanic & Atmospheric Administration. 2010. U.S. Drought Monitor. Drought Information Center. U.S. Department of Agriculture. Available online at http://www.drought.noaa.gov/index.html.

### Probability of Future Occurrence

The probability of Lewis County experiencing a severe weather event on an annual basis is very high. For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Extreme cold, snow accumulation, and wind events are common occurrences between November and March. Major winter storms are expected at least twice each year during the winter season; however, these weather patterns rarely last more than a few days. Severe ice storms also occur in Lewis County during the winter months. The probability of this type of event is high.

Wind events are also common in Lewis County and can occur throughout the year. Wind is often associated with winter storms during the winter and thunderstorms during the warmer months, but can also occur without additional storm influences. The probability of a severe wind event is high; at least 3-5 occurrences each year.

Several major thunderstorms are expected in Lewis County each year between April and September; however, these types of events rarely cause serious damage. The probability of a severe thunderstorm in Lewis County is high.

Lewis County has a moderate probability of experiencing a damaging hail storm in any given year. These types of events most frequently occur in the spring, but can occur throughout the summer as well.

Tornadoes are rare, but the conditions for a funnel cloud to form are reported in Lewis County several times each year. Nevertheless, based on the historical record of tornadoes in this area, the probability for a small tornado to occur in Lewis County is low. The probability of a higher magnitude tornado occurring in this area is extremely low (less than 10% chance).

### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Lewis County. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. In general, snow in this region tends to have low moisture content because of the low temperatures and arid environment. However, heavy snow is not uncommon. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing in Lewis County occurs from a variety of departments and agencies. The state and federal highways are maintained by the Idaho Transportation Department. County roads are plowed by the five highway districts and city departments plow within their respective city limits. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on Lewis County residents as not only is power cut to homes

and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Lewis County schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms do occur in Idaho affecting all counties, but usually are localized events. Their impacts are fairly limited and do not significantly affect the communities enough to declare a disaster. The loss potential from flooding that results from severe thunderstorms can be significant in Lewis County.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property as well as to the vast forestlands and extensive agricultural development in Lewis County. The most significant losses are most clearly seen in the agriculture sectors of the County's economy. Potential losses to agriculture can be disastrous. They can also be very localized; thus, individual farmers can have significant losses, but the event may not drastically affect the economy of the County. Furthermore, crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Federal and state aid is available for County's with declared hail disasters resulting in significant loss to local farmers as well as the regional economy. Homeowners in Lewis County rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Lewis County due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)
- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $65,000, it is estimated that there are 2,877 structures in unincorporated areas of Lewis County with a total average value of approximately $187 million. Using the criteria outlined above, an estimate of the impact of high winds in Lewis County has been made. The

potential wind and tornado damage to all improvements is estimated at approximately $2.8 million. The estimated damage to roofs is approximately $720,000.

Power failure often accompanies severe storms. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events; however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food.

The impacts of drought in Lewis County will be primarily felt in the agricultural sector from the loss in production of crops. Lewis County is primarily dryland farmed; thus, a significant loss in production could lead to millions of dollars in lost revenues. However, most farmers in the area have insurance to protect their livelihoods from these kinds of weather-related occurrences. The actual value of agricultural crops in Lewis County is unknown, but it is estimated in the millions of dollars depending on the year and the crop rotation of various landowners.

### *Earthquake*

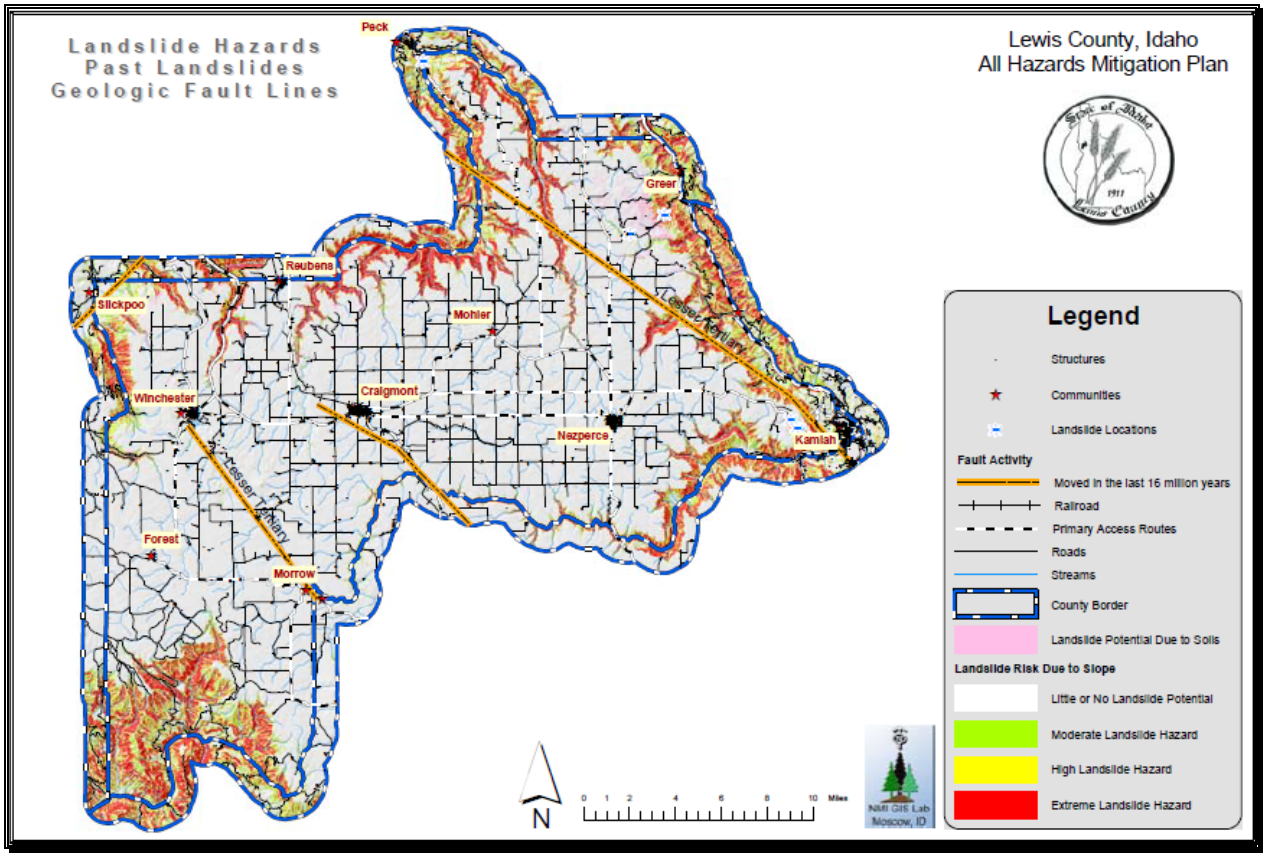
Communities in Lewis County can expect some structural failure of older multistory unreinforced masonry buildings as a result of even lower intensity earthquakes. Cornices, frieze, and other heavy decorative portions of these types of structures may fail. The potential impacts of a substantial earthquake event are highly variable. The International Building Code 2000, as adopted by Lewis County, requires structural earthquake protection for Zone D. Many of the structures and infrastructure throughout the county may not incur any damages at all; however, damage to roads, bridges, unreinforced masonry, chimneys, foundations, water lines, and many other components are at risk. Fires can also be a secondary hazard to structures sustaining earthquake damage.

Because structural damage by earthquakes is typically not complete destruction, rather it 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 significantly impact local municipal and private wells and could result in the loss of traditional land uses.

Past events suggest that an earthquake in the Lewis County area would cause little to no damage. Nonetheless, severity can increase in areas that have softer soils, such as unconsolidated sediments. Damage would be negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; and considerable in poorly built, old, or badly designed structures.

There are three known, but currently inactive fault lines in Lewis County. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard.

**Figure 5.4. Fault Line Locations in Lewis County.**




## Probability of Future Occurrence

Based on historical records, Lewis County has not experienced any seriously damaging earthquakes in recorded history. Due to the County's juxtaposition to more earthquake prone regions within Idaho, it is possible that at some point in the future there could be earthquake events that affect central Idaho.

Peak ground acceleration (pga) in percent g is a measure of the ground motion, which decreases, the further you are from the earthquake. The USGS Shaking Hazard maps for the United States are based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from quake sources. Colors on the map show the levels of horizontal shaking that have a 1 in 10 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of "g" (g is the acceleration of a falling object due to gravity). The model is based on seismic activity and fault-slip rates and takes into account the frequency of occurrence of earthquakes of various magnitudes. Locally, this hazard may be greater because site geology may amplify ground motions. As shown in Figure 4.6, Lewis County has 10% chance of exceeding a 12% pga in the next 50 years. [45] No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard.

[45] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In unincorporated Lewis County, the number and value of unreinforced masonry homes or homes with masonry chimneys is unknown, but estimated to be at least 200. Using an average home value of $65,000 in Lewis County, the approximately total value of these structures is $13 million.

## *Wildland Fire*

***The Lewis County Wildfire Mitigation Plan[46] provides a comprehensive analysis of the wildland fire risks and recommended protection and mitigation measures for all jurisdictions in Lewis County. The information in the "Wildland Fire" sections of this Lewis County Multi-Hazard Mitigation Plan are excerpted from that more detailed document.***

Lewis County lies in the vegetative ecosystem known as the "Palouse Prairie" community. The Palouse Prairie Bioregion is widespread over much of eastern Washington, northern Idaho, and western Montana. These areas are typically characterized by rolling hills, deep soils, and a mild climate. One hundred fifty years ago the typical vegetation consisted of perennial bunchgrasses, which grew in tufts or clumps, accompanied by many various species of "wildflowers." Together, the grasses and flowers gave the appearance (in spring and early summer at least) of a lush meadow. This type of vegetation occurs in relatively moist environments, where the climate is almost wet enough to support the growth of trees. The principal bunchgrasses were Idaho fescue, bluebunch wheatgrass, and prairie junegrass. Short shrubs, especially snowberry and wild rose, were common. Mosses and lichens were an important but inconspicuous feature.

Vegetative structure and composition within Lewis County is closely related to elevation, aspect and precipitation. Warm and dry environments characterize the flat, mid elevation plateaus. Intense agricultural development in these areas limits the establishment of woody tree species or other native vegetation. Dry land farming and ranching activities tend to lower fuel accumulations; thus supporting fires that burn rapidly at relatively low intensities. These fuel types are common in central Lewis County, as well as in much the eastern and northern reaches extending towards the breaks of the Clearwater River.

Along the east aspect slopes of the Clearwater River canyon vegetative patterns begin to show a shift toward forested communities dominated by ponderosa pine and Douglas-fir. The southern arm of Lewis County, stretching towards the breaks of the Salmon River, can also be characterized by a ponderosa pine and Douglas-fir vegetative community; however, fuel continuity is broken sporadically by sections of cleared farm or ranch ground, logging activities, and roadways. These forested conditions possess a greater

[46] King, Tera and V. Bloch. 2010. Lewis County Community Wildfire Protection Plan. Northwest Management, Inc. Moscow, Idaho.

quantity of both dead and down fuels as well as live fuels. Rates of fire spread tend to be lower than those in the grass and croplands, however, intensities can escalate dramatically, especially under the effect of slope and wind. These conditions can lead to control problems and potentially threaten lives, structures and other valued resources.

Much of the steep, dry slopes that rise from the Salmon River, Big Canyon Creek, and Mission Creek canyons that establish many of the Lewis County borders are primarily covered with light bunch and cheat grasses that typically support very fast moving fires. These slopes are characterized by forested draws, saddles, and benches that not only add to fuel build ups, but also channel heat and fumes making direct attack efforts difficult and dangerous for firefighters. These areas are highly valued for their cultural and scenic qualities. Although there are few homes built directly on the steeper gradients, most structures are located along the upper canyon rims. The juxtaposition of these homes to the high fire risk slopes will continue to challenge the ability to manage wildland fires in the wildland-urban interface.

Agricultural practices surrounding most communities within Lewis County 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. This pattern is particularly apparent around Craigmont and Nezperce. Cultivation has also broken fuel continuity in areas surrounding Winchester, Reubens, and Forest.

Before the development of agriculture and other land uses, the Palouse Prairie Bioregion had a rich fire history, with relatively frequent fires. The last decade has seen the increase in the occurrence of cheatgrass (*Bromus tectorum L*.), an exotic grass species that is able to out-compete native bunchgrasses. Cheatgrass responds well to soil disturbance and is found in abundance along roadsides, driveways, new construction areas, and in recently burned areas. Over time, vegetative species composition in unmanaged land has shifted toward fire prone species, particularly in high use areas where disturbance is common.

Fuels throughout the entire prairie community in Lewis County are fairly consistent, dominated by grasslands or cultivated fields. Areas dominated by grass can be described as Fuel Models 1 and 3 (FM1 and FM3). Fires in these fuel types tend to spread rapidly, but burn at relatively low intensity. Wild or cultivated grains that have not been harvested can burn more intensely, especially under severe weather conditions. Where grasses become less consistent, wind is needed to push fires through the bunchgrass. Timber dominated fuel complexes can be described as FM2 or FM8. Open ponderosa pine and Douglas-fir stands characterize FM2 and typically support low to moderate intensity surface fires; however, jackpotting in denser clumps may result in torching of individual trees or produce firebrands. Surface fuel accumulations in FM8 forest fuel types are generally denser than in FM2, which leads to more intense, slow burning surface fires. Under severe weather conditions, this fuel type could support very intense ground and surface fires or crown fires. Frequent jackpotting, spotting, and torching of individual trees is common.

The majority of homes and structures within and surrounding communities on the Camas Prairie are at low to moderate risk of loss to wildland fire. The prevalence of grasses and agricultural crops pose a low threat to homes surrounded by these fuels, as fire typically spreads quickly and burns at relatively low intensities. However, there are a number of individual homes that are at much higher risk to wildland fire loss in the area largely due to use of highly ignitable materials in home construction, location of the home on a steep slope or within heavy fuels, and the lack of defensible space surrounding the home. Home defensibility

practices can dramatically increase the probability of home survivability. The amount of fuel modification necessary will depend on the specific attributes of the site. 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.

Developments in wildland-urban interface areas often face high fire risk because of the combination of high fire hazard (high vegetative fuel loads) and limited fire suppression capabilities. Unfortunately, occupants in many wildland-urban interface areas also face high safety risks, especially from large fires that may spread quickly. The safety risks in interface areas are often exacerbated by limited numbers of roads (in the worst case only one access road) that are often narrow and winding and subject to blockage by a wildland fire.

Developments in rural wildland-urban interface areas face a range of risk factors. Developments that have all or most of the following attributes are at the highest level of risk:

1) Location in or surrounded by heavy fuel loads with a high degree of continuity (i.e. few significant firebreaks). Risk may be particularly high if the fuel load is grass, brush, and smaller trees subject to low moisture levels in short duration drought periods.
2) Steep slopes, which cause fires to spread more rapidly.
3) Limited fire suppression capacity including limited water supply capacity for fire suppression purposes, limited firefighting personnel and apparatus, and typically long response times for fire alarms.
4) Limited access for firefighting apparatus and limited evacuation routes for residents at risk.
5) Construction of structures to less than fully fire-safe practices,
6) Lack of maintenance of firebreaks and defensible zones around structures.

Using data on past fire extents and fire ignition compiled by the IDL, the occurrence of wildland fires in the region of Lewis County has been evaluated. The IDL database of wildfire ignitions used in this analysis includes ignition and extent data from 1983 through 2002 within their protection. An analysis of the IDL reported wildfire ignitions in Lewis County reveals that during this period approximately 78,950 acres burned as a result of 233 ignitions.

| Table 5.5. Wildfire Ignition Summary. | | |
|---|---|---|
| General Cause | Number of Ignitions | Percent of Total Ignitions |
| Lightning | 109 | 46.8% |
| Campfire | 10 | 4.3% |
| Smoking | 3 | 1.3% |
| Debris Burning | 45 | 19.3% |
| Arson | 8 | 3.4% |
| Equipment Use | 30 | 12.9% |
| Railroad | 0 | 0.0% |
| Children | 2 | 0.9% |
| Miscellaneous | 26 | 11.2% |
| Total | 233 | |

Although many very large fires, growing to over 250,000 acres have burned in North Central Idaho, actual fires in this county have usually been controlled at much smaller extents. One notable exception to this was the Maloney Fire in 2000 which burned over 74,500 acres costing approximately $5.0 million to contain. When considering the past 20 years of data, the average number of acres burned and cost of firefighting is highly influenced by the Maloney Fire of 2000. When this one fire is removed from the dataset, the average area burned each 5-year period is approximately 1,100 acres (222 acres per year) at a 5-year periodic cost of $400,000 ($78,700 per year average).

| Table 5.6. Idaho Department of Lands Wildfire Data 1983-2002. | | | | |
|---|---|---|---|---|
| | **1983-1987** | **1988-1992** | **1993-1997** | **1998-2002** |
| | | *--- Number of Ignitions ---* | | |
| Lightning Ignition | 28 | 39 | 10 | 32 |
| Human Ignition | 30 | 28 | 21 | 19 |
| Miscellaneous Ignition | 5 | 4 | 9 | 8 |
| | | *--- Totals ---* | | |
| Acres Burned | 319 | 2,808 | 929 | 74,894 |
| Costs of Firefighting | $ 59,791 | $ 749,747 | $ 189,786 | $ 5,575,142 |

## Local Event History

**2003 Milepost 59 Fire** - The Milepost 59 fire was started on August 14, 2003 by a catalytic converter on a disabled vehicle. The vehicle ran out of gas and pulled onto the shoulder of US highway 12 approximately 7 miles northwest of Kamiah, Idaho. The fire was located on the west side of highway 12 at the base of a steep slope with a northeast aspect. The fire was reported at 9:05 and the first engine arrived on-scene at 9:20. At that point, the fire was estimated to be several acres in size and was expanding rapidly. Although an attempt was made with crews, engines, and 2 dozers to initial attack the fire, suppression efforts were unsuccessful due to extended drought conditions, steep terrain, rock bluffs, and the inability to mobilize air resources at night. Poor visibility created by smoke and an inversion limited effective air support. Dozers and hand crews attempted to hold the fire at 150 acres with fire lines and burn out operations. By mid-morning the inversion lifted and the wind picked up. The fire blew up to approximately 2,000 acres, and made an upriver run of about 2 miles. The fire, managed as a Type 3 incident, was divided into 2 divisions,

with over 100 people, 3 dozers, 3 engines and an assortment of volunteer and rural equipment on-scene. A decision was made to request a Type 2 incident management team. By August 16th, the fire had doubled to over 4,700 acres, and was threatening residences. The fire was essentially being attacked from 2 locations. The Idaho Department of Lands was spear-heading the attack on both the upriver and downriver flanks of the fire on Highway 12, and the Nezperce rural fire department and local farmers were working the agriculture lands on the west side of the fire. Suppression forces had also doubled in size with more than 200 people assigned to the fire, not including volunteers. Two residences within the fire were saved by burn-out operations and air support and a number of other residences ahead of the fire were prepped. A decision to close Highway 12 to all but emergency vehicles was made. By nightfall on Sunday, August 17th, the fire was contained at an estimated size of 5,500 acres and a Florida Type 2 team arrived. The final shift was completed by Friday, August 29th, 15 days after ignition. The final size of the fire was 8,142 acres, and the total cost was approximately $2.6 million.

**2008 Church Canyon Fire** – The Church Canyon Fire, reported on August 7, 2008, was ignited by lightning and was located 3 miles southeast of Kamiah on land managed by the Idaho Department of Lands. The fire grew to approximately 800 acres, but was contained on August 14th. A total of 177 firefighters were deployed to fight this fire.

### Probability of Future Occurrence

Fire was once an integral function within the majority of ecosystems in Idaho. The seasonal cycling of fire across the landscape was as regular as the July, August and September lightning storms plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition.[47] The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[48] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[49] Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation throughout Lewis County.

