LATAH COUNTY, IDAHO

MULTI-HAZARD MITIGATION PLAN

JULY 2011

Prepared By

Northwest Management, Inc.

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 **Latah County Multi - Hazard Mitigation Plan** was updated during 2010-2011 by the Latah County Multi-Hazard and Wildfire Protection 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:

- Latah County Multi-Hazard Mitigation Plan – 2011 Revision
  - 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.

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

FEMA

July 27, 2011

Honorable Jennifer Barrett
Chair, Latah County Commissioners
P.O. Box 8068
522 S. Adams
Moscow, Idaho 83843

Dear Chair Barrett:

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has approved the ***Latah County 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 July 27, 2016:

Latah County	**City of Dreary**	**City of Troy**
City of Potlatch	**City of Onaway**	**City of Kendrick**
City of Juliaetta	**City of Genesee**	**City of Moscow**
City of Bovill	**North Latah Highway District**	**South Latah Highway District**

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

cc: David Jackson, Idaho Bureau of Homeland Security

BH:bb

www.fema.gov

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Chapter 1

Plan Overview

IN THIS SECTION:

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

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 Latah County, Idaho. The planning team responsible for implementing this project was led by Latah County Disaster Services. Agencies and organizations that participated in the planning process included:

- Bovill Rural Fire District
- City of Bovill
- City of Deary
- City of Genesee
- City of Juliaetta
- City of Kendrick
- City of Moscow
- City of Onaway
- City of Potlatch
- City of Troy
- Clearwater Resource Conservation and Development Council, Inc.
- Deary Rural Fire District
- Genesee City & Rural Fire Department
- Idaho Bureau of Homeland Security
- Idaho Department of Lands
- Juliaetta Volunteer Fire Department
- Kendrick Volunteer Fire Department
- Latah County Commissioners and County Departments
- Latah County Highway Districts
- Moscow Volunteer Fire Department and Rural Fire District
- Northwest Management, Inc.
- Potlatch Rural Fire District
- Troy Rural Fire District
- USDA Forest Service
- USDI Bureau of Land Management

In the fall of 2009, Latah County Disaster Services solicited competitive bids from companies to provide the service of leading the assessment, developing the data, and updating the Latah County Multi - Hazard Mitigation Plan. Northwest Management, Inc. (NMI) was selected to provide this service to the County. The Project Co-Managers from Northwest Management, Inc. were Mr. Vaiden Bloch and Mrs. Tera R. King.

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 Latah County updated or developed annexes for the following hazards:

Updated Hazards:

- Flood
- Landslide
- Severe Weather
- Wildland Fire

New Hazards Assessed:

- Terrorism/Civil Unrest
- Extended Power Outage

Additional hazard annexes may be added to this Plan as funding allows. The highest priority hazards to be considered for future evaluation are:

- Hazardous Materials
- Crop Loss
- Earthquake
- Volcano
- Technological Hazards
- Pandemic

A Phase I Assessment was facilitated with Latah 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 Latah County.

Latah County Phase I Risk Assessment:

		Magnitude		
		Low	Medium	High
Frequency	Low			**Flood**
	Medium		**Extended Power Outage**	**Severe Weather** **Landslide** **Terrorism/Civil Unrest**
	High			**Wildland Fire**

The inclusion of additional hazards was considered; however, due to funding limitations, participating jurisdictions chose not to assess technological, man-caused, or other hazards until additional funding becomes available. At such a time, the Multi - Hazard Mitigation Plan will be revised to include additional hazards such as hazardous materials, earthquake, and pandemic.

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

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

October 31st, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Reg. 61720 to 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 Latah 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

Latah 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

Latah 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 All Hazards Mitigation Plan.

City of Moscow:

1. *Mitigation* - Repair and restore essential systems and services before and after hazard events.
2. *Planning* - Provide for direction and control of emergency events.
3. *Planning* - Provide for the protection, use, and distribution of critical resources.
4. *Planning* - Provide for continuity of government.
5. *Planning* - Coordinate operations with internal and external emergency service organizations.

City of Deary:

1. *Planning* - Identify hazardous material flow through the City.
2. *Planning* - Reduce losses from structure fires by working with private property owners to ensure that smoke alarms and fire extinguishers are located in each residence.

3. *Mitigation* - Work with local organizations to improve sheltering capacity during severe weather events.
4. *Mitigation* - Reduce flood damage by installing appropriately sized culverts in identified high risk areas.
5. *Planning* - Continue to work with partners on the implementation of wildfire protection measures.
6. *Planning* - Continue to provide residents with well-trained and properly equipment emergency services.
7. *Planning* - Meet or exceed the requirements of FEMA for a county level All Hazards Mitigation Plan.

City of Juliaetta:

1. *Mitigation* - Provide reliable water supply for fire suppression.
2. *Planning* - Continue to encourage rural area residents to form a fire district.
3. *Mitigation* - Develop a community sheltering program for disaster events.
4. *Planning* - Improve the capabilities of the city fire department.
5. *Planning* – Improve the community's ability to continue basic services during a power outage.
6. *Planning* – Identify strategies that will reduce impacts and losses within the community.

City of Potlatch:

1. *Planning* - Develop land use policies to alleviate potential hazard risks and impacts for future development.
2. *Mitigation* – Strategically locate and plan infrastructure projects that take into consideration the impacts of natural hazards.
3. *Planning* - Strengthen emergency operations plans and procedures by increasing collaboration among public agencies, non-profit organizations, business, and industry.
4. *Planning* - Work with local fire department to help reduce losses from structure fires through working with private property owners to ensure that smoke alarms and fire extinguishers are located in each residence.
5. *Mitigation* – Repair or restore essential systems and services before and after hazard events.
6. *Planning* - Provide for direction and control of emergency events.
7. *Planning* - Coordinate operations with internal and external emergency service organizations.
8. *Mitigation* – Identify hazardous material flow through the community.
9. *Planning* - Continue to work with fire department to implement wildfire protection measures.
10. *Planning* - Continue to provide residents with well-trained and properly equipped emergency service providers.
11. *Mitigation* – Establish an alternative power source to maintain function of water and sewer infrastructure during hazard events.

12. *Mitigation* – Provide for quick response to flooding of the Potlatch River by storing sandbags and other flood control equipment.
13. *Planning* - Continue to pursue grant opportunities for community projects.

City of Bovill:

1. *Mitigation* – Establish an alternative power source to maintain function of water and sewer infrastructure during hazard events.
2. *Planning* – Provide for quick response to flooding of the Potlatch River by storing sandbags and other flood control equipment within the City.
3. *Planning* – Identify strategies that will reduce impacts and losses within the community.

City of Genesee:

1. *Planning* - Continue working on projects that will reduce the risk of hazards to the community.
2. *Planning* - Encourage participation in the National Flood Insurance Program.
3. *Mitigation* - Reduce the impacts of repetitive flood incidents on Cow Creek.

City of Kendrick:

1. *Mitigation* – Provide a secure and accessible storage facility for emergency equipment.
2. *Planning* – Improve the capabilities of the city fire department.
3. *Planning* – Continue to encourage rural area residents to form a fire district.
4. *Mitigation* – Provide reliable water supply for fire suppression.
5. *Planning* – Improve the community's ability to continue basic services during a power outage.
6. *Mitigation* – Begin working on options to upgrade the city's sewer treatment system.
7. *Planning* – Identify strategies that will reduce impacts and losses within the community.

City of Onaway:

1. *Planning* – Continue working on reducing residents' exposure to hazards.
2. *Planning* - Encourage participation in the National Flood Insurance Program.
3. *Mitigation* - Develop wildfire evacuation plans and continue working on wildland fire mitigation projects.

City of Troy:

1. *Planning* – Encourage participation in the National Flood Insurance Program.
2. *Planning* – Protect the city's critical infrastructure from hazard events.
3. *Mitigation* – Improve transportation infrastructure to alleviate issues during hazard events.
4. *Mitigation* – Protect the community from wildland fire.

North Latah County Highway District:

1. *Mitigation* - Reduce flood damage by installing appropriately sized culverts in identified high risk areas.
2. *Mitigation* - Reduce flood damage by raising road grades out of the floodplain.
3. *Mitigation* - Improve bank stability at water crossings.
4. *Mitigation* - Improve infrastructure capacity by replacing older, insufficient bridges.
5. *Mitigation* - Improve signage at intersections across the District.
6. *Planning* - Continue to pursue grant opportunities for improvements.
7. *Planning* - Work on widening collector routes.
8. *Planning* – Continue to improve the condition of the overall County road system.

South Latah Highway District:

1. *Mitigation* - Reduce flood damage by installing appropriately sized culverts in identified high risk areas.
2. *Mitigation* - Reduce flood damage by raising road grades out of the floodplain.
3. *Mitigation* - Improve bank stability at water crossings.
4. *Planning* - Establish a more effective communication system.
5. *Planning* – Continue to improve the condition of the overall County road system.

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 as well as to identify planning mechanisms that may incorporate the information and requirements contained in this Plan. Existing programs and policies were reviewed in order to identify those that may weaken or enhance the hazard mitigation objectives outlined in this document.

Latah County Comprehensive Plan

The Latah County Comprehensive Plan[4] is currently being revised. The existing Plan was adopted as last amended in 2004. The document outlines a pattern of growth for the County that is compatible with community traditions, values, and vision for the future. The Comprehensive Plan serves as a basis for ordinances and regulations that will achieve the overall goals identified through the active participation of county residents.

[4] Latah County, Idaho. 2004. Latah County Comprehensive Plan. Latah County Board of Commissioners. Moscow, Idaho. Available online at www.latah.id.us.

Latah County Emergency Operations Plan

The Latah County Emergency Operations Plan[5] – Basic Plan contains the procedures and guidelines for how the Emergency Operations Center and Incident Command System will interface during a disaster. The Basic Plan applies to all emergency response elements, government agencies, and disaster relief organizations and agencies supporting Latah County emergency operations.

Latah County Addressing Ordinance

In September of 2009, the Latah County Board of Commissioners adopted Ordinance #292 Uniform Rural Addressing[6] to set a uniform addressing system for all unincorporated portions of Latah County to assist with emergency response and various other services.

Latah County Land Use Ordinance

The Latah County Land Use Ordinance #269[7] sets out land use codes for Latah County in accordance with the Latah County Comprehensive Plan and Idaho Code including land use zones, regulations, and development standards.

Latah County Building Code Ordinance

The Latah County Building Code Ordinance #280[8] adopted the International Building Code, 2006 edition; the International Residential Code, 2006 edition, Parts I through VI and IX; the American National Standard Accessible and Usable Buildings and Facilities, ICC/ANSI A117.1, 2003 Edition; the International Mechanical Code, 2006 edition; the International Fuel Gas Code, 2006 Edition; the International Energy Conservation Code, 2006 edition; the International Existing Building Code, 2006 edition; the International Property Maintenance Code, 2006 edition; excluding all appendices thereto except as herein enumerated, are hereby adopted by Latah County for the regulation of the erection, construction, enlargement, alteration, repair, moving, conversion, occupancy, use, height, area and maintenance of all buildings and structures in Latah County, including installation of manufactured homes in accordance with the provisions of the Title 44, Chapter 22 Idaho Code. These Codes and regulations are hereby adopted by reference and shall be the Latah County Building Code.

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[5] Latah County, Idaho. 2008. Latah County Emergency Operations Plan. Latah County Board of Commissioners. Moscow, Idaho. Available online at www.latah.id.us.

[6] Latah County, Idaho. 2009. Ordinance #292 Uniform Rural Addressing System. Latah County Board of Commissioners. Moscow, Idaho. Available online at www.latah.id.us.

[7] Latah County, Idaho. 2006. Latah County Land Use Ordinance #269. Latah County Board of Commissioners. Moscow, Idaho. Available online at www.latah.id.us.

[8] Latah County, Idaho. 2007. Latah County Building Code Ordinance #280. Latah County Board of Commissioners. Moscow, Idaho. Available online at www.latah.id.us.

City of Moscow Comprehensive Plan

The City of Moscow Comprehensive Plan[9] is a statement of the community's values and policies to guide the long-range physical development of the City and its Area of City Impact. Through the vision, goals, objectives, policies, and implementation strategies, the Plan provides a framework for decision-making regarding land use and community character, all modes of transportation, adequate and affordable housing, livable neighborhoods, adequate public facilities and services, and economic development. The Comprehensive Plan sets forth broad policies and goals that reflect the aspirations and visions of Moscow's residents.

City Codes

The cities of Moscow[10], Troy[11], Genesee[12], and Kendrick[13] have all developed online forums for posting and updating city codes. Juliaetta, Bovill, Deary, Onaway, and Potlatch have also developed city codes to help govern growth and development; however, these codes are not yet available online. All of these jurisdictions have adopted ordinances covering health and sanitation services, building regulations, business regulations, fire regulations and standards, zoning regulations, and subdivision regulations. While the codes aren't the same for each community, they have all addressed basic elements for future planning, community development, and safety of residents.

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[9] Comprehensive Plan. Moscow City Council. Adopted December 2009. Moscow, Idaho. Available online at http://www.moscow.id.us/comm_dev/planning/comp_plan.aspx. Accessed January 2011.

[10] City Code Titles. 2010. Moscow City Council. Available online at http://www.ci.moscow.id.us/citycode/index.aspx. Accessed January 2011.

[11] City Code. 2008. Troy City Council. Available online at http://www.sterlingcodifiers.com/codebook/index.php?book_id=704. Accessed January 2011.

[12] City Code. 2009. Genesee City Council. Available online at http://www.sterlingcodifiers.com/codebook/index.php?book_id=694. Accessed January 2011.

[13] City Code. 2010. Kendrick City Council. Available online at http://www.sterlingcodifiers.com/codebook/index.php?book_id=809. Accessed January 2011.

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Chapter 2

Planning Process

IN THIS SECTION:

- Description of the Planning Process
- The Planning Team
- Planning Committee Meetings
- Public Involvement

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 Latah 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 Latah 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 Latah County was Sandy Rollins representing the Latah County Disaster Services. Additional partners included local communities, fire departments, law enforcement, federal and state agencies, 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 community 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 All Hazards Mitigation Plan is applicable to the following Jurisdictions:

- Latah County
- City of Bovill
- City of Deary
- City of Genesee
- City of Juliaetta
- City of Kendrick
- City of Moscow
- City of Onaway
- City of Potlatch
- City of Troy
- North Latah County Highway District (new jurisdiction)
- South Latah Highway District (new jurisdiction)

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 attend at least one planning committee meeting or meet with committee leadership, 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 Latah County Disaster Services at County Board of Commissioner 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. For example two representatives from the city of Moscow regularly attended city council and department head meetings to keep the council apprised of the planning process. Additionally, members of the Kendrick and Juliaetta Fire Departments met with their city councilpersons outside of regularly scheduled meetings to discuss their respective risk assessments and mitigation strategy. Northwest Management, Inc. also attended a Latah County Local Emergency Planning Commission meeting to update members of that group regarding the development of the 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 the process, collect data and other information, and develop specific mitigation

strategies. For example, Northwest Management, Inc. and Latah County Disaster Services met individually with the city of Potlatch (Mayor David Brown) and the city of Troy (Dave McGraw) to review the city's risk assessment and mitigation strategy and ensure their participation in the planning process. Northwest Management also conducted conference calls with the city of Genesee (Mayor Steve Odenburg), the South Latah Highway District (Kevin Renfrow), and the Onaway city council (Mayor Kenny Owens and Diane Nagle) to request specific information, review pertinent sections of the document, discuss hazard events, and update project lists.

- Public meetings hosted by multiple jurisdictions involving elected officials, municipality representatives, local volunteers, business community representatives, and local citizenry. Numerous representatives of the planning committee attended public meetings. These meetings were also attended by city councilpersons from the city of Bovill and the city of Kendrick as well as the Latah County LEPC chairman.

- Written correspondence was provided at least monthly between the planning committee leadership and each participating jurisdictions updating the cooperators on the progress of the document, 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, several participating jurisdictions hosted copies of the draft Latah 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, Latah 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 Latah County Multi – Hazard Mitigation Plan's preparation. Many participants served on the committee as dual representatives of more than one jurisdiction. Initially, each jurisdiction as well as other representatives were personally invited to the first planning committee meeting by Latah County Disaster Services. Additionally, all committee meetings were open to the public.

Latah County Participants:
*Indicates Adopting Jurisdiction

- *Alan Martinson ..... Latah County Disaster Services
- Casey Strong ..... Idaho Department of Lands
- *Cliff Heimgartner ..... Juliaetta/Kendrick Fire Department/City of Juliaetta
- *Dan Carscallen ..... City of Moscow and North Latah County Highway District
- Dave Summers..... Idaho Department of Lands
- *David Duke..... Moscow Police Department
- Debi Ruppe ..... Idaho Bureau of Homeland Security
- Dick Hodge..... Clearwater RC&D
- *Ed Button ..... Moscow Fire Department and Rural Fire District
- *James Agidius ..... Latah County GIS Department
- *Janiece Atkins ..... City of Bovill
- *Jason Boal ..... Latah County Planning Department
- Jason Svancara..... Idaho Department of Lands
- Kristen Sanders..... Bureau of Land Management
- Lisa Spinelli ..... US Forest Service, Palouse Ranger District
- *Michelle Fuson..... Latah County Planning and Building
- Mike McGee ..... Juliaetta/Kendrick Fire Department
- *Rhonda Bunney ..... Latah County Sheriff's Office
- *Sandy Rollins..... Latah County Disaster Services
- Tera King..... Northwest Management, Inc.
- Vaiden Bloch..... Northwest Management, Inc.
- *Val Norris ..... Juliaetta/Kendrick Fire Department/City of Kendrick

Committee Meeting Minutes

The minutes of each planning committee meeting are included in the Appendices.

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 Latah County planning committee, periodic press releases were submitted to the *Moscow-Pullman Daily News*, the *Latah Eagle*, and the *Lewiston Morning Tribune*. Informative flyers were also distributed around town and to local offices within the communities by the committee members.

Figure 2.1. Press Release #1.

Media Release

From: Sandy Rollins, Latah County Disaster Services
Date: February 3, 2010
RE: Latah County Multi-Hazard Mitigation Plan Update

Latah County Set to Update Hazard Risk Plans

Latah County has launched a project to update the Latah County Multi-Hazard Mitigation Plan and the Community Wildfire Protection Plan. Local agencies and organizations in Latah County have created a committee to complete the required 5-year updates of these documents as part of the FEMA Pre-Disaster Mitigation program and National Fire Plan and Healthy Forests Restoration Act. The project is being funded through a FEMA grant.

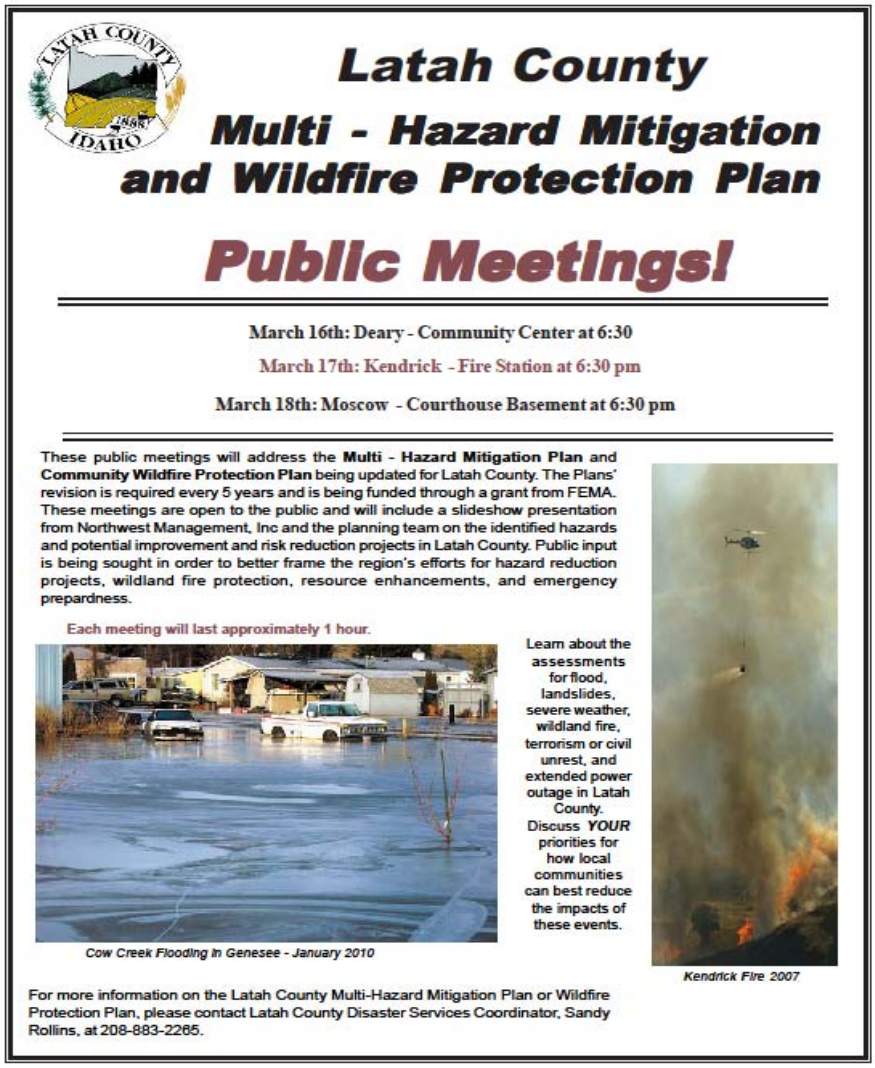
The planning updates will include risk analyses, vulnerability assessments, and mitigation recommendations for the hazards of flood, landslide, severe weather, wildland fire, terrorism/civil unrest, and extended power outage. Northwest Management, Inc. has been retained by Latah County to provide risk 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, Idaho Department of Lands, U.S Forest Service, Bureau of Land Management, highway districts, private landowners, area businesses, various Latah County departments, and others. One of the goals of 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 public meetings to discuss preliminary findings and to seek public input on the Plans' recommendations. A notice of the dates and locations of these meetings will be posted in local newspapers. Once completed, the updated draft Plans will also be available for public review and comment. For more information on the Latah County Multi - Hazard Mitigation Plan and Community Wildfire Protection Plan updates, contact Sandy Rollins, Latah County Disaster Services, at 208-883-2265.

Public Meetings

Public meetings were scheduled in several communities during the hazard assessment phase of the planning process to share information on the Plan, obtain input on the details of the hazard assessments, and discuss potential mitigation treatments. Attendees at the public meetings were asked to give their impressions of the accuracy of the information generated and provide their opinions of potential treatments.

The schedule of public meetings included three locations in the County; Deary, Moscow, and Kendrick; that were attended by a number of individuals on the committee and from the general public. 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.



Latah County
Multi - Hazard Mitigation and Wildfire Protection Plan

Public Meetings!

March 16th: Deary - Community Center at 6:30

March 17th: Kendrick - Fire Station at 6:30 pm

March 18th: Moscow - Courthouse Basement at 6:30 pm

These public meetings will address the **Multi - Hazard Mitigation Plan** and **Community Wildfire Protection Plan** being updated for Latah County. The Plans' revision is required every 5 years and is being funded through a grant from FEMA. 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 improvement and risk reduction projects in Latah 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, terrorism or civil unrest, and extended power outage in Latah County. Discuss ***YOUR*** priorities for how local communities can best reduce the impacts of these events.

Cow Creek Flooding in Genesee - January 2010

Kendrick Fire 2007

For more information on the Latah County Multi-Hazard Mitigation Plan or Wildfire Protection Plan, please contact Latah County Disaster Services Coordinator, Sandy Rollins, at 208-883-2265.

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

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 in 2009-10, the committees 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.

The first draft of the document was prepared after the public meetings and presented to the committee at the May 2010 meeting for full committee review. The completed draft document was released for public review on June 28th, 2010. The public review period remained open until July 16th, 2010.

Continued Public Involvement

Latah County is dedicated to involving the public directly in review and updates of this Multi - Hazard Mitigation Plan. The Latah 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 Latah County Disaster Services, 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.

Chapter 3

Community Profile

IN THIS SECTION:

- Latah County Characteristics
- Overview of Emergency Response System
- Regional Hazard Profile

Chapter 3 – Community Profile

Latah County Characteristics

Information summarized from the Latah County Area, Idaho soil survey manuscript.[14]

Latah County, Idaho is in the southwestern part of the Idaho Panhandle and home of the University of Idaho. Major population centers in the area are Moscow, Bovill, Onaway, Deary, Genesee, Juliaetta, Kendrick, Potlatch, and Troy. A large part of this area is cultivated with the main crops being wheat, barley, and peas. Woodland areas are mostly in the higher rainfall zones in the northern and eastern regions. The western part of Latah County includes the dune-like topography of the Palouse hills. Dissecting the loess-covered plains are deep canyons along the Potlatch River and its tributaries on the southern end of the county. Most of these canyons are forested. Rangeland predominates on south-facing slopes near Juliaetta and Kendrick. Elevation ranges from about 1,000 feet above sea level along the Potlatch River to about 5,000 feet. Wooded ridges and low mountains occur above the loess-covered plain along Paradise Ridge, Tomer Butte, and the Palouse Range and in the northern part of the soil survey area. The highest elevation in Latah County is Moscow Mountain, which is 4,983 feet above sea level.

Geography and Climate

Latah County is located in northern Idaho and covers about 1,077 square miles. The geography, topography, climate, and other natural attributes such as vegetation vary significantly across Latah County. The geographic diversity of Latah County is an important factor to consider in wildfire mitigation planning.

The climate in Latah County is moderate. The highest average daily temperature occurs in July and is approximately 84 degrees Fahrenheit (F). The lowest average daily temperature occurs in January and is approximately 24 degrees (F). The average annual rainfall is about 24 inches. Average monthly precipitation varies from about 1 inch in July and August to approximately 2.8 inches in November and December. Average annual snowfall is about 48 inches.

[14] Barker, Raymond J. 1981. United States Department of Agriculture Soil Conservation Service. University of Idaho, College of Agriculture. Idaho Soil Conservation Commission.

Demographics

Latah County reported a total population of 34,935 in 2000 with approximately 13,838 housing units. The 2009 Census Bureau population estimate for Latah County is 38,046.[15] Latah County has nine incorporated communities; Moscow (pop. 21,291), Potlatch (pop. 791), Deary (pop. 552), Troy (pop. 798), Juliaetta (pop. 609), Kendrick (pop. 369), Bovill (pop. 305), Onaway (pop. 230), and Genesee (pop. 965). The total land area of the county is roughly 1,076.89 square miles (689,209.6 acres).

The City of Moscow contains more than 60% of Latah County's total population. Other incorporated cities in Latah County contain approximately 13% of the County's population. The remaining population (approximately 27%) is scattered in small communities and in rural areas throughout the area.[16]

Table 3.1. Selected Demographic Statistics.

Subject	Number	Percent
Total population	34,935	100.0
SEX AND AGE		
Male	18,107	51.8
Female	16,828	48.2
Median age (years)	28.4	(X)
RELATIONSHIP		
In households	31,010	88.8
Householder	13,063	37.4
Spouse	6,783	19.4
Child	7,849	22.5
Under 18 years	124	0.4
Non-relatives	2,822	8.1
HOUSEHOLDS BY TYPE		
Households	13,063	100.0
Family households (families)	7,879	60.3
With own children under 18 years	3,823	29.3
Married-couple family	6,791	52.0
Average household size	2.37	(X)
Average family size	2.92	(X)

[15] U.S. Census Bureau. 2010. Annual Estimates of the Resident Population of Idaho. CO-EST2009-01-16 Population Division, U.S. Census Bureau.

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

Socioeconomics

Latah County had a total of 13,838 housing units and a population density of 32.4 persons per square mile reported in the 2000 Census. Ethnicity in Latah County is distributed: white 93.9%, black or African American 0.6%, American Indian or Alaskan Native 0.6%, Asian 2.1%, two or more races 1.5%, and Hispanic or Latino 2.1%.

Specific economic data for individual communities is collected by the US Census; in Latah County this includes Moscow, Potlatch, Deary, Troy, Juliaetta, Kendrick, Bovill, Onaway, and Genesee. Latah County households earn a median income of $32,524 annually. In 2000, Deary, Troy, Juliaetta, Bovill, Onaway, and Genesee had median household incomes of $36,167, $36,250, $33,295, $36,875, and $39,821, respectively, which were all above the County median income during the same period. The communities of Moscow, Potlatch, and Kendrick had median household incomes of $26,884, $28,021, and $31,000 in 2000, which is below the Latah County median income during the same period.

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 Latah County, a significant number of families are at or below the poverty level. Approximately 7.9% of Latah County families are below poverty level.[17]

Table 3.2. Poverty Status Statistics in 1999.

	Number	Percent
Families	620	(X)
Percent below poverty level	(X)	7.9
With related children under 18 years	381	(X)
Percent below poverty level	(X)	9.8
Individuals	5,186	(X)
Percent below poverty level	(X)	16.7
18 years and over	4,451	(X)
Percent below poverty level	(X)	18.5
65 years and over	162	(X)
Percent below poverty level	(X)	5.4
Related children under 18 years	712	(X)
Percent below poverty level	(X)	10.2

The unemployment rate was 4.9% in Latah County in 1999, compared to 4.4% nationally during the same period. Approximately 5.6% of the Latah County employed population worked in natural resources with much of the indirect employment relying on the employment created through these natural resource

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

occupations. Approximately 55% of Latah County's employed persons are private wage and salary workers, while around 36.4% are government workers.[18]

Table 3.3. Occupation and Industry		
	Number	Percent
OCCUPATION		
Management, professional, and related occupations	6,807	39.5
Service occupations	2,831	16.4
Sales and office occupations	4,165	24.2
Farming, fishing, and forestry occupations	421	2.4
Construction, extraction, and maintenance occupations	1,432	8.3
Production, transportation, and material moving occupations	1,567	9.1
INDUSTRY		
Agriculture, forestry, fishing and hunting, and mining	972	5.6
Construction	807	4.7
Manufacturing	941	5.5
Wholesale trade	282	1.6
Retail trade	1,969	11.4
Transportation and warehousing, and utilities	435	2.5
Information	442	2.6
Finance, insurance, real estate, and rental and leasing	513	3.0
Professional, scientific, management, administrative, and waste management services	1,131	6.6
Educational, health and social services	6,847	39.8
Arts, entertainment, recreation, accommodation and food services	1,507	8.7
Other services (except public administration)	802	4.7
Public administration	575	3.3

Natural Resources

Latah 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 Latah 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

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

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 – Latah County is home to a diverse array of fish and wildlife species. Latah 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 Latah 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 the western portion of Latah 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 Latah 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 28% of the total area. The next most common vegetation cover type represented is foothills grassland at 12%. Mixed mesic forests represent approximately 12% of the total area as well.

Table 3.4. Vegetative Cover Types.

	Acres	Percent of Area
Agricultural Land	190,819	28%
Foothills Grassland	81,752	12%
Mixed Mesic Forest	80,584	12%
Western Red Cedar/Grand Fir Forest	54,989	8%
Warm Mesic Shrubs	42,176	6%
Douglas-fir	37,596	5%
Mixed Xeric Forest	33,271	5%
Grand Fir	31,320	5%
Ponderosa Pine	30,815	4%
Western Hemlock	18,853	3%
Douglas-fir/Grand Fir	16,934	2%
Cloud	10,910	2%
Lodgepole Pine	9,511	1%

Table 3.4. Vegetative Cover Types.		
	Acres	Percent of Area
Shrub Dominated Riparian	6,940	1%
Mixed Needleleaf/Broadleaf Forest	4,385	1%
Douglas-fir/Lodgepole Pine	4,340	1%
Western Red Cedar/Western Hemlock	3,829	1%
Needleleaf/Broadleaf Dominated Riparia	3,593	1%
Mixed Riparian (Forest and Non-Forest)	3,378	<1%
Western Larch	3,147	<1%
Needleleaf Dominated Riparian	2,792	<1%
Urban	2,584	<1%
Mixed Barren Land	2,574	<1%
Western Larch/Douglas-fir	2,393	<1%
Other cover types	8,385	~1%
Total	687,874	100%

Hydrology

Latah County is 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.[19] The Idaho Department of Water Resources has prepared General Lithologies of the Major Ground Water Flow Systems in Idaho. The majority of Latah 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.

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.[20]

[19] 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.

[20] 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.

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.[21]

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.

Development Trends

A relatively large percentage of the county is privately owned. Private parcels are becoming more and more expensive as the population grows and more property is developed. This factor combined with the highly variable topography throughout the county is expected to produce significantly higher demands on privately held land in the future.

Table 3.5. Ownership Categories.

Landowner	Acres	Percent
Private	404,682	58.7%
Forest Industry	126,701	18.4%
US Government	108,285	15.7%
State	35,577	5.2%
University	9,856	1.4%
Highway	2,100	0.3%
City	1,990	0.3%
Railroad	665	0.1%
Latah County	493	0.1%
School District	296	0.0%

Overview of Emergency Response System

Latah County has a broad base of emergency response organizations and personnel. In many cases, local police departments, fire departments, and ambulance services are the first to respond to an incident;

[21] 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.

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. .

The city of Moscow and all its emergency response organizations is dispatched by Whitcom. The remainder of Latah County is dispatched by the Latah County Sheriff's Office.

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 Latah 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.[22]

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.

[22] 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.

