2022

Idaho County Multi-Hazard Mitigation Plan



Idaho County Disaster Management Idaho County, Idaho 9/1/2022

FORWARD

"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 **Idaho County, Idaho Multi-Hazard Mitigation Plan** was updated in 2021-2022 by the Idaho County MHMP planning team in cooperation with Northwest Management, Inc. of Moscow, Idaho.

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

Cover Photo: US-95 Slide South of Riggins²

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

² ITD. Jahns, Megan. "Repairs to US-95 slide south of Riggins complete". November 3, 2020. https://itd.idaho.gov/news/us95rigginsslide/

Placeholder for FEMA approval letter

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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 Idaho County, Idaho. The Idaho County Multi-Hazard Mitigation Plan was updated in 2016 and this document serves as the required 5-year update of the Multi-Hazard Mitigation Plan under the Pre-Disaster Mitigation program.

In the spring of 2021, Idaho County Disaster Management contracted services to update the Idaho County Multi-Hazard Mitigation Plan to Northwest Management, Inc. of Moscow, Idaho. The Idaho County Community Wildfire Protection Plan update simultaneously as a joint planning effort.

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

- Elk City Volunteer Fire Department
- Cottonwood Police Department
- Kooskia Fire Department
- Glenwood-Caribel Fire/Quick Response Unit
- BPC Rural Fire District
- Harpster Fire Protection District
- St. Mary's Ambulance Services
- Western Governors' University
- Camas Prairie Amateur Radio
- Public Health Idaho North Central District
- Northwest Management, Inc.
- Idaho County Disaster Management
- North Idaho Correctional Institute
- City of Ferdinand
- City of Grangeville
- City of Cottonwood
- City of White Bird

- City of Stites
- City of Riggins
- City of Kooskia
- City of Kamiah
- Grangeville Volunteer Fire Department
- Sundance Services
- Alternative Nursing Services
- Grangeville Police Department
- Idaho County citizens/business
- Syringa Hospital and Ambulance
- Idaho County Free Press
- Civil Air Patrol
- Keuterville Highway District
- Idaho County Sheriff's Office
- Idaho Department of Lands
- Idaho Bureau of Homeland Security
- United States Forest Service

Goals and Guiding Principles

Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a Multi-Hazard Mitigation Plan approved by the Federal Emergency Management Agency (FEMA) is required for Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Program (PDM) eligibility. The HMGP and PDM programs provide funding, through state

emergency management agencies, to support local mitigation planning and projects to reduce potential disaster damages.

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

In order to be eligible for project funds under the Flood Mitigation Assistance (FMA) program, communities are required under 44 CFR Part 79.6(d)(1) to have a mitigation plan that addresses flood hazards. On October 31st, 2007, FEMA published amendments to the 44 CFR Part 201 at 72 Federal Reg. 61720 to incorporate mitigation planning requirements for the FMA program (44 CFR Part 201.6). The revised Local Mitigation Plan Review Crosswalk (October 2011) 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 July 1, 2008, was used as the official guide for development of a FEMA-compatible Idaho County, Idaho Multi-Hazard Mitigation Plan.

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 Office of Emergency Management 4040 Guard Street, Bldg 600 Boise, ID 83705

A FEMA designed plan will be evaluated on its adherence to a variety of criteria, including:

- 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

Planning Philosophy and Goals

Idaho 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 Idaho County residents, communities, state agencies, local governments, and businesses less vulnerable to the effects of natural and man-made 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 prioritization will be the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

Jurisdictional Planning and Mitigation Goals

As part of the 2014-15 revision process, each participating jurisdiction in Idaho County was asked to develop its own set of planning and mitigation goals to help reflect and keep track of individual priorities and changes in hazard vulnerability over time. During the first planning committee meeting, the group discussed several overall short-term and long-term goals as well as goals for the planning process itself. Members of the committee were given a list of example goals statements and a blank goals worksheet to fill out and return. The following section outlines the goals submitted by each jurisdiction.

Idaho County:

- This planning process will involve planning for both manmade and natural hazards of Flood, Earthquake, Landslides, Wildland Fire (excerpted from existing CWPP), and Severe Weather;
- 2. Additional hazards will be added to this plan as pre-mitigation planning is completed in the future;
- 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;
- 4. Inform communities about the unique challenges of natural hazard preparedness in the county;
- 5. Reduce the impact of hazard events and potential losses incurred by both public and private residents and entities;

- 6. Consider land use policies to alleviate potential hazard risks and impacts for future development;
- 7. Improve enrollment in the National Flood Insurance Program within communities that are at risk to floods through increased outreach and information;
- 8. Establish mitigation priorities and develop mitigation strategies in Idaho County;
- 9. Strategically locate and plan infrastructure and fuels reduction projects that take into consideration the impacts of natural hazards;
- 10. Reduce the area of wildland-urban interface (WUI) land burned and losses experienced because of wildland fires where these fires threaten communities in the wildland-urban interface;
- 11. Provide recommendations for alternative treatment methods, such as brush density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated fuels; and
- 12. Meet or exceed the requirements of the National Fire Plan and FEMA Multi-Hazard Mitigation Plan and Community Wildfire Protection Plan.

Integration with Other Local Planning Mechanisms

During the development of this Multi-Hazard Mitigation Plan several planning and management documents were reviewed to avoid conflicting goals and objectives. Existing programs and policies were reviewed to identify those that may weaken or enhance the hazard mitigation objectives outlined in this document. The following narratives help identify and briefly describe some of the existing planning documents and ordinances considered during the development of this plan. This list does not necessarily reflect every plan, ordinance, or other guidance document within each jurisdiction; however, this is a summary of the guidance documents known to and recommended for review by members of the planning team.

City of Cottonwood Emergency Plan

The City of Cottonwood Emergency Plan addresses the city's operational plan in the event of several potential disasters and emergencies such as a North Idaho Correctional Institution escape, a structural or wildland fire, and loss of water supply as well as other disasters. The Plan offers basic guidelines regarding the city's response and jurisdictional control.

It is anticipated that the Multi-Hazard Mitigation Plan will support the City of Cottonwood Emergency Plan. The hazard assessments conducted during the MHMP planning process may help identify additional hazards and will support the improvement of the city's response capability.

Nez Perce Reservation Emergency Operations Plan

The Nez Perce Reservation Emergency Operations Plan outlines the policies and concepts that guide response at the local level in response to, and recovery from natural and man-caused disasters. The Emergency Operations Plan describes an array of tribal responses and efforts to save lives, limit human suffering, and protect public health, safety, and property, including wildlife, natural resources, the environment, and local economy from the damaging effects of natural and man-caused disaster emergencies.

It is anticipated that the Multi-Hazard Mitigation Plan will support the Nez Perce Reservation Emergency Operations Plan. The hazard assessments conducted during the MHMP planning process may help identify additional hazards and will support the improvement of the tribe's response capability.

North Idaho Correctional Institution Facility Risk Assessment

The purpose of the North Idaho Correctional Institution's (NICI) Facility Risk Assessment is to 1) promote sensitivity to the scope of potential threats which could compromise the safe and secure operation of all Idaho Department of Correction facilities and community work centers, 2) provide a sense of what threats require the prioritized appropriation of Department of Correction resources, 3) assess the current facility and community work center emergency preparedness, and 4) to provide guidance as the department's emergency preparedness process evolves.

NICI's Facility Risk Assessments provides valuable information that will be incorporated into the risk assessments completed during the MHMP planning process.

2022 Idaho County Community Wildfire Protection Plan (CWPP)

The 2022 Idaho County CWPP was updated during a joint planning effort with the 2022 Idaho County MHMP update process. The CWPP will serve as a stand-alone plan located in the appendix to the MHMP and was incorporated into the MHMP. The CWPP makes up a large part of the Wildland Fire chapter (Chapter 8) of the current MHMP. There are mitigation action items in Chapter 9 (Mitigation Strategy) of the current MHMP, however, there are also CWPP projects in this MHMP appendix that apply to both plans.

Idaho County Natural Resources Plan, August 2016

This plan was developed in recognition that the citizens of Idaho County desire to ensure a continued lifestyle of quiet enjoyment of private property and the natural resources found therein. This plan identifies the culture, heritage, customs, economic needs, and values of Idaho County citizens regarding natural resources and states that these realities must be taken into consideration by state and federal agencies when they develop plans that impact land use and natural resources with Idaho County. The Idaho Count Multi-Hazard Mitigation Plan was updated using a framework and planning philosophy consistent with those outlined in the Idaho County Natural Resources Plan.

CHAPTER 2 – THE PLANNING PROCESS

Documenting the Planning Process

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

The Planning Team

Idaho County Disaster Management Coordinator, Jerry Zumalt, led the planning team efforts alongside Sandi Paul who oversaw the CWPP update process. The planning team consisted of resource professionals that included county and city elected officials and staff, fire protection districts, law enforcement, and public health districts.

The planning philosophy employed in this project included 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)(4) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans that impact multiple jurisdictions. As an adopting jurisdiction in the Idaho County Multi-Hazard Mitigation Plan jurisdictions were required to participate throughout the planning process, either through regular meetings or outside correspondence; provide feedback on goals, hazard ratings, and capabilities; provide input toward hazard risk analysis, review and submit mitigation action items, and adopt the final plan by resolution.

The following is a list of jurisdictions that have met the requirements for an adopting jurisdiction and are thereby included in the Multi-Hazard Mitigation Plan:

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- Idaho County
 - City of Kooskia City of Riggins
- City of CottonwoodCity of Ferdinand
- City of Stites
- City of Grangeville
- City of White Bird

These jurisdictions also participated in previous iterations of the Idaho County MHMP. For this update, the city of Kamiah did not formally adopt the plan, however, a representative from Lewis County was involved in the plan to represent the Idaho County part of the Kamiah area.

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:

- One-on-one correspondence and discussions between the planning team 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. Phone calls and emails were exchanged regularly between planning team members during the planning process to answer questions and request additional information.
- Written correspondence was provided regularly between the planning team leadership and each participating jurisdictions updating the cooperators on the document's progress, making requests for information, and facilitating feedback. NMI representatives used an email distribution list of all the stakeholders to announce meetings, distribute meeting minutes, provide draft sections for review, and request information. All 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 team leadership, several participating jurisdictions hosted copies of the draft Idaho County Multi-Hazard Mitigation Plan during the public review period.

Planning Team Meetings

Idaho County Disaster Management sent a formal invitation to prospective planning team members inviting them to the initial project kickoff meeting. Additionally, an announcement regarding the kickoff meeting was made at the local LEPC meeting as well as other venues. Additional members were invited individually as they were identified by the planning team. A record of the formal invitation letter is included in the Appendices.

The following list of people participated in at least one of the planning committee meetings, volunteered time, or responded to elements of the Multi-Hazard Mitigation Plan's preparation. A few participants served on the planning team as dual representatives of more than one jurisdiction. Some of the participants were also part of the original 2009 planning committee. A record of sign-in sheets and planning team meeting agendas is included in the Appendices.

Name	Title	Organization
Jerry Zumalt	Disaster Management Coordinator	Idaho County
Sandi Paul	Fire Mitigation Coordinator	Idaho County
Mark Anderson	Chief	Kooskia FD
Terry Cochran	Chief	Cottonwood Police Department
Brenda Tilley	City Clerk-Treasurer	City of Riggins
Mike Goodwin		City of Stites
Angie Riener	City Clerk-Treasurer	City of Ferdinand
Bob West	Emergency Manager	Lewis County, Idaho
Tim Droegmiller	NPT Forestry/Fire	Nez Perce Tribe
Jeff Handel	FMO	Nez Perce Tribe
Tom McLeod		Red River Ranger District-NCF
Graydon Galloway		Salmon River Ranger District-NCF
Brian Perry		Grangeville Fire Department

Table 1: 2021-2022 Idaho County Planning Team Members

Name	Title	Organization
Jared Andrews		Grangeville Fire Department
Bob Mager		Grangeville Fire Department
Greg Danly	Chief	Cottonwood Fire Department
Clinton Riener		Cottonwood Fire Department
Joe Armstrong-Nelson	Chief	Harpster Fire
Steve Repp		Dixie Volunteer Fire Department
John Cantlon		Secesh Fire Department
Kelly Martin		Warren
Patrick Hagen		Avista
Tyre Holfeltz	Fire Prevention and Risk Mitigation	Idaho Department of Lands
Tyre nonenz	Program Manager	Idano Department of Lands
Dave Schwartz		Idaho Department of Lands
Kevin Chaffee		Idaho Department of Lands
Dave Crousser		Idaho Department of Lands
Connor Shropshire		Idaho Department of Lands
Risto McFeely		Public Health District 2
Meagan McCoy		Public Health District 2
Dean Neufeld		Public Health District 2
Barbara Grimm	GIS Coordinator	Idaho County
Ben Stowell	GIS Analyst	Idaho County
Polly Smith	Secretary	3 Rivers Amateur Radio Club
Amanda Maki		USFS
Jennie Fischer	NEPA Planner	Nez Perce-Clearwater NF
Justin Pappani	Fire Ecologist	Nez Perce-Clearwater NF
Ryan Bender		IOEM
Lorrie Pahl		IOEM
Brad Tucker	Environmental Planning Manager	Northwest Management, Inc.
Adam Herrenbruck	Planning Associate	Northwest Management, Inc.

Public Involvement

News Releases

The public was made aware of the beginning of the plan update process through a news release that went to two local newspapers – the Idaho County Free Press and the Clearwater Progress. Planning team members were also encouraged to spread the word about the planning process and to discuss the issue of wildfire in Idaho County to make the public more aware of the process without becoming directly involved in the planning. The news release can be found in the Appendix.

Community Information Meeting

On June 19, 2021, Idaho County Fire Mitigation attended the Secesh Meadows community meeting. The Fire Mitigation Coordinator, Sandi Paul, presented the county fire mitigation program including what options are available to residents of the Secesh, Burgdorf, Warren, and surrounding areas. Representatives from the Payette National Forest also attended the meeting and discussed wildfires in the area and what measures individual property owners could do to reduce the threat of wildfire affecting

their properties. This community meeting informed residents about the dangers of wildfire, wildfire mitigation strategies, and the role that planning plays in the hazard mitigation process.

MHMP Public Comment Period

A public comment period was conducted from DATE to DATE to allow members of the public an opportunity to view the full draft of the Multi-Hazard Mitigation Plan. People could then submit comments and any other input to the planning team for consideration. A news release was submitted to the local newspapers on DATE announcing the comment period, the locations of the plan for review, and instructions on how to submit comments. Paper copy drafts were printed and made available at LOCATIONS. An electronic version of the plan was made available online at LOCATIONS. The news release can be found in the Appendix.

For the complete record of the public comments received and a description of how they were implemented into the plan, see the Appendix.

Continued Public Involvement

Idaho County is dedicated to involving the public directly in reviews and updates of this Multi-Hazard Mitigation Plan. The County Disaster Management Coordinator, through the planning committee, is responsible for the annual review and update of the plan as recommended in the "Plan Monitoring and Maintenance" section in Chapter 9. Through this process the public will continue to be involved in the Multi-Hazard Mitigation Plan even after state and FEMA approval.

CHAPTER 3 – COMMUNITY PROFILES

Idaho County Characteristics

The following section has been summarized from information available at Idaho County's website3 which was information borrowed from: <u>Idaho County Voices, From The Pioneers To The Present, Pioneer Days</u> <u>in Idaho County</u>, Volume 1 by Alfreda Elsensohn.

Idaho County is the largest County in Idaho by geographic area. It covers 8,503 square miles and has 6,925 square miles of National Forest land within the county.

The area now comprising Idaho County was part of Oregon Territory from 1848 to 1859. With Oregon statehood, it became a part of Washington Territory, and, in 1863, of Idaho Territory. A law in 1875 forced some changes regarding Idaho County boundaries. Therefore, in amendment of that law, new boundaries were defined to as they are to this day.

The first settlement in the new county was by gold seekers from Pierce, Idaho, who in 1861 followed the Nez Perce Trail into Elk City Basin, hopeful of finding gravel deposits that would contain gold. The hopes of miners were realized, and Elk City became the pioneer settlement of the upper Clearwater County. No town existed until the following year when a local government was established.

The gold seekers trek had begun. News of discoveries in Florence reached the ears of prospectors everywhere. Thousands of men left good gravel deposits for the better promise of gold in the Idaho mountain area of Florence. By the fall of 1862 a town of tents, lean-tos and brush houses had developed into a boom town. Florence became the first county seat town.

By 1875 Mount Idaho was developing into a prosperous town. Built largely as a stop for traffic to the gold fields, it seemed destined to be a more permanent settlement than the boom towns. It won a special election in 1875 for county seat. Mining was spreading to other areas: Orogrande, Dixie, Newsome, Salmon River, Golden, Marshall Lake, Burgdorf and others. Seventeen mining districts existed at that time, according to the Bicentennial Edition of the Idaho County Free Press published in 1976.

Mining activities had slowed down before World War II and the war saw the close of the remaining operations. In years since, several have tried to reopen, but most of today's mining is done with the use of small suction-type dredges that one sees operating along streams.

While the early mining towns were drawing in gold seekers, a new kind of traffic was developing. The Pre-Emption Act of 1841 allowed any American not already owning land to buy 160 acres in the public domain and pay later \$ 1.25 per acre. The Homestead act of 1862 supplemented the Pre-emption Act by offering a settler 160 acres of public land for a nominal fee after five years of residence. Stages and wagons

³ Idaho County, Idaho. Available at http://idahocounty.org/idaho-county-history/. Accessed August, 2021.

lumbered across the Prairie with passengers including families looking to settle on this land, and with entrepreneurs who knew that hotels, livery barns, saloons, blacksmith shops, stores, real estate firms and other businesses would be needed and would provide a profitable living.

While land was available in some areas, land on the Nez Perce Reservation was not open to the settlers until the government concluded a treaty with the Nez Perce Tribe ceding a part of their land to the Federal Government. The opening up of the land gave rise to the growth of agriculture. Many who had come into the State to search for gold remained to take up land, finding their gold in the rich soil and favorable climatic conditions. By 1864 ranches were scattered over the Prairie and along the rivers.

In 1905 at Portland and again in 1909 at Seattle the Idaho County exhibit of grains and grasses won the Gold Medal in competition with several other states. Stock raising began almost simultaneously with the tilling of the soil. Mountains, valleys, river breaks and high plateaus afforded fine grazing land. Cattle, horses, sheep and swine were raised. To breed better horses the pioneers shipped sires from the East.

Idaho County did not escape the wars on ranges between the sheep men and the cattlemen in the early 1900's. The Forest Service stepped in to help control the range. The first passenger train whistled into Grangeville on the Camas Prairie Railroad in 1908 and the present State Cattle Association was organized in the 1920's. Idaho County organized its Association in 1958. Hereford and Aberdeen-Angus eventually became the main breeds of beef cattle.

Following the War, the growth of Grangeville brought another change in county seat. An election gave it to the fast-growing town where it has remained. By 1937 a North-South highway from Bonners Ferry to Boise was completed and all except two small stretches were oiled.

The timber industry developed as an economic asset to the County. In the 1940's this industry began to develop on a full scale. While sawmills, mostly privately owned, were built earlier to produce lumber chiefly for home building, it was the huge demand for timber after World War II that made timber production a leading industry. "Potlatch Forest Inc. began cutting on the first major site on the Forest in 1944 in the Meadow Creek-Cougar Creek area. Within two years 75 million board feet had been taken out of the area.

While mining as an economic asset to the county was short lived, it gave the county its economic beginning and contributed sporadically to the economy throughout its developing years. Forestry and the timber industry, farming and ranching remain the lifeblood of the county, invigorated in recent years by the growth of tourism as a lucrative industry.

Description of the Region

Idaho County is located in Central, Idaho with the Snake River running along the western boundary. The Salmon River, Lochsa River, Clearwater River, Selway River, and their respective tributaries, drain Idaho County's heartland and empty into the Snake River. Elevations range from less than 1,000 feet above sea level at the confluence of the Snake and Salmon Rivers to 9,400 feet in the Seven Devils Wilderness at the western side of the County. Much of the county is covered by mountains and canyons with elevational

changes of thousands of feet, making Idaho County one of the most inaccessible and remote counties in the state. Ownership is mixed between federal (mainly US Forest Service), state, and private owners.

Entity	Acres	Percent of Total Area
US Forest Service	4,434,502.1	81.5%
Private	791,650.3	14.6%
Bureau of Land Management	91,913.7	1.7%
State	74,044.1	1.4%
Other (including BIA land)	26,336.0	0.5%
Water	13,054.6	0.2%
Indian Reservation	4,183.5	<1%
State Fish & Game	1,497.1	<1%
State Parks & Recreation	159.3	<1%
U.S. Fish & Wildlife Service	126.7	<1%
National Park Service	84.2	<1%
Total	5,437,551.7	100%

Table 2: Land ownership in Idaho County.

Geography and Climate

The topography of Idaho County is extremely varied, from low elevation of the Clearwater, Snake and Salmon River canyons to high, steep mountainous terrain of the Seven Devils Wilderness, Gospel Hump Wilderness, Selway-Bitterroot Wilderness, and the Frank Church River of No Return.

High-glaciated mountains throughout Idaho County are dotted with dozens of glacial lakes. The terrain is very steep, rocky, and rugged, and much is granite rock covered with alpine vegetation. The Camas Prairie in the northwestern portion of the County is relatively gentle and rolling with tributaries of the South Fork and Middle Fork of the Clearwater Rivers and the Salmon River creating significant canyons as they drain the prairie in all directions.

Idaho County is relatively free of any significant mountain barriers to impede the normal movement of the moisture laden air masses from the Pacific Ocean. Most of the total annual precipitation is attributed to storms rotating around a center of low atmospheric pressure traveling on an easterly course. Average annual precipitation received by Idaho County ranges from 19.21 inches in Cottonwood to 25.8 inches at Elk City, with Grangeville and Kooskia receiving from 21 to 23 inches. The greatest amount of precipitation is received between January and February, normally in the form of snow, and very little precipitation occurs during the summer months. The average annual snowfall can range from 21.1 inches at Kooskia to 42.6 inches at Cottonwood and as much as 128 inches at Lolo Pass in the northeastern corner of the County. The mean annual temperature varies from 51.4 degrees Fahrenheit at Elk City to 50.9 degrees Fahrenheit at Kooskia. The lowest temperature occurs between January and February, with Elk City reporting a maximum low of -43 degrees Fahrenheit in February 1996. The highest temperatures annually occur in July and August, and Kooskia reported a high of 116 degrees Fahrenheit in July 1934.

Demographics and Socioeconomics

The 2020 US Census4 established the Idaho County population at 16,541, which is a 1.7% increase from 2010. The population of Grangeville in 2010 was 3,141 and increased to 3,308 in 2020, a 5.3% increase. Grangeville was the only incorporated city to experience population growth from 2010 to 2020.

City	1970	1980	1990	2000	2010	2020
Idaho County	12,891	14,769	13,783	15,511	16,267	16,541
Cottonwood	867	941	882	944	900	822
Ferdinand	157	144	135	145	159	133
Grangeville	3,636	3,666	3,226	3,228	3,141	3,308
Kamiah	1,307	1,478	1,157	1,160	1,295	1,117
Kooskia	809	784	692	675	607	514
Riggins	533	527	443	410	419	372
Stites	263	253	204	226	221	171
White Bird	185	154	108	106	91	83

Table 3: Population Trends in Idaho County.

Population trends show that while the county has continued to gain in population over the past several decades, many of the communities are losing residents. This suggests that more people are moving into the more rural and unincorporated parts of the County, which means that more homes are potentially being built in the wildland urban interface. The home ownership rate in Idaho County is 77.5%. This is about 7% higher than the state average. The US Census Bureau reports in the 2020 Census that owner-occupied housing units have a median value \$197,200.

Table 4: Owner-occupied housing units by value in Idaho County.

Owner-occupied units	Total	%
Less than \$50,000	321	6.4
\$50,000 to \$99,999	673	13.4
\$100,000 to \$149,999	781	15.6
\$150,000 to \$199,999	766	15.3
\$200,000 to \$299,999	1,197	23.9
\$300,000 to \$499,999	972	19.4
\$500,000 to \$999,999	195	3.9
\$1,000,000 or more	103	2.1
All units	5,008	100%

⁴ US Census Bureau. "Explore Census Data". <u>https://data.census.gov/cedsci/</u>.

The median household income in Idaho County was reported at \$44,951 for the 2020 Census and the poverty rate was reported at 11.7%, which is 0.2% lower than the poverty rate for the state of Idaho. 58.2% of all workers in Idaho County are employees of private companies and 16.6% of workers are employees of local, state, or federal governments.

Development Trends

Idaho County has seen a significant influx of people moving in, mostly into unincorporated areas of Idaho County. The resulting changes in development are mostly individual private property owners building and upgrading smaller parcels or improving private lands. Some of the developments in various unincorporated areas are highlighted below.

Secesh Meadows and Burgdorf

The Secesh Meadows and River Community area in the southern part of Idaho County has more than 200 property owners. In 2021 existing cabins and property continue to be bought and sold resulting in upgrades and new construction. A new firehouse/community center was built using donated funds and the community utilizes a historical pioneer cemetery used for internment annually.

Road maintenance and winter trail grooming continues to be a high priority need as usage by recreationists has surged in the area. Daily traffic is estimated at 400 cars per day that pass Burgdorf. Recreational use, including UTV's and trailer and tent camping has dramatically increased over the past two years and thousands are visiting this area per week. This wild and scenic area is surrounded by the Payette National Forest, with the inclusion of endangered wild-run salmon within the Secesh drainage. Burgdorf Hot Springs is a National Register Historical Site. Relationships and plans are forming among interested residents of the area which include Burgdorf and now Warren connections. Road signage is in urgent need of upgrade as many signs have been stolen or damaged. The local bar and grill business underwent new ownership recently with the new full-time owners living and working locally. Some property owners are part time residents but many of the homes in the area are primary residences and business, lived in and used year-round. Local residents have built and maintained a fire station without any outside assistance.

Key stakeholders in the area include private property owners (200+) in the Secesh and Burgdorf areas, Secesh Stage Stop, Burgdorf Hot Springs and Historical Site, USFS, IDL, Fish & Game, Nez Perce Tribe, Idaho and Valley County Commissioners/Departments, and recreational groups such as ATV and snowmobile clubs, hikers, fishermen and hunters. The Secesh salmon run is fully native with no hatchery plants. This is an important factor for protection. A conservation easement on the Burgdorf Meadow is managed primarily by the Nez Perce Tribe.

Warren

The historic mining community continues to be comprised primarily of second homes and cabins. Some mining activity is occurring, and private property does occasionally change hands, but most ownership is long-term and those residing there are self-sufficient and value the remote location and their independence. One café and some cabin rentals primarily serve the recreational population that come to Warren and use it as a jumping off point for outdoor opportunities year-round. A backcountry airstrip is

located to the Southwest of town. Warren receives hundreds of recreationists each year, such as ATV, UTV, motorcycle, snowmobile, and automobile users. Remnants of old historic buildings are still standing in the downtown. The US Forest Service has an unmanned guard station in Warren. The main road into Warren is groomed to facilitate the winter recreationists coming from McCall.