Overall, the threat of wildland fire appears moderate for Lewis County. This is in large part because of the levels of rain and snowfall which helps to minimize the period of time the County is most susceptible to severe wildfires. However, for portions of Lewis County, depending on conditions in specific developments in wildland-urban interface areas, the threat may be moderate to high, especially during periods of

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

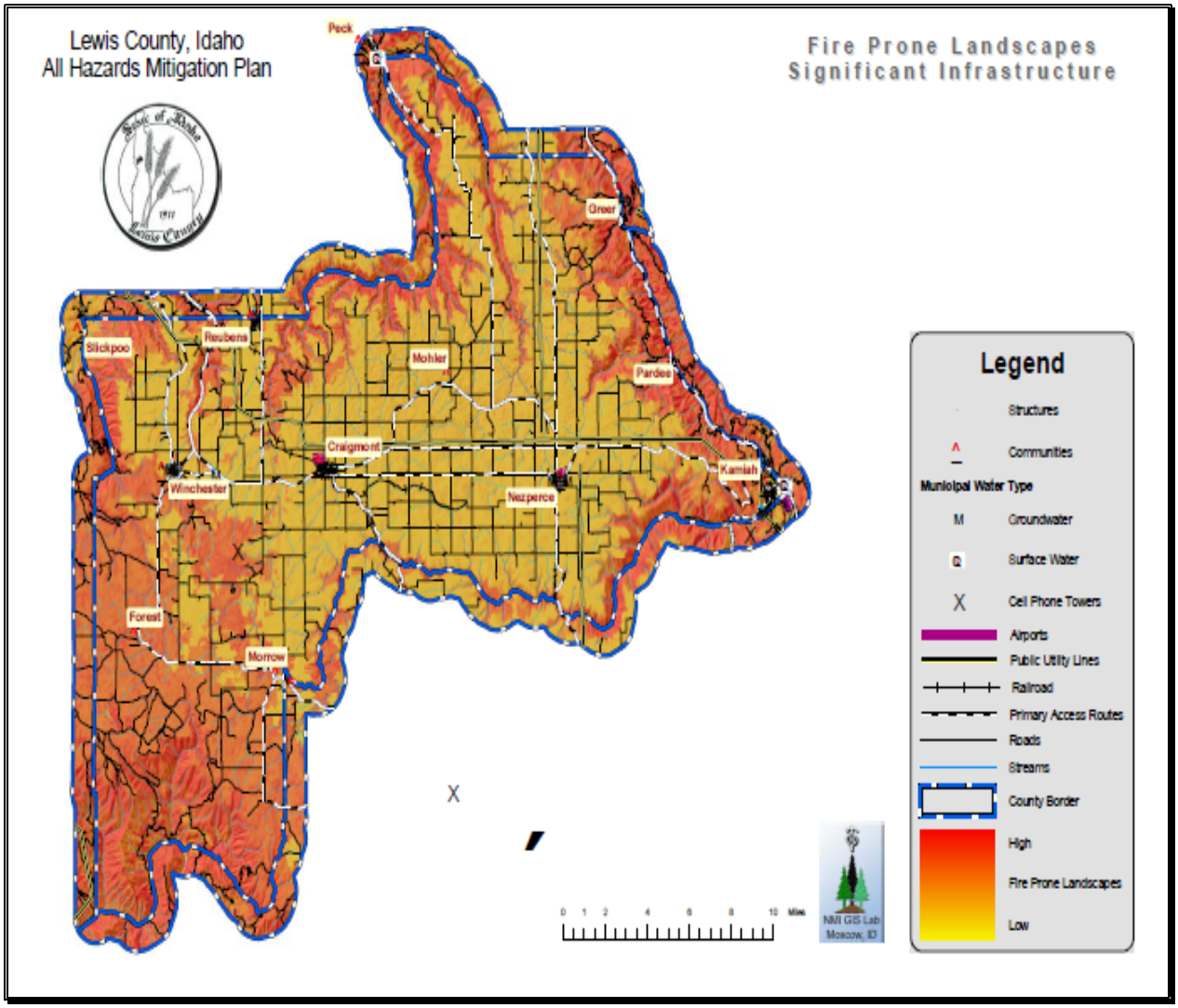
[48] Barrett, J.W. 1979. Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge. USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 106.

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

drought. According to the State of Idaho Hazard Mitigation Plan, Lewis County is ranked 26th in the State for existing risk and 19th for potential risk.[50]

A Fire Prone Landscapes model was developed in 2005 as part of the Lewis County Community Wildfire Protection Plan process. Digital Elevation Models and factors such as vegetation, riparian zones, wind direction, slope, and past fire occurrence were used to assess the potential for the landscape to burn during the fire season. 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 to burn in the event of a wildfire. The analysis ranked factors from 0 (little to no risk) to 100 (extremely high risk).

**Figure 5.5. Lewis County Fire Prone Landscapes Model.**




[50] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

### Value of Resources at Risk

It is difficult to estimate potential losses in Lewis County due to wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive.

Ignition potential is high throughout the County. Recreational areas, major roadways, debris burning, and agricultural equipment are typically the most likely human ignition sources. Lightning is also a common source (47% of all ignitions) of wildfires in Lewis County.

Lewis County is actively pursuing funds to help with wildland fire mitigation projects and public education programs. While mitigation efforts will significantly improve the probability of a structure's survivability, no amount of mitigation will guarantee survival.

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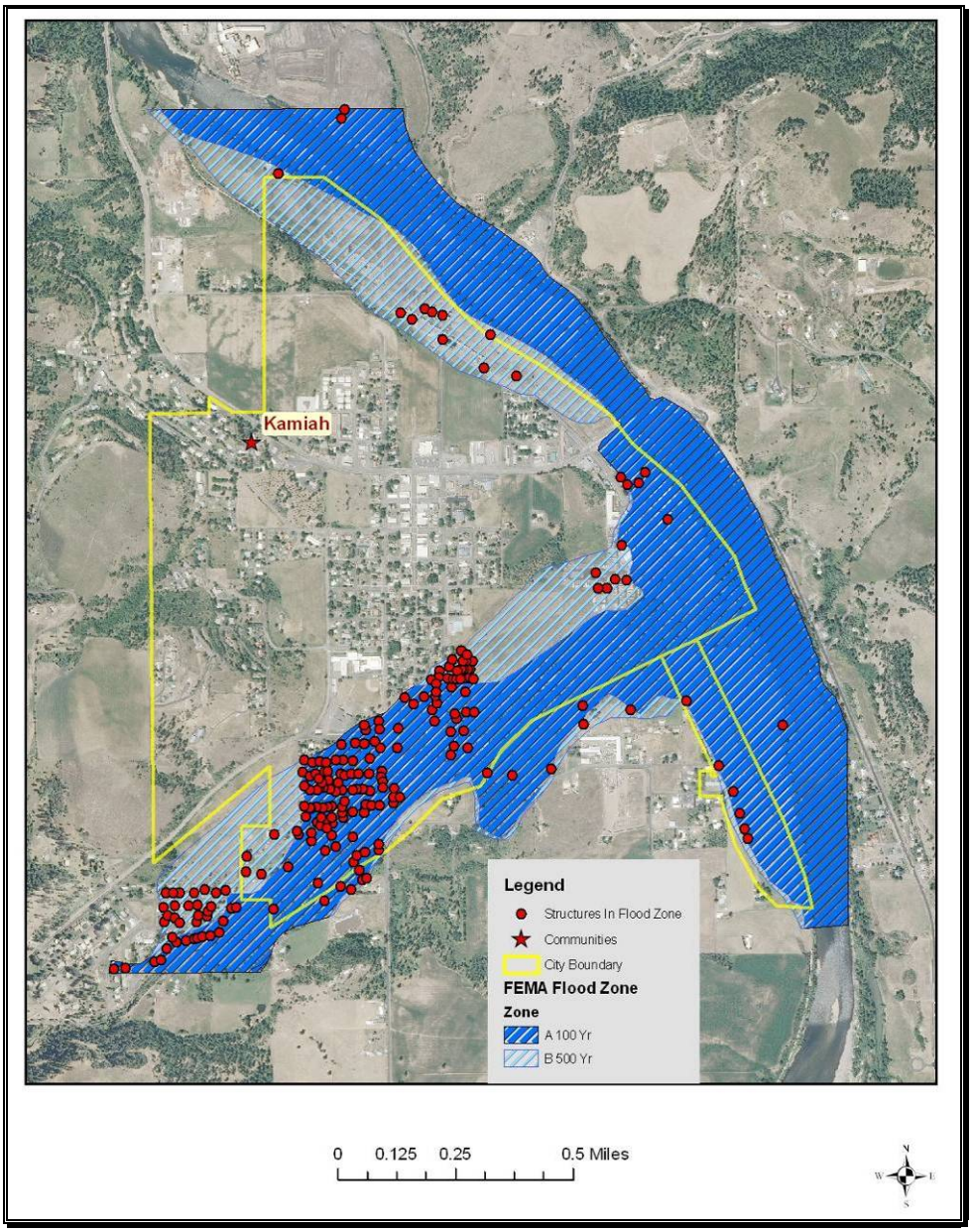
# *City of Kamiah Annex*

## *Flood*

Kamiah is located at the junction of U.S. Highway 12 and State Highways 162 and 64 approximately 65 miles southeast of Lewiston. The two major flood plains affecting Kamiah are from the Clearwater River and Lawyer Creek.

Most of the businesses and infrastructure associated with the community is on the western bank of the Clearwater River, which is part of Lewis County. However, there are several homes and businesses that sit on the eastern bank, which is in Idaho County.

**Figure 5.6. FEMA Flood Zones and land ownership surrounding Kamiah.**



Kamiah sits at the base of the east aspect slope that defines the Clearwater River canyon. Lawyer Creek runs down from the Camas Prairie bisecting Kamiah at the south east corner of town. At the confluence of Lawyer Creek with the Clearwater River an alluvial fan has developed. This alluvial fan and the perched and serpentine movement of Lawyer Creek across the fan threaten areas of Kamiah that have previously not been affected by flood events.

The primary access into Kamiah is by U.S. Highway 12, part of the Lewis and Clark Trail. This two lane highway follows the path of the Clearwater River and can be very narrow and windy. State Highway 162 enters Kamiah from the southwest and is also a narrow two lane highway that provides the quickest route from the Camas Prairie. Sections of these roadways are within the floodplains of the Clearwater River and Lawyer Creek and could become impassable during a flood event. If the bridge across the Clearwater River at Kamiah is not compromised, then several secondary access routes may exist in Idaho County depending on the extent of flooding.

If both routes were compromised, State Highway 64 on the Lewis County side of the river could function as an access route. Also known as the Kamiah-Nezperce Grade, Highway 64 is a very narrow and windy, primarily gravel, single lane road that climbs the steep canyon wall to the Camas Prairie above. This is not a desirable access route for emergency service vehicles or heavy public/business travel. Not only does it lack suitable turnouts and guard rails, the type of weather events that cause flooding would further reduce the functionality of this road. During the 1996/1997 floods, this road was closed periodically due to small landslides depositing material on the road surface. The road itself was narrowed in two places when the fill slope slumped.

The location of the town site at the junction of two large floodplains guarantees periodic flood impacts. The residents of Kamiah have long recognized their vulnerability to flood. Since the major flood events of 1996/1997, these communities have been involved in very comprehensive and detailed evaluation of mitigation activities and flood preparedness through Kamiah Project Impact Partnership. The community is also working on a project that will assess and eventually improve the stormwater drainage system in Kamiah. Currently, stormwater runoff is piped to and deposited either directly into Lawyer Creek or into the city's antiquated stormwater system. Both eventually deliver stormwater into the Clearwater River, which can further exacerbate a flood event. This practice can also lead to surface contaminants being introduced into Lawyer Creek and the Clearwater River.

### Probability of Future Occurrence

The probability of flood events occurring in Kamiah is high. Locations labeled as Flood Zone A in Figure 5.6 are areas that will be subject to a 1% probability of a certain size flood occurring in any given year (100-year flood). Flood Zone B represents areas between the limits of the base flood and the .2% annual chance (500 year flood).

Low magnitude flood events can be expected several times each year in the Lawyers Creek drainage. However, due to the flat topography and drainage infrastructure, the impacts of these events are slight and will usually amount to minor and temporary traffic issues. Larger magnitude and high impact flood events have occurred repeatedly along Lawyers Creek. These types of flood events have the highest probability of occurrence in the winter or early spring. Minor flash floods are common on the numerous small tributaries

feeding Lawyers Creek upstream of the community, but are not likely to have an impact on the Lawyers Creek channel within Kamiah.

### Value of Resources at Risk

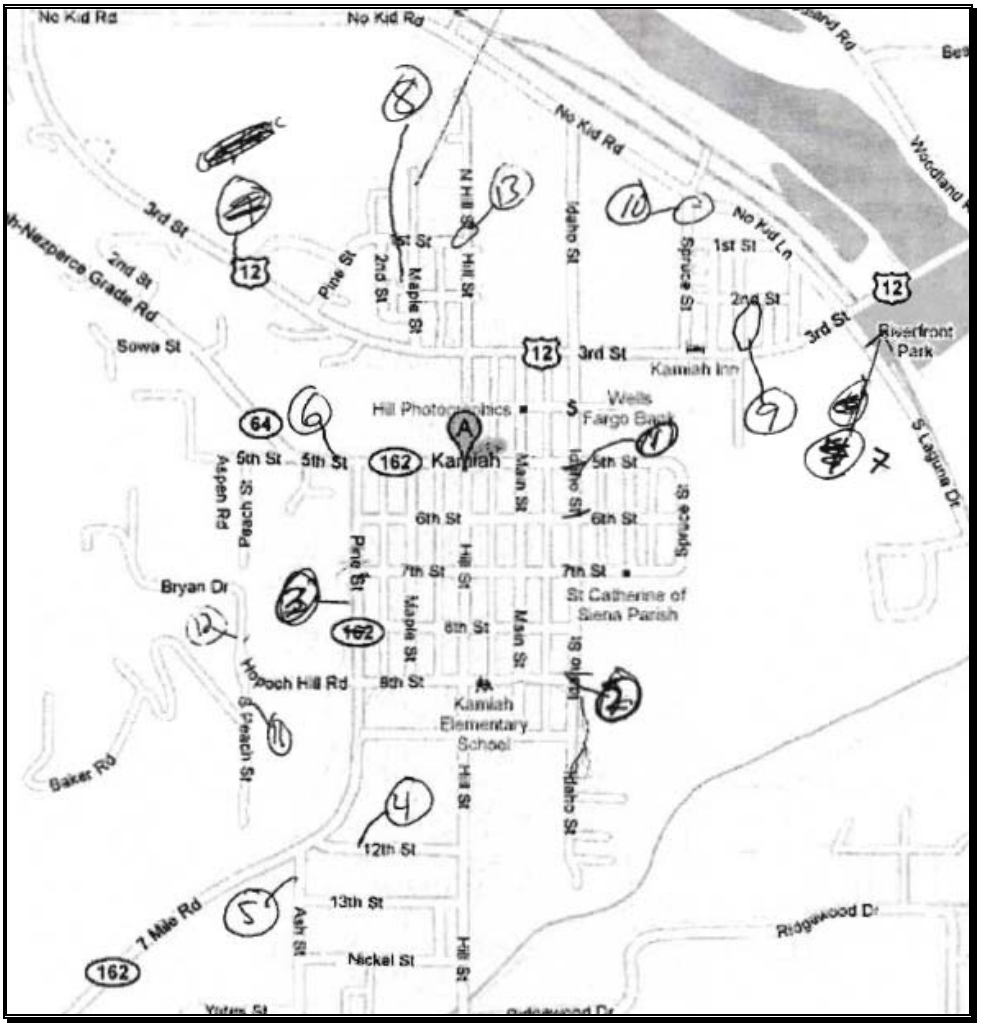
Kamiah operates under the uniform building code. Both Lewis County and the city of Kamiah have adopted floodplain ordinances to mitigate development in flood prone areas. Both entities are currently working on updating the existing ordinances to reflect changes in the floodplain itself as well as local policy and growth issues.

No engineered flood control devices exist on the Main Fork of the Clearwater River. The Army Corps of Engineers did work on Lawyer Creek to Mission Creek in the 1960's. The channeling and levees were constructed to handle a 10 year flood event. Larger events have breeched and weakened the levees and the channel has started to move back into its historic floodplain. They are inspected annually by the US Army Corps.

Bridges, roads, and the city water treatment plant are the most affected infrastructure in Kamiah during flood events. Restricted travel corridors also impact major industries that are not directly affected by floods.

The existing Flood Insurance Rate Map for Kamiah was made effective in 1985. Since then the Kamiah Bridge on U.S. Highway 12 has been replaced; thus, it is likely that the floodplain has been altered in this area. Additionally, the U.S. Corp of Engineers has completed a channelization and stabilization project on the identified section of Lawyer's Creek that has altered the mapped floodplain. Nevertheless, there are 165 structures within the FEMA-identified floodplains (100- and 500-year) in Kamiah, yielding an estimated total improvement value of $20.6 million (based on $125,000 average structure value). There is currently no repetitive loss properties identified in Kamiah; however, the city has identified 13 project areas that have been repeatedly damaged due to stormwater drainage issues. Five of these project areas will impact approximately 125 structures (residential and commercial). The remaining projects will impact approximately 2-6 structures (residential and commercial) each. This information is being used to develop a stormwater drainage mitigation program.

**Figure 5.7. Repeatedly Stormwater Damaged Properties.**




The average damage to structures was estimated based on the structure's location as either completely within or out of the flood zone. The estimated value of contents is ½ the value of the improvements equating to an additional $9.4 million in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation. There are currently 13 NFIP policies in Kamiah.

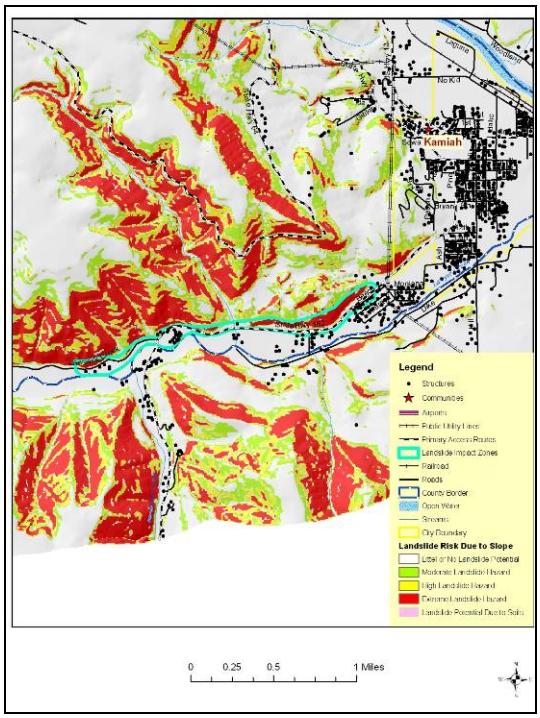
Critical infrastructure located within the identified floodplain for Kamiah includes 2 water wells, the airport, the sewer plant, and the water treatment facility.

## *Landslide*

Kamiah is located in the canyon of the Clearwater River at the mouth of Lawyer Creek. The Clearwater River and Lawyer Creek have cut deep canyons into the Camas Prairie and the basalt flows that underlie much of the area. Large areas of landslide deposits dominate the geology around Kamiah, the result of the movement of sedimentary materials interbedded with the basalt flows. Landslide deposits occur where major sedimentary interbeds are exposed along the steep valley sides.

The Kamiah area 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. Although recent years have not seen the same level of activity that was typical in ancient times, these characteristics remain. Many of the slopes and hillsides along the Clearwater River and in the vicinity of Kamiah are comprised by material deposited by past landslides. The location of landslide deposits in canyons is controlled by the presence of sedimentary interbeds, the hydrologic regime, and the occurrence of basalt overlying clay-rich weathered basement 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 canyon 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.[51]

Poorly sorted material deposited during debris flow events is also present in alluvial fans in the Kamiah area. These deposits are at the mouths of steep chutes and small canyons along the break-lands of the Clearwater drainage. 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. During these events, material present in the sedimentary layers was washed down the steep drainages and deposited at the mouth of the chutes, forming alluvial fans of varying sizes. These activities are historically infrequent, with recurrence cycles on the order of years to decades. However, these events can result in significant damage to buildings and infrastructure, disrupt travel, reduce water quality, and jeopardize safety.




*Kamiah Landslide Impact Zone*

The Kamiah Landslide Impact Zone encompasses a small population cluster along the north side of State Route 162 at the mouth of Lawyers Creek canyon. Structures in this Zone have a moderate to high risk of being affected by landslide activity due to the steep canyon walls and historic activity. Homes and travel routes that have been constructed at the mouths of steep chutes and through alluvial deposits are at an increased risk of being affected by landslide activity. These historic deposits are a strong indicator of debris flows in the future. Furthermore, these deposits tend to be unstable and somewhat prone to movement. The following is a list of areas that are built in alluvial fans:

[51] Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

- The homes and infrastructure west of the Kamiah-Nezperce Grade Road, particularly in the Ida Road and Gibler Road Area.
- Homes and infrastructure west of Pine Street in the Bryan Drive and Baker Road area.
- Stretches of the Seven Mile Road and Lawyer Creek Road at the mouth of steep draws and canyons.

Debris flow activity and the resulting alluvial sediment deposition is associated with soil saturation and high precipitation events. As mentioned, landslide events are highly associated with significant precipitation events. The areas noted above are in locations with landslide characteristics. The probability of these events occurring during normal weather conditions is low. However during high levels of precipitation, residents and county representatives should monitor these areas for landslide activity.

The main access route to and from Kamiah is U.S. Highway 12. Much of this highway travels along river corridors with steep slopes abutting the roadway. Landslides affecting this travel route can have a significant impact on the community of Kamiah as supplies and other commerce must bypass the town by traveling several hundred miles around (i.e. through Missoula or Grangeville). Additionally, residents of Kamiah, particularly commuters could be cut-off from the only efficient access route.

The potential for debris flows and landslides would dramatically escalate in the event of a large wildland fire event that denudes the steep canyon 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 canyon walls.