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
3-Sep-1960	4-Sep-1960	Lightning - Wind	0.05	-	$1,136.36	$0.00
12-Apr-1961	13-Apr-1961	Wind	0.07	-	$113.64	$0.00
23-Nov-1961	25-Nov-1961	Winter Weather	-	-	$2,500.00	$250.00
17-Dec-1961	19-Dec-1961	Winter Weather	1.00	-	$5,000.00	$0.00
6-Apr-1962	7-Apr-1962	Wind	-	-	$111.11	$0.00
19-Apr-1962	20-Apr-1962	Wind	0.39	-	$113.64	$113.64
16-Dec-1962	21-Dec-1962	Fog - Winter Weather	0.16	-	$0.00	$0.00
1-Jan-1963	31-Jan-1963	Winter Weather	0.44	-	$0.00	$0.00
14-Apr-1963	14-Apr-1963	Wind	0.04	-	$111.11	$0.00
7-Jul-1963	7-Jul-1963	Hail - Wind	-	-	$0.00	$250,000.00
1-Dec-1963	31-Dec-1963	Fog - Winter Weather	0.27	-	$111.11	$0.00
1-Jan-1964	31-Jan-1964	Wind - Winter Weather	0.22	-	$111.11	$0.00
11-Mar-1964	13-Mar-1964	Wind - Winter Weather	0.16	-	$0.00	$0.00
20-Dec-1964	24-Dec-1964	Severe Storm/Thunder Storm - Wind - Winter Weather	-	-	$111,111.11	$0.00
8-Jul-1965	8-Jul-1965	Hail - Severe Storm/Thunder Storm	-	-	$0.00	$1,136.36
26-Jul-1965	26-Jul-1965	Lightning - Wind	-	-	$111.11	$0.00
2-Aug-1965	2-Aug-1965	Hail - Severe Storm/Thunder Storm - Wind	-	-	$111.11	$111.11
12-Jul-1966	12-Jul-1966	Hail - Severe Storm/Thunder Storm - Wind	-	-	$0.00	$5,000.00
25-Aug-1966	26-Aug-1966	Wind	-	-	$111.11	$111.11
26-Aug-1967	26-Aug-1967	Wildfire	-	-	$2,255,454.54	$0.00
19-Jul-1968	20-Jul-1968	Wind	-	-	$1,136.36	$113.64
10-Aug-1968	23-Aug-1968	Severe Storm/Thunder Storm	-	-	$0.00	$11,363.64
6-Jan-1969	7-Jan-1969	Winter Weather	-	-	$11,627.91	$0.00
26-Jan-1969	26-Jan-1969	Winter Weather	-	-	$11,627.91	$0.00
22-Mar-1969	23-Mar-1969	Wind	-	-	$111.11	$0.00
17-Jan-1970	18-Jan-1970	Severe Storm/Thunder Storm - Winter Weather	-	-	$25,000.00	$0.00

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
24-Jan-1970	24-Jan-1970	Severe Storm/Thunder Storm	-	-	$5,000.00	$0.00
16-Jul-1970	16-Jul-1970	Hail - Lightning - Wind	-	-	$277.78	$27,777.78
4-Dec-1970	5-Dec-1970	Winter Weather	-	-	$50.00	$0.00
21-Jan-1971	21-Jan-1971	Wind	-	-	$1,000.00	$0.00
9-Apr-1971	9-Apr-1971	Wind	-	-	$250.00	$0.00
2-Aug-1971	2-Aug-1971	Severe Storm/Thunder Storm	-	-	$50.00	$5.00
3-Aug-1971	3-Aug-1971	Severe Storm/Thunder Storm	-	-	$5,000.00	$0.00
27-Oct-1971	27-Oct-1971	Winter Weather	0.07	-	$17.86	$0.00
8-Dec-1971	9-Dec-1971	Winter Weather	-	-	$50.00	$0.00
9-Jan-1972	12-Jan-1972	Wind - Winter Weather	0.07	-	$113,636.36	$0.00
23-Jan-1972	23-Jan-1972	Wind - Winter Weather	2.00	0.05	$227.27	$0.00
29-Feb-1972	29-Feb-1972	Wind	-	-	$555.56	$0.00
6-Jul-1972	6-Jul-1972	Lightning	-	-	$500.00	$0.00
18-Jul-1972	18-Jul-1972	Lightning - Wind	-	-	$555.56	$0.00
9-Aug-1972	9-Aug-1972	Lightning - Wind	-	-	$166.67	$0.00
14-Aug-1972	15-Aug-1972	Severe Storm/Thunder Storm - Wind	-	-	$555.56	$0.00
6-Dec-1972	8-Dec-1972	Winter Weather	-	-	$111.11	$0.00
3-Jan-1973	3-Jan-1973	Winter Weather	-	-	$250.00	$0.00
2-May-1973	2-May-1973	Tornado	-	-	$500.00	$0.00
22-Jun-1973	23-Jun-1973	Lightning - Wind	-	-	$161.29	$0.00
13-Aug-1973	25-Aug-1973	Lightning - Wind	-	-	$0.00	$111.11
1-Nov-1973	30-Nov-1973	Severe Storm/Thunder Storm - Wind - Winter Weather	0.02	-	$111.11	$0.00
14-Jan-1974	18-Jan-1974	Severe Storm/Thunder Storm - Wind	-	-	$3,571,428.57	$0.00
29-Sep-1974	29-Sep-1974	Wind	0.13	-	$625.00	$0.00
7-Jan-1975	10-Jan-1975	Severe Storm/Thunder Storm - Winter Weather	-	0.02	$1,136.36	$0.00
4-Feb-1975	6-Feb-1975	Wind - Winter Weather	-	-	$111.11	$0.00

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
9-Feb-1975	13-Feb-1975	Winter Weather	-	-	$113.64	$0.00
2-Jun-1975	2-Jun-1975	Hail - Lightning - Severe Storm/Thunder Storm - Wind	-	-	$111.11	$11.11
23-Jun-1975	23-Jun-1975	Hail - Lightning - Severe Storm/Thunder Storm - Wind	-	-	$111.11	$11.11
6-Jul-1975	6-Jul-1975	Lightning - Wind	0.07	-	$357.14	$0.00
14-Jul-1975	14-Jul-1975	Hail - Lightning - Severe Storm/Thunder Storm - Wind	1.00	-	$11.36	$113.64
10-Nov-1975	10-Nov-1975	Wind - Winter Weather	-	-	$1,136.36	$0.00
26-Nov-1975	27-Nov-1975	Winter Weather	-	-	$11.36	$0.00
30-Nov-1975	30-Nov-1975	Winter Weather	-	-	$113.64	$0.00
16-Feb-1976	17-Feb-1976	Wind - Winter Weather	-	-	$1,136.36	$0.00
10-May-1976	10-May-1976	Lightning - Severe Storm/Thunder Storm - Wind	-	-	$7,142.86	$0.00
2-Aug-1976	2-Aug-1976	Flooding - Hail - Lightning - Wind	-	-	$2,500.00	$250,000.00
3-Aug-1976	3-Aug-1976	Hail - Severe Storm/Thunder Storm - Wind	-	-	$125.00	$12,500.00
15-Jul-1978	15-Jul-1978	Hail - Lightning - Severe Storm/Thunder Storm - Wind	-	-	$16,666.67	$16,666.67
12-Aug-1978	31-Aug-1978	Severe Storm/Thunder Storm	-	-	$0.00	$62,500.00
1-Jan-1979	31-Jan-1979	Winter Weather	-	-	$11,363.60	$0.00
1-Feb-1979	13-Feb-1979	Winter Weather	-	-	$1,136.36	$0.00
30-May-1981	30-May-1981	Flooding	-	-	$50,000.00	$5,000.00
23-Jan-1982	23-Jan-1982	Wind - Winter Weather	-	-	$25,000.00	$0.00
25-Jul-1984	25-Jul-1984	Hail - Severe Storm/Thunder Storm - Wind	-	-	$2,500.00	$250,000.00
29-Jul-1984	29-Jul-1984	Hail - Severe Storm/Thunder Storm - Wind	-	-	$5,000.00	$50,000.00
23-Apr-1985	23-Apr-1985	Wind	-	-	$7,142.86	$0.00
30-Apr-1987	30-Apr-1987	Flooding - Hail	-	-	$50,000.00	$500,000.00
14-Jun-1987	14-Jun-1987	Lightning	-	-	$3,846.15	$384.62
9-Dec-1987	9-Dec-1987	Wind	-	-	$7,142.86	$0.00

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
20-Dec-1987	21-Dec-1987	Winter Weather	-	-	$7,142.86	$0.00
22-Dec-1987	22-Dec-1987	Winter Weather	0.61	-	$1,136.36	$0.00
1-Aug-1988	31-Aug-1988	Drought	-	-	$0.00	$11,363.64
12-Aug-1988	12-Aug-1988	Lightning	-	-	$29,411.76	$0.00
1-Oct-1988	31-Oct-1988	Drought	-	-	$11,363.64	$11,363.64
30-Dec-1988	30-Dec-1988	Winter Weather	-	-	$7,142.86	$0.00
30-Dec-1988	30-Dec-1988	Severe Storm/Thunder Storm - Winter Weather	-	-	$2,380.95	$0.00
31-Jan-1989	31-Jan-1989	Winter Weather	0.29	-	$71,428.57	$7,142.86
2-Mar-1989	2-Mar-1989	Flooding	-	-	$7,142.86	$0.00
16-Jul-1989	16-Jul-1989	Lightning	-	-	$0.00	$50,000.00
8-Jan-1990	8-Jan-1990	Wind	0.03	1.00	$16,129.00	$0.00
4-Dec-1990	4-Dec-1990	Wind	0.13	-	$6,250.00	$0.00
18-Dec-1990	31-Dec-1990	Winter Weather	0.68	0.02	$11,363.64	$113,636.36
18-Dec-1990	19-Dec-1990	Winter Weather	-	-	$6,250.00	$0.00
30-Dec-1990	31-Dec-1990	Winter Weather	-	-	$2,500.00	$0.00
28-Feb-1991	28-Feb-1991	Winter Weather	0.29	-	$7,142.86	$0.00
3-Mar-1991	3-Mar-1991	Wind	-	-	$1,136.36	$0.00
16-Oct-1991	16-Oct-1991	Wind	1.14	0.14	$71,428.57	$7,142.86
26-Oct-1991	26-Oct-1991	Winter Weather	-	-	$5,000.00	$50,000.00
9-Apr-1992	9-Apr-1992	Wind	-	-	$1,724.14	$0.00
17-Apr-1992	17-Apr-1992	Wind	-	-	$11,363.64	$11,363.64
1-Jun-1992	30-Jun-1992	Drought	-	-	$0.00	$1,136,363.64
1-Jul-1992	31-Jul-1992	Drought	-	-	$0.00	$1,136,363.64
1-Aug-1992	31-Aug-1992	Drought	-	-	$0.00	$1,136,363.64
11-Aug-1992	15-Aug-1992	Lightning	-	-	$1,136.36	$113.64
20-Aug-1992	20-Aug-1992	Heat - Wind	-	-	$26,315.79	$26,315.79
21-Aug-1992	21-Aug-1992	Winter Weather	-	-	$5,555.56	$55,555.56

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
24-Aug-1992	26-Aug-1992	Winter Weather	-	-	$138.89	$13,888.89
1-Sep-1992	30-Sep-1992	Drought	-	-	$0.00	$1,136,363.64
1-Oct-1992	31-Oct-1992	Drought	-	-	$113,636.36	$1,136,363.64
1-Jan-1993	15-Mar-1993	Winter Weather	-	-	$0.00	$7,142.85
2-Jun-1993	2-Jun-1993	Landslide	-	2.00	$5,000.00	$0.00
1-Sep-1993	30-Sep-1993	Winter Weather	-	-	$0.00	$11,363.64
12-Nov-1993	12-Nov-1993	Wind	-	-	$12,500.00	$0.00
1-Nov-1994	1-Nov-1994	Wind	0.10	-	$5,000.00	$0.00
1-Dec-1994	1-Dec-1994	Severe Storm/Thunder Storm - Winter Weather	-	-	$1,136.36	$0.00
5-Dec-1994	5-Dec-1994	Winter Weather	-	-	$7,142.86	$0.00
15-Apr-1995	15-Apr-1995	Winter Weather	-	-	$0.00	$100,000.00
23-Jan-1996	23-Jan-1996	Winter Weather	-	-	$3,600.00	$0.00
8-Feb-1996	8-Feb-1996	Flooding	0.17	-	$0.00	$0.00
24-Apr-1996	26-Apr-1996	Flooding	-	-	$16,666.67	$0.00
16-Nov-1996	16-Nov-1996	Winter Weather	-	-	$857,142.86	$0.00
1-May-1997	31-May-1997	Flooding	-	-	$571,428.57	$0.00
1-Jun-1997	15-Jun-1997	Flooding	-	-	$666,666.67	$0.00
4-Mar-1998	5-Mar-1998	Winter Weather	-	-	$3,571.43	$0.00
9-Jul-1998	9-Jul-1998	Severe Storm/Thunder Storm - Wind	-	-	$45,000.00	$0.00
10-Jul-1998	10-Jul-1998	Hail - Severe Storm/Thunder Storm - Wind	-	-	$10,000.00	$5,000,000.00
27-Dec-1998	29-Dec-1998	Flooding	-	-	$5,000.00	$0.00
2-Feb-1999	2-Feb-1999	Wind	-	-	$600,000.00	$0.00
24-Feb-1999	25-Feb-1999	Flooding	-	-	$1,000,000.00	$0.00
25-Sep-1999	25-Sep-1999	Wind	-	-	$10,000.00	$0.00
9-Jan-2000	9-Jan-2000	Wind	-	-	$8,000.00	$0.00
16-Jan-2000	16-Jan-2000	Severe Storm/Thunder Storm - Wind	-	-	$30,000.00	$0.00
2-Feb-2000	3-Feb-2000	Flooding	-	-	$15,000.00	$0.00

Table 3.6. SHELDUS Database For Latah County, Idaho.

Start Date	End Date	Hazard Type	Injuries Reported	Fatalities Reported	Reported Property Damage	Reported Crop Damage
15-Dec-2000	15-Dec-2000	Wind	-	-	$7,500.00	$0.00
13-Mar-2001	13-Mar-2001	Wind	-	-	$2,333.33	$0.00
1-Dec-2001	1-Dec-2001	Winter Weather	-	-	$16,666.67	$0.00
31-Jan-2003	31-Jan-2003	Severe Storm/Thunder Storm	-	-	$50,000.00	$0.00
6-May-2005	6-May-2005	Flooding	-	-	$1,000,000.00	$0.00
15-Jan-2006	20-Jan-2006	Landslide	-	-	$7,500.00	$0.00
8-Mar-2006	8-Mar-2006	Wind	-	-	$1,000.00	$0.00
18-May-2006	18-May-2006	Severe Storm/Thunder Storm - Wind	-	-	$400.00	$0.00
14-Dec-2006	15-Dec-2006	Wind	0.43	-	$68,000.00	$0.00
6-Jan-2007	6-Jan-2007	Wind	-	-	$250.00	$0.00
11-Jan-2008	11-Jan-2008	Winter Weather	0.50	-	$0.00	$0.00
18-Aug-2008	18-Aug-2008	Severe Storm/Thunder Storm - Wind	-	-	$1,000.00	$0.00

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Chapter 4

Hazard Risk Assessment

IN THIS SECTION:

- Flood Annex
- Landslide Annex
- Severe Weather Annex
- Wildland Fire Annex
- Extended Power Outages Annex

Chapter 4 – Hazard Risk Assessment

Latah County Risk Assessments

Flood

Floods have been a serious and costly natural hazard affecting Latah 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.[23]

[23] 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."*[24]

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. Latah 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 Latah 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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[24] 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.[25]

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.

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

[25] 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 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.[26]

The magnitude of most floods in Latah 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 Latah County, based on the variety of natural processes that cause floods:

- Heavy rainfall on wet or frozen ground, before a snow pack has accumulated, typically cause fall and early winter floods

[26] 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.

- Rainfall combined with melting of the low elevation snow pack typically cause winter and early spring floods
- Late spring floods in Latah County result primarily from melting of the snow pack

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 Latah County. The steep walls of the Potlatch River drainage pose special problems to Highway 3 and 99 the major intercommunity travel route to Kendrick and Juliaetta. 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.

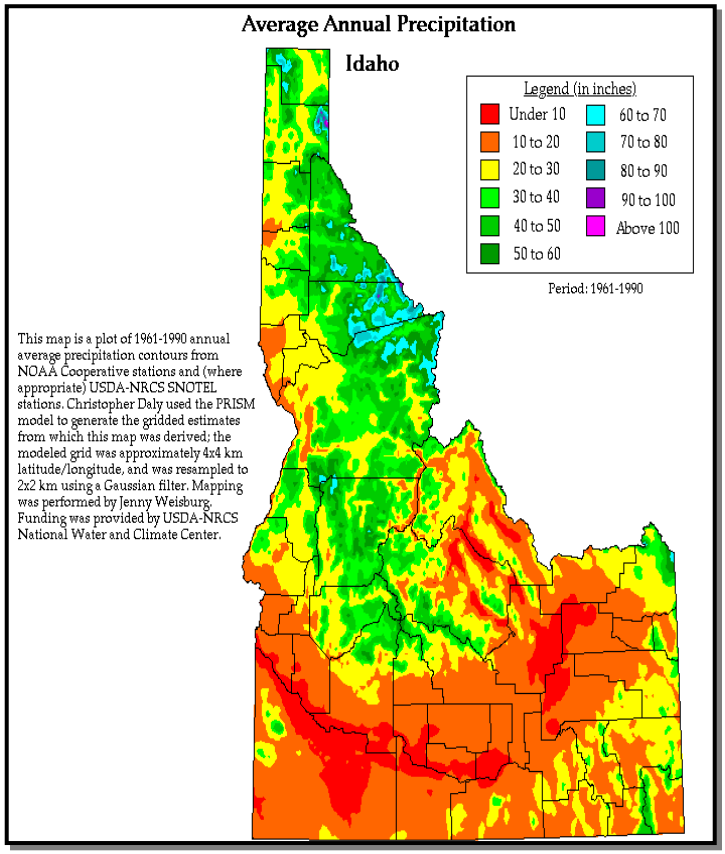
The pattern of average annual temperatures for the State indicates the effect both of latitude and altitude. The highest annual averages are found in the lower elevations of the Clearwater and Little Salmon River Basins, and in the stretch of the Snake River Valley from the vicinity of Bliss downstream 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 Latah 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.[27]

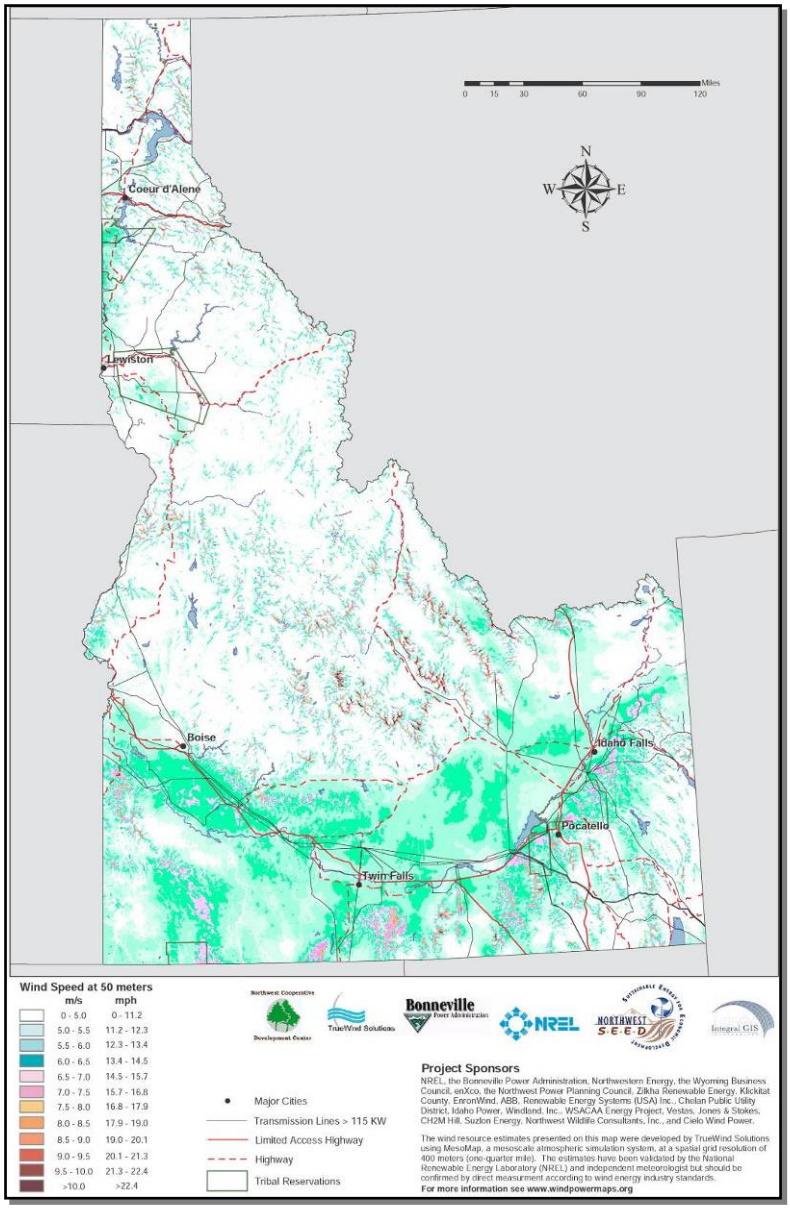


Snowfall distribution is affected both by availability of moisture and by elevation. Annual snowfall totals in Shoshone County have reached nearly 500 inches. The greatest long-term (1942-56) seasonal average was 182 inches at Mullan Pass, while the greatest snow depth (also 182 inches) was recorded 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.

Figure 4.3. Idaho Average Wind Speed Map.[28]

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



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 Latah 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 Latah County:

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

Table 4.1. Weather and Climate for Latah County, Idaho.			
Temperature		Degrees	Month
	Lowest Average Daily Minimum Temperature	22	January
	Highest Average Daily Maximum Temperature	84.3	July
	Hottest Month		July
	Coldest Month		January
Precipitation	Average Annual Total Precipitation	24 inches	
	Average Annual Snowfall	43 inches	
Humidity	Average July Afternoon Humidity	20 %	
	Average January Afternoon Humidity	69%	
Elevation	1,583Feet (Moscow)		
	1,230Feet (Kendrick)		

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 Latah 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.[29]

[29] 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.

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.[30]

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.[31]

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

[31] 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.

Wildland Fire

The original Latah County Wildfire Mitigation Plan was completed and adopted in June of 2005 with a subsequent update, the Latah County Wildland Urban Interface Wildfire Mitigation Plan Update Addendum, being adopted in August of 2007. As part of this planning process, a complete 5-year update was also conducted for the Wildland Urban Interface Wildfire Mitigation Plan. This chapter is an adaptation of the more comprehensive 2011 Latah County Wildfire Protection 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

Latah 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.

Historic Fire Regime

Historical variability in fire regime is a conservative indicator of ecosystem sustainability, and thus, understanding the natural role of fire in ecosystems is necessary for proper fire management. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes, the fire return interval

(frequency) and fire severity prior to settlement by Euro-Americans, to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Historical fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

Table 4.2. Historic Fire Regimes in Latah County.

Historic Fire Regime	Description	Acres	Percent of Area
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	75,712	11%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	95,517	14%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	439,674	64%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	66,554	10%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	3,162	0%
Water	Water	126	0%
Barren	Barren	836	0%
Sparsely Vegetated	Sparsely Vegetated	0	0%
Indeterminate Fire Regime Characteristics	Indeterminate Fire Regime Characteristics	7,065	1%

The table above shows the amount of acreage in each defined fire regime in Latah County. The historic fire regime model in Latah County shows that much of the forested areas in the central and eastern regions of the County historically had an approximate 35-200 year fire return interval and typically experienced low and mixed severity fires. In contrast, much of western Latah County, which is primarily agricultural fields or rangeland, historically experienced much more frequent fires (less than 35 year intervals) and were stand replacing fires. Much of the canyonlands north of Juliaetta and Kendrick as well as areas near Potlatch also experienced mostly stand replacing fires; however, the return interval was slightly longer at 35 to 200 years.

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.[32, 33] Coarse scale definitions for historic fire regimes have been developed by Hardy et al[34] and Schmidt et al[35] 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. [36] 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.[37,38] 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 Latah County shows that a significant portion of the county that is not in agriculture is moderately departed (47%) 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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[32] Agee, J. K. Fire Ecology of the Pacific Northwest forests. Oregon: Island Press. 1993.

[33] 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.

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

[35] 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.

[36] 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.

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

[38] 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 4.3. Fire Regime Condition Classes in Latah County.		
Condition Class	Acres	Percent of Area
Fire Regime Condition Class I	67,396	10%
Fire Regime Condition Class II	322,560	47%
Fire Regime Condition Class III	40,664	6%
Water	126	0%
Urban	16,366	2%
Barren	836	0%
Sparsely Vegetated	0	0%
Agriculture	240,699	35%

Most of the forestlands in Latah County are in Condition Class II likely due to aggressive fire suppression activities since the early 1900s. Much of the Moscow Mountain area, particularly on the northern side, is considered a Condition Class I. This area is primarily owned by industrial forestland owners or the University of Idaho. Active forest management by these owners has effectively mimicked historic wildfire cycles and kept these forests in a more natural condition.

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, and local agencies and private individuals.[39] "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 Tribal, state, and local governments".[40] The role of the federal agencies in Latah County is and will be much more limited. Property owners share a responsibility to protect their residences and businesses and minimize danger by creating defensible areas around them and taking other measures to minimize the risks to their structures.[41] With treatment, a

[39] 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.

[40] 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

[41] 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

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. [42]

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;[43]
- 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.

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[42] 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.

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

- **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 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.

Latah 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. This existing structure layer was updated in 2010 using 2009 NAIP imagery for Latah County. The resulting output identified the extent and level of population density throughout the county. Based on committee review and discussion, the output was adjusted to include areas of significant infrastructure and to incorporate gaps along important transportation routes. The updated and revised population density model output was adopted as the WUI for Latah County, Idaho.

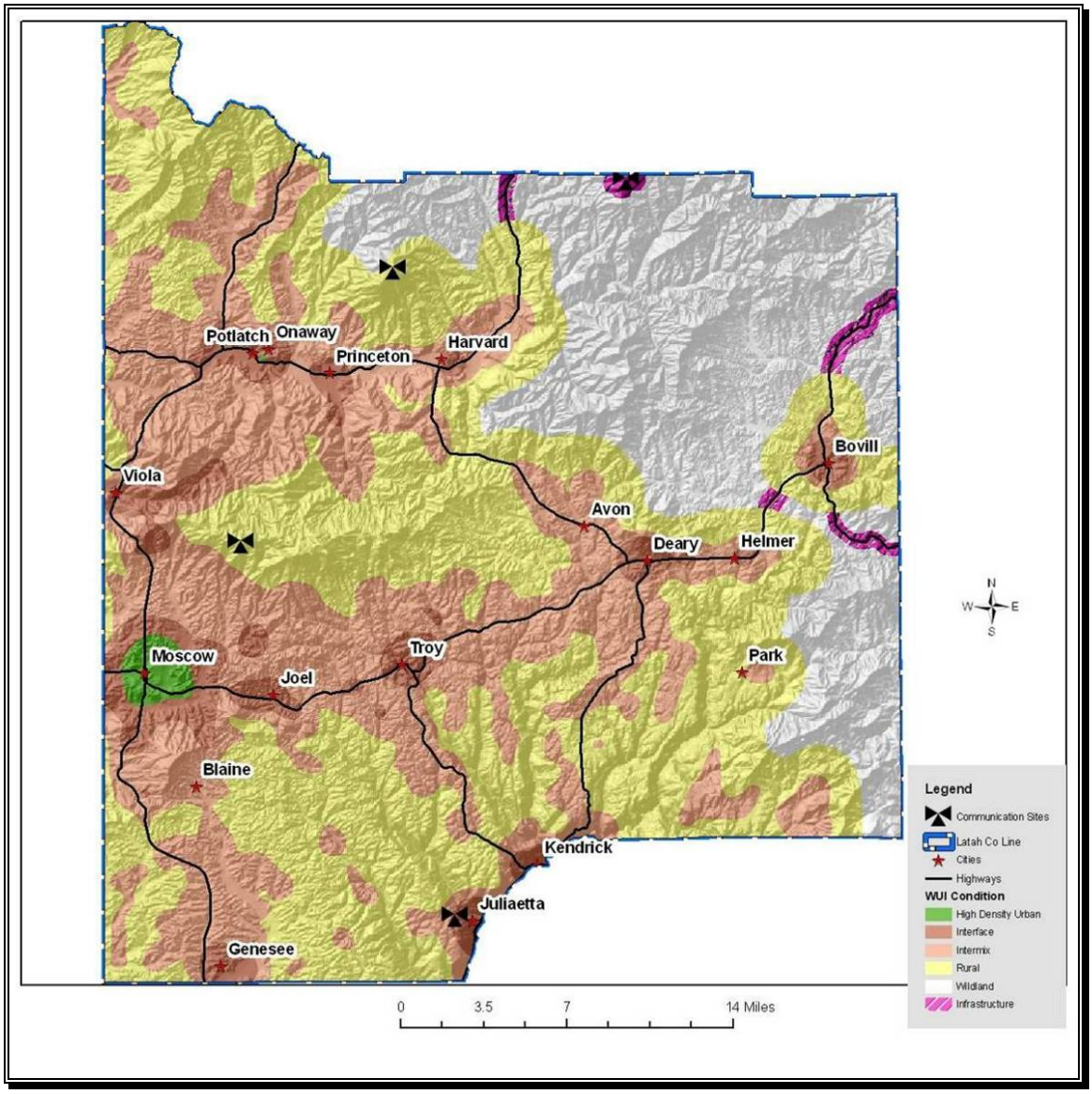
By evaluating structure density in this way, WUI areas can be identified on maps by using mathematical formulae and population density indexes. The resulting population density indexes create concentric circles showing high density areas, interface, and intermix condition WUI, as well as rural condition 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 Community Wildfire Protection 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 Latah County Community Wildfire Protection Plan 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 4.4 Wildland Urban Interface in Latah County, Idaho.

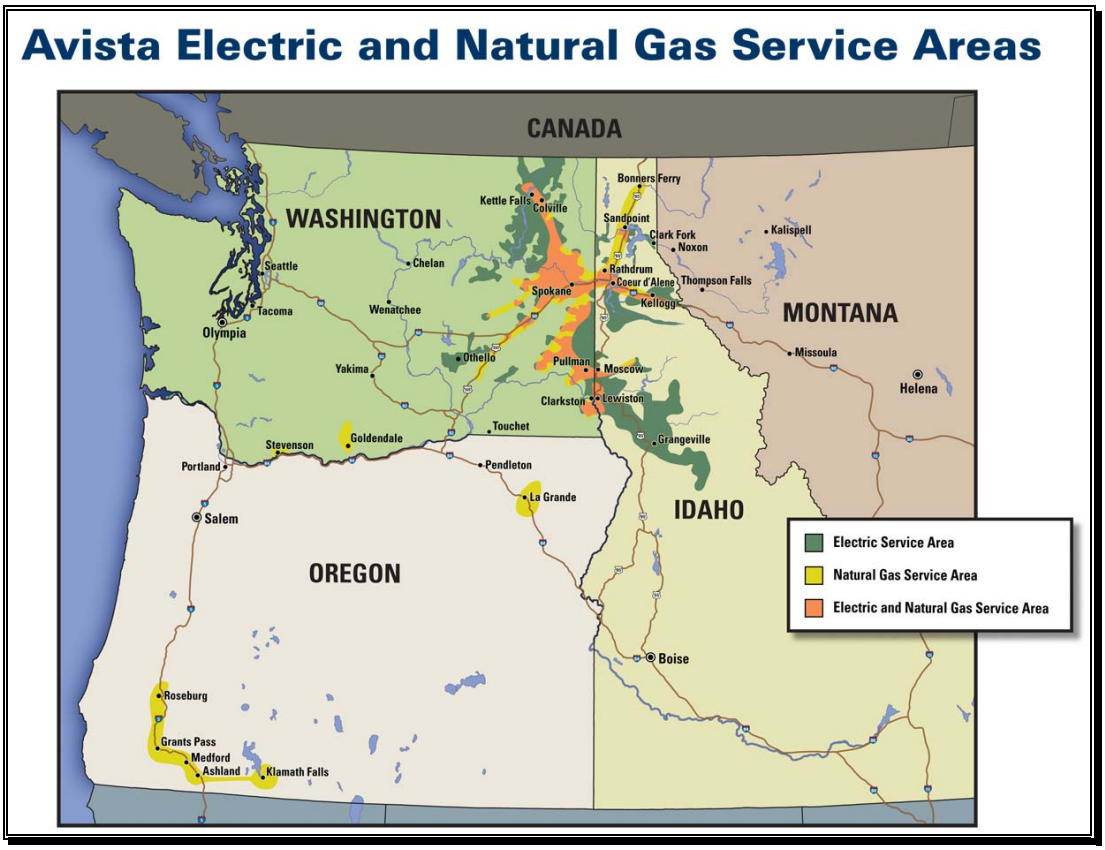


**An additional communications tower is located just outside the eastern border of Latah County near Elk River. This site completes the network of towers used by emergency services.*

Extended Power Outages

Power is supplied to the residents and businesses within Latah County by Avista Utilities and Clearwater Power Company. These companies have had a strong presence in the Inland Northwest for a number of years and as such, have developed an extensive power grid network that traverses throughout the region. Avista Utilities provides electricity to more than 340,000 customers in four western states (Oregon, Washington, Idaho, and Montana). Clearwater Power Company currently services eleven counties in three states (Oregon, Washington, and Idaho).