Elk City, Dixie, Red River, Newsome, Orogrande

Elk City, Dixie, and Red River has seen a lot of new development. Newsome, and Orogrande have not seen much new development. Most of the new development consists of private property owners building houses and outbuildings within the WUI. Home construction is occurring in Elk City and logged, private tree farms and timber ground is being sold for development northwest of Elk City. More structures have been built in the communities of Dixie, Elk City, and Red River. Mining operation facilities have been built including a mill site and new mine shaft along Mother Lode Road just outside Elk City.

This area has not seen many changes in land use; however, traditional uses of recreation continue in the area, including ATV use, hunting, and fishing. The USFS continues to harvest timber, complete hazardous fuels reduction projects, as well as increase its larger landscape Prescription Burning Program. The volume of people visiting the area has increased noticeably in the past five years, including a large increase in ATV, UTV, and motorcycle use. There has also been an increase in mining activity, especially in Orogrande, Elk City Township, and along the South Fork Clearwater River. Smaller mining operations continue throughout the area and new ore processing operations have begun along Mother Lode Road.

Mining companies are providing employment opportunities in the Orogrande area, as mining operations expand. Most of the major business in these communities have stayed constant, but a restaurant and motel were recently remodeled and reopened. The services available in Elk City have remained, including a store, gas station, a few restaurants, laundromat, post office, school, health clinic, USFS office, and lodging. School enrollment has doubled at the Elk City School. The public school also provides services and resources to several home-schooled children throughout the area, as requested.

Harpster

The Harpster area has seen an increase in new homes being built but no new major business. The land use in the Harpster area has not changed much. Outdoor recreation continues to be popular, especially on the South Fork Clearwater River and motorists traveling on SH-13. Locals have observed that many new property owners in the Harpster area are not accustomed to a rural lifestyle and moving into the area proves challenging for many. The area has not experienced major changes in infrastructure or industry in the past five years.

Unincorporated Grangeville Area

The Grangeville Rural Fire District is changing from primarily rural agricultural lands to an increased number of single-family dwellings. Fuels, and therefore wildfire risk is increasing because of these structures in the WUI and the increase in water consumption and the water demand for firefighting is increasing. Overall land use changes include less agricultural uses and more residential uses.

A lack of standardization has resulted in a road system with wide variability of road dimensions and quality. It is increasingly difficult for response equipment to access some locations due to this variability.

Several major industries and employers are located within the Grangeville RFD, including Idaho Forest Group, Advanced Welding & Steel, Rocky Canyon Pellet Co., CHS Primeland, The McGregor Company, and the US Forest Service.

City of Grangeville

Grangeville is the largest city in Idaho County. A large influx of people moving into rural parts of the county has nonetheless affected the city of Grangeville. Local populations rely on Grangeville as a principal city and source for many services. Grangeville is the county seat of Idaho County and home to the Idaho County Courthouse and county departments. The city also offers gas stations, shopping, healthcare, pharmacies, banking, schools, churches, restaurants, lodging, entertainment, and other services. Grangeville is home to an important healthcare system in Idaho County, Syringa Hospital and Clinics. The North Central District Health Department also has an office in Grangeville.

Highway 95 passes through the city of Grangeville and so the city experiences a large volume of traffic in both commercial vehicles and private motorists. State Highway 13 also cuts through Grangeville connecting with US-12 at Kooskia. Grangeville is close to many popular outdoor recreation areas and is a popular destination for outdoor recreationists.

City of Cottonwood

The city of Cottonwood has seen fewer changes in development compared to other parts of Idaho County, but overall increases in people moving to rural Idaho County has had some impacts to the greater Cottonwood area. Cottonwood is in northwest Idaho County in an area heavily dominated by agricultural land. US-95 passes through the edge of Cottonwood and the city offers several important services to the area, including gas stations, shopping, healthcare, pharmacies, banking, schools, churches, restaurants, lodging, entertainment, and other services. Cottonwood has an important healthcare center for the area, St. Mary's Hospital.

The city of Cottonwood has made several improvements to the city infrastructure and some improvement projects are ongoing. The streets have been improved to the County Road Administration Board standards base. Stormwater drainage has been improved on the city streets. There is an ongoing project to improve or change creek drainage.

City of Stites

The city of Stites sits along the South Fork Clearwater River and SH-13 runs north/south through town. Stites is roughly four miles upstream, or south, of Kooskia. Stites has several services, including basic shopping, lodging, dining, and churches. For other services, residents rely on nearby cities including Kooskia, Kamiah, and Grangeville. Clearwater Valley High School is located in between Kooskia and Stites. The city of Stites sits completely within the boundaries of the Nez Perce Reservation.

In the last few years Stites has seen some changes in city leadership and in some city positions. Stites has completed several improvement projects in the past few years as well. Some of these projects include a well-improvement project, wastewater improvement project, drinking water upgrade, improvements to the canyon creek storm drain and culvert, and the implementation of a pump to discharge overflow water underneath SH-13. Stites recently added a 170,000-gallon bolted steel water tank that replaced the two

existing smaller tanks which held 90,000 gallons. Stites also recently added a new city park and a new structure where the old community center stood until 1996. Stites has recently seen increases in the residential parts of town, including the dividing of city lots.

City of Kooskia

Kooskia sits in northwest Idaho County at the confluence of the South and Middle forks of the Clearwater River. It is accessed by both US-12 and SH-13 and the city lies completely within the boundaries of the Nez Perce Reservation. Kooskia offers several important services to the area, including gas stations, shopping, healthcare, pharmacies, banking, schools, churches, restaurants, lodging, entertainment, and other services. Outdoor recreation opportunities in the Kooskia area, especially the Clearwater River, bring many tourists and outdoor enthusiasts through Kooskia each year.

The city of Kooskia is currently working on improvements to its sewer and wastewater system to stay in compliance with DEQ mandates. It has also made and is continuing to work on improvements to Fire and EMS response. The city recently received a reevaluation with slight improvement in the fire protection class rating. In emergency services it had a strong cooperative agreement with the City of Stites. Three business buildings have recently sold, and redevelopment is being planned. A new housing development is planned on an old trailer court site that has been vacant for years. Several other vacant properties are being developed for housing.

City of Ferdinand

Ferdinand sits in the far northwest corner of Idaho County, just off US-95, about eight miles north of Cottonwood. The landscape surrounding the city of Ferdinand is dominated by agriculture, especially grain production. Ferdinand has few services, but the city does house grain storage facilities, a church, dining, and a vet clinic. The city of Ferdinand is located within the boundaries of the Nez Perce Reservation and is roughly eight driving miles from Craigmont in Lewis County.

City of Riggins

The city of Riggins is in southwest Idaho County along the Salmon River. Outdoor recreation, especially river recreation and tourism are a very important part of the local economy. The city sits at the bottom of a rugged canyon with US-95 running through the length of town, therefore, Riggins experience high volumes of commercial and private vehicle traffic regularly. Riggins offers several important services for the area, including gas stations, shopping, healthcare, banking, schools, churches, restaurants, lodging, entertainment, and other services. Riggins has several outfitters for hunting, fishing, and rafting, and is considered a jumping off point for recreation in both the mountains and river. Due to the topography of the area, the greater Riggins section of US-95 is very important to the flow of transportation and accessibility for this part of Idaho. The time zone line separating the state of Idaho follows the Salmon River, therefore, Riggins is in the Mountain Time Zone.

City of White Bird

White Bird sits just off US-95 along White Bird Creek, which flows into the Salmon River not far away. White Bird is about 17 driving miles south of Grangeville, and about 29 driving miles north of Riggins. Old Highway 95 passes through White Bird and the city offers some services, including dining, lodging, library, churches, and postal services. The greater White Bird area has many recreational opportunities and tourist

attractions including camping, river recreation, hiking, hunting, and historical attractions. US-95 bypasses White Bird just to the west but the city is visible from the highway. Areas within the White Bird greater area include Joseph Plains, Doumecq, and Slate Creek. These areas have experienced a growth in residential construction as populations increase from folks leaving the suburb life for a more rural lifestyle.

Natural Resources

Idaho 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, agriculture, and mining) has altered plant community succession and has resulted in dramatic shifts in the fire regimes and species composition. As a result, some forests in Idaho County have become more susceptible to large-scale, high-intensity fires posing a threat to life, property, and natural resources including wildlife and plant populations. High-intensity, stand-replacing fires have the potential to seriously damage soils, native vegetation, and fish and wildlife populations. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Fish and Wildlife

Idaho County is home to a diverse array of fish and wildlife species. Idaho County streams provide habitat for trout, salmon, sturgeon, bass, catfish, crappie, perch, and pike, 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

Vegetation in Idaho County is a mix of forestland and rangeland ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the forest vegetation of the area. The full extent of the county was evaluated for cover type using LANDFIRE imagery in tabular format and is presented in the table below.

The most represented vegetated cover type is conifer dominated forests at approximately 75% of the total area. The next most common vegetation cover type represented is perennial grass slopes at 7%. Shrublands are the third most common cover type at 5% closely followed by agriculture, exotics, and areas that are sparsely covered with vegetation (4%, 3%, and 3% respectively). None of the remaining ground cover types total more than 2% in any one category and most total less than 1%.

Land Cover	Percent of Total
	Area
Conifer	75%
Grassland	7%
Shrubland	5%
Agriculture	4%
Exotic Herbaceous	3%
Sparsely Vegetated	3%
Riparian	2%

Developed	1%
Water	<1%
Hardwood	<1%
Barren	<1%
Snow-Ice	<1%
Conifer-Hardwood	<1%
Total	100%

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

Hydrology

The Idaho Water Resource Board is charged with the development of the Idaho Comprehensive State Water Plan. Included in the State Water Plan are the statewide water policy plan, and component basin and water body plans which cover specific geographic areas of the state (IDEQ 2003). The Idaho Department of Water Resources has prepared General Lithologies of the Major Ground Water Flow Systems in Idaho. The majority of Idaho 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 (WQS). These uses include:

- Aquatic Life Support: cold water biota, seasonal cold-water biota, and warm water biota;
- Contact Recreation: primary (swimming) and secondary (boating);
- Water Supply: domestic, agricultural, and industrial; and
- Wildlife Habitat and Aesthetics

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

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

fires that increase soil hydrophobic characteristics), can lead to increased surface runoff and debris flow to stream channels.

A significant component of Idaho County's infrastructure is the water sources that are maintained for use by communities. While the Idaho Water Resources Board does not monitor all drinking water supplies in the State, they are charged with maintaining standards on municipal drinking water supplies. These include community water sources, water used in a business, and similar drinking water supplies in the County. Three categories of municipal water are recognized: Groundwater, spring-groundwater, and surface water. The former two are generally considered resistant to surface disturbances such as fire, flood, landslide, and severe weather events. The latter is considered much more influenced by many hazards. Earthquakes can impact all collection types, while landslides that directly contact any of them will have an impact.

Air Quality

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants that are common in outdoor air, considered harmful to public health and the environment, and that come from numerous and diverse sources. These standards address six pollutants known to harm human health including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen dioxide.⁵

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.⁶

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.

Due principally to local wind patterns, air quality in Idaho County is generally good to excellent, rarely falling below IDEQ pollution standards. However, locally adverse conditions can result from occasional

⁵ United States Environmental Protection Agency. *Reviewing National Ambient Air Quality Standards (NAAQS): Scientific and Technical Information.* https://www.epa.gov/naaqs. Accessed August 2021.

⁶ 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.

wildland fires in the summer and fall, and prescribed fire and agricultural burning in the spring and fall. All major river drainages are subject to temperature inversions, which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and would potentially affect all communities in Idaho County.

Smoke management in Idaho County is facilitated, in part, by the Idaho/Montana Airshed Group. This group advises when conditions are appropriate for prescribed burning based on information participating members (burners) supply to them. There is a slim portion of Airshed Unit 12B in the northern end of the county, Airshed Units 14, 15 and 16 make up the extreme southern portion of the county. The remainder of the county is in Airshed Unit 13. The Missoula impact zone is just to the northeast of Idaho County. Class I areas in/near Idaho County include Hells Canyon, Eagle Cap, and Selway/Bitterroot areas. An airshed is a geographical area which is characterized by similar topography and weather patterns (or in which atmospheric characteristics are similar, e.g., mixing height and transport winds). The USDA Forest Service, Bureau of Land Management, and the Idaho Department of Lands are all members of the Montana/Idaho State Airshed Group, which is responsible for coordinating burning activities to minimize or prevent impacts from smoke emissions. Prescribed burning must be coordinated through the Missoula Monitoring Unit, which coordinates burn information, provides smoke forecasting, and establishes air quality restrictions for the Montana/Idaho Airshed Group. The Monitoring Unit issues daily decisions that may restrict burning when atmospheric conditions are not conducive to good smoke dispersion. Burning restrictions are issued for airsheds, impact zones, and specific projects. The monitoring unit is active from March through November. Each Airshed Group member is also responsible for smoke management all year.7

Additionally, the Federal Air Rules for Indian Reservations (FARR) in Idaho, Oregon, and Washington is a set of air quality regulations established under the Clean Air Act. The FARR creates rules to manage activities that cause air pollution.

The FARR applies to all residents (both tribal members and non-tribal members) and businesses located within the exterior boundaries of reservations in Idaho, Oregon, and Washington. The ownership status of land on the reservation does not affect how the rules apply.

The Rule for Forestry and Silvicultural Burning Permits sets up a permit program for forestry and silvicultural burning on the Nez Perce Indian Reservation. People on the reservation who want to perform forestry and silvicultural burning will need to get a permit. Forestry and silvicultural burning is the burning of vegetation that comes from the growing and harvesting of trees and timber. This type of burning includes slash burning, burning for reducing fire hazards, and burning for managing the forest

⁷ Montana/Idaho Airshed Management Group. 2010. Montana/Idaho Airshed Management System. Available online at https://mi.airshedgroup.org/.

environment. Burning may also be performed to prevent disease, to control pests, and for forest reproduction.

Hazard Management Capabilities

Idaho County Disaster Management is responsible for the administration and overall coordination of the disaster management program for Idaho County and the cities within the county. The Incident Command System (ICS) is the basis for all direction, control and coordination of emergency response and recovery efforts. Emergency response and supporting agencies and organizations have agreed to carry out their objectives in support of the incident command structure to the fullest extent possible.

The Idaho County Government Office houses a staff of emergency management personnel trained and dedicated to mitigating the negative impacts of natural and man-made disasters in the County. City offices throughout the county are equally dedicated to reducing catastrophic losses from disasters although their budgets are extremely limited.

Many states, counties and communities in the nation believe they are prepared for natural and man-made disasters; however, not all of them have faced the necessity of testing this belief. Too often, resources are tested beyond the ability of counties and communities to effectively respond, especially when the unexpected occurs. The Idaho Bureau of Homeland Security (IBHS) and FEMA work closely with the counties and communities of Idaho in the form of desktop exercises and preparedness drills in order to increase preparations and abilities of the state's first responders.

On February 18, 2020, the Board of Idaho County Commissioners adopted by Resolution 2020-03, a Comprehensive Plan. The Board of County Commissioners also approved and adopted Idaho County Ordinance 67, establishing and classifying all land in the unincorporated areas of Idaho County as multiuse with no restrictions except for Idaho County Ordinance 70 pertaining to subdivisions and Idaho County Ordinance 53 pertaining to mobile and manufactured homes. Idaho County, as defined above, and the municipalities of Ferdinand, Grangeville, Kamiah, Kooskia, Riggins, Stites, and White Bird participate in preparedness drills, public education efforts, and the implementation and enforcement of planning and zoning policies.

The Payette and Nez Perce-Clearwater National Forests have Cooperative Law Enforcement agreement that allows the Forest Service to pay the County Sheriff's Department for services and equipment used on the Forest. Idaho Department of Lands also has memorandums of understanding with all the rural fire departments within Idaho County that allows the Forest Service or the fire departments to render mutual aid on fires outside of their respective jurisdiction.

CHAPTER 4 – FLOOD

Regional and Local Hazard Profile

Floods have been a serious and costly natural hazard affecting Idaho County and are the primary natural disaster in the State of Idaho. 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. Major disaster declarations related to flooding were made for Idaho in 1956, 1957, 1961, 1962, 1963, 1964, 1972, 1974, 1984, 1996, 1997, 2005, 2006, 2008, 2010, 2011, and 2019.

Floods can be divided into two major categories in central Idaho: riverine and flash flood. Riverine flooding is associated with a river's watershed, which is the natural drainage basin that conveys water runoff from rain and snowmelt. Riverine flooding occurs when the flow of runoff is greater than the carrying capacities of the natural drainage systems. Rainwater and snowmelt runoff that is not absorbed by soil or vegetation seeks surface drainage lines following natural topography lines. These lines merge to form a hierarchical system of rills, creeks, streams, and rivers. Generally, floods can be slow or fast rising depending on the size of the river or stream.

Flash floods are a "rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country."⁸ Flash floods may also occur in draws or gulleys where there is no stream or creek. These are characterized by a rapid rise in water level, high velocity, and large amounts of debris. Major factors in flash flooding are the intensity and duration of rainfall and the steepness of watershed and stream gradients. The amount of watershed vegetation, the natural and artificial flood storage areas, and the configuration of the stream bed and floodplain are contributing features. Flash floods may result from the failure of a dam, rapid snowmelt, loss of vegetation due to wildfire, or the sudden breakup of an ice jam.

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 the damaging effects of flash

⁸ National Weather Service – Glossary. "Flash Flood". Available online at https://forecast.weather.gov/glossary.php?word=flash%20flood.

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 during the spring and summer months due to thunderstorm activity.

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.⁹

Flooding from ice or debris jams is a relatively common phenomenon in central Idaho and has been a significant contributor to flood-related damages in Idaho County specifically. Small jams frequently occur in many of the streams throughout Idaho County, particularly at bridge abutments and culverts.

Unusually heavy snowpacks 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 situations quickly introduce large quantities of water into the stream channel system, easily overloading its capacity.

On small drainages, the most severe floods are usually a result of rainfall on frozen ground; however, moderate quantities of warm rainfall on a snowpack, 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.

The major source of flood waters in Idaho 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. The magnitude of most floods in Idaho County depends on the combinations of intensity and duration of rainfall, pre-existing soil conditions, area of a basin, elevation of the rain or snow level, and the amount of snowpack. Man-made changes to a basin also can affect the size of floods. Although

⁹ Barnhill, Dave, et al. "Flash Floods – How do they occur?". Waterlines. Division of Water, Indiana Department of Natural Resources. Spring-Summer 1999. Indianapolis, Indiana.

floods can happen at any time during the year, there are typical seasonal patterns for flooding in southern Idaho, based on the variety of natural processes that cause floods:

- Heavy rainfall on wet or frozen ground, before a snowpack has accumulated, typically cause fall and early winter floods
- Rainfall combined with melting of the low elevation snowpack typically cause winter and early spring floods
- > Late spring floods in Idaho County result primarily from melting of the snowpack

The most 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". 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."¹⁰

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

¹⁰ FEMA. Federal Emergency Management Agency. National Flood Insurance Program. Washington D.C. Available online at www.fema.gov.

hydrologic response. Re-vegetation of burned slopes diverts overland flow (fast and flood producing) to subsurface flow (slower and flood moderating).

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.

Development in or near floodplains increases the likelihood of flood damage. New developments near a floodplain add structures and people in flood areas thereby increasing, not the extent of the flood itself, but the impacts or damages that may be caused. New construction can also alter surface water flows by diverting water to new courses or increasing the amount of water that runs off impervious pavement and roof surfaces. This second effect diverts waters to places previously unaffected by flood issues. 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.

Except for dam failure, flood events are typically caused by severe weather events such as thunderstorms or rapid spring runoff. Idaho County has a high risk of major flood damages; however, flood events can trigger other types of hazard events that may be more damaging than the flood itself. Flooding can result in power outages, impact transportation systems, cause water contamination, cause crop loss, spill hazardous materials, and spread disease.

Idaho County

All three types of flood events occur in Idaho County. Riverine flooding occurs along all tributaries to the Snake, Salmon, and Clearwater Rivers. The mountainous terrain that exists throughout much of the county 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 smaller tributaries throughout the county. To a lesser extent, the Snake and Salmon Rivers are also affected by rain on snow events. Due to its large drainage area, the impacts of flood events on the main stem of the Snake River are muted; however, tributaries to the Snake and Salmon Rivers can be greatly influenced by rain on snow events. In general, these flood events can be predicted 24 to 72 hours in advance of the rising waters.

In Idaho County, summer thunderstorms can result in flash flooding of specific smaller drainages. Often there is little time to react to the quickly rising waters. Due to the nature of the terrain within the county, localized flooding from thunderstorms tends to be more of a storm drainage problem for many communities. Short-term blockage of roads is usually the biggest issue as drainage structures are overwhelmed by the rapid influx of water.

Ice/debris flows occur as part of riverine and flash flooding, usually exacerbating the effects of those types of flood events. In the event of a fire, farming, or heavy logging activity, flash flooding and mudslides can
result due to the loss of vegetation that usually holds the soil in place and intercepts some of the water's velocity.

The Snake, Salmon, and Clearwater River drainages are collector watersheds for the Seven Devils Mountain Range and the Clearwater Mountain Range in the eastern part of the county. Numerous smaller tributaries drain into the Snake, Salmon, and Clearwater Rivers including the Lochsa, Selway, South Fork of the Clearwater, Little Salmon, Rapid River, and Middle Fork of the Salmon. Most of these drainages have large, high elevation drainage areas; thus, are heavily influenced by rain-on-snow events. Flash floods have also been recorded but are not as common.

Many bridge crossings have been identified by the Highway Districts as outdated and inadequate for high water events. Debris often collects on bridge abutments causing water to back up.

A high level of sediment is prevalent in Idaho County drainages during periods of runoff primarily from the abundance of high elevation washouts and agricultural fields in the lowlands. 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 areas. Debris can plug culverts and accumulate on bridge abutments at several locations. Many secondary routes are not paved, which results in gravel washing downslope 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 Idaho County. Debris jams during high water events have caused considerable flood damage to adjacent properties.

Table 5: Improvement values and parcel acres in the FEMA floodplain

Number of	Total value of all	Average improvement	Parcel acres in FEMA
improvements	improvements	Value	floodplain
1,691	\$231,465,105.00	\$136,880.61	130,884.9

Figure 1: FEMA-recognized floodplain in Idaho County



National Flood Insurance Program (NFIP)

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.

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.

Community Name	Policies in	Total Coverage	Total Written Premium + EPE	Floodplain Manager
	2	ćroo ooo	ćoo4	Tanua Kanaadu
GRANGEVILLE, CITY OF	2	\$500,000	2981	Tonya Kennedy
KOOSKIA, CITY OF	8	\$1,729,300	\$10,970	Charlotte Schilling
STITES, CITY OF	4	\$575 <i>,</i> 600	\$5,276	Rey Mireles

As of April 30, 2022, three cities in Idaho County were participating in the NFIP.

Description	Definition	
Policies in Force	The number of policies in force for a given state and combination of attributes.	
Total Coverage	The total building and contents coverage for the policies in force.	
Total Written Premium + FPF	This represents the sum of the premium and FPF (federal policy fee) for the policies in force.	

Local Event History

Idaho County has experienced a long history of high magnitude floods, typically by "50 and 100-year" levels. The diverse landscape and weather patterns within Idaho 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 is devastating and can cause extraordinary flooding events.

Recent Major Flood Hazard Events

Heavy Rain Event 3/16/2017

An atmospheric river brought several inches of rainfall to central Idaho which was already soaked from previous rains. This contributed to mudslides that shut down roads and flooding that affected residences and property.

Several locations along US-12 experienced flooding, mud and debris on the road which caused it to close for 10 hours. Three inches of rain with snowmelt occurred a week before this event contributing to saturated soils. A nearby sensor in Lowell recorded 1.23 inches of rainfall 24 hours leading up to the flooding. Multiple culvert washouts and other mudslides were reported through March 24 along the following roads: Cedar Creek, Big Cedar and Cove. Idaho County declared a state of emergency because of all the issues. Estimated \$50,000 in property damage.

Flood Event 4/9/2019

Moderate to heavy rainfall combined with snow melt contributed to flooding, mudslides and road washouts and closures. The South Fork of the Clearwater River at Stites, crested at a record level of 10.79 feet on the morning of April 9, which contributed to the town of Stites being flooded. This led to flooding of 3 to 5 homes along the west side of the river along North River Road. A torrent of fast-moving water developed in an unnamed gulch located east of Stites along Stites Grade Road and this led to the closure of Idaho Highway 13 and the flooding of Stites. Approximately 30 to 50 homes were affected by the flooding in the town of Stites with many wells contaminated and the National Guard rescued two people who were trapped in their home.

Very large mudslides caused US-12 to close between Orofino and Kamiah from April 9 to April 13. A home in Syringa was flooded by a debris flow and US-12 between Kooskia and Syringa experienced erosion and water running on the road leading to the closure of Highway 12. Clear Creek, located approximately 2 miles southeast of Kooskia, washed out two private bridges, flooded approximately 5 homes, destroyed a trailer home, and damaged county road Clear Creek Road. The Nez Perce U.S. Forest Service closed Smith Creek Road due to flooding of the Little Smith Creek causing a washout. Numerous other bridges, culverts and roads were washed out across Idaho County. Damages to Idaho County infrastructure from this event have totaled to around 6 million dollars.

FEMA-4443-DR Public Assistance

Primary Impact: Damage to roads and bridges; Total Public Assistance cost estimate: \$3,131,215

Flash Flood Event 8/9/2019

An evening severe thunderstorm brought damaging hail and flash flooding along Highway 95 in central Idaho. Another storm brought quarter-sized hail and a debris flow north of Salmon. A severe thunderstorm put down an inch and a half of rain in 30 minutes over the canyons near Lucile. This caused large debris flows in Fiddle Creek, Sheep Creek and Chair Creek that covered US-95 with up to four feet deep of mud. More than a dozen vehicles became stuck in the mud. The highway was closed until the next day when one lane was opened. The highway opened totally by Monday, three days later. The flooding also damaged Cow Creek Road and John Day Road. Estimated \$10,000 in property damage.

Probability of Future Occurrence

The probability of flood events occurring in Idaho County is high. Low magnitude flood events can be expected several times each year. However, due to various flood control measures and drainage infrastructure, the impacts of these events in unincorporated areas are slight and usually amount to minor and temporary traffic issues throughout the county. Larger magnitude and high impact flood events have

occurred but are not likely in any given year. These types of flood events have the highest probability of occurrence in the winter or early spring and often have a greater impact on the cities of Kamiah, Riggins, White Bird, Grangeville, Cottonwood, Kooskia, and Stites. Minor flash flood events are expected annually usually because of summer thunderstorms or rain-on-snow events.

The main stem of the Salmon River does not usually cause significant flooding problems; however, the potential for severe damage exists. The U.S. Highway 95 route from Riggins to White Bird parallels the path of the river. Extremely high-water flows could begin undercutting the roadway causing severe damage and potential isolation of communities in the Salmon River canyon. Furthermore, much of the canyon itself is susceptible to both small- and large-scale landslides. A slide causing even partial blockage of the channel would cause not only the highway, but numerous individual homesites to be inundated with backed up floodwaters. The communities of White Bird, Slate Creek, Lucile, and Riggins could be at risk if this type of event were to occur.