### Local Event History

Recent slides have occurred along Highway 12 near the Kamiah Bridge just outside the County boundary, which slowed traffic flow and resulted in repair costs. Additionally, Lolo Pass on Highway 12 in adjacent Idaho County has been closed on several recent occasions due to avalanches. The 2008 avalanches closed U.S. Highway 12 for several days and nearly caused several accidents.

### Probability of Future Occurrence

The Idaho Geological Survey has aggressively been mapping surface geologic features along the Clearwater River. These maps provide valuable information for planning of private and public land use by identifying areas of unstable geologic formations. This work indicates that there are numerous visible landslides blocks on many of the steep slopes above the community of Kamiah and in the Lawyer Creek and Seven Mile Creek areas. The presence of these landslide blocks is a strong indicator of possible landslide activity in the future.

The Landslide Prone Landscapes model depicts Kamiah as having a moderate to high risk of landslides as a result of the geology and soil parent material in the area.

### Value of Resources at Risk

Slides in the identified Kamiah Impact Zone are more likely to be larger and more damaging as weaknesses in the underlying rock formations give way. Although infrequent, this type of slide has the potential to not only block, but destroy road corridors, dam waterways, and demolish structures. There are 38 structures with an estimated total value of $4.8 million within the Impact Zone as well as sections of State Highway

162 and Lawyers Creek Road. It is likely that all of these structures and infrastructure would be destroyed or severely damaged in the event of a major slide in this area.

The cost of cleanup and repairs resulting from slumps along roadways is difficult to estimate due to the variable circumstances with each incident including the size of the slide and proximity to a Highway District shop. Other factors that could affect the cost of the damage may include culverts, streams, and removal of debris. This type of information is impossible to estimate; thus, no repair costs for damaged roadways are given.

### *Severe Weather*

The city of Kamiah does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

#### Local Event History

**2008 Hail Storm –** A hail storm affected the community of Kamiah in 2008 causing several thousand dollars in damage to the community center and the St. Mary Clinic as well as several other public and private structures and vehicles.

#### Probability of Future Occurrence

The probability of a severe weather event occurring in Kamiah on an annual basis is moderate to high. However, the impacts to the community are usually minimal and are the same as those described for Lewis County as a whole.

For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Kamiah has a moderate probability of experiencing extreme cold or severe winter weather, a high probability of experiencing a severe wind event, a high probability of experiencing major thunderstorms (usually 3-5 per year), a moderate probability of experiencing a damaging hail storm, and a low probability of experiencing a tornado.

#### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Kamiah. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance crew. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on

residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Kamiah schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Kamiah to cause significant damages. However, the loss potential from flooding which results from severe thunderstorms could be significant.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Kamiah. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Kamiah rarely incur severe damage to structures (roofs); however, it has happened as recently as 2008. Hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Kamiah due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)
- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $125,000, it is estimated that there are 571 structures in Kamiah with a total average value of approximately $71.4 million. Using the criteria outlined above, an estimate of the impact of high winds in Kamiah has been made. The potential wind and tornado damage to all improvements is estimated at approximately $1.1 million. The estimated damage to roofs is approximately $87,000.

Power failure often accompanies severe storms. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm

and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed.

The city of Kamiah does not have any assets or resources directly at risk to drought. The city does filter and process water from the Clearwater River for sale to citizens and service recipients. In the event of an extreme drought, this service may become temporarily limited.

### *Earthquake*

The city of Kamiah does not have any differing levels of risk associated with this hazard than Lewis County as a whole. However, an inactive fault line lies just to the west of the community. The Community Building in town has been seismically evaluated due to suspicious cracks in the foundation in similar areas on both sides of the building. It was determined that these cracks were likely caused by the structure's proximity to the fault line. It is also known that several structures in nearby Kooskia (7 miles away) have structural damage due to seismic activity.

#### Probability of Future Occurrence

The City has 10% chance of exceeding a 12% pga in the next 50 years.[52]

#### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Kamiah in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Kamiah, the American Legion hall, the Presbyterian Church, the airport facility, the schools, the water treatment plant, and approximately 25 additional structures in the downtown district are assumed to be unreinforced masonry. The value of these structures is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Kamiah is unknown, but estimated to include at least 125 buildings.

### *Wildland Fire*

Most of the businesses and infrastructure associated with the community is on the western bank of the Clearwater River, which is part of Lewis County. However, there are several homes and businesses that sit on the eastern bank, which is part of Idaho County. As Kamiah grows, more and more homes are being built along the steep slopes of the river canyon. The economy in this part of the County is more focused on the lumber and tourism industries than agriculture.

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[52] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

The Lewis County portion of Kamiah sits at the base of the east aspect slope that defines the Clearwater River canyon. This slope is characterized by very patchy timber intermixed with grasslands. Drier habitat species such as ponderosa pine and Douglas-fir grow in fairly open stands on this steep slope. Fires in this fuel type were historically frequent, but generally burned at low to moderate intensities. Fire suppression over the past few decades has led to increased brush, regeneration, and other surface fuels in the understory, which can lead to more intense fires. Torching, crowning, and spot fires tend to occur more frequently under these conditions.

The timber component of the system becomes much more continuous to the north, but transitions to a grassland habitat to the south. Lawyer Creek, which defines the southern border of Lewis County, drains into the Clearwater River at the south end of Kamiah. The steep, south aspect slope of the deep canyon created by this tributary is dominated by lower growing grass species with very few trees or shrubs. Fires in these grassland ecosystems cure early in the summer and become increasingly prone to ignition.

Both natural and man-caused fires occur in this area. The high density of recreational and industrial activity near the river and the intense use of mechanized equipment for farming and logging increase potential ignition sources significantly. The use of equipment near cured grasses sparked the 2003 Milepost 59 Fire, which burned over 8,000 acres in the Clearwater River canyon 5 miles north of Kamiah. 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. Contact between power lines and trees can also spark fires, especially during windy conditions. The occurrence of arson fires each year is rising, most notably on the Highway 64 Grade. So far, local fire emergency resources have controlled these fires before they caused serious damage and threatened lives or property.

Lightning events are common across Lewis County; however, ignitions due to down strikes occur more frequently on the river breaks. The cured grasses that cover the steep slopes of the Clearwater River canyon and the dry forest habitat types that dominate much of the area surrounding Kamiah are very receptive to ignition.

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 fuel types and moisture levels, 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 regardless of whether the event occurs in forest or rangeland fuels.

The primary access into Kamiah is by U.S. Highway 12, part of the Lewis and Clark Trail. This two lane highway follows the path of the Clearwater River and can be very narrow and windy. State Highway 162 enters Kamiah from the southwest and is also a narrow two lane highway that provides the quickest route from the Camas Prairie. Both Highway 12 and 162 could function as escape routes; however, it is possible that one or both would become impassable in the event of a fire. Sections of these roadways abut timber-type fuels and steep slopes. The Clearwater River canyon near Kamiah is narrow enough in some places that a fire on either side could shut down Highway 12 due to extreme heat and fumes. If both routes are disabled, there are several secondary roads on the Idaho County side of the River that could function as escape routes including Woodland Road and Tom Taha Road. U.S. Highway 12 is also vulnerable to closure

due to fire in areas outside the County. Wildland fires affecting any portion of this travel route in Idaho could have a significant impact on the community of Kamiah as supplies and other commerce must bypass the town by traveling several hundred miles around (i.e. through Missoula or Grangeville). Additionally, residents of Kamiah, particularly commuters, as well as emergency personnel could be cut-off from the only efficient access route

State Highway 64, also known as the Kamiah-Nezperce Grade, is a very narrow and windy, primarily gravel, single lane road that climbs the steep canyon wall to the Camas Prairie above. This is not an adequate escape route. Not only does it lack suitable turnouts and guard rails, but there is also a history of ignitions along the roadway.

High tension power lines run along the southwestern side of the community. Sections of these transmission lines cross over forest ecosystems. These lines have a moderate potential of sparking an ignition, particularly during severe wind events. Efforts should be made to insure power line corridors are kept clear of fuels.

Tourism is an important component of Kamiah's economy. Travelers seeking adventure along the Lewis and Clark Trail pass through Kamiah on U.S. 12. Lodging, dining, and other recreational facilities have become relatively dependent on the flow of travelers during the warmer months. Restricted access due to wildfires may negatively effect this cash flow.

Structural fire protection is provided to Kamiah and the surrounding areas by the Kamiah Volunteer Fire Department. The Idaho Department of Lands - Maggie Creek District, USDA Forest Service, and the Nez Perce Tribe offer wildland fire protection.

### Local Event History

**1910 Fire –** In 1910 much of northern Idaho was burned by numerous wildland fires; Kamiah was one of the casualties of these fires. Originally, the town of Kamiah was located closer to the Clearwater River near No Kid Lane, but the townsite was moved to its present location after a wildfire in 1910 burned most of the structures to the ground.

**2003 Milepost 59 Fire** - The Milepost 59 fire was started on August 14, 2003 by a catalytic converter on a disabled vehicle. The vehicle ran out of gas and pulled onto the shoulder of US Highway 12 approximately 7 miles northwest of Kamiah, Idaho. The fire was located on the west side of highway 12 at the base of a steep slope with a northeast aspect. The Idaho Department of Lands was spear-heading the attack on both the upriver and downriver flanks of the fire on Highway 12 and the Nezperce rural fire department and local farmers were working the agriculture lands on the west side of the fire. Suppression forces had also doubled in size with more than 200 people assigned to the fire, not including volunteers. Two residences within the fire were saved by burn-out operations and air support and a number of other residences ahead of the fire were prepped. A decision to close Highway 12 to all but emergency vehicles was made. By nightfall on Sunday, August 17$^{th}$, the fire was contained at an estimated size of 5,500 acres and a Florida Type 2 team arrived. The final shift was completed on Friday, August 29$^{th}$, 15 days after ignition. The final size of the fire was 8,142 acres and the total cost was approximately $2.6 million.

**2008 Church Canyon Fire** – The Church Canyon Fire, reported on August 7, 2008, was ignited by lightning and was located 3 miles southeast of Kamiah on land managed by the Idaho Department of Lands. The fire grew to approximately 800 acres, but was contained on August 14th. A total of 177 firefighters were deployed to fight this fire.

### Probability of Future Occurrence

The community of Kamiah has a moderate to high risk of experiencing a wildland fire on an annual basis according to the Fire Prone Landscapes model (Figure 5.5.), which has been recently demonstrated by the 2003 Milepost 59 Fire. Homes built on steep slopes or with timber directly abutting or overhanging structures are at the highest risk. Fires in these timber fuel types are generally much more intense and difficult to control than rangeland fires. Dry grasses on the steep slopes rising from the community center would support very rapidly spreading wildfires, leaving little time for residents to escape. Additionally, the abundance of recreational and other human activities in the area drastically increase potential ignition sources. Preparing a home prior to a wildfire event will significantly increase its chance of survival.

The location of the townsite in the bottom of a narrow canyon exacerbates already hazardous landscape characteristics. A fire on either side of the river would funnel hot gases and fumes through the canyon. Intense heat, sparks, or fire brands could easily light the opposite side; thus, compounding the threat. Additionally, there are only a few safe escape routes available to residents.

### Value of Resources at Risk

It is difficult to estimate potential losses in Kamiah from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to wildland fuels.

# *City of Craigmont Annex*

## *Flood*

Craigmont is located on the Camas Prairie between Winchester and Ferdinand. There are two unnamed drainages that flow through the town. These drainages are not perennial streams, but active ditches for spring runoff and seasonal storm flow. The main ditch comes into town from Highway 95 on the southwest corner of town. It then runs just north and parallel to Main Street, and exits the town to the southeast along Prairie road connecting back into Highway 95. There are a few homes located near the ditch. For most of its length the ditch runs adjacent to the business district. The second ditch flows in from the north along Second Street. It joins up with the first ditch between First and Division.

Floods in the area are the result of two different types of weather events, rain-on-snow and thunderstorms. Rain-on-snow events that affect Craigmont occur when significant snow pack exists within the hydrologic divide of the two streams that run through town. The boundaries of these divides are within 5 miles of town. Warm rains falling on the snow pack result in a significantly increased rate of snowmelt. Often this melting occurs while the ground is frozen and the water cannot be absorbed into the soil, resulting in increased overland flows. Flood waters recede slowly as rain-on-snow weather events tend to last for several days.

Thunderstorms are localized summer events. They are typified by intense rain fall in a localized area. Flooding occurs rapidly, overwhelming the water carry capacity of channels in a short time. The duration of subsequent flooding tends to be a matter of hours.

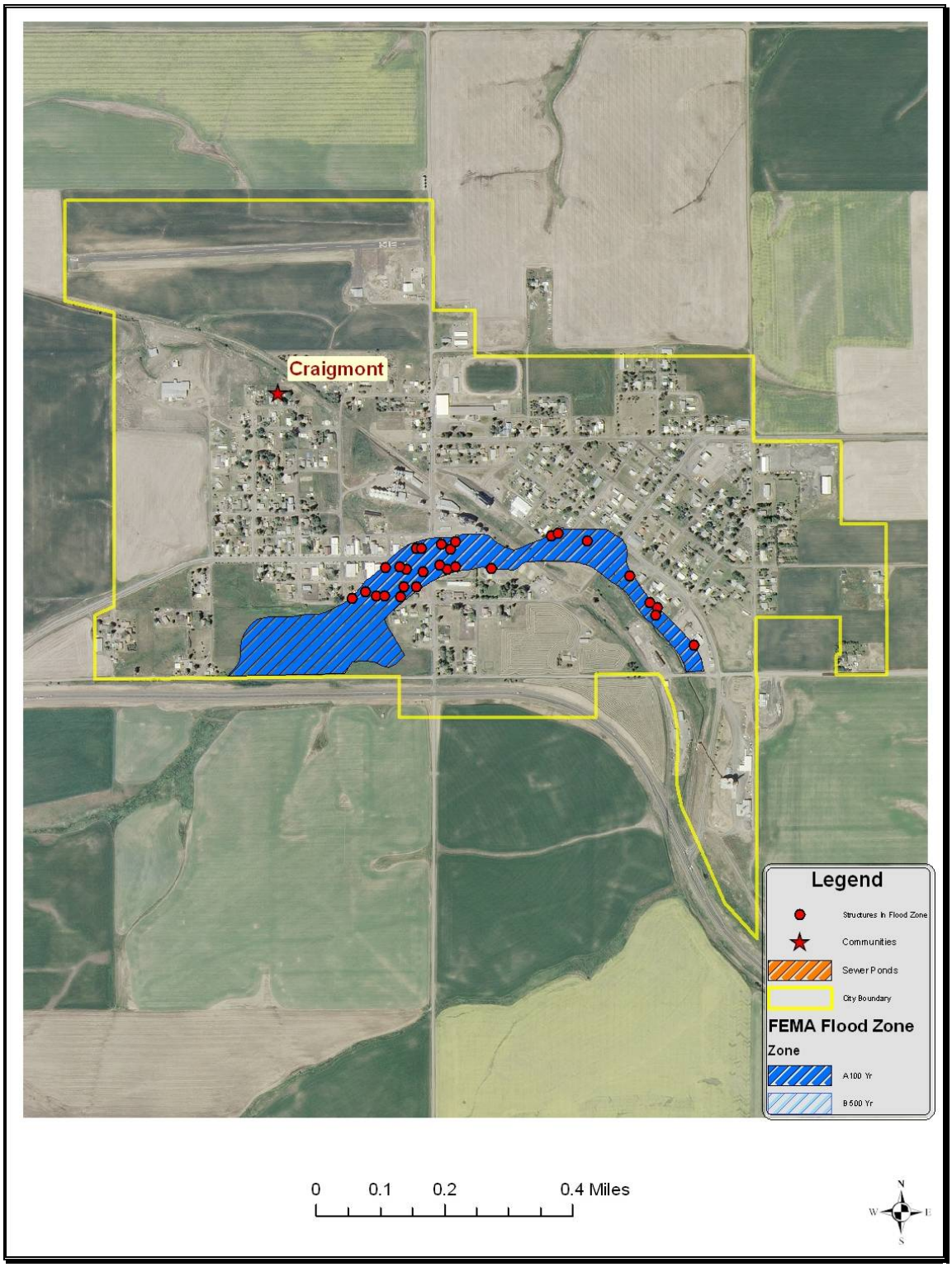
Major impacts from both types of flooding in Craigmont are the restricted use of Main Street. At the east end of town both Main Street and the main ditch run under a railroad overpass. This underpass restricts both the flow of water and traffic. During flood events the culvert under the overpass is not sufficient to handle the volume of water. The resulting backwaters result in flooding of the underpass. The higher flood waters in the underpass back up along Main Street in the vicinity of the underpass as well as adjacent secondary streets, parking areas and structures.

Due to past flood events, few active structures remain in the flood zone. Reducing the potential for floods may enhance the commercial value of unused structures and empty lots located along the Main Street business district. Homes in the area appear to have elevated first floors, raising the living areas above flood level. Basements may experience some flooding. Although this is a major inconvenience to the homeowner, it does not generally result in large economic loss, or the need to leave the home.

There are alternative access routes in and around Craigmont that provide for access when Main Street is compromised due to flood waters. The primary access into the Craigmont community center is via U.S. Highway 95, the main route connecting north and south Idaho. This roadway is well-traveled not only by area commuters, but also by intra- and interstate travelers. Most of U.S. 95 through Lewis County is adjacent to relatively flat agriculture fields; however, the Winchester Grade portion, which scales the Lapwai Creek canyon, is bordered by steep, timbered slopes. Highway 95 has been compromised in adjacent counties by past by flood events. Closure of Highway 95 in adjacent counties during floods

significantly reduces the amount of outside help that can reach Craigmont and other communities in Lewis County.

**Figure 5.8. FEMA Flood Insurance Rate Map for Craigmont, Idaho.**



Other access routes, including State Highway 62, the Nezperce-Craigmont Shortcut Road, and the Power Line Road, are located in areas that have been intensively developed for agricultural purposes and are generally at low risk of flood damage. These roads may be difficult or impossible to pass during extreme flood events, but the effects of flood damage tend to be minimal.

Most residents in Craigmont are either connected to the municipal water system or have drilled personal wells. City wells and the water system are located outside of the floodplain. The city's ability to provide clean drinking water during flood events should not be compromised.

### Probability of Future Occurrence

The probability of flood events occurring in Craigmont is low to moderate. Locations labeled as Flood Zone A in Figure 5.8 are areas that will be subject to a 1% probability of a certain size flood occurring in any given year (100-year flood). Flood Zone B represents areas between the limits of the base flood and the .2% annual chance (500 year flood).

Craigmont is generally only at risk to flooding during the spring runoff season or due to major rain-on-snow events. Prolonged rain and soil saturation may lead to localized pooling and flooding in Craigmont. Low magnitude flood events can be expected several times each year, particularly in the spring. Flash floods are not likely to occur in this area. Larger magnitude and high impact flood events have occurred, but are not likely in any given year.

### Value of Resources at Risk

Craigmont operates under the uniform building code. No specific city ordinances exist to limit or regulate building in the floodplain.

The two ditches that run through town cross under main city roads and near several homes and businesses. Many culverts appear to be undersized to handle major flood events. No dikes or levees have been built along the ditch to contain flood waters. There appears to be no ongoing maintenance of the ditches other than what individual landowners had done where the ditches cross private property.

Power lines, city water/sewer, emergency services (fire/ambulance), City hall, schools and other public facilities are located outside of the floodplain. These services will not be directly impacted by flooding and are able to fully function during flood emergencies

There are 28 structures within the FEMA-identified floodplains (100- and 500-year) in Craigmont, yielding an estimated total improvement value of $1.8 million (based on $65,000 average structure value). There are currently no repetitive loss properties in Craigmont. The average damage to structures was estimated based on the structure's location as either completely within or out of the flood zone. The estimated value of contents is ½ the value of the improvements equating to an additional $910,000 in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation. There is currently 1 NFIP policies in Craigmont.

There is no critical infrastructure or facilities at risk of flooding in Craigmont.

### *Landslide*

The city of Craigmont has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 25%. While small, low angle slumps may occur on eyebrows of the surrounding hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure.

#### Probability of Future Occurrence

There are no structures directly at risk from landslides within the city of Craigmont. Small slumps may occur along U.S. Highway 95 or other secondary roads, but these are not likely to block traffic.

#### Value of Resources at Risk

In some cases, roadside slumps may cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by Central Highway District with few complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

### *Severe Weather*

The city of Craigmont does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

#### Probability of Future Occurrence

The probability of a severe weather event occurring in Craigmont on an annual basis is very high. However, the impacts to the community are usually minimal and are the same as those described for Lewis County as a whole.

For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Craigmont has a high probability of experiencing extreme cold or severe winter weather, a high probability of experiencing a severe wind event, a high probability of experiencing major thunderstorms (usually 3-5 per year), a moderate probability of experiencing a damaging hail storm, and a low probability of experiencing a tornado.

#### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Craigmont. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow

and the structural characteristics of the buildings. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance crew. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Craigmont schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Craigmont to cause significant damages. However, the loss potential from flooding which results from severe thunderstorms could be significant.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Craigmont. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Craigmont rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Craigmont due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)

- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $65,000, it is estimated that there are 514 structures in Craigmont with a total average value of approximately $33 million. Using the criteria outlined above, an estimate of the impact of high winds in Craigmont has been made. The potential wind and tornado damage

to all improvements is estimated at approximately $487,500. The estimated damage to roofs is approximately $130,000.