Figure 4.5. Avista Utilities Service Area.

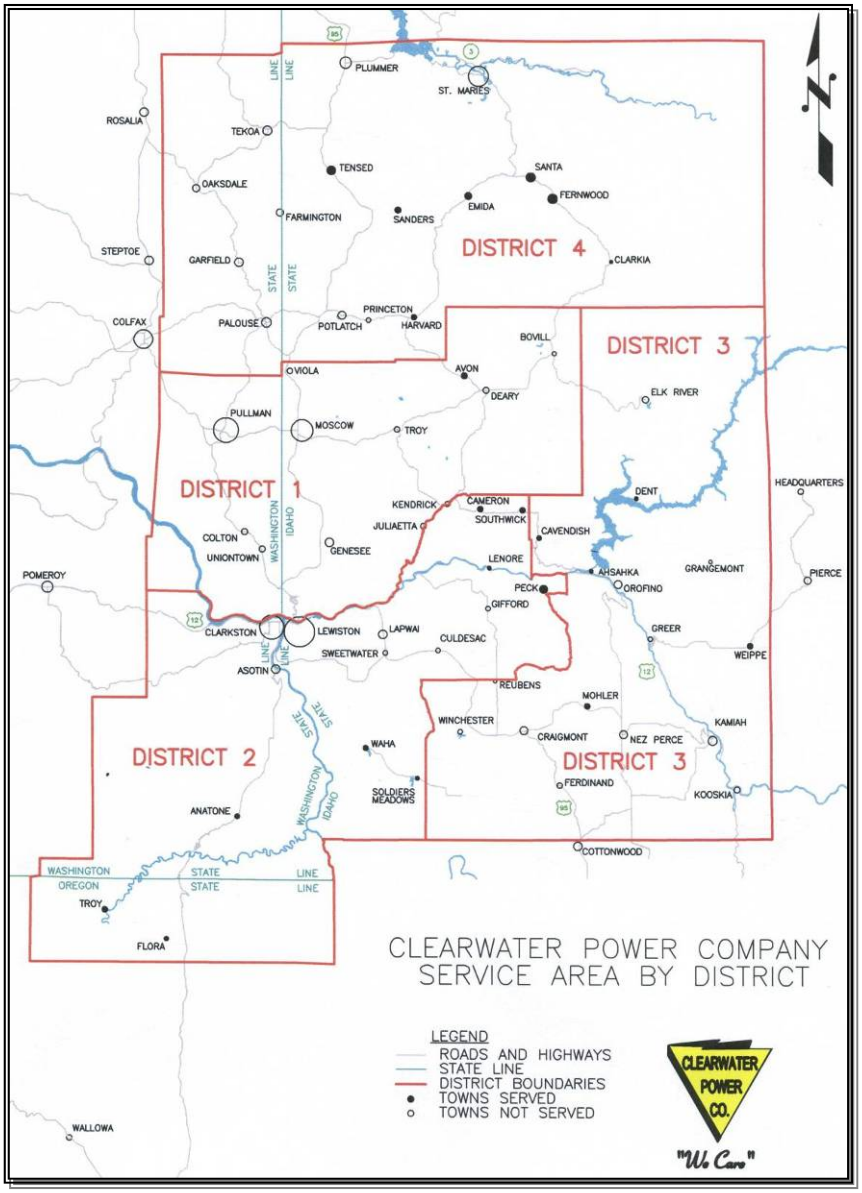


Power outages can be a serious and costly occurrence. Extended power outages can result in a collapse of community infrastructure and services. Traffic lights go off, telephone landlines quit working, gas pumps stop operating, businesses and schools close. Essential community functions such as hospitals, police and fire departments, airports, and critical care facilities should all be equipped with backup power generators to maintain their necessary functions. The length of time these essential services can stay operational is dependant upon how extensively they prepared for a disaster such as a power outage.

An understanding of the primary causes of power failure is essential when preparing for power outages. In many instances, a basic understanding regarding the reason power outages occur can help focus planning efforts to minimize the effects power outages can have on a region.

Power outages can occur for a variety of reasons, but weather events, objects falling on power lines, catastrophic failure of power grid components, and grid overload (too much demand at one time) are the most common. Most power outages in Latah County typically result from weather related damage and/or from foreign objects falling onto power lines and power poles.

Figure 4.6. Clearwater Power Company Service Area.



Strong winds, freezing rain, and heavy snow are typical of significant weather events that commonly result in a loss of power. Strong winds can topple power lines and poles and blow limbs off of trees onto power lines. Freezing rain and heavy snow can accumulate on power lines and overwhelm the tension strength a power line is capable of supporting. When this occurs power lines collapse and fall to the ground creating power outages and a potential electrical hazard on the ground.

Objects adjacent to power lines that have the ability to fall onto the power lines are potential hazards. The most common of these are typically trees and tree limbs but can also include street lights, signs, and low flying aircraft. When objects such as these fall onto power lines they often trap the line under them on the ground. This creates an additional hazard as the power line may electrically charge the downed object creating another hazard when trying to remove the obstruction.

Catastrophic failure of power grid components includes all aspects of the power system such as underground high voltage feeder lines, shorts on power poles, malfunctioning substations, transformer failures, and conductor failure. In addition, power companies routinely shut off power for maintenance and repairs. When this occurs it is the responsibility of the power company to notify the affected area beforehand to ensure that proper precautions can be taken within the service area.

Grid overload can reduce the amount of available power to a service area. Typically this occurs during peak demand times such as during evenings when the majority of customers are at home and using power, and during cold weather periods when there is an increased demand for electricity used for home heating.

Rolling blackouts, an intentionally-engineered power outage, can occur if a higher than normal demand for power continues for a prolonged period of time. These blackouts are typically a last resort measure used by an electric utility company in order to avoid a total blackout of the power system and are usually in response to a situation where the demand for electricity exceeds the supply capability of the power network. These rolling blackouts may be localized to a specific part of the electricity network or may be more widespread and affect entire regions or countries. Rolling blackouts generally result from two causes: insufficient generation capacity or inadequate transmission infrastructure to deliver sufficient power where it is needed.

There is no way to prevent all power outages from occurring. The power infrastructure of Latah County will always be prone to some level of power outages brought on by unforeseeable events. There are; however, mitigation actions that can be accomplished to help prevent outages in the first place as well as reduce the impacts when they do occur. For example, the juxtaposition between trees and power lines should be monitored with standards closely adhered to as identified by the power company. In areas where trees or tree branches have encroached upon a power lines' right-of-way, a certified arborist or related professional should be used to reduce encroachment and eliminate the potential of it falling on the line. Routine inspections conducted by the power companies on its infrastructure should report any potential problems or hazards found to the County. This will allow the County to communicate with the residents should further action be necessary. Finally, a map of the power infrastructure within Latah County should be readily accessible to the public and other pertinent members of the community.

Critical community institutions and offices such as hospitals, care facilities, police and fire departments, airports, and community utility services should all be capable of maintaining a "ready state" during times of power outages.

At the county level, a focus towards public education regarding power outages should be made a priority. When extended periods of times pass between major power outages, both emergency response units and the public tend to forget to review plans and take necessary precautions

Requiring building permits and compliance with building codes is a good foundation for avoiding damage to a community's electrical infrastructure. Builders, future homeowners, and power companies should coordinate with one another so that all parties can be made aware of the potential risk of building near electrical infrastructure. Periodic publication of the highlights of these building codes can help to keep up public awareness.

Chapter 5

Jurisdictional Vulnerability Assessment

IN THIS SECTION:

- Latah County Annex
  - City of Moscow Annex
  - City of Deary Annex
  - City of Juliaetta Annex
  - City of Potlatch Annex
  - City of Bovill Annex
  - City of Genesee Annex
  - City of Kendrick Annex
  - City of Onaway Annex
  - City of Troy Annex
  - North Latah Highway District Annex
  - South Latah Highway District Annex

Chapter 5 – Jurisdictional Vulnerability Assessment

Latah County Annex

The Flood Mitigation Plan contained within this Multi – Hazard Mitigation Plan fulfills the requirements of a Flood Mitigation Plan as specified in 44 CFR 78.5 of the Federal Register describing the Flood Mitigation Assistance program. The purpose of this section is to prescribe actions, procedures, and requirements for administration of the Flood Mitigation Assistance (FMA) program, authorized by Sections 1366 and 1367 of the National Flood Insurance Act of 1968, 42 U.S.C. 4104c and 4104d. The goal of FMA is to assist state and local governments in funding cost-effective actions that reduce or eliminate the long term risk of flood damage to buildings, manufactured homes, and other insurable structures.

Flood

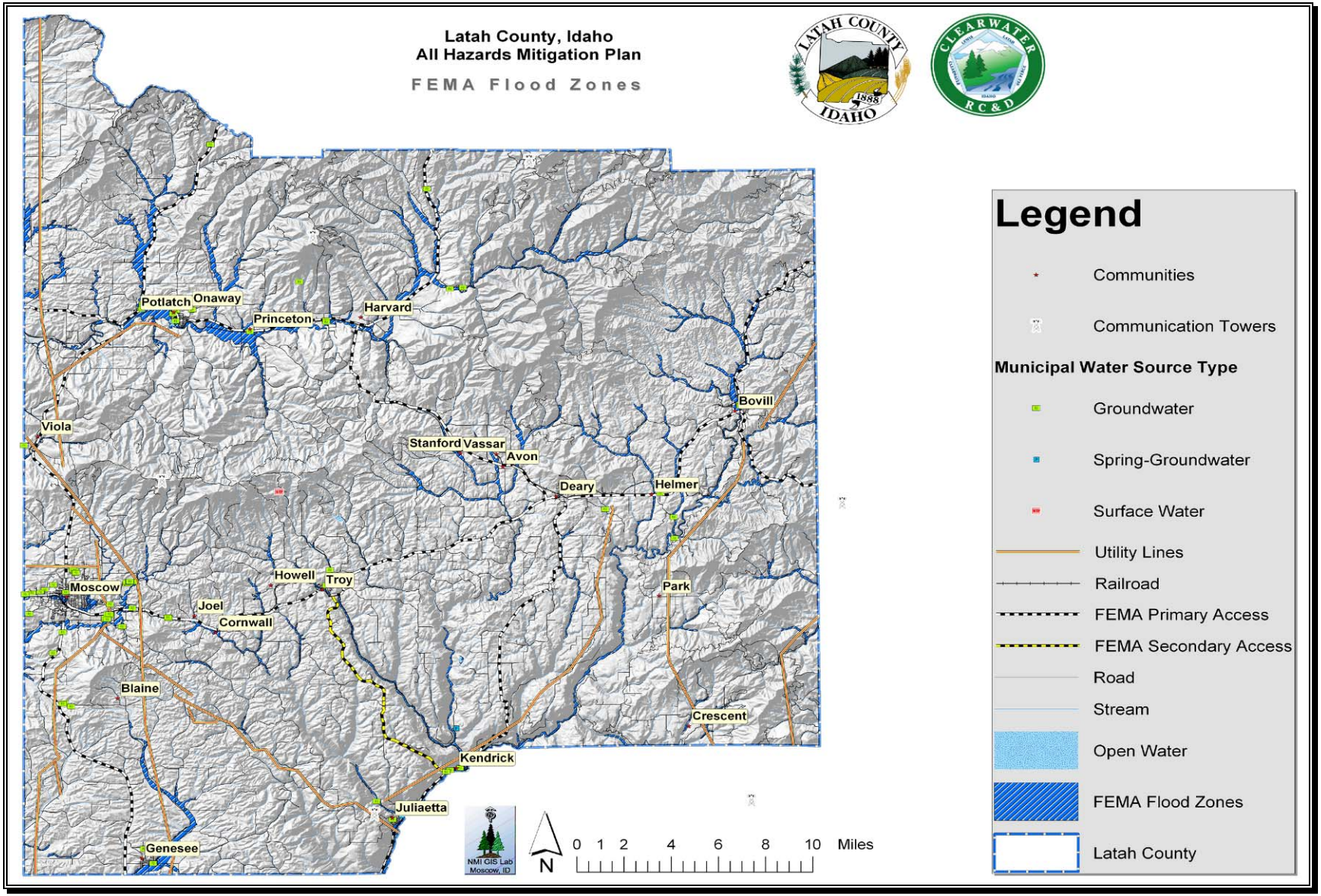
All three types of flood events occur in Latah County. Riverine flooding occurs along all tributaries of the Potlatch and Palouse Rivers. The mountainous terrain of the Palouse creates a flood-prone environment. Rain-on-snow events can and do occur at almost all elevations across the county. These events often contain enough moisture to cause flooding on the Potlatch and the Palouse Rivers 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 Palouse is a diverse combination of moderate to steep sloped forests, rolling grain fields, river gorges and canyons. When rain-on-snow events occur in this area, the run off tends to come off the entire watershed at the same time, quickly filling all channels that flowing from the area.

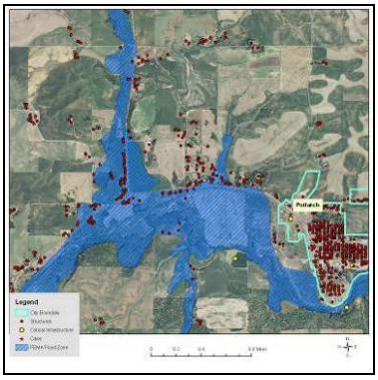
Summer thunderstorms can result in flash flooding of specific smaller drainages. Often there is little time to react to the quickly rising waters. Due to the nature of the terrain within the Palouse, localized flooding from thunderstorms tends to be more of a storm drainage problem for many communities. Short term blockage of roads is usually the biggest impact as drainage structures are overwhelmed by the amount of water.

Ice/debris flows occur as part of riverine and flash flooding, usually exacerbating the effects of those types of flood events. In a case of a fire or other major disturbance, flash flooding can result from the loss of vegetation that usually intercepts some of the waters' velocity as it flows downhill. In extreme cases, this can also lead to debris flows as the ground is saturated and soil and other materials is eroded and transported.

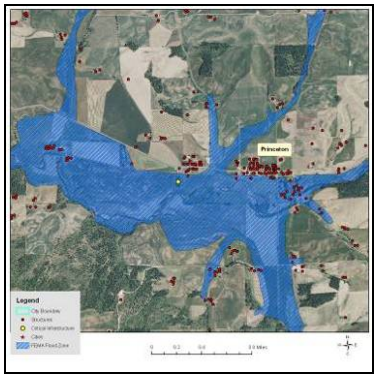
Figure 5.1. Latah County FEMA Floodplains.



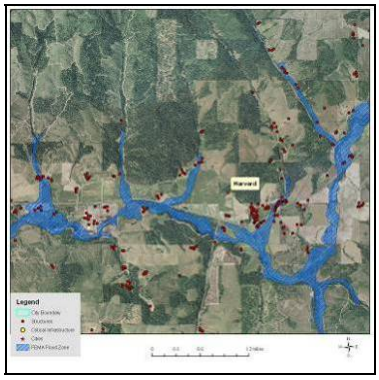
Most of the structures in the FEMA-identified floodplain for unincorporated areas of Latah County are located along the Palouse River near Harvard/Princeton and Potlatch, along 4 Mile Creek at Viola, and in the Joel area from the headwaters of Middle Potlatch Creek. The Palouse River and Potlatch River drainages are collector watersheds for numerous small tributaries originating in the Sand Mountain, Baby Grand Mountain, and Abes Knob areas of the Clearwater Mountains. Some of these tributaries contributing to the floodplain include Meadow Creek, Hatter Creek, Gold Creek, Deep Creek, Moose Creek, East Fork Potlatch River, and West Fork 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.



Palouse River and Deep Creek floodplain west of Potlatch



Palouse River floodplain at Princeton



Palouse River floodplain at Harvard

4 Mile Creek floodplain at Viola

Middle Potlatch Creek floodplain near Joel

In September 2010, Latah County and the US Army Corps of Engineers conducted a Continuing Eligibility Inspection of the Potlatch Junction (Deep Creek) levee. The purpose of the inspection was to ensure the levee continues to meet the requirements of the Corps' rehabilitation assistance should it become damaged as a result of a flood. The inspection resulted in the levee being rated as "Minimally Acceptable" due to a significant amount of vegetation possibly concealing warning signs of degradation or levee failure. Additionally, the report cited the need to maintain encroachments, improve access to the levee for maintenance and flood fighting purposes, address animal damages, revamp rip rap in some areas, maintain

outfall of the culvert next to Highway 95, and develop a site-specific plan for flood fighting activities near authorized encroachments.

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 Latah County. Debris jams during high water events have caused considerable flood damage to adjacent properties.

Latah County has experienced a long history of high magnitude floods since first recorded in 1897, typically by "50 and 100-year" levels. The diverse landscape and weather patterns within Latah 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 spring and late winter. The combination of the above two events are devastating and can cause extraordinary flooding events. In Latah County, flood-related State disasters were declared in 1994, 1996 (x2), and 1997. According to the State of Idaho Hazard Mitigation Plan, Latah County has a high probability of experiencing floods as well as a high potential impact.

January thru February 1996 - The third week of January 1996 brought large amounts of low elevation snow, especially in the Idaho Panhandle where weather stations measured an additional 10 inches of snow to the existing snow pack. By the end of January, sites in the north had as much as 2-1/2 feet of snow on the ground. During the last week of January temperatures dropped into the single digits for highs and below zero for lows. This caused ice to form on many of the rivers where low temperatures were in the 20 to 30 degree below zero range. On February 6, a warning was issued indicating that temperatures were warming up, that snow was becoming wet and dense, and that although the mainstream rivers were not showing a response, there was still a good potential for flooding. By the 7th, the Boise National Weather Service began receiving reports of small stream flooding in the area east of Lewiston including small tributaries to the Clearwater River. Preliminary assessments indicated the most severe impacts were to infrastructure and housing, with approximately 708 family dwelling units affected. Damage to public property, not counting federal highways, was estimated at approximately $12.9 million. A Major Disaster declaration for Benewah, Bonner, Boundary, Clearwater, Kootenai, Latah, Lewis, Nez Perce, and Shoshone Counties was signed by Governor Batt on February 10, 1996 and by President Clinton the following day.

February 1996 Flooding in Kendrick

December 1996 thru February 1997 - During the middle to late December 1996 and January and February of 1997, above normal snowfall occurred in northern and western Idaho. A warm, moist current of air from

the subtropics (known locally as the "Pineapple Express") arrived in Idaho, dumping warm rain on melting snow. The result was widespread flooding, power outages, landslides, road closures, and structure damage from crushing snow loads. Riverbank erosion and landslides filled the rivers with thick silt and debris. Large sections of the highway system were damaged or destroyed, isolating several communities for days. Mountain snow packs in the late winter were holding more than one and a half times the amount of water normally held at that time of year. Snowfall was well above average in Latah and other northern Idaho counties, sometimes exceeding twice the design snow loads of buildings. There was substantial damage to several schools and other public and private structures throughout the State. The aftermath resulted in over $7 million in damages and over $6 million in clean-up, recovery, and restoration costs.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are approximately 714 improvements within the FEMA-identified floodplains (100- and 500-year) in unincorporated areas of Latah County, yielding a total improvement value of $79.2 million. There are currently no repetitive loss properties in Latah County. 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 $39.6 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.

Critical infrastructure located within the identified floodplain for the unincorporated areas of the county include the Potlatch Creek Bridge, the Boulder Creek Campground bridge, and the sewer lagoons in Princeton and Viola.

Latah County participates in the National Flood Insurance Program and has developed local ordinances to better regulate and direct development in floodplain areas. These local ordinances regulate planning, construction, operation, and maintenance of any works, structures, and improvements. Latah 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. Currently, the Latah County Planning Department acts as the Latah County Floodplain Manager.

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 provides a list of the communities within Latah County that currently participate in the NFIP.[44]

Table 5.1. Communities Participating in NFIP as of 2010.

CID#	Community	Date of Entry	Current Effective Map Date	CRS Class
160086	Latah County*	08/15/80	04/15/02	-
160133	Deary	06/05/85	06/05/85	-
160087	Genesee	12/18/79	12/18/79	-
160088	Juliaetta	03/04/80	03/04/80	-
160089	Kendrick	02/01/80	02/01/80	-
160090	Moscow	05/15/80	05/15/80	8
160091	Troy	12/18/79	12/18/79	-
160202	Bovill	12/18/79	12/18/79	-

* Unincorporated areas only.

Latah County has no communities with identified special flood hazard areas that are not participating in the NFIP. Latah County has no communities under suspension or revocation of participation in the NFIP (IDWR 2004).

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 5.2.[45]

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

Community Name	Policies In-Force in 2010 (2003)(1996)	Insurance In-Force	Written Premium In-Force
Latah County*	29 (25)(15)	$4,525,900	16,430
Deary, City of	4 (3)(2)	$226,000	1,078
Genesee, City of	15 (11)(1)	$2,218,000	4,795
Juliaetta, City of	2 (N/A)	$890,300	1,891
Kendrick, City of	2 (4)(NA)	$490,000	687
Moscow, City of	182 (137)(79)	$12,174,200	61,924
Troy, City of	12 (6)(2)	$1,240,700	7,515
Bovill, City of	2 (0)(1)	$235,300	2,429

[44] 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.

[45] 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.

*does not include policies in incorporated areas.

Overall participation by individuals and businesses in the NFIP appears to be low; however, as seen in Table 5.2, the number of policies in most communities has risen substantially since the 1996-1997 flood events most likely due to the heightened awareness after the disaster. Potential reasons for continuing low participation in the program are:

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

Landslide

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

- 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 the 1996-97 and other flood events, small landslides and road slumps are common throughout Latah County.

The majority of the landslide potential in Latah County occurs in the steep canyons along the Potlatch River and in mostly uninhabited areas in the northeast corner of the County. The canyons associated with Little Potlatch Creek, Middle Potlatch Creek, West Fork Creek, and Big Bear Creek near Kendrick and Juliaetta have the high propensity for slides due primarily to the steep slopes. Wildfires and/or severe storms that saturate the soils could lead to major slide events in these areas. The probability of major, high velocity landslides, including those caused by severe local storms, is moderate. Two Landslide Impact Zones have been recognized for Latah County; one at the base of the slope just west of Juliaetta and another along Highway 99 at Kendrick.

There is a moderate probability of small slides occurring on slopes ranging from 5-35%, particularly in the Bovill and Park areas 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 Latah 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.

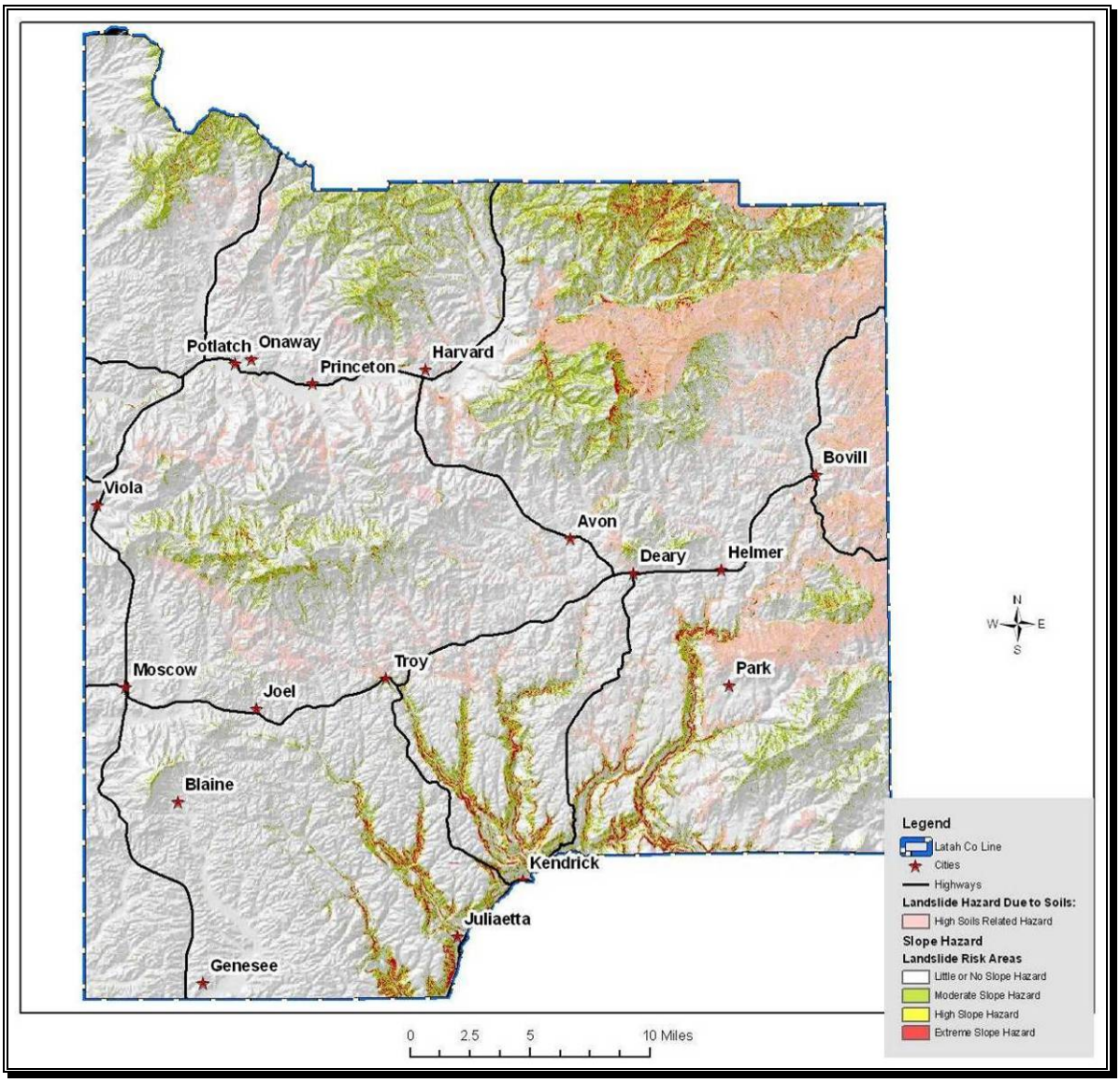
To portray areas of probable landslide risk due to slope related factors, slope models were used to identify areas of low, moderate and high risk. This analysis identified the low risk areas as slopes in the range of 20°-25° (36-46%), moderate as 26°-30° (48-60%) and high risk as slopes in the range 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.[46]

Soil factors, as described above account for additional risks. There are approximately 46,701 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 62% of that area is at little to no risk due to slope and geological factors, 30% is at Moderate landslide risk, 8% is at High landslide risk, and no area 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.

[46] 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 5.3. Landslide Risk Due to Slopes, Geology, and Soils.			
Risk Due to Slopes and Geology		Acres	Percent
	Little or No Landslide Risk	28,955	62%
	Moderate Landslide Risk	14,068	30%
	High Landslide Risk	3,679	8%
	Extreme Landslide Risk	-	0%

Figure 5.2. Landslide Prone Landscapes in Latah County.



Much of the populated areas in Latah 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.[47]

Wildfires in theses impact zones 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.

Value of Resources at Risk

Due to the relatively low landslide risk throughout most of Latah 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.

Severe Weather

Severe weather in Latah 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 Latah County in February 1996, November 1996 – January 1997, and 2008 as a result of severe winter weather events.

All of Latah 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 will receive snowfall, while the Palouse 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 Latah 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

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

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 Latah 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.

February 2008 Winter Storm – Due to heavy snow falls in previous weeks and additional snowfall forecasted, Latah County declared a state of disaster in early February 2008. Latah County and several area communities were overwhelmed with snow removal from public facilities and streets. Genesee ($3,016.25), Deary ($12,342.35), North Latah County Highway District ($40,964.24), and South Latah Highway District ($226,096.24) received funding for snow removal assistance.

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 Latah County.

Due to their relative frequency and minimal severity, severe thunderstorms are not well documented in Latah 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 Washington 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 Latah 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 Latah 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 Latah County 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 Latah 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 Latah 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.

Latah 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 of the 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 Latah 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[48] there were 4 tornadoes in Latah County between 1880 and 2000. The May 2, 1973 and May 19, 1986 tornadoes were reported as F1 and the May 1, 1991 and June 1, 1991 tornadoes were reported as F0. The Emergency Broadcast System as well as the Latah County Emergency Operations Plan was activated in response to the 1986 twister, which touched down near Tensed just north of Latah County. No injuries or damages were reported. The May 1991 event occurred near Genesee according to local reports. There was no damage; however, the strong winds blew branches off a tree that knocked out the power to the community of Troy. In September 2003, a funnel cloud was reported locally near Troy that pulled the roof off one barn and damaged the roof of another.

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

Drought can have a broad effect on Latah 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 Latah 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 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. Since 2002, Latah County has not been issued a Drought Emergency Declaration Order.[49] According to the State Hazard Mitigation Plan, Latah County has not been included in a drought disaster declaration since their period of record began in 1977.[50]

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

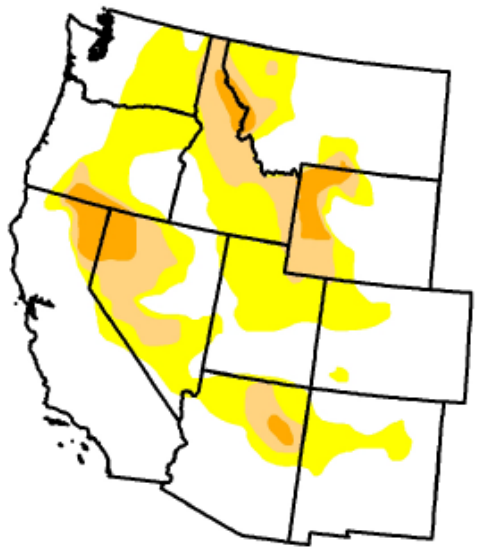
[50] Idaho Bureau of Homeland Security. 2007. State of Idaho Hazard Mitigation Plan. Hazard Mitigation Program. November 2007. Available online at http://www.bhs.idaho.gov/Resources/PDF/SHMPFinalw-signatures.pdf.

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 June 1, 2010, the Drought Monitor showed Latah County as experiencing moderate drought conditions on an improving trend since the beginning of the year.[51]

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

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	61.2	38.8	14.1	4.1	0.0	0.0
Last Week (05/25/2010 map)	60.0	40.0	15.1	4.1	0.0	0.0
3 Months Ago (03/09/2010 map)	36.0	64.0	23.0	5.7	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 (06/02/2009 map)	47.5	52.5	23.1	8.2	0.0	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Latah 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 Latah County occurs from a variety of departments and agencies. The main highways are maintained by the Idaho Transportation Department. County roads are plowed by either the North or South Latah Highways Districts and city departments plow within their 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 Latah 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

[51] 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.

loss of economic activity. Latah 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 Latah 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 Latah 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 Latah 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 Latah 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, there are 10,590 total assessed improvements in Latah County with a total value of approximately $1.6 billion. Using the criteria outlined above, an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $23.3 million. The estimated damage to roofs is approximately $1.6 million.

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 Latah County will be primarily felt in the agricultural sector from the loss in production of crops. Latah County is one of the highest wheat producing counties in the country; thus, a loss of 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 Latah County is unknown, but it is estimated in the millions of dollars depending on the year and the crop rotation of various landowners.

Wildland Fire

The Latah County Community Wildfire Protection Plan[52] provides a comprehensive analysis of the wildland fire risks and recommended protection and mitigation measures for all jurisdictions in Latah County. The information in the "Wildland Fire" sections of this Latah County Annex is excerpted from that more detailed document.

Vegetative structure and composition within the central and eastern portion of Latah County is closely related to elevation, aspect, and precipitation. Relatively mild and moist environments characterize the undulating topography of the region which transitions from the Palouse prairie communities of the west to the forested ecosystems of the east. Highly variable topography coupled with dry, windy weather conditions typical of the region contribute to the potential for large fire development.

The transition between developed agricultural land and timberlands occurs abruptly, usually along distinct land use and property boundaries. In the higher, mountainous areas, moisture becomes more abundant due to a combination of higher precipitation and reduced solar radiation. Vegetative patterns shift from forested communities dominated by ponderosa pine, western larch, and Douglas-fir at the lower elevations to grand fir, western white pine and lodgepole pine at the higher elevations. Engelmann spruce and western red cedar are commonly found in moist draws and frost pockets.

Forested areas dominated by ponderosa pine or Douglas-fir tend to be quite dry, as they typically inhabit south and west aspects where the drying effect of the sun and the wind create conditions favorable for shade-intolerant species. Light grass fuels and the abundance of pine needles cast from overstory trees contribute to the fine fuel loads along the forest floor. Fires in the dry ponderosa pine and mixed species forests tend to burn at reduced rates of spread relative to open range and agricultural areas due to the shielding of the wind by overstory trees. However, in areas of low stocking, there may not be a significant wind reduction factor, allowing fire to be pushed more rapidly through the surface fuels. If regular forest tending has kept surface fuel loading and ladder fuels to a minimum, fires in these dry forest types will generally remain on the surface. However, if heavy surface fuel loads and abundant understory regeneration is present, fires in these dry forest types can burn at high intensities, leading to torching of large mature trees. These conditions present significant control problems for suppression resources and can pose a significant threat to homes in the fire path

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

Fire suppression often depends on two important factors: availability of fire suppression resources and access. Fire suppression resources include firefighting personnel, equipment and apparatus as well as water and chemical fire suppressants. The greater the availability of fire suppression resources, the more likely it is that a given fire will be contained quickly. Fire suppression also depends on access. Fires in remote areas without ground access are more difficult to fight and thus harder to contain than are fires in roaded areas. Access and effective response is partially a function of land management objectives. Lands managed for natural conditions where roads have not been built or the existing roads have been obliterated tend to have a much poorer fire suppression response than commercial forestlands where road systems are maintained.