The Little Salmon River heads in the Meadows Valley in Adams County and flows northward to its confluence with the Salmon River at Riggins. Major tributaries include Goose Creek, Hazard Creek, Boulder Creek, and Rapid River. The drainage area is 516 square miles and includes elevations from 1,760 feet at the mouth to 9,000 feet in the Seven Devils Mountains and Hazard Creek drainages.

The Little Salmon River travels through a very narrow canyon before discharging into the Salmon River at Riggins. Any kind of blockage such as a log or debris jam or slide could cause water to back up and potentially flood homes and Highway 95 in the canyon. The New Year's flood of 1997 caused severe damages to communities and homes in the Little Salmon River canyon. Many homes and other structures along the river were completely flooded and, in a few cases, washed away. A combination of floodwaters and mudslides along the Highway 95 corridor cut off access along this route and resulted in very high repair costs.

Only a short section of the Clearwater River from Kooskia to Kamiah is within Idaho County. Both the Kooskia and Kamiah bridges were built to withstand nearly any kind of flood event; thus, the main stem of the Clearwater River will not likely cause serious flooding or damage in Idaho County. The Middle Fork and South Fork of the Clearwater River have a much higher probability of causing flood damage to area residents and communities. Although the USGS data is limited for the South Fork, the 1964 flood was well outside the normal range of peak flows for the river. The 1996 and 1997 floods also show up as being above average peak flows. Due to the density of development as well as the lack of structurally sound levees, the communities of Kooskia, Harpster, and Stites as well as several individual residences along the South Fork of the Clearwater have a high risk to flood events.

The Lochsa River has its origins in the Bitterroot Mountains near the Idaho-Montana border and drains 1,182 square miles. The USGS peak flow data shows that there have been numerous years where peak flows are above the normal range of variability. This suggests that the Lochsa River and its tributaries respond to heavy rains and potential flash flood events more frequently than the larger Middle Fork and South Fork drainages. This scenario is likely true for the Selway River as well. Deep snowpack in the Bitterroot Mountains will also heavily influence peak flows on these drainages.

Impacts of Flood Events

Due to several swift bodies of water in Idaho County, there is some reasonable probability of a floodrelated fatality. Flash flood events, or accidents, could result in a death or injury. First responders or other persons could be pinned under debris and drowned or receive trauma from debris being carried along the waterway. Once flood waters recede, mold can grow in wet material causing a public health hazard. Flood waters may contain sewage and hazardous chemicals that could be left on people's property following a flood event. Furthermore, water and food may be contaminated, and heat and electricity may be inoperable for a period of time. Although the probability of these types of impacts occurring at a moderate to large scale is very low, all of these factors could contribute to a decline in current and long-term health of Idaho County residents.

The continuity of operations for Idaho County and most other jurisdictions within the county will not be compromised due to a flood event. The delivery of some services may be hindered by localized flooding in certain areas; however, due to the availability of alternative routes, this is not a significant concern. Damage to facilities, equipment, or files could impact certain organizations or public services depending on the extent of damage and duration of the event.

Flood events in Idaho County are most likely to affect private property by damaging homes, businesses, barns, equipment, livestock, and vehicles. Both water and contaminants can damage or permanently ruin equipment. Flood waters can also erode land. This is particularly an issue when lands supporting roads, power lines, pipelines, sewage control facilities, levees, bridges, and other infrastructure are damaged by erosion.

In Idaho County, it is unlikely that flood events would cause any long-term environmental impacts. Some environmental impacts that may be realized by localized flooding could include erosion of stream banks, loss of riparian plant life, or contamination by chemicals or sewage. Flooding in some areas may have some environmental benefits such as establishing meanders that slow the stream flow, replenishing wetland areas, and replenishing the soil with nutrients from sediment.

Flooding in Idaho County is likely to have a significant or long-term effect on the local economy. Depending on the magnitude of the event, individual residents and businesses may be adversely impacted, but the economic viability of the community will not be affected. Severe damage to transportation infrastructure may have a short-term impact on certain communities due to the presence of state and U.S. highway routes, but alternative routes are available.

Elk City

Many of the homes, dispersed properties, and communities in the greater Elk City area are located along rivers and creeks, therefore there is constant potential for flooding. Access can be limited in some of these areas and therefore the potential for a flood event to impact transportation also exists.

Elk City's existing wastewater treatment lagoons are located along and share a common dike with Big Elk Creek, the primary surface water feature in the city. According to the FIRM, the entirety of the lagoons lies within the 100-year floodplain. A major flooding event in the area of the wastewater lagoons would

likely result in overtopping of the lagoon dikes, producing both an environmental disaster, and a severe health risk to residents of Elk City and downstream water users. A project was initiated in 2018 to address this issue and is currently ongoing.



Figure 2: Flood Impact Zones north of Elk City

Figure 3: Flood Impact Zones southwest of Elk City



Harpster

The community of Harpster is located on the South Fork Clearwater River so there is a flood hazard potential all along the river corridor. Properties located right along the river have experienced some minor flooding in the past five years. ID-13 also runs along the river and is an important transportation route for Harpster area residents.





Figure 5: Northern Harpster area Flood Impact Zone



Figure 6: Southern Harpster area Flood Impact Zone



Lucile

The unincorporated community of Lucile is located between the east bank of the Salmon River and US-95. The area contains recreation sites, private residences, and the Cow Creek Road bridge within the floodplain.



Figure 7: Lucile Flood Impact Zone

Pollock-Pinehurst

This area is located along US-95 south of Riggins with the Little Salmon River flowing through a steep canyon containing recreation sites, tourism, private residences, and many roads and bridges. Also included in this flood zone, north of Pollock, is a side canyon containing Rapid River Road which follows the Rapid River and is lined with private residences and a state fish hatchery.

Figure 8: North end of the Pollock-Pinehurst Flood Impact Zone



Figure 9: South end of the Pollock-Pinehurst Flood Impact Zone



Slate Creek

This community is located south of White Bird along US-95 where Slate Creek flows into the Salmon River. There is some private property and some recreation access within the floodplain along the Salmon River, however, most of the structures within the floodplain are located near the creek and/or its confluence with the river. A USFS ranger station is located adjacent to the floodplain as well.





Development Trends

There have been no changes in development that affect the vulnerability to these communities regarding this hazard.

Value of Resources at Risk

An analysis of parcels that lie with the FEMA-identified floodplains (100- and 500-year) in unincorporated Idaho County shows there are 1,071 improvements with a total value of \$162,183,969. The value is based on the county's assessed value of property improvements and does not reflect the replacement cost of a structure or some other assessed improvement. There are currently no repetitive loss properties within Idaho County.

Resources at risk include transportation infrastructure, utilities, recreational infrastructure, natural resources, agriculture, and other resources. The impact from flood damage to any of these types of resources would extend beyond the monetary value of the thing itself and could affect the local economy and the livelihood of Idaho County residents and neighbors.

Flood Impact Zones were mapped using the FEMA-recognized flood zone in Idaho County and overlayed with a building footprint layer to express structures located within the flood zone. The flood zones represent a 1% annual chance flood hazard. Improvements and improvement values are derived from Idaho County parcel data. Improvements are included in the analysis if the improvement or a significant part of the parcel is located within the flood zone.

Flood Impact Zone	Number Of Improvements	Total Improvement Value
Elk City	98	\$8,764,104
Harpster	67	\$7,605,955
Lucile	10	\$1,806,917
Pollock-Pinehurst	156	\$19,521,818
Slate Creek	26	\$4,591,626

Adopting Jurisdiction Assessments

The following assessments were written for the adopting jurisdictions of the MHMP. Assessments generally focus on people, structures, and infrastructure within the Emergency Service Number boundary for each community; nevertheless, where applicable, influences and/or critical facilities and infrastructure in the surrounding area were also assessed. The Emergency Service Number boundary does not equate to the actual city boundaries; however, in most cases, it is similar. Improvement values were assessed using parcel data that lies within the city limits of each adopting jurisdiction.

City of Grangeville

The main Three Mile Creek is a tributary of the South Fork of the Clearwater River and joins it at River Mile 7.6. Long Haul Creek flows into Cottonwood Creek, which joins the South Fork of the Clearwater River at River Mile 4.7. These streams flow to the north from the east-west trending ridge of White Bird Hill. The watershed area is generally forested above the 4,000 foot elevation to the highest point of 6,123 feet. The area below 4,000 feet is primarily pasture and hayland. The five channels run nearly parallel through town with gradients ranging from 120 feet per mile on the Middle Fork Three Mile Creek to 155 feet per mile on the West Fork Three Mile Creek.

The East Fork Three Mile Creek joins the main channel downstream of the Grangeville city limits. The main Three Mile Creek separates into the Middle Fork and the West Fork near the intersection of Hall Street and West North 4th Street.

Grangeville is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Grangeville. Although thunderstorms don't pose a significant impact of the community of Grangeville, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impacts from all types of flooding in Grangeville are the restricted use of roadways and bridges. The main culverts that direct the creeks could restrict water flow, consequently backing up water onto the adjacent area. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

Numerous structures and businesses still operate near the floodplain, but have not been significantly influenced.

The primary access routes into Grangeville are Highway 95, Highway 13, and Mt. Idaho Grade. Highway 95 is the main route connecting north and south Idaho. This highway is well traveled by not only area

commuters, but also intra and inter-state travelers. Most of Highway 95 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Grangeville to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Grangeville vicinity due to flooding. Although road closures due to flooding are not uncommon.

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

Figure 11: City of Grangeville Flood Impact Zone



Local Event History

Heavy rains and spring runoff have caused several flood events in Grangeville. Although there have been no recent major flood events, Grangeville has had flood events in the past. The following flood descriptions occurred throughout the county, not just in the city of Grangeville.

A flood in 1870 appears to have had the largest volume evidenced by the debris deposited in the channel northeast of town; however, no useful data is available on this flood. A flood on May 31st, 1917, occurred after nearly five inches of rain fell during the month. The culvert under Main Street was plugged which caused additional flood damage. The most damaging flood occurred on May 21st, 1921. A druggist was trapped in the basement of his store and drowned. Main Street from Hall to State Streets was flooded and was reported to be under two feet of water. This flood was also the result of extensive rain. The rodeo grounds were flooded on May 22nd, 1948. During this same flood, the Middle Fork Three Mile Creek overwhelmed a bridge on the north side of the city and flooded three properties. This flood was also the result of extensive rain fall.

A winter flood occurred on December 21st, 1955, and was the result of a large, warm air mass moving in and centering over the area. Earlier precipitation fell as snow on saturated soil. The total precipitation from October through December was 11.7 inches. The combination of warm air and rain with the heavy snowpack caused flooding over an extensive area. Six businesses had flooding in the basements and first floor level. The greatest damages were reported along the West Fork Three Mile Creek. Hall Street was reported to have been severely eroded. Culverts and grates were reportedly clogged with debris. No dollar amounts were estimated for damages. The April 9th, 1964 flood damaged four businesses on Main Street. The flood was a result of spring rains on saturated soils. The flood of December 3rd, 1975 inundated Main Street from Hall to State Streets. The flooding was a result of 0.9 inches of precipitation in the ten days prior with extremely low temperatures during this same period. There was a deep snowpack on the north facing slopes and just prior to the flood, a warm, moist air mass moved into the area and melted the snow. Ice reportedly plugged culverts, but no damage was reported.

Probability of Future Occurrence

The probability of flood events occurring in Grangeville is moderate to high. Low magnitude flood events can be expected several times each year, particularly along Three Mile and Long Haul Creeks within the city limits. However, due to the flat topography and drainage infrastructure, the impacts of these events are slight and will usually amount to minor and temporary traffic issues. Larger magnitude and high impact flood events have occurred but are not likely in any given year. These types of flood events have the highest probability of occurrence in the winter or early spring in Grangeville. Minor flash floods are common on the numerous small tributaries feeding Three Mile and Long Haul Creeks near the community, but are not likely to have a significant impact on the channel within the city center.

Impacts of Flood Events

The potential impacts from flooding in Grangeville are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The major impacts from flooding in Grangeville are the restricted use of several streets, commercial, and residential areas due to overburden of existing drainage facilities. Three Mile and Long Haul Creeks, and their tributaries, run through culverts under much of the City and many culverts and bridges exist within the surrounding area.

The availability of food and other supplies is not likely to be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response is also not likely to be impacted by flood events in Grangeville. While individual homes and businesses may incur damages as a result of a flood, the economy of the community will not likely be impacted by this type of hazard.

Environmental damages resulting from a flood event are also unlikely. Three Mile and Long Haul Creeks occupy a relatively wide floodplain through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 149 assessed improvements within the Grangeville Flood Impact Zone with assessed improvement values totaling \$25,976,602. All these improvements are located withing the city limits of Grangeville. There is no critical infrastructure located within the identified floodplain for Grangeville.

City of Ferdinand

Ferdinand is located on the edge of the Camas prairie with relatively flat to gently rolling terrain. There are no major creeks or rivers in the immediate area. There are some minor drainages that drain the agriculture fields surrounding Ferdinand which drain to the north and into Lawyer Creek.

Ferdinand is potentially subjected to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Ferdinand. Although thunderstorms don't pose a significant impact of the community of Ferdinand, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impacts from all types of flooding in Ferdinand are the restricted use of roadways and bridges. The main culverts that direct the creeks could restrict water flow, consequently backing up water onto the adjacent area. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

Numerous structures and businesses still operate near the floodplain, but have not been significantly influenced. .

The primary access routes into Ferdinand is Highway 95. Highway 95 is the main route connecting north and south Idaho. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highway 95 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Ferdinand to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Ferdinand vicinity due to flooding. Although road closures due to flooding are not uncommon.

Local Event History

No major flooding events have occurred in Ferdinand.

Probability of Future Occurrence

The probability of flood events occurring in Ferdinand is low. Low magnitude flood events can be expected several times each year, particularly where culverts become plugged. However, due to the flat topography and drainage infrastructure, the impacts of these events are slight and will usually amount to minor and temporary traffic issues. Minor flash floods are common on the numerous small tributaries feeding Lawyer Creek near the community but are not likely to have a significant impact on the city center.

Impacts of Flood Events

The potential impacts from flooding in Ferdinand are very similar to the impacts described for Idaho County as a whole. Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The major impacts from flooding in Ferdinand are the restricted use of some streets due to overburden of existing drainage facilities.

The availability of food and other supplies is not likely to be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response is also not likely to be impacted by flood events in Ferdinand. While individual homes and businesses may incur damages because of a flood, the economy of the community will not be impacted by this type of hazard.

Environmental damages resulting from a flood event are also unlikely. Intermittent streams in the region occupy a relatively wide floodplain near the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 23 parcels with assessed improvements within the city limits of Ferdinand that are in the flood zone totaling \$1,817,650 in assessed improvement values. There is no critical infrastructure located within the identified floodplain for Ferdinand.

City of Cottonwood

The city of Cottonwood is located along U.S. Highway 95 near the western extent of the Camas Prairie. Cottonwood Creek flows out of the Cottonwood Butte watershed area eastward through the city and continues across the Prairie to eventually drain into the South Fork of the Clearwater near Stites.

Cottonwood Creek flows along its natural course; however, much of its path through downtown Cottonwood is diverted to an underground system. The Cottonwood Creek channel as well as the stormwater drainage system carrying runoff beneath the commercial district is insufficient to handle a major flood event. Additionally, willow trees growing in the riparian area are beginning to clog Cottonwood Creek both in the downtown area and along the southeast edge of the town exacerbating potential flood issues.

Cottonwood is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Cottonwood. Although thunderstorms don't pose a significant impact of the community of Cottonwood, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impacts from all types of flooding in Cottonwood is that commerce may be disrupted and distribution of basic services such as emergency response and postal services are likely slowed. Electrical service may also be impacted as power is shut off in flooded areas to prevent electric shock. The lack of electricity could become a secondary hazard as the ability of residents to cook or provide heat is halted. Previous flood events have compromised or damaged the city's sewer system as well as the chlorine basin for wastewater treatment due to increased stormwater. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

The Cottonwood Creek floodplain will not likely isolate the community; however, it could have significant impacts on major access routes. In the event that the underground section of the creek was damaged or overwhelmed, much of the downtown area along Main and King Street would likely flood. This could cut off residents' access to groceries, the Post Office, and city government buildings. The Nuxoll fuel station, Reiner's grocery store, the fire station, and a small portion of St. Maries Hospital are directly within the

100-year floodplain. Furthermore, Cottonwood Creek passes beneath Highway 95 near the southern entrance to the community.

Several structures and businesses still operate near the floodplain, but have not been significantly influenced



Figure 12: Inundation map expressing flood inundation for a 100-year storm event in Cottonwood ***Map provided by JUB Engineering



Figure 13: City of Cottonwood Flood Impact Zone (using FEMA flood plain)

The primary access route into Cottonwood is Highway 95. Highway 95 is the main route connecting north and south Idaho. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highway 95 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses several major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Cottonwood to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Cottonwood vicinity due to flooding. Although road closures due to flooding are not uncommon.

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

Local Event History

Heavy rains and spring runoff have caused several flood events in Cottonwood. The most recent major flood event was recorded in 2014 where a rain on snow event on Cottonwood Butte plugged culverts in town and washed out Maple Street.

Probability of Future Occurrence

The city of Cottonwood has a high risk of flood damage due to the potential failure of the underground portion of the Cottonwood Creek channel and an inadequate storm drainage system beneath the city's commercial district. Low magnitude flood events can be expected several times each year, particularly along Cottonwood within the city limits. However, due to the flat topography and drainage infrastructure, the impacts of these events are slight and will usually amount to minor and temporary traffic issues. Larger magnitude and high impact flood events have occurred but are not likely in any given year. These types of flood events have the highest probability of occurrence in the winter or early spring in Cottonwood. Minor flash floods are common on the numerous small tributaries feeding Cottonwood Creek near the community, but are not likely to have a significant impact on the channel within the city center.

Impacts of Flood Events

The potential impacts from flooding in Cottonwood are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The major impacts from flooding in Cottonwood are the restricted use of several streets, commercial, and residential areas due to overburden of existing drainage facilities. Cottonwood Creek runs through culverts under much of the city and its tributaries flow through many of the culverts and bridges exist within the surrounding area.

The availability of food and other supplies is not likely to be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response is also not likely to be impacted by flood events in Cottonwood. While individual homes and businesses may incur damages as a result of a flood, the economy of the community will not be impacted by this type of hazard.

Environmental damages resulting from a flood event are also unlikely. Cottonwood and Graves Creeks occupy a relatively wide floodplain through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 37 improvements within the city limits of Cottonwood that are in the FEMA recognized flood zone, totaling \$4,273,844 in assessed improvements for this area. The Cottonwood Fire Department is one identified critical facility located within the FEMA identified floodplain for Cottonwood. Floodwater inundation modeling was conducted by JUB Engineering. If this modeling is used as the flood hazard area for the city of Cottonwood, it can be predicted that the total number of improvements, and improvement values, would probably double. The modeling for a 100-year storm event shows inundation in many areas outside of the FEMA floodplain. For planning purposes, the 100-year inundation map was used as a visual

estimate for where the Cottonwood flood hazard area should be and this area was manually drawn, solely for the purpose of informing this plan as to roughly what kinds of improvement values exist in the flood hazard area. This area contains roughly 78 assessed improvements totaling, roughly, \$8,406,884 in assessed improvement values. This manually drawn flood zone for Cottonwood and the inundation modeling maps provided by JUB Engineering can be viewed in the Appendix.

City of Riggins

The city of Riggins is located at the confluence of the Main Salmon River and the Little Salmon River. The town lies on a narrow strip of land between the base of the slope and river. The Little Salmon River flows along Highway 95 south of Riggins and the Salmon River roughly parallels Highway 95 north of town.

Riggins is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Riggins. Although thunderstorms don't pose a significant impact of the community of Riggins, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impact from flooding in Riggins is the inundation of water into several residential areas, a significant portion of the city's commercial district on the east side of Highway 95, and the potential for water to overtop U.S. Highway 95, which is the primary access route in the area. The 100-year floodplain in this area includes several sections of the highway along the Little Salmon River and two sections along the Salmon River on the north side of town near Bullseye Corner and the river-access parking facility. Furthermore, the bridge at the confluence of Rapid River and the Little Salmon River and at the junction of Highway 95 and the Salmon River Road could also be at risk during flood events. Disruption of traffic on Highway 95 would significantly impact inter- and intrastate traffic and affect food, fuel, and other deliveries to the many Idaho County communities.

Several structures and businesses still operate near the floodplain, but have not been significantly influenced.

The primary access route into Riggins is Highway 95. Highway 95 is the main route connecting north and south Idaho. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highway 95 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses several major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable

enough to support some large truck travel. All of these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Riggins to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Riggins vicinity due to flooding. Although road closures due to flooding are not uncommon.





During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

Local Event History

Heavy rains and spring runoff have caused several flood events in Riggins. Although there have been no recent major flood events, Riggins has had flooding in the past. During the New Year's Day Flood of 1997, an accumulation of snow followed by a warming trend with rain resulted in landslides and floods on every creek along the Salmon River including the Little Salmon River. This event caused the loss of power and phone lines for nearly three weeks throughout the Riggins area. Highway 95 as well as several secondary routes were also severely damaged both north and south of town. Homes and other property were washed away and truck deliveries supplying food and fuel were halted due to the extreme flooding. An abandoned home damaged and moved downstream by the 1997 New Years Day Flood sits on an island in the Little Salmon River approximately ½ mile upstream of the Salmon River Road bridge. If a flood event moved this structure further downstream, it is possible the house would crash into the bridge causing not only structural damage, but additional debris build up at a vulnerable location for the city.

Probability of Future Occurrence

The city of Riggins, particularly on the south end, has a high risk of flood damage as has been demonstrated by past events. Low magnitude flood events can be expected several times each year, particularly along Little Salmon River within the city limits. Due to the steep topography and narrow walls, the impacts of these events could be extreme and may amount to significant traffic issues. Larger magnitude and high impact flood events have occurred but are not likely in any given year. These types of flood events have the highest probability of occurrence in the winter or early spring in Riggins. Minor flash floods are common on the numerous small tributaries feeding Little Salmon and Salmon Rivers near the community but are not likely to have a significant impact on the channel within the city center.

Impacts of Flood Events

The potential impacts from flooding in Riggins are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The major impact from flooding in Riggins is the inundation of water into several residential areas, a significant portion of the city's commercial district on the east side of Highway 95, and the potential for water to overtop U.S. Highway 95, which is the primary access route in the area. The 100-year floodplain in this area includes several sections of the highway along the Little Salmon River and two sections along the Salmon River on the north side of town near Bullseye Corner and the river-access parking facility. Furthermore, the bridge at the confluence of Rapid River and the Little Salmon River and at the junction of Highway 95 and the Salmon River Road could also be at risk during flood events. Disruption of traffic on Highway 95 would significantly impact inter- and intrastate traffic and affect food, fuel, and other deliveries to the many Idaho County communities.

Flooding of any public facilities will impact residents of Riggins as commerce is disrupted and distribution of basic services such as emergency response and postal services are slowed. Electrical service may also be impacted as power is shut off in flooded areas to prevent electric shock. The lack of electricity could become a secondary hazard as the ability of residents to cook or provide heat is halted. Additionally, grocery and petroleum outlets may be closed or contaminated, which may lead to a lack of fresh drinking water and food sources as well as residents' inability to leave the area. Any amount of flooding typically causes damage to structures. Much of the damage may be cosmetic, but still very costly. More extreme damage may be caused as river and stream channels migrate or infrastructural components, such as bridges or municipal wells, are destroyed.

Environmental damages resulting from a flood event are also unlikely. Salmon, Little Salmon and Rapid Rivers occupy a relatively narrow floodplain through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

The population of Riggins has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 96 improvements within the city limits of Riggins that are in the FEMA flood zone totaling \$15,197,535 in assessed improvement values. There is no critical infrastructure located within the identified floodplain for Riggins.

City of Stites

The city of Stites is a small community located along the South Fork of the Clearwater River a few miles upstream of Kooskia.

Stites' flooding problems are due primarily to the overflow of the South Fork Clearwater River. South Fork Clearwater River flows into the city from the south along the western city limits and out of the city through the northern city limits. Cottonwood Creek also drains into the South Fork of the Clearwater River at Stites.

The city of Stites is protected from the South Fork Clearwater River by a levee, which was built in 1974 by the COE. The levee was designed to protect the city from a 40-year flood. For the purposes of the National Flood Insurance Program, only levees providing 100-year flood protection are considered; thus, the 100-year flood boundaries were computed disregarding the Stites levee.

Nearly all of Stites on the east bank of the river and portions on the west bank is within the 100-year floodplain including the commercial district, all city facilities and emergency services, and a large section of State Route 13, which passes through the middle of town.

Floods in Stites are generally the result of three different types of weather events, rain-on-snow, snowmelt and thunderstorms. Rain-on-snow events that affect the town occur when significant snow pack exists in the Clearwater Mountains. 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. Additionally, many of the smaller tributaries such as Cottonwood Creek can be significantly impacted by thunderstorms causing flash flooding and putting many homes and roadways at risk. Floods from thunderstorms do not occur as frequently as those from general rain and snowmelt conditions, but they can be far more severe.

The major impacts from all types of flooding in Stites are the restricted use of roadways and bridges. The main culverts that direct the creeks could restrict water flow, consequently backing up water onto the adjacent area. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

Numerous structures and businesses still operate near the floodplain, but have not been significantly influenced. .

The primary access routes into Stites is Highway 13 and Highway 12. Highway 12, just north of Stites, is the main east and west route connecting Lewiston, Idaho with Missoula, Montana. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highways 12 and 13 through Idaho County are adjacent to moderate to steep sloped forestland and rangeland, and agricultural

fields. These highways also traverse several steep draws and cross major creeks and rivers within the county.



Figure 15: City of Stites Flood Impact Zone



0.0325 0.065 0.13 Miles 0 1

N

Highways

Stites City Limits

There are several other good access routes that extend from the community in all directions such as, Cottonwood Creek Canyon, Lamb Creek, and Stites Grade Road. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All of these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Stites to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Stites vicinity due to flooding. Although road closures due to flooding are not uncommon.

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

Local Event History

Heavy rains and spring runoff have caused several flood events in Stites. The most recent major flood events were recorded in 2010 when a Presidential Disaster was declared for flooding near Stites. Small stream, flash floods took out roads and culverts east and south-east of Kooskia (Clear Creek; Leitch Creek) which caused over 30 infrastructure project repairs ultimately funded by FEMA.

The largest flow recorded at the USGS stream gaging station located near the south end of town on the west bank of the South Fork Clearwater River occurred on June 8th, 1964. The discharge was 17,500 cubic feet per second (cfs) from a drainage area of 1,150 square miles. The water rose to an elevation of 1,322 feet at the gage. This flood had a probability of .017% of occurring in any given year and is equivalent to about a 60-year flood. The U.S. Army Corps of Engineers (COE) reports that the flood of May 1948 was of approximately the same magnitude as the flood of June 8th, 1964.