Power failure often accompanies severe storms. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed.

The city of Craigmont does not have any assets or resources directly at risk to drought. However, the economy of the region may be affected by extended periods of drought due to the impacts on the agricultural sector.

### *Earthquake*

The city of Craigmont does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

#### Probability of Future Occurrence

The City has 10% chance of exceeding a 12% pga in the next 50 years.[53]

#### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Craigmont in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Craigmont, the school, the Camas Club, the grocery store, the post office, and the drug store are assumed to be unreinforced masonry. The value of these structures is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Craigmont is unknown, but estimated to include at least 75 buildings.

### *Wildland Fire*

Craigmont is located on the Camas Prairie between Winchester and Ferdinand. The city of Craigmont was originally encompassed by the historic Nez Perce Indian Reservation; however, the city property was ceded in 1863. Agricultural fields surround the city center and extend for several miles in all directions. This area is almost entirely privately owned and there are very few trees and little native prairie grasslands dotting the

[53] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

landscape. U.S. Highway 95 travels along the southern edge of the community and is the main method of transporting the grains, canola, peas, and other crops that are grown in the area to markets.

There is very little native vegetation remaining near Craigmont. The native Camas Prairie plant community has been almost exclusively replaced by agriculture and pasture lands. A few patches of native species, such as big bluestem, blue camas, shooting star, and lupines, can be found sporadically along fence lines or in un-tillable corners. The remnant prairie grasslands historically burned at relatively frequent intervals, but generally were lower intensity fires. The agricultural fields currently dominating the landscape become very dry during the summer months. These cured grasses can be very flammable, especially under extreme weather conditions, such as drought or wind. In the event of an uncontrolled wildfire, these light fuels would tend to support very fast moving, yet lower intensity fires. However, modification of the vegetation around structures can be done quickly with available farm equipment and is usually effective in controlling wildfire.

Although lightning events are common in Lewis County, the community of Craigmont is more prone to man-caused ignitions than lightning strikes due to the flat topography and agricultural development. Annual field burning, debris fires, and vehicle use are much more common ignition sources. Stubble fires seldom escape landowner's boundaries; however, the IDL responds to a few 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 potential source of ignitions. Not only do sparks from vehicles ignite fuels along roadways, but fires are also started by vehicles driving through dry fields or on unimproved trails. Grain trucks, ATV's, and pickups are used regularly in farming operations.

The primary access into the Craigmont community center is via the U.S. Highway 95 Business Route. Most of U.S. 95 through Lewis County is adjacent to relatively flat agriculture fields. Other access routes; including State Highway 62, the Shortcut Road, and the Powerline Road; are also located in areas that have been intensively developed for agricultural purposes and are generally at low risk of wildfire.

High tension power lines run just north of the community of Craigmont along Cold Springs Road and Powerline Road. These and the other public transmission lines strung to homes throughout the area are at low risk of causing a wildfire due to the agricultural development. Nevertheless, under severe wind conditions or in the event of a downed line, there is some potential for ignition.

The Craigmont Volunteer Fire Department provides structural fire protection for the community of Craigmont. Additionally, the Idaho Department of Lands, Craig Mountain District and the Nez Perce Tribe provide wildland fire protection.

### Probability of Future Occurrence

Residents in the Craigmont area have low to moderate probability of experiencing a wildland fire due to the extensive agricultural development according to the Fire Prone Landscapes model (Figure 5.5.). Nevertheless, in the event of wildfire, the light fuels would likely support a very fast-moving rangeland fire. The primary fire risk is associated with the abundance of human activity and the use of machinery near dry, flashy fuels. The receptive nature of these fuels increases the likelihood of a fire start. Most homeowners

maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

### Value of Resources at Risk

It is difficult to estimate potential losses in Craigmont from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to fuels.

# *City of Nezperce Annex*

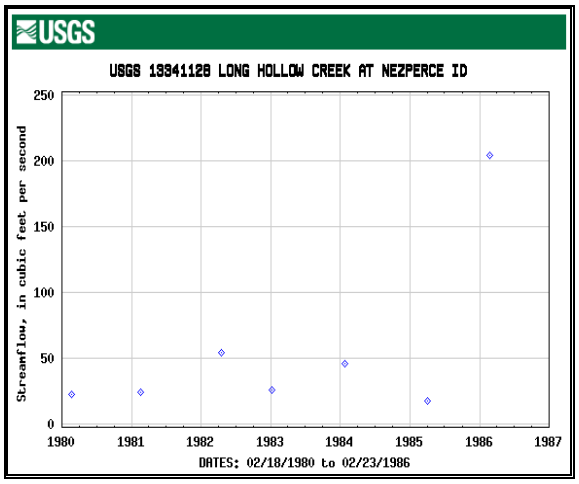
## *Flood*

Nezperce is located on the Camas Prairie between Craigmont and Kamiah. Long Hollow Creek bisects the town running south to north. The creek drains agricultural fields in the area surrounding the city. U.S. Routes 62, 64, and 162 intersect in Nezperce and are the main method of transporting the grains, canola, peas, and other crops that are grown in the area.

Long Hollow Creek enters the southeast corner of town from a bridge under Highway 162. After crossing underneath Maple Street it turns north running parallel to Maple Street. The creek leaves town at the north end turning to the west just before the city's sewer ponds. Long Hollow creek is described as a perennial stream and drains 17.66 square miles.

The topography of Nezperce is typical of the Camas Prairie. There is little elevation change from one side of town to the other. Because of this limited topographic change, the FIRM maps show a very wide, but generally shallow flood plain. This floodplain was recognized early; therefore, a block-wide area of non-residential development along Long Hollow Creek was part of the city's early design. The current FIRM floodplain exceeds this early designation by one to two city blocks.

During the 1960's the US Army Corps of Engineers straightened, widened, and built dikes along Long Hollow Creek. These mitigation structures were designed to pass 700 cubic feet per second, which is the 100 year flow for Long Hollow Creek. Long Hollow Creek now runs in a levee confined channel 11-16 feet wide and 6- 9 feet deep. The construction of this confined channel has significantly reduced the periodic flood events that affected the town historically. Since the construction of the channel, interviews with local residents and a search of local news sources cannot find an incidence of flooding due to the water overtopping the levees.

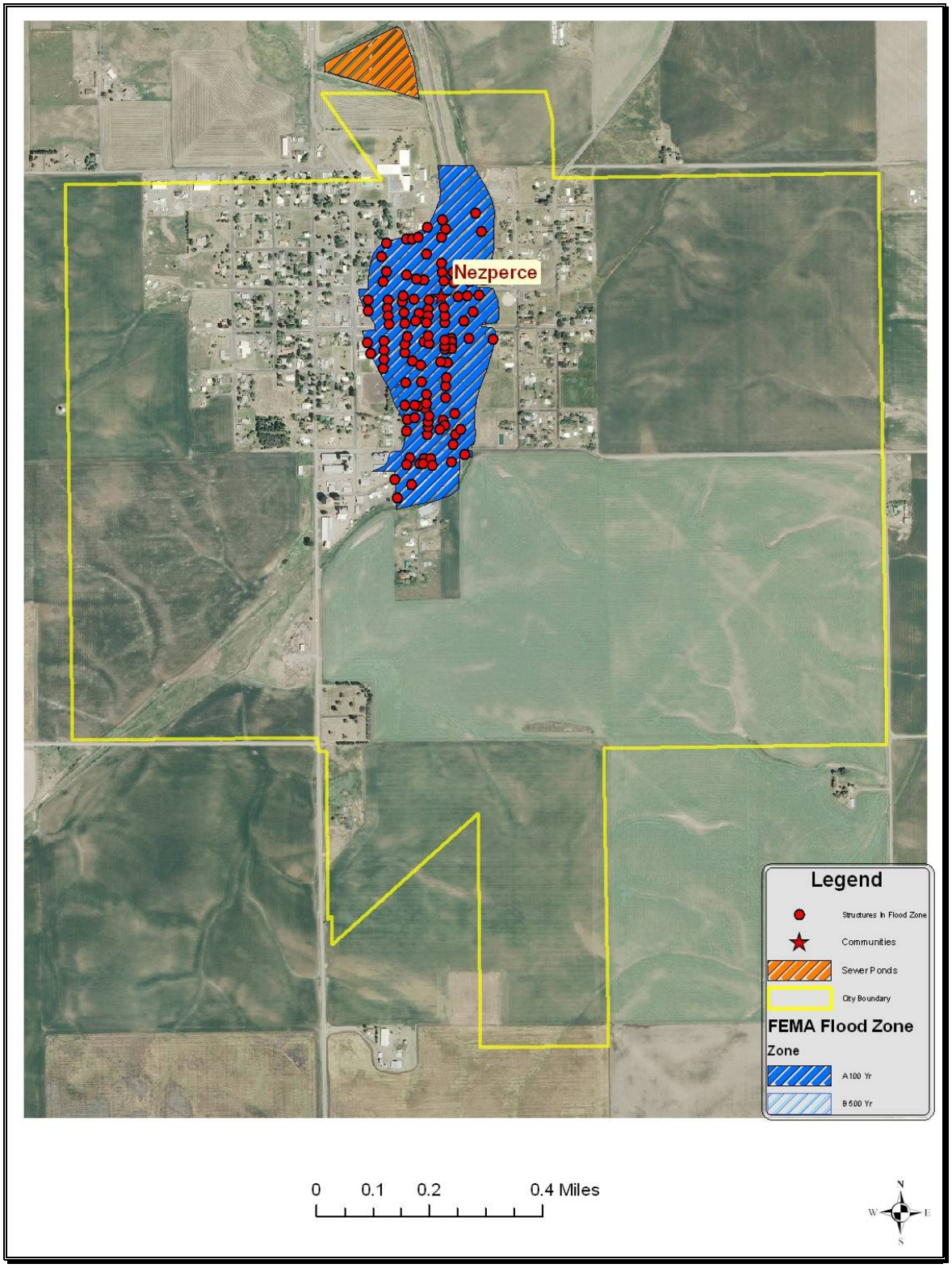



*The United State Department of Geological Services (USGS) established a surfacing monitoring station in Long Hollow Creek from 1980 to1986. The monitoring station was in Nezperce near the junction of the creek and 5th street. Peak stream flows from 1980 to 1986 exceeded 200 $ft^3$/sec and had a maximum gage height of 5.11 feet. Gage height is the height of the water surface above the gage datum (zero point (USGS 2010).*

*USGS. U.S. Geological Survey. U.S. Department of Interior. Peak Streamflow for the Nation. Available online at http://nwis.waterdata.usgs.gov/nwis/peak/?site_no=13344500&. January 2010.*

The Corps annually inspects the levees along Long Hollow Creek and makes the report available to the city. Nezperce is required to submit a yearly report to the Corps on the amount of time and money the city has spent maintaining the levees. As part of the original construction project, the Corp required the city to take care of all general maintenance needs of the levees once the project was completed. Due to the construction of the levees, storm water flow often back ups into the streets and may have some minor impact on a few residences.

**Figure 5.9. FEMA Flood Zones and land ownership surrounding Nezperce.**




The constructions of homes and other structures continue in the floodplain. Several newer manufactured homes have been placed within 50 feet of Long Hollow Creek. Many of these newer developments have occurred within the area once considered undevelopable by the early city planners.

The two primary access routes into Nezperce are State Highway 62 and 162. These are both two lane, paved routes. Highway 62 is the fastest route to Craigmont, while 162 heads south through Lawyer canyon to Grangeville. State Route 64 and the Russell Ridge Road both provide access to the Clearwater River canyon; these roads are steep and narrow, and during major flood causing storm events may be impassable. There are several other good access routes that extend from the community in all directions. These are typically one lane gravel roads; however, they are wide and stable enough to support large truck travel. All of these potentially access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevation relief around Nezperce to provide place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event.

Roads are the most affected infrastructure in Craigmont during flood events. Access between the east and west parts of town separated by Long Hollow creek could be problematic if the 4$^{th}$ street bridge is compromised. Even if the bridge itself is not compromised the water covering the roads on the approaches to the bridge may make passage unsafe. This restricted access across Long Hollow Creek means separate flood shelters may need to be identified on both the east and west sides of town. Historically there has been little long term damage to road systems in the Nezperce area. Paved road surfaces require some cleaning of flood carried debris, while local gravel roads need grading and some spot replacement of surface rock. The spur line of the Camas River Railroad that ran from Craigmont to Nezperce has been abandoned.

Most residents in Nezperce are either connected to the municipal water system or have drilled personal wells. City wells and the water system are located outside of the floodplain. The city's ability to provide clean drinking water during flood events should not be compromised.

Most farmers in this area do not irrigate; thus, supplemental wells for agricultural purposes are not usually necessary. However, some ranchers use surface runoff or small springs to provide water for livestock. These water resources can be affected by seasonal floods, but the impacts are minimal.

### Probability of Future Occurrence

Residents in the Nezperce area have low risk of experiencing smaller periodic floods. They have a high risk of experiencing catastrophic flooding during base or greater flood events if the levees along Long Hollow Creek are breached. Locations labeled as Flood Zone A in Figure 5.9 are areas that will be subject to a 1% probability of a certain size flood occurring in any given year (100-year flood). Flood Zone B represents areas between the limits of the base flood and the .2% annual chance (500 year flood).

### Value of Resources at Risk

Nezperce operates under the uniform building code. Both Lewis County and the city of Nezperce have adopted floodplain ordinances to mitigate development in flood prone areas. Both entities are currently working on updating the existing ordinances to reflect changes in the floodplain itself as well as local policy and growth issues.

Since the Flood Insurance Rate Maps for Nezperce were made effective in 1989, the U.S. Corp of Engineers has completed a channelization and stabilization project on the affected section of Long Hollow Creek that

has altered the floodplain. Nevertheless, there are 112 structures within the FEMA-identified floodplains (100- and 500-year) in Nezperce, yielding an estimated total value of $7.3 million (based on $65,000 average structure value). There are currently no repetitive loss properties in Nezperce. The average damage to structures was estimated based on the structure's location as either completely within or out of the flood zone. The estimated value of contents is ½ the value of the improvements equating to an additional $3.6 million in potential losses. In reality, the damages will most likely not be equally distributed between buildings based on building materials, building location, and flood location. However, these estimates provide a basic approximation. There are currently 7 NFIP policies in Nezperce.

Critical infrastructure located within the identified floodplain for Nezperce includes city hall, the County Courthouse and offices, the Sheriff's Office, the U.S. Post Office, the fire department, the ambulance garage, the city shop, the medical clinic, and the Legion Hall.

At the local level, Nezperce should develop a plan for updating and maintenance of culvert inlets and outlets throughout town, including storm drain inlet and outlets. Major weather events that cause floods can interrupt electrical service. Backup power systems for emergency services, the city water system, and communication networks would help in emergency response situations.

Continued participation in NFIP and enforcement of building codes in the flood plain will help keep Nezperce eligible for low cost flood insurance.

### *Landslide*

The city of Nezperce has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 25%. While small, low angle slumps may occur on eyebrows of the surrounding hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure; however, there is some risk of traffic being delayed temporarily while road crews clear the debris and stabilize the bank.

#### Probability of Future Occurrence

There are no structures directly at risk from landslides within the city of Nezperce. Small slumps may occur along State Highways 162, 62, 64, or other secondary roads.

#### Value of Resources at Risk

In some cases, roadside slumps may cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by highway districts or city road departments with little complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

### *Severe Weather*

The city of Nezperce does not have any differing levels of risk associated with this hazard than Lewis County as a whole. However, severe storms are being exacerbated by an antiquated stormwater drainage system

within the city. Currently, Nezperce is experiencing drainage issues on Oak Street between 7th and 8th Avenue and at the Lincoln Project at 5th Avenue and Maple Street. The community's industrial district is also experiencing minor flooding due to stormwater drainage issues. The installation of a culvert at Pine Street and 2nd Avenue would help alleviate overland flow down Pine Street and help prevent pooling in front of residences in this area as well as protect State Route 64.

### Probability of Future Occurrence

The probability of a severe weather event occurring in Nezperce on an annual basis is very high. However, the impacts to the community are usually minimal and are the same as those described for Lewis County as a whole.

For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Nezperce has a high probability of experiencing extreme cold or severe winter weather, a high probability of experiencing a severe wind event, a high probability of experiencing major thunderstorms (usually 3-5 per year), a moderate probability of experiencing a damaging hail storm, and a low probability of experiencing a tornado.

### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Nezperce. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance crew. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Nezperce schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Nezperce to cause significant damages. However, the loss potential from flooding which results from severe thunderstorms could be significant. An outdated and

inefficient stormwater drainage system is exacerbating the potential flood damage to businesses and residents in the community.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Nezperce. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Nezperce rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Nezperce due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)
- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $65,000, it is estimated that there are 357 structures in Nezperce with a total average value of approximately $23 million. Using the criteria outlined above, an estimate of the impact of high winds in Nezperce has been made. The potential wind and tornado damage to all improvements is estimated at approximately $348,075. The estimated damage to roofs is approximately $90,000.

Power failure often accompanies severe storms. More rural parts of the County are sometimes better prepared to deal with power outages for a few days due to the frequent occurrence of such events; however, prolonged failure, especially during cold winter temperatures can have disastrous effects. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food.

The city of Nezperce does not have any assets or resources directly at risk to drought. However, the economy of the region may be affected by extended periods of drought due to the impacts on the agricultural sector.

### *Earthquake*

The city of Nezperce does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

### Probability of Future Occurrence

The City has 10% chance of exceeding a 12% pga in the next 50 years.[54]

### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Nezperce in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Nezperce, the hotel, the grocery store, the County Courthouse, the Christian Church, Bell Equipment, Dokken Implement, the grain silo, and the school are assumed to be unreinforced masonry. The value of these structures is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Nezperce is unknown, but estimated to include at least 75 buildings.

## *Wildland Fire*

Nezperce is located on the Camas Prairie between Craigmont and Kamiah. The city of Nezperce was originally encompassed by the historic Nez Perce Indian Reservation; however, the city property was ceded in 1863. Agricultural fields surround the city center and extend for several miles in all directions. This area is almost entirely privately owned and there are very few trees and little native prairie grasslands dotting the relatively even landscape. U.S. Routes 62, 64, and 162 intersect in Nezperce and are the main method of transporting the grains, canola, peas, and other crops that are grown in the area.

There is very little native vegetation remaining near Nezperce. The native Camas Prairie plant community has been almost exclusively replaced by agriculture and pasture lands. A few patches of native species, such as big bluestem, blue camas, shooting star, and lupines, can be found sporadically along fence lines or in untillable corners. The prairie grasslands historically burned at relatively frequent intervals, but generally were lower intensity fires. The agricultural fields currently dominating the landscape become very dry during the summer months. These cured grasses can be very flammable, especially under extreme weather conditions, such as drought or wind. In the event of an uncontrolled wildfire, these light fuels would tend to support very fast moving, yet lower intensity fires. However, modification of the vegetation around structures can be done quickly with available farm equipment and is usually effective in controlling wildfire.

Although lightning events are common in Lewis County, the community of Nezperce is more prone to man-caused ignitions than lightning strikes due to the flat topography and agricultural development. Annual field burning, debris fires, and vehicle use are much more common ignition sources. Stubble fires seldom escape agricultural boundaries; however, the IDL responds to a few each year. These fires are generally easily

[54] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

suppressed by modifying the vegetation; 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 are also commonly started by vehicles driving through dry fields or on unimproved trails. Grain trucks, ATV's, and pick ups are used regularly in farming operations.

The two primary access routes into Nezperce are State Highway 62 and 162. These are both two lane, paved routes. Highway 62 is the fastest route to Craigmont, while 162 heads south through Lawyer canyon to Grangeville. State Route 64 and the Russell Ridge Road both provide access to the Clearwater River canyon; however, these roads are too steep, narrow, and dangerous to serve as identified escape routes. There are several other good escape routes that extend from the community in all directions. These are typically one lane gravel roads; however, they are wide and stable enough to support large truck travel. All of these potentially escape routes are adjacent to either farm or pasture ground; thus, they have a low risk of becoming threatened in the event of a fire.

Structural fire protection is provided to Nezperce and the surrounding areas by the Nezperce Volunteer Fire Department. The Idaho Department of Lands and the Nez Perce Tribe offer wildland fire protection.

### Local Event History

**2003 Milepost 59 Fire** - The Milepost 59 fire was started on August 14, 2003 by a catalytic converter on a disabled vehicle. The vehicle ran out of gas and pulled onto the shoulder of US Highway 12 approximately 7 miles northwest of Kamiah and east of Nezperce. The fire was located on the west side of highway 12 at the base of a steep slope with a northeast aspect. The Idaho Department of Lands was spear-heading the attack on both the upriver and downriver flanks of the fire on Highway 12 and the Nezperce rural fire department and local farmers were working the agriculture lands on the west side of the fire. Suppression forces had also doubled in size with more than 200 people assigned to the fire, not including volunteers. Two residences within the fire were saved by burn-out operations and air support and a number of other residences ahead of the fire were prepped. A decision to close Highway 12 to all but emergency vehicles was made. By nightfall on Sunday, August 17$^{th}$, the fire was contained at an estimated size of 5,500 acres and a Florida Type 2 team arrived. The final shift was completed on Friday, August 29$^{th}$, 15 days after ignition. The final size of the fire was 8,142 acres and the total cost was approximately $2.6 million.