Because wildland fires are being effectively suppressed, the patterns and characteristics of fires are changing. Vegetation that historically would have been minimized by frequent fires has become more dominant. Over time, some species have also become more susceptible to disease and insect damage, which leads to an increase in mortality. The resulting accumulation of dead wood and debris creates the types of fuels that promote intense, rapidly spreading fires.

Decades of logging and fire suppression have also changed the characteristics of forests, trending towards younger forest stands. Mature forests are typically less dense, and contain larger more fire-resistant trees. Young forests are denser with larger numbers of small, less fire-resistant trees. Younger trees have thinner bark and may sustain more economic damage than an older stand.

Areas subject to wildland-urban interface fires have very different fire hazard characteristics. The defining characteristic of the wildland-urban interface area is that structures are built in areas with essentially continuous (and often high) vegetative fuel loads. When wildland fires occur in such areas, they tend to spread quickly and structures in these areas may, unfortunately, become little more than additional fuel sources for wildland fires. The placement of homes in wildland urban interface settings has also changed over time. Historically pioneering families built their homes in low lands, close to water and the fields they intended to work. Within the last 50 years, rural homes have increasingly been built in locations chosen because of the view or other amenities. Thus, many newer homes are in locations more difficult to defend against wildland fires.

Fire risk to structures and occupants in wildland-urban interface areas is high due to high vegetative fuel loads and limited fire suppression resources compared to urban or suburban areas. Homes in wildland-urban interface areas are most commonly on wells rather than on municipal water supplies, which limits the availability of water for fire suppression. Less availability of water resources makes it more likely that a small wildland fire or a single structure fire will spread before it can be extinguished.

In many areas of Latah County, narrow winding roads, dead end driveways, and inadequate bridges impede access by firefighting apparatus. As with water supplies, the lower availability of firefighting personnel and apparatus and longer response times increase the probability that a small wildland fire or a single structure fire will spread.

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.

Potential safety issues within interface areas are often increased by homeowners' reluctance to evacuate homes quickly. Instead, homeowners often try to protect their homes with whatever fire suppression resources are available. Such efforts generally have very little effectiveness. Unfortunately, homeowners who delay evacuation often place themselves in jeopardy.

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.

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.[53] The fires burned from 1 to 47 years apart, with most at 5- to 20-year intervals.[54] With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age.[55] 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 Latah County.

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

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

[55] 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.

Flannigan Creek Fire 2003 - High temperatures and low fuel moisture levels were the prelude to a fire that began outside a building on Flannigan Creek Road east of Viola on the north side of Moscow Mountain. The fire that began on July 30th, 2003 destroyed five homes. The fire started outside a shop building and quickly spread to the structure and to nearby dry grass and trees (actual cause and origin is being litigated). The fire also ignited a nearby residential structure and continued spreading to the nearby ridge eventually burning nearly 200 acres of timber and grassland. As the fire moved into the forestland, it spread through an urban-interface environment that contained a variety of homesites with differing levels of defensible space. The Idaho Department of Land as well as several Latah County rural fire districts struggled to contain the rapidly spreading fire. Local law enforcement officials assisted the effort by evacuating 30 homes in the vicinity of the blaze. As the fire continued to spread, the incident was eventually classified as a high priority fire for Pacific Northwest aircraft fire suppression resources. This priority classification allowed the assignment of five fixed-wing aircraft (large aerial tankers to single engine air tankers) and three helicopters. It has been generally recognized that the use of these aerial fire suppression resources were instrumental in the control of the Flannigan Creek Fire.

Brady Gulch Fire – 2007 - The Brady Gulch Fire, also named the Kendrick Fire in the State fire reporting system, was human caused. The fire started along Highway 3 around midday July 31st, 2007 and burned 120 acres directly adjacent to the town of Kendrick. The Kendrick Fire Department responded along the Highway and requested assistance from the Idaho Department of Lands, Deary Rural Fire District, and Troy Rural Fire District. The fuels type consisted of dry grasses and brush on a steep slope, which caused the fire to spread rapidly uphill from Kendrick towards Brady Gulch. The rural fire districts successfully suppressed the fire along the highway and kept it from spreading into town. Due to the poor access in the area and a high rate of spread, the IDL ordered multiple aircraft and additional hand crews. As the fire advanced upslope, command used aerial resources to direct the fire away from homes as much as possible. Hand crews were used to construct fireline from the Highway along the flanks of the fire. As the sun set, the rate of spread slowed and the fire was contained by midnight. During the first operational period, 6 air tankers, 5 helicopters, and one air attack platform were assigned to the fire. There were also engines from 5 area fire districts, the IDL, and the Nez Perce Tribe. Crews were ordered from IDL offices in Deary and Orofino, the Bureau of Land Management, and the Forest Service.

Overall, the threat of wildland fire appears moderate for Latah 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 Latah County, depending on conditions in specific developments in wildland-urban interface areas, the threat may be moderate to high, especially during periods of drought. According to the State of Idaho Hazard Mitigation Plan, Latah County is ranked 16th in the State for current risk and 8th for potential risk.[56]

Using data on past fire extents and fire ignition compiled by the IDL, the occurrence of wildland fires in the region of Latah County has been evaluated. The IDL database of wildfire ignitions used in this analysis includes ignition and extent data from 1999 through 2009 within their jurisdiction. An analysis of the IDL

[56] 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.

reported wildfire ignitions in Latah County reveals that during this period approximately 2,179 acres burned as a result of 170 ignitions, which results in an average of 16.1 acres burned per fire.

Table 5.4. Summary of IDL database 1999-2009.

General Cause	Number of Ignitions	Percent of Total Ignitions	Acres Burned	Percent of Total Acres
Lightning	87	51%	101	4%
Campfire	6	4%	9	0%
Smoking	3	2%	0	0%
Debris Burning	23	14%	786	29%
Arson	2	1%	903	33%
Equipment Use	25	15%	412	15%
Railroad	0	0%	-	0%
Children	0	0%	-	0%
Miscellaneous	24	14%	518	19%
Total	170	100%	2,729	100%

Within the IDL protection area 49% of the fires during this period were human-caused with the majority of the ignitions resulting from equipment use and debris burning. Although only a small percentage of fires are started by arson, during this period, arson resulted in the most acres burned (33%). Debris burning resulted in the second most acres burned at 29%. Most of the fires caused by debris burning are suppressed quickly. It is also noteworthy that lightning accounts for 51% of the total ignitions in Latah County, but only contributes about 4% of the total acres burned. This statistic is testament to success of the initial attack capabilities of the IDL and its mutual aid partners.

Value of Resources at Risk

It is difficult to estimate potential losses in Latah 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 (51% of all ignitions) of wildfires in Latah County.

Latah 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.

Extended Power Outage

Electrical power has become an indispensible part of modern day life. Latah County's leisure, healthcare, government, economy, and livelihood depend on a constant supply of electrical power. Even a temporary stoppage of power can lead to relative chaos, monetary setbacks, and possible loss of life. Our communities live on electricity and without a steady supply from the power grid, pandemonium would break loose. Power outages can be especially disastrous when it comes to life-support systems in places like hospitals and nursing homes. Because Latah County is mostly rural, traffic control issues would not likely be a large concern.

Power failures are particularly critical at sites where the environment and public safety are at risk. Institutions such as hospitals, sewage treatment plants, mines, etc., should have backup power sources, such as standby generators, which will automatically start up when electrical power is lost. Other critical systems, such as telecommunications and emergency response should also have access to have emergency power. In 2006, Latah County received more than $800,000 from the federal government to beef up emergency response systems and train for disasters. This grant helped Latah County purchase a new backup generator.

Extended power outages also affect the County's and most communities' ability to provide government and other services such as trash pickup, street lights, municipal water, law enforcement, and fire and medical services. Power outages may also impact the County jail as prisoners rely on Latah County to provide food, warmth, and shelter.

Severe weather events, particularly high winds and ice, are the most common cause of power outages. These types of outages are generally short-term (2-12 hours) and do not have a significant impact on residents. However, depending on the time of day, even short term outages can result in considerable lost revenues for local businesses. Outages also impact the power suppliers, Avista and Clearwater Power, due to lost revenues from use as well as response and repair costs. Short term outages can also affect emergency response as communication capabilities are slowed and hospitals are running on backup power supplies. A long term outage in Latah County would have drastic economic impacts.

Most communities in Latah County can provide potable water for 1-3 days without electricity to run pumps. However, a backup power source would eventually be required to replenish storage tanks. Many communities do not have a standby generator to power sewer treatment facilities, which could lead to effluent being backed up and potential contamination of the water supply.

Despite advances in computer technology, power outages are a major cause of PC and server downtime. An extended outage (defined as an outage lasting longer than the computers uninterruptible power supply) can prevent unprotected computers from initiating their required shutdown procedure. PC and server operating systems are not designed to support abrupt losses of power known as "hard" shutdowns, but rather rely on a set of processes that prepare a computer for a shut down such as saving memory, stopping applications, etc. Hard shutdowns can result in lost or corrupted data and a lengthier time-to-recovery after power returns.

Life safety would also be at risk, particularly if the outage occurred during the winter months when many residents are relying on electricity for heating and cooking. Special needs populations would have the greatest risk during extended power outages due to reduced abilities to adapt to the situation; their dependence on life support systems, medication, or oxygen; and difficulties with transportation. Generally, power companies maintain a list of customers who may be more negatively affected or would require immediate assistance in the event of an outage. This type of information should also be shared with Latah County Disaster Services and local emergency responders in order to ensure these populations receive adequate support.

Shooters shut down powerhouse at Dworshak Dam

PORTLAND, Ore. - For the third time in a year, shooters have damaged major transmission lines in the area of Dworshak Dam on the North Fork of the Clearwater River, this time causing a power outage. The FBI and the Latah County sheriff are investigating, and the Bonneville Power Administration is offering a $5,000 reward for information leading to the arrest of the vandals.

Two 500,000-volt transmission lines and the powerhouse at Dworshak Dam were knocked out of service shortly after 3 p.m. on June 6. Shooters blasted away insulators at two towers about 26 miles northeast of Dworshak near the town of Bovill, Latah County, Idaho. No communities lost power because of the outages.

Replacing the insulators cost BPA $9,200, but the greatest loss was 800 megawatts of generation at the powerhouse, which was worth about $140,000. In addition, once the generators were offline, water from the Dworshak reservoir flowed over the dam spillway instead of through turbines. The spilling water increased the dissolved gas levels in the river below the dam, seriously threatening migrating salmon.

"Our line maintenance crews helped bypass the vandalized towers to keep power flowing. Then they replaced 35 insulators on the Dworshak-Taft line," Kler said. "Had those insulators failed completely, that line could have fallen. At the moment that live line touched the ground, people and animals in the area could have been seriously injured or killed by the electricity traveling through the ground."

Initially, the Dworshak-Taft number 1 transmission line went out of service. That outage caused the Hatwai-Dworshak line to go dead, which, in turn, shut down the Dworshak Dam powerhouse. In all, the lines were out of service for over 19 hours; the powerhouse was offline for nine hours. The lines and the powerhouse returned to service around 11a.m. on June 7.

BPA News. June 12, 2002

Latah County has experienced a long history of power outages. The diverse landscape, rural settings, and weather patterns within Latah County are the triggers for much of the power outages that occur. Rain-on-snow events and periods of extreme wind are very typical throughout the county in the spring and late winter. The combination of these types of events can cause significant power outages.

Table 5.5. Record of Latah County Power Outages.			
Date	**Cause**	**Duration**	**Effect**
2/26/2009	Weather Conditions	3 hours	Approximately 18,000 residents throughout the Palouse region lost power
10/15/2009	Hot Line Hold	1 hour	3,000 residents on the east side of Moscow lost power
7/13/2007	Unknown	3 hours	Residents of Kendrick lost power
8/20/2007	Rain Sparked Power Pole Fire	2 hours	Approximately 1,600 Moscow residents lost power
5/5/2006	Crash Into Utility Pole	45 minutes	Residents of Potlatch lost power
2/22/2005	Crash Into Utility Pole	2 hours	55 Moscow residents lost power
3/4/2004	Equipment Failure	3 hours	6,000 Moscow residents lost power
2/28/2002	Animal Damage	2 hours	Portions of U of I campus and north Moscow lost power
12/2/2002	Animal Damage	10 hours	Deary and Bovill residents lost power
9/26/2001	High Winds and Rain	7 hours	U of I and parts of Moscow lost power
2/17/2000	Equipment Failure	Unknown	Kendrick and Juliaetta residents lost power
12/29/1999	Ice Loading on Lines	1-2 hours	Genesee residents lost power
10/11/1999	Planned-Maintenance	2 hours	Affected customers were notified beforehand to prepare for outage
2/28/1999	Equipment Failure	4 hours	Residents of Genesee lost power
4/17/1999	Power Pole Caught Fire	1-2 hours	2,000 residents of Viola, Potlatch, Troy, and Moscow lost power
9/9/1998	Rain Storm	Unknown	6 residents of Moscow reported a loss of power
2/20/1997	Power Pole Caught Fire	Unknown	8 block in south Moscow lost power
7/9/1997	Crop duster fly's into power line	1 hour	150 Moscow residents and 1 local radio station lost power
7/29/1997	Equipment Failure	8 hours	Residents of Deary, Bovill, and Helmer lost power
7/29/1997	Fallen Power Line	7.5 hours	Residents of Deary, Bovill, Juliaetta, Kendrick, and parts of Troy lost power
9/30/1997	Crash Into Utility Pole	5 minutes	Residents of Moscow, Genesee, and surrounding Areas lost power
9/1/1996	Crash Into Utility Pole	Several hours	U of I and Palouse Empire Mall lost power
7/31/1995	Tree trimming contractor felled tree on power line	12 hours	Moscow courthouse and jail, plus 5 or 6 block surrounding area
8/10/1995	Utility Truck Hits Power Pole	30 minutes	Northwest section of Moscow lost power
8/23/1995	Transformer Failure	9 hours	9 homes in Moscow's Indian Hills neighborhood lost power
11/3/1993	High Winds	Unknown	Residents of Bovill lost power (school cancelled)
2/18/1986	Heavy Wet Snow Caused Trees To Fall Onto Power Lines	Unknown	Sporadic power outages throughout Moscow

Wildland fires also have the potential to cause extended power outages. During a fire, power companies typically de-energize sections of the power grid in order to prevent arcing from the smoke as well as to protect firefighters. The length of the outage and the damage caused to the power line would be dependent on the location and intensity of the fire. This type of outage could significantly impact communities and rural residents. In the summer months, an extended outage can cause food spoilage on an individual level (refrigerators and freezers) as well as in grocery and other stores.

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Latah County, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

Additionally, as shown in the June 2002 vandalism of insulators at two towers near Bovill, power generation at Dworshak Dam on the nearby North Fork of the Clearwater River can also be affected by outages. This type of outage resulted in over $9,000 in repair costs and about $140,000 worth of lost power generation during the downtime. There could have also been a life safety risk as well as an ecological risk to migrating salmon resulting from this incident.

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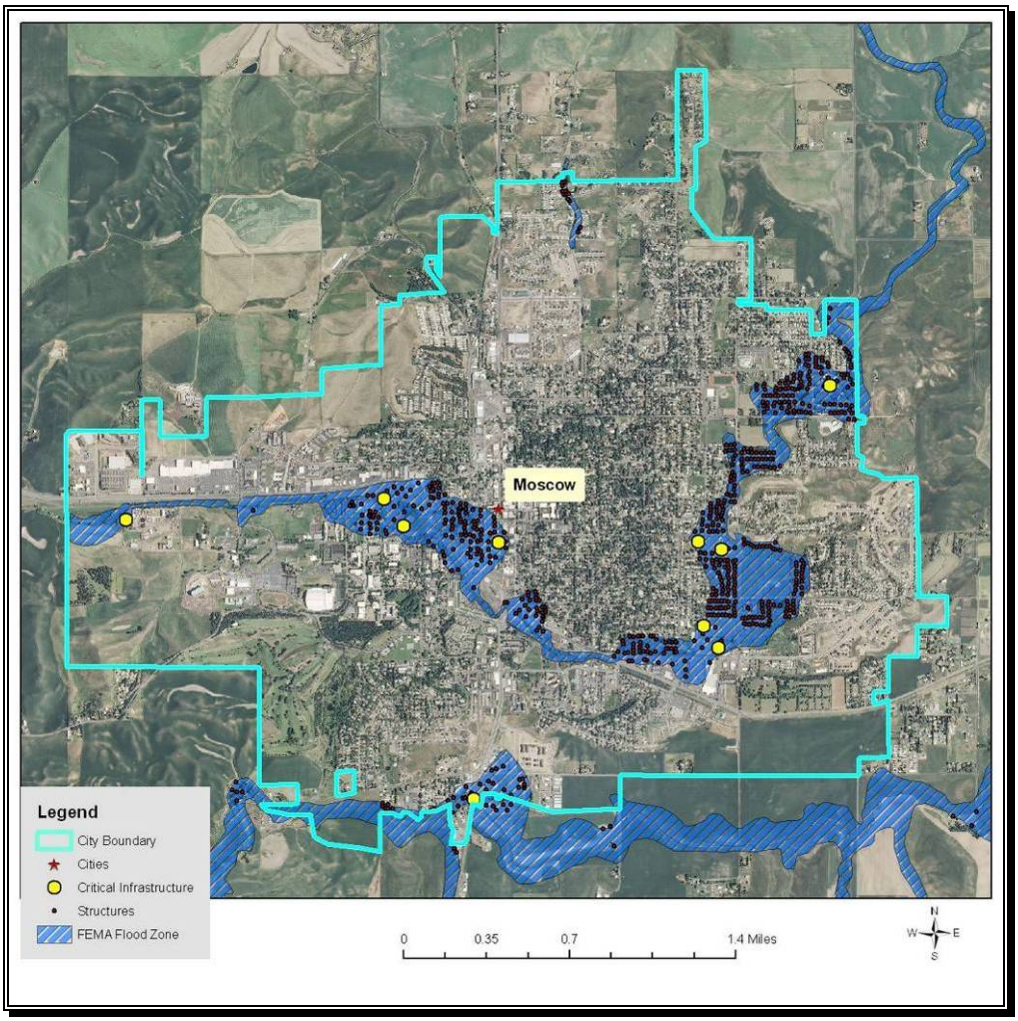
City of Moscow Annex

Flood

Moscow is located in the heart of the Palouse at the intersection of Highway 8 and 95. The major floodplains affecting Moscow is from Paradise Creek, Hog Creek, and the South Fork of the Palouse River. City streets, highways and railroad lines cross these floodways. There are commercial, industrial and residential areas with public utilities in and around the floodplains.

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 Moscow occur when significant snow pack exists within the Moscow Mountain and Paradise Ridge area. 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 that are typified by intense rain fall over a short time period. Flooding occurs rapidly, overwhelming the water carry capacity of channels.

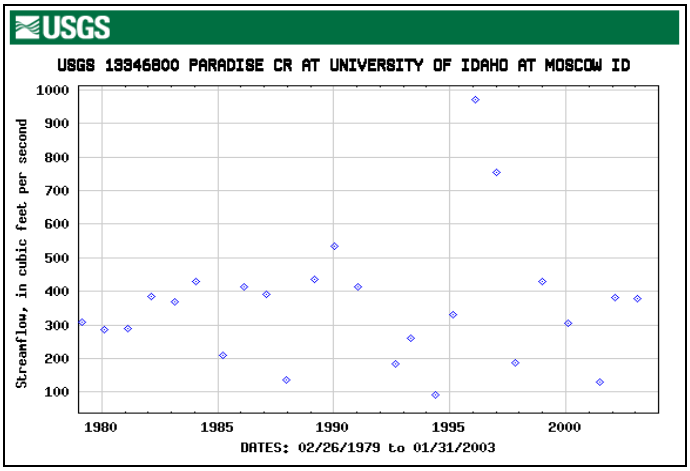
Figure 5.4. FEMA Flood Insurance Rate Map for Moscow, Idaho.



The major impacts from both types of flooding in Moscow are the restricted use of several streets, highways, railroad lines, commercial, industrial, and residential areas. Within the City of Moscow, there are 31 crossings over Paradise Creek. A covered section of Paradise Creek, 1,070 feet long, extends from Line Street west to University's Physical Plant.

Warm weather or rain after a heavy snowfall is responsible for high flows in these streams. A high level of sediment is prevalent during periods of runoff. This sediment tends to cause a deteriorating condition in streambeds and channels through deposition. Natural obstructions to flood waters include trees, brush, and other vegetation along the stream banks in the floodplain area. Historically, considerable debris has been allowed to accumulate in these channels, plugging culverts and bridges at several locations throughout town, but recent efforts have lessened this hazard.

The topography around Moscow ranges from steep mountains in the headwaters to broad, rounded and rolling high prairies in the lower parts of the Paradise Creek Basin. Grasses and shrubs are the predominant native types of vegetation in the lower areas of the Paradise Creek basin, while coniferous forests are found in the mountainous areas. Grain elevators, fuel stations, and several other businesses operate within the floodplain.



The United States Department of Geological Services (USGS) established a surfacing monitoring station in Paradise Creek from 1979 to 2003. The monitoring station was located on the western side of Moscow. Peak stream flows from 1979 to 2003 exceeded 970 cubic feet per second and had a maximum gage height of 11.26 feet. Gage height is the height of the water surface above the gage datum (zero point).

February 1996 Flooding – Moscow experienced considerable damages during the February 1996 flood event. Several residential areas along Paradise Creek (east Moscow) and the South Fork of the Palouse River (south Moscow) incurred damages. This event was considered a 500-year flood in some areas.

May 2005 Flash Flood – Several residential areas as well two water and sewer districts reported damage from a flash flood in Moscow. One home was severely damaged by mud and debris, but numerous basements were flooded with water. Other damages included washed out ditch lines, driveways, and roadways. Both highway districts incurred damages as culverts were washed out and ditches were plugged with debris.

The construction of homes and other structures continue in the floodplain. Several newer homes have been built within the floodplain, but seem to have elevated first floors, raising the living area above the flood level and do not appear to have basements. Several new streets have also been built within the floodplain since the FIRM maps were developed.

The primary access into Moscow is U.S. Highway 95 and Highway 8. Highway 95 is the main route connecting north and south Idaho. Highway 95 crosses both the South Fork of the Palouse River and Paradise Creek and has been compromised in the past by flood waters.

Most residents of the community are connected to the municipal water system or have drilled personal wells. City wells and the water systems are located outside of the floodplain. The city's ability to provide clean drinking water during flood events will not likely be compromised by flooding.

Value of Resources at Risk

There are 674 improvements within the FEMA-identified floodplains (100- and 500-year) in Moscow, yielding an estimated total improvement value of $112.4 million. There are currently no repetitive loss properties in Moscow. 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 $56.2 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 182 NFIP policies in Moscow.

Critical infrastructure located within the identified floodplain for Moscow includes the fire stations #1 and #2, the West Park Elementary School, the Good Samaritan Village Care Center, the Fairgrounds, an electrical substation, the Nazarene Church, Short's Funeral Home, the wastewater treatment facility, the University of Idaho police station, and a bridge on U.S. Highway 95.

Landslide

The city of Moscow 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Moscow. Small slumps may occur along U.S. Highway 95, Highway 8, or other secondary roads. In some cases, this 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 Moscow does not have any differing levels of risk associated with this hazard than Latah County as a whole.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Moscow. 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 street department under Moscow Public Works. 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. Moscow 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 Moscow to cause significant damages. However, the loss potential from flooding that 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 Moscow. 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 Moscow 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 Moscow 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, there are 6,096 total assessed improvements in Moscow with a total value of approximately $931.2 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $14 million. The estimated damage to roofs is approximately $914,400.

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 Moscow 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.

Wildland Fire

Moscow is the largest community in Latah County, set in the midst of the rolling Palouse Prairie. Land use in the vicinity of Moscow is dominated by agriculture, with large fields of wheat, hay, peas and other crops surrounding the majority of town. To the south and east of Moscow is Paradise Ridge, which supports mixed pine and fir forest. Paradise Ridge has also been a favored area for residential development, exposing homes in the area to varying degrees of wildland fire risk. There is essentially no measurable threat to the homes within the city center. Homes on the periphery are at some risk where cured grain fields abut the homes.

Fuels in the vicinity of Moscow are a combination of rangeland and forest fuels. The availability of agricultural lands surrounding the periphery of town is seasonally dependent, with live crop moisture remaining high into mid July. Once cured, grain crops such as wheat become available to burn. All these fuel types have the potential to burn at high intensities with very rapid rates of spread. However, these light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

Forest fuels along Paradise Ridge are characterized as open ponderosa pine stands. This is a warm, low elevation site that cures early in the summer months. There is a considerable understory fuel ladder in many areas. When draped with pine needle cast from the overstory trees, this creates a highly flammable ladder fuel that can contribute to torching and an overall increase in fire behavior.

The shrub layer is often interspersed with fine grass fuels that that cure early in the year. The presence of the fine fuels in the shrub understory increases fine fuel continuity, providing a consistent fuel bed for fire to spread. Fires in these fuel types are generally surface fires that burn with low to moderate intensities, but spread with moderate rates of spread. Spread rates escalate dramatically when under the influence of slope and wind. Fire intensities can increase dramatically when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities, with torching, crowning and long-range spotting.

A roadway ignition off South Mountain View Road between East Palouse River Road and the Troy Highway demonstrates the potential for accidental ignitions in residual stubble. The fire burned with rapid rates of

spread toward Mountain View Trailer Court. Fortunately, the quick response time of the Moscow Rural Fire Department helped to contain the fire within 20 yards of the homes.

The overall risk to homes in the Moscow area is low, with isolated areas of high risk associated with Paradise Ridge. The prevalence of agricultural land along the periphery of town helps to reduce overall risk. These fields can present a significant threat to homes and structures when cured. However, most homes and structures have an adequate fire break of green lawn, roadways or other natural or man made fire breaks, providing adequate protection from direct flame impingement. However, where fuel breaks or defensible space do not exist, the risk presented by these fuels is significant.

Paradise Ridge represents the largest concentration of urban interface in the Moscow assessment. The abundance of dry pine, grass and brush fuels, moderate slopes and windy conditions increases the probability for ignitions to develop into wildland fires, threatening homes and lives in the area.

Many homes have adequate defensible space; however, some homes and many outbuildings and garages directly abut wildland fuels. Some structures were observed to have considerable accumulations of dry pine needles on roofs and gutters, increasing the probability of home ignition from long-range spotting. Cedar shake roofing material was also noted in the area, dramatically elevating the potential for home ignition from long-range spotting. Driveway access is good to very poor, with some homes accessed via narrow, overgrown drives with inadequate turn-arounds.

There are a number of communication sites on Paradise Ridge and Moscow Mountain that may be threatened in the event of wildland fire.

Structural fire protection is provided by the Moscow Volunteer Fire Department and Moscow Rural Fire District. The Idaho Department of Lands has equipment and responsibility is responsible for wildland fire protection in forested areas. The Ponderosa District IDL office is stationed along Highway 3 approximately 1 mile south of Deary.

Value of Resources at Risk

It is difficult to estimate potential losses in Moscow 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 flashy fuels.

Extended Power Outage

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

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Moscow, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Moscow. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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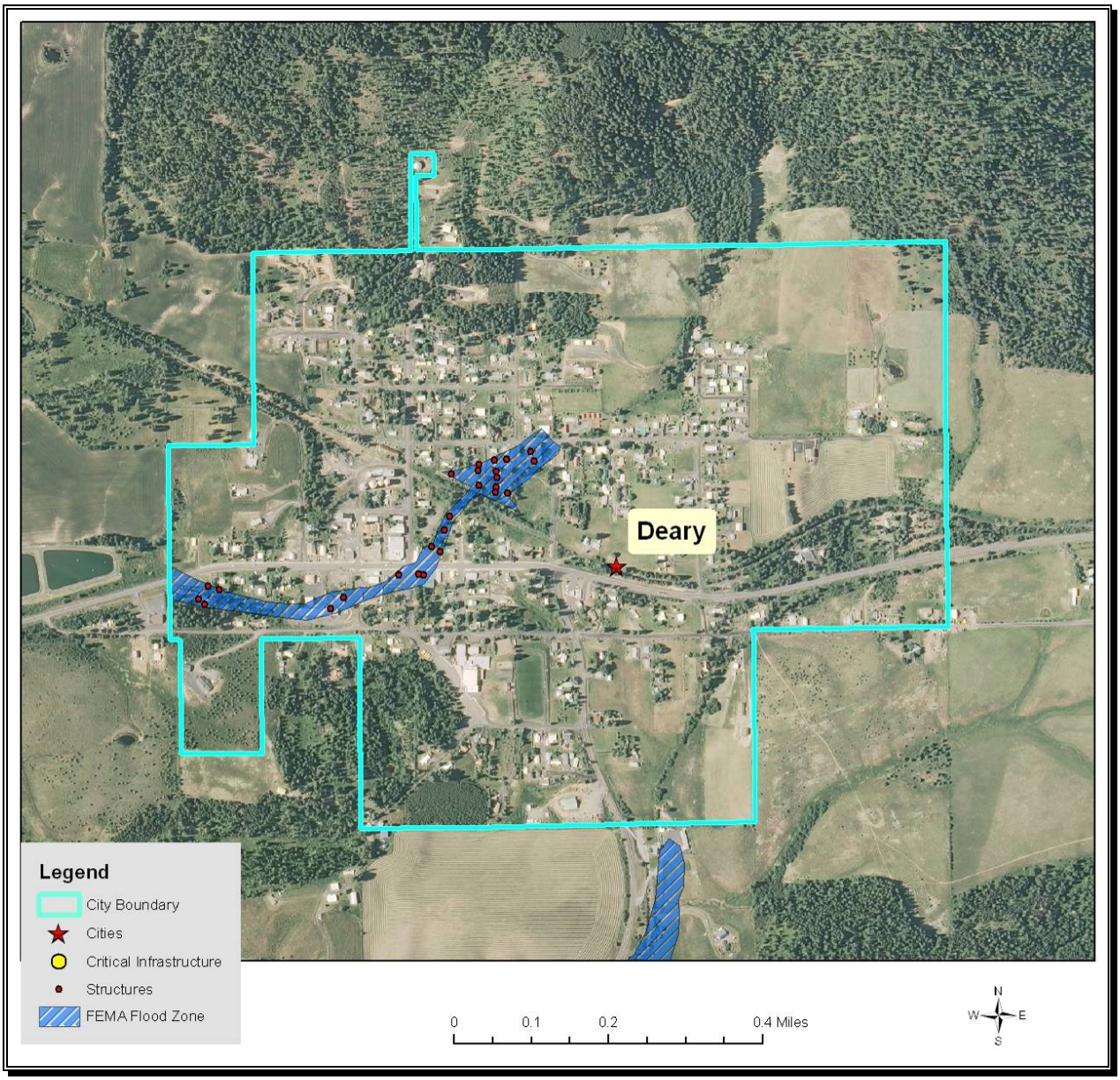
City of Deary Annex

Flood

Deary is located east of Troy approximately 12 miles along Highway 8. The floodplain affecting Deary is an unnamed drainage system coming from the north under Highway 8 and exiting on the west end of Deary near the sewer ponds. This waterway crosses through town from the northeast and has several inadequate culverts. At 5th Avenue and the railroad tracks, the culvert is under-sized and has a city sewer pipe running through the pipe, which further reduces its capacity. This drainage starts north of town traveling south through a culvert under the railroad grade then spills into a ditch on the east side of the city park running into a culvert system near White Horse Restaurant, under Highway 8, across Line Street and then spills back into the drainage system again. When debris, sediment, or ice jams these culverts, water overflows onto adjacent properties and streets causing erosion and building damage.

The construction of new homes and other structures has ceased within the narrow floodplain. The homes within the floodplain are mainly manufactured homes or single level homes without basements. Several older businesses still exist within the floodplain, but seem to be at a lower risk from floods.

Figure 5.5. FEMA Flood Insurance Rate Map for Deary, Idaho.



Due to the construction of the railroad, storm water flow often backs up into the streets and may have some minor impact on several residences and streets. Many culverts appear to be undersized to handle major flood events. The drainage system under the White Horse Café seems to be inadequate also. There appears to be some ongoing maintenance and cleaning out of sewer lines and storm drains.

Most of the residents in the Deary area have a low risk of experiencing major flood damage or long term disruption of business. Due to the inadequate sized culvert under the railroad, the residences of the 5th street trailer park and surrounding areas have a much higher risk due to the nature of the under-sized culvert. Flood impacts are mainly limited to disruption of road travel, and limited localized flooding of structures.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 21 improvements within the FEMA-identified floodplains (100- and 500-year) in Deary, yielding an estimated total improvement value of $1.3 million. There are currently no repetitive loss properties in Deary. 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 $655,943 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 only 4 NFIP policies in Deary.

There is no identified critical infrastructure within the floodplain in Deary. Roads are the most affected infrastructure in Deary during flood events. Access through town could be problematic if the underground culvert system was compromised. This restricted access may cause temporary delays. Historically there has been little long term damage to road systems in the Deary area.

Most residents in Deary are connected to the municipal water system or have drilled personal wells. City wells and the water system are located outside of the floodplain. Deary's water storage capacity consists of 400,000 galloons, which will last the town 5 to 6 days if power was lost due to a flood event. The cities ability to provide clean drinking water during flood events should not be compromised.