On the morning of April 9, 2019, the South Fork of the Clearwater River at Stites, crested at a record level of 10.79 feet, which contributed to the town of Stites being flooded. This led to flooding of 3 to 5 homes along the west side of the river along North River Road. A torrent of fast-moving water developed in an unnamed gulch located east of Stites along Stites Grade Road and this led to the closure of Idaho Highway 13 and the flooding of Stites. Approximately 30 to 50 homes were affected by the flooding in the town of Stites with many wells contaminated and the National Guard rescued two people who were trapped in their home.

Probability of Future Occurrence

The city of Stites has a very high risk of flood damage during large (40-year plus) events. The levee along the South Fork of the Clearwater River will likely protect Stites from most flood events; however, if a large event were to occur, Stites would be heavily damaged with most city and county services shut down. It is likely Highway 13 and the Luke's Gulch Road Bridge would be damaged or closed, effectively isolating residents. Nearly all of the residential and commercial structures and infrastructure would have some flood damage during a 100-year event.
Impacts of Flood Events

The potential impacts from flooding in Stites are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The major impacts from flooding in Stites are the restricted use of several streets, commercial, and residential areas due to overburden of existing drainage facilities. The South Fork of the Clearwater River and its tributaries run through culverts and pass under bridges through the surrounding area.

The availability of food and other supplies could be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response may also be impacted by flood events in Stites. Individual homes and businesses may incur damages because of a flood and the economy of the community may be impacted by this type of hazard as well.

Environmental damages resulting from a flood event are also unlikely. The South Fork of the Clearwater River, and Cottonwood Creek occupy a relatively narrow floodplains through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 97 assessed improvements within the city limits of Stites that are in the FEMA flood zone totaling \$6,002,934 in assessed improvement values. The Stites wastewater facility is one identified critical facility located within the identified floodplain for Stites.

City of Kamiah

The majority of the city of Kamiah is located at the eastern edge of Lewis County at the confluence of Lawyer Creek and the Clearwater River. The sections of the city that lie in Idaho County include residential areas on the south side of Lawyer Creek as well as homes and businesses on the east side of the Clearwater River. Most of the Kamiah's residential area and business district as well as public services are in Lewis County. A comprehensive flood assessment for the entire community is given here as the affects of a major flood event including damages would be incurred in both counties.

The drainage area of the Clearwater River encompasses approximately 4,800 square miles. The river has numerous tributaries including the Middle and South Forks of the Clearwater River, which meet at Kooskia approximately seven miles upstream of Kamiah. The area within the drainage basin consists of narrow canyons and valleys, plateaus, and steep, wooded mountain slopes. Elevations range from approximately 1,180 feet at Kamiah to nearly 9,000 feet at the headwaters of the Middle Fork of the Clearwater River. The Lawyer Creek drainage consists of a narrow canyon and rolling plateau land, ranging in elevation from approximately 1,200 feet at the mouth to over 5,000 feet at the headwaters.

Kamiah is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Kamiah. Although thunderstorms don't pose a significant impact of the community of Kamiah, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impacts from all types of flooding in Kamiah are the restricted use of roadways and bridges. The main culverts that direct the creeks could restrict water flow, consequently backing up water onto the adjacent area. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

Numerous structures and businesses still operate near the floodplain, but have not been significantly influenced.



The primary access route into Kamiah is Highway 12. Highway 12 is the main east and west route connecting Lewiston, Idaho with Missoula, Montana. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highway 12 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions such as; 7 Mile Road, and Kamiah-NezPerce Grade. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All of these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Kamiah to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Kamiah vicinity due to flooding. Although road closures due to flooding are not uncommon.

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

Local Event History

Historically, flooding in and around Kamiah has been caused by a rain-on-snow condition or high runoff from snowmelt. The Clearwater River does relatively minor damage within the city. In the past, only the low-lying city park upstream of the U.S. Highway 12 Bridge has been inundated. Outside the city, the lumber mill on the east side of the Clearwater River was heavily flooded in 1948 and 1964.

In May 1957 and January 1965, Lawyer Creek ran rampant, tearing through levees and causing overbank damages. Levees along the creek have been damaged often by floodflows. During these floods, residents of the area bordering the creek had their property turned into islands as the creek broke through its levees. Flooding occurred in 1996 along Lawyer creek that triggered sandbagging to protect homes. The 1996 flood also flooded other sections of Kamiah including the city park.

Another problem caused by the high, fast runoff in the Clearwater Basin during the 1948 and 1964 floods was the accumulation of river debris, especially logs. In 1964, tens of thousands of board feet of cedar lumber were washed down the Clearwater River from the Selway River drainage. This log jam was nearly three miles long. The U.S. Highway 12 bridge at Kamiah was closed to traffic while the log jam passed. In 1948, a log jam contributed to the heavy damage done to the Union Pacific railroad bridge. Major repairs were required before train traffic was allowed on the bridge.

Probability of Future Occurrence

Flood protection along Lawyer Creek has included numerous levee projects. Some of this work has been done by local agencies and individual landowners. The Army Corps of Engineers constructed levees along Lawyer Creek in the Kamiah area. However, portions of the levees have been destroyed by past

flooding and only some have been rebuilt. Some levees have been constructed by private firms along the Clearwater River. Because of their instability, levees along Lawyer Creek and the Clearwater River were not included in the determination of the 100-year floodplain in Kamiah.

The city of Kamiah has a high risk of flooding by Lawyer Creek and a moderate risk from the Clearwater River. Land use and zoning policies specific to the safe and effective management of the floodplain in Kamiah would help alleviate the impact of flooding to future development. Regulation of future development in the existing floodplain may help reduce the vulnerability and potential impact to the community in the event of a flood.

Impacts of Flood Events

The potential impacts from flooding in Kamiah are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Lawyer Creek does not have a history of peaking at the same time as the Clearwater River. With its lower mean altitude of 3,500 feet, the Lawyer Creek basin generally peaks in mid to late January while the Clearwater River typically peaks in late May and early June. The stream is subject to rapid increases in flow during hard rains. Rain coupled with snowmelt has led to flooding problems in the past.

Lawyer Creek; however, is capable of causing extensive damage through a fairly large residential section of Kamiah. Rain-on-snow events in late winter have triggered the largest Lawyer Creek flows. High flows combined with the steep slope of the creek results in fast velocities, approaching fourteen feet per second in a 100-year event. Velocities in this range can cause severe erosion of the channel area, stream banks, and levees. As a result of the unpredictable erosion, overbank flooding can become concentrated. Old stream channels, some of which have been tilled, are clearly evident outside the present channel banks.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The availability of food and other supplies is not likely to be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response is also not likely to be impacted by flood events in Kamiah. While individual homes and businesses may incur damages as a result of a flood, the economy of the community will not be impacted by this type of hazard.

Environmental damages resulting from a flood event are also unlikely. The South Fork of the Clearwater River, and Lawyer Creek occupy a relatively narrow floodplains through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these

impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

The population of Kamiah has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are no structures within the Idaho County portion of Kamiah city limits that are in the flood zone. Most of the structures that are within the 100-year flood zone occur in Lewis County. The portions of the 100-year floodplain in Idaho County consist primarily of the U.S. Highway 12 Bridge across the Clearwater River, several secondary access route bridges on Lawyer Creek, the Blue North Timber, Inc. mill site, and a surface water collection point are within the floodplain. The greater Kamiah area flood impact zone within Idaho County contains 59 assessed improvements totaling \$7,703,095 in assessed improvement values. There are no critical infrastructure located within the identified floodplain for Kamiah.

City of Kooskia

The city of Kooskia is located at the confluence of the Middle and South Forks of the Clearwater River, and the junction of State Highway 13 and U.S. Highway 12. The Middle and South Forks comprise a drainage area of nearly 4,300 square miles. The South Fork Clearwater River is the smaller of the two drainages with an area of 1,160 square miles. The Middle Fork Clearwater River drainage is made up of the Lochsa and Selway River basins, which have their headwaters in the Bitterroot Mountains. The area within the drainage basins is made up of narrow canyons and valleys; rolling plateau land, and steep, wooded mountain slopes.

The drainage area of the Clearwater River encompasses approximately 4,800 square miles. The river has numerous tributaries including the Middle and South Forks, which meet at Kooskia. The area within the drainage basin consists of narrow canyons and valleys, plateaus, and steep, wooded mountain slopes. Elevations range from approximately 1,180 feet at Kamiah to nearly 9,000 feet at the headwaters of the Middle Fork.

Kooskia is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood

elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Kooskia. Although thunderstorms don't pose a significant impact to the community of Kooskia, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

The major impacts from all types of flooding in Kooskia are the restricted use of roadways and bridges. The main culverts that direct the creeks could restrict water flow, consequently backing up water onto the adjacent area. Some streets are not paved, which results in gravel washing down-slope potentially clogging sewer and storm drains. Sewer and storm drains could fill quickly, consequently backing up these lines and restricting the flow of water.

Numerous structures and businesses still operate near the floodplain, but have not been significantly influenced.

The primary access routes into Kooskia are Highways 12 and 13. Highway 12 is the main east and west route connecting Lewiston, Idaho with Missoula, Montana. These highways are well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highways 12 and 13 through Idaho County are adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. These highways also traverse several steep draws and crosses major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions such as; Kidder Ridge Road, Clear Creek Road, Winona Grade Road, and N River Drive. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All of these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around Kooskia to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been little damage to roadways in the immediate Kooskia vicinity due to flooding. Although road closures due to flooding are not uncommon.

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.



Local Event History

The two largest floods to hit Kooskia were in 1964 and 1948. In these two years, the Middle and South Forks peaked with major flood flows at nearly the same time. The Middle Fork peaked with 78,500 cfs and 83,500 cfs in 1948 and 1964 respectively. The two rivers peaked closest together in the 1964 flood, thereby causing a larger peak on the main stem of the Clearwater River downstream of the confluence. The peak discharge on the South Fork equaled that of a 50-year flood, while the 83,500 cfs recorded on the Middle Fork in 1964 was slightly less than that of a 50-year flood.

In 1964, 3.5 inches of rain fell in a 50-hour period to compound the high snowmelt runoff. In both 1964 and 1948, the eastern part of the city on the Middle Fork as well as the business district along the South Fork was flooded; however, most of the damage was from shallow flooding. During the 1964 flood, water seeped through a large area of the dike along the South Fork and sandbagging had to be done on the dike near the airport. Several residents of eastern Kooskia were evacuated during both events.

Another problem caused by the high, fast runoff in 1964 and in 1948 was log jamming. In both years, but especially in 1964, tens of thousands of board feet of cedar lumber were washed down the Middle Fork Clearwater River from the Selway River drainage. This jam measured nearly three miles long during the 1964 flood and raised havoc at every bridge the jam passed. Due to the stress and potential damage, many bridges crossing the Middle Fork were closed to traffic.

A Presidential Disaster was declared in 2010 for flooding near Kooskia. Small stream, flash floods took out roads and culverts east and south-east of Kooskia (Clear Creek; Leitch Creek) which caused over 30 infrastructure project repairs ultimately funded by FEMA.

Probability of Future Occurrence

Many dikes and levees have been constructed along both the Middle and South Forks of the Clearwater River in the Kooskia vicinity. A levee on the west bank of the South Fork extends from the mouth upstream to a point across the river from Third Avenue. The levee on the east bank begins approximately 1,000 feet downstream of B Street and extends upstream to approximately 350 feet above First Avenue. The levee begins again at the upstream end of the sewage lagoons, near Kooskia Airport, and extends upstream to approximately 5,000 feet past the southern city limits. South of the city, there are levees in various places along both sides of the South Fork Clearwater River. In February of 1948, the COE performed clearing and snagging work along the South Fork levee for 2,000 feet in anticipation of the spring runoff that year. In 1949, the COE made emergency repairs to 3,000 feet of the same levee above River Mile 1.0. These repairs were required due to the flood of 1948. After the 1964 flood, local crews constructed a dike along the south side of the Middle Fork. This dike extends from the intersection of Dike Street and U.S. Highway 12, downstream 2,000 feet to a point upstream of the sewage lagoons. The dike along the Middle Fork has been tested twice with large flows in 1972 and 1974. Although flows in these years were not as large as the 1964 flood, they were close, coming within 2,000 cfs.

Nearly all of Kooskia on both sides of the South Fork of the Clearwater River and a significant portion of the city along the south side of the Middle Fork, particularly on the eastern edge, have a high risk of

flooding. This includes large sections of residential areas as well as much of the Main Street business district. City Hall, the fire department, the airport, the wastewater treatment facility, and three municipal well heads are included in this floodplain. Just south of the city limits, the floodplain also includes the Clearwater Forest Industries mill and a portion of the parcel containing Clearwater Valley High School. Furthermore, a section of State Route 13 through downtown Kooskia and a section U.S. Highway 12 on the north side of the Middle Fork are within the floodplain and could potentially be damaged or closed. The State Route 13 bridge crossing on the Middle Fork and a smaller access bridge about ½ mile upstream are also in the floodplain; however, both bridges were built to withstand major flood event.

The city of Kooskia has a very high risk of flooding from both the Middle and South Forks of the Clearwater River. The levees currently built along the riverbanks will likely protect the city from most flood events; however, most of these levees were built over 50 years ago and may not hold during a large event.

Impacts of Flood Events

The potential impacts from flooding in Kooskia are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

The availability of food and other supplies is not likely to be impacted or interrupted by a flood event. Furthermore, the delivery of community services such as postal services, health care, law enforcement, and emergency response is also not likely to be impacted by flood events in Kooskia. While individual homes and businesses may incur damages as a result of a flood, the economy of the community will not be impacted by this type of hazard.

Environmental damages resulting from a flood event are also unlikely. The South Fork and Middle Fork of the Clearwater River occupy a relatively narrow floodplain through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including

wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

The population of Kooskia has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 196 assessed improvements within the city limits of Kooskia that are in the FEMA flood zone totaling \$14,078,154 in assessed improvement values. There is no critical infrastructure located within the identified floodplain for Kamiah.

City of White Bird

The city of White Bird is located along White Bird Creek approximately one mile upstream from its confluence with the Salmon River. The town lies on a narrow strip of land between the base of the slope and river. The Salmon River flows along Highway 95 to the west of White Bird and White Bird Creek passes throught the city of White Bird and under Highway 95 before it ties in with the Salmon River.

White Bird is normally subject to spring rain runoff flooding. Occasionally rain on snow with frozen or saturated soils will cause floods during the winter months. Trash and debris may cause an increase in flood elevations by plugging culverts and bridge openings. Gravel bars may develop which will raise the channel bottom and reduce the channel flow area. Approximately 20 acres are subject to inundation by 100-year floods.

Thunderstorms are localized summer events that can also have an impact on the flooding potential of Riggins. Although thunderstorms don't pose a significant impact to the community of White Bird, awareness of the potential risks of thunderstorms is very valuable. Storms resulting in intense rain fall often occur rapidly and overwhelm the carrying capacity of the nearby streams. The duration of subsequent flooding tends to be a matter of hours.

Shallow flooding occurs when culvert capacities are inadequate and unconfined flow overtops the channel banks. Once out of channel, the water scatters in undefined low areas. The limits of flooding and depth will be different for each flood as they are dependent upon the variable nature of the debris carried by the flood, the brush along the channel, the location of parked cars, and other conditions that depend on the time of the year (i.e. ice and snow accumulations).

During major flood events, there is also a high risk of water backing up the sewer system. Inflow exceeding the pumping capacity of the headworks could lead to a backup that would cause flooding into basements and adjacent properties as well as standing water near transmission lines. The overall impact and damages caused by a sewer backup may be greater than the initial flood event.

A section of recreational, residential, and commercial property is also within the 100-year floodplain along the Salmon River near the confluence of White Bird Creek including the main bridge crossing at Deer Creek.

Local Event History

Heavy rains and spring runoff have caused several flood events in White Bird. There have been no recent major flood events however.

Probability of Future Occurrence

The city of White Bird has a moderate risk of flood damage due to the levee along White Bird Creek. Properties in the floodplain along the Salmon River also have a moderate risk of damage due to flooding.

Impacts of Flood Events

The potential impacts from flooding in White Bird are very similar to the impacts described for Idaho County as a whole. First responders and other volunteers aiding with emergency flood control or cleanup efforts are potentially at risk of injury due to accidents or possibly exposure to contaminated water. Although unlikely, the city's water supply could be affected by contaminated flood waters entering the groundwater supply.

The major impact from flooding in White Bird is the inundation of water into several residential areas and a small section of the town's commercial district on the east side of Old Highway 95. The White Bird Creek bridge crossing on the U.S. Highway 95 connection road is also within the floodplain and could become damaged or plugged during a flood event with significant consequences to downtown White Bird. A levee, built by the Corps of Engineers, helps protect the community from White Bird Creek flood events. The levee is the responsibility of Flood District #6 and is in reasonably good condition; however, there are some encroachment and development issues. Several structures and businesses still operate near the floodplain, but have not been significantly influenced.

The old U.S. Highway 95 passes directly through the White Bird community center. The reroute of Highway 95 bypasses the town site to the west via a large bridge across the White Bird Creek drainage. The primary access into the community center is a short spur road off the new U.S. 95 that connects to the old highway. Highway 95 is the main route connecting north and south Idaho. This highway is well traveled by not only area commuters, but also intra and inter-state travelers. Most of Highway 95 through Idaho County is adjacent to moderate to steep sloped forestland and rangeland, and agricultural fields. This highway also traverses several steep draws and crosses several major creeks and rivers within the county.

There are several other good access routes that extend from the community in all directions. Some are two-lane paved roads, while others are typically one lane gravel roads; however, they are wide and stable enough to support some large truck travel. All these potential access routes dip in and out of small drainages and cross small streams that may prove impassable in major flood events. There is enough elevational relief around White Bird to provide a place for people to go until flood waters recede. There would be no need to evacuate the entire community during a flood event. Historically, there has been

little damage to roadways in the immediate White Bird vicinity due to flooding. Although road closures due to flooding are not uncommon.



Flooding of any public facilities will impact residents of White Bird as commerce is disrupted and distribution of basic services such as emergency response and postal services are slowed. Electrical service may also be impacted as power is shut off in flooded areas to prevent electric shock. The lack of electricity could become a secondary hazard as the ability of residents to cook or provide heat is halted. Additionally, grocery and petroleum outlets may be closed or contaminated, which may lead to a lack of fresh drinking water and food sources as well as residents' inability to leave the area. Any amount of flooding typically causes damage to structures. Much of the damage may be cosmetic, but still very costly. More extreme damage may be caused as river and stream channels migrate or infrastructural components, such as bridges or municipal wells, are destroyed.

Environmental damages resulting from a flood event are also unlikely. Salmon River and White Bird Creek occupy a relatively narrow floodplain through the community. Scouring and erosion along the banks of the stream is possible, however, due to grass and other vegetation, these impacts will most likely be minimal and localized. Contamination of the riparian area by floodwaters containing chemicals or other pollutants is a possibility, but this type of event is more likely to be realized in the surrounding areas than within the community due to the hydrologic profile of the floodplain.

The impacts of a sewer backup caused by flooding would be more widespread than the property and infrastructure damages caused by this type of event. The combined flow of stormwater and sanitary sewer would create a significant public health concern. Not only could potable water sources be contaminated, but standing water often attracts insects. Additionally, there could be environmental concerns including wildlife habitat damage and long-term soil impacts in flooded areas due to contaminants in the floodwaters.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are 13 assessed improvements within the city limits of White Bird that are in the flood zone with a total assessed improvement value \$915,763. The main bridge crossing at Deer Creek is located within the identified floodplain for White Bird, as well as the wastewater facility.

The greater White Bird area flood zone contains 49 assessed improvements totaling \$7,267,888 in assessed improvement values. This includes parcels located in the flood plain in the Doumecq area along the Salmon River, west of White Bird.

Figure 18: City of White Bird and greater area Flood Impact Zone



CHAPTER 5 – EARTHQUAKE

Regional and Local Hazard Profile

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

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

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

Idaho experiences numerous minor earthquakes annually. Hebgen Lake and Borah Peak were two of the largest earthquakes in the continental United States (7.3 and 6.9 magnitude, respectively). They may affect large areas, cause great damage to structures, cause injury or loss of life, and alter the socioeconomic functioning of the communities involved. The hazard risk of earthquakes varies from place to place depending upon the regional and local geology.

According to the handbook "Putting Down Roots in Earthquake Country", published by the Idaho Geological Survey¹¹, the mountainous regions of eastern and central Idaho, both north and south of the Snake River, are at the most risk for large damaging earthquakes. However, moderate earthquakes can occur anywhere in Idaho and could cause significant damage to un-reinforced infrastructure and even fatalities. Currently, many of Idaho's counties have building codes in place for new construction that help structures mitigate the effects of shaking. Older public buildings, especially unreinforced masonry, within Idaho County could be at risk to shaking hazards and may need to be retrofitted for seismic stability.

¹¹ IGS. April 2011. Idaho Geologic Survey. "Putting Down Roots in Earthquake Country – Your Handbook for Earthquakes in Idaho." Available online at https://adacounty.id.gov/emergencymanagement/wp-content/uploads/sites/39/eqcountry.pdf.

The International Building Code (IBC), a nationwide industry standard, sets construction standards for different seismic zones in the nation. IBC seismic zone rankings for Idaho are among the highest in the nation. When structures are built to these standards, they have a better chance to withstand earthquakes.

Structures that are in compliance with the 1970 Uniform Building Codes (UBC), which are now replaced by the International Building Code, are generally less vulnerable to seismic damages due to the inclusion of seismic construction standards.

Future injuries and property losses from earthquake hazards can be reduced by considering these hazards when making decisions about land use, by designing structures that can undergo ground shaking without collapse, by securely attaching the non-structural elements of a building, and by educating the public about what to do before, during, and after an earthquake to protect life and property.¹²

Earthquakes are measured both in terms of their inherent "magnitude" and in terms of their local "intensity." The magnitude of an earthquake is essentially a relative estimate of the total amount of seismic energy released and may be expressed using the familiar "Richter Scale" or using the "moment magnitude scale" now favored by most technical authorities.

Both the Richter scale and the moment magnitude scale are based on logarithmic formulae, meaning that a difference of one unit on the scales represents about a thirty-fold difference in amount of energy released (and, therefore, potential to do damage). On either scale, significant damage can be expected from earthquakes with a magnitude of about 5.0 or higher. What determines the amount of damage that might occur in any given location, however, is not the magnitude of the earthquake but the intensity at that particular place.

Earthquake intensity decreases with distance from the earthquake's "epicenter" (its focal point), but also depends on local geologic features such as depth of sediment and bedrock layers. Intensity is most commonly expressed using the "Modified Mercalli Intensity Scale." This measure describes earthquake intensity on an arbitrary, descriptive, twelve-degree scale (expressed as Roman numerals from I to XII) with significant damage beginning at around level VII (see Figure 19Error! Reference source not found.). Mercalli intensity is assigned based on eyewitness accounts.

¹² Noson, Linda Lawrance, et al. Washington State Earthquake Hazards. Washington Division of Geology and Earth Resources Information Circular 85. Olympia, Washington. 1988.

Figure 19: Modified Mercalli Intensity Scale¹³

LEVEL	DESCRIPTION
I	Not felt except by a very few under especially favorable circumstances.
I	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
m	Felt quite noticeably indoors, especially on upper of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
v	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run indoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
x	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rail bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen of ground surface. Lines of sight and level are distorted. Objects are thrown into the air

While Mercalli and PGA intensities are arrived at differently, they correlate reasonably well. While the locations most susceptible to earthquakes are known, there is little ability to predict an earthquake in the short term.

Idaho County

Based on historical records, Idaho County has not experienced any seriously damaging earthquakes in recorded history. Several distant earthquakes produced intensities strong enough to be felt in the county, and two earthquake epicenters were recently recorded within Idaho County.

¹³ https://sciencefest.indiana.edu/earthquake-part-3/





Local Event History

The following tables highlight recent (since 2014) earthquake events that are significant either because they occurred in Idaho County and/or because they were felt in Idaho County. The "felt" earthquakes are recorded through the "Did You Feel It?" (DYFI) program with the USGS¹⁴ and measured using the Modified Mercalli Intensity (MMI) scale. DYFI records the city in which the earthquake was felt, the rating on the MMI scale, and the number of responses. For the earthquakes with epicenters within Idaho County, all locations where the earthquake was felt are included.

Idaho County Earthquakes

November 23, 2018

Magnitude 3.0 earthquake near Riggins, Idaho

City	State/Region	MMI	Responses
Riggins	ID	II	2
Lucile	ID	II	2
Pollock	ID	II	1
Benton City	WA	II	1
Rupert	ID	I	1

November 20, 2018

Magnitude 4.1 earthquake near Stites, Idaho

City	State/Region	MMI	Responses
Grangeville	ID	IV	28
Kooskia	ID		7
White Bird	ID	IV	7
Riggins	ID	IV	7
Kamiah	ID	II	5
Elk City	ID		5
Lucile	ID	IV	4
McCall	ID	II	4
New Meadows	ID	III	3
Garden City	ID	II	3
Greencreek	ID	II	2

¹⁴ https://earthquake.usgs.gov/earthquakes/map/?extent=20.96144,-130.16602&extent=52.45601,-59.85352

City	State/Region	MMI	Responses
Cottonwood	ID		2
Pollock	ID	II	2
Donnelly	ID	II	2
Boise	ID	II	2
Boise	ID	II	2
Ferdinand	ID	II	1
Pierce	ID	II	1
Orofino	ID	II	1
Moscow	ID	II	1
Council	ID	II	1
Pullman	WA	II	1
Cascade	ID	II	1
Walla Walla	WA	II	1
Cheney	WA	I	1
Boise	ID	II	1
Boise	ID	II	1

Regional Earthquakes Felt in Idaho County

September 8, 2020

Magnitude 4.4 earthquake near Stanley, Idaho

City	State/Region	MMI	Responses
White Bird	ID	II	1
Cottonwood	ID	II	1
Kooskia	ID	II	1

June 25, 2020

Magnitude 4.6 earthquake near Stanley, Idaho

City	State/Region	MMI	Responses
Cottonwood	ID	II	1
Elk City	ID		2
Grangeville	ID		1
Kooskia	ID	II	1

April 1, 2020

Magnitude 4.1 earthquake near Stanley, Idaho

City	State/Region	MMI	Responses
Pollock	ID	II	2
Elk City	ID		1
Kooskia	ID	V	1

March 31, 2020

Magnitude 6.5 earthquake near Stanley, Idaho

City	State/Region	MMI	Responses
Cottonwood	ID	IV	2
Elk City	ID	V	10
Grangeville	ID	IV	15
Kamiah	ID	IV	10
Kooskia	ID	IV	5
Pollock	ID	VI	1
Riggins	ID	V	2
Stites	ID	IV	1

July 5, 2017

Magnitude 5.0 earthquake near Lincoln, Montana

City	State/Region	MMI	Responses
Grangeville	ID	II	1

July 6, 2017

Magnitude 5.8 earthquake near Lincoln, Montana

City	State/Region	MMI	Responses
Elk City	ID		5
Kooskia	ID		7
Kamiah	ID	III	10
Stites	ID	II	2
Grangeville	ID	III	9
Ferdinand	ID	П	2

Cottonwood ID III 2

January 3, 2015

Magnitude 5.0 earthquake near Challis, Idaho

City	State/Region	MMI	Responses
Elk City	ID	III	3
Riggins	ID		6
Pollock	ID	III	1
Lucile	ID	II	2
Grangeville	ID	II	5
Kooskia	ID	II	4
Kamiah	ID	II	1
Cottonwood	ID	II	1

April 13, 2014

Magnitude 4.8 earthquake near Challis, Idaho

City	State/Region	MMI	Responses
Elk City	ID	II	1
Riggins	ID	II	1
Kamiah	ID	II	1

Probability of Future Occurrence

There are several known geologic faults throughout Idaho County most with a north to south orientation. Peak ground acceleration (pga), in percent g, is a measure of the ground motion, which decreases, the further you are from the earthquake. The USGS Shaking Hazard maps for the United States are based on current information about the rate at which earthquakes occur in different areas and on how far strong shaking extends from quake sources. Colors on the map in Figure 21 show the levels of horizontal shaking that have a 1 in 10 chance of being exceeded in a 50-year period. Shaking is expressed as a percentage of "g" (g is the acceleration of a falling object due to gravity). This map is based on seismic activity and fault-slip rates and considers the frequency of occurrence of earthquakes of various magnitudes. Locally, this hazard may be greater than that shown because site geology may amplify ground motions.