### Probability of Future Occurrence

Residents in the Nezperce area have low to moderate probability of experiencing a wildland fire due to the extensive agricultural development according to the Fire Prone Landscapes model (Figure 5.5.). Nevertheless, in the event of wildfire, the light 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.

The primary fire risk is associated with the abundance of human activity and the use of machinery near dry, flashy fuels. The receptive nature of these fuels increases the likelihood of a fire start. Most homeowners maintain an adequate defensible space around structures by watering their yards or mowing grass and weeds.

### Value of Resources at Risk

It is difficult to estimate potential losses in Nezperce from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to fuels.

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# *City of Winchester Annex*

## *Flood*

The community of Winchester is located in the northwest corner of Lewis County at the top of the Winchester Grade on Highway 95. There is no FEMA-identified floodplain directly affecting Winchester; however, Winchester Lake just south of town is considered the headwaters of Lapwai Creek.

### Probability of Future Occurrence

Due to the topography, Winchester would not likely be directly affected by flooding; however, roads in the surrounding area may be impacted.

### Value of Resources at Risk

Winchester has no resources at risk from flood events.

## *Landslide*

The city of Winchester has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 25%. While small, low angle slumps may occur on eyebrows of the surrounding hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure; however, there is some risk of traffic being delayed temporarily while road crews clear the debris and stabilize the bank.

### Probability of Future Occurrence

There are no structures directly at risk from landslides within the city of Winchester. Small slumps may occur along U.S. Highway 95 or other secondary roads.

### Value of Resources at Risk

In some cases, roadside slumps may cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by Evergreen Highway District with few complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

## *Severe Weather*

The city of Winchester does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

### Probability of Future Occurrence

The probability of a severe weather event occurring in Winchester on an annual basis is very high. However, the impacts to the community are usually minimal and are the same as those described for Lewis County as a whole.

For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Winchester has a high probability of experiencing extreme cold or severe winter weather, a high probability of experiencing a severe wind event, a high probability of experiencing major thunderstorms (usually 3-5 per year), a moderate probability of experiencing a damaging hail storm, and a low probability of experiencing a tornado.

### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Winchester. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance crew. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Area schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Winchester to cause significant damages. Furthermore, this community does not have any existing flood concerns although damage due to failures in the stormwater drainage system could cause minor damages.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Winchester. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Winchester rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Winchester due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)
- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $65,000, it is estimated that there are 273 structures in Winchester with a total average value of approximately $17.7 million. Using the criteria outlined above an estimate of the impact of high winds in Winchester has been made. The potential wind and tornado damage to all improvements is estimated at approximately $260,000. The estimated damage to roofs is approximately $42,000.

Power failure often accompanies severe storms. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed.

The city of Winchester does not have any assets or resources directly at risk to drought. However, the economy of the region may be affected by extended periods of drought due to the impacts on the agricultural sector.

### *Earthquake*

The city of Winchester does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

#### Probability of Future Occurrence

The City has 10% chance of exceeding a 12% pga in the next 50 years.[55]

#### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Winchester in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake.

[55] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Winchester, the Community Center, the Corner Grocery, and the Lake City Inn & Bar are assumed to be unreinforced masonry. The value of these structures is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Winchester is unknown, but estimated to include at least 30 buildings.

### *Wildland Fire*

Winchester is located along U.S. Highway 95 at the top of the Winchester Grade. Farming is a large part of the economy, but tourism also contributes. The Winchester Lake State Park just south of town draws numerous recreationalists all throughout the year. This reservoir is a popular fishing, hiking, picnicking, and camping destination. Although much of the area has been developed for agricultural purposes, there is still forestland around the State Park and to the east and south of the community center. Winchester and the surrounding area are surrounded by the Nez Perce Indian Reservation; however, the actual city property was ceded in 1863. Mud Springs Reservoir and another small lake nearby are owned and managed by the Tribe. Tribal members frequent these areas for spiritual and recreational purposes.

Many homes near Winchester have some defensible space around structures in the form of pasture for livestock or small farm fields. A fire start in a field or pasture can generally be quickly controlled by modifying vegetation and creating fuel breaks. Nevertheless, fires in this type of light, flashy fuels will tend to spread very rapidly leaving little time to effectively protect structures. CRP fields that are overgrown with tall grasses and other vegetation may support higher fire intensities than cultivated or grazed areas.

The Mission Creek canyon west of Winchester forms the border between Lewis and Nez Perce County. The west aspect slope on the Lewis County side is characterized by a relatively open Douglas-fir and ponderosa pine habitat type. Low growing grasses and various brush species dominate the understory. These fuels typically cure early in the summer becoming exceedingly prone to ignition. Fires in this type of vegetation tend to be very rapidly spreading, but burn at moderate intensities. This fuel type is very flashy and easily influenced by weather patterns making suppression efforts difficult and potentially dangerous for firefighters. More heavily timbered areas located in some of the cooler draws can burn very intensely, throwing fire brands and creating rolling embers that ignite spot fires.

There are numerous homes within the timbered area southwest of Winchester, many of which are adjacent to or overtopped by hazardous fuels. These typically drier habitat types are dominated by ponderosa pine, lodgepole pine, Douglas-fir, and western larch. Historically, the understories of these stands were relatively open; maintained by periodic, low intensity surface fires. Years of fire suppression has led to more overcrowded conditions with dense accumulations of dead and down wood and other surface fuels. Additionally, regeneration has begun to encroach on many naturally open meadows. Enhanced vertical and horizontal fuel continuity can lead to larger fires with increased occurrences of crowning and torching. These hazardous fuel complexes coupled with dry summers and numerous ignition sources significantly increase the probability of an intense and destructive wildfire.

Both natural and man-caused fires occur in this area. The high intensity of recreational use at Winchester Lake State Park and in the timber land to the south and west of the community increase potential ignition sources significantly. The use of mechanized equipment near dry fuels is widespread; yet this also increases the fire risk. 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. Contact between power lines and trees can also spark fires, especially during windy conditions.

Lightning events are common across Lewis County; however, ignitions due to strikes occur more frequently in the canyon-lands. The Maloney Creek Fire of 2000 was started by a lightning strike in the Maloney Creek drainage near the Salmon River south of Winchester. This fire burned a large portion of the southern arm of Lewis County and neighboring Nez Perce County. The cured grasses and dry forest habitat types that cover the landscape near Winchester are very receptive to ignition.

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 fuel types and moisture levels, 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 regardless of whether the event occurs in forest or rangeland fuels.

The primary access into the Winchester community center is via U.S. Highway 95-Business Route, the main highway connecting north and south Idaho. This roadway is well-traveled not only by area commuters, but also by intra- and interstate travelers. Most of U.S. 95 through Lewis County is adjacent to relatively flat agriculture fields; however, the Winchester Grade portion, which scales the Lapwai Creek canyon, is bordered by steep, timbered slopes. The fire potential on these dry slopes was recently demonstrated by a wildfire that caused severe tree mortality and closed this major transportation route for a significant period of time.

Other potential escape routes include the Old Winchester Grade, Forest Road, and several graveled secondary roads. These routes are typically located in areas at low risk of wildfire; however, there are a few sections that pass through stands of timber or encompass steep grades.

The Winchester Volunteer Fire Department is crossed trained to provide both structural protection for the City of Winchester and wildland fire protection for the area surrounding the City of Winchester. The Winchester Rural Fire Department, established at the beginning of 2010, will provide both structural and wildland fire protection for the southern section of Lewis County. The Winchester Rural Fire Department works with the Idaho Department of Lands, Craig Mountain District, and the Nez Perce Tribe regarding wildland fires and wildland fire protection.

### Probability of Future Occurrence

The community of Winchester has high probability of experiencing a wildland fire according to the Fire Prone Landscapes model (Figure 5.5.), which has been recently demonstrated by the 2000 Maloney Creek Fire and a smaller fire in Lapwai Creek canyon. Those homes with timber directly abutting or overhanging structures are at the highest risk. Fires in these timber fuel types are generally much more intense and difficult to control than rangeland fires. Additionally, the abundance of recreational and other human

activities in the area drastically increase potential ignition sources. Preparing a home prior to a wildfire event will significantly increase its chance of survival.

### Value of Resources at Risk

It is difficult to estimate potential losses in Winchester from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Typically, structures located in forested areas without an adequate defensible space or fire resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to wildland fuels.

# *City of Reubens Annex*

## *Flood*

The community of Reubens is located on the northern boundary of Lewis County on the Reubens-Gifford Road north of Winchester. There is no FEMA-identified floodplain directly affecting Reubens and there are no nearby waterways that could cause flooding within the townsite. Furthermore, there are no major drainages along the Reubens-Gifford Road that could compromise the primary access route.

### Probability of Future Occurrence

The community of Reubens is not at risk to flooding.

### Value of Resources at Risk

Reubens has no resources at risk from flood events.

## *Landslide*

The city of Reubens has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 25%. While small, low angle slumps may occur on eyebrows of the surrounding hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. It is also probable that small slides will continue to occur on the cut and fill slopes of some roads. This type of slide is generally small with little permanent damage to the road or other infrastructure; however, there is some risk of traffic being delayed temporarily while road crews clear the debris and stabilize the bank.

### Probability of Future Occurrence

There are no structures directly at risk from landslides within the city of Reubens. Small slumps may occur along County Route P3 or other secondary roads.

### Value of Resources at Risk

In some cases, roadside slumps may cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by Central Highway District with few complications. Road slumps are generally reported as regular maintenance; thus, there are few records associated with these events.

## *Severe Weather*

The city of Reubens does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

### Probability of Future Occurrence

The probability of a severe weather event occurring in Reubens on an annual basis is very high. However, the impacts to the community are usually minimal and are the same as those described for Lewis County as a whole.

For Lewis County and its communities, the probability of severe weather events is defined as follows based on historical events and local knowledge:

**High Probability of Occurrence** = Greater than 75% chance of occurrence annually

**Moderate Probability of Occurrence** = 40% - 74% chance of occurrence annually

**Low Probability of Occurrence** = Less than a 39% chance of occurrence annually

Reubens has a high probability of experiencing extreme cold or severe winter weather, a high probability of experiencing a severe wind event, a high probability of experiencing major thunderstorms (usually 3-5 per year), a moderate probability of experiencing a damaging hail storm, and a low probability of experiencing a tornado.

### Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Reubens. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. Frozen water pipes are the most common damage to residential and business structures. Older homes tend to be at a higher risk to frozen water pipes than newer ones. Snow plowing within the city limits is accomplished by the city's maintenance crew. Private landowners are responsible for maintaining their own driveways or other private roads. Utility supplies are impacted during severe winter storms as power is lost on a regional basis. This has a two-fold impact on residents as not only is power cut to homes and businesses, but primary heating is lost for many residents. Gas furnaces and wood stoves supplement electrical heating, but with wood heating the senior population is at a disadvantage. Emergency response to severe winter storms includes site visits by police or fire department personnel, opening of shelters, or assistance with shopping, medical attention, and communications. The economic losses caused by severe winter storms may frequently be greater than structural damages. Employees may not be able to travel to work for several days and businesses may not open. Damages are seen in the form of structural repair and loss of economic activity. Area schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms are not likely to be severe enough in Reubens to cause significant damages. However, the loss potential from flooding which results from severe thunderstorms could be significant.

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Reubens. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential financial loss resulting from a localized hail storm. Homeowners in Reubens rarely incur severe damage to structures (roofs); however, hail damage to vehicles is not uncommon. The damage to vehicles is difficult to estimate because the number of vehicles impacted by a specific ice storm is unknown. Additionally, most hail damage records are kept by various insurance agencies.

It is difficult to estimate potential losses in Reubens due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

We have estimated losses based on wind and tornado damage as follows:

- 3% of the buildings damaged causing 50% of value loss (loss could be from downed or damaged trees, damaged outbuildings, damaged fences/poles, damage to siding, damaged landscaping etc.)
- 5% of the buildings received damage to roof (requiring replacement of roof equaling $3,000)

Damages associated with sensitive receptor irritation have not been estimated. We have also not estimated the potential for a large scale wildfire event associated with high winds. Based on the data provided by the County and an average structure value of $65,000, it is estimated that there are 89 structures in Reubens with a total average value of approximately $5.8 million. Using the criteria outlined above, an estimate of the impact of high winds in Reubens has been made. The potential wind and tornado damage to all improvements is estimated at approximately $97,500. The estimated damage to roofs is approximately $20,000.

Power failure often accompanies severe storms. All communities should be prepared to deal with power failures. Community shelters equipped with alternative power sources will help local residents stay warm and prepare food. A community-based system for monitoring and assisting elderly or disabled residents should also be developed.

The city of Reubens does not have any assets or resources directly at risk to drought. However, the economy of the region may be affected by extended periods of drought due to the impacts on the agricultural sector.

### *Earthquake*

The city of Reubens does not have any differing levels of risk associated with this hazard than Lewis County as a whole.

#### Probability of Future Occurrence

The City has 10% chance of exceeding a 12% pga in the next 50 years.[56]

#### Value of Resources at Risk

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are several publicly accessible unreinforced masonry structures in Reubens in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some

[56] USGS. 2008 United States National Seismic Hazard Maps. U.S. Geological Survey. U.S. Department of Interior. Available online at http://earthquake.usgs.gov/hazards/products/conterminous/2008/. October 2009.

older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

In Reubens, the Community Center is the only public building assumed to be unreinforced masonry. The value of this structure is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Reubens is unknown, but estimated to include at least 10 buildings.

### *Wildland Fire*

Reubens is a small farming community located near the Nez Perce – Lewis County border on Reubens Road. Big Canyon lies to the east of the community center and Lapwai Creek canyon is to the west. The area between is characterized by gently rolling hills that have been extensively developed for agricultural use. However, there is scattered timber along Reubens Road and in nearby canyons. Reubens is surrounded by the Nez Perce Indian Reservation on the most northern fringes of the Camas Prairie. The Reubens town site was ceded from the Reservation in 1863.

Many homes near Reubens have a large defensible space around structures in the form of pasture for livestock or farm fields. A fire start in a field or pasture can generally be quickly controlled by modifying vegetation and creating fuel breaks. Nevertheless, fires in this type of light, flashy fuels will tend to spread very rapidly leaving little time to effectively protect structures.

The slopes of Big Canyon and the Lapwai Creek canyon are characterized by dry east and west aspects. Low growing grasses on these slopes cure early in the summer becoming exceedingly prone to ignition. The timbered areas along County Route P3 and in the canyons are typically drier habitat types dominated by ponderosa pine, Douglas-fir, and some western larch and grand fir. Historically, the understories of these stands were relatively open; maintained by periodic, low intensity surface fires. Years of fire suppression has led to more overcrowded conditions with dense accumulations of dead and down wood and other surface fuels. Additionally, regeneration has begun to encroach on many naturally open meadows. Enhanced vertical and horizontal fuel continuity can lead to larger fires with increased occurrences of crowning and torching. These hazardous fuel complexes coupled with dry summers and numerous ignition sources significantly increase the probability of an intense and destructive wildfire.

Both natural and man-caused fires occur in this area. The use of mechanized equipment near dry fuels is very common, yet this activity has a high potential of sparking a fire. 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. Contact between power lines and trees can also spark fires, especially during windy conditions. Lightning events are common across Lewis County; however, ignitions due to strikes occur more frequently on breaks of the canyons. The cured grasses and dry forest habitat types that cover the steep slopes of the canyon-lands to the east and west of Reubens are very receptive to ignition. 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 fuel types and moisture levels, 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 regardless of whether the event occurs in forest or rangeland fuels.

County Route P3 is the primary access into Reubens from either Lewis County or Nez Perce County. This is a paved two lane road that provides a connection from Highway 95 on the Camas Prairie to Highway 12 along the Clearwater River. Most of this roadway travels through areas that are at low risk of wildland fire; however, there are a few areas that may be at somewhat higher risk due to light surface fuels or steeper topography. Timber fuels along P3 from Reubens to Highway 95 have been cut to create a fire resistant buffer for the road and the power line corridor. There are also several gravel roads that could provide additional escape routes from the community if necessary. These routes are typically located in low fire risk areas.

High tension power lines are located to the southwest of the community in addition to public transmission lines that run along the Reubens Road and homes throughout the area. Corridors for these power lines have been cut in forested areas; however, it is imperative that these low risk buffer zones are maintained periodically.

As of 2009, the community of Reubens and the surrounding area receive structural fire protection from the Winchester Rural Fire District. The Idaho Department of Lands, Craig Mountain District and the Nez Perce Tribe provide wildland fire protection.

### Probability of Future Occurrence

The community of Reubens has a moderate to high probability of experiencing a wildland fire according to the Fire Prone Landscapes model (Figure 5.5.). Most homes in this area are surrounded by crops or pastureland, which serves as a defensible space. However, those homes with timber directly abutting or overhanging structures are at much higher risk. Fires in these timber fuel types are generally much more intense and difficult to control than rangeland fires. Additionally, the use of farm and logging equipment and other human activities in the area drastically increase potential ignition sources. Preparing a home prior to a wildfire event will significantly increase its chance of survival.

Due to the lack of a localized fire protection service and the rural nature of the community, response time for emergency equipment from other communities or agencies will be considerable. Therefore, it is even more important for homeowners to implement fuel reduction projects and other fire mitigation efforts.

### Value of Resources at Risk

It is difficult to estimate potential losses in Reubens from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is impossible to forecast the path a wildfire will take and what type of assets and resources, manmade and ecological, will be at risk. Thus, no value estimates were made for this hazard.

Homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive.

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# Chapter 6

## Mitigation Strategy

IN THIS SECTION:

- Administration and Implementation of Action Items
- Incorporation into Existing Planning Mechanisms
- Prioritization of Action Items
- Jurisdictional Mitigation Strategies
    - Lewis County Annex
    - City of Craigmont
    - City of Kamiah
    - City of Nezperce
    - City of Winchester
    - City of Reubens

# Chapter 6 – Mitigation Strategy

## Administration and Implementation of Action Items

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

All risk assessments were made based on the conditions existing during 2010, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the Counties' 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.

### *Incorporation into Existing Planning Mechanisms*

Lewis 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. Through their resolution of adoption as well as their participation on the planning committees, each jurisdiction is aware of, and committed to incorporating the risk assessments and mitigation strategies contained herein into other local planning documents and other mechanisms for community protection from hazards. It is anticipated that the research, local knowledge, and documentation of hazard conditions coalesced in this document will serve as a tool for decision-makers as new policies, plans, and projects are evaluated.

There are several existing documents and/or programs in Lewis County where information from this Multi-Hazard Mitigation Plan, including mitigation strategies and risk assessments, can be integrated. Some of the ways the Multi-Hazard Mitigation Plan is currently integrated into other Lewis County plans and programs include:

**Lewis County Comprehensive Plan** – The Comprehensive Plan and the Multi-Hazard Mitigation Plan complement each other; one provides guidance on growth and development and the other describes the risk of hazards in certain areas. The risk assessments contained in the Multi-Hazard Mitigation Plan will be invaluable as the Board of Commissioners and city councils consider future development options.

**Lewis County Emergency Operations Plan** – Because the Multi-Hazard Mitigation Plan was a collaborative process with many of the local emergency responders in Lewis County, several components of the risk assessment as well as the mitigation strategies will directly impact the future of

response capacity and safety of emergency service personnel. Many of the action items will improve emergency response and upgrade response tactics. As local fire and EMS personnel as well as law enforcement programs grow and develop in Lewis County, so too should the Emergency Operations Plan. Conversely, as recommendations are made in the Emergency Operations Plan, new action items can be added to the Multi-Hazard Mitigation Plan.

**Lewis County Transportation Plan**- Many of the action items in this Multi-Hazard Mitigation Plan are related to the improvement or reinforcement of transportation infrastructure; thus, this document and the Transportation Plan complement each other. Action items from this document are used to develop inventories, priorities, and improvement schedules in the Transportation Plan. Additionally, the risk assessments are used to guide new road and water crossing construction projects. The Highway Districts in Lewis County are independent taxing districts and view both documents as guidance and mechanisms for funding options.

**Clearwater Economic Development Association (CEDA)** – CEDA is a local economic development organization that often assists Lewis County with business growth and planning projects. CEDA, Lewis County, and local communities have developed a prioritized list of projects that will benefit the residents of Lewis County. The risk assessments in the Multi-Hazard Mitigation Plan are incorporated into many of these projects as they are planned and implemented. Additionally, CEDA may also be a resource in the successful completion of items listed in the mitigation strategies.

**Lewis County Fire Mitigation** – Lewis County has a very active fire mitigation program and often works with several local partners to implement on-the-ground mitigation projects as well as wildland fire suppression efforts. The Multi-Hazard Mitigation Plan and associated Community Wildfire Protection Plan are integral to the planning of future hazardous fuels reduction and other projects in addition to being a vehicle for funding for the program. The Multi-Hazard Mitigation Plan committee serves as a wildland urban interface advisory group for the planning and implementation of all wildland fire mitigation projects.