Landslide

The city of Deary has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 35%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Deary. Small slumps may occur along Highway 8 or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Deary does not have any differing levels of risk associated with this hazard than Latah County as a whole.

February 2008 Winter Storm – Due to heavy snow falls in previous weeks and additional snowfall forecasted, Latah County declared a state of disaster in early February 2008. Latah County and several area communities were overwhelmed with snow removal from public facilities and streets. Deary received funding for snow removal assistance in the amount of $12,342.35.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Deary. 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. Deary 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 Deary to cause significant damages. However, the loss potential from flooding that results from severe thunderstorms could be significant.

Winter 2008 Damages in Deary

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 Deary. 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 Deary 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 Deary 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, there are 310 total assessed improvements in Deary with a total value of approximately $15.5 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $232,746. The estimated damage to roofs is approximately $46,500.

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

The city of Deary 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.

Wildland Fire

The community of Deary is located on Highway 8 between the junctions of Highway 3 from the south and the Harvard-Deary cut-off (Highway 9) from the north. The landscape in the Deary area is a combination of steppe-prairie that has been largely converted to agricultural fields and timber stringers. Forest habitats become more consistent at increasing elevations and along creek drainages. Forest composition is a mix of ponderosa pine, Douglas-fir, larch, and lodgepole pine. Cedar and grand fir are also present in moist creek bottoms and cold air drainages.

The fuels immediately adjacent to Deary are a mix of light, flashy grass, agricultural, and forest. The availability of the agricultural lands to burn is seasonally dependent, with live crop moisture remaining high into mid July. Once cured, grain crops such as wheat become available to burn. This fuel type has the potential to burn at high intensities with very rapid rates of spread.

Fuels in the timbered areas can be described open pine and mixed conifer. On south and west slopes exposed to wind and sun, the light grasses and pine needle litter are quite fire prone, drying early in the season and remaining available to burn well into the fall. These fuel types extend into the northern portion of Deary on the flanks of Potato Hill. Fires in these fuel types are generally surface fires that burn with low to moderate intensities. However, intensities increase dramatically when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities with torching, crowning, and long-range spotting.

Many of the forested lands in the area are actively managed as timber grounds by private, non-industrial landowners or by large corporate landowners such as Potlatch Corporation. Timber harvest practices in the area help to break fuel continuity and reduce stand densities. Slash is treated following harvest either by

piling and burning or by broadcast burning. This effectively reduces the fire hazard in the short as well as long term development of the stand.

There is considerable recreational use of Potato Hill north of Deary, with a number of recreational trails frequented by motorized users. Use in this area further augments the ignition profile by exposing motorized equipment to dry forest fuels.

Risk in the Deary area is isolated to the north end of Deary, where wildland fuels mix with residential development on the flanks of Potato Hill. Some of these homes have been built with materials that are unfavorable for survival of a wildland fire event. Use of cedar shake roofing material was noted in the area. The combination of this highly flammable roofing material and the dry forest type increases the probability of structural loss. Furthermore, access to some homes may be difficult due to narrow roads and lack of adequate turn-arounds.

There are isolated patches of timber south of Highway 8 in Deary; however, these pose little risk to the community. The periphery of town is surrounded by light fuel, flashy grass or agricultural fuels, except where noted on Potato Hill. These homes in the peripheral area are generally well separated from burnable vegetation by green lawns or roads. There are isolated outbuildings that have accumulated light, flammable vegetation in their immediate vicinity, increasing the chance of fire loss.

Homes south of Deary are accessed by Bear Ridge Road, Drury Road, and Texas Ridge Road are generally at low risk, although there are a number of homes at significantly higher risk due to lack of defensible space surrounding the home. Many homes have been tucked into the timbered stringers between agricultural fields. Although these stringers are usually narrow, there is the potential for development of high intensity wildland fires.

There are a number of well-maintained highways and secondary roads leading in all directions. It is highly unlikely that any of these routes would be compromised for any duration due to the light fuels in the vicinity of the road corridors. There are some short segments of secondary road that travel through heavily timbered areas. However, these segments are limited and alternative travel routes are available.

Structural fire protection in Deary is provided by the Deary Rural Fire District. Wildland fire protection is provided by the Ponderosa Area of the Idaho Department of Lands.

Value of Resources at Risk

It is difficult to estimate potential losses in Deary 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.

Extended Power Outage

The city of Deary does not have any differing levels of risk associated with this hazard than Latah County as a whole. Deary's water storage capacity consists of 400,000 galloons, which will last the town about 5 to 6 days without power.

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Deary, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Deary. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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City of Juliaetta Annex

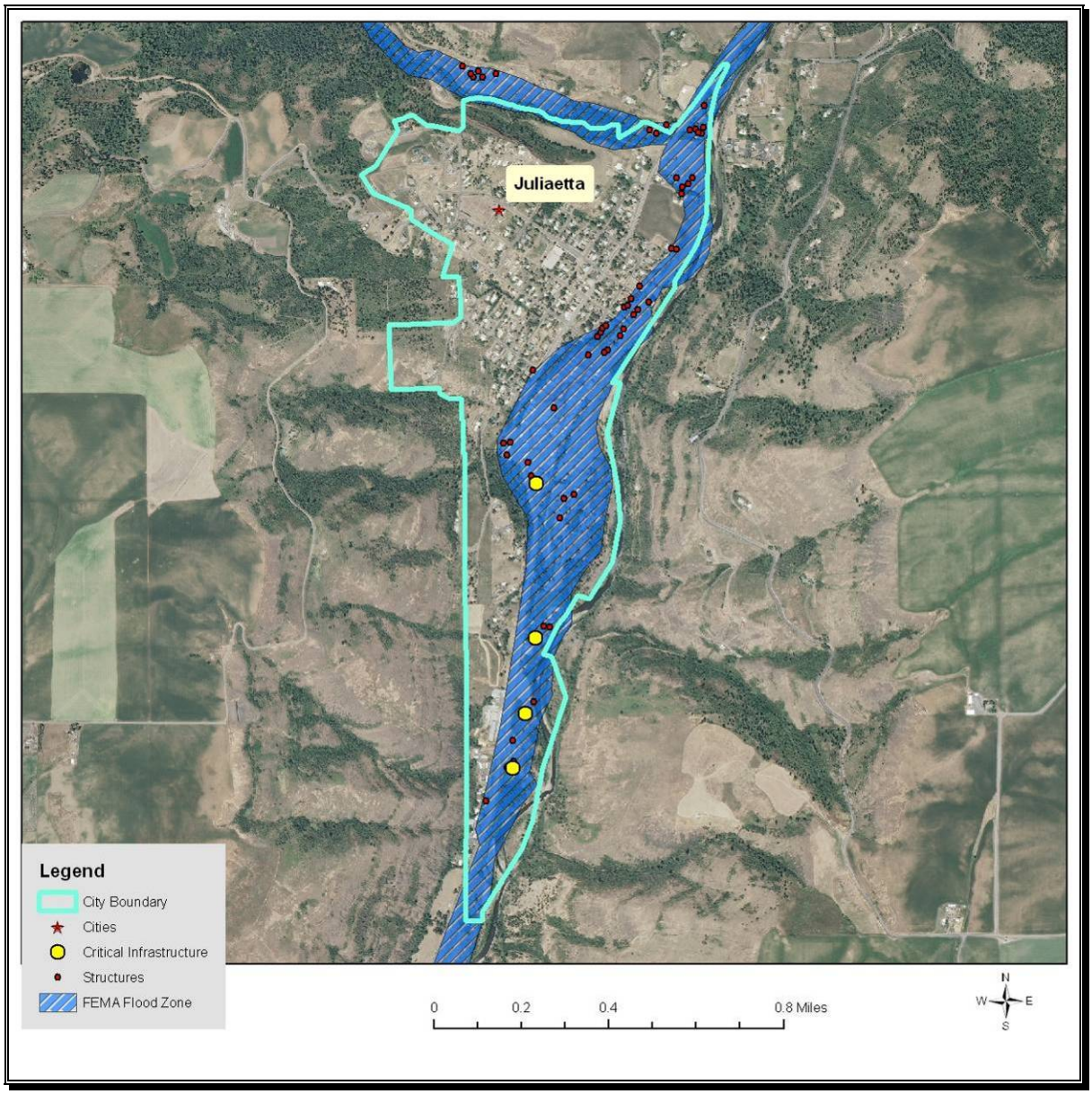
Flood

Juliaetta is located at the base of Fix Ridge on the northern banks of the Potlatch River and between the Middle Potlatch Creek and the Little Potlatch Creek drainages. These water bodies drain several hundred square miles of various watersheds. Floods in the area are typically the result of rain-on-snow events. Warm rains falling on the snow pack result in a significantly increased rate of snowmelt. Often the melting occurs when the ground is frozen and the water cannot be absorbed fast enough, resulting in increased overland flows. Flood waters recede slowly as the weather events tend to last for several days. Thunderstorms are also likely to affect the community. These events usually are localized, but still can have a significant impact. They are usually typified by intense rain with flooding occurring rapidly, overwhelming the carrying capacity of the nearby streams and rivers. The duration is usually only a matter of hours, but the affects can be widespread throughout the impact areas of the town.

Portions of Juliaetta on the south side of State Route 3 are within the floodplain including several homes and a few industrial facilities and other businesses. Of particular note are the grain elevator, pole yard, and gas station on the west side of town. The official FIRM map shows the floodplain crossing State Route 3 in this area. The wastewater treatment facility is also located within the floodplain. Juliaetta is not protected by a levee system that meets the requirements of the Army Corps of Engineers. The old Burlington Northern railroad bed, which parallels the river, may offer a minimal amount of flood protection; however, nothing has been done to stabilize or reinforce this berm to function as an emergency levee. Under intense flooding conditions, the old railroad bed would likely be either overtopped or washed out.

February 1996 Flooding – Juliaetta experienced considerable damages during the February 1996 flood event, particularly to roadways, bridges, the dike, and individual homes. Highway 3 was washed out effectively cutting both Kendrick and Juliaetta off from Lewiston. Due to water contamination caused by Bovill's wastewater treatment facility being flooded, both Kendrick and Juliaetta had to boil their drinking water for two days.

Figure 5.6. FEMA Flood Insurance Rate Map for Juliaetta, Idaho.



In 1993, a flash flood and subsequent mudslide killed two local residents on Highway 3 about a half mile east of Juliaetta. The two people were killed when their car was unexpectedly engulfed and pushed over an embankment by sliding rocks, trees, mud, and water from a small draw on American Ridge. Highway 3 was blocked by a 10 to 12 foot high and 200 foot wide pile of debris left by the flood. Historical accounts suggest that this draw has flash flooded several times and rocks and other debris from the hillside are common on the roadway.

The United States Department of Geological Services (USGS) established a surfacing monitoring station in the Potlatch River from 1945 to 1970. Peak stream flows from 1945 to 1970 exceeded 16,000 cubic feet per second and had a maximum gage height of 13.7 feet. Gage height is the height of the water surface above the gage datum (zero point).

Most residents of Juliaetta are connected to the municipal water system or have drilled personal wells. Most of the well heads and the water storage tanks are located well outside of the flood plain; however, if the stabilized stream bank on the east side of the community were washed out or otherwise damaged, one well head and the domestic water treatment facility would be at risk. In the event that power was cut off to the water treatment facility, the community's water storage tanks hold enough water to provide drinking water for the community for approximately five to six days. The city's ability to provide clean drinking water during flood events may be compromised.

The majority of residents in the Juliaetta area have a moderate to low risk of damage caused by smaller periodic floods. Higher magnitude base flood events would likely affect a greater number of the population and could potentially cause extensive damage to critical components of the community's infrastructure. Flash flooding of the smaller tributaries, especially Little Potlatch Creek and Middle Potlatch Creek, may cause damage or loss of life or property as was seen by the two flash flood fatalities in 1993.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 49 improvements within the FEMA-identified floodplains (100- and 500-year) in Juliaetta, yielding an estimated total improvement value of $3.6 million. There are currently no repetitive loss properties in Juliaetta. 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 $1.8 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 only 2 NFIP policies in Juliaetta.

Critical infrastructure located within the identified floodplain for Juliaetta includes the fire station, two electrical substations, and the wastewater treatment facility. Access into and out of the community could pose a serious problem during major flood events. Many roads, bridges, and culverts would restrict traffic

Landslide

Juliaetta is located in the bottom of the Potlatch River canyon. Large areas of landslide deposits dominate the geology around the community as a result of the movement of sedimentary materials interbedded with basalt flows.

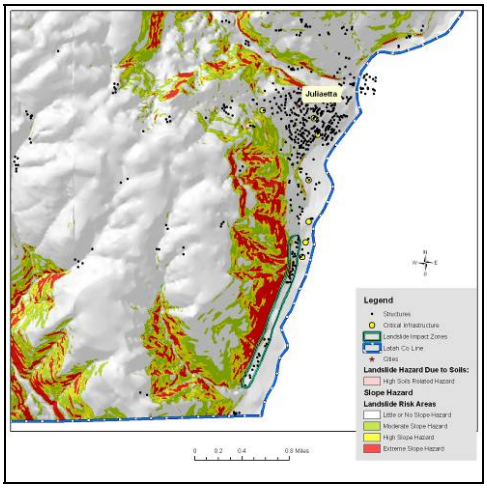
Landslides have been occurring in the Juliaetta area since ancient times. The slope instability throughout the area is evident by these types of slides. Many of the slopes and hillsides along the Potlatch River and in the vicinity of Juliaetta are comprised by material deposited by past landslides. Location 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.[57]

McGary Road Slide in 1998

Past landslide activities include one that occurred in 1998 on the McGary Road and one just east of Juliaetta north of Highway 3. The McGary Road Slide (Nez Perce County just south of Juliaetta) was due to natural springs in the hillside and the configuration of the road. The McGary Road Slide destroyed a mobile home in its path and injured the two residents inside. This same section above the road slid again in 1999 when the ground again became saturated and unstable despite reconstruction efforts that recontoured McGary Road after the slide in 1998.

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



Juliaetta Landslide Impact Zone

Poorly sorted material deposited during debris flow events is also present in alluvial fans in the Juliaetta area. These deposits are at the mouths of steep chutes and small canyons along the breaks of the Potlatch River 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 events 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.

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

The Juliaetta Landslide Impact Zone encompasses a small population cluster at the base of the steep canyon wall. The structures within this Zone have a moderate risk of experiencing landslide 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:

- The homes and infrastructure north and south of Highway 3.
- Homes located along McGary Grade (Nez Perce County).

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

The 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.

Value of Resources at Risk

Slides in the identified Juliaetta 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 12 improvements with a total value of $856,166 within the Impact Zone as well as a section of State Highway 3. 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, proximity to Highway District shop, and whether the slide occurred on the cut or 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 estimate; thus, no repair costs for damaged roadways are given.

Severe Weather

The city of Juliaetta is less impacted by weather extremes than the majority of Latah County. Due to its lower elevation and location in a protected canyon, this area does not typically receive significant snow accumulations or high wind events. Juliaetta does not have any differing level of risk associated with thunderstorms, hail, or drought than Latah County as a whole.

Value of Resources at Risk

Thunderstorms are not likely to be severe enough in Juliaetta to cause significant damages. However, the loss potential from flooding that 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 Juliaetta. 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 Juliaetta 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.

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 Juliaetta 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.

Wildland Fire

The community of Juliaetta is located within the steep Potlatch River canyon along the southern boarder of Latah County. Deeply incised canyons carved by the Potlatch River and smaller creeks and drainages are the dominant landscape feature of the area. The Potlatch River serves as the boarder between Latah County and Nez Perce County to the east. Highway 3 provides the primary access to Kendrick from Deary and continues south through Juliaetta, joining with Highway 12 downstream at the Clearwater River. Highway 99 also provides access from Troy. Both Highway 3 and 99 descend steep grades from the Prairie Steppe region above into the deep canyon carved by the Potlatch River. Other drainages that join the Potlatch from the north include Bear Creek in the Kendrick area and Middle Potlatch Creek and Little Potlatch Creek in the Juliaetta area. These drainages have carved steep canyons through the underlying basalt as well, giving the area its deep canyon landscape.

The intersections of the Potlatch River and smaller feeder drainages create multiple aspects with very steep slopes. Most areas have some southerly aspect, resulting in hot, dry environmental conditions. The thin soils in the area also have very low moisture retention ability, resulting in dry vegetative species composition. The combination of steep slopes, south aspects and xeric species composition result in a landscape that is very fire prone.

Vegetation is dominated by short grasses with scattered timber on the driest sites, with an increasing tree and shrub component on hard east or northeast aspects and along creek drainages. These fuels can best be described as short grass or grass and timber. These fuels become available to burn early in the year due to the dry nature of the area. The steep slopes lead to increased rates of spread and increased intensities. However, these light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

Fuels in the more heavily timbered areas where light grass and shrub surface or pine litter are the primary carrier under open pine stands comprise the fuel bed. Fires in these fuel types are generally surface fires that burn with low to moderate intensities. However intensities increase dramatically when burning on steep slopes such as those in the Kendrick-Juliaetta area or when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities, with torching, mid to long-range spotting.

The homes and businesses immediately adjacent to the Highway 3 corridor are at low risk to wildland fire. Generally, these structures are surrounded by urban landscaping, with the dry, xeric slopes behind and leading away from the community centers. Fires starting low on the steep slopes would quickly spread up and away from most homes and businesses.

However, homes on midslope locations are at a much elevated risk. This is particularly true in the Juliaetta area where multiple homes have been built high above the valley on the South Grade and Dennler Loop Roads and the American Ridge Road. Fires originated below the steep slopes leading to homes in these areas would burn with very rapid rates of spread and at high intensities. Without adequate defensible space and use of fire retardant building materials these homes would be at a significantly elevated risk of loss.

Roads in this area are quite steep, although they appear to be wide enough to accommodate most emergency traffic. The road network in the area does provide for an alternative escape route to the north in the event an escape to the south was compromised. However, the available roads are steep with many switchbacks, slowing egress.

Structural protection for Juliaetta is provided by the Juliaetta Fire Department. There is no rural structural fire protection in this area; however, the Ponderosa Area of the Idaho Department of Lands provides wildland fire protection.

Value of Resources at Risk

It is difficult to estimate potential losses in Juliaetta 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, particularly those located midslope, would have the highest risk due to their adjacency to flashy fuels and the probability that a fire would move rapidly uphill.

Extended Power Outage

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

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Juliaetta, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Juliaetta. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

City of Potlatch Annex

Flood

The community of Potlatch is located approximately 17 miles north of Moscow near the intersection of Highway 6 and U.S. Highway 95. The Palouse River flows along Potlatch's southern and western boundary, but the River's floodplain does not directly impact any structures or critical infrastructure within the city limits. However, during the 1996-97 flood events, floodwaters overtopped the Highway 6 near its intersection with U.S. Highway 95 cutting off the community's primary access route. This is type of event is likely to occur again at this location.

Additionally, the city's sewer lagoons have been damaged by floodwaters in the past. Potlatch is currently working on a bank stabilization project that will reinforce the lagoons. As part of this project, the city is also replacing a very old sewer line that goes under the Potlatch River.

Value of Resources at Risk

Potlatch currently has no resources at risk from flood events. However, the city is working on two annexation projects that may incorporate approximately 320 and 30-50 additional acres, respectively, into the city limits. The larger of these projects will include a significant amount of land that is in the floodplain.

Landslide

The city of Potlatch has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 15%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Potlatch. Small slumps may occur along Highway 6 or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Potlatch does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, Potlatch currently has very little built infrastructure designed to channel stormwater. Over the years, stormwater runoff has created gullies and ditches along some of the city streets. Because much of Potlatch is located on a hillside, stormwater can be very problematic.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Potlatch. 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. Potlatch 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 Potlatch to cause significant damages. However, the loss potential from flooding that 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 Potlatch. 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 Potlatch 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 Potlatch 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, there are 392 total assessed improvements in Potlatch with a total value of approximately $27.3 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $409,606. The estimated damage to roofs is approximately $58,800.

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

The city of Potlatch 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.

Wildland Fire

The community of Potlatch is located on Highway 6, east of Highway 95 in the Palouse River valley. The valley continues to broaden to the west from Princeton toward Potlatch and Onaway. The topography of much of the surrounding area is gentle to rolling, particularly toward the west end of the Palouse valley near Highway 95. This makes much of the area well-suited to agricultural production. There are a number of timbered stringers that run from the outskirts of town south toward Moscow Mountain and the Palouse Range. These stringers intermix with the agricultural land before transitioning to pine and fir forest on the flanks of the Palouse Range.

The fuels immediately adjacent to Potlatch and Onaway are primarily agricultural, with very little wildland fuel in the vicinity. The availability of these agricultural lands to burn is seasonally dependent, with live crop moisture remaining high into mid July. Once cured, grain crops such as wheat become available to burn. These fuel types have the potential to burn at high intensities with very rapid rates of spread. However the light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

Fuels in the timbered stringers can be described as open pine stands. Fires in this fuel type are generally surface fires that burn with low to moderate intensities. However intensities increase dramatically when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities with torching, crowning, and long-range spotting.

The majority of homes and structures in the Potlatch-Onaway vicinity are at low risk of loss to wildland fire. The prevalence of developed agricultural land and grass fuels pose a low threat to homes surrounded by these fuels during most periods of the year. Risk does increase toward late summer and fall as crops cure and become available to burn. However, there are generally few homes that would be threatened in the event of an agricultural fire.

There is scattered development outside the community, particular along Rock Creek Road, East Rock Creek Road, and Dobyn Lane. Additionally, some of the area the city is considering annexing for residential

development is located on a forested hillside south of the town. Homes' defensibility in these areas could be further augmented, although there are generally few highly hazardous areas.

There are 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, or by 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. In most cases, maintaining a clean and green lawn or clearing weeds and grasses away from structures is sufficient for protection in lighter fuels. However, 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.

Similarly, there is very little threat to the infrastructure serving the area. Highway 6 and Highway 95 are the primary access. Additionally, there are a number of secondary routes throughout the area that would provide adequate escape routes in the event of a large wildland fire. The potential for these routes to be compromised for any duration due to wildland fire is very low.

Fire protection in Potlatch is provided by the Potlatch Rural Fire District. Wildland fire protection is provided by the Idaho Department of Lands, Ponderosa District located in Deary.

Value of Resources at Risk

It is difficult to estimate potential losses in Potlatch 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 flashy fuels.

Extended Power Outage

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

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Potlatch, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Potlatch. This would cost the power companies millions to replace depending on the scale of

the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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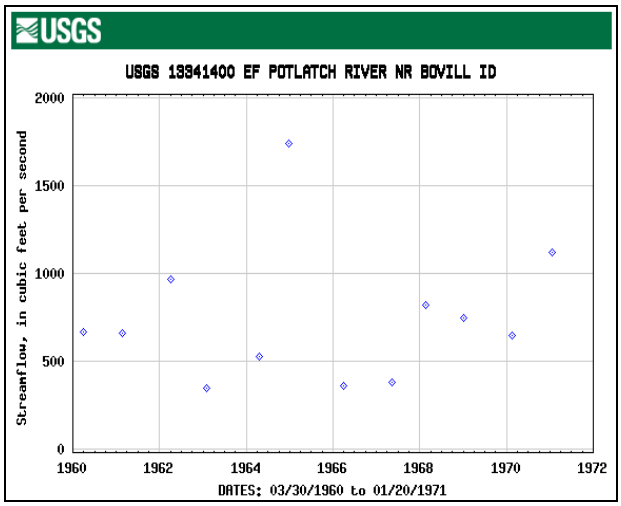
City of Bovill Annex

Flood

Bovill is located approximately 8 miles northeast of Deary at the intersection Highway 8 and 3. The major flood plain affecting Bovill is from the Potlatch River. Geographically Bovill lies in a full floodplain that slows the river's flow southward toward Kendrick, which has historically resulted in large amounts of floodwater on the surrounding riparian area and western edge of town. The Potlatch River drains approximately 41.6 square miles.

The United States Department of Geological Services (USGS) established a surfacing monitoring station along the Potlatch River near Bovill from 1960 to 1971. Peak stream flows from 1960 to 1971 exceeded 1,740 cubic feet per second and had a maximum gage height of 8.19 feet. Gage height is the height of the water surface above the gage datum (zero point).



The United States Department of Geological Services (USGS) established a surfacing monitoring station along the Potlatch River near Bovill from 1960 to 1971. Peak stream flows from 1960 to 1971 exceeded 1,740 cubic feet per second and had a maximum gage height of 8.19 feet. Gage height is the height of the water surface above the gage datum (zero point).

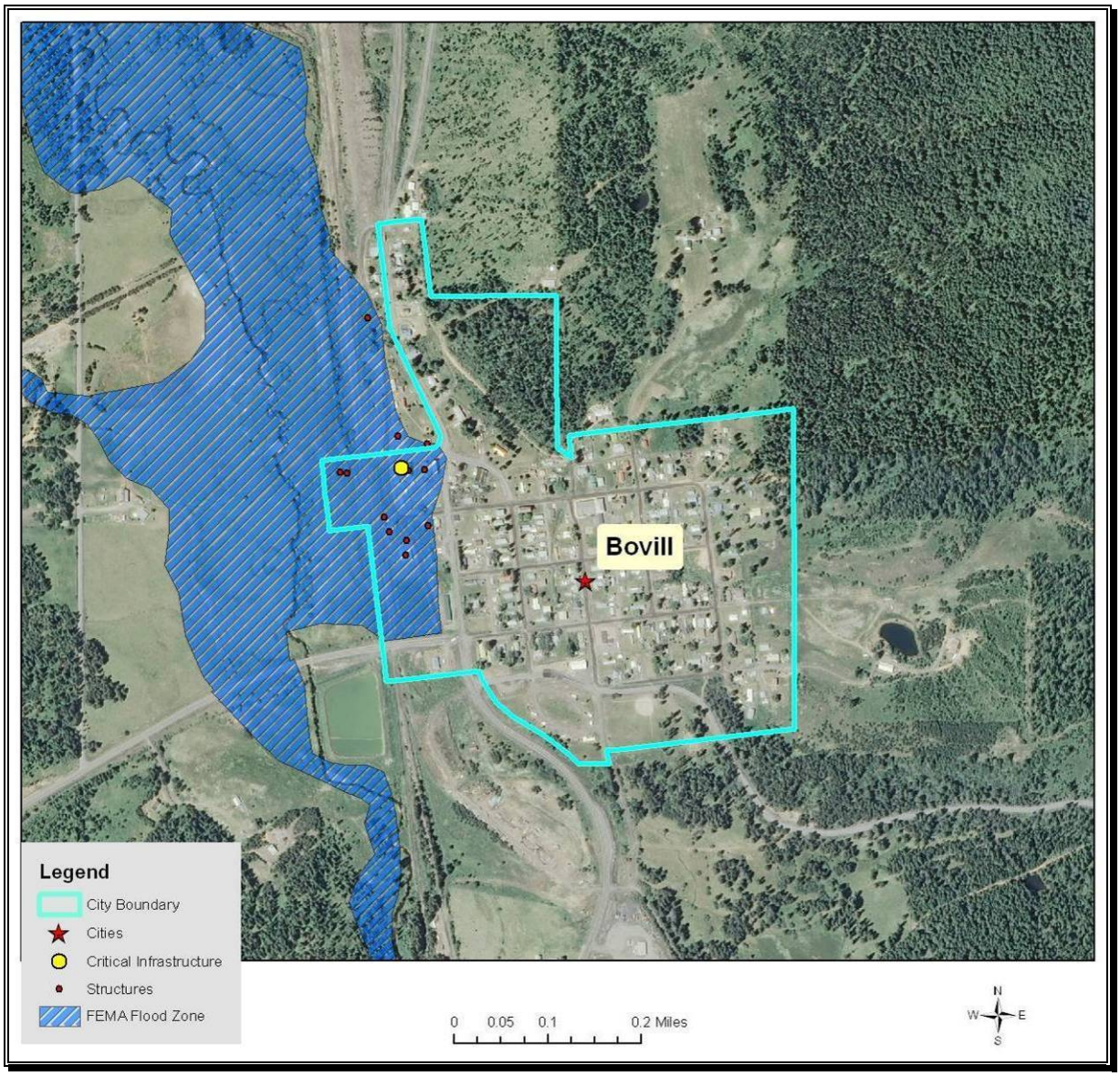
The topography of Bovill is moderate to steep sloped mountainous terrain. Steep canyons and ravines exist within this portion of the County. The west end of town has very little elevational change until you cross First Street. East of First Street, there is a gentle slope eastward. Most of the commercial zone of the town is located within the floodplain.

The primary access into Bovill is by U.S. Highway 8 and 3. Highway 8 enters the town from the west from Deary and then south from Elk River. Highway 3 enters Bovill from the north from Clarkia. Sections of these roadways are within the floodplain of the Potlatch River and could become impassable during a flood event. If the bridge across the Potlatch River is compromised, then the only access routes would be from Clarkia and Elk River. Clarkia and Elk River are under-developed communities which do not have many available services. All of the potential access routes to and from Bovill dip in and out of small drainages and cross small streams that may also prove impassable in major flood events.

Most residences in Bovill are connected to the municipal water system or have drilled personal wells. City wells are located within the flood plain, while storage tanks are located east of town outside of the floodplain. The cities ability to provide clean drinking water during flood events may be compromised.

No engineered flood control devices exist on the Potlatch River, although the railroad grade does act as a levee during some flooding events. However, during high water flows, the railroad grade is not high enough to protect the entire community.

Figure 5.7. FEMA Flood Insurance Rate Map for Bovill, Idaho.



The location of the town site in the "saucer-like" floodplain guarantees periodic flood impacts. The residents of Bovill have long recognized their vulnerability to flood. Residences in the Bovill area have a high risk of experiencing smaller periodic floods as well as catastrophic flooding during base flood events.

February 1996 Flooding – Bovill experienced considerable damages during the February 1996 flood event. Much of the downtown area and sections of the highway were underwater. Additionally, the wastewater treatment facility was flooded causing contamination of the water system. This affected the downstream communities of Juliaetta and Kendrick as well. Several days after the flood crested, the Washington Water Power station started leaking natural gas due to the vent pipe being underwater.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 12 improvements within the FEMA-identified floodplains (100- and 500-year) in Bovill, yielding an estimated total improvement value of $282,291. There are currently to repetitive loss properties in Bovill. 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 $141,145 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 only 2 NFIP policies in Bovill.

Critical infrastructure located within the identified floodplain for Bovill includes only the fire station. Bridges, roads, commercial district, cities water well, and the city's water treatment plant is the most affected infrastructure in Bovill during flood events. If the Potlatch River Bridge is compromised restricted travel corridors will effected the major industries in the area. There are a number of log trucks and chip trucks that travel through Bovill on a daily basis to deliver products to local mills. Historically there has been little long term flood damage to the road system in the Bovill area.

Landslide

The city of Bovill has a low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 35%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Bovill. Small slumps may occur along Highway 3, Highway 8, or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Bovill does not have any differing levels of risk associated with this hazard than Latah County as a whole. Snow accumulations in this part of the County will likely be greater due to the higher elevation.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Bovill. 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. Bovill 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 Bovill to cause significant damages. However, the loss potential from flooding that 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 Bovill. 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 Bovill 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 Bovill 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, there are 196 total assessed improvements in Bovill with a total value of approximately $5 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $74,431. The estimated damage to roofs is approximately $29,400.

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. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

The city of Bovill 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.

Wildland Fire

The community of Bovill is located at the junction of Highway 8 and Highway 3 in west central Latah County. Bovill sits in the wide flood plain of the Potlatch River, surrounded by forestland that has historically sustained this community. Much of forestland surrounding Bovill is privately owned and managed for timber production. Past harvest activities have broken fuel continuity across the landscape, creating a mosaic of age classes throughout the forest.

The community of Bovill itself sits in a large, wide meadow created within the flood plain of the Potlatch River. Very few wildland fuels directly abut the homes or structures. Streets and green lawns are the primary feature within the community center, with very little potential for wildland fire to move from outside the community into populated areas.

Dense stands of Douglas-fir and grand fir mix with western larch in close proximity to the community. The forest type surrounding Bovill is quite moist, only becoming available to burn during late summer. In areas with few surface fuels, fires typically spread slowly and burn at relatively low intensities. However during extreme fire weather conditions fires in these fuels can erupt into stand replacing, high intensity wildland fires. In such a case wooden structures in Bovill may be at some risk from spotting and radiant heat. However, it is likely that a fire would be traveling away from the community.

Fires in grassy riparian area near town typically burn rapidly and at high intensities, however the resonance time is low and burned areas cool quickly after passage of the fire front.

Homes and businesses within the community of Bovill are at low risk to wildland fire. Although forest land is in close proximity to the community, it does not abut the community. Homes on the periphery would be at highest risk in the event of a large wildland fire. The homes within the community are well protected by residential landscaping, streets and other characteristics associated with the urban landscape. The community is located in a flat area, and city streets are well maintained.

There is little infrastructure in the community that is at risk to wildland fire. It is very likely that main travel routes would be jeopardized in the event of a fire in the area, but escape routes are available in multiple directions.

Structural fire protection is provided by the Bovill Fire Protection District. The community is serviced by a hydrant system and the Potlatch River is in close proximity, providing ample water resources.

Wildland fire protection is provided by the Ponderosa Area of the Idaho Department of Lands and the Clearwater-Potlatch Timber Protection Association in Elk River, Idaho. The relatively close proximity of the Ponderosa District and the Clearwater-Potlatch Timber Protective Association provides quick initial attack response to wildland fires in the area.