The following information is presented by the website *homefacts*¹⁵, using data from the US Geological Survey.

Community	Probability of a 5.0 Earthquake within the next 50 Years
Grangeville	7.81%
Ferdinand	7.53%
Cottonwood	7.18%
Riggins	11.60%
Stites	7.75%
Kamiah	7.64%
Kooskia	7.60%
White Bird	8.31%
Elk City	8.74%

The map below shows "how often scientists expect damaging earthquake shaking around the U.S. On this map, 'damaging earthquake shaking' is that of Modified Mercalli Intensity (MMI) level of VI or higher."¹⁶



¹⁵ http://www.homefacts.com/earthquakes/Idaho.html. Accessed April 2022.

¹⁶ USGS. "Introduction to the National Seismic Hazard Maps" https://www.usgs.gov/programs/earthquake-hazards/science/introduction-national-seismic-hazard-maps. Accessed April 2022.

Impacts of Earthquake Events

Past events suggest that an earthquake in the Idaho County area would cause little to no damage. Nonetheless, severity can increase in areas that have softer soils, such as unconsolidated sediments.

Although unlikely in Idaho County, buildings that collapse because of an earthquake can trap and bury people, putting lives at risk, and creating clean-up costs. Upgrading existing buildings to resist earthquake forces is more expensive than meeting code requirements for new construction; thus, a high number of structures in Idaho County, particularly those built prior to seismic code requirements, remain at risk.

Communities in Idaho County can expect some structural failure of older multistory unreinforced masonry buildings because of even low intensity earthquakes. Cornices, frieze, and other heavy decorative portions of structures may fail. The potential impacts of a substantial earthquake event are highly variable. Many of the structures and infrastructure throughout the county may not incur any damages at all; however, damage to roads, bridges, unreinforced masonry, chimneys, foundations, water lines, sewer lines, natural gas pipelines, and many other components are at risk. Fires can also be a secondary hazard to structures sustaining earthquake damage. The economic losses to businesses in the area may be very high as owners are forced to stop production or close their doors for even just a day.

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

Development Trends

The most significant recent change in development in Idaho County is an increase in rural residents and property owners. This development trend could mean that more structures, wells, and other improvements in the county now exist and therefore could be potentially damaged if a serious earthquake event were to occur.

Value of Resources at Risk

Current Idaho County parcel data was analyzed to analyze values of resources at risk. Improvement values across the county total more than \$1.27 million with an average value of roughly \$137,700 per improvement. These numbers reflect both incorporated and unincorporated Idaho County and include homes and other structures of various construction styles and with a wide range of building materials. Some are more susceptible than others to damage and value loss from earthquake. US Census data reports 6,462 total housing units in Idaho County. Owner-occupied housing units across the county total 5,008, with a median value of \$197,200.

City of Grangeville

There are no recorded occurrences of earthquakes significantly impacting the city of Grangeville; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Grangeville does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

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

Development Trends

The population of Grangeville showed a slight increase in population over the past decade, but there have not been major changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

A visual assessment of the community's public and commercial structures concludes that approximately one-third of the businesses on Main Street are likely unreinforced brick construction including several with common walls. However, most of the governmental offices and schools with masonry construction or ornamentation are reinforced including city hall, the fire station, the courthouse, post office, elementary and junior high school, high school, and public works building. It is probable that most of the new construction and renovation projects that have occurred in downtown Grangeville have been built to seismic safety standards. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Grangeville is unknown but according to the 2020 Decennial Census¹⁷ there are 1,538 housing units in Grangeville.

City of Ferdinand

There are no recorded occurrences of earthquakes significantly impacting the city of Ferdinand; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Ferdinand does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are no known publicly accessible unreinforced masonry structures in Ferdinand, however there are potentially numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude

¹⁷ US Census Bureau. "Explore Census Data". https://data.census.gov/cedsci/.

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

Development Trends

The population of Ferdinand has decreased over the previous decade and therefore the demand for development has not increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

In Ferdinand, there are no known unreinforced masonry buildings within the city limits. Unreinforced masonry structures were typically built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Ferdinand is unknown but estimated to include at least 10 buildings. The 2020 Census records that there are 66 total housing units in Ferdinand.

City of Cottonwood

There are no recorded occurrences of earthquakes significantly impacting the city of Cottonwood; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Cottonwood does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

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

Development Trends

The population of Cottonwood has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

A visual assessment of the community's public and commercial structures concludes that approximately twenty-six businesses on Main Street are likely unreinforced brick construction, several with common walls. Additionally, two public schools, the post office, and three banks are potentially unreinforced brick or cinder block structures. The city hall as well as the community center also appears to be unreinforced masonry. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry

chimneys in Cottonwood is unknown but estimated to include at least 50 buildings. According to the 2020 Census Cottonwood has 388 total housing units.

City of Riggins

There are no recorded occurrences of earthquakes significantly impacting the city of Riggins; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Riggins does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole, but the city sits right along Highway 95 in a steep river canyon. If an earthquake event occurs locally, it could impact the highway and lead to significant impacts to the residents and economy of Riggins.

Impacts of Earthquake Events

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

Development Trends

The population of Riggins has decreased over the previous decade and therefore the demand for development has not significantly increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

A visual assessment of the community's public and commercial structures concludes that approximately nineteen businesses or organizations on Main Street are likely unreinforced block or brick. At least ten of the downtown commercial businesses were built using block construction prior to 1975 including the grocery store, a motel, and two gas stations. Furthermore, the high school, the IOOF hall, two churches, and the elementary school were constructed either entirely or partially with block construction techniques. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Riggins is unknown but estimated to include at least 15 buildings. The 2020 Census records that Riggins has 271 total housing units.

City of Stites

There are no recorded occurrences of earthquakes significantly impacting the city of Stites; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Stites does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

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

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard. The population of Stites decreased significantly over the past decade.

Value of Resources at Risk

Based on a visual estimate of the downtown area, the post office, city hall/fire station, and the hardware store are likely unreinforced masonry structures. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Stites is unknown but estimated to include at least 10 buildings. The 2020 Census reports that Stites contains 105 total housing units within the city.

City of Kamiah

There are no recorded occurrences of earthquakes significantly impacting the city of Kamiah; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Kamiah does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. There are no know publicly accessible unreinforced masonry structures in Kamiah, however there are likely numerous homes and other buildings throughout the city with unreinforced chimneys. The Community Building in town has been seismically evaluated due to suspicious cracks in the foundation in similar areas on both sides of the building. It was determined that these cracks were likely caused by the structure's proximity to the fault line.

Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

Development Trends

The population of Kamiah has seen a slight decrease over the previous decade and therefore the demand for development has not seen a significant increase. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

In Kamiah, the American Legion Hall, the Presbyterian Church, the airport facility, the schools, the water treatment plant, and approximately 25 additional structures in the downtown district are assumed to be unreinforced masonry. The value of these structures is unknown. These structures were built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in Kamiah is unknown but estimated to include at least 125 buildings. The 2020 Census reports Kamiah having 601 total housing units, however, many of these are not in Idaho County.

City of Kooskia

There are no recorded occurrences of earthquakes significantly impacting the city of Kooskia; however, some minimal shaking has been felt because of larger earthquakes elsewhere. Kooskia does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole.

Impacts of Earthquake Events

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. Most of the commercial and public structures in Kooskia were built using wood construction materials; however, there are several cinderblock buildings and/or red-brick buildings as well. City hall was built using cinderblocks; however, it is not known if the structure is reinforced. There are approximately 5 commercial buildings that are likely unreinforced masonry structures in Kooskia in addition to the numerous homes and other buildings throughout the city with unreinforced chimneys. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents.

Development Trends

The population of Kooskia decreased by roughly 16% over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

In Kooskia, there are at least 5 unreinforced masonry buildings within the city limits. Unreinforced masonry structures were typically built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry

chimneys in Kooskia is unknown but estimated to include at least 25 buildings. Kooskia has 287 total housing units according to the 2020 US Census.

City of White Bird

There are no recorded occurrences of earthquakes significantly impacting the city of White Bird; however, some minimal shaking has been felt because of larger earthquakes elsewhere. White Bird does not have any differing issues or levels of risk associated with this hazard than Idaho County as a whole. The city of White Bird sits at the bottom of a canyon; thus, landslides resulting from earthquakes are a great concern. Also, ingress and egress from the city could be complicated by slides or road damage on U.S. Highway 95 or Old Highway 95. The White Bird Grade has considerable slide potential and the Highway 95 bridge spanning White Bird Creek is directly above much of the residential portion of the city of White Bird.

Impacts of Earthquake Events

Unreinforced masonry (URM) structures and unreinforced chimneys of homes will likely be damaged in the event of an earthquake. Most of the commercial and public structures in White Bird were built using wood construction materials; however, there are several cinderblock and/or unreinforced masonry buildings as well. The school and post office are potentially unreinforced brick and cinder block, in addition to the numerous homes and other buildings throughout the City with unreinforced chimneys that would be at high risk during an earthquake. Damaged or collapsed chimneys could result in the secondary hazard of fire. Nonstructural damage caused by falling and swinging objects may be considerable after any magnitude earthquake. Damage to some older, more fragile bridges and land failure causing minor slides along roadways may isolate some residents. The steep nature of the terrain in the area poses the risk of an earthquake triggering a landslide and potentially damaging property or road systems.

Development Trends

The population of White Bird has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

In White Bird, there are at least 2 unreinforced masonry buildings within the city limits. Unreinforced masonry structures were typically built prior to the inclusion of articles for seismic stability in the Uniform Building Codes in 1972. The number and value of unreinforced masonry homes or homes with masonry chimneys in White Bird is unknown but estimated to include at least 10 buildings. According to the 2020 US Census, White Bird contains 55 total housing units.

CHAPTER 6 – LANDSLIDE

Regional and Local Hazard Profiles

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of "mass wasting," which denotes any down-slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses five modes of slope movement: falls, topples, slides, spreads, and flows. These are further subdivided by the type of geologic material (bedrock, debris, or earth). Debris flows (commonly referred to as mudflows or mudslides) and rock falls are examples of common landslide types.

Almost every landslide has multiple causes. Slope movement occurs when forces acting down-slope (mainly due to gravity) exceed the strength of the earth materials that compose the slope. Causes include factors that increase the effects of down-slope forces and factors that contribute to low or reduced strength. Landslides can be initiated in slopes already on the verge of movement by rainfall, snowmelt, changes in water level, stream erosion, changes in ground water, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors.¹⁸

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.

While landslide events are undoubtedly costly, losses in Idaho are difficult to estimate because of landslide frequency and the fact that many smaller events are handled locally or privately, without State involvement. For example, ongoing landslide problems magnify the challenges of maintaining U.S. 95, the primary north-south 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 the disruption of families, is impossible to quantify.¹⁹

¹⁸ USGS. "What is a Landslide and What Causes One?" <u>https://www.usgs.gov/faqs/what-landslide-and-what-</u> causes-one.

¹⁹ Idaho Office of Emergency Management. "Risk Assessment: Landslide". State Hazard Mitigation Plan, 2018. https://ioem.idaho.gov/wp-content/uploads/sites/57/2018/12/ID-SHMP-Chapter-3.7-Landslide.pdf.

Figure 22: Disaster Declarations involving Landslide Events²⁰²¹

Date	Counties Affected	Description
January 1997	Clearwater, Elmore, Gem, Idaho, Kootenai, Latah, Nez Perce, Owyhee, Payette, Shoshone, Washington	In early March 1997, northern Idaho received 12 to 18 inches of snow on top of an existing snowpack that exceeded 150 to 170 percent of the average. A subsequent rainstorm caused a rapid snowmelt. The resulting mudslides and flooding lasted for an extended period and damaged many public facilities, including county road systems. The President issued a Federal Disaster declaration (DR-1177) on June 13, 1997, for Boundary, Bonner, Benewah, Kootenai, and Shoshone Counties. Additional counties were affected by the rains.
March 2011	Bonner, Clearwater, Idaho, Nez Perce, Nez Perce Tribe, Shoshone	On May 6, 2011, Governor C.L. "Butch" Otter requested a major disaster declaration due to flooding, landslides, and mudslides during the period of March 31 to April 11, 2011. The Governor requested a declaration for Public Assistance for six counties and one Tribe and Hazard Mitigation statewide. On May 20, 2011, President Obama declared that a major disaster exists in the State of Idaho. This declaration made Hazard Mitigation Grant Program assistance requested by the Governor available for hazard mitigation measures statewide.
February 12, 2016	Idaho	State Disaster Proclamation ID-01-2016 for HWY 14 Landslide
March 6, 2017	Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Shoshone, Valley	State Disaster Proclamation ID-03-2017 and federal DR-4313 for flooding, landslides and avalanches that caused over \$9 million in losses. The northern panhandle counties received persistent rainfall and snowmelt that caused widespread flooding, landslides, water over roads, damaged levees and flooding of homes and basements.
April 2019	Adams, Idaho, Kootenai, Latah, Lewis, Valley, Nez Perce Tribe	Severe Storms, Flooding, Landslides, and Mudslides, FEMA-4443-DR. The Governor requested a declaration for Public Assistance for five counties and the Nez Perce Tribe and Hazard Mitigation statewide. Total Public Assistance cost estimate was more than \$3.1 million. On June 12, 2019, President Trump declared that a major disaster exists in the State of Idaho.

There is no practical warning system for individual landslides. The current procedure is to monitor situations on a case-by-case basis and respond after the event has occurred. Generally accepted warning signs for landslide activity include:²²

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations

²⁰ Idaho Office of Emergency Management. "Risk Assessment: Landslide". State Hazard Mitigation Plan, 2018. https://ioem.idaho.gov/wp-content/uploads/sites/57/2018/12/ID-SHMP-Chapter-3.7-Landslide.pdf.

²¹ FEMA. "Declared Disasters". https://www.fema.gov/disaster/declarations.

²² Idaho Office of Emergency Management. "Risk Assessment: Landslide". State Hazard Mitigation Plan, 2018. https://ioem.idaho.gov/wp-content/uploads/sites/57/2018/12/ID-SHMP-Chapter-3.7-Landslide.pdf.

- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased soil content
- Sudden decrease in creek water levels though rain is still falling or recently stopped
- Sticking doors and windows or visible open spaces indicating jambs and frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together.

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. In general, any land use changes that affect drainage patterns or that increase erosion or change ground-water levels can augment the potential for landslide activity.

Idaho County

Idaho County covers a large variety of terrain from the Snake River at the bottom of Hells Canyon on the west to the spine of the Bitterroot Mountains on the Idaho and Montana border in the east. Idaho County spans several wilderness areas including the River of No Return, Gospel Hump, and Selway-Bitterroot. Idaho County's geology is complex and diverse.

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 Idaho 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 information that suggested characteristics pertaining to very low permeability and/or developed a hardpan layer and soils developed from schist and granite parent material were selected as soils with potential high landslide risk. 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.



Figure 23: Landslide Risk in Idaho County, reflected in landslide-prone soils and slope percentage

To portray areas of probable landslide risk due to slope related factors, slope models (Figure 23) 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 since 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 assumed risk and their proximity to development and human activity. With additional field reconnaissance the areas of high risk can be 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.²³

Idaho County communities and infrastructure in the river canyons tend to have the highest risk of landslides due to the steep topography and soil types on the adjacent slopes. Most of the major transportation highways in Idaho County are also located along these river corridors making them highly susceptible to slides. Interruption or closure of these routes could result in the isolation of several communities and slow delivery of necessary supplies. Power outages and loss of communication infrastructure could also result from slides along the rivers where these systems are already somewhat vulnerable. County and USNF road systems are often located along or near streams and drainages and are also heavily impacted by landslides. These road systems are vital to local travel.

The Idaho County communities of; Grangeville, Cottonwood, and Ferdinand have very little risk of experiencing major property damage or loss of life due to landslides. The communities throughout the county that are located within a steep narrow drainage such as; Riggins, White Bird, Stites, Kamiah, and Kooskia, among others, are at a moderate to high risk.

The community of Pollock is located along the Little Salmon River in southern Idaho County. This area is characterized by the steep slopes rising from the Little Salmon River and its many tributaries. Mixed conifer forests and open grassy slopes surround this relatively isolated community for many miles. Much of the Pollock area is at a high risk of landslides, which could damage numerous structures as well as cut off Highway 95, Idaho's main north/south transportation corridor. Pollock has been an area of active landslide activity in the geologic past as well as in the present. Factors leading to slope instability have been present in the area since ancient times.

Fires in the Pollock area can cause a domino effect of multiple hazards. Higher intensity fires not only remove most of the vegetation, but they also cause soils to become hydrophobic or water repellent for a period of time after the fire. This combination leads to unusually high runoff after rain showers or during the spring runoff season. As streams and rivers begin to reach and exceed flood stage, bank failures and

²³ 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.
channel migration are common. Road building and other soil disturbances tend to exacerbate this effect leading to even more severe landslides.

Individual homes in Pollock are at moderate to high risk to landslide activity. Homes and travel routes that have been constructed at the mouths of drainages 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. Debris flow activity and the resulting alluvial sediment deposition is associated with soil saturation and precipitation events. As mentioned, landslide events are generally associated with large precipitation events. The probability of these events occurring during normal weather conditions is quite low. However, during large precipitation events, residents and county representatives should monitor this area for landslide activity.

Local Event History

February 17, 1986 - A winter storm brought several mudslides to Idaho and Clearwater Counties. Mud and rock covered Highway 95 near the White Bird Hill. Highway 12 was closed between Lowell and the Montana line due to slides. Clear Creek Road near Kooskia was also closed due to flooding and rockslides.

March 12, 1997 - Mudslides totaling \$9.5 million in damages plagued north Idaho. In Idaho County, a 1.5 mile stretch on Carrot Ridge Road between Greer and Woodland cost \$46,000 to repair slide damages.

1996/1997 - Landslides occurred throughout southwestern and west-central Idaho during a major flooding event in 1996/1997. The landslides were associated with heavy and prolonged precipitation, warm temperatures, and certain topographic, geologic, and soil characteristics. The effects of these landslides included damage to and closure of highways, destruction of power and telephone lines, buildings and vehicles, burial and flooding of irrigation facilities, and damming and sedimentation of rivers and streams. Total damages exceeded \$1.6 million in Adams County and \$2.5 million in Idaho County.

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

May 13, 2012 – A heavy rain event caused a debris slide/slope failure along Leitch Creek southeast of Kooskia. Damages resulted in a County and State Declaration to acquire funding for repairs to the slope and roadway.

February 18, 2016 – Late winter a landslide occurred on Highway 14 cutting off access to and from Elk City, ID. The landslide was approximately 250 feet wide and 700 feet long burying about 250 feet of the highway ten and a half miles west of Elk City. Elk City residents were able to use a Forest Service road to get to town for supplies however, officials had to limit use of this road due to spring rains, above freezing temperatures, and heavier traffic. Idaho Transportation Department has received \$500,000 in emergency funds from the Federal Highway Administration to assist in the repairs.

Figure 24: February 18, 2016, Elk City Landslide (via Google Earth)



August 9, 2019 – Heavy rain in the evening caused a mudslide to affect US-95 between mileposts 197 and 205. Idaho Transportation Department estimated there was about four feet of mud on the roadway. The highway was closed much of August 10 but reopened later that day. Traffic was back to normal capacity by Monday August 12. Flash flooding and mudslides damaged orchards, gardens, and water lines to homes. There was also damage to the Cow Creek Road and the John Day Road.²⁴²⁵

July 3, 2020 – A rockslide measuring roughly 120 feet wide, and 40 feet deep covered US-95 about six miles south of Riggins (Milepost 188). More sliding occurred on July 10. North-south traffic on the highway was closed for months and improvements were made to Old Pollock Road for a detour. This road experienced landslides as recently as 2016 and required several closures for improvement and repairs. Long term repair was considered completed on November 24.²⁶

²⁴ Highway emerges unscathed from mudslide that destroyed Fiddle Creek fruit gardens | News | idahocountyfreepress.com.

²⁵ All lanes of Highway 95 back open after mudslide near Grangeville | KBOI (idahonews.com).

²⁶ https://itd.idaho.gov/news/us95rigginsslide/.

July 1, 2021 – A mudslide hit US-95 north of Riggins, temporarily closing the highway. ²⁷ This occurred roughly between Race Creek Road and Lucile Road.

May 9, 2022 – Rocks fell onto US-95 at the top of White Bird Grade south of Grangeville, blocking the southbound lane of traffic. Rock sizes ranged from six inches to six feet wide and the Idaho Transportation Department placed concrete railing to protect drivers. Spotters and flaggers were posted to watch the slide area and to be prepared to stop traffic if necessary.

Probability of Future Occurrence

Most of the landslide potential in Idaho County occurs in the steep canyons along the Salmon River, Little Salmon River, and Clearwater River and among the many streams throughout the county. These canyons and gulches have a high propensity for slides based on steep slopes, unstable soils, and history of occurrence. Wildfires and/or severe storms that saturate the soils could lead to major slide events in these areas. The probability of occurrence of major, high velocity landslide events in this area, including those caused by severe local storms, is high. Areas that have a history of sliding have an increased probability of sliding again.

Impacts of Landslide Events

In Idaho County, minor landslides along toe-slopes and roadways occur annually with minimal impact to local residents. Population centers and individual homes in the Salmon River (Pinehurst, Pollock, Riggins, Lucile, Slate Creek, and White Bird) and Lochsa River (Lowell and Powell) corridors have the highest risk of experiencing slides; however, most of the damage from slides in Idaho County will likely occur along roadways. Major landslides in communities that are situated along river corridors could cause property damage, injury, and death and may adversely affect a variety of resources. For example, water supplies, fisheries, sewage disposal systems, forests, dams, and roadways can be affected for years after a slide event.

The negative economic impacts of landslides include the cost to repair structures, loss of property value, disruption of transportation routes, medical costs in the event of injury, and indirect costs such as lost timber and fisheries. Slides in the river and stream drainages may also block the channel causing water to back up and spill over into areas not previously at risk to flooding. Numerous communities and homes could be at risk if this type of event were to occur. In many cases, a slide blocking the water channel would also cut off emergency access routes as many roads in Idaho County parallel the streams and rivers. Most of the communities in Idaho County have a moderate chance of being directly affected by landslides.

Stream channel erosion and natural meandering may also cause small slides or cave-ins along the riverbanks. Migration of the stream channels may result in the loss of traditional land uses over long periods of time. Water availability, quantity, and quality can be affected by landslides and would have a

²⁷ https://www.kxly.com/mudslide-hits-us-95-north-near-riggins/.

very significant economic impact on Idaho County. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

Transportation corridors, however, may be severely impacted and often are at the most risk of landslides. U.S. Highway 95 has experienced numerous slides of varying severity that have blocked one or both lanes for several days. As the sole north-south transportation route from southern Idaho to northern Idaho, closures along this roadway greatly impact the delivery of necessary supplies to Idaho County. Closure of Highways 12 and 14 due to slides could effectively isolate the communities of Elk City, Lowell, and Powell, particularly during the winter months when all other forest routes are closed. Landslides that occur on primary local transportation routes can severely impact residents in the various communities of Idaho County. The following county and USNF road systems are additional travel routes at high risk to landslide activity.

Leitch Creek Road

Southeast of Kooskia, Leitch Creek Road is highly susceptible to sliding for roughly four miles, from its intersection with Clear Creek Road upstream to its intersection with Tahoe Loop Road. The steep slope on the south side of Leitch Creek is prone to sliding and this risk is exacerbated by the stream undercutting the toe of the slope. When analyzing the parcel data in this area, 12 improvements are found, valued at \$2.2 million. However, these improvements are located on the relatively flat ground above the steep slopes. The main resource at risk in this area is the road.

Big Salmon Road (NF-1614)

This entire road is at high risk to slides, from Short's Bar just east of Riggins, all the way to the end of the road at the Vinegar Creek Boat Launch. This stretch of road is about 25 miles long and has been impacted by many significant slides on the upslope side of the road, with the most recent slide occurring between French Creek and Fall Creek. There are 14 assessed improvements along Big Salmon Road totaling more than \$1.9 million in assessed values. However, the primary concern for impacts from landslides is on the roadway and the effects a disruption would have to transportation and recreation.

Figure 25: Big Salmon Road, east of Riggins from Short's Bar to Vinegar Creek Boat Ramp



Luke's Gulch Road

This road leaves the Camas Prairie and drops down to the South Fork Clearwater River, following an unnamed stream down to the river. This roughly 2-mile segment is prone to sliding, both on the upslope above the roadway, as well as below the road where the stream undercuts the slope as it meanders through the narrow canyon. Along the stretch of road that contains landslide-prone slopes, there are 6 improvements valued at roughly \$941,000, however, the main concern is the impact sliding has on the roadway.

Carrot Ridge Road (Woodland Grade Road)

In the far northwest corner of Idaho County, this road runs southeast from the Greer Grade (Clearwater County), up and along the ridge and eventually connecting to the community of Woodland. Granitic soils lead to frequent slope destabilization in steep areas and slides are especially common after fires. This area does not experience a lot of traffic, but slides do occur, most recently in 2017 and 2019. These major slides were repaired using State Emergency Relief Funds authorized by the Idaho Legislature. Repair costs in 2019 were estimated at almost \$1 million. The main resource at risk in this area is the road system. There is one parcel with an improvement located in the far northwest part of this area valued at \$228,549.

Figure 26: Luke's Gulch Road, northeast of Grangeville and Carrot Ridge Road, south of Greer (Clearwater County)



Figure 27: Leitch Creek Road, southeast of Kooskia



Development Trends

The primary change in development that affect this jurisdiction's vulnerability regarding landslide, is the large influx of people moving to Idaho County without knowledge of its landslide risk. New residents in the unincorporated parts of the county rely on road systems that are prone to landslides without consideration of how a landslide event might affect their daily lives.

Value of Resources at Risk

The cost of cleanup and repairs of 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.

The Landslide Impact Zones identified in the table below were assessed for improvements and improvement values within the designated zone. This data was provided by the Idaho County Assessor's Office and in almost all cases an improvement is a house or some other kind of structure, such as a shop or storage building.