**Kamiah Grants** – The city of Kamiah has an active grant writing partnership that uses the Multi-Hazard Mitigation Plan as a direct link to numerous funding sources. The community has taken a proactive interest in updating the Multi-Hazard Mitigation Plan in order to improve the quality of the information gathered in their risk assessment as well as to incorporate planned projects in their mitigation strategy to ensure their eligibility for a wide variety of funding mechanisms.

## *Prioritization of Action Items*

The prioritization process will include a special emphasis on benefit-cost 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 County and local jurisdictions with overall coordination provided by the Lewis County Emergency Management.

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. Often the types of projects that each 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. Lewis County will consider all pre-disaster mitigation proposals brought before the Board of Commissioners by 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 guiding criterion in establishing project priorities. Lewis 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 new projects and deletion of completed projects will occur annually and be facilitated by Lewis County Emergency Management and the joint planning committee. All mitigation activities, recommendations, and action items mentioned in this document are dependent on available funding and staffing.

### *Prioritization Scheme*

All of the action item and project recommendations made in this MHMP were prioritized by the planning committee using one of two prioritization schemes. The city of Kamiah prioritized their own list of projects and mitigation measures through a group discussion and voting process referred to as Scheme One. Lewis County and the cities of Nezperce, Craigmont, Winchester, and Reubens prioritized their projects and mitigation measures using a numerical scoring system referred to as Scheme Two. Prioritization Scheme Two is made up of nine scoring criteria for non-planning projects and four criteria for planning-related projects.

#### Scheme One

Each jurisdiction using Prioritization Scheme One chose to rank their mitigation strategy recommendations through a group discussion, informal benefit/cost review, and voting process. Projects in these sections are rated on a "High", "Moderate", or "Low" scale.

#### Scheme Two

A numerical scoring system is used to prioritize projects. This prioritization serves as a guide for the counties when developing mitigation activities. This project prioritization scheme has been designed to rank projects on a case by case basis. In many cases, a very good project in a lower priority category could outrank a mediocre project in a higher priority. The County mitigation program does not want to restrict funding to only those projects that meet the high priorities because what may be a high priority for a specific community may not be a high priority at the County level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the regional, county, and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been developed. Any type of project, whether county or site specific, will be prioritized in this more formal manner. To prioritize projects, a general scoring system has been developed. This prioritization scheme has been used in statewide all hazard mitigations plans. These factors range from benefit-cost ratios, to details on the hazard being mitigated, to environmental impacts.

Since planning projects are somewhat different than non-planning projects when it comes to reviewing them, different criteria will be considered, depending on the type of project.

The factors for the non-planning projects include:

- Benefit/Cost
- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development
- Potential project effectiveness and sustainability

The factors for the planning projects include:

- Benefit/Cost
- Vulnerability of the community or communities
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development

Since some factors are considered more critical than others, two ranking scales have been developed. A scale of 1-10, 10 being the best, has been used for cost, population benefit, property benefit, economic benefit, and vulnerability of the community. Project feasibility, hazard magnitude/frequency, potential for repetitive loss reduction, potential to mitigate hazards to future development, and potential project effectiveness and sustainability are all rated on a 1-5 scale, with 5 being the best. The highest possible score for a non-planning project is 65 and for a planning project is 30.

The guidelines for each category are as follows:

**Benefit / Cost (BC)**

The analysis process will include summaries as appropriate for each project as well as benefit / cost analysis results. Projects with a negative BC analysis result will be ranked as a 0. Projects with a positive BC analysis will receive a score equal to the projects BC analysis results divided by 30. Therefore a project with a BC ratio of 150:1 would receive 5 points, a project with a BC ratio of 300:1 (or higher) would receive the maximum points of 10.

FEMA Requirement §201.4(c)(4)(iii) details criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which should include consideration for communities with the highest risks, repetitive loss properties, and most intense

development pressures. Further, the requirement states that for non-planning grants, a principal criterion for prioritizing grants shall be the extent to which benefits are maximized according to a BC review of proposed projects and their associated costs. For many of the initiatives identified in this plan, the County may seek financial assistance under FEMA's HMGP or PDM programs. Both of these programs require detailed BC analysis as part of the FEMA award process. Participating jurisdictions in Southeast Washington are committed to implementing mitigation strategies with benefits that exceed costs. For projects which do not require financial assistance from grant programs that require this type of analysis, the Counties reserve the right to define "benefits" according to parameters that would otherwise be considered subjective, while still meeting the needs and goals of the plan.

**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 the entire population. A ranking of 5 has the potential to impact 50% of the population, and a ranking of 1 will impact approximately 10% of 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 $400,000,000 or more in losses. Property benefit of less than $400,000,000 will receive a score of the benefit divided by $400,000,000, times 10. Therefore, a property benefit of $80,000,000 would receive a score of 2 ([80,000,000÷400,000,000] x 10 = 2). 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 10 would prevent a total economic collapse, a ranking of 5 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.

**Vulnerability of the Community**

For planning projects, the vulnerability of the community is considered. 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 planning participation by the smaller or less vulnerable communities in the

state, the score will be based on the other communities being considered for planning grants. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

**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.

**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 5, 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 5. Those that do not address repetitive losses receive a rating 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 and sustainability**

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually 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 thresholds of:

Project Ranking Priority Score Non-Planning Projects

- High 40-65
- Moderate 25-39
- Low 1-24

Project Ranking Priority Score Planning Projects

- High 18-30
- Moderate 12-17
- Low 1-11

## Jurisdictional Mitigation Strategies

The following tables outline all of the participating jurisdictions' mitigation strategy for at least the next five year period. All of the action items from the 2005 Plan were carried into the updated mitigation strategy; however, the committee thoroughly reviewed and discussed each proposed project, and in some cases, chose to revise the action item or delete it altogether. Completed projects are listed in the tables where appropriate and in a summary following each jurisdiction's strategy table. Deferred and/or revised action items are identified in the tables where appropriate in the "2011 Status" column. Deleted action items are discussed in the summary following Lewis County's mitigation strategy table.

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Implement public education programs regarding high risk hazards in Lewis County. | Goal #1, 2, and 3<br>Priority Ranking: High | Partnership: Lewis County, University of Idaho, Clearwater RC&D, and various other partners. | Annual Project | Ongoing | Nez Perce Tribe, Idaho Department of Lands, North Central Idaho Fire Prevention Cooperative, Project Learning Tree, Bureau of Land Management, U.S. Forest Service |
| | Adopt and enforce the International Building Code. | Goal #1 and 2<br>Priority Ranking: High | Lewis County Commission | IBC Adopted – working on updates | Ongoing | International Building Code Handbook |
| | Continue to develop the existing Transportation Plan by standardizing practices for excavation, construction, and grading of roads. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Lewis County Highway Districts and Idaho Transportation Department | Transportation Plan completed – working on updates | Ongoing | Idaho Transportation Department |
| | Work with Idaho County to determine the "true" boundary between the counties. | Goal #2 and 5<br>Priority Ranking: High | Partnership: Lewis County Commission and Idaho County Commission | New Project | 2 years | Public Records Archives, University of Idaho |
| | Implement land use and development policy to reduce exposure to hazards. | In 2009, Lewis County updated its Comprehensive Growth Policy Plan including the development of policies that will help reduce exposure to hazards. | | Completed | | |

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Develop improved hazard warning systems. | Goal #2 and 4<br>Priority Ranking: High | Partnership: Lewis County Emergency Management and various partners | Working w/ NWS for installation of river gauge near Kamiah | Ongoing | Rural Fire Assistance, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, Volunteer Fire Assistance, Federal Excess Property |
| | Identify repetitive loss properties for all hazards and consider possible solutions. | Goal #1, 2, 4, and 5<br>Priority Ranking: High | Lewis County Emergency Management | Annual Project | Ongoing | FEMA and Idaho Bureau of Homeland Security |
| | Establish a Hazard Advisory Commission. | Lewis County established a Local Emergency Planning Committee in 2005 that has remained active to-date. | | Completed | | |
| | Develop a mass casualty annex and evacuation plan annex as part of the Lewis County Emergency Operations and Response Plan. | Goal #2 and 3<br>Priority Ranking: Moderate | Lewis County Emergency Management | New Project | 2 years | Counties with similar annexes, Idaho Bureau of Homeland Security |
| | Continue to improve the existing Transportation Plan by conducting a review of bridge and culvert conditions countywide. | Goal #2, 4, 5, and 6<br>Priority Ranking: High | Partnership: Lewis County Highway Districts and Idaho Transportation Department | Revised Action Item<br>Transportation Plan completed – working on updates | Ongoing | Idaho Transportation Department |
| | Continue to improve and update the County GIS system including development of E911 capability. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, Sheriff's Office, and cities | Revised Action Item<br>Annual Project | Ongoing | FEMA, Idaho Bureau of Homeland Security, Community Facilities Loans and Grants (Rural Housing Service) |

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| Earthquake | Assess seismic hazards to public buildings. | Goal #1, 2, 4, 5, and 6<br>Priority Ranking: Low | Lewis County Emergency Management | Deferred due to lack of funds | Ongoing | International Building Code |
| Extended Power Outage | Obtain a portable generator. | Goal #2<br>Priority Ranking: Moderate | Lewis County Emergency Management | Deferred due to lack of funds | 2 years | FEMA, Idaho Bureau of Homeland Security, Rural Fire Assistance, Volunteer Fire Assistance, State Fire Assistance, Idaho Forestry Assistance Program |
| | Assess and hardwire emergency facilities for use with portable generators. | In 2008, Lewis County obtained generators for the County Courthouse and the water systems in Kamiah and Nezperce. The communities of Craigmont and Winchester have generator switching capabilities. | | Completed | | FEMA, Idaho Bureau of Homeland Security, Community Facilities Loans and Grants (Rural Housing Service) |
| Flood | Encourage participation in the National Flood Insurance Program. | Goal #1, 2, 3, and 7<br>Priority Ranking: High | Lewis County Emergency Management | Annual Project | Ongoing | Idaho Bureau of Homeland Security |
| | Continue to work with the Idaho Department of Ecology on an updated floodplain ordinance. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Lewis County Commission and Idaho Department of Ecology | New Project | 1 year | Idaho Department of Ecology |
| | Develop countywide levee safety program and levee task force. | Lewis County participates on a levee task force with Idaho County, Idaho Bureau of Homeland Security, US Army Corp of Engineers, Soil Conservation Service, Idaho Department of Water Resources, Natural Resources Conservation Service, Idaho Fish and Game, the Nez Perce Tribe, and the Department of Environmental Quality. | | Completed | | |

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Send County planning and zoning professionals to targeted training courses on flood-related issues. | Goal #2 and 3<br>Priority Ranking: High | Lewis County Commission | New Project | 3 years | |
| | Review all road profiles in flood zones A and B to determine degree of road profile rise needed to elevate the travel surface out of the flood zone | This action item was accomplished in 2006 with the completion of the Lewis County Transportation Plan. | | Completed | | |
| | Replace existing undersized and damaged culvert on Miller Road with a 142"x91"x50' arch bottom culvert allowing for an increase of up to 370 cfs (100-year flood standards). | Goal #1, 2, 4, and 6<br>Priority Ranking: High | Partnership: Lewis County Emergency Management and Kamiah Highway District | New Project | 2 years | Idaho Transportation Department |
| | Obtain funding to improve debris retention and collection systems. | Goal #1, 2, 4, and 6<br>Priority Ranking: Moderate | Partnership: Lewis County Highway Districts, cities, and Idaho Transportation Department | Deferred due to lack of funds | 5 years | Idaho Transportation Department |
| Landslide | Map existing chronic slide locations along US Highway 12 and State Route 64 and develop long-term solutions. | Goal #1, 2, 4, 5, and 6<br>Priority Ranking: Moderate | Lewis County Highway Districts | Revised Action Item<br>Deferred due to lack of funds | 2 years | University of Idaho, FEMA, Idaho Bureau of Homeland Security |
| | Work with neighboring counties and other partners to identify landslide prone areas and consider alternatives for reducing development in high risk areas. | Goal #1, 2, 4, 5, and 6<br>Priority Ranking: High | Lewis County Emergency Management, Idaho County, Clearwater County, Nez Perce County, and Nez Perce Tribe | Revised Action Item<br>Deferred due to lack of funds | 2 years | University of Idaho, FEMA, Idaho Bureau of Homeland Security |

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snow load resistance. | Goal #1, 2, and 3<br>Priority Ranking: Moderate | Lewis County Emergency Management | Deferred due to lack of funds | 5 years | International Building Code |
| | Maintain snow removal equipment and priority route schedules. | Goal #2 and 4<br>Priority Ranking: High | Lewis County Highway Districts | Annual Project | Ongoing | Idaho Transportation Department, Federal Excess Property |
| Wildland Fire | Continue to work on the creation of a Central Ridge/Mohler Rural Volunteer Fire Department and a Craigmont Rural Volunteer Fire Department to cover unprotected areas. | Goal #1, 2, 3, 4, and 8<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, existing fire districts, cities, and the Idaho Department of Lands | Revised Action item<br>Long-term public education process | Ongoing | Idaho Department of Lands, Nez Perce Tribe |
| | Continue to work on the acquisition of funds to support equipment, tools, personal protective equipment, communication equipment, and training updates and upgrades for all fire districts in Lewis County. | Goal #1, 2, and 4<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, fire districts, cities, Nez Perce Tribe, and the Idaho Department of Lands | Annual Project | Ongoing | Rural Fire Assistance, Communities at Risk, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, US Forest Service, Bureau of Land Management, Idaho Department of Lands, Volunteer Fire Assistance, Federal Excess Property, Idaho Department of Commerce |
| | Continue to implement hazardous fuels reduction projects in high wildfire risk areas as identified in the Lewis County Community Wildfire Protection Plan. | Goal #1, 2, 3, 4, 5, and 6<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, fire districts, cities, Nez Perce Tribe, and the Idaho Department of Lands | Annual Project | Ongoing | Nez Perce Tribe, Idaho Department of Lands, Bureau of Land Management, U.S. Forest Service, Clearwater RC&D |

**Table 6.1. Lewis County Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Continue to implement roadside fuels reduction projects along primary access corridors as identified in the Lewis County Community Wildfire Protection Plan. | Goal #1, 2, 4, and 5<br>6<br>Priority Ranking: Moderate | Partnership: Lewis County Emergency Management, fire districts, cities, Nez Perce Tribe, and the Idaho Department of Lands | Annual Project | Ongoing | Nez Perce Tribe, Idaho Department of Lands, Bureau of Land Management, U.S. Forest Service, Clearwater RC&D, Idaho Transportation Department |
| | Enhance communication capabilities throughout the region and comply with new narrow band standards. | Goal #1, 2, and 4<br>Priority Ranking: High | Partnership: Lewis County Emergency Management and Sheriff's Office, fire districts, cities, and the Idaho Department of Lands | Revised Action Item<br>Annual Project | 2013 | FEMA and Idaho Bureau of Homeland Security |
| | Identify areas lacking a sufficient water supply and develop accessible fill sties where necessary. | Goal #1, 2, 4, and 6<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, fire districts, Nez Perce Tribe, and the Idaho Department of Lands | Deferred due to lack of funds | 2014 | Nez Perce Tribe, Idaho Department of Lands, Office of Species Conservation |
| | Continue to provide high quality training to volunteer firefighters in Lewis County fire departments. | Goal #, 2, and 4<br>Priority Ranking: High | Partnership: Lewis County Emergency Management, existing fire districts, cities, Nez Perce Tribe, and the Idaho Department of Lands | Annual Project | Ongoing | Clearwater Fire Academy and Idaho Department of Lands |
| | Continue to work with the newly established Winchester Rural Fire District to improve response capability and overall coverage. | Goal #1, 2, 3, 4, and 8<br>Priority Ranking: High | Partnership: Winchester Rural Fire District and Lewis County Emergency Management | New Project | Ongoing | |
| | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #1, 3, 4, 5, and 6<br>Priority Ranking: High | Partnership: Lewis County and various partners | New Project<br>Annual Project | Ongoing | |

Since the original document was written in 2005, Lewis County has completed several mitigation projects to help protect citizens from all types of natural and man-made hazards. Most of these projects were listed in the 2005 Plan; however, some were not. The following is an inclusive accounting of Lewis County's completed hazard mitigation projects including some that were not originally identified in the All Hazard Mitigation Plan.

1. Lewis County revised its Comprehensive Plan in 2009 to help guide land use and development.
2. In 2006, Lewis County and its partners completed a comprehensive Transportation Plan covering the entire county including a list of bridge and culvert replacement needs as well as flood impact areas.
3. Lewis County established a Local Emergency Planning Committee in 2005.
4. Lewis County is currently working with the Idaho Department of Ecology to revise and update its existing floodplain ordinance and develop alternatives for floodplain management.
5. Lewis County and the National Weather Service are working on an agreement to install river gauges near Kamiah that will help monitor water levels and flood events.
6. In 2008, Lewis County obtained generators for the County Courthouse and the water systems in Kamiah and Nezperce. The County is currently working on making their generators more portable for use in other communities. The communities of Craigmont and Winchester have generator switching capabilities.
7. Lewis County participates on a levee task force with Idaho County, Idaho Bureau of Homeland Security, US Army Corp of Engineers, Soil Conservation Service, Idaho Department of Water Resources, Natural Resources Conservation Service, Idaho Fish and Game, the Nez Perce Tribe, and the Department of Environmental Quality.
8. Lewis County has developed a centralized GIS data system.
9. Lewis County and the city of Winchester worked with local residents to establish the Winchester Rural Volunteer Fire District.
10. Lewis County has developed memorandum of understandings with all local fire districts, the Idaho Department of Lands, and the Idaho Transportation Department.

During the 5-year revision process, the Lewis County committee deleted a small number of action items from its original 2005 mitigation strategy. The following is a list of the deleted projects as well as an explanation for exclusion in this update.

1. Action Item – Adopt a countywide policy to allow law enforcement to effectively control crowds during emergency situations.
    a. Reason for Deletion – Committee, including the Sheriff, did not feel this was an issue in Lewis County and could not recall the reason for inclusion in the first place.

2. Action Item – Identify alternatives to reduce development in the floodplain.
    a. Reason for Deletion – The committee agreed to remove this action item in favor of more specific action items addressing flood hazards.

3. Action Item – Identify alternatives to reduce development in landslide prone landscapes.
    a. Reason for Deletion – The committee agreed to remove this action item in favor of more specific action items addressing flood hazards.

4. Action Item – Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe weather events and floods.
    a. Reason for Deletion – The committee agreed that generally the procedures and programs to complete this activity were already present in Lewis County and that more specific action items regarding mitigation of severe weather and flood events were listed.

5. Action Item – Support and encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.
    a. Reason for Deletion – The committee determined in consultation with local utility providers that underground utilities were being addressed in new construction wherever possible. Additionally, broad-scale replacement of overhead powerlines is not feasible or practical in the region.

6. Action Item – Inspect buildings, particularly unreinforced masonry, for earthquake stability.
    a. Reason for Deletion – The committee determined that seismic inspections on all unreinforced masonry in Lewis County was not feasible and often the responsibility of private owners. The committee agreed to remove this action item in favor of more specific action items addressing seismic assessment of public facilities.