Value of Resources at Risk

It is difficult to estimate potential losses in Bovill 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.

Extended Power Outage

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

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Bovill, but these events are costly. Power outages 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.

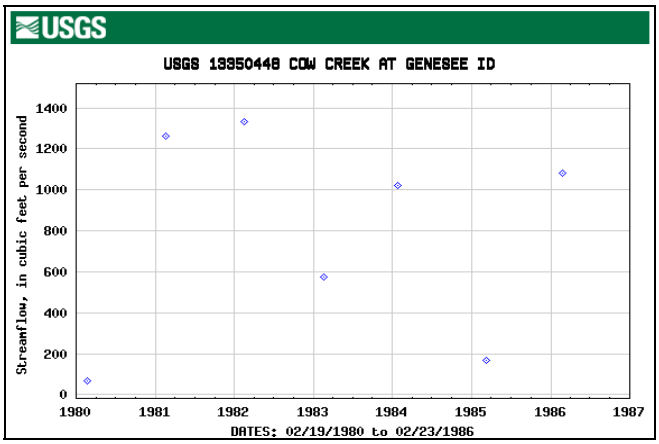
Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Bovill. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor’s data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

City of Genesee Annex

Flood

Genesee is located approximately 14 miles south of Moscow, lying just east of Highway 95. The major floodplain affecting Genesee is Cow Creek. 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 Genesee occur when significant snow pack exists within the Cow Creek watershed. 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 that are typified by intense rain fall in a localized area. This type of flooding occurs rapidly overwhelming the water carry capacity of Cow Creek in a relatively short time.



The United States Department of Geological Services (USGS) established a surfacing monitoring station in Cow Creek from 1980 to 1986. The monitoring station was located near the city of Genesee. Peak stream flows from 1980 to 1986 exceeded 1,330 cubic feet per second and had a maximum gage height of 16.62 feet. Gage height is the height of the water surface above the gage datum (zero point).

Cow Creek enters the northeast corner of town flowing under Chestnut Street and Laurel Street before exiting the southwest portion of town near the city's sewer ponds. Both bridges seem to be able to withstand minor periodic flooding, but may back water up during the catastrophic flooding event. No dikes or levees have been built along the creek to contain flood waters.

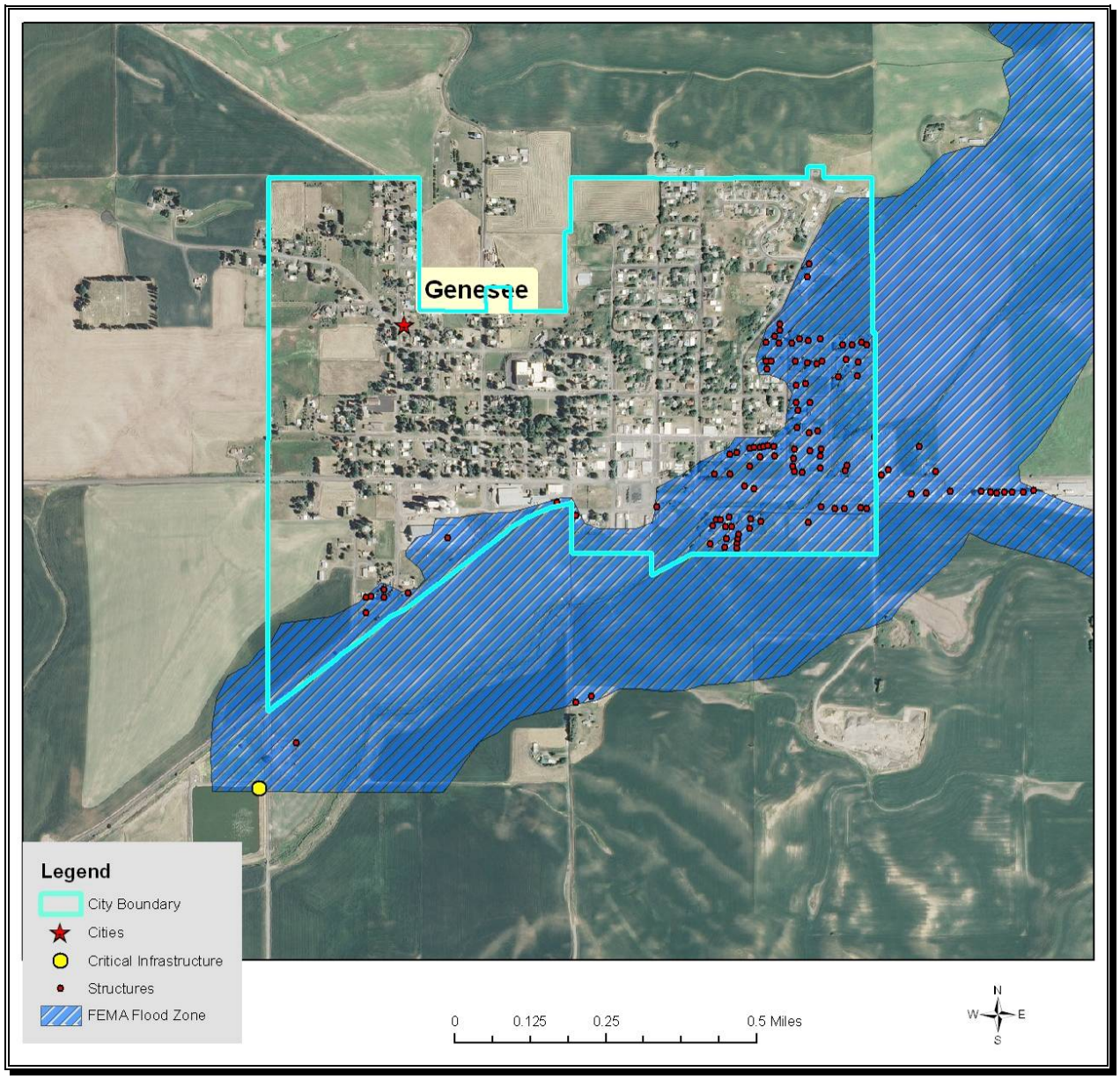
The major impacts from both types of flooding in Genesee are the restricted use of several streets in the eastern portion of town. The bridges on Chestnut Street and Laurel Street restrict water, which causes floodwaters to backup in the adjacent riparian area, streets, and residential area.

2010 Cow Creek Flooding – Heavy rain and rapid snow melt over frozen ground in the Cow Creek drainage basin caused considerable impact on the community of Genesee. On January 5th, 2010 diminished channel capacity from siltation and sod accumulation overtime caused major overbank flooding upstream of the Chestnut Street Bridge. City employee and equipment costs, equipment repairs and materials, and damage claims totaled $10,743.36. Restoration of Cow Creek and mitigation estimates totaled $89,243.36 for channel cleaning and hydroseeding and dike construction.

The topography of Genesee is typical of a Palouse agricultural community. The town is located in a rolling, open prairie which provides for some elevation change. The FIRM maps show a very wide, but generally shallow floodplain. Several grain elevators, fuel stations, a manufacturing plant, and various other businesses operate within the floodplain. The construction of homes and other structures continue in the

flood plain. Several newer manufactured homes and stick built homes have been constructed or placed well inside the floodplain. Newer homes in the area appear to have elevated first floors, raising the living area above the flood level and do not appear to have basements. Several new streets have also been built within the floodplain since the FIRM maps were developed. The primary access into Genesee is via U.S. Highway 95, the main route connecting north and south Idaho. Highway 95 has been compromised in the past by Cow Creek floodwaters.

Figure 5.8. FEMA Flood Insurance Rate Map for Genesee, Idaho.



Most residences in Genesee are either connected to the municipal water system or have personal wells drilled. One city well is located within the floodplain, while the other well and the water storage tanks are located outside of the floodplain. Genesee's water storage tanks (2 tanks) contain 550,000 gallons of water

resulting in 2 to 3 days of normal use if the city lost power due to a flooding event. The cities ability to provide clean drinking water during flood events may be compromised.

Residences in the Genesee area have moderate risk of experiencing major flood damage or long term disruption of business. Flood impacts are mainly limited to disruption of road travel and limited localized flooding of structures.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 61 improvements within the FEMA-identified floodplains (100- and 500-year) in Genesee, yielding an estimated total improvement value of $6.5 million. There are currently no repetitive loss properties in Genesee. 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 $3.2 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 only 15 NFIP policies in Genesee.

Cow Creek Flooding in 2010

Critical infrastructure located within the identified floodplain for Genesee includes the sewage treatment facility. Roads, bridges, one water well, and housing developments are the most affected infrastructure in Genesee during flood events. Historically, there has been little long term damage to the road systems in the community

Landslide

The city of Genesee has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 15%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Genesee. Small slumps may occur along secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Genesee does not have any differing levels of risk associated with this hazard than Latah County as a whole.

February 2008 Winter Storm – Due to heavy snow falls in previous weeks and additional snowfall forecasted, Latah County declared a state of disaster in early February 2008. Latah County and several area communities were overwhelmed with snow removal from public facilities and streets. Genesee received funding for snow removal assistance in the amount of $3,016.25.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Genesee. 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. Genesee 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 Genesee to cause significant damages. However, the loss potential from flooding that 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 Genesee. 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 Genesee 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 Genesee 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, there are 447 total assessed improvements in Genesee with a total value of approximately $37.7 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $565,720. The estimated damage to roofs is approximately $67,050.

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. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

The city of Genesee 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.

Wildland Fire

The community of Genesee is located in the south western portion of Latah County, on the Nez Perce-Latah County line just to the east of Highway 95. Aside from the concentration of homes within the community's boundaries, there are many homes scattered throughout the rural areas of this town. Genesee is surrounded entirely by agricultural fields, with little native vegetation in the vicinity. The few patches of timber in the area are usually associated with home sites and pose very little direct threat to homes and resources within the area.

Genesee lies in the vegetative ecosystem known as the "Palouse Prairie" community and is characterized by rolling hills, deep soils, and a mild climate. The landscape surrounding Genesee has been almost completely developed for agricultural purposes, primarily the production of winter wheat with various rotation crops. The principal vegetation in non-agriculturally developed areas is Idaho fescue, bluebunch wheatgrass, prairie junegrass, and various wildflowers. Short shrubs, especially snowberry and wild rose, are also common in more sheltered areas.

Before the development of agriculture and other land uses, the Palouse Prairie Bioregion had a rich fire history, with relatively frequent fires. Agricultural practices surrounding rangeland communities like Genesee 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.

The majority of homes and structures in the Genesee vicinity are at low risk of loss to wildland fire. The prevalence of developed agricultural land and grass fuels pose a low threat to homes surrounded by these fuels. 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, or by 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. In most cases, maintaining a clean and green lawn or clearing weeds and grasses away from structures is sufficient for protection in lighter fuels. However, 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.

Similarly, there is very little threat to the infrastructure serving Genesee. Highway 95 is the primary access route to the community. Additionally, there are a number of secondary routes throughout the area. The potentially for these routes to be compromised for any duration due to wildland fire is very low.

Structural fire protection in the area is provided by the Genesee City and Rural Fire Department. These fire departments provide quick response for emergencies in the area. Wildland fire protection is provided by the Genesee Rural Fire Department.

Value of Resources at Risk

It is difficult to estimate potential losses in Genesee 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 have considerable 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 flashy fuels.

Extended Power Outage

The city of Genesee does not have any differing levels of risk associated with this hazard than Latah County as a whole. Genesee's water storage tanks (2 tanks) contain 550,000 gallons of water resulting in 2 to 3 days of normal use during a power outage.

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Genesee, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Genesee. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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City of Kendrick Annex

Flood

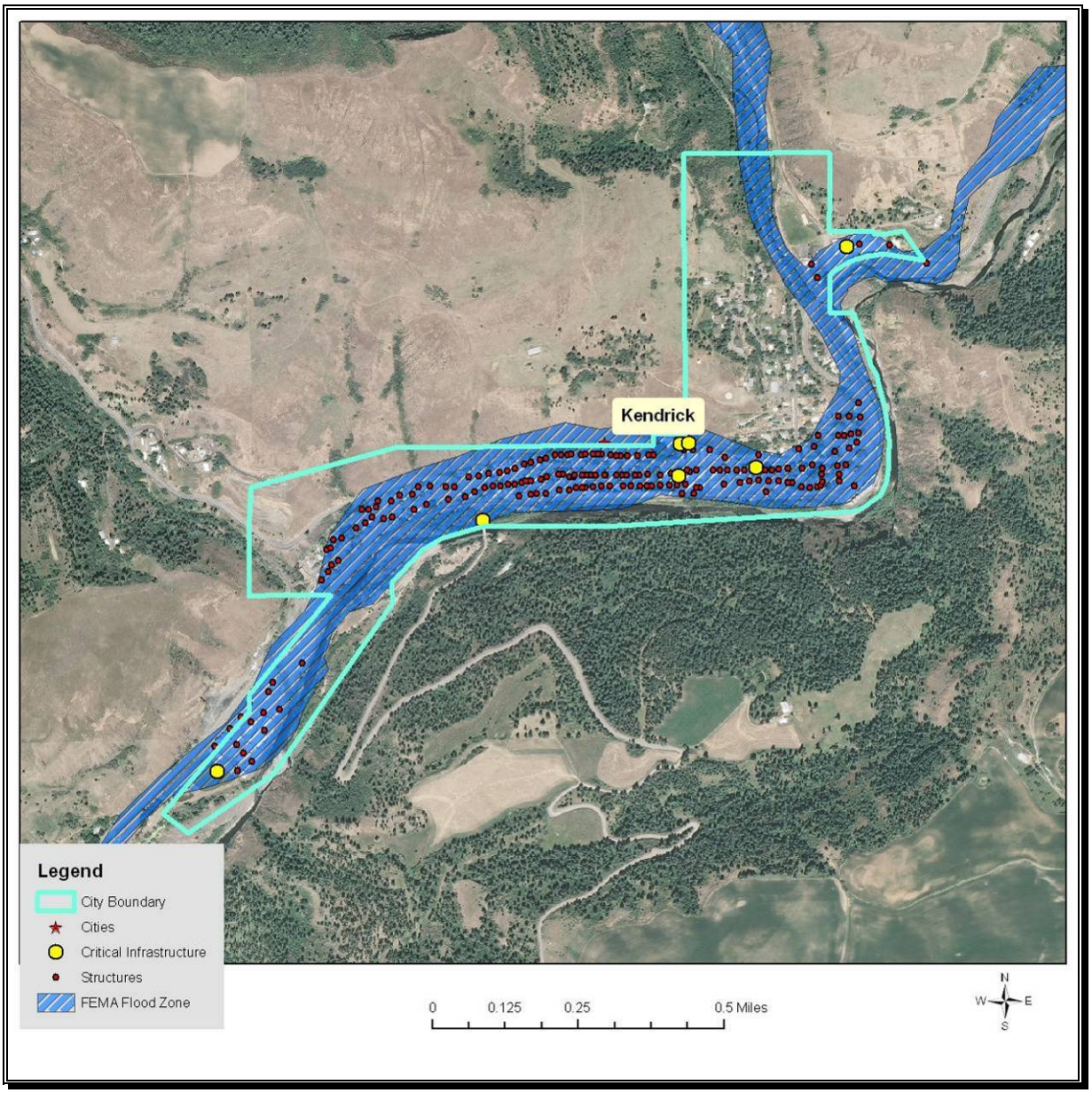
Kendrick is located in a deep gorge on the northern banks of the Potlatch River and the western banks of Big Bear Creek. These two water bodies drain several hundred square miles. Nearly the entire community is located in the floodplain. Floods in the area are generally the result of rain-on-snow events. Warm rains falling on the snow pack result in a significantly increased rate of snowmelt. Often the melting occurs when the ground is frozen and the water cannot be absorbed fast enough, resulting in increased overland flows. Flood waters recede slowly as the weather events tend to last for several days and it takes a long time to drain this huge watershed. Thunderstorms may also affect the community. These events are usually typified by intense rain fall in an area and flooding occurs rapidly, overwhelming the carrying capacity of the nearby streams and rivers.

February 1996 Flooding – Kendrick experienced considerable damages during the February 1996 flood event, particularly to roadways, bridges, the dike, and individual homes. Highway 3 was washed out effectively cutting both Kendrick and Juliaetta off from Lewiston. Due to water contamination caused by Bovill's wastewater treatment facility being flooded, both Kendrick and Juliaetta had to boil their drinking water for two days. Some of the flooding problems occurred due to hydrologic pressure. The water was filtering through the soil under the levee and coming up through the ground in several places within the community. There are no mitigation measures to reduce this type of flooding.

The United States Department of Geological Services (USGS) established a surfacing monitoring station in the Potlatch River from 1945 to 1970. Peak stream flows from 1945 to 1970 exceeded 16,000 cubic feet per second and had a maximum gage height of 13.7 feet. Gage height is the height of the water surface above the gage datum (zero point).

The primary access routes into Kendrick are State Highways 3, 99, and Cavendish Road from the south. All of the community's access roads dip in and out of small drainages and cross small streams that may prove impassible in major flood events.

Figure 5.9. FEMA Flood Insurance Rate Map for Kendrick, Idaho.



Most residents of Kendrick are connected to the municipal water system or have drilled personal wells. Two of the three wells in town are located within the flood plain. The third well, as well as the water storage tank are located outside of the flood plain. Kendrick has the ability to store 225,000 gallons of water, which could support approximately 3 days of water to the town if power was lost due to a flood event. The cities ability to provide clean drinking water during flood events may be compromised.

Flood protection in Kendrick is provided by the levee built by the Army Corps of Engineers c in the 1930s. The levee runs along the northern banks of the Potlatch River to the bridge near the high school stretching 1,200 feet. The construction of this levee significantly reduced the periodic flood events, but has not completely reduced the risk of the catastrophic flood events. The levee was breached in 1974 resulting in the Corp reconstructing 1,100 feet of the levee. Due to the construction of the levee, stormwater flow

often backs up into streets and residences. Some pump systems are placed in these areas to pump the excess water out of the area.

Residents in the Kendrick area have a moderate risk of experiencing smaller periodic floods and a high risk of catastrophic flooding during base flood events if the levees along Potlatch River are breached.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 129 improvements within the FEMA-identified floodplain (100- and 500-year) in Kendrick, yielding an estimated total improvement value of $7.9 million. There are currently no repetitive loss properties in Kendrick. 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 $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 only 2 NFIP policies in Kendrick.

Critical infrastructure located within the identified floodplain for Kendrick includes the fire station, city hall, the medical clinic, the high school, the wastewater treatment facility, Sperry Grade Bridge, and the TDS telephone communications office.

Landslide

Kendrick is located in the bottom of the Potlatch River canyon. Large areas of landslide deposits dominate the geology around the community as a result of the movement of sedimentary materials interbedded with basalt flows.

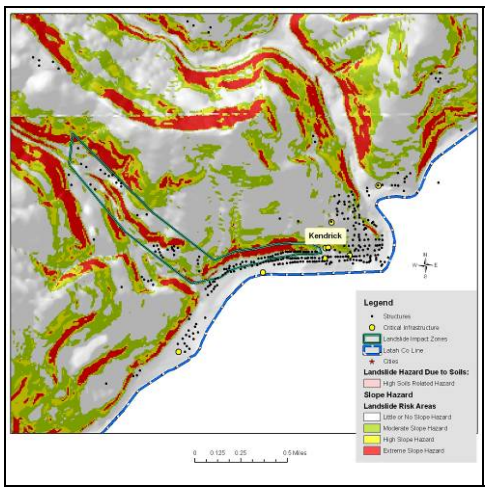
Landslides have been occurring in the Kendrick area since ancient times. Although recent years have not seen a high level of activity, the slope instability remains. Many of the slopes and hillsides along the Potlatch River and in the vicinity of Kendrick are comprised by material deposited by past landslides. 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.[58]

The Idaho Geological Survey has aggressively been mapping surficial geologic features along the Potlatch River. These maps provide valuable information for private and public land planning by identifying areas of unstable geologic formations. This work indicates that there are numerous visible landslide blocks on many

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

of the steep slopes above the community of Kendrick and in the Potlatch River drainage. The presence of these landslide blocks is a strong indicator of possible landslide activity in the future.

Poorly sorted material deposited during debris flow events is also present in alluvial fans in the Kendrick area. These deposits are at the mouths of steep chutes and small canyons along the breaks of the Potlatch River 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 events 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.



Kendrick Landslide Impact Zone

The Kendrick Landslide Impact Zone encompasses a small population cluster at the base of the steep canyon wall on the north side of town and along Highway 99. The structures within this Zone have a moderate risk of experiencing landslide 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:

- The homes and infrastructure north and south of Highway 3.
- Homes and infrastructure along Highway 99.
- Homes located up Cedar Ridge Road.

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

The 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.

Value of Resources at Risk

Slides in the identified Kendrick 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 73 improvements with a total value of $2 million within the Impact Zone as well as a sections of State Highways 3 and 99. 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, proximity to Highway District shop, and whether the slide occurred on the cut or 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 estimate; thus, no repair costs for damaged roadways are given.

Severe Weather

The city of Kendrick is less impacted by weather extremes than the majority of Latah County. Due to its lower elevation and location in a protected canyon, this area does not typically receive significant snow accumulations or high wind events. Kendrick does not have any differing level of risk associated with thunderstorms, hail, or drought than Latah County as a whole.

Value of Resources at Risk

Thunderstorms are not likely to be severe enough in Kendrick to cause significant damages. However, the loss potential from flooding that 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 Kendrick. 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 Kendrick 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.

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 Kendrick 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.

Wildland Fire

The community of Kendrick is located within the steep Potlatch River canyon along the southern boarder of Latah County. Deeply incised canyons carved by the Potlatch River and smaller creeks and drainages are the dominant landscape feature of the area. The Potlatch River serves as the boarder between Latah County and Nez Perce County to the east. Highway 3 provides the primary access to Kendrick from Deary and continues south through Juliaetta, joining with Highway 12 downstream at the Clearwater River. Highway 99 also provides access from Troy. Both Highway 3 and 99 descend steep grades from the Prairie Steppe region above into the deep canyon carved by the Potlatch River. Other drainages that join the Potlatch from the north include Bear Creek in the Kendrick area and Middle Potlatch Creek and Little Potlatch Creek in the Juliaetta area. These drainages have carved steep canyons through the underlying basalt as well, giving the area its deep canyon landscape.

The intersections of the Potlatch River and smaller feeder drainages create multiple aspects with very steep slopes. Most areas have some southerly aspect, resulting in hot, dry environmental conditions. The thin soils in the area also have very low moisture retention ability, resulting in dry vegetative species composition. The combination of steep slopes, south aspects and xeric species composition result in a landscape that is very fire prone.

Vegetation is dominated by short grasses with scattered timber on the driest sites, with an increasing tree and shrub component on hard east or northeast aspects and along creek drainages. These fuels can best be described as short grass or grass and timber. These fuels become available to burn early in the year due to the dry nature of the area. The steep slopes lead to increased rates of spread and increased intensities. However, these light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

Fuels in the more heavily timbered areas where light grass and shrub surface or pine litter are the primary carrier under open pine stands comprise the fuel bed. Fires in these fuel types are generally surface fires that burn with low to moderate intensities. However intensities increase dramatically when burning on steep slopes such as those in the Kendrick-Juliaetta area or when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities, with torching, mid to long-range spotting.

The homes and businesses immediately adjacent to the Highway 3 corridor are at low risk to wildland fire. Generally, these structures are surrounded by urban landscaping, with the dry, xeric slopes behind and leading away from the community centers. Fires starting low on the steep slopes would quickly spread up and away from most homes and businesses.

However, homes on midslope locations are at a much elevated risk. Fires originated below the steep slopes leading to homes in these areas would burn with very rapid rates of spread and at high intensities. Without adequate defensible space and use of fire retardant building materials these homes would be at a significantly elevated risk of loss.

Roads in this area are quite steep, although they appear to be wide enough to accommodate most emergency traffic. The road network in the area does provide for an alternative escape route to the north

in the event an escape to the south was compromised. However, the available roads are steep with many switchbacks, slowing egress.

Structural protection for Kendrick is provided by the Kendrick Fire Department. There is no rural structural fire protection in this area; however, the Ponderosa Area of the Idaho Department of Lands provides wildland fire protection.

Value of Resources at Risk

It is difficult to estimate potential losses in Kendrick 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, particularly those located midslope, would have the highest risk due to their adjacency to flashy fuels and the probability that a fire would move rapidly uphill.

Extended Power Outage

The city of Kendrick does not have any differing levels of risk associated with this hazard than Latah County as a whole. Kendrick has the ability to store 225,000 gallons of water, which could supply approximately 3 days of water to the town if power was lost.

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Kendrick, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Kendrick. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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City of Onaway Annex

Flood

The community of Onaway is located just northeast of Potlatch in an area surrounded by agricultural fields. There is no FEMA-identified floodplain directly affecting the community of Onaway; however, a major flood event could impact Highway 6 near its intersection with U.S. Highway 95. This is the main access route to the community.

Value of Resources at Risk

Onaway has no resources at risk from flood events.

Landslide

The city of Onaway has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 15%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Onaway. Small slumps may occur along secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Onaway does not have any differing levels of risk associated with this hazard than Latah County as a whole.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Onaway. 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. Potlatch 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 Onaway to cause significant damages. However, the loss potential from flooding that 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 Onaway. 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 Onaway 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 Onaway 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, there are 114 total assessed improvements in Onaway with a total value of approximately $5.3 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $80,107. The estimated damage to roofs is approximately $17,100.

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

maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

The city of Onaway 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.

Wildland Fire

The community of Onaway is located on Highway 6, east of Highway 95 in the Palouse River valley. The valley continues to broaden to the west from Princeton toward Potlatch and Onaway. The topography of much of the surrounding area is gentle to rolling, particularly toward the west end of the Palouse valley near Highway 95. This makes much of the area well-suited to agricultural production. There are a number of timbered stringers that run from the outskirts of town south toward Moscow Mountain and the Palouse Range. These stringers intermix with the agricultural land before transitioning to pine and fir forest on the flanks of the Palouse Range.

The fuels immediately adjacent to the Potlatch and Onaway are primarily agricultural, with very little wildland fuel in the vicinity. The availability of these agricultural lands to burn is seasonally dependent, with live crop moisture remaining high into mid July. Once cured, grain crops such as wheat become available to burn. These fuel types have the potential to burn at high intensities with very rapid rates of spread. However the light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

Fuels in the timbered stringers can be described as open pine stands. Fires in this fuel type are generally surface fires that burn with low to moderate intensities. However intensities increase dramatically when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities with torching, crowning, and long-range spotting.

The majority of homes and structures in the Potlatch-Onaway vicinity are at low risk of loss to wildland fire. The prevalence of developed agricultural land and grass fuels pose a low threat to homes surrounded by these fuels during most periods of the year. Risk does increase toward late summer and fall as crops cure and become available to burn. However, there are generally few homes that would be threatened in the event of an agricultural fire.

There is scattered development outside the community, particular along Rock Creek Road, East Rock Creek Road, and Dobyn Lane. Homes' defensibility in these areas could be further augmented, although there are generally few highly hazardous areas.

There are 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, or by 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. In most cases, maintaining a clean and green lawn or clearing weeds and grasses away from structures is sufficient for protection in

lighter fuels. However, 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.

Similarly, there is very little threat to the infrastructure serving the area. Highway 6 and Highway 95 are the primary access. Additionally, there are a number of secondary routes throughout the area that would provide adequate escape routes in the event of a large wildland fire. The potential for these routes to be compromised for any duration due to wildland fire is very low.

Fire protection in Onaway is provided by the Potlatch Rural Fire District. Wildland fire protection is provided by the Idaho Department of Lands, Ponderosa District located in Deary.

Value of Resources at Risk

It is difficult to estimate potential losses in Onaway 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 flashy fuels.

Extended Power Outage

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

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Onaway, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Onaway. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

City of Troy Annex

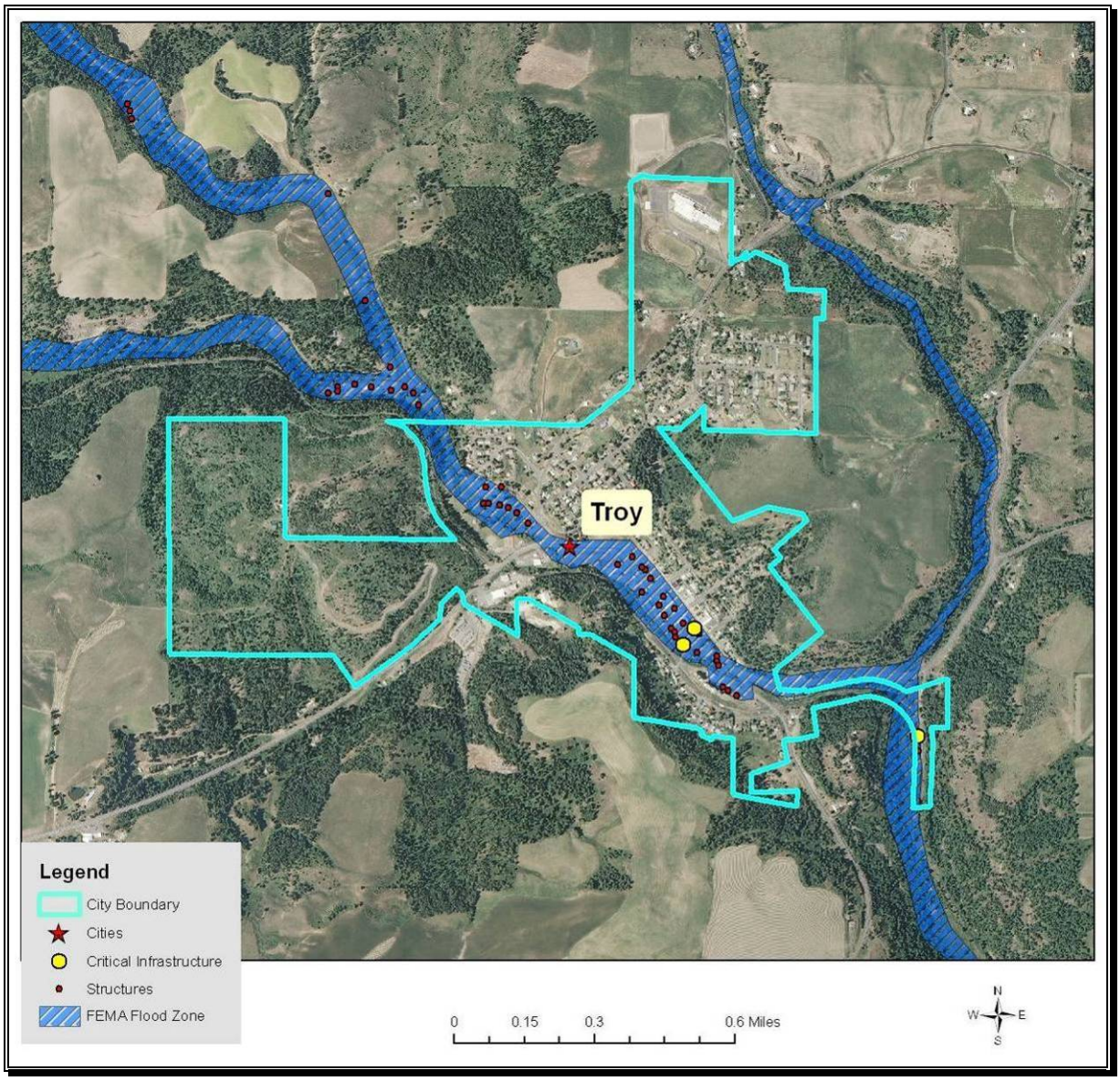
Flood

Troy is located approximately 11 miles east of Moscow. The West Fork of Little Bear Creek and its tributaries are the main source of flooding in Troy. This creek bisects the town running east to west and drains agricultural fields as well as several forested watersheds surrounding Troy.

Floods in the area are the result of rain-on-snow events. Rain-on-snow events that affect Troy occur when significant snow pack exists within the hydrologic watershed surrounding Troy. 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 have not had a significant impact on Troy historically, but are common localized events in the summer that could cause flash flooding.

Major impacts from flooding in Troy are the restricted use of Highway 8 and Highway 99. At the east end where Highway 8 and Highway 99 intersect, the bridge may back water up to grain elevators as a result of debris or ice jams. In the west part of town where Highway 8 crosses the West Fork of Little Bear Creek, traffic and water flow could also be restricted during a flood. West Fork of Little Bear Creek is heavily loaded with silt, willows, trees, shrubs, grasses, debris and trash that tend to clog and impede storm and sewer drains.

Figure 5.10. FEMA Flood Insurance Rate Map for Troy, Idaho.



At the intersection of Big Meadow Creek and Mckeehan Road, the culvert is under-sized and could result in restricted flow into the West Fork of Little Bear Creek. There are several homes above this culvert that could be impacted. Several streets and road shoulders erode under flood conditions within Troy. Many streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains.

West Fork of Little Bear Creek that runs through town crosses under main city roads and near several homes and businesses. No dikes or levees have been built along the creek to contain flood waters. There appears to be no ongoing maintenance of the creek. Big Meadow Creek north of Troy has several culverts that seem to be undersized to handle major flood events.

February 1996 Flooding – Troy experienced considerable damages during the February 1996 flood event. The culvert near the convenience store on Highway 8 was pinched causing water to backup along the Highway. The store and White Pine Café as well as the trailer court downstream incurred damages.