Landslide Impact Zone	Total Number	Total Assessed
	Of Improvements	Improvement Value
Riggins	292	\$37,923,515
Pollock	121	\$17,680,703
Mount Idaho	44	\$7,617,064
Highway 14	2	\$344,141
Harpster Slide Area	1	\$93,018
Stites	201	\$16,194,218
Kooskia	313	\$23,858,505
Kamiah	620	\$83,188,421
Lowell	16	\$3,745,523
Tahoe/Red Pine Creek	79	\$12,661,046
All Zones	1,689	\$203,306,154

Table 6: Total Assessed Improvement Values in Landslide Impact Zones

Slides in the identified Impact Zones 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. The highest risk areas in these impact zones are typically at the higher elevations where slopes exceed 25% grade. Each Landslide Impact Zone is mapped and structures within these impact zones are highlighted using a statewide building footprints layer. Single slide events will not likely impact the entire population, but rather individual structures. Many of the main access and secondary roads could also be at risk from slides initiating in these impact zones.

Figure 28: Landslide Impact Zones in Idaho County



City of Grangeville

The city of Grangeville has very little risk to landslides due to the flat topography of the surrounding area and the built environment. Small slumps make occur along some roadways, but these are not likely to cause significant damage to the community. The few slopes in and around the community are generally less than 10% grade. While small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction.

Impacts of Landslide Events

Grangeville may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Grangeville. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

Development Trends

The population of Grangeville showed a slight increase in population over the past decade, but there have not been major changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are no structures or infrastructure directly at risk from landslides within the city of Grangeville. The cost of cleanup and repairs of 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.

City of Ferdinand

The city of Ferdinand has very little risk to landslides due to the flat topography of the surrounding area and the built environment. Small slumps make occur along some roadways, but these are not likely to cause significant damage to the community. The few slopes in and around the community are generally less than 10% grade. While small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction.

Impacts of Landslide Events

Ferdinand may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Ferdinand. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

Development Trends

The population of Ferdinand has decreased over the previous decade and therefore the demand for development has not increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are no structures or infrastructure directly at risk from landslides within the city of Ferdinand. The cost of cleanup and repairs of 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.

City of Cottonwood

The city of Cottonwood has very little risk to landslides due to the flat topography of the surrounding area and the built environment. Small slumps make occur along some roadways, but these are not likely to cause significant damage to the community. The few slopes in and around the community are generally less than 10% grade. While small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction.

Impacts of Landslide Events

Cottonwood may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Cottonwood. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

Development Trends

The population of Cottonwood has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are no structures or infrastructure directly at risk from landslides within the city of Cottonwood. The cost of cleanup and repairs of 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.

City of Riggins

Riggins sits in the canyon of the Salmon River at the mouth of the Little Salmon River. The Salmon and Little Salmon Rivers have cut deep canyons into the Salmon Mountains and the basalt flows that underlie much of the area. The Riggins area has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. 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.²⁸

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

Overall, Riggins has a high risk of landslides because of the geology and soil parent material in the area.

Impacts of Landslide Events

Riggins may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Riggins. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

The main access route to and from Riggins is U.S. Highway 95. Much of this highway travels along river corridors with steep slopes abutting the roadway. Landslides affecting this travel route can have a significant impact on the community of Riggins as supplies and other commerce must bypass the city by traveling several hundred miles around. Additionally, residents of Riggins, particularly commuters could be cut-off from the only efficient access route.

The potential for debris flows and landslides would dramatically escalate in the event of a large wildland fire event that denudes the steep canyon slopes of vegetative cover. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the fragile soil to the canyon walls.

²⁸ Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

Development Trends

The population of Riggins has decreased over the previous decade and therefore the demand for development has not significantly increased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Figure 29: Riggins Landslide Impact Zone; building footprints within this zone are also shown



Value of Resources at Risk

Slides in the identified Riggins 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 292 improvements with an assessed total value of \$37,923,515 within the Impact Zone as well as sections of U.S. Highway 95. This includes more than just the city limits of Riggins, but it is likely that many of these structures and infrastructure would be destroyed or severely damaged in the event of a major slide in this area.

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

City of Stites

Stites is located in the canyon of the Cottonwood Creek at its confluence with the South Fork of the Clearwater River. Cottonwood Creek and the South Fork have cut deep canyons into the Camas Prairie and the basalt flows that underlie much of the area. The Stites area has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. Although recent years have not seen the same level of activity that was typical in ancient times, these characteristics remain. 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.²⁹

The city of Stites has a moderate probability of experiencing damaging landslides. The slopes in and around the community are generally greater than 35% grade. There are numerous buildings that abut the toe slope of the canyon wall on the east side of the city. Small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction.

²⁹ Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

Figure 30: Stites Area Landslide Impact Zone; building footprints appear as black polygons



Impacts of Landslide Events

Stites may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Stites. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

The main access route to and from Stites is U.S. Highway 12 and State Highway 13. Much of these highways travel along river corridors with steep slopes abutting the roadways. Landslides affecting these travel routes can have a significant impact on the community of Stites as supplies and other commerce must bypass the city by traveling dozens of miles around. Additionally, residents of Stites, particularly commuters could be cut-off from the only efficient access route.

The potential for debris flows and landslides would dramatically escalate in the event of a large wildland fire event that denudes the steep canyon slopes of vegetative cover. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the fragile soil to the canyon walls.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

Slides in the identified Stites 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 201 assessed improvements with an estimated total assessed value of \$16,194,218 within the Impact Zone as well as sections of State Route 13. It is likely that many structures and much of the infrastructure would be destroyed or severely damaged in the event of a major slide in this area.

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

City of Kamiah

Kamiah lies in the canyon of the Middle Fork of the Clearwater River at its confluence with the Lawyer Creek. Lawyer Creek and the Middle Fork have cut a deep canyons into the Camas Prairie and the basalt flows that underlie much of the area. The Kamiah area has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. Although recent years have not seen the same level of activity that was typical

in ancient times, these characteristics remain. 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.³⁰

The city of Kamiah has a low probability of experiencing damaging landslides. The few slopes in and around the community are generally less than 10% grade. While small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. The greater Kamiah area within Idaho County, as expressed for the Kamiah Landslide Impact Zone, has a higher chance of experiencing a landslide event due to steeper slopes, roadways that follow streams, and the presence of rural homes and buildings.

Impacts of Landslide Events

Kamiah may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Kamiah. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

The main access route to and from Kamiah is U.S. Highway 12 and State Highway 162. Much of these highways travel along river corridors with steep slopes abutting the roadways. Landslides affecting these travel routes can have a significant impact on the community of Stites as supplies and other commerce must bypass the city by traveling dozens of miles around. Additionally, residents of Stites, particularly commuters could be cut-off from the only efficient access route.

The potential for debris flows and landslides would dramatically escalate in the event of a large wildland fire event that denudes the steep canyon slopes of vegetative cover. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the fragile soil to the canyon walls.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

³⁰ Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.



Value of Resources at Risk

Slides in the identified Kamiah Impact Zone are more likely to be larger and more damaging as weaknesses in the underlying rock formations give way. Although infrequent, this type of slide has the potential to not only block, but destroy road corridors, dam waterways, and demolish structures. There are 620 assessed improvements with an estimated total assessed value of \$83,188,421 within the Impact Zone as well as sections of U.S. Highway 12 and State Routes 64 and 162. It is likely that many structures and much of the infrastructure would be destroyed or severely damaged in the event of a major slide in this area.

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

City of Kooskia

Kooskia is located in the canyon of the confluence of the South and Middle Forks of the Clearwater River. The South and Middle Forks have cut a deep canyons into the Camas Prairie and the basalt flows that underlie much of the area. The Kooskia area has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. Although recent years have not seen the same level of activity that was typical in ancient times, these characteristics remain. 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.³¹

The city of Kooskia has a low to moderate probability of experiencing damaging landslides. The slopes in and around the community are generally less than 35% grade. Small, low angle slumps may occur on eyebrows of the surrounding rolling hills, these will be infrequent and likely the result of water saturation or a major disturbance such as an earthquake or road construction. Portions of the greater Kooskia area do have a higher probability of landslides due to steeper slopes, roadways that follow streams, and the presence of rural homes and buildings. The biggest threat that landslides pose in the Kooskia area, is to the road systems that residents rely on daily.

³¹ Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

Figure 32: Kooskia Area Landslide Impact Zone



Impacts of Landslide Events

Kooskia may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on Kamiah. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

The main access route to and from Kooskia is U.S. Highway 12 and State Highway 13. Much of these highways travel along river corridors with steep slopes abutting the roadways. Landslides affecting these travel routes can have a significant impact on the community of Kooskia as supplies and other commerce must bypass the city by traveling dozens of miles around. Additionally, residents of Kooskia, particularly commuters could be cut-off from the only efficient access route.

The potential for debris flows and landslides would dramatically escalate in the event of a large wildland fire event that denudes the steep canyon slopes of vegetative cover. The loss of the vegetative cover reduces slope stability by removing much of the organic matter that helps absorb and intercept precipitation and anchor the fragile soil to the canyon walls.

Development Trends

The population of Kooskia has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

Slides in the identified Kooskia 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 313 assessed improvements with an estimated total value of \$23,858,505 within the Impact Zone as well as sections of U.S. Highway 12 and State Route 13. It is likely that many structures and much of the infrastructure would be destroyed or severely damaged in the event of a major slide in this area.

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

City of White Bird

White Bird sits in the canyon of White Bird Creek just upstream from its confluence with the Salmon River. The Salmon River and White Bird Creek have cut deep canyons into the Clearwater Mountains and the basalt flows that underlie much of the area. The White Bird area has been an area of active landslide activity in the geologic past as well as in the present. The factors that lead to slope instability have been present in the area since ancient times. 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.³²

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

Impacts of Landslide Events

White Bird may be indirectly affected by landslides that adversely affect a variety of resources such as water supplies, fisheries, sewage disposal systems, forests, dams, and roadways upstream of the community. Water availability, quantity, and quality can be affected by landslides and could have a very significant economic impact on White Bird. The loss or redistribution of water would affect agricultural crops grown in certain areas, ranching activities, and personal and municipal wells.

The main access route to and from White Bird is White Bird Hill Grade which is accessed via U.S. Highway 95 just south of the town site, as well as several miles up the grade to the north. Both roads steadily climb White Bird Hill north of the community with steep slopes abutting the roadway. US Highway 95 follows the Salmon River canyon south of White Bird with steep slopes abutting the roadway here as well. Landslides affecting these travel routes can have an impact on the community of White Bird, however it is not expected to be a significant impact due to alternative routes in the region.

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.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

There are no structures or infrastructure directly at risk from landslides within the city of White Bird. The cost of cleanup and repairs of roadways is difficult to estimate due to the variable circumstances with

³² Weisz, D. W., K. L. Othberg, and R. M. Breckenridge. 2003. Surficial Geological Map of the Payette Quadrangle, Idaho and Lewis Counties, Idaho. Idaho Geological Survey.

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.

CHAPTER 7 – SEVERE WEATHER

Regional and Local Hazard Profiles

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.

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 above sea level at the confluence of the Clearwater and Snake Rivers to 12,655 feet at Mt. Borah in Custer County. Comprised of 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 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 regions. 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 several 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; 4,000 and 5,000 feet from November through February; 3,000 to 4,000 feet from December through February; and 2,000 to 3,000 feet only one or two months of the year. 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 during that month.

Average Annual Precipitation Idaho



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 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

³³ Western Region Climate Center. "PRISM Precipitation & Dew Point Climatology Maps". WRCC: PRISM Precip Maps (dri.edu).

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 in north Idaho than in the southern regions of the State.

Thunderstorms do occur within Idaho affecting almost all counties, including Idaho County, but usually are localized events. Their impacts are 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.

Snowfall distribution is affected both by availability of moisture and by elevation. Annual snowfall totals in Shoshone County in northern Idaho 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 snowpack 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. Hydro-electric power is generated by the waters of the many rivers in Idaho.

Winter storms are a part of life in Idaho. They vary in degree and intensity and can occur at any time 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 amount of snow accumulated during any given storm. Additionally, these storms could be measured by the accompanying wind or associated temperatures.

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 accompany 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 areas in connection with summer thunderstorms. The incidence of summer thunderstorms is greatest in mountainous areas with lightning often causing forest and range fires.

Past weather patterns show that severe weather conditions are likely to happen in any part of Idaho County in any given year. The topographical features of the county contribute greatly to the various weather patterns that occur. 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 effects are generally transportation problems and loss of utilities. When transportation accidents occur, motorists are stranded and schools and businesses close. The effects 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 Idaho County will always dictate when and where severe storms will occur.



Drought is generally defined as "a deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage." Drought is the absence of precipitation, rather than the presence of an event such as a hurricane, tornado, or fire. It's often described as a "creeping phenomenon" because it slowly impacts many sectors of the economy and operates on many different timescales. Just as drought is difficult to define, it's also difficult to predict and monitor—particularly when marking the beginning and end of a period of drought. Drought's effects also vary from region to region.

Due to climatic differences, what might be considered a drought in one part of the country may not be a drought somewhere else.³⁴

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 snowpacks 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 snowpacks.

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.³⁵

Idaho County is relatively free of any significant mountain barriers to impede the normal movement of the moisture laden air masses from the Pacific Ocean. Most of the total annual precipitation is attributed to storms rotating around a center of low atmospheric pressure traveling on an easterly course. Average annual precipitation received by Idaho County ranges from 19.21 inches in Cottonwood to 25.8 inches at Elk City, with Grangeville and Kooskia receiving from 21 to 24 inches. The greatest amount of precipitation is received between January and February, normally in the form of snow, and very little precipitation occurs during the summer months. The average annual snowfall can range from 21.1 inches at Kooskia to 42.6 inches at Cottonwood and as much as 128 inches at Lolo Pass in the northeastern corner of the County. The mean annual temperature varies from 51.4 degrees Fahrenheit at Elk City to 50.9 degrees Fahrenheit at Kooskia. The lowest temperature occurs between January and February, with Elk City reporting a maximum low of -43 degrees Fahrenheit in February 1996. The highest temperatures annually occur in July and August, and Kooskia reported a high of 116 degrees Fahrenheit in July 1934.

Idaho County

Severe weather in Idaho County ranges from the commonly occurring thunderstorms to hail, high winds, tornadoes, drought, dense fog, lightning, and snowstorms.

³⁴ National Integrated Drought Information System. Drought Basics. <u>https://www.drought.gov/what-is-drought/drought-basics</u>.

³⁵ Idaho Office of Emergency Management. State of Idaho Hazard Mitigation Plan, 2018. Hazard Mitigation Program. Available online at <u>https://ioem.idaho.gov/wp-content/uploads/sites/57/2018/12/ID-SHMP-Chapter-3.5-Drought.pdf</u>.

All of Idaho County is at risk to severe winter weather events and there is a high probability of their continued occurrence in this area. Commonly, higher elevations in the mountains will receive significant snowfall, while areas along the Salmon and Clearwater Rivers 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 any given year. Winter conditions can change very rapidly. It is not uncommon to have a snowstorm at night with sunshine the next day.

In Idaho County, ice storms occur when a layer of warm air is between two layers of cold air. Frozen precipitation melts while falling into the warm air layer, and then proceeds to refreeze in the cold layer above the ground. If the precipitate is partially melted, it will land on the ground as sleet. However, if the warm layer completely melts the precipitate, becoming rain, the liquid droplets will continue to fall, and pass through a thin layer of cold air just above the surface. This thin layer of air then cools the rain to a temperature below freezing (32°F). However, the drops themselves do not freeze, a phenomenon called supercooling. When the supercooled drops strike the ground or anything else below 32°F, they instantly freeze, forming a thin film of ice that can build up on trees, utilities, roads, and other structures, infrastructure, and personal property.³⁶

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

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

Windstorms are frequent in Idaho County and they have been known to cause substantial damage. Under most conditions, the County's highest winds come from the northwest. However, during the summer months lightning and thunderstorms often come from the south to southwest. Due to the abundance of agricultural development in Idaho 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.

³⁶ Wikipedia. "Ice Storm". Wikimedia Foundation, Inc. March 2011. Available online at <u>http://en.wikipedia.org/wiki/Ice_storm</u>.

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 Idaho County. 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.³⁷ 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 the Coast Range and central Idaho.

Idaho 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. Details about wildfire mitigation are discussed in the wildland fire chapter of this Multi-Hazard Mitigation Plan.

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 and May, 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 Idaho 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. Areas most vulnerable to tornado are those subject to severe thunderstorms or those with a recurrence rate of 5 percent or greater, meaning the County experiences one damaging severe thunderstorm event at least once every 20 years.

There were 2 reports of tornadoes in Idaho County between 1880 and 2021. They occurred in April 1979 (F0) and October 2010 (F0). No injuries or deaths were reported because of these events.³⁸

In every drought, agriculture is adversely impacted, especially in non-irrigated areas such as the dry land farms and rangelands in Idaho County. Droughts impact individuals (farm owners, tenants, and farm laborers), the agricultural industry, and other agriculture-related sectors.

Drought affects water levels for use by industry, agriculture, and individual consumers. Water shortages affect firefighting capabilities through reduced flows and pressures. Drought also affects power production. Much of Idaho's power is produced by hydro-electric dams. When water levels drop, electric companies cannot produce enough power to meet demand and are forced to buy electricity from other sources. Oftentimes, drought is accompanied by extreme heat. When temperatures reach 90 degrees and above, people are vulnerable to sunstroke, heat cramps, and heat exhaustion. Pets and livestock are also

³⁷ <u>http://www.nhc.noaa.gov/aboutgloss.shtml#h</u>. Accessed October 2012.

³⁸ <u>https://www.ncdc.noaa.gov/stormevents/</u>. Accessed April 2022.

vulnerable to heat-related injuries. Crops can be vulnerable as well. In the past Idaho droughts, crop yields were significantly lessened. Drought increases the danger of wildland fires. In Idaho County, fires in rangeland areas are particularly dangerous due to typically high rates of spread and the scattered nature of structures and infrastructure.

Local Event History

Flood Event 4/9/2019

The South Fork of the Clearwater River at Stites, crested at a record level of 10.79 feet on the morning of April 9. This led to flooding of 3 to 5 homes along the west side of the river along North River Road. A torrent of fast-moving water developed in an unnamed gulch located east of Stites along Stites Grade Road and this led to the closure of Idaho Highway 13 and the flooding of Stites. Approximately 30 to 50 homes were affected by the flooding in the town of Stites with many wells contaminated and the National Guard rescued two people who were trapped in their home. Very large mudslides caused US-12 to close between Orofino and Kamiah from April 9 to April 13. A home in Syringa was flooded by a debris flow and US-12 between Kooskia and Syringa experienced erosion and water running on the road leading to the closure of Highway 12. Clear Creek, located approximately 2 miles southeast of Kooskia, washed out two private bridges, flooded approximately 5 homes, destroyed a trailer home, and damaged county road Clear Creek Road. The Nez Perce U.S. Forest Service closed Smith Creek Road due to flooding of the Little Smith Creek causing a washout. Numerous other bridges, culverts and roads were washed out across Idaho County. Estimated \$6 million in property damage.

FEMA-4443-DR Public Assistance

- Primary Impact: Damage to roads and bridges
- Total Public Assistance cost estimate: \$3,131,215
- Idaho County per capita impact: \$146.46

Flash Flood Event 8/9/2019

A severe thunderstorm put down an inch and a half of rain in 30 minutes over the canyons near Lucile. This caused large debris flows in Fiddle Creek, Sheep Creek and Chair Creek that covered US-95 with up to 4 feet deep of mud. More than a dozen vehicles became stuck in the mud. The highway was closed until the next day when one lane was opened. The highway opened totally by Monday, three days later. The flooding also damaged Cow Creek Road and John Day Road. Estimated \$10,000 in property damage.

Weather-Caused Debris Flow (Landslide) Event 7/3/2020

Between 28-30 June 1.67 of rain was measured at the Riggins COOP (45.42/ -116.31). Around 10 AM on the 3rd a rockslide was reported near mile marker 188 on US Route 95 in Idaho. This slide closed both lanes of the highway. A bypass was built and opened on the 9th, however instability in the slope continued to hinder repair (which continued through much of the summer). Estimated \$180,000 in property damage.

Blizzard Event 12/27/2016

Strong winds sustained at 35 mph with gusts to 50 mph combined with falling snow and over a foot of existing transportable snow to create blizzard conditions on the Camas Prairie. At least 5 vehicles and one snowplow became stuck on US-95, and tow trucks were unable to give assistance because of heavy

drifting in the morning. Because of the whiteout conditions, US-95 from Grangeville to Cottonwood, Red Rock Road, Highway 162, and Highway 7 were closed for much of the day and were not fully opened back up until the morning of the 28th.

Excessive Heat Event 8/9/2018

A ridge of high pressure brought a record-breaking heat wave across lower elevations in north central Idaho August 9th and 10th. The Pittsburg RAWS reached 116 on the 9th and 119 on the 10th. RAWS have a well-documented warm bias, so these temperatures are difficult to compare to other observations. Nevertheless, in this notoriously hot location, 119 appears to be the warmest in its period of record going back to 1993. Furthermore, the Slate Creek RAWS reached 113 on the 9th and 114 on the 10th. Finally, Riggins reached 109 on the 10th, one degree shy of the record high of 110, with observations going back to 1896.

Cottonwood set record highs of 103 on the 10th and 99 on the 9th. The two-day mean maximum temperature of 102 is the hottest two day stretch since observations began in 1976. Grangeville reached 104 on the 10th and 99 on the 9th. Kamiah just inside Spokane's County Warning Area recorded the second hottest two day mean maximum temperature stretch with 109.5. Kamiah set record highs of 109 on the 9th and 110 on the 10th.

Excessive Heat Event 6/27/2021

An unusually strong ridge of high pressure settled over the Pacific Northwest bringing hot daytime temperatures and warm overnight lows. The consecutive days of heat made it difficult to cool locations without air conditioning. Daily record highs were set for several observation sites.

OROFINO / GRANGEVILLE REGION (ZONE)

Highs temperatures reached from 100 to 110 degrees Fahrenheit with overnight lows in the upper 60s to lower 70s. Orofino peaked out at 112 degrees on the 29th.

SOUTHERN CLEARWATER MOUNTAINS (ZONE)

High temperatures ranged from the upper 90s to 107 degrees at lower elevations with overnight lows in the 60s.

LOWER HELLS CANYON / SALMON RIVER REGION (ZONE)

High temperatures ranged from 100 to 110 degrees with overnight lows generally in the 60s. There were some exceptions, such as the observation site at Pittsburg Landing reaching 115 degrees on the 29th with a morning low that day of 78 degrees.

Frost/Freeze Event 4/28/2019

Sub-freezing temperatures occurred in central Idaho therefore compromising sensitive vegetation such as flowering fruit trees. A low of 29 degrees was recorded just south of Riggins which is near the threshold for compromising potential blossom drop in some fruit trees. A low of 28 degrees was recorded in Grangeville which is right at the threshold for compromising potential blossom drop in some fruit trees.

Hail Event 7/19/2016

A long-lived thunderstorm produced hail over a greater part of Grangeville and heavy rain over downtown. Many hail reports were received ranging from half an inch, and up to one inch south of town. Minor flooding also occurred on Main Street. Large amounts of hail created hazardous driving conditions, causing a vehicle to slide off Highway 95. Ping-pong-sized hail was reported along the highway, 5 miles southwest of Grangeville, with nickel-sized hail being reported in the city itself.

Hail Event 7/8/2019

A severe thunderstorm moved over southern portions of Grangeville, Idaho, and areas along U.S. Highway 95 southwest of the city. Large amounts of hail created hazardous driving conditions, causing a vehicle to slide off the highway. Ping-pong-sized hail was reported along the highway, 5 miles southwest of Grangeville, with nickel-sized hail being reported in the city itself.

Hail Event 8/9/2019

An evening severe thunderstorm brought damaging hail and flash flooding along Highway 95 in central Idaho. Mostly egg-sized hail with up to baseballs fell between Slate Creek and Riggins, Idaho and damaged greenhouse roofs, fences, pump house tanks, PVC pipelines, windshields, vehicles, and orchards. Estimated \$150,000 in property damage and \$50,000 in crop damage.

Heavy Rain Event 2/12/2016

South Fork RAWS reported 0.50 inches of rain over the 7 days preceding the event. The greatest 1-day rainfall was Feb 15, when 0.23 inches fell. Fenn Ranger Station RAWS reported 2.21 inches of rain over the 7 days preceding the event. The greatest 1-day rainfall was Feb 15, when 0.81 inches fell. Red River RAWS reported 1.08 inches of rain over the 7 days preceding the event. The greatest 1-day rainfall was Feb 14, when 0.48 inches fell.

Significant debris slid onto Idaho Highway 14 between Grangeville and Elk City, cutting off the only route into Elk City and Dixie (total population 250). This is a slide prone area, but significant rain had occurred during the prior week. Roughly 200-400% of average rainfall occurred during the week ending 2/20/16, most of which occurred during an atmospheric river event on the 14th and 15th. Nearby observations indicate there was virtually no precipitation in the 48 hours immediately prior to the slide, but the soaking precipitation during the atmospheric river, seasonal snowmelt, and thaw/refreeze cycles may have all played a role in this event. Clearing debris and creating a safe corridor for travel continued for months after the event.

Heavy Rain Event 3/16/2017

An atmospheric river brought several inches of rainfall to central Idaho which was already soaked from previous rains. This contributed to mudslides that shut down roads and flooding that affected residences and property.

Several locations along US-12 experienced flooding, mud and debris on the road which caused it to close for 10 hours. Three inches of rain with snowmelt occurred a week before this event contributing to saturated soils. A nearby sensor in Lowell recorded 1.23 inches of rainfall 24 hours leading up to the flooding. Multiple culvert washouts and other mudslides were reported through March 24 along the

following roads: Cedar Creek, Big Cedar, and Cove. Idaho County declared a state of emergency because of all the issues. Estimated \$50,000 in property damage.

Heavy Snow Event 10/23/2020

A half a dozen trees, mostly evergreen, were damaged by heavy, wet snow, causing power outages in western Clearwater County. Total snowfall in inches included: 7 Rudo Rd. Grangemont, 6 three miles NE Orofino, 2.3 Woodland, and 1.5 Grangeville. Estimated \$5,000 in property damage.

Heavy Snow Event (Rockslides) 3/8/2017

A plume of moisture moved over Idaho and western Montana causing heavy precipitation over central Idaho. Heavy wet snow contributed to multiple rockslides with one covering Mount Idaho Grade Road southeast of Grangeville. Due to the already saturated ground, the heavy precipitation downed multiple trees and power lines. Widespread power outages were reported with one spotter reporting 8.5 hours without power east of Kooskia. Snowfall amounts ranged from 4 inches in Grangeville to up to 10 inches across the northern Camas Prairie. Estimated \$5,000 in property damage.

FEMA-4313-DR Public Assistance

- Primary Impact: Damage to roads and bridges
- Total Public Assistance cost estimate: \$9,625,389
- Idaho County per capita impact: \$128.97

Heavy Snow Event 2/15/2021

A combination of heavy snow and falling trees (around 30-40 trees) caused power outages and blocked roads throughout the zone. The area from Lowell to just west of Bald Mountain on US Highway 12 received 18 inches of heavy snow, which was very significant for these lower elevations. Also, driving was very difficult on Mt. Idaho grade and in the Dixie area where they received 17.8 inches from the storm.