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Support efforts to improve the County's GIS data system. | Goal #1<br>Priority Ranking: Moderate | Kamiah City Council | New Project | Ongoing | |
| | Conduct a study to identify loss of riparian habitat resulting from hazard impacts and identify restoration needs. | Goal #1, 2, and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council and consulting firm | New Project | 2 years | Idaho Department of Ecology, Idaho Department of Lands, Nez Perce Tribe |
| | Implement recommendations from a Riparian Habitat Restoration Assessment. | Goal #1 and 3<br>Priority Ranking: Low | Kamiah City Council | New Project | 4 years | Idaho Department of Ecology, Idaho Department of Lands, Nez Perce Tribe |
| | Inventory extrication/retrieval equipment for all emergency response units and identify shortfalls. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Kamiah City Council and Kamiah Volunteer Fire Department | New Project | 1 year | |
| | Implement an Extrication/Retrieval Equipment Purchase project based on the results of the inventory. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Kamiah City Council and Kamiah Volunteer Fire Department | New Project | 5 years | Federal Excess Property |
| | Inventory emergency evacuation center/command post supplies and equipment to determine shortfalls. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Kamiah City Council and Public Works and Lewis County Emergency Management | New Project | 1 year | |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Prioritize emergency evacuation center/command post needs based on inventory and begin seeking funding for purchase of necessary supplies and equipment. | Goal #1 and 3<br><br>Priority Ranking: High | Partnership: Kamiah City Council and Public Works and Lewis County Emergency Management | New Project | 5 years | Rural Fire Assistance, Communities at Risk, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, US Forest Service, Bureau of Land Management, Idaho Department of Lands, Volunteer Fire Assistance, Federal Excess Property, Idaho Department of Commerce |
| | Obtain and equip an incident command vehicle with off-road capabilities. | Goal #1<br><br>Priority Ranking: Low | Partnership: Kamiah City Council and Police Department, and Kamiah Fire Department | New Project | 2 years | Rural Fire Assistance, Communities at Risk, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, US Forest Service, Bureau of Land Management, Idaho Department of Lands, Volunteer Fire Assistance, Federal Excess Property, Idaho Department of Commerce |
| | Develop and implement resident (including youth) Multi-Hazard Recognition and Problem Solving Public Education Program. | Goal #1 and 3<br><br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Kamiah School District | New Project | Ongoing | Project Learning Tree, Idaho Bureau of Homeland Security, Idaho Department of Lands, Nez Perce Tribe, Kamiah Police Department |
| | Implement land use and development policy to reduce exposure to hazards. | Goal #1, 2, and 3<br><br>Priority Ranking: Moderate | Kamiah City Council | New Project | 5 years | |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Develop a list of funding mechanisms or sources for identification, planning, and implementation of mitigation strategies. | Goal #1<br>Priority Ranking: Moderate | Kamiah City Clerk | New Project | 1 year | Kamiah Grants program |
| | Develop an improved hazard warning system. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Kamiah City Council and Lewis County Emergency Management | New Project | 3 years | Rural Fire Assistance, Communities at Risk, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, US Forest Service, Bureau of Land Management, Idaho Department of Lands, Volunteer Fire Assistance, Federal Excess Property, Idaho Department of Commerce |
| | Install previously purchased emergency generator at newly constructed Kamiah Water Treatment Plant. | Goal #1<br>Priority Ranking: High | Kamiah Public Works | New Project | 1 year | |
| | Send all emergency service response organizations to participate in the Idaho/Lewis Counties P-25 Compliant Radio Project. | Goal #1 and 2<br>Priority Ranking: High | Kamiah City Council | New Project | 2 years | |
| | Support the development of mass casualty and evacuation annexes in the Lewis County Emergency Operations and Response Plan and integrate the annexes into other existing planning documents in Kamiah. | Goal #1, 2, and 3<br>Priority Ranking: High | Partnership: Kamiah City Council and Police Department and Lewis County Emergency Management | New Project | 2 years | |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Educate the public on mass casualty and emergency evacuation protocols. | Goal #1<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Kamiah School District | New Project | 3 years | Kamiah Police Department. Lewis County Sheriff's Office, Kamiah Fire Department |
| | Conduct community-wide multi-hazard risk assessment and prioritize hazards for planning and mitigation projects. | Goal #1, 2, and 3<br>Priority Ranking: High | Kamiah City Council | New Project | 1 year | Kamiah Police Department, Kamiah Fire Department, Lewis County Sheriff's Office |
| Earthquake | Conduct Earthquake Stability Feasibility Plan starting with the seismic assessment of public buildings and facilities. | Goal #1, 2, and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council and consulting firm | New Project | 2 years | Idaho Geologic Survey |
| | Prioritize findings and recommendations from Earthquake Stability Feasibility Plan and implement a Public Building Stability Project. | Goal #1 and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council and consulting firm | New Project | 3 years | |
| Flood | Encourage participation in the National Flood Insurance Program. | Goal #1<br>Priority Ranking: Low | Kamiah City Council | Annual Project | Ongoing | Idaho Bureau of Homeland Security and Lewis County Emergency Management |
| | Update the FEMA Flood Insurance Rate Maps for Kamiah. | Goal #1, 2, and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council, Idaho Bureau of Homeland Security, and FEMA | New Project | 5 years | FEMA, Idaho Bureau of Homeland Security |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Assess, identify, prioritize, and implement mitigation strategies in a Kamiah Community River Management Plan project. | Goal #1, 2, and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Public Works and consulting firm | New Project | 5 years | Idaho Department of Ecology, U.S. Corps of Engineers, Nez Perce Tribe |
| | Using the River Management Plan and the Lewis County Comprehensive Plan, conduct a Lawyer's Creek Flood Feasibility Plan and implement recommended mitigation strategies identified in the Plan. | Goal #1 and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Public Works and consulting firm | New Project | 4 years | Idaho Department of Ecology, U.S. Corps of Engineers, Nez Perce Tribe |
| | Implement Lawyer's Creek Flood Intervention Project. | Goal #1 and 3<br>Priority Ranking: Moderate | Kamiah City Council and Public Works | New Project | 3 years | Idaho Department of Ecology, U.S. Corps of Engineers, Nez Perce Tribe |
| | Conduct an inventory of the bridges in Kamiah including condition assessment and repair/replacement needs. | Goal #1, 2, and 3<br>Priority Ranking: Low | Kamiah Highway District | New Project | 1 year | Idaho Transportation Department |
| | Prioritize bridge needs based on inventory and implement a Kamiah Bridge Improvement Project. | Goal #1 and 3<br>Priority Ranking: Low | Kamiah Highway District | New Project | 2 years | Idaho Transportation Department |
| | Assess the condition of the Kamiah Levee, develop potential mitigation strategies, and implement a Kamiah Levee Improvement Project. | Goal #1, 2, and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and U.S. Army Corp of Engineers | New Project | 2 years | U.S. Corps of Engineers |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Use the 2011 revised Lewis County floodplain ordinance as a template for revising the city floodplain ordinance. | Goal #1<br>Priority Ranking: Moderate | Kamiah City Council | New Project | 2 years | Lewis County Emergency Management |
| Landslide | Access landslide hazards in Kamiah and along critical ingress/egress corridors and determine mitigation techniques. | Goal #1, 2, and 3<br>Priority Ranking: Moderate | Kamiah Street Department | New Project | 3 years | Kamiah Highway District, Idaho Transportation Department, University of Idaho |
| | Prioritize and implement Landslide Prevention Project based on recommendations in the landslide assessment. | Goal #1 and 3<br>Priority Ranking: Moderate | Kamiah Street Department | New Project | 4 years | |
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snowload resistance. | Goal #1, 2, and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Kamiah School District | Deferred due to lack of funds | 5 years | International Building Code |
| | Prioritize public facility snowload resistance needs. | Goal #1 and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Kamiah School District | New Project | 5 years | |
| | Implement a Kamiah Snowload Resistant Public Facility Project. | Goal #1 and 3<br>Priority Ranking: Moderate | Partnership: Kamiah City Council and Kamiah School District | New Project | 5 years | Idaho Department of Commerce, FEMA, Idaho Bureau of Homeland Security |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Conduct Stormwater Drainage Feasibility Plan with special focus on Highway 12/Business District, Highway 64/Pine Street, present and proposed projects (St. Mary's Project), floodplain connectivity, and areas of impact for each. | Goal #1 and 2<br>Priority Ranking: High | Partnership: Kamiah City Council and consulting firm | New Project | 3 years | Idaho Department of Ecology, Idaho Transportation Department, Nez Perce Tribe, Kamiah Street Department |
| | Prioritize findings identified in the Kamiah Stormwater Drainage Feasibility Plan. | Goal #1 and 3<br>Priority Ranking: High | Kamiah City Council | New Project | 4 years | |
| | Inventory equipment available for emergency responses to severe weather events and prioritize needs. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Kamiah Volunteer Fire Department and Police Department | New Project | 1 years | |
| | Purchase equipment and other needs necessary to respond effectively to severe weather events based on the inventory. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Kamiah Volunteer Fire Department and Police Department | New Project | 2 years | FEMA, Idaho Bureau of Homeland Security, Idaho Department of Commerce, Federal Excess Property |
| | Conduct a risk assessment for potential hail damage and develop and mitigation plan. | Goal #1, 2, and 3<br>Priority Ranking: Low | Kamiah City Council | New Project | 2 years | Natural Resources Conservation District, Farm Services Agency |
| | Implement the recommendations made in the Hail Damage Mitigation Plan. | Goal #1 and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council and Public Works and various partners | New Project | 5 years | Natural Resources Conservation District, Farm Services Agency |

**Table 6.2. City of Kamiah Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Implement Kamiah Stormwater Drainage Capacity Building, Repair, & Renovation Project. | Goal #1 and 3<br>Priority Ranking: High | Kamiah City Council | New Project | 5 years | FEMA, Idaho Bureau of Homeland Security |
| Wildland Fire | Conduct a needs assessment for potential defensible space and hazardous fuel reduction projects. | Goal #1, 2, and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council, Kamiah Volunteer Fire Department, and Lewis County Emergency Management | New Project | 2 years | Idaho Department of Lands, Nez Perce Tribe, Lewis County Emergency Management |
| | Implement defensible space and hazardous fuels reduction projects based on the priorities identified in the needs assessment and the Lewis County Wildfire Protection Plan. | Goal #1 and 3<br>Priority Ranking: Low | Partnership: Kamiah City Council, Kamiah Volunteer Fire Department, and Lewis County Emergency Management | New Project | 5 years | Idaho Department of Lands, Nez Perce Tribe, Lewis County Emergency Management |
| | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Kamiah City Council and various partners | Annual Project | Ongoing | |

In the 2005 Lewis County All Hazards Mitigation Plan, action items specific to the cities and/or special districts were not separated from the overall Lewis County mitigation strategy; therefore, most of the projects listed for Kamiah are new. However, the city has been actively working on hazard mitigation measures. The following is a list of completed projects since 2005.

1. Kamiah has assembled a stormwater drainage mitigation and improvement committee to assess Kamiah's dated stormwater drainage system, identify improvement needs, and seek grant funding.

2. In 2008, Lewis County and Kamiah worked together to obtain a generator for the city water system.

**Table 6.3. City of Craigmont Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Support efforts to improve the County's GIS data system. | Goal #2 and 4<br>Priority Ranking: High | Craigmont City Council | New Project | Ongoing | |
| | Educate residents and the surrounding community about the potential risks of natural hazards and appropriate preparedness. | Goal #1, 2, and 4<br>Priority Ranking: Moderate | Partnership: Craigmont City Council and Craigmont Schools | New Project | Ongoing | Nez Perce Tribe, Idaho Department of Lands, North Central Idaho Fire Prevention Cooperative, Project Learning Tree, Bureau of Land Management, U.S. Forest Service |
| | Work with local partners to address and strengthen mutual aid agreements. | Goal #2, 4, and 5<br>Priority Ranking: High | Partnership: Craigmont City Council and Craigmont Volunteer Fire Department | New Project | Ongoing | Idaho Department of Lands |
| Earthquake | Assess seismic hazards to public buildings. | Goal #1, 2, and 4<br>Priority Ranking: Low | Partnership: Craigmont City Council and consulting firm | Deferred due to lack of funds. | Ongoing | |
| Flood | Encourage participation in the National Flood Insurance Program. | Goal #1, 2, 3, and 4<br>Priority Ranking: Moderate | Craigmont City Council | Annual Project | Ongoing | Idaho Bureau of Homeland Security, Lewis County Emergency Management |
| | Use the revised Lewis County floodplain ordinance as a template for revising the city floodplain ordinance. | Goal #3 and 4<br>Priority Ranking: High | Craigmont City Council | New Project | 2 years | Lewis County Emergency Management, Idaho Department of Ecology |

**Table 6.3. City of Craigmont Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snow load resistance. | Goal #1, 2, and 4<br><br>Priority Ranking: High | Partnership: Craigmont City Council and Craigmont Schools | Deferred due to lack of funds. | 5 years | International Building Code |
| | Design and implement a stormwater management and mitigation project. | Goal #2, 3, and 4<br><br>Priority Ranking: Moderate | Partnership: Craigmont City Council and City Maintenance | New Project | 3 years | FEMA, Idaho Bureau of Homeland Security, Idaho Department of Commerce |
| Wildland Fire | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #1, 2, 3, 4, and 5<br><br>Priority Ranking: High | Partnership: Craigmont City Council and various partners | Annual Project | Ongoing | |

**Table 6.4. City of Nezperce Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Support efforts to improve the County's GIS data system. | Goal #1 and 4<br>Priority Ranking: High | Nezperce City Council | New Project | Ongoing | |
| | Replace old fire hydrants throughout the city. | Goal #1<br>Priority Ranking: High | Partnership: Nezperce City Council and City Maintenance | New Project | 3 years | Idaho Department of Commerce, FEMA, Idaho Bureau of Homeland Security, Rural Housing Service |
| Earthquake | Assess seismic hazards to public buildings. | Goal #4<br>Priority Ranking: Low | Partnership: Nezperce City Council and consulting firm | Deferred due to lack of funds. | Ongoing | |
| Flood | Encourage participation in the National Flood Insurance Program. | Goal #3 and 4<br>Priority Ranking: High | Nezperce City Council | Annual Project | Ongoing | Idaho Bureau of Homeland Security, Lewis County Emergency Management |
| | Update the FEMA Flood Insurance Rate Maps for Nezperce. | Goal #4<br>Priority Ranking: High | Partnership: Nezperce City Council, Idaho Bureau of Homeland Security, and FEMA | New Project | 5 years | FEMA, Idaho Bureau of Homeland Security |
| | Rehabilitate culverts and improve the stormwater drainage system throughout the city. | Goal #3 and 4<br>Priority Ranking: High | Nezperce City Maintenance | New Project | 7 years | Idaho Transportation Department |

**Table 6.4. City of Nezperce Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| | Install a new stormwater pipe and manholes to divert water from the industrial district to Long Hollow Creek. | Goal #3 and 4<br>Priority Ranking: High | Nezperce City Maintenance | New Project | 5 years | FEMA, Idaho Bureau of Homeland Security, Idaho Transportation Department |
| | Install a new culvert at the intersection of Pine Street and 2nd Avenue. | Goal #3 and 4<br>Priority Ranking: Moderate | Nezperce City Maintenance | New Project | 2 years | FEMA, Idaho Bureau of Homeland Security, Idaho Transportation Department |
| | Install drain tile between 7th and 8th Avenues on Oak Street. | Goal #3 and 4<br>Priority Ranking: Moderate | Nezperce City Maintenance | New Project | 2 years | FEMA, Idaho Bureau of Homeland Security, Idaho Transportation Department |
| | Use the revised Lewis County floodplain ordinance as a template for revising the city floodplain ordinance. | Goal #4<br>Priority Ranking: High | Nezperce City Council | New Project | 2 years | Lewis County Emergency Management, Idaho Department of Ecology |
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snow load resistance. | Goal #2 and 4<br>Priority Ranking: High | Partnership: Nezperce City Council and Nezperce Schools | Deferred due to lack of funds. | 5 years | |
| | Remove dead trees along Oak Street near the arena. | Goal #2 and 4<br>Priority Ranking: Moderate | Nezperce City Maintenance | New Project | 1 year | Idaho Department of Lands |

**Table 6.4. City of Nezperce Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| Wildland Fire | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #1 and 4<br><br>Priority Ranking: High | Partnership: Nezperce City Maintenance and various partners | Annual Project | Ongoing | |
| | Construct a new fire station large enough to house all response apparatus and other equipment. | Goal #1<br><br>Priority Ranking: Moderate | Nezperce Volunteer Fire Department | New Project | 5 years | Rural Fire Assistance, Communities at Risk, State Fire Assistance, FEMA, Idaho Bureau of Homeland Security, US Forest Service, Bureau of Land Management, Idaho Department of Lands, Volunteer Fire Assistance, Federal Excess Property, Idaho Department of Commerce |

In the 2005 Lewis County All Hazards Mitigation Plan, action items specific to the cities and/or special districts were not separated from the overall Lewis County mitigation strategy; therefore, most of the projects listed for Nezperce are new. However, the city has been actively working on hazard mitigation measures. The following is a list of completed projects since 2005.

1. In 2005-10, Nezperce completed the replacement of their 100 year old sanitary sewer line as well as a full update of their lagoons including a new lift station and pumps, bar rack, chlorination contact chamber system, and effluent draw off structure. This project also resulted in the redesign and replacement of several city streets and sidewalks.

2. In 2008, Lewis County and Nezperce worked together to obtain a generator for the city water system.

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**Table 6.5. City of Winchester Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Support efforts to improve the County's GIS data system. | Goal #1, 4, and 6<br>Priority Ranking: High | Winchester City Council | New Project | Ongoing | |
| | Work with local partners to improve sheltering capacity during emergency evacuation events. | Goal #1, 4, 5, and 6<br>Priority Ranking: Moderate | Winchester City Council and American Red Cross | New Project | 2012 | American Red Cross, Idaho Bureau of Homeland Security, Lewis County Emergency Management |
| | Identify and implement increased security measures for the city hall and the fire and emergency medical services building in order to reduce asset accessibility. | Goal #1, 2, 4, 5, and 6<br>Priority Ranking: High | Winchester City Council, Winchester Police Department, and Lewis County Sheriff's Office and Emergency Management | New Project | 2014 | Lewis County Sheriff's Office, FEMA, Idaho Bureau of Homeland Security, Winchester Fire Department and EMS |
| | Install a security fence surrounding the city well. | Goal #1, 4, and 7<br>Priority Ranking: Moderate | Winchester City Maintenance | New Project | 2 years | Idaho Department of Commerce, Idaho Department of Ecology, Idaho Department of Water Resources |
| Earthquake | Assess seismic hazards to public buildings. | Goal #1, 2, and 4<br>Priority Ranking: Low | Partnership: Winchester City Council and consulting firm | Deferred due to lack of funds. | Ongoing | |

**Table 6.5. City of Winchester Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snow load resistance. | Goal #124<br><br>Priority Ranking: High | Partnership: Winchester City Council and Winchester Schools | Deferred due to lack of funds. | 5 years | |
| Wildland Fire | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #123456<br><br>Priority Ranking: High | Partnership: Winchester City Council and various partners | Annual Project | Ongoing | |

In the 2005 Lewis County All Hazards Mitigation Plan, action items specific to the cities and/or special districts were not separated from the overall Lewis County mitigation strategy; therefore, most of the projects listed for Winchester are new. However, the city has been actively working on hazard mitigation measures. The following is a list of completed projects since 2005.

1. The city of Winchester worked with local residents and Lewis County to establish the Winchester Rural Fire District.

**Table 6.6. City of Reubens Mitigation Strategies.**

| Hazard | Action Item | Goals Addressed | Responsible Departments or Organizations | 2011 Status | Projected Completion Year | Potential Resources |
|---|---|---|---|---|---|---|
| General | Support efforts to improve the County's GIS data system. | Goal #1 and 3<br>Priority Ranking: High | Reubens City Council | New Project | Ongoing | |
| Earthquake | Assess seismic hazards to public buildings. | Goal #3<br>Priority Ranking: Low | Partnership: Reubens City Council and consulting firm | Deferred due to lack of funds. | Ongoing | |
| Severe Weather | Encourage schools and other public facilities to inspect buildings for snow load resistance. | Goal #2 and 3<br>Priority Ranking: High | Reubens City Council | Deferred due to lack of funds. | 5 years | |
| Wildland Fire | Continue to work on action items and proposed projects in the Lewis County Wildfire Protection Plan. | Goal #1 and 3<br>Priority Ranking: High | Partnership: Reubens City Council and various partners | Annual Project | Ongoing | |

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# Chapter 7

## Appendices

IN THIS SECTION:

- List of Tables
- List of Figures
- Local Resolutions of Adoption
- Planning Committee Minutes
- Summary of 2011 Revisions
- Public Meeting Slideshow

# Chapter 7 – Appendices

## Supporting Information

### *List of Tables*

Table 3.1. Selected Demographic Statistics. 21
Table 3.2. Poverty Status Statistics in 1999. 22
Table 3.3. Occupation and Industry 23
Table 3.4. Vegetative Cover Types. 25
Table 4.1. Weather and Climate for Lewis County, Idaho. 44
Table 4.2. Fire Regime Condition Classes in Lewis County. 55
Table 5.1. Communities Participating in NFIP. 64
Table 5.2. NFIP Policy Statistics As of 3/31/2010 in Lewis County. 64
Table 5.3. Significant assets and infrastructure in Lewis County Flood Zones. 66
Table 5.4. Landslide Risk Due to Slopes, Geology, and Soils. 70
Table 5.5. Wildfire Ignition Summary. 82
Table 5.6. Idaho Department of Lands Wildfire Data 1983-2002. 82
Table 6.1. Lewis County Mitigation Strategies. 137
Table 6.2. City of Kamiah Mitigation Strategies. 145
Table 6.3. City of Craigmont Mitigation Strategies. 153
Table 6.4. City of Nezperce Mitigation Strategies. 155
Table 6.5. City of Winchester Mitigation Strategies. 159
Table 6.6. City of Reubens Mitigation Strategies. 161

# *List of Figures*

Figure 2.1. Press Release #1. ..... 14
Figure 2.2. Public Meeting Flyer. ..... 15
Figure 3.1. Summary of SHELDUS Hazard Profile. ..... 29
Figure 4.1. State Landslide Disaster Declarations 1976-2000. ..... 39
Figure 4.2. Average Annual Precipitation in Idaho from 1961 to 1990. ..... 42
Figure 4.3. Idaho Average Wind Speed Map. ..... 43
Figure 4.4. Seismicity of Idaho from 1990-2006. ..... 46
Figure 4.5. Earthquake Magnitude Probability Model. ..... 48
Figure 4.6. Earthquake Peak Acceleration Model. ..... 50
Figure 4.7 Wildland Urban Interface in Lewis County, Idaho. ..... 58
Figure 5.1. Lewis County FEMA Floodplains. ..... 62
Figure 5.2. Landslide Prone Landscapes in Lewis County. ..... 70
Figure 5.3. U.S. Drought Monitor for Western Region. ..... 74
Figure 5.4. Fault Line Locations in Lewis County. ..... 78
Figure 5.5. Lewis County Fire Prone Landscapes Model. ..... 84
Figure 5.6. FEMA Flood Zones and land ownership surrounding Kamiah. ..... 87
Figure 5.7. Repeatedly Stormwater Damaged Properties. ..... 90
Figure 5.8. FEMA Flood Insurance Rate Map for Craigmont, Idaho. ..... 100
Figure 5.9. FEMA Flood Zones and land ownership surrounding Nezperce. ..... 108

## Lewis County Resolution of Adoption

**Resolution of the Commissioners of Lewis County, Idaho**
#2011-06

A resolution of the Lewis County Board of Commissioners declaring county support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).