Value of Resources at Risk

According the Latah County Assessor's parcel data, there are 61 improvements within the FEMA-identified floodplains (100- and 500-year) in Troy, yielding an estimated total improvement value of $4.2 million. There are currently no repetitive loss properties in Troy. 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 $2.1 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 only 12 NFIP policies in Troy.

Critical infrastructure located within the identified floodplain for Troy includes the city hall and the fire station. Troy's city sewer treatment plant is also located within the floodplain, but has been elevated enough to withstand a flood event. Roads and bridges are the most affected infrastructure in Troy during flood events; however, alternative routes to all parts of town are available. Most residents in Troy are connected to the municipal water system or have drilled personal wells. City wells and water storage tanks are located outside of the floodplain. The city's ability to provide clean drinking water during flood events should not be compromised. The storage capacity of Troy's water tanks are 190,000 gallons, so this could last the town 1 to 2 days if power was lost due to a flood. Each well is run off of different power supplies (Avista/Clearwater). This may help Troy's ability to retain power unless both power providers lose power simultaneously.

Landslide

The city of Troy has a very low probability of experiencing damaging landslides. Slopes in and around the community are generally less than 35%. 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.

Value of Resources at Risk

There are no structures directly at risk from landslides within the city of Troy. Small slumps may occur along Highway 8 or other secondary roads. In many cases, this will cause temporary sediment delivery into nearby streams and plugged culverts. These types of events are cleaned up by the highway district or the city road department 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 Troy does not have any differing levels of risk associated with this hazard than Latah County as a whole.

May 1991 Tornado - A tornado event in 1991 occurred near Genesee according to local reports. There was no damage; however, the strong winds blew branches off a tree that knocked out the power to the community of Troy.

September 2003 Funnel Cloud - A funnel cloud was reported locally near Troy that pulled the roof off one barn and damaged the roof of another.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Troy. 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. Troy 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 Troy to cause significant damages. However, the loss potential from flooding that 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 Troy. 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 Troy 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 Troy 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, there are 479 total assessed improvements in Troy with a total value of approximately $32 million. Using the criteria outlined above an estimate of the impact of high winds on in the County has been made. The potential wind and tornado damage to all improvements is estimated at approximately $480,677. The estimated damage to roofs is approximately $71,850.

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. A community-based system for monitoring and assisting elderly or disabled residents should also be developed. All households should maintain survival kits that include warm blankets, flashlights, extra batteries, nonperishable food items, and clean drinking water.

The city of Troy 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.

Wildland Fire

The community of Troy is located to the east of Moscow, near the junction of Highway 8 and Highway 99. Troy sits in the West Fork Creek drainage below the meadow-steppe prairie that surrounds Moscow and Deary. Troy is surrounded by forested vegetation; however, very little of this vegetation directly infringes on the community.

The community center of Troy is surrounded by mixed species forest of Douglas-fir and grand fir, with ponderosa pine on dry south and west-facing slopes. The light grasses and needle litter surface fuels on pine dominated sites are quite fire prone, drying early in the season and remaining available to burn well into the fall. Fires in these fuel types are generally surface fires that burn with low to moderate intensities. However intensities increase dramatically when jackpots or consistent ladder fuels are encountered. Under extreme conditions, fires in these fuels can develop extremely high intensities, with torching, crowning, and long-range spotting.

The availability of agricultural lands surrounding the periphery of town to burn is seasonally dependent, with live crop moisture remaining high into mid July. Once cured, grain crops such as wheat become

available to burn. These fuel types have the potential to burn at high intensities with very rapid rates of spread. However, the light, flashy fuels burn out quickly with little residual heat following passage of the flaming front.

The overall risk to the community of Troy is quite low, with isolated areas of moderate risk outside the community center along Randall Flat Road, Dutch Flat Road, and toward Tamarack Road. Risk is elevated in these areas by lack of defensible space, poor access, and presence of dry pine fuels. However, the fuels throughout the area are scattered and could be easily mitigated by adopting a number of defensible space measures.

Risk associated with agricultural fields can easily be mitigated by creating defensible space around homes and outbuildings. Roadside ignition potential can also be reduced by creating fuel breaks of plowed dirt along farm fields where paralleled by roads.

North Idaho Cedar Products of Troy presents some unique challenges for the community. The dangers associated with cedar log decks very near the community center was demonstrated in July 2004 when a fire, possibly started by fireworks, burned a considerable volume of cedar logs. The high-intensity fire that resulted could have easily moved to the surrounding forestland had conditions been drier. This event also demonstrates how easy cedar bark and log decks ignite and the potential for incendiaries from the roadside or from firebrands generated at a distance to cause considerable loss.

There are multiple roads throughout the area that are suitable as escape routes. Most pass through agricultural land and are at very little risk of being compromised for any duration. Road segments that pass through forested areas are generally short and well-buffered, reducing the potential for compromised access.

Structural fire protection for the community of Troy is provided by the Troy Rural Fire District. The Idaho Department of Lands has equipment and responsibility for wildland fire protection in this area.

Value of Resources at Risk

It is difficult to estimate potential losses in Troy 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.

Extended Power Outage

The city of Troy does not have any differing levels of risk associated with this hazard than Latah County as a whole. The storage capacity of Troy's water tanks are 190,000 gallons, which would last the town 1 to 2 days if power was lost. Each well is run by a different power supplier (Avista/Clearwater). This will help Troy maintain a constant power supply unless both providers are down simultaneously.

May 1991 Tornado - The May 1991 tornado event occurred near Genesee according to local reports. There was no damage; however, the strong winds blew branches off a tree that knocked out the power to the community of Troy.

Value of Resources at Risk

There is no reliable estimate regarding the total costs and losses that power outages create within Troy, but these events are costly. Power outages 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.

Sections of power line could be lost during a wildland fire in Latah County, which may affect residents and businesses in Troy. This would cost the power companies millions to replace depending on the scale of the loss as well as have a dire impact on communities. This type of power outage would likely take weeks of repair and replacement work to become fully functional again.

Computer and data systems such as medical records, assessor's data, and client information may also be damaged or lost during an extended outage. Most computers have a backup power source; however, these sources are not designed to last for days. Corruption of data and files could have a long term effect on many local organizations and businesses.

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North Latah County Highway District Annex

Flood

North Latah County Highway District's maintenance facilities are located in Deary, Moscow, and Potlatch. The Moscow facility has experienced flooding with minor damage on four occasions in the last 40 years. There is typically minor to moderate damage to roads, culverts, and bridges during flood events for which the North Latah County Highway District is responsible, but these are managed as they occur.

May 2005 Flash Flood – Several residential areas as well two water and sewer districts reported damage from a flash flood in Moscow. One home was severely damaged by mud and debris, but numerous basements were flooded with water. Other damages included washed out ditch lines, driveways, and roadways. Both highway districts incurred damages as culverts were washed out and ditches were plugged with debris.

Value of Resources at Risk

The North Latah County Highway District County Road system has a high risk of being impacted by flood events, but there is minimal direct risk to District assets and resources. In past flood events, the District's response has been limited due to the lack of available rock and other repair materials. These issues are managed by finding alternative materials.

Landslide

The North Latah County Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, in the event significant landslides or small roadside slumps, the Highway District would be responsible for clearing debris from affected roadways.

Value of Resources at Risk

The North Latah County Highway District has a high risk of being impacted by landslides in Latah County. While the District, does not have any equipment or other assets directly at risk, the District will be responsible for cleanup and repair costs associated with the county road system.

Severe Weather

The North Latah Highway does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, the District is responsible for plowing snow from the County Road system. The Highway District maintains a prioritized list designating the order in which roads are cleared starting with the main arterials and ending with residential areas.

February 2008 Winter Storm – Due to heavy snow falls in previous weeks and additional snowfall forecasted, Latah County declared a state of disaster in early February 2008. Latah County and several area communities were overwhelmed with snow removal from public facilities and streets. North Latah County Highway District received funding for snow removal assistance in the amount of $40,964.24.

Value of Resources at Risk

The North Latah County Highway District has significant risk of being impacted by severe weather events due to their responsibility for the maintenance of the roads. Additionally, the District's facilities in Deary, Moscow, and Potlatch may be at risk to severe high wind events, hail damage, or significant snow accumulations. Roofing materials at each facility are rated properly for snow load to minimize risks, but there is always a potential for damage. The North Latah County Highway District has no other assets or other resources at risk to severe weather events.

Wildland Fire

The North Latah County Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, the Highway District is responsible for keeping the county roads open and may provide additional equipment and operator resources to help construct fire lines, if necessary.

Value of Resources at Risk

The North Latah County Highway District stations in Deary, Moscow, and Potlatch are not at risk to wildland fire due to their location in developed areas. This District has no other known assets or other resources at risk to wildland fires. The District has assisted local rural fire districts in wildland firefighting operations by shuttling water to the fire location, but there is no written mutual aid agreement covering this type of activity.

Extended Power Outage

The North Latah County Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole.

Value of Resources at Risk

The North Latah County Highway District does not have any assets or resources directly at risk to extended power outages; however, their day-to-day operations would be impacted due to their inability to use office equipment, pump fuel, or power some types of shop equipment needed to maintain their fleet.

South Latah Highway District Annex

Flood

South Latah Highway District's maintenance facilities are located Genesee and Kendrick. There is typically minor to moderate damage to roads, culverts, and bridges during flood events for which the South Latah Highway District is responsible, but these are managed as they occur.

May 2005 Flash Flood – Several residential areas as well two water and sewer districts reported damage from a flash flood in Moscow. One home was severely damaged by mud and debris, but numerous basements were flooded with water. Other damages included washed out ditch lines, driveways, and roadways. Both highway districts incurred damages as culverts were washed out and ditches were plugged with debris.

Value of Resources at Risk

The South Latah Highway District County Road system has a high risk of being impacted by flood events, but there is minimal direct risk to District assets and resources. In past flood events, the District's response has been limited due to the lack of available rock and other repair materials. These issues are managed by finding alternative materials.

Landslide

The South Latah Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, in the event significant landslides or small roadside slumps, the Highway District would be responsible for clearing debris from affected roadways.

Value of Resources at Risk

The South Latah Highway District has a high risk of being impacted by landslides in Latah County. While the District, does not have any equipment or other assets directly at risk, the District will be responsible for cleanup and repair costs associated with road systems.

Severe Weather

The South Latah Highway does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, the District is responsible for plowing snow from the road system. The Highway District maintains a prioritized list designating the order in which roads are cleared starting with the main arterials and ending with residential areas.

February 2008 Winter Storm – Due to heavy snow falls in previous weeks and additional snowfall forecasted, Latah County declared a state of disaster in early February 2008. Latah County and several area communities were overwhelmed with snow removal from public facilities and streets. South Latah Highway District received funding for snow removal assistance in the amount of $226,096.24.

Value of Resources at Risk

The South Latah Highway District has significant risk of being impacted by severe weather events due to their responsibility for the maintenance of the roads. Additionally, the District's facilities in Genesee and

Kendrick may be at risk to severe high wind events, hail damage, or significant snow accumulations. The South Latah Highway District has no other assets or other resources at risk to severe weather events.

Wildland Fire

The South Latah Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole. However, the Highway District is responsible for keeping the county roads open and may provide additional equipment and operator resources to help construct fire lines, if necessary.

Value of Resources at Risk

The South Latah Highway District stations in Genesee and Kendrick are not at risk to wildland fire due to their location in developed areas. This District has no other known assets or other resources at risk to wildland fires.

Extended Power Outage

The South Latah Highway District does not have any differing levels of risk associated with this hazard than Latah County as a whole.

Value of Resources at Risk

The South Latah Highway District does not have any assets or resources directly at risk to extended power outages; however, their day-to-day operations would be impacted due to their inability to use office equipment, pump fuel, or power some types of shop equipment needed to maintain their fleet.

Chapter 6

Mitigation Strategy

IN THIS SECTION:

- Plan Monitoring and Maintenance
- Prioritization of Action Items
- Latah County Annex
- City of Moscow
- City of Deary
- City of Juliaetta
- City of Potlatch
- City of Bovill
- City of Genesee
- City of Kendrick
- City of Onaway
- City of Troy
- North Latah Highway District
- South Latah Highway District

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 Latah 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.

Latah 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. It is anticipated that the research, local knowledge, and documentation of hazard conditions coalesced in this document will continue to serve as a tool for decision-makers as new policies, plans, and projects are evaluated.

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.

Plan Monitoring and Maintenance

As part of the policy of Latah 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. Latah County Disaster Services (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. Re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

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 Latah County's revised Comprehensive Plan into the action items for the regional MHMP?
- Incorporate additional hazard chapters as funding allows.
- Consider adding a section to each jurisdictions mitigation strategy titled "Ideas for Implementation" and may include a list of ideas from stakeholders on how the action could be completed if appropriate.

All meeting minutes, press releases, and other documentation of revisions should be kept on record by Latah County Disaster Services.

Five Year Re-evaluation Agenda

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 Latah County Disaster Services.

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 Latah County Disaster Services.

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. Latah 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. Latah 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 Latah County Disaster Services 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

A numerical scoring system is used to prioritize projects. This prioritization serves as a guide for the County 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. Latah County 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 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 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 180:1 would receive 6 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. Latah County is committed to implementing mitigation strategies with benefits which exceed costs. For projects which do not require financial assistance from grant programs that require this type of analysis, the County reserves 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 100 percent of the identified target population. A ranking of 5 has the potential to impact 50 percent of the identified target population, and a ranking of 0 will not impact the population. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

Property Benefit

Property benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save $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
- Medium 25-39
- Low 1-24

Project Ranking Priority Score Planning Projects

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

Jurisdictional Mitigation Strategies

Latah County Annex

Table 6.1. Latah County Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Continue to implement and develop public education programs.	Goal #1, 2, and 3 Priority Ranking: High	Partnership: North Central Idaho Fire Prevention Cooperative, Latah County Disaster Services, and local fire districts	Annual	Ongoing
	Enforce existing land use and development policies including floodplain restrictions to reduce residents' exposure to hazards.	Goal #1, 2, and 6 Priority Ranking: High	Latah County Planning and Building	Modified wording to address the root cause of the issue	Ongoing
	Continue to provide funding for signage of rural addresses and road signs.	Goal #4 and 6 Priority Ranking: High	Partnership: Latah County Commission, rural fire districts, and highway districts.	Annual	3 years
	Assess and hardwire the Latah County Fairgrounds for use with a portable generator.	Goal #4 and 5 Priority Ranking: Moderate	Latah County Disaster Services	Modified wording to be more specific	3 years
	Inspect buildings, particularly unreinforced masonry, for hazard stability.	Goal #4 and 5 Priority Ranking: Moderate	Latah County Disaster Services	Deferred due to lack of funding	Ongoing

Table 6.1. Latah County Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Continue to develop the Community Emergency Response Team program throughout Latah County by training additional volunteers.	Goal #2 and 3 Priority Ranking: Moderate	Latah County Disaster Services	Annual	Ongoing
	Continue to develop and maintain a countywide Evacuation Plan with designated routes (include main routes as well as routes in rural areas).	Goal #2 and 6 Priority Ranking: High	Partnership: Latah County Disaster Services and Idaho Transportation Department	New project	Ongoing
	Develop a plan to deal with refugees and displaced families resulting from disaster events in areas outside of Latah County.	Goal #2 and 6 Priority Ranking: Moderate	Partnership: Latah County Disaster Services and Idaho Bureau of Homeland Security	New project	Ongoing
	Continue to enhance radio availability in each fire district and improve range within the region.	Goal #2 and 5 Priority Ranking: Moderate	Latah County Disaster Services	Annual	Ongoing
	Obtain funding for mobile repeater stations with backup power sources.	Goal #1, 2, 4, and 5 Priority Ranking: High	Latah County Disaster Services and Sheriff's Office	Deferred due to lack of funding	Ongoing
	Continue to maintain a strong Local Emergency Planning Committee and Hazard Advisory Committee.	Goal #2, 3, and 6 Priority Ranking: High	Latah County Disaster Services	New project	Ongoing

Table 6.1. Latah County Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Work with the American Red Cross to update emergency shelter list and conduct field visits.	Goal #2 and 6 Priority Ranking: Moderate	Partnership: Latah County Disaster Services and American Red Cross	New project	Ongoing
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #2 and 6 Priority Ranking: High	Latah County Disaster Services and Planning and Building	Annual	Ongoing
	Improve the State Highway 9 crossing over Flat Creek.	Goal #1, 4, and 5 Priority Ranking: Low	Partnership: Latah County Disaster Services and Idaho Transportation Department	Deferred due to lack of funding	3 years
	Address the maintenance needs on the outfall culvert of the Potlatch Junction levee next to U.S. Highway 95.	Goal #1, 2, 4, 5, and 6 Priority Ranking: High	Partnership: Latah County Disaster Services and Idaho Transportation Department	New project	2 years
	Develop a site-specific plan for addressing flood fighting activities along the Potlatch Junction levee.	Goal #1, 2, and 7 Priority Ranking: High	Latah County Disaster Services	New project	1 year

Table 6.1. Latah County Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Address the Potlatch Junction levee maintenance needs cited in the September 2010 US Army Corps of Engineers Continuing Eligibility Inspection report including removal of vegetation, encroachments in the right-of-way, access improvements, animal damages, and bank stabilization needs.	Goal #1, 2, 5, and 6 Priority Ranking: High	Partnership: Latah County Disaster Services and US Corp of Engineers	New project	3 years
	Develop an inventory of all culverts, bridges, and roads to help determine maintenance priorities and road profiles that need elevated out of the floodplain.	Goal #4 Priority Ranking: High	Partnership: Latah County Disaster Services and highway districts	Modified wording to be more specific	Ongoing
	Develop a countywide safety program by assigning a designee to monitor flood conditions and maintenance of existing levees.	Goal #2 and 3 Priority Ranking: High	Partnership: Latah County Disaster Services, LEPC and US Corp of Engineers	Modified wording to be more specific	3 years
Landslide	Develop a landslide hazard identification and mitigation program and use as guidance in the development of the Latah County Comprehensive Plan.	Goal #1, 2, 3, and 6 Priority Ranking: Moderate	Latah County Commission and Planning and Building	Deferred due to lack of funding	5 years
Severe Weather	Retrofit schools and other public buildings known to have inadequate snowload resistance.	Goal #1, 4, and 5 Priority Ranking: Moderate	Partnership: Latah County Disaster Services and school districts	Deferred due to lack of funding	5 years

Table 6.1. Latah County Mitigation Strategies.					
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Wildland Fire	Develop a public education campaign specifically to provide awareness for residents in the Juliaetta and Kendrick area regarding the lack of a rural fire district and the ramifications.	Goal #2 and 3 Priority Ranking: High	Partnership: Latah County Disaster Services, cities of Juliaetta and Kendrick, and Juliaetta and Kendrick Fire Departments	Deferred due to lack of funding and local interest	3 years
	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #1, 4, and 5 Priority Ranking: High	Partnership: Latah County Disaster Services and various partners	Annual	Ongoing

Since the original document was written in 2005, Latah County has completed several of its identified action items including:

1. Latah County has adopted a more comprehensive building code ordinance as well as a rural addressing ordinance. The cities of Moscow and Juliaetta have also adopted these ordinances.
2. Latah County has funded a full time GIS position and a centralized GIS data system.
3. Latah County has developed a program to ensure that rural addresses are clearly posted to aid in emergency response.
4. Latah County received funding to purchase a generator for the Courthouse.
5. Latah County is currently in the process of updating its Comprehensive Plan, which contains provisions regarding hazard mitigation as suggested in the 2005 version of the Latah County Multi-Hazard Mitigation Plan.
6. Latah County Disaster Services has 15 trained volunteers participating in the CERT program.

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City of Moscow

Table 6.2. City of Moscow Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies including floodplain restrictions to reduce residents' exposure to hazards.	Goal #4 and 5 Priority Ranking: Moderate	Moscow City Council and Administration Department	Modified wording to be more specific	Ongoing
	Obtain funding to develop an Emergency Operations Center for the city of Moscow.	Goal #1 and 3 Priority Ranking: High	Moscow Administration and Fire Administration Departments	New project	3 years
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #1, 3, and 5 Priority Ranking: Moderate	Moscow Community Development Department	Modified wording to be more specific	Ongoing
	Continue to support programs that address bank stabilization and channel restoration, particularly within the identified floodplain.	Goal #1 and 2 Priority Ranking: High	Partnership: Moscow Public Works Department, University of Idaho, and various special interest groups	New project	Ongoing
Extended Power Outage	Install jersey barriers to protect the Avista transfer station and the Williams pipeline near the intersection of the Old Pullman Highway and Stadium Way.	Goal #1 and 3 Priority Ranking: High	Partnership: Moscow Public Works Department, Avista, Latah County Disaster Services, and University of Idaho	New project	2 years

Table 6.2. City of Moscow Mitigation Strategies.					
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #2, 3, and 5 Priority Ranking: High	Partnership: Moscow Administration Department and various partners	Annual	Ongoing

Since the original document was written in 2005, the city of Moscow has completed several of its identified action items including:

1. The city of Moscow has adopted a more comprehensive building code ordinance that includes provisions for many hazard issues.
2. The city of Moscow updated its Comprehensive Plan in 2009. The new document contains provisions regarding hazard mitigation as suggested in the 2005 version of the Latah County Multi-Hazard Mitigation Plan.
3. The city of Moscow has completed an Emergency Evacuation Plan.

City of Deary

Table 6.3. City of Deary Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Obtain funding to equip all vehicles and emergency apparatus with adequate radios.	Goal #6 Priority Ranking: Moderate	Partnership: Deary City Council and Deary Rural Fire District	Modified wording to be more specific	Ongoing
	Obtain a generator to maintain the functionality of the fire/emergency medical services station during power outages.	Goal #3 and 6 Priority Ranking: High	Partnership: Deary Rural Fire District and Deary City Council	Modified wording to be more specific	2 years
	Obtain funding for a utility trailer to haul the Search and Rescue 4-wheeler and rescue boggan.	Goal #6 Priority Ranking: Moderate	Partnership: Deary Rural Fire District and Deary City Council	New project	3 years
	Obtain funding for an updated community warning siren for use during all types of emergency events.	Goal #6 Priority Ranking: High	Partnership: Deary Rural Fire District and Deary City Council	New project	2 years
	Develop a program that will help identify hazardous materials transported through the City.	Goal #1 Priority Ranking: Moderate	Deary Maintenance Crew	New project	3 years

Table 6.3. City of Deary Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #7 Priority Ranking: High	Deary City Council	Modified wording to be more specific	Ongoing
Flood	Replace inadequate culverts on Line Street, First Avenue, Second Avenue, Fifth Avenue, Park Street, Reservoir Road, and 6th Avenue to improve flow and reduce flood damages.	Goal #4 and 7 Priority Ranking: Moderate	Deary Maintenance Crew	New project	3 years
	Encourage residents to participate in the National Flood Insurance Program.	Goal #7 Priority Ranking: High	Deary Maintenance Crew	Modified wording to be more specific	Ongoing
	Install a culvert at Railroad fill to direct water drainage and prevent flood damage and erosion.	Goal #4 and 7 Priority Ranking: Moderate	Deary Maintenance Crew	New project	3 years
	Raise the grade on First Avenue at Pine Creek to remove it from the floodplain.	Goal #7 Priority Ranking: Moderate	Deary Maintenance Crew	New project	3 years
Severe Weather	Work with local organizations and the Red Cross to identify and equip adequate emergency shelters.	Goal #3 Priority Ranking: Low	Deary Maintenance Crew	New project	4 years

Table 6.3. City of Deary Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #2, 5, and 7 Priority Ranking: High	Partnership: Deary City Council and Deary Rural Fire District	Annual	Ongoing

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City of Juliaetta

Table 6.4. City of Juliaetta Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #6 Priority Ranking: High	Juliaetta City Council	Modified wording to be more specific	Ongoing
	Obtain funding to purchase generators for emergency sheltering facilities and to maintain the water system during power outages.	Goal #3, 5, and 6 Priority Ranking: High	Juliaetta City Council and Maintenance Crew	Modified wording to be more specific	3 years
	Establish and outfit emergency shelters within the community.	Goal #3 and 5 Priority Ranking: Low	Juliaetta City Council	New project	3 years
	Improve the McGary Bridge crossing over the Potlatch River to standards that meet the weight rating for emergency response vehicles.	Goal #6 Priority Ranking: High	Partnership: South Latah Highway District and Juliaetta City Council	Deferred due to lack of funding	5 years
	Establish a cell tower to provide better phone service to residents and communities in the Potlatch River canyon.	Goal #4 and 6 Priority Ranking: Moderate	Partnership: Kendrick City Council, Juliaetta City Council, and Latah County Disaster Services	New project	2 years
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #6 Priority Ranking: High	Juliaetta City Council	Modified wording to be more specific	Ongoing

Table 6.4. City of Juliaetta Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Wildland Fire	Develop a public education campaign specifically to provide awareness for residents in the Juliaetta and Kendrick area regarding the lack of a rural fire district and the ramifications.	Goal #2, 4, and 6 Priority Ranking: High	Partnership: Latah County Disaster Services, Juliaetta City Council, Kendrick City Council, and Juliaetta and Kendrick Fire Departments	Modified wording to be more specific	3 years
	Extend and upgrade water resources for fire suppression on the south end of town past Brownie Cut and Stock to the edge of the city boundary along Highway 3.	Goal #1, 4, and 6 Priority Ranking: Low	Partnership: Latah County Disaster Services, Juliaetta City Council, Kendrick City Council, and Juliaetta and Kendrick Fire Departments	New project	4 years
	Develop dry hydrants along the Potlatch River and/or stand alone pumps to enhance water resources for fire suppression.	Goal #1, 4, and 6 Priority Ranking: Moderate	Partnership: Latah County Disaster Services, Juliaetta City Council, Kendrick City Council, Juliaetta and Kendrick Fire Departments, and US Corp of Engineers	New project	4 years
	Obtain funding to construct a new station to house wildland fire equipment, which will allow for the 24-hour availability.	Goal #4 and 6 Priority Ranking: High	Partnership: Juliaetta City Council and Juliaetta Fire Department	New project	Ongoing
	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #2, 4, and 6 Priority Ranking: High	Partnership: Juliaetta City Council and various partners	Annual	Ongoing

Since the original document was written in 2005, Latah County has completed several of its identified action items including:

1. The city of Juliaetta adopted a more comprehensive building code ordinance that includes provisions for many hazard issues.

City of Potlatch

Table 6.5. City of Potlatch Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #1 and 7 Priority Ranking: High	Potlatch City Council	Modified wording to be more specific	5 years
	Develop a program and work with partners to help identify hazardous material transport through the City.	Goal #3, 7, and 8 Priority Ranking: High	Partnership: Potlatch City Council and Idaho Transportation Department	New project	2 years
	Work with the fire department to educate homeowners about smoke alarms and fire extinguishers in the home.	Goal #4 and 7 Priority Ranking: High	Potlatch City Council and Potlatch Rural Fire District	New project	Ongoing
	Continue to upgrade and improve the City's wastewater treatment facility.	Goal #2 and 5 Priority Ranking: High	Partnership: Potlatch Water and Sewer Department and Latah Economic Development	New project	Ongoing
	Obtain funding to install or replace sidewalks along main city streets.	Goal #2 Priority Ranking: High	Partnership: Potlatch Streets and Water and Sewer Departments and Latah Economic Development	New project	Ongoing

Table 6.5. City of Potlatch Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Develop options and obtain funding for the improvement or replacement of the Rock Creek Bridge.	Goal #2 and 5 Priority Ranking: Moderate	Potlatch City Council and Streets Department	New project	5 years
Severe Weather	Improve sheltering capacity at the schools and churches.	Goal #2, 3, and 5 Priority Ranking: Moderate	Potlatch City Council	New project	5 years
	Obtain funding to construct stormwater mitigation infrastructure throughout the City.	Goal #2 and 5 Priority Ranking: Moderate	Potlatch Water and Sewer Department	New project	5 years
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #1 and 7 Priority Ranking: Low	Potlatch City Council	Modified wording to be more specific	Ongoing
	Improve response capability by providing for storage of sand and sandbags within the City.	Goal #6 and 12 Priority Ranking: Low	Potlatch City Council and Potlatch Rural Fire District	New project	2 years
	Work with local planners, developers, and engineers to ensure lands being considered for annexation in the floodplain is developed responsibly.	Goal #1 and 7 Priority Ranking: High	Potlatch City Council	New project	2 years

Table 6.5. City of Potlatch Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Extended Power Outage	Obtain funding for additional generators to power the sewer and water infrastructure during an outage.	Goal #2, 5, and 11 Priority Ranking: High	Potlatch Water and Sewer Department	Modified wording to be more specific	3 years
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #1, 7, 9, and 10 Priority Ranking: High	Partnership: Potlatch City Council and various partners	Annual	Ongoing

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City of Bovill

Table 6.6. City of Bovill Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Obtain funding to purchase a backhoe to aid in fireline construction around the City's water storage tanks and to clear sediment and debris from ditches and culverts during flood events.	Goal #3 Priority Ranking: High	Bovill City Council and Maintenance Crew		4 years
	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #3 Priority Ranking: High	Bovill City Council	Modified wording to be more specific	Ongoing
Flood	Obtain a storage facility for sandbags and a generator.	Goal #2 and 3 Priority Ranking: Moderate	Bovill City Council and Maintenance Crew		2 years
	Encourage residents to participate in the National Flood Insurance Program.	Goal #3 Priority Ranking: High	Bovill City Council	Modified wording to be more specific	Ongoing
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #3 Priority Ranking: High	Partnership: Bovill City Council and various partners		Ongoing

Table 6.6. City of Bovill Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Extended Power Outage	Obtain a portable generator and transfer switch to backup water and sewer facilities.	Goal #1 and 3 Priority Ranking: High	Bovill City Council and Maintenance Crew		3 years
	Work with Avista to routinely clear hazard trees from the power line corridor in Potlatch River Canyon.	Goal #1 and 3 Priority Ranking: High	Partnership: Bovill City Council and Avista		Ongoing

Since the original document was written in 2005, Bovill has completed several of its identified action items including:

1. Bovill inspected the snowload resistance of its public school and, as a result, replaced all of the windows.

City of Genesee

Table 6.7. City of Genesee Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #1 and 2 Priority Ranking: High	Genesee City Council	Modified wording to be more specific	Ongoing
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #1 and 2 Priority Ranking: High	Genesee City Council	Modified wording to be more specific	Ongoing
	Conduct a stability assessment of Cow Creek from Highway 95 to Genesee and implement projects that will address chronic flooding issues.	Goal #3 Priority Ranking: High	Partnership: Genesee City Council and Maintenance Crew and consultant	New project	3 years
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #1 Priority Ranking: Moderate	Partnership: Genesee City Council and various partners	Annual	Ongoing

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City of Kendrick

Table 6.8. City of Kendrick Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #7 Priority Ranking: High	Kendrick City Council and Planning and Zoning	Modified wording to be more specific	Ongoing
	Establish a cell tower to provide better phone service to residents and communities in the Potlatch River canyon.	Goal #2, 5, and 7 Priority Ranking: Moderate	Partnership: Kendrick City Council, Juliaetta City Council, and Latah County Disaster Services	New project	2 years
	Improve the Sperry Bridge crossing over the Potlatch River to standards that meet the weight rating for emergency response vehicles.	Goal #2 and 7 Priority Ranking: High	Partnership: South Latah Highway District, Idaho Transportation Department, and Kendrick Maintenance Department	Deferred due to lack of funding	5 years
	Obtain funding to build a wastewater treatment facility that meets Environmental Protection Agency requirements.	Goal #5 and 6 Priority Ranking: High	Kendrick City Council and Planning and Zoning	New project	5 years
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #7 Priority Ranking: High	Kendrick City Council and Planning and Zoning	Modified wording to be more specific	Ongoing

Table 6.8. City of Kendrick Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Establish a nearby storage facility for sandbags and other flood control equipment.	Goal #1 and 7 Priority Ranking: Moderate	Partnership: Kendrick City Council and Kendrick Fire Department	New project	3 years
Wildland Fire	Develop a public education campaign specifically to provide awareness for residents in the Juliaetta and Kendrick area regarding the lack of a rural fire district and the ramifications.	Goal #2, 3, and 5 Priority Ranking: High	Partnership: Latah County Disaster Services, Juliaetta City Council, Kendrick City Council, and Juliaetta and Kendrick Fire Departments	Modified wording to be more specific	3 years
	Replace the water line across Highway 3 to the Brocke Industrial Plan with a 10" line.	Goal #2, 4, and 7 Priority Ranking: Low	Kendrick Maintenance Department	New project	3 years
	Obtain funding to construct a new station to house wildland fire equipment, which will allow for the 24-hour availability.	Goal #1, 2, and 4 Priority Ranking: High	Partnership: Kendrick City Council and Kendrick Fire Department	New project	Ongoing
	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #2 Priority Ranking: High	Partnership: Kendrick City Council and various partners	Annual	Ongoing
	Establish dry hydrants in strategic locations to assist with water resupply efforts.	Goal #2, 4, 5, and 7 Priority Ranking: Moderate	Partnership: Kendrick Fire Department, Kendrick City Council, and U.S. Army Corp of Engineers	New project	3 years

Table 6.8. City of Kendrick Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Extended Power Outage	Obtain a portable generator to maintain emergency functions during power outages.	Goal #4, 5, and 7 Priority Ranking: High	Partnership: Kendrick City Council and Kendrick Fire Department	Modified wording to be more specific	2 years

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City of Onaway

Table 6.9. City of Onaway Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #1 and 2 Priority Ranking: Moderate	Onaway City Council	Modified wording to be more specific	Ongoing
	Obtain funding to purchase a backhoe for use in establishing fire lines near the water reservoir and city well as well as to keep ditches clear of sediment and debris and standing water out of intersections during flood events.	Goal #1 Priority Ranking: High	Partnership: Onaway City Council and Onaway Water and Sewer Association	New project	2 years
Flood	Educate the public and encourage residents to participate in the National Flood Insurance Program.	Goal #1 and 2 Priority Ranking: Low	Onaway City Council	Modified wording to be more specific	Ongoing
Wildland Fire	Detail an escape route for citizens and encourage residents to make a personal evacuation plan for their property.	Goal #1 and 3 Priority Ranking: High	Partnership: Onaway City Council and Potlatch Rural Fire District	New project	2 years
	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #1 and 3 Priority Ranking: Moderate	Partnership: Onaway City Council and various partners	Annual	Ongoing

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City of Troy

Table 6.10. City of Troy Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Enforce existing land use and development policies in order to reduce residents' exposure to hazards.	Goal #1 and 2 Priority Ranking: High	Troy City Council	Modified wording to be more specific	Ongoing
Flood	Encourage residents to participate in the National Flood Insurance Program.	Goal #1 and 2 Priority Ranking: High	Troy City Council	Modified wording to be more specific	Ongoing
	Improve the State Highway 8 crossing over Little Bear Creek.	Goal #2 and 3 Priority Ranking: High	Partnership: Troy City Council and City Maintenance and Idaho Transportation Department	Deferred due to lack of funding	3 years
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #2 and 4 Priority Ranking: High	Partnership: Troy City Council and various partners	Annual	Ongoing
Extended Power Outage	Obtain 3 backup generators to power the new city well and sewer treatment facilities, the Duthie Park pump station, and the sand filter below the city reservoir.	Goal #2 Priority Ranking: High	Partnership: Troy City Council and City Maintenance and Troy Rural Fire District	Modified wording to be more specific	2 years

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North Latah County Highway District

Table 6.11. North Latah County Highway District Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Identify additional funding sources to help with regular maintenance of debris retention and collection systems as well as a system for logging maintenance activities.	Goal #6 and 8 Priority Ranking: High	Partnership: North Latah County Highway District and Latah County	New project	Ongoing
	Improve existing and increase warning, regulatory, and road name signage at intersections.	Goal #5and 8 Priority Ranking: High	North Latah County Highway District	New project	Ongoing
	Continue to pursue grant opportunities for improvements on arterial routes.	Goal #1, 2, 3, 6, and 8 Priority Ranking: High	North Latah County Highway District	New project	Ongoing
	Widen and pave existing unpaved collector routes.	Goal #7 and 8 Priority Ranking: Moderate	North Latah County Highway District	New project	Ongoing
	Widen existing paved collector routes.	Goal #7 and 8 Priority Ranking: Moderate	North Latah County Highway District	New project	Ongoing

Table 6.11. North Latah County Highway District Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Replace older, insufficient bridges through grant projects.	Goal #4 and 8 Priority Ranking: High	North Latah County Highway District	New project	Ongoing
	Work on functional road classification changes.	Goal #6 and 8 Priority Ranking: Moderate	North Latah County Highway District	New project	Ongoing
Flood	Develop an inventory of all culverts, bridges, and roads to help determine maintenance priorities and road profiles that need elevated out of the floodplain.	Goal #1, 2, and 3 Priority Ranking: High	Partnership: North Latah County Highway District and Latah County Disaster Services	New project	Completed in 2006. Update scheduled for 2011
	Maintain inventory and maps of infrastructure components.	Goal #1 and 2 Priority Ranking: High	North Latah County Highway District	New project	Completed in 2006 and updating as needed
	Obtain funding to replace bridge on Viola Road on the south end of the community to improve flow.	Goal #3, 6, and 8 Priority Ranking: High	Partnership: North Latah County Highway District and Latah County Disaster Services	New project	2 years
Extended Power Outage	Obtain funding to purchase a generator to help maintain services during power outages.	Goal #6 and 8 Priority Ranking: High	Partnership: North Latah County Highway District and Latah County Disaster Services	New project	3 years

Table 6.11. North Latah County Highway District Mitigation Strategies.					
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Severe Weather	Maintain snow removal equipment and a priority schedule for communities and primary transportation routes.	Goal #8 Priority Ranking: High	North Latah County Highway District	New project	Ongoing
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #6 Priority Ranking: Moderate	Partnership: North Latah County Highway District and various partners	New project	Ongoing

Since the original document was written in 2005, the North Latah County Highway District has completed several of its identified action items including:

1. The North Latah County Highway District has recently replaced a bridge on one of the main access points for the community of Viola. They are working on obtaining funding to replace a second bridge near this community.