High Wind Event 11/13/2020

Southerly down sloping winds ahead of a strong cold front caused damage on the Camas Prairie of north central Idaho. Wind gusts of 50 to 60 miles per hour were common, with a peak gust of 73 miles per hour, measured just northwest of Grangeville. At least 3 power poles were snapped in half, adding to up to 1000 customers without power. In addition, trees were blown down, debris blown through windows and across roads, and blowing snow occurred early in the event causing 'near-zero' visibility as reported by the Idaho Department of Transportation. Estimated \$23,000 in property damage.

Thunderstorm Wind Event 5/16/2019

High winds from a thunderstorm along with wet soil conditions lead to considerable uprooted trees in East Kamiah. The greatest damage occurred along a two mile stretch of US-12 from Rock Road to the Kamiah Bridge. Trees fell across US-12 resulting in traffic disruption, in addition one residential trailer and one travel trailer were also damaged by falling trees. Estimated \$20,000 in property damage.

High Wind Event 1/12/2021

A strong southerly pressure gradient developed ahead of a robust Pacific cold front to bring two distinct periods of high winds to the Camas Prairie. On the morning of the 12th, wind gusts near 60 mph ahead of

the front brought severe crosswind to US-95 south of Grangeville. The second period of wind, associated with the passing cold front, occurred in the early morning hours of the 13th, and brought more widespread impacts to the area. Severe crosswind on US-95 south of Grangeville caused a tractor trailer to tip over on White Bird Grade. Overall estimated \$20,000 in property damage.

Thunderstorm Wind Event 8/29/2017

Monsoon moisture moved up across a very hot atmosphere sparking showers and thunderstorms across central Idaho. The storms were mainly dry and produced a microburst over Kamiah and into Woodland. Trees were ripped out across town which caused widespread power outages. The City of Kamiah declared a Disaster Declaration due to the volume of trees that fell across town. Kamiah is across the Clearwater River from NWS Missoula's County Warning Area, but the damage extended into Clearwater County as well. A spotter reported a pine tree with a diameter of 2.5 feet snapped in half from the strong wind. They estimated the wind gust to be 60 mph. Also, power was reported out for 13 hours. Estimated \$10,000 in property damage.

Strong Wind Event 9/7/2020

Unseasonably cold air spilled into the region resulting in strong northeast winds. Downed trees were reported along Highway 12 from Lowell to the Montana border. Sporadic power and phone outages occurred at Lowell. Wind gusts were generally 40 to 45 mph. Estimated \$10,000 in property damage.

Strong Wind Event 3/28/2021

A strong Pacific cold front, along with a stronger than normal mid-level wind maximum near 90 knots, brought wind damage to portions of north-central Idaho and western Montana. More than 600 customers were affected by power outages in an area from Grangeville to Elk City to Dixie, ID. In the mountains, there were multiple measured gusts in the 40s mph, while Hells Half RAWS (elevation of 8100 feet) measured the highest gust of 57 mph. Additionally, the Idaho Department of Transportation reported a few trees down on ID-12 east of Lowell, ID. Estimated \$1,000 in property damage.

Winds Caused Wildfires 9/7/2020

Winds gusting to 45 mph caused trees to fall on power lines, and this in turn sparked several wildfires near Orofino. These fires spread quickly in the low humidity and windy environment. Later named the Sunnyside Complex, an initial damage assessment included 13 homes, 31 outbuildings, and 27 vehicles destroyed. Highway 12 was also closed for a time. Estimated \$2.5 million in property damage.

Winter Storm Event 1/6/2020

Strong winds and falling snow made for hazardous travel on the Camas Prairie. A peak wind gust of 59 miles per hour was reported at the Grangeville Airport the afternoon of the 6th which resulted in the total loss of a local drive-in movie theater screen. A semi-truck and trailer was also blown off US Highway 95 about 5 miles south of Grangeville. The highest snow total reported was 12 inches in Cottonwood. Estimated \$10,000 in property damage.

Winter Storm Event 12/29/2017

A prolonged period of moderate to heavy snow caused difficult travel conditions and sporadic power outages across central Idaho. While lower elevations experienced a mixture of snow, rain and freezing rain, the combination of rain and snow melt led to water on roadways in a few places.

In Elk City, heavy snow brought down power lines and trees causing an extended power outage that lasted for three days from 11 am PST on the 28th to 10 am PST on the 30th. Heavy wet snow also caused several power outages in the Lower Middle fork, Lowell, Selway and Tahoe areas. The Idaho Transportation Department reported 37 inches at the Powell Shed. Around 22 inches of snow was reported at Lolo Pass, between 14 and 18 inches of snow fell in Elk City and the Dixie COOP reported 11 inches over 3 days. For the lower elevations, Kooskia saw 6 inches of heavy wet snow while freezing rain was reported on highway 12 with several trees down near Lowell. Estimated \$5,000 in property damage.

Winter Weather 1/11/2018

A person from the public in Elk City estimated over 5 inches of total snowfall while areas along US-12 between Powell and Lolo Pass saw 8 to 15 inches. During the early morning hours of the 12th, heavy snow changed to rain and caused several trees to snap or become uprooted falling onto US-12 near Lowell. One tree was estimated to be 36 inches in diameter and the Idaho Transportation Department reported that the ground has been saturated and not frozen. Estimated \$5,000 in property damage.

Probability of Future Occurrence

The probability of Idaho County experiencing a severe weather event on an annual basis is very high.

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

Wind events are also common in Idaho County and can occur throughout the year. Wind is often associated with winter storms during the winter and thunderstorms during the warmer months, but can also occur without additional storm influences. Significant wind events are expected 3-5 times annually.

Several major thunderstorms are expected in Idaho County each year between April and September; however, these types of events rarely cause serious damage.

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

Tornadoes are relatively rare, but the conditions for a funnel cloud to form are reported in Idaho County several times each year. Nevertheless, based on the historical record of tornadoes in this area, the probability of a small tornado occurring in Idaho County is low. The probability of a higher magnitude tornado occurring in this area is extremely low.
The probability of Idaho County experiencing a major long-term drought in any given year is low to moderate. While Idaho County does experience droughts, on the whole, they are mild and do not cause long term damage. The impacts of drought on the agricultural sector are mitigated by the availability of irrigation water. Drought has a more significant impact on wildfire risk from season to season.

Impacts of Severe Weather Events

Winter storms with heavy snow, high winds, and/or extreme cold can have a considerable impact on Idaho County, particularly in the mountainous areas to the north. However, most residents are well accustomed to the severe winter conditions in this part of Idaho. Structures in Idaho communities are generally built to handle the snow load for the area; thus, severe damages from winter storms are rarely reported.

Power outages and unplowed roads are a frequent occurrence throughout many parts of the County, but most residents are prepared to handle the temporary inconvenience. Blowing and drifting snow can often be difficult for crews to keep roads open. 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.

Idaho County has experienced several "ice storms" in recent memory. The freezing rain from an ice storm covers everything with a heavy layer of ice that can cause hazardous road conditions resulting in numerous accidents. Trees have been heavily damaged as branches break from the weight of the ice. The weight of the ice can also snap power lines and bring down utility poles. The loss of power during the winter months can last from a few hours to a few days and is particularly dangerous for those relying on electrical heat. The loss of a heat source can cause hypothermia, frost bite, or even death and can also lead to damages caused by frozen pipes.

Many types of severe weather events tend to impact transportation routes and related infrastructure, especially snow and thunderstorms. Numerous traffic accidents occur along Highway 95 and other primary routes each year, but are particularly common during the winter months due to ice and snowpack as well as poor visibility.

Wind usually accompanies snow storms in Idaho County; thus, large accumulations are not common as much of the snow is blown away. Commonly, heavy drifting is the cause of disruptions to normal commuting activities (delays and inability to plow roads and driveways). High wind events during the spring and summer months could lead to crop damages as well.

The potential impacts of a severe hail storm in Idaho 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. The highest potential damage from hail storms in Idaho County is the economic loss from crop damage. Even small hail can cause significant damage to young and tender plants and fruit. Trees can also be severely damaged by hail.

So far, tornadoes have not had any serious impacts on Idaho County residents. Minor damages may occur as a result of the high winds associated with a tornado.

The impacts of drought are diverse and often ripple through the economy. Thus, impacts are often referred to as either direct or indirect. A loss of yield resulting from drought is a direct or first-order impact of drought. However, the consequences of that impact (for example, loss of income, farm foreclosures, and government relief programs) are secondary or even tertiary impacts. The impacts of drought in Idaho County can be classified into one of three principal types: economic, environmental, and social. Economic impacts range from; direct losses in the broad agricultural and agriculturally related sectors (including forestry and fishing), to losses in recreation, transportation, banking, and energy sectors. Other economic impacts would include added unemployment and loss of revenue to local, state, and federal government. Environmental losses include damages to plant and animal species, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; and soil erosion. These losses are difficult to quantify, but growing public awareness and concern for environmental quality has forced public officials to focus greater attention on them. Social impacts mainly involve public safety, health, conflicts between water users, and inequities in the distribution of impacts and disaster relief programs. As with all natural hazards, the economic impacts of drought are highly variable within and between economic sectors and geographic regions, producing a complex assortment of winners and losers with the occurrence of each disaster.

Development Trends

The county has seen an increase in population, mostly to unincorporated and rural areas. This could create some impact to emergency response efforts during severe weather events, however, these changes in development do not significantly affect Idaho County's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Idaho 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. Additionally, due to the lack of significant topographic features, the wind tends to blow much of the snow accumulation away. Snow plowing in Idaho County occurs from a variety of departments and agencies. The state highways are maintained by the State of Idaho. Plowing of county roads is done by the local highway districts and the road departments of the individual cities. Idaho County has developed a pre-determined list of critical routes in order to prioritize the plowing of arterials and other main access routes. 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 Idaho 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. 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. 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. According to the 2020 US Census, 41.5% of occupied housing units in Idaho County are heated with wood, 34.3% are heated with electricity, and roughly 23.5% of homes utilize other fuel oils, bottled gasses, and utility gasses for heat. Less than 1% of homes in the county, 22 units, are heated via solar energy.

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. Idaho County schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow covered roads.

Thunderstorms do occur within 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 caused by severe thunderstorms can be significant in Idaho 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 extensive agricultural development in Idaho County. 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 Idaho 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 Idaho County due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community has 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 \$6,000) 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 9,237 parcels with improvements in Idaho County with a total value of approximately \$1.27 billion. Using the criteria outlined above the potential wind and tornado damage to all buildings is estimated at approximately \$19.1 million. The estimated damage to roofs is approximately \$2.77 million.

When considering home values at risk, the US Census reports that there are 8,769 total housing units, 6,462 occupied housing units, and 2,307 vacant housing units in Idaho County. There are 5,008 owneroccupied homes in the county and the median value of these is \$197,200.

Although the financial impacts of drought can be substantial and extended, accurately quantifying these impacts is problematic. Drought typically does not cause direct losses to structures or infrastructure, although the forest and rangelands in Idaho County are at increased risk to wildfires as a result of drought conditions. Idaho County has experienced numerous large wildland fires in the past two decades resulting in thousands of acres of forest and rangeland burned and numerous structures and livelihoods lost. The resulting smoke and road closures often affect local citizens as well have impacts on the economy.

The tangible losses are most clearly seen in the agriculture and livestock ranching sectors of the County's economy. Dry land agriculture can be negatively impacted by drought conditions due to reduced yields and limited crop diversification. Livestock ranchers may be forced to recalculate range carrying capacities, change field rotations, and provide supplemental feed for livestock. Reduced hydroelectric power production can also result from decreased water levels in the area reservoirs.

City of Grangeville

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Grangeville on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of Grangeville showed a slight increase in population over the past decade, but there have not been major changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Grangeville. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Grangeville to cause significant damages. However, the loss potential from flooding 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 Grangeville. 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 hailstorm. Homeowners in Grangeville 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 1,476 total housing units, 1,245 occupied housing units, and 231 vacant housing units in Grangeville. There are 775 owner-occupied homes in Grangeville and the median value of these is \$141,700.

Power failure often accompanies severe storms. 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. According to the 2020 Census, in Grangeville 56.1% of housing units are heated by electricity, 22.4% of housing units are heated by wood, and 20.4% are heated by other various fuels and gasses.

City of Ferdinand

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Ferdinand on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of Ferdinand has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Ferdinand. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Ferdinand to cause significant damages. However, the loss potential from flooding 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 Ferdinand. 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 hailstorm. Homeowners in Ferdinand 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 Ferdinand 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 56 total housing units, 52 occupied housing units, and 4 vacant housing units in Ferdinand. There are 41 owner-occupied homes in Ferdinand and the median value of these is \$119,600.

Power failure often accompanies severe storms. 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. According to the 2020 Census, about 42% of housing units in Ferdinand are heated by various fuels and gasses, 34.6% are heated by wood, and 23.1% are heated by electricity.

City of Cottonwood

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Cottonwood on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of Cottonwood has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Cottonwood. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Cottonwood to cause significant damages. However, the loss potential from flooding 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 Cottonwood. 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 loss resulting from a localized hailstorm. Homeowners in Cottonwood 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 Cottonwood 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 425 total housing units, 373 occupied housing units, and 52 vacant housing units in Cottonwood. There are 278 owner-occupied homes in Cottonwood and the median value of these is \$122,700.

Power failure often accompanies severe storms. 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. According to the 2020 US Census, 36.5% of housing units are heated by electricity in Cottonwood, about 31% of housing units are heated by other fuels and gasses.

City of Riggins

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Riggins on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of Riggins has decreased over the previous decade therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Riggins. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Riggins to cause significant damages. However, the loss potential from flooding 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 Riggins. 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 hailstorm. Homeowners in Riggins 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 Riggins 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 258 total housing units, 129 occupied housing units, and 129 vacant housing units in Riggins. There are 70 owner-occupied homes in Riggins and the median value of these is \$172,700. Power failure often accompanies severe storms. 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. According to the 2020 US Census 48.1% of housing units are heated by electricity, 28.7% are heated by various fuels and gasses, and 23.3% are heated by wood.

City of Stites

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Stites on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Stites. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Stites to cause significant damages. However, the loss potential from flooding 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 Stites. 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 loss resulting from a localized hailstorm. Homeowners in Stites 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 Stites 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 112 total housing units, 91 occupied housing units, and 21 vacant housing units in Stites. There are 71 owner-occupied homes in Stites and the median value of these is \$88,800.

Power failure often accompanies severe storms. 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. According to the 2020 US Census, 48.4% of housing units are heated by wood, 36.3% are heated by electricity, and 13.2% are heated by fuel oil and kerosene.

City of Kamiah

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Kamiah on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Kamiah. Damage to roofs by heavy snow accumulations depends on the moisture content of the snow and the structural characteristics of the buildings. In general, snow in this region tends to have low moisture content because of the low temperatures and arid environment. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County schools are occasionally closed during and right after a severe winter storm because of cold temperatures and snow-covered roads.

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

Although the financial impacts of hail can be substantial and extended, accurately quantifying these impacts is problematic. Hail typically causes direct losses to structures and other personal property within Kamiah. The most significant losses are most clearly seen in the agriculture sectors of the economy. Potential losses to agriculture can be disastrous. Crop damage from hail will also be different depending on the time of year and the type of crop. Most farmers carry insurance on their crops to help mitigate the potential loss resulting from a localized hailstorm. Homeowners in Kamiah 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 Kamiah due to windstorms and tornadoes. Construction throughout the County has been implemented in the presence of high wind events, and therefore, the community is at a higher level of preparedness to high wind events than many other areas experiencing lower average wind speeds.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 703 total housing units, 606 occupied housing units, and 97 vacant housing units in Kamiah. There are 384 owner-occupied homes in Kamiah and the median value of these is \$150,300.

Power failure often accompanies severe storms. 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. According to the 2020 US Census, 49.5% of housing units are heated by electricity, 25.1% are heated by wood, and, and roughly 23% are heated by other fuels and gasses.

City of Kooskia

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

Probability of Future Occurrence

The probability of a severe weather event occurring in Kooskia on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of Kooskia has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in Kooskia. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 Kooskia to cause significant damages. However, the loss potential from flooding 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 Kooskia. 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 hailstorm. Homeowners in Kooskia 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 Kooskia 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 322 total housing units, 255 occupied housing units, and 67 vacant housing units in Kooskia. There are 194 owner-occupied homes in Kooskia and the median value of these is \$118,300.

Power failure often accompanies severe storms. 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. According to the 2020 US Census, 42.7% of housing units in Kooskia are heated with electricity, 36.1% use wood heat, and roughly 21% use other fuels and gasses for heat.

City of White Bird

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

Probability of Future Occurrence

The probability of a severe weather event occurring in White Bird on an annual basis is very high.

Impacts of Severe Weather Events

The impacts of severe weather events to the community are usually minimal and are the same as those described for Idaho County as a whole; however, their ability to respond to this hazard varies greatly. No specific jurisdictions or special districts were identified as having differing issues or levels of risk associated with this hazard unless specifically referenced.

Development Trends

The population of White Bird has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate the cost of potential winter storm damages to structures and the economy in White Bird. 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. Additionally, snow rarely accumulates for long periods of time due to regular wind events. 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 public works department. 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. Idaho County 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 White Bird to cause significant damages. However, the loss potential from flooding 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 White Bird. 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 hailstorm. Homeowners in White Bird 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 White Bird 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.

Potential wind damage losses were calculated for improvements in the entire county earlier in the plan. When considering home values at risk, the US Census reports that there are 67 total housing units, 51 occupied housing units, and 16 vacant housing units in White Bird. There are 48 owner-occupied homes in White Bird and the median value of these is \$140,900.

Power failure often accompanies severe storms. 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. According to the 2020 US Census, 47% of housing units in White Bird use various fuel oils, kerosene, bottled gasses, and utility gasses for heat, 29.4% of housing units use wood heat, and only 23.5% of homes use electricity for heat.

CHAPTER 8 – WILDLAND FIRE

Regional and Local Hazard Profiles

Elements of the 2022 Idaho County Community Wildfire Protection Plan have been incorporated into this chapter.

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

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

<u>Weather</u>

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 effect 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 types, will burn differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influences vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. 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 leads 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 role 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 influence fire behavior. 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 due to a decrease in the surface to volume ratio. Fires in large fuels generally burn at a slower rate but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensities can lead to torching (single trees becoming completely involved) and potential development of crown fires. 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 determines how fires will burn.

The study of fire behavior recognizes the dramatic and often-unexpected effect small changes in any single component have 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.

Idaho County Wildfire Hazard Assessment

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.

Figure 34: Historic Fire Regime in Idaho County



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.

Group	Description	Percent of Total
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	19.09%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	3.23%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	42.37%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	33.96%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	0.91%
Water	Water	0.26%
Snow / Ice	Snow / Ice	0.02%
Barren	Barren	0.03%
Sparsely Vegetated	Sparsely Vegetated	0.11%

More than 75% of the county falls within the Fire Regime Groups III and IV. This means that a majority of the fuel types within the county burn every 35 - 200 years with low and mixed severity to replacement severity. The long return interval is typical of the forest communities at higher altitudes. Nearly twenty percent of the county can expect a fire return interval of 35 years or less with a low to mixed severity. The ratio of grass to shrubs generally determines how often this fuel type burns and how severe the burn is. More grass increases the frequency but reduces the intensity, while more shrubs decrease the frequency but increases the intensity. Fire Regime Group I is primarily in the canyons of the major river corridors throughout the county.

Vegetation Condition Class

Vegetation Condition Class (VCC) represents a simple categorization of the associated Vegetation Departure (VDEP) layer and indicates the general level to which current vegetation is different from the simulated historical vegetation reference conditions. VDEP and VCC are based upon methods originally described in the Interagency Fire Regime Condition Class Guidebook but are not identical to those methods. In LANDFIRE 2012[™], the original three VCC classes were divided in half to create six VCC classes

to provide additional precision.³⁹ An updated GIS layer using LANDFIRE data was used to create a vegetation condition class map specific to Idaho County.

Class Name	Description	Percent of Total
Vegetation Condition Class I.A	Very Low, Vegetation Departure 0-16%	1.2%
Vegetation Condition Class I.B	Low to Moderate, Vegetation Departure 17-33%	40.1%
Vegetation Condition Class II.A	Moderate to Low, Vegetation Departure 34-50%	43.8%
Vegetation Condition Class II.B	Moderate to High, Vegetation Departure 51-66%	9.0%
Vegetation Condition Class III.A	High, Vegetation Departure 67-83%	0.8%
Water	Water	0.3%
Snow / Ice	Snow / Ice	0.0%
Non burnable Urban	Non burnable Urban	0.2%
Burnable Urban	Burnable Urban	0.6%
Barren	Barren	0.0%
Sparsely Vegetated	Sparsely Vegetated	0.1%
Non burnable Agriculture	Non burnable Agriculture	2.5%
Burnable Agriculture	Burnable Agriculture	1.4%

More than 83% of Idaho County is 17% to 50% departed from the natural regime. This is considered low and moderate departure and is likely due to vigorous fire suppression efforts and advanced fire suppression techniques and equipment. The 9% of the county that has seen 51% to 66% departure (orange on the map) is located primarily in and adjacent to the Salmon River drainages. These areas have frequent rangeland fire activity and have experienced invasive grass species moving in. The red areas represent High departure (67% to 83%) and make up less than 1% of the area. These classes are most likely present due to a combination of factors. Fire suppression in areas surrounded by agricultural and residential zones could lead to a forest succession that is outside the normal historic vegetation conditions. Areas that typically contain open-canopy ponderosa pine and grass for example, might begin to experience an increased presence of closed canopy Douglas-fir and other species. Some of these areas could also be impacted by development, logging, invasive species introduction, and replacement-severity fire activity.

³⁹ LANDFIRE™. "Vegetation Condition Class." Available online at <u>https://www.landfire.gov/vcc.php</u>.

Figure 35: Vegetation Condition Class in Idaho County



Landscape Risk Assessments

Most homes and structures within and surrounding Idaho County communities are along a spectrum from low to moderate to high risk of loss to wildland fire. Individual characteristics of each community and structure dictate the risk factors. The prevalence of tree and shrub fuels pose a moderate to high threat to homes surrounded by these fuels as fire typically spreads quickly through the grasses and burns at relatively high intensities in the brush and forest fuels, especially where declining forest health is a factor. Many homes are at low risk because of the management of fuels in the area immediately surrounding the structures and access routes. There are several individual homes that have a much higher risk to wildland fire loss largely due to the use of highly ignitable materials in home construction or the lack of defensible space surrounding the home. Home defensibility practices can dramatically increase the probability of home survivability. The amount of fuel modification necessary will depend on the specific attributes of the site. Considering the high spread rates possible 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 an active fire.

Idaho County is comprised of three ecological sub-regions, the Camas Prairie in the northwestern corner of the County, the arid Snake and Salmon River canyonlands, and the vast forestlands of the Clearwater Mountains.

Agriculture & Rangeland Communities

The communities of Grangeville, Cottonwood, Ferdinand, Fenn, and Green Creek lie in the Camas Prairie vegetative ecosystem known as the "steppe" community. The Steppe Ecosystem is widespread over much of Idaho, eastern Oregon and Washington, and portions of northern Nevada, California, and Utah. The central Idaho portion of this ecosystem occurs over a variety of landforms and vegetation types. Native vegetative communities range from vast expanses of grasslands to old-growth sagebrush communities.

The combination of deep and productive soils makes the Camas Prairie well suited to growth of both grassland and forest vegetation. The relatively arid meadow-steppe ecosystem of the Camas Prairie (part of the Palouse prairie bioregion) is dominated by bluebunch wheatgrass, Idaho fescue, and a plethora of wildflowers including Blue Camas for which the prairie was named. Over the course of the past century, most of the native meadow-steppe grasslands have been converted to agriculture fields producing winter wheat, canola, bluegrass, alfalfa, peas, and many other crops.

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

Agricultural and irrigation practices surrounding some communities within the Camas Prairie have created a patchwork of green, lush vegetation and cured cropland. This patchwork helps to break the continuity

of fuels that are available to burn. This pattern is particularly apparent around Grangeville, Ferdinand, and Cottonwood. However, dry rangeland fuels become prevalent along the lower slopes of the Salmon and Snake River Valleys providing a consistent fuel bed for fire spread. There is little break in the continuity of fuels surrounding the communities of Slate Creek, White Bird, and Riggins. Most of the land outside of towns and communities within these fuel types is dominated by xeric vegetation with few breaks in continuity. Under dry and windy conditions, fires in these vegetative types can burn thousands of acres in a single burning period.

Fuels throughout the entire steppe community in Idaho County are quite consistent, dominated by grasslands. Fires in these fuel types tend to spread rapidly but burn at relatively low intensity. Where grasses become less consistent, wind is needed to push fires through the bunchgrass. Without wind, the fire will drop to the ground and in the absence of fine fuels, fire spread will stop.

Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass. The fine fuel structure and its ability to completely dominate disturbed sites provide a dry, consistent fuel bed for fire. Where this invasive has encroached in grass stands, it now provides a consistent bed of fine fuels that actively carry fire without the influence of wind. Because of these characteristics, cheatgrass will support fire during months of the year and under conditions that native vegetation would not have sustained.

Continued natural and human-caused disturbances will favor cheatgrass; shifting species composition away from native species toward this highly flammable exotic. Consequently, the landscape will become increasingly fire prone over time. Fuels in more populated areas will continue to become increasingly receptive to ignition sources; thus, increasing both the frequency and intensity of wildland fires.

Forestland Communities

Vegetative structure and composition throughout much of Idaho County is closely related to elevation, aspect, and precipitation. Warm and mesic environments characterize the undulating topography of the Camas Prairie which transitions from the steppe plant communities of the northwest to the forested ecosystems of the south and east. Keuterville, Clearwater, Pinehurst, Harpster, Elk City, Dixie, Warren, and Secesh Meadows are some of the communities that fall into this type.

At higher elevations and in the mountainous river canyons, moisture becomes less limiting due to a combination of higher precipitation and reduced solar radiation. Vegetative patterns begin to show a shift toward forested communities dominated by ponderosa pine and Douglas-fir at the lower elevations, transitioning to lodgepole pine and subalpine species at the highest elevations. The forested conditions possess a greater quantity of both live and dead and down fuels. Rates of fire spread tend to be lower than those in the grass and shrub lands; however, intensities can escalate dramatically, especially under the influence of slope and wind. These conditions, as well as reduced access and difficult terrain features, can lead to control problems and potentially threaten lives, structures, and other valued resources.

Coniferous woodlands associated with the national forest and wilderness areas cover the majority of the county. The transition zone between forest and meadow-steppe or river breaklands vegetation consists of a complex mosaic dependent on localized topographic and climatic conditions. A ponderosa pine and Douglas-fir habitat type typically forms the lower timberline on hills and low mountains. Mixed Douglas-

fir, grand fir, lodgepole pine, and western larch forests dominate at middle elevations, while subalpine fire, lodgepole, and Engelmann spruce occur at higher elevations. Western red cedar and Engelmann spruce commonly grow in moist draws and frost pockets. This type of forest is highly valued for its scenic qualities as well as for its proximity to travel corridors in Idaho County. This has led to increased recreational and residential home construction in these areas. The juxtaposition of highly flammable forest types and residential areas will affect the management and response to wildland fires.