Whereas, the Lewis County Board of Commissioners supports the updated Multi-Hazard Mitigation Plan, and

Whereas, The Lewis County Board of Commissioners has participated in the development of the updated Multi-Hazard Mitigation Plan, and

Whereas, the updated Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate.

Therefore be it resolved, that the Lewis County Board of Commissioners do hereby adopt and support and will facilitate implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 6th Day of JUNE 2011

Carroll A. Keith, Chairman

Charles E. Doty – Commissioner

ATTEST: Cathy Larson, Clerk

Don Davis - Commissioner

CLERK OF THE DISTRICT COURT
EX OFFICIO AUDITOR AND RECORDER
STATE OF IDAHO
SECOND JUDICIAL DISTRICT LEWIS COUNTY

## City of Craigmont Resolution of Adoption

**Resolution of Adoption by the City of Craigmont, Idaho**
**#** 1014

**A resolution of the City of Craigmont declaring support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).**

Whereas, the City Council of Craigmont supports the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the City Council of Craigmont has participated in the development of the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the updated Lewis County Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate by the City Council of Craigmont, and

Therefore be it resolved, that the City Council of Craigmont does hereby adopt and support and will facilitate the implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 5th Day of July 2011

by the City Council of Craigmont located in Lewis County, Idaho.

Roger D. Ruggen
By:
Mayor, City of Craigmont

LaDeen R. Thomason
Attested by:
Clerk, City of Craigmont

## City of Kamiah Resolution of Adoption

**Resolution of Adoption by the City of Kamiah, Idaho**
**#** 2011-5

**A resolution of the City of Kamiah declaring support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).**

Whereas, the City Council of Kamiah supports the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the City Council of Kamiah has participated in the development of the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the updated Lewis County Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate by the City Council of Kamiah, and

Therefore be it resolved, that the City Council of Kamiah does hereby adopt and support and will facilitate the implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 25th Day of May 2011

by the City Council of Kamiah located in Lewis County, Idaho.

Dale Schneider, Mayor

ATTEST:

Cathy LaBatt, City Clerk/Treasurer

2011-5

## City of Nezperce Resolution of Adoption

**Resolution of Adoption by the City of Nezperce, Idaho**
**# 2011-4**

**A resolution of the City of Nezperce declaring support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).**

Whereas, the City Council of Nezperce supports the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the City Council of Nezperce has participated in the development of the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the updated Lewis County Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate by the City Council of Nezperce, and

Therefore be it resolved, that the City Council of Nezperce does hereby adopt and support and will facilitate the implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 25th Day of July 2011

by the City Council of Nezperce located in Lewis County, Idaho.

Steve A Bateman

By:
Mayor, City of Nezperce

Rhonda J Schmidt

Attested by:
Clerk, City of Nezperce

## City of Winchester Resolution of Adoption

**Resolution of Adoption by the City of Winchester, Idaho**
**#** 2011-1

**A resolution of the City of Winchester declaring support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).**

Whereas, the City Council of Winchester supports the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the City Council of Winchester has participated in the development of the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the updated Lewis County Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate by the City Council of Winchester, and

Therefore be it resolved, that the City Council of Winchester does hereby adopt and support and will facilitate the implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 7th Day of July 2011

by the City Council of Winchester located in Lewis County, Idaho.

By:
Mayor, City of Winchester

Attested by:
Clerk, City of Winchester

CITY OF WINCHESTER CORPORATE SEAL STATE OF IDAHO

## City of Reubens Resolution of Adoption

**Resolution of Adoption by the City of Reubens, Idaho**
**#** 2011-7

**A resolution of the City of Reubens declaring support and adoption of the updated Lewis County Multi-Hazard Mitigation Plan (2011 Revision).**

Whereas, the City Council of Reubens supports the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the City Council of Reubens has participated in the development of the updated Lewis County Multi-Hazard Mitigation Plan, and

Whereas, the updated Lewis County Multi-Hazard Mitigation Plan will be utilized as a guide for planning as related to the FEMA Pre-Disaster Mitigation program as well as other purposes as deemed appropriate by the City Council of Reubens, and

Therefore be it resolved, that the City Council of Reubens does hereby adopt and support and will facilitate the implementation of the updated Lewis County Multi-Hazard Mitigation Plan as deemed appropriate.

Passed and approved this 6th Day of July 2011

by the City Council of Reubens located in Lewis County, Idaho.

By:
Mayor, City of Reubens

Attested by:
Clerk, City of Reubens

# *Planning Committee Minutes*

## *July 12th – Lewis County Courthouse*

Agenda Item #1 – Introduction:

Dave Hasz began the meeting by explaining the purpose of the project and introducing the planning committee in attendance.

Agenda Item #2 – Project Purpose and Scope:

Tera gave a brief background of the process and explained the purpose of the Multi-Hazard Mitigation Plan update including the new requirements from FEMA. Critical sections of the current CWPP will be included in the MHMP to satisfy the new requirement that the wildfire chapter must be included in the main document.

Agenda Item #3 – Reference Info:

Goals Statements – Each jurisdiction (Lewis County plus towns) needs to complete a goals statement per the new requirements. NMI provided examples and a fill-in goals worksheet that will be distributed electronically.

Jurisdictions - The committee will continue with the county and cities as the adopting jurisdictions.

Recent Events – Tera asked that the committee sent any information regarding hazard events that had occurred since 2005. This could include pictures, after action reports, etc. She would also like copies of any new planning documents that the County or cities had adopted that might affect/conflict with the recommendations in the MHMP.

Agenda Item #4 – Draft Review:

The committee reviewed the draft chapters 1-4 and the flood sections in Chapter 5. Tera explained each section in the document and pointed out where information was missing or the data needed updated. She asked that the committee pay particular attention to critical facilities located in the floodplain and mark any new development areas. Edits to these sections need to be sent to NMI by July 30th.

Agenda Item #5– Public Involvement:

Tera handed out a draft press release announcing the initiation of the project as well as the public meeting date. The committee decided to hold a public meeting in Nezperce immediately following the next committee meeting (3pm on August 16th). After a few corrections, the press release was submitted to the County Public Information Officer for immediate release. Tera also handed out the public meeting flyer. She needs the committee to send photos and/or edits to the flyer by July 30th. The flyer will be distributed by the committee members.

Agenda Item #6 – Terrorism/Civil Unrest Supplement:

As part of the Terrorism/Civil Unrest Supplement Update, the committee reviewed the existing document focusing on the information contained in Chapter 3. The critical infrastructure list and vulnerability assessments had not been entirely completed in the 2005 version; thus, the committee went through the

checklist and noted where all of the critical facilities were located. Tera will put together the vulnerability assessment forms for completion at the next meeting.

Agenda Item #7 – Mitigation Strategy:

Tera handed out the 2005 list of mitigation action items. These items will be broken down by jurisdiction in the updated document. The committee went through each item and noted its 2010 status and other corrections in the summary. Tera asked that the committee continue to review this list and send edits to NMI by July 30th. Any new projects should also be explained and sent to NMI.

Agenda Item #8 – Task List:

***Information can be sent to Tera King at king@consulting-foresters.com .****

1. Complete Goals Statements by July 30th – County and Cities
2. Send committee electronic copies of handouts – Tera
3. Send info on recent events or new planning guidelines asap – County and Cities
4. Send edits to Chapters 1-4 by July 30th.
5. Review action item list and send edits and/or new projects by July 30th.

Agenda Item #9 – Adjournment:

The Lewis County MHMP update planning committee meeting was adjourned at 3:20 pm. The next meeting will be held on August 16th at 1pm at the Courthouse.

## *August 16th, 2010 – Lewis County Courthouse*

Agenda Item #1 – Old Business:

As discussed at the previous meeting, NMI facilitated the phase I hazard assessment, which helps the committee prioritize each hazard in relation to each other. The results of the assessment are shown below.

| | | **Magnitude** | | |
|---|---|---|---|---|
| | | Low | Medium | High |
| **Frequency** | Low | **Terrorism/Civil Unrest** | | **Earthquake** |
| | Medium | | **Flood** | |
| | High | | **Severe Weather**<br>**Landslide**<br>**Wildland Fire** | |

Tera also updated the committee on the status of the goals statements received from each community. So far, the County is the only jurisdiction meeting this requirement.

The committee also spent a considerable amount of time filling out the vulnerability assessment (score cards) for each critical facility discussed at the last meeting. Tera will input the scores into the Terrorism Supplement.

Agenda Item #2 – Draft Review:

Tera handed out Chapter 5 for the committee to review. She asked that each jurisdiction proofread the section that applied to them and send her comments. The committee also discussed the number of unreinforced masonry structures in each community.

Agenda Item #3 – Public Involvement:

The public meeting is scheduled for this afternoon directly following the committee meeting. Once all of the revisions are received from the committee, NMI will facilitate the public comment period for the document. Tera handed out a draft press release to be reviewed by the committee.

Agenda Item #4 – Mitigation Strategy:

Based on previous discussions and the original Plan, NMI prepared mitigation strategies to be reviewed by each jurisdiction. The committee discussed prioritization of the action items and concluded that the scoring method was appropriate for all jurisdictions except Kamiah. Kamiah will prioritize its own projects.

Agenda Item #5 – Task List:

***Information can be sent to Tera King at king@consulting-foresters.com .****

1. Complete Goals Statements asap –Cities
2. Send committee electronic copies of handouts – Tera
3. Send info on recent events or new planning guidelines asap – County and Cities
4. Send edits to Chapter 5 asap - Committee
5. Review action item list and send edits and/or new projects asap - Committee.
6. Review public comment period press release - Commitee

Agenda Item #6 – Adjournment:

The Lewis County MHMP update planning committee meeting was adjourned at 3:00 pm. No additional committee meetings were scheduled at this time.

## *November 10th, 2010 – Winchester City Hall*

In order to complete the jurisdictional review and gather additional information, Northwest Management attended the November Local Emergency Planning Committee (LEPC) meeting in Winchester. Vaiden Bloch reviewed each element that he need from each of the participating jurisdictions, answered questions, and explained how to submit revisions. Dave Hasz reiterated that once Idaho Bureau of Homeland Security and FEMA had reviewed and approved the Plan, each community would be asked to adopt the Plan by resolution.

# *Summary of 2011 Revisions*

**Overall Changes**

1. The entire Multi-Hazard Mitigation Plan (MHMP) was reorganized and reformatted to improve overall readability, make specific information easier to find for each jurisdiction, and to make the document more conducive to periodic updates. Rather than being organized by hazard as in the 2005 version, the 2011 MHMP is organized by jurisdiction.

2. Most of the hazard-specific information was retained in the 2011 MHMP; however, it has been separated into sections that apply directly to each participating jurisdiction.

3. Rather than incorporating the Lewis County Community Wildfire Protection Plan as one chapter, but a separate document, the 2011 MHMP includes a full section on the wildfire hazard within the document. The information is based on the existing Community Wildfire Protection Plan, but repeated in the 2011 MHMP for ease of access to the information.

**Chapter 1**

1. The information contained in Chapter 1 is basically the same; however, the planning committee conducted a new Phase I assessment. Due to funding limitations, no new hazards were included in the 2011 revision; however, several hazard types were identified for future consideration.

2. As an improvement to the 2005 MHMP, the planning committee decided that each jurisdiction should develop its own specific set of goals for the planning process. This was done to improve ownership in the document as well as to encourage the sharing of ideas and information on common issues.

3. As an addition to Chapter 1, the 2011 MHMP included a review of existing planning mechanisms that may affect the recommendations made in this Plan or could be dovetailed with the hazard mitigation planning process and outcomes.

**Chapter 2**

1. Chapter 2 contains basically the same elements as in the 2005 MHMP.

2. The 2011 MHMP included the same jurisdictions as the 2005 version.

3. The public meeting slideshow was moved to Chapter 7 to improve readability.

**Chapter 3**

1. Chapter 3 contains basically the same type of information as in the 2005 MHMP; however, some of the information was summarized or deleted based on its relative usefulness. The planning committee felt this was justified based on experience over the last 5 years of the document's use and it improved general readability.

**Chapter 4 and 5**

1. Chapters 4, 5, 6, and the Lewis County Community Wildfire Protection Plan were combined into Chapters 4 and 5 of the 2011 MHMP. Chapter 4 provides a general overview of each hazard while Chapter 5 provides jurisdiction-specific information regarding each hazard without repeating the general information for each area.

2. In addition to incorporating the majority of the 2005 MHMP's information into Chapters 4 and 5 of the 2011 MHMP, each jurisdiction provided new information to add to the risk and vulnerability assessment narratives. Additional or new information was also incorporated or updated as was necessary to accurately reflect the current situation.

**Chapter 6**

1. Much of the information previously contained in Chapter 7 of the 2005 MHMP was incorporated into Chapter 6 of the 2011 MHMP. However, the presentation format was changed dramatically. The 2005 MHMP organized the mitigation strategies by type or category. The 2011 MHMP includes a mitigation strategy for each jurisdiction. The planning committee felt this improved the quality of the projects and action items included and made it easier for each jurisdiction to find their own projects. Additionally, the planning committee believes that this format will make tracking progress and updating the Plan much easier to facilitate in the future.

2. A summary of accomplishments since 2005 for each jurisdiction was included in Chapter 6 as well.

**Chapter 7**

1. Much of the information previously included in Chapter 8 of the 2005 MHMP is now contained in Chapter 7 of the 2011 MHMP. However, the resolutions of adoption were moved to the Foreword of the 2011 document and the cited literature is included as footnotes in each section.

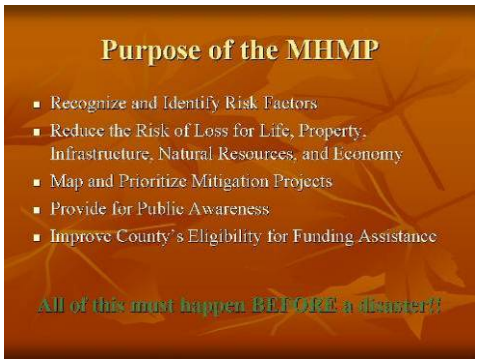
2. The 2011 MHMP added a summary of revisions, public meeting slideshow (previously included in Chapter 2), and a list of potential funding sources.

# *Public Meeting Slideshow*

Slide 1

Slide 2

Slide 3

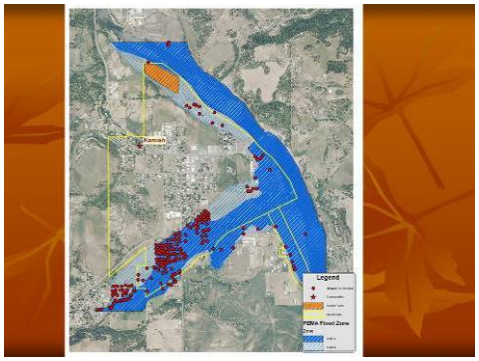



Slide 4

Slide 5

Slide 6

Slide 7

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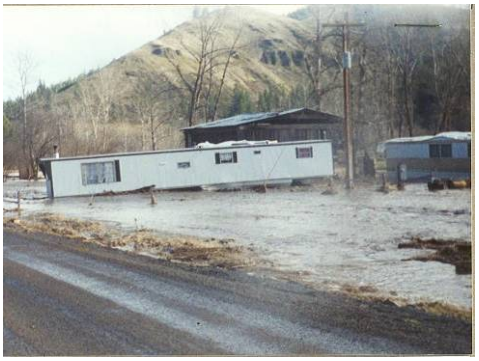

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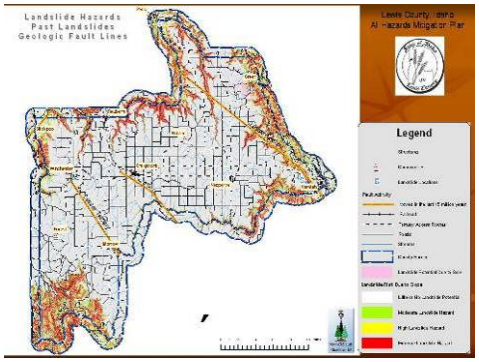


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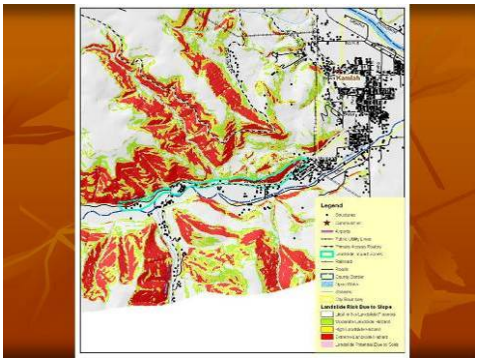

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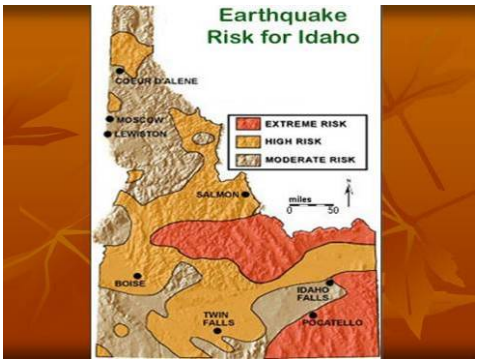
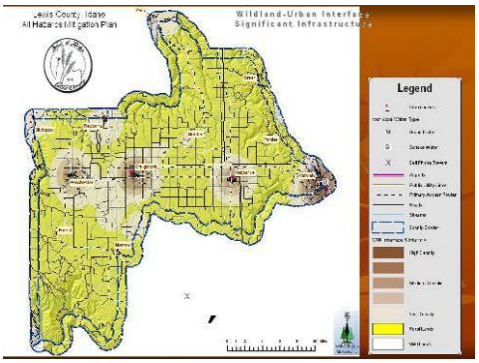
Slide 12




Slide 13

Slide 14




Slide 15

## Terrorism and Civil Unrest

- Working with stakeholders to assess.
- Potential Vulnerabilities
  - Government Buildings
  - Land Management Offices
  - Airports
  - Commerce – Lewiston
  - Infrastructure – water, power, and sewer systems
- Refugees?

Slide 16

## Preparedness

- Emergency Services
- Fire Protection
- Weather Impacts
- Flood Protection/Programs
- Earthquake & Landslide Readiness
- Hospital Protection
- Highway District Readiness
- Communications

Slide 17

## Types of Projects

- Defensible Space and Fuels Treatments
- Floodplain Management/Levee Maintenance
- Slope Stabilization
- Studies (e.g. watershed) and Evaluations (e.g. culvert capacity)
- Access Improvements
- Emergency Response Needs
- Policy Issues
- Infrastructure Hardening
- Public Education

Slide 18

## Public Involvement

- Press Releases about planning efforts
- Informational flyers
- Public Meeting
- Public Review of the DRAFT Plan will be facilitated once all sections have been completed and reviewed by the committee
- Open public adoption hearings

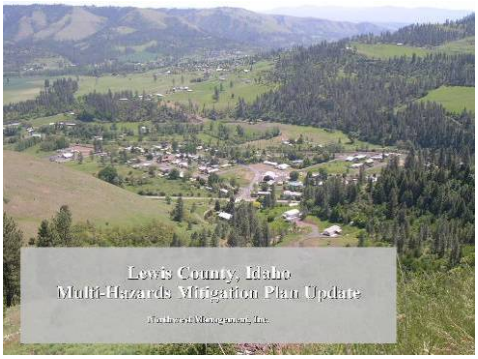
Slide 19

## Your Input

- Maps on the walls – Mark them up!
- Talk to one of the planning committee members.
- Let us know your ideas and concerns.
- Make this YOUR Plan!

- Thank you for attending and participating! Please visit with us.

Slide 20



## *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: | BLM RFA Coordinator at 208-373-3861 |

| | |
|---|---|
| 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: | Idaho BLM at 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 www.fs.fed.us and Idaho Department of Lands 208-769-1525 |

| | |
|---|---|
| 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 and 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 or Idaho Department of Lands at 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: Idaho Department of Lands at 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: Idaho Department of Commerce at 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: Idaho Department of Lands at 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: Idaho Department of Commerce at 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.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: Idaho Bureau of Homeland Security at 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: Idaho Department of Lands at 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 Selland 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 at 208-384-3403 or BSU's Selland College at 208-426-1974.

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