2. Both the North Latah and South Latah Highway Districts are currently updating their Transportation Plans. Emergency Evacuation Plans have been completed for the city of Moscow and the University of Idaho.

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South Latah Highway District

Table 6.12. South Latah Highway District Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
General	Install proper pavement markers on asphalt roads.	Goal #5 Priority Ranking: Moderate	South Latah Highway District	New project	2 years
	Install riprap on bridge abutments district wide.	Goal #3 and 5 Priority Ranking: High	South Latah Highway District	New project	5 years
	Improve the McGary Bridge crossing over the Potlatch River to standards that meet the weight rating for emergency response vehicles.	Goal #35 Priority Ranking: High	Partnership: South Latah Highway District and Juliaetta City Council	New project	4 years
	Identify additional funding sources to help with regular maintenance of debris retention and collection systems as well as a system for logging maintenance activities.	Goal #3 and 5 Priority Ranking: High	Partnership: South Latah Highway District and Latah County Disaster Services	New project	1 year
	Improve the Sperry Bridge crossing over the Potlatch River to standards that meet the weight rating for emergency response vehicles.	Goal #3 and 5 Priority Ranking: High	Partnership: South Latah Highway District and Kendrick City Council	New project	3 years
	Update radio system to monitor all emergency channels and equip all vehicles.	Goal #4 and 5 Priority Ranking: Moderate	South Latah Highway District	New project	Ongoing

Table 6.12. South Latah Highway District Mitigation Strategies.

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
Flooding	Raise the grade and update Gilji Road to provide flood control.	Goal #2 and 5 Priority Ranking: Moderate	South Latah Highway District	New project	5 years
	Raise the grade and replace culverts on Greiser Road.	Goal #1, 2, and 5 Priority Ranking: Moderate	South Latah Highway District	New project	5 years
	Install larger culverts at the intersection of Miller Road and Lenville Road, on Jones Road, on Fern Hill Road (x3), on Blaine Road at Renfrow's, and on Blain Road at Martinson intersection to improve flow during high water events.	Goal #1 and 5 Priority Ranking: High	South Latah Highway District	New project	5 years
	Develop an inventory of all culverts, bridges, and roads profiles to help determine maintenance priorities and road sections that need elevated out of the floodplain.	Goal #1, 2, and 5 Priority Ranking: High	Partnership: South Latah Highway District and Latah County Disaster Services	New project	Ongoing
	Replace culverts and raise the grade at the intersection of Eikum Road and Danielson and Berger Roads.	Goal #1, 2, and 5 Priority Ranking: Moderate	South Latah Highway District	New project	5 years

Table 6.12. South Latah Highway District Mitigation Strategies.					
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2011 Project Status	Projected Completion Year
	Replace the double culverts on Danielson Road with one larger culvert to improve flow during high water events.	Goal #1 and 5 Priority Ranking: Moderate	South Latah Highway District	New project	5 years
	Raise the grade on portions of Borgen Road, Campbell Loop, Roseneau Road, Blaine Road, Danielson Road, and Genesee/Troy Road to remove them from the floodplain.	Goal #2 and 5 Priority Ranking: High	South Latah Highway District	New project	5 years
Severe Weather	Maintain snow removal equipment and a priority schedule for communities and primary transportation routes.	Goal #5 Priority Ranking: High	South Latah Highway District	New project	Ongoing
Wildland Fire	Continue to work on action items and proposed projects in the Latah County Wildfire Protection Plan.	Goal #5 Priority Ranking: Moderate	Partnership: South Latah Highway District and various partners	New project	Ongoing

Since the original document was written in 2005, the South Latah Highway District has completed several of its identified action items including:

1. Both the North Latah and South Latah Highway Districts are currently updating their Transportation Plans. Emergency Evacuation Plans have been completed for the city of Moscow and the University of Idaho.

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Chapter 7

Appendices

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Latah County Resolution of Adoption

BOARD OF COUNTY COMMISSIONERS
LATAH COUNTY, IDAHO

RESOLUTION NO. 2011-10

A RESOLUTION OF THE BOARD OF COUNTY COMMISSIONERS OF LATAH COUNTY, STATE OF IDAHO DECLARING COUNTY SUPPORT AND ADOPTION OF THE UPDATED LATAH COUNTY MULTI-HAZARD MITIGATION PLAN AND COMMUNITY WILDFIRE PROTECTION PLAN.

WHEREAS, the Board of County Commissioners of Latah County, State of Idaho is the duly elected governing body of Latah County, a political subdivision of the State of Idaho, having such powers and duties as are set forth in the Constitution and Statutes of the State of Idaho; and

WHEREAS, the Latah Board of County Commissioners supports the Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

WHEREAS, The Latah Board of County Commissioners has participated in the development of the Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

WHEREAS, the Multi-Hazard Mitigation Plan and Community Wildfire Protection 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.

NOW THEREFORE BE IT RESOLVED that the Latah County Board of County Commissioners do hereby adopt and support and will facilitate implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 9th day of May 2011.

Jenifer Barrett, Chair

Tom S. Stroschein, Commissioner

ATTEST:

5-9-11

Clerk/Deputy

David McGraw, Commissioner

City of Moscow Resolution of Adoption

RESOLUTION 2011-06

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MOSCOW, A MUNICIPAL CORPORATION OF THE STATE OF IDAHO, DECLARING SUPPORT AND ADOPTION OF THE LATAH COUNTY MULTI-HAZARD MITIGATION PLAN AND COMMUNITY WILDFIRE PROTECTION PLAN.

WHEREAS, the City Council of Moscow supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

WHEREAS, the City of Moscow has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

WHEREAS, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Moscow;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Moscow does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

PASSED AND APPROVED by the Mayor and the Council of the City of Moscow, Idaho, this 6th day of June, 2011.

Nancy Chaney, Mayor

ATTEST:

Stephanie Kalasz, City Clerk

CITY OF MOSCOW INCORPORATED JULY 12 1887 STATE OF IDAHO

RESOLUTION 2011 -06 ADOPTION OF THE LATAH COUNTY MULTI-HAZARD MITIGATION PLAN JUNE 6, 2011 PAGE 1 OF 1

City of Deary Resolution of Adoption

Resolution of Adoption by the City of Deary, Idaho
#199

A resolution of the City of Deary declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Deary supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Deary has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Deary, and

Therefore be it resolved, that the City Council of Deary does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 9 Day of JUNE 2011

by the City Council of Deary located in Latah County, Idaho.

John W Henderson
By:
Mayor, City of Deary

Judy Heath
Attested by:
Clerk, City of Deary

City of Juliaetta Resolution of Adoption

Resolution of Adoption by the City of Juliaetta, Idaho
 # 2011-02

A resolution of the City of Juliaetta declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Juliaetta supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Juliaetta has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Juliaetta, and

Therefore be it resolved, that the City Council of Juliaetta does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 12th Day of July 2011

by the City Council of Juliaetta located in Latah County, Idaho.

Jeff L Lohman
By:
Mayor, City of Juliaetta

Becky Tuft
Attested by:
Clerk, City of Juliaetta

City of Potlatch Resolution of Adoption

Resolution of Adoption by the City of Potlatch, Idaho
No. 2001-03

A resolution of the City of Potlatch declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Potlatch supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Potlatch has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Potlatch, and

Therefore be it resolved, that the City Council of Potlatch does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 23 Day of MAY 2011

by the City Council of Potlatch located in Latah County, Idaho.

By:
Mayor, City of Potlatch

Attested by:
Clerk, City of Potlatch

City of Bovill Resolution of Adoption

Resolution R-2011-1

A resolution of the City of Bovill declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Bovill supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Bovill has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Bovill, and

Therefore be it resolved, that the City Council of Bovill does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 6th day of June, 2011, by the Bovill City Council, Latah County, Idaho.

Janiece L. Atkins

Janiece Atkins, Mayor

ATTEST:

Terry L Christie

Terry Christie, City Clerk

City of Genesee Resolution of Adoption

Resolution of Adoption by the City of Genesee, Idaho
#2011-1

A resolution of the City of Genesee declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Genesee supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Genesee has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Genesee, and

Therefore be it resolved, that the City Council of Genesee does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 7th Day of June 2011

by the City Council of Genesee located in Latah County, Idaho.

Steve Odenburg
By:
Mayor, City of Genesee

LATAH CO. IDAHO. CITY OF GENESEE

Karen Wright
Attested by:
Clerk, City of Genesee

City of Kendrick Resolution of Adoption

Resolution of Adoption by the City of Kendrick, Idaho
#11-236

A resolution of the City of Kendrick declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Kendrick supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Kendrick has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Kendrick, and

Therefore be it resolved, that the City Council of Kendrick does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 21 Day of June 2011

by the City Council of Kendrick located in Latah County, Idaho.

Dale Lieuallen
Mayor

ATTEST:

Barbara Brady
Clerk Treasurer

City of Onaway Resolution of Adoption

Resolution of Adoption by the City of Onaway, Idaho
#_____

A resolution of the City of Onaway declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Onaway supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Onaway has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Onaway, and

Therefore be it resolved, that the City Council of Onaway does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 2 Day of June 2011

by the City Council of Onaway located in Latah County, Idaho.

By:
Mayor, City of Onaway

Deanne Nagle Clerk
Attested by:
Clerk, City of Onaway

City of Troy Resolution of Adoption

Resolution of Adoption by the City of Troy, Idaho
#2011-01

A resolution of the City of Troy declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the City Council of Troy supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the City Council of Troy has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 Troy, and

Therefore be it resolved, that the City Council of Troy does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 11 Day of July 2011

by the City Council of Troy located in Latah County, Idaho.

Ken Whatley Jr.
By:
Mayor, City of Troy

Attested by:
Clerk, City of Troy

North Latah County Highway District Resolution of Adoption

Resolution of Adoption by the North Latah County Highway District
#11-03

A resolution of the North Latah County Highway District declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the North Latah County Highway District supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the North Latah County Highway District has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 North Latah County Highway District, and

Therefore be it resolved, that the North Latah County Highway District does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this 11th Day of May 2011

by the North Latah County Highway District located in Latah County, Idaho.

By:
Chairman, Board of Commissioners
North Latah County Highway District

Attested by:

South Latah Highway District Resolution of Adoption

Resolution of Adoption by the South Latah Highway District
#__5__

A resolution of the South Latah Highway District declaring support and adoption of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Whereas, the South Latah Highway District supports the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the South Latah Highway District has participated in the development of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan, and

Whereas, the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection 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 South Latah Highway District, and

Therefore be it resolved, that the South Latah Highway District does hereby adopt and support and will facilitate the implementation of the Latah County Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan as deemed appropriate.

Passed and approved this __8th__ Day of __June__ 2011

by the South Latah Highway District located in Latah County, Idaho.

_____ - chairman SLHD
By:
South Latah Highway District

_____ - District Clerk
Attested by:

Planning Committee Minutes

January 15th, 2010 – Latah County Courthouse

Agenda Item #1 – Introduction:

NMI began the meeting by asking for introductions and handing out review materials.

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 and the integration of the Community Wildfire Protection Plan. Both documents will be updated, but remain separate. Critical sections of the CWPP will be included in the MHMP to satisfy new requirements. Also, the updated plan will include two additional chapters, Civil Unrest/terrorism, and Extended Power Outage.

Agenda Item #3 – Update Approach:

Plan Feedback - Sandy liked the existing format that had all the information broken down by jurisdiction. Kristen wanted to see more streamlined information with easy access to the critical detail. Tables and all graphics could be placed in the appendix with dynamic tables showing planned, completed, and ongoing activities' status as they are changed in subsequent updates.

Mission & Goals Statements – Each jurisdiction needs to complete a goals statement per 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.

Fire District Summary – The update will include a different format for fire district information. NMI asked that each fire district as well as the agencies fill out the summary form, which includes a brief summary, a rundown of each district's issues, and a fire district "needs" section. Sandy has an old list of equipment resources that she will provide for update and inclusion.

Critical Facilities – Sandy has an outdated list that NMI can review and present at the next meeting.

Recent Events/Projects –

- Winter Storm – snow storm resulted in disaster declaration in Jan/Feb 2008.
- South Fork Paradise Creek altered floodplain project?
- Brady Gulch Fire
- Genesee flooding – disaster declaration for flooding on Cow Creek in January 2010
- The only completed project identified was the bridge in Viola. Another bridge at the south access to Viola is proposed for the next round of grant funding.
- Sand bags storage facility is needed for Kendrick.
- Each jurisdiction needs to review their sewer and water treatment facilities. Back up power generation would be good projects for those types of facilities.
- Cow Creek (Genesee) needs a stream assessment and bank stabilization project.
- New ordinance recently created in Latah County requires temporary address be placed on all non-structure properties to aid in search and rescue/first responder needs.
- Juliaetta and Kendrick Fire Departments need better incident reporting systems.

- Need to create a Juliaetta/Kendrick Rural Fire Department to cover unprotected areas outside the cities.

Phase I Hazard Assessment - NMI led the committee through an exercise to help determine their perspective on the potential severity of each hazard within the county. Each hazard was scored for its frequency and potential impact and placed in a matrix to show how each hazard ranked relative to each other. The results of the assessment for each county are given below.

		Magnitude		
		Low	**Medium**	**High**
Frequency	**Low**			**Flood**
	Medium		**Extended Power Outage**	**Severe Weather** **Landslide** **Terrorism/Civil Unrest**
	High			**Wildland Fire**

Agenda Item #4 – Public Involvement:

The committee reviewed the example press release and will send NMI revisions and suggestions by Friday, January 22nd.

It was decided that three public meetings would be held in March 2010. Evening meetings will be held in Moscow (Courthouse), Deary (Community Center), and Kendrick (Fire Hall).

Agenda Item #5– Map Review:

Existing data will be used in the map updates. New parcel layer, addresses, roads and parcel master listing are needed for the analysis. NMI will contact Michelle Fuson and James Agidius for data.

Agenda Item #6 – Other Stuff:

Tera went over the tentative timeline noting the final completion date target of July 15th, 2010. Tera and Sandy reviewed what was happening with the Western States grant application. This is not part of the MHMP update project, but will likely be incorporated into the process due to overlap in most of the key players. There has also been a suggestion to put together a Firewise Training Workshop. The details need to be worked out, but the committee feedback was supportive.

Agenda Item #7 – Task List:

Information can be sent to Tera King at king@consulting-foresters.com .*

1. Send NMI fire district survey – Fire Departments and Agencies
2. Complete Goals Statements – County and Cities

3. Send committee electronic copies of handouts – Tera
4. Send NMI Resource list – Sandy
5. Send NMI revisions to press release by January 22nd - Committee

Agenda Item #8 – Adjournment:

The Latah County MHMP update planning committee meeting was adjourned at 11:35 a.m. The next meeting will be held on February 26th at 9am in the Courthouse basement.

February 26th, 2010 – Latah County Courthouse

Agenda Item #1 – Introduction:

NMI began the meeting by asking for introductions and handing out review materials.

Agenda Item #2 – Old Business:

Tera passed out a list of the critical facilities currently listed and mapped. She asked the committee review the list and add any that were missing. She also reminded the fire districts and agencies that they needed to turn in their summary forms for inclusion in both documents' update. Goal statements are still missing from most of the participating jurisdictions as well. Sandy agreed to try to push this with the cities.

Agenda Item #3 – Action Item Review:

The committee began reviewing all of the action items in the CWPP and deciding what the current status was or if the action item was still viable. Several corrections were made and new items were added. The committee also began reviewing the list of MHMP action items, but only completed discussion on about half.

Agenda Item #4 – Public Meetings:

Public meetings are scheduled in Moscow (Courthouse), Deary (Community Center), and Kendrick (Fire Hall) for the week of March 15th-18th. Tera handed out the announcement flyer that will be sent to the newspapers and distributed to the communities.

Agenda Item #5– Map and Data Update:

Vaiden has started mapping CWPP priority project areas based on the information from the last meeting. This will be finished and displayed at the public meetings. Vaiden is also working on mapping critical facilities, repetitive loss areas, landslide impact zones, and floodplains. The analysis from these data will be presented in tabular and map form at the April meeting.

Agenda Item #6 – Other Stuff:

There has been no official award notice on the Western States grant, so no movement has been made to move the project forward. The County is considering applying for a Community Protection Program grant as well, which would be a much smaller scale project. The stipulations for the grant include locating a project adjacent to a planned federal project that has a fire component. NMI will work the Palouse Ranger District to identify potential project areas. The committee also discussed organizing a Firewise Training

Workshop similar to the one held in Corvallis last fall. Tera passed out an example flyer and agreed to look into the cost of this type of workshop and report back to the committee in April.

Agenda Item #7 – Redzone Software Demonstration:

Dave Summers from the Idaho Department of Lands attended the meeting to explain and demonstrate the use of the Redzone software program for mapping and evaluating structures in the WUI. Dave went through a powerpoint presentation, which included screen shots of the actual software program. Several representatives from the County discussed how Redzone was similar to existing capabilities. Everyone agreed that the software is useful and would be beneficial to the Moscow Mountain fuels project; however, committee members were undecided on whether or not the program could be recreated using existing GIS capabilities at the County. Another issues that was raised was whether or not the County would have time to create a similar program and keep it updated.

Agenda Item #8 – Task List:

Information can be sent to Tera King at king@consulting-foresters.com .*

1. Send NMI fire district survey – Fire Departments and Agencies
2. Complete Goals Statements – County and Cities
3. Send committee electronic copies of handouts – Tera

Agenda Item #9 – Adjournment:

The Latah County MHMP update planning committee meeting was adjourned at 12:00pm. The next meeting will be held on April 23rd, 2010 at 9am in the Courthouse basement.

April 23rd, 2010 – Latah County Courthouse

Agenda Item #1 – Introduction:

NMI began the meeting by asking for introductions and handing out review materials.

Agenda Item #2 – Old Business:

Tera reminded the fire districts and agencies that they needed to turn in their summary forms for inclusion in both documents' update. Goal statements are still missing from most of the participating jurisdictions as well. Tera will try contacting the cities personally to get a response. So far their level of participation does not warrant inclusion in the document. The committee finished reviewing the current list of action items that was started at the last meeting.

Agenda Item #3 – CWPP Draft Review:

Tera handed out the draft CWPP for review. She walked the committee through the document pointing out where data was still missing or where more information was required. It was noted that the WUI map needed an "Infrastructure" component in order to include major highways and power lines in the assessment. The committee also reviewed the current project list and map and discussed the format of the fire district summaries. Tera asked that the fire department send their logo or patches. The resource list and department contact information will be included in the Appendices.

Agenda Item #4 – MHMP Map and Data Review:

Tera handed out the preliminary flood analysis and landslide impact zone spreadsheets and maps for the committee to review. There were several comments on the location of the boundaries and inclusion of certain structures. The committee also reviewed a "weather" map that Vaiden produced for the severe weather chapter. The map includes information on prevailing wind and speeds, lightning strikes, and ignition potential based on August high temperatures. At the end of the meeting, the committee went through the first section of the critical infrastructure worksheets for the Terrorism chapter. There was a lot of discussion on what should be included and the location of certain facilities. The second phase of this assessment will be completed at the May meeting after Tera inserts the names of the facilities into individual assessment forms.

Agenda Item #5– Other WUI Committee Stuff:

The committee discussed the Redzone presentation at the last meeting. It seems that the County has reservations about implementing the software because they similar capabilities already. The committee agreed that there was no reason to recreate the wheel and spend the money for no reason; however, there were concerns about the County's time constraints for developing this type of program that would be compatible with their existing system and neighboring counties that were using Redzone. Sandy agreed to discuss the issue with the County GIS department to decide if this was something they wanted to take on.

There still has been no word on the Western States grant. The committee agreed that Bald Mountain was the first choice and Vassar Connection was second for the Community Protection Program grant. Tera will work with the Forest Service to develop an application. Sandy and Ed talked about Benewah County's recent WUI Cost Share Workshop. Both thought it was an excellent course that Latah County would benefit from as well. Sandy and Debi will work on contacting the presenter and setting this up.

Agenda Item #6 – Task List:

Information can be sent to Tera King at king@consulting-foresters.com .*

1. Send NMI fire district survey – Fire Departments and Agencies
2. Complete Goals Statements – County and Cities
3. Send fire department logos - committee
4. Send committee electronic copies of handouts – Tera
5. Set date for WUI Cost Share workshop – Sandy
6. Write Community Protection Program grant application - Tera
7. Review CWPP and send edits - Committee

Agenda Item #7 – Adjournment:

The Latah County MHMP update planning committee meeting was adjourned at 12:00pm. The next meeting will be held on May 28th, 2010 at 9am in the Courthouse basement.

May 28th, 2010 – Latah County Courthouse

Agenda Item #1 – Introduction:

NMI began the meeting by handing out review materials.

Agenda Item #2 – Old Business:

Tera reminded the fire districts and agencies that they needed to turn in their summary forms and logos for inclusion in both documents' update. Goal statements are still missing from several of the participating jurisdictions as well. Tera will try contacting the cities personally to get a response.

Agenda Item #3 – MHMP Draft Review:

Tera handed out the draft MHMP for review. She walked the committee through the document pointing out where data was still missing or where more information was required. She also pointed out the sections of the document that are specific to each jurisdiction including the vulnerability assessments and the mitigation strategies. It was noted that the committee would work on prioritizing action items at the next committee meeting.

Agenda Item #4 – Terrorism Worksheets:

Based on the infrastructure list completed at the last meeting, Tera handed out the vulnerability assessment forms for each facility. Representatives from the various areas were given a stack of assessments to fill out for their respective communities.

Agenda Item #5– Other WUI Committee Stuff:

The committee briefly discussed the upcoming cost-share workshop. Sandy is working on handout materials. Tera also explained that no Community Protection Program grant was submitted due to the lack of a site that met all the requirements. There has been no movement on the Western States grant approval letter.

Agenda Item #6 – Task List:

Information can be sent to Tera King at king@consulting-foresters.com .*

1. Send NMI fire district survey – Fire Departments and Agencies
2. Complete Goals Statements – County and Cities
3. Send fire department logos - committee
4. Review CWPP and send edits – Committee
5. Review MHMP and send edits – Committee
6. Complete and send facility assessment forms - Committee

Agenda Item #7 – Adjournment:

The Latah County MHMP update planning committee meeting was adjourned at 11:00am. The next meeting will be held on June 18th, 2010 at 9am in the Courthouse basement.

June 18th, 2010 – Latah County Courthouse

Agenda Item #1 – Introduction:

NMI began the meeting by handing out review materials.

Agenda Item #2 – Old Business:

Tera reminded the remaining fire districts and agencies that they needed to turn in their summary forms and logos for inclusion in both documents' update. Goal statements are still missing from a few of the participating jurisdictions as well. Tera will continue to contact the holdouts individually.

Agenda Item #3 –Draft Review:

Tera handed out the draft MHMP for review. She walked the committee through the document pointing out where data was still missing or where more information was required. She also pointed out the sections of the document that are specific to each jurisdiction including the vulnerability assessments and the mitigation strategies. It was noted that the committee would work on prioritizing action items at the next committee meeting.

Agenda Item #4 – MHMP and CWPP Project Prioritization:

Projects and action items in both the MHMP and CWPP were prioritized. The committee agreed that because several of the jurisdictions were not present that the numerical scoring system should be used for all MHMP projects. A group discussion and decision process was used to prioritize all of the projects in the CWPP.

Agenda Item #5– Public Review:

The committee reviewed the press release and timeline for the public review process. Tera asked that any changes to the press release be sent by June 23rd.

Agenda Item #6 – Terrorism Plan:

The committee briefly reviewed the rough draft of the Terrorism Plan. Tera will be working on filling this out while the rest of the document is out for public review. Several members of the committee are still working on their critical facilities assessment forms.

Agenda Item #7– Other WUI Committee Stuff:

Sandy noted that there was still no word on the Western States grant, but that the application for next year's projects had been sent. The committee is still interested in hosting a Firewise Training Workshop, but would like to hold off until after they see how a similar workshop is presented at the Annual Wildfire Conference in October.

Agenda Item #8 – Task List:

Information can be sent to Tera King at king@consulting-foresters.com .*

1. Send NMI fire district survey – Remaining Fire Departments
2. Complete Goals Statements – Remaining Cities
3. Send fire department logos - committee
4. Review CWPP and send edits – Committee
5. Review MHMP and send edits – Committee
6. Complete and send facility assessment forms – Committee
7. Send edits to public review press release - Committee

Agenda Item #9 – Adjournment:

The Latah County MHMP update planning committee meeting was adjourned at 11:00am.

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 Latah 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 which resulted in the addition of extended power outage as a new hazard addressed in the Plan.

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. In addition to retaining all of the jurisdictions who participated in the 2005 MHMP process, the North Latah County Highway District and the South Latah Highway District were added as participating jurisdictions in the 2011 MHMP.

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 Latah 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.

2. A summary of accomplishments since 2005 for each jurisdiction was included in Chapter 6.

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

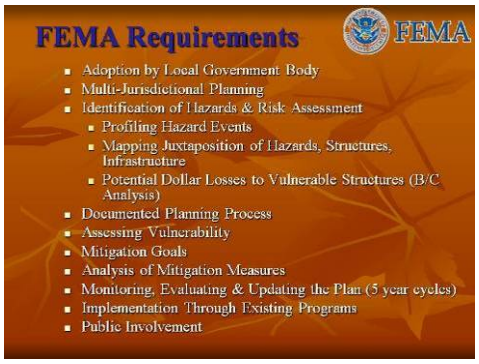
Slide 1

Slide 2

Slide 3

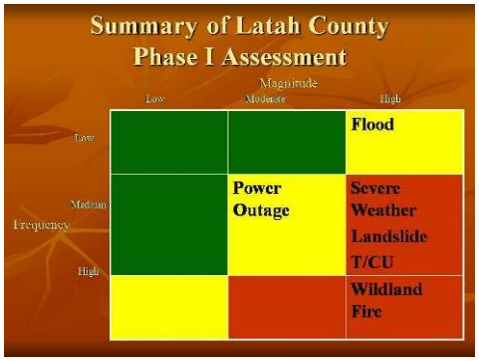
Slide 4

Slide 5



Slide 6

Slide 7



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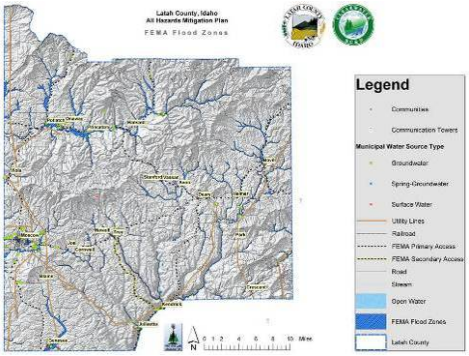

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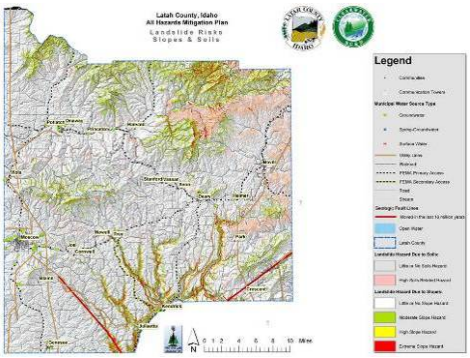

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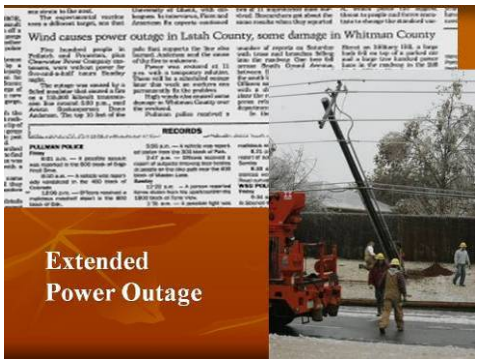

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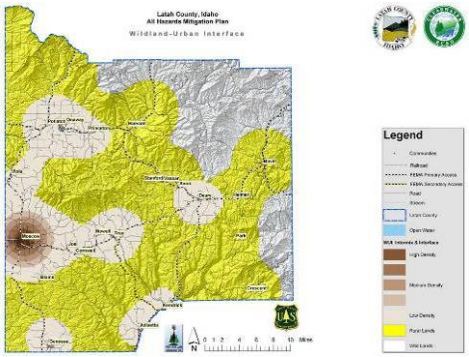

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Slide 18

Slide 19

Slide 20

Slide 21

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.

This plan was developed by Northwest Management, Inc. under contract with Latah County. Funding for the project was provided by the Board of County Commissioners and the Federal Emergency Management Agency.

Copies of this document are available through the Latah County Disaster Services office at 208-883-2265.

Citation of this work:

King, Tera R. and V. Bloch. *Lead Authors.* Latah County, Idaho Multi-Hazard Mitigation Plan – 2011 Revision. Northwest Management, Inc. Moscow, Idaho. July 2011. Pp 239.

King, Tera R. and V. Bloch. *Lead Authors.* Latah County, Idaho Multi-Hazard Mitigation Plan Terrorism and Civil Unrest Supplement – 2011 Revision. Northwest Management, Inc. Moscow, Idaho. July 2011. Pp 41.

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