Potential Mitigation Activities

Homeowners should be encouraged to use fire resistant materials when building or remodeling a structure in accordance with Firewise, FAC (Fire Adapted Communities) or similar organization.

Vegetation should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Many access roads throughout the county require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. Most of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some housing developments within the county have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. Most of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Post-fire Rehabilitation

The first year after a fire has been shown to be the most critical for erosion and slope stabilization as vegetation attempts to recolonize the slopes. Therefore, every effort should be made, post-fire, to mitigate any further disturbance to affected watersheds. Soils, vegetation, and litter are all critical to the

functioning of hydrologic processes. A watershed with good hydrologic conditions typically has 75% ground cover experiences only about 2% or less of rainfall as surface runoff.⁴⁰ Conversely, a watershed that has had significant amounts of ground cover removed by a wildland fire can result in a surface runoff increase of 70%.⁴¹

Slope stabilization treatments often include grass seeding, reforestation, contour-felled logs, mulch, silt fence construction, placement of straw wattles, and lop and scatter slash. These practices are often implemented as a 'first line of defense' against post-fire sediment movement.

Road treatments such as outsloping, gravel on road surface, rocks in the ditch, culvert removal, culvert upgrading, overflows, armored stream crossings, rolling dips, and water bars are all meant to mitigate water's erosive force. Increasing the water and sediment processing capabilities of roads and road infrastructure can prevent large cut-and-fill failures and the movement of sediment downstream. Trash racks and storm patrols can be used to reduce culvert blockages that may result in road failure and increased risk to downstream flooding and sediment deposition.

Channel treatments may be utilized to prevent downstream flooding and debris flows. In-channel structures are designed to reduce the rate at which water flows which allows sediment to settle out. As these structures decay, sediment is gradually released downstream. Debris that is currently in the channel may be removed to reduce the likelihood that it will become mobilized during a flood. Temporary dams constructed of straw, logs, or rocks are the most common examples.

There will likely be many private landowners that will require financial and implementation assistance with these activities, as well as the county. Both public and private infrastructure (i.e. culverts, bridges, road surfaces, etc.) will be affected which can impact the economy of Idaho County. Correcting these issues as soon as possible can reduce the impact on local citizens in the region.

Local Event History

Federal databases that collect fire occurrences, causes, locations, and perimeters was analyzed to get a picture of wildfire history in Idaho County. Past planning efforts looked at detailed records of wildfire ignitions and extents from the Idaho Department of Lands (IDL), US Forest Service (USFS), and Bureau of Land Management (BLM). These planning efforts examined several decades of data and found that wildfire ignitions since the 1980s have followed a general trend of increase in both wildfire ignitions and acres burned. The upward trends could be attributed to a higher amount of people moving to more rural

⁴⁰ Robichaud, Peter R.; Beyers, Jan L.; Neary, Daniel G. 2000. Evaluating the effectiveness of postfire rehabilitation treatments. Gen. Tech. Rep. RMRS-GTR-63. Fort Collins: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 85 p.

⁴¹ Robichaud, Peter R.; Beyers, Jan L.; Neary, Daniel G. 2000. Evaluating the effectiveness of postfire rehabilitation treatments. Gen. Tech. Rep. RMRS-GTR-63. Fort Collins: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 85 p.

areas of Idaho County. Another contributing factor could be the spread of invasive species. Wildfires are overwhelmingly caused by lightning or other natural ignitions. A significant number of fires are caused by humans, however.

This planning process took a close look at wildfire data since the 2016 plan was finalized. The data range used is from 2016 through 2021 and covers fires reported by multiple agencies. The data collected would suggest that number of ignitions and acres burned fluctuates greatly, depending on the severity of the fire season. In the date range, Idaho County had two fire seasons (2017 and 2021) that were more severe than the other four. In 2017 the number of ignitions (300) and the total acres burned (>300k) far surpassed all the other fire years. The number of ignitions in 2021 were not significantly higher than 2018-2020 but the acres burned (>200k) was significantly higher than those years. It should be noted that roughly half of these acres came from the Snake River Complex. This complex didn't cross the Salmon River into Idaho County, however, the fire still impacted Idaho County in several significant ways. Similarly, the Powerline and Lolo Peak Fires in 2017 only touched the Idaho County boundary and those two fires combined for more than 100,000 acres.

Recent and impactful fires located primarily within Idaho County

The Dixie-Jumbo Fires were located about 15 miles south of Elk City, Idaho. These fires reached more than 47,000 acres and were started by lightning on July 5 and July 6, 2021. The Storm Creek Fire, part of the Storm Theatre Complex, occurred 9 miles southeast of Powell, Idaho, and reached a little more than 15,000 acres in size. Altogether the fires were more than 22,000 acres in size and were started by a series of lightning strikes on July 25, 2021. In 2020 the Shissler Fires burned more than 11,000 acres about two miles south of Red River Hot Springs after starting from a lightning strike on August 17. Much of the Rattlesnake Creek Fire in 2018 was in nearby Adams County to the south and the fire only grew to about 8,000 acres. However, the fire threatened homes and structures in the Pollock and Pinehurst area and was found to be human caused. In 2017 The Highline Fire started by lightning on July 29, east of Warren and burned more than 89,000 acres. The Gun Club Fire in 2016 burned more than 2,000 acres within about one mile of the city of Riggins and required a Type 2 Incident Management Team.





Figure 36: Large Fire Perimeters in Idaho County since 2016









Prior to 2016: Large Fires in the WUI

Although relatively infrequent, fires in the forest fuel types present throughout much of Idaho County have the potential to result in large, intense fires, creating high social and economic costs. In 2007 the Poe Cabin destroyed several homes and other structures and threatened many more. The Clearwater-Municipal Complex and Teepee Springs Fires during the summer of 2015, consisted of several fires in Adams, Clearwater, Lewis, and Idaho Counties. The fires within this Clearwater-Complex began August 10 from lightning and were driven by hot, dry, and windy conditions. In the first few days, the fire burned 50,000 acres, 62 homes, and more than 200 outbuildings. The Teepee Springs fire began from lightning on August 12 about three miles southeast of Riggins, Idaho. This fire grew to 122 square miles in size and crossed the Salmon River before reaching its final size of over 95,000 acres before firefighter efforts and winter weather extinguished the flames.

Probability of Future Occurrence

Wildland-Urban Interface

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 (WUI).

Past planning efforts have stated that 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.⁴²

 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.

For the 2021-2022 planning process, the planning team utilized a definition of WUI advocated by the Idaho Department of Lands, that can be easily mapped at a HUC12 level:

Definition: An area where developed lands interact with undeveloped lands and includes the infrastructure and natural resources that communities rely on for existence.

Location: It is found in remote, scattered development areas to highly developed urban areas and everywhere in between.

Mapping

- 1. All private land is extracted from the BLM ownership layer
- 2. Private Lands are buffered with a 1.5-mile buffer
- 3. The 1.5-mile buffer is put over the top of HUC12 watersheds
- 4. Those watersheds that by ocular estimation are more than 50% encompassed by the 1.5-mile buffer are selected
- 5. Finally, the 1.5-mile buffer is extended to the selected HUC12's to create the final WUI for a County

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, state and federal agencies, and local Fire Protection Districts. The Appendix contains additional WUI maps that examine sub-regions within Idaho County for a more focused, detailed view.

Risk Assessment Mapping

For the Wildfire Risk Assessment Map, Idaho County used guidance from the Idaho Department of Lands to analyze various categories that affect likelihood of a catastrophic wildfire, including slope, aspect, fire history, vegetation class, and wildland urban interface. Each of these categories was weighted and put into the raster model, resulting in an output fire hazard that is the sum of each class value. For example, the lowest value for the analysis is 3: 1 for slope, 1 for aspect, 1 for WUI, and zeroes for fire history and vegetation class. The highest possible value is 18: 3 for slope, 3 for aspect, 3 for WUI, 3 for fire history, and 6 for vegetation class. This model is widely used in produced by the IDL and is widely used in Idaho.

Figure 38: Idaho County WUI



Figure 39: Wildfire Hazard in Idaho County



Impacts of Wildland Fire Events

Wildland fires, big and small, are dangerous to both Idaho County residents and emergency response personnel. Wildland fire suppression activities have a very high frequency of injuries, such as heat exhaustion and smoke inhalation, and have caused numerous deaths nationwide. Fire events in Idaho County typically result in a multi-department and agency response effort; thus, coordinating activities and ensuring everyone's safety is paramount.

Local residents with property in the path of wildland fire will likely suffer the greatest impacts through loss of structures and/or the value of any timber or agricultural crops on their land. Many fires require an evacuation of nearby residences in order to ensure the safety of citizens. Evacuation procedures require the coordination of law enforcement and fire service organizations and may involve temporary sheltering in extreme cases.

Idaho County, like most areas, has sensitive populations, such as elderly residents and children, who may be affected by air quality during a wildland fire. Smoke and particulates can severely degrade air quality, triggering health problems. In areas heavily impacted by smoke, people with breathing problems might need additional services from doctors or emergency rooms.

Commerce in Idaho County and the rest of the region may also be interrupted by wildland fires. Transportation corridors will likely be temporarily closed or slowed due to a fire burning in the area. Heavy smoke from a wildfire several miles away could be dense enough to make travel unsafe on roadways.

The environmental impacts from a fire are dependent on the vegetation present and the intensity of the fire. Most of the rangeland and forest ecosystems present in Idaho County are adapted to periodic fire events and benefit from occasional, low intensity burns. On the other hand, overcrowded forest conditions or over mature stands of sage brush will likely burn much more intensely than occurred historically. These types of fires tend to result in a high rate of mortality in the vegetation and often adversely impact soil conditions. High intensity fires are also much more dangerous and difficult to suppress.

Idaho 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.

Vulnerabilities

Past large fire events clearly illustrate the mounting urban-interface issue facing Idaho County. Population growth rates have been greatest in the western part of the County around Grangeville, Cottonwood, Kamiah, and Riggins with development sprawling along the river corridors and toward bedroom communities such as Mount Idaho, Harpster, Burgdorf, Secesh Meadows, Keuterville, Clearwater, and White Bird. The growing appreciation for seclusion has led to significant development in many of the lower elevation forests. Frequently, this development is in the dry ponderosa pine/Douglas-fir, forest types where grass, needles, and brush surface litter create forest fuel conditions that are at a high propensity for fire occurrence. Human use is strongly correlated with fire frequency, with increasing numbers of fires
as use increases. Discarded cigarettes, tire fires, and hot catalytic converters increase the potential for fire starts along roadways. Careless and unsupervised use of fireworks also contributes to unwanted and unexpected wildland fires. Further contributing to ignition sources are some harvest activities, accumulated slash conditions, recreational forest and wildland users, and the debris burners and "sport burners" who use fire to rid ditches of weeds and other burnable materials. The increased potential for fire starts and the fire prone landscapes in which homes have been constructed greatly increases the potential for fires in interface areas.

Residents

Residents with property in the path of wildland fire will likely suffer the greatest impacts through loss of structures and/or the value of any timber or agricultural crops on their land. Many fires require an evacuation of nearby residences to ensure the safety of citizens. Evacuation procedures require the coordination of law enforcement and fire service organizations and may involve temporary sheltering in extreme cases.

Idaho County, like most areas, has sensitive populations, such as elderly, immune compromised residents and children, who may be affected by air quality during a wildland fire. Smoke and particulates can severely degrade air quality, triggering health problems. In areas heavily impacted by smoke, people with breathing problems might need additional services from doctors or emergency rooms. Smoke from wildfires is a significant and increasing public health impact in Idaho County.

Transportation and Infrastructure

Due to the remote nature of Idaho County and its extreme topography, transportation is a vital asset to both emergency response and public safety. Access (ingress and egress) can be a major vulnerability during a disaster event, such as wildfire. Hazards like landslides, severe weather, and wildfires have been known to impact the transportation system in Idaho County and leave residents and motorists stranded or cut off from basic services such as health care, food/water, shelter, and protection from a disaster event. Limited access within remote areas and a lack of maintenance on existing travel routes, increases fire suppression response time and has a direct effect on fire spread leading to increased fire size and destructive potential.

US Highway 95 is the main north/south highway in the state and the only significant transportation route for many Idaho County residents and people traveling through or recreating in the area. Many principal cities and communities are located on or near US 95. US Highway 12 is another important transportation route for the region. It runs west to east from Kamiah and Kooskia to the Montana line along the Clearwater and Lochsa Rivers and is heavily used by travelers, residents, recreationists, and for commerce.

Idaho 13 is a stretch of highway along the SF Clearwater that connects US 12 to US 95 in Grangeville and is an important arterial. Idaho 14 follows the SF Clearwater near Harpster, east to Elk City. This is an important route for rural residents of the Elk City/Orogrande area, along with many other rural residents, recreationists, and people who work in natural resources. The network of rural county and forest roads across Idaho County is extensive and each road is vital to the individuals who use it. There are many

significant roadways that are also highly susceptible to various hazards that are essential to wildfire mitigation, response, evacuation, and rehabilitation.

There are numerous bridges throughout Idaho County with many stakeholders including federal, state, county, city, and private users. Bridges are inspected on a regular basis but hazards that threaten road use also pose risks to bridges. Local public electrical and telephone utility and fiber optic lines travel both above and below ground along roads and highways with high exposure to failure during a wildfire event. Cell phone service is poorly established in many parts of the county with service primarily in the more populated areas of Idaho County. Urban residents throughout most of Idaho County have municipal water systems, which include networks of public fire hydrants. Subdivisions and development outside municipal boundaries typically rely on individual or community well systems. Some have water distribution systems, most do not.

Economy

Commerce in Idaho County and the rest of the region may also be interrupted by wildland fires. Transportation corridors will likely be temporarily closed or slowed due to a fire burning in the area. Heavy smoke from a wildfire several miles away could be dense enough to make travel unsafe on roadways. Natural resources and farming are two important elements of the Idaho County economy. During wildfire season field work is often being done in the forest products and mining industries, along with heavy farming activity such as harvesting. Roads typically experience heavy use by equipment and industrial vehicles including log trucks, farming/mining equipment, and delivery vehicles. Restrictions and damages caused by wildfires can greatly impact the industries that are important in Idaho County, especially the timber industry.

Recreation is a major component of the local economy and is greatly impacted by a severe wildfire season, especially by area closures and poor air quality. Sites that experience heavy recreational use around and during wildfire season include many camp and boat launch sites along the rivers, trailheads and trails used by hikers, horses, and ATVs, lakes, popular hunting and fishing areas, campgrounds, designated wilderness areas, and a vast forest road system, much of which is very poorly maintained.

Development Trends

Idaho County residents are building homes in the more rural parts of the county, therefore putting extra pressure on rural fire districts to protect these homes. It is important for residents that live within the county's wildland-urban interface to use building materials that reduce the structure's ignitibility. Furthermore, these homeowners should be educated in the use of defensible space techniques and employ those techniques around their homes.

Value of Resources at Risk

It is difficult to estimate potential losses in Idaho 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. However, one can draw conclusions from the average costs to suppress a wildland fire. According to the National Interagency Fire Center's website⁴³, there were 58,950 wildland fires that federal agencies responded to in 2020. The cost to suppress these fires totaled more than \$2.27 billion.

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 and infrastructure 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 appropriate resources, but they can also be the most destructive.

City of Grangeville

The community of Grangeville is located on the Camas Prairie at approximately 3,300 feet elevation. The surrounding area is primarily farmland to the north, east, and west, with relatively flat terrain to rolling hills. Vegetation is predominantly agricultural in nature interspersed with uncultivated grasslands and isolated open ponderosa pine stands. To the south, terrain slopes upward to just over 6,000 feet within five miles of town. Vegetation quickly changes from the open grasslands of the Camas Prairie to dry-site Ponderosa Pine and Douglas-fir stands to denser stands of mixed conifer on the north-facing slopes. Drainages are predominantly moister site spruce/fir stands.

The Crimson Ridge Subdivision and Bear Den RV Park are new developments being constructed along U.S. Highway 95 and Fish Hatchery Road west of town. At completion, Crimson Ridge will encompass 80 new home sites. Additional home sites are also being developed south of Bear Den RV Park along Fish Hatchery Road. Other subdivisions include Meadow Grass Acres, The Vineyards, and Golden Hills.

Fuels Assessment

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

Infrastructure

Residents of Grangeville depend on the Three Mile Creek Watershed for most of the water resources; however, homeowners outside of the city limits typically have drilled personal wells. Most farmers in this

⁴³ National Interagency Fire Center. Suppression Costs. https://www.nifc.gov/fire-information/statistics/suppression-costs.

area do not irrigate so supplementary wells for agricultural purposes are not usually necessary; however, several ranchers use surface runoff or small springs to provide water for livestock. Ground water resources would not likely be seriously affected by wildland fire.

The Three Mile Creek Watershed, located three miles directly south of Grangeville, consists of ponderosa pine and Douglas-fir stands. Much of this drainage has been logged over the years with little subsequent management. There are several acres of dense pine and fir regeneration stands intermixed with multilayered stands of Douglas-fir, pine, and western larch. These slopes are of moderate to high concern for potential crown fire spread leading up to the High Camp Loop Road, where communications facilities are at risk as well as to private homes on either side of this drainage. Potential impacts of a large stand-replacing fire in this area could negatively affect the community of Grangeville via potential flooding, erosion, and degradation of water quality.

Escape

Highway 95 travels north and south through Grangeville. Highway 13 travels east then north along the South Fork of the Clearwater River towards Kooskia. Highway 95 to the north is surrounded by agriculture and pasture that should remain safe for travel in the event of a wildfire. Highway 95 to the south and Highway 13 to the east both travel through moderate terrain surrounded by forests. These access routes have significant risk of being cut-off by wildfire.

Community Assessment

Residents of the Grangeville area have low to moderate risk of experiencing a wildland fire due to the extensive agricultural development. Nevertheless, in the event of wildfire, the light fuels would likely support a very fast-moving rangeland fire. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event.

As the community grows, more and more homes are also being built in the wildland urban interface, particularly south and southwest of town. Many of these new homes abut forest-type fuels and are accessed by one-way in and one-way out driveways, which dramatically increases the likelihood of loss of life or property in the event of a wildland fire. These homes and other buildings are at much higher risk of experiencing a fire.

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

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

The Three Mile Creek Watershed should be a high priority for fire mitigation treatments due to the dependence of the community on the water resources produced by this facility.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. Most of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The Grangeville Rural Fire District is responsible for structural fire protection in this area, while the USDA Forest Service, the Idaho Department of Lands, and the USDI Bureau of Land Management provide wildland fire protection.

Probability of Future Occurrence

The probability of a wildland fire threatening Grangeville on an annual basis is moderate. Homes and other structures located in the forestlands or agricultural fields within or surrounding the community have a high wildfire risk. Rangeland or 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 appropriate 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. The agriculture areas surrounding Grangeville have historically had a fire frequency of less than 35 years with low to mixed severity. The current vegetation condition class surrounding Ferdinand suggests that there has been a high alteration of the vegetation in this area. This is likely attributed to prairie being converted for agricultural uses.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in Grangeville are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the grasslands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Grangeville to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of Grangeville has increased over the previous decade but much of the demand for development has been focused on the unincorporated parts of the county. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Grangeville from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Grangeville would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

City of Ferdinand

The city of Ferdinand is located on the Camas Prairie in the northwestern portion of Idaho County. Farming and ranching drives the economy in this small city. Agricultural fields surround the city center and extend for several miles in all directions. This area is almost entirely privately owned and there are very few trees and little native prairie grasslands dotting the relatively even landscape. U.S. Highway 95 passes directly through Ferdinand and is the main method of transporting the grains, canola, peas, and other crops that are grown in the area. Ferdinand is encompassed by the Nez Perce Indian Reservation.

Fuels Assessment

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

Infrastructure

Residents of Ferdinand either are connected to a municipal well or have drilled personal wells. Most farmers in this area do not irrigate so supplementary wells for agricultural purposes are not usually necessary; however, several ranchers use surface runoff or small springs to provide water for livestock. These water resources would not likely be seriously affected by a rangeland fire.

The Grangeville Line of the Camas Prairie Railroad traveling from Spalding through Ferdinand and Fenn to Grangeville was abandoned several years ago. This line historically transported grain, lumber, fertilizer, and other products to and from Camas Prairie markets.

Escape

Highway 95 travels north and south through Ferdinand. The highway is surrounded by agriculture and pasture, in all directions, that should remain safe for travel in the event of a wildfire.

Community Assessment

Residents in the Ferdinand area have low risk of experiencing a wildland fire due to the extensive agricultural development. Nevertheless, in the event of wildfire, the light fuels would likely support a very fast-moving rangeland fire. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event.

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

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The Ferdinand Volunteer Fire Department is responsible for structural protection around the community of Ferdinand. Due to the many rural farms and ranches, many of the districts/departments typically have mutual aid agreements in order to provide the best service possible and to provide back up for each other.

Probability of Future Occurrence

The probability of a wildland fire threatening Ferdinand on an annual basis is low. Homes and other structures located adjacent to agricultural fields within or surrounding the community have a higher wildfire risk. Rangeland or 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 appropriate 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. The agriculture areas surrounding Ferdinand have historically had a fire frequency of less than 35 years with low to mixed severity. The current vegetation condition class surrounding Ferdinand suggests that there has been a high alteration of the vegetation in this area. This is likely attributed to prairie being converted for agricultural uses.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in Ferdinand are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the grasslands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Ferdinand to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of Ferdinand has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Ferdinand from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Ferdinand would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

City of Cottonwood

The city of Cottonwood is located on the Camas Prairie upland along U.S. Highway 95 between Fenn and Ferdinand. The city is surrounded by cultivated agriculture and hay ground. Cottonwood Butte is a 5,730-foot knob rising just north of Keuterville and west of Cottonwood. The Butte creates a rain shadow resulting in drier conditions on the east slope.

Fuels Assessment

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

Infrastructure

Residents of Cottonwood either are connected to a municipal well or have drilled personal wells. Most farmers in this area do not irrigate so supplementary wells for agricultural purposes are not usually necessary; however, several ranchers use surface runoff or small springs to provide water for livestock. These water resources would not likely be seriously affected by a rangeland fire.

The Grangeville Line of the Camas Prairie Railroad traveling from Spalding through Cottonwood and Fenn to Grangeville was abandoned several years ago. This line historically transported grain, lumber, fertilizer, and other products to and from Camas Prairie markets.

Escape

Highway 95 travels north and south adjacent to Cottonwood. The highway is surrounded by agriculture and pasture, in all directions, that should remain safe for travel in the event of a wildfire.

Community Assessment

Residents in the Cottonwood area have low risk of experiencing a wildland fire due to the extensive agricultural development. Nevertheless, in the event of wildfire, the light fuels would likely support a very fast-moving rangeland fire. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event.

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

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The

vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The Cottonwood Volunteer Fire Department is responsible for structural protection around the community of Cottonwood. Due to the many rural farms and ranches, many of the districts/departments typically have mutual aid agreements in order to provide the best service possible and to provide back up for each other.

Probability of Future Occurrence

The probability of a wildland fire threatening Cottonwood on an annual basis is low. Homes and other structures located adjacent to agricultural fields within or surrounding the community have a higher wildfire risk. Rangeland or 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 appropriate 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. The agriculture areas surrounding Cottonwood have historically had a fire frequency of less than 35 years with low to mixed severity. The current vegetation condition class surrounding Cottonwood suggests that there has been a high alteration of the vegetation in this area. This is likely attributed to prairie being converted for agricultural uses.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in Cottonwood are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the grasslands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Cottonwood to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of Cottonwood has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Cottonwood from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Cottonwood would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

City of Riggins

The community of Riggins is located at the intersection of the Main Salmon and the Little Salmon Rivers. Drainages coming off the western slope of the Salmon River canyon have become rural residential areas. There are several homes and small ranches leading up to the Nez Perce National Forest boundary on the Race Creek Road, Bean Creek Road, Kessler Creek Road, and the Seven Devils Road (Squaw Creek and Papoose Creek).

The economy of this small roadside community is almost completely dependent on the flow of tourist dollars. As the "Whitewater Capital of the World", Riggins is a bustling metropolis throughout the rafting and kayaking seasons. This area is also popular for its fishing and camping opportunities.

Fuels Assessment

The rangeland vegetation dominating the city site is typically of the Salmon River canyon consisting of cured grasses and patches of sage brush. Scattered ponderosa pine grows in many of the shallow draws where the soil moisture is slightly higher, particularly on the east side of the river. Several hardwood species can also be found along the narrow banks of the Little Salmon. The slopes rising from the city center are actively grazed by livestock and wildlife, which helps to reduce the fine fuel loads. Fires in rangeland fuels typically burn at low intensities, but spread very rapidly, especially under the influence of up canyon winds.

Along the upper breaks on the west side of the river, land is dominated by forest cover intermixed with rangelands. These habitat types will experience ground fires under normal fire conditions, but have the potential to spread to crowns when fuel moisture is low and winds are high. Ladder fuels are present in the interface between the range lands and the forest lands, which increases the likelihood of a torching and crowning wildfire. The dry nature of the vegetation combined with steep canyon slopes makes this area very susceptible to rapidly spreading rangeland fires.

Infrastructure

Residents of Riggins depend on a community well system and personal wells. These water resources would not likely be severely affected by a wildland fire; however, the electrical power that operates the pumps on the wells could potentially be interrupted or damaged leaving all or a portion of the community without water.

Escape

U.S. Highway 95 is the main access into Riggins. This two-lane highway provides rapid egress both to the north and south. Although it dead ends several miles up the Main Salmon River, the Salmon River Road is heavily used during the summer months. Boaters, anglers, rafters, and residents use this narrow corridor excessively. The gravel/paved, single-lane roadway follows the river's contours eastward crossing several light duty bridges along the way. There are only a few turnouts, no guard rails, and bridges are inadequately signed. This road has recently undergone a major renovation project, which greatly improves safety along this roadway. Heavy traffic and recreational use make this passageway extremely prone to a fire ignition. Furthermore, emergency evacuation of this corridor would be difficult and unsafe. The only alternate escape route from Riggins is the Bean Creek Road, a Forest Road traveling north along the ridge on the west side of the river all the way back to White Bird. In order to function as a safe escape route, this road would need clearing of hazardous vegetation, regular maintenance, and emergency route signage.

Community Assessment

Residents of the Riggins area have moderate to high risk of experiencing a wildland fire due to the intense recreational activities, dry, flashy fuels, regular stiff up canyon winds, and steep slopes rising from the river canyon. Therefore, it is imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event.

Many homes in this area are accessed by one-way in and one-way out driveways. It is difficult for emergency response personnel to protect these homes safely; therefore, it is more likely that homes with this characteristic will experience loss of life or property in the event of a wildland fire. Many of the homes in the creek drainages on the west side of the Salmon River are accessed by only a single roadway. In most cases, these roads dead end near the top of the ridge within the National Forest. Homes in the Race Creek, Squaw Creek, Bean Creek, and Kessler Creek drainage are at a higher fire risk due to the flashy fuels and limited ingress and egress. This situation is further exacerbated by their location in a draw, which may funnel hot gases and fumes. Fires in this type of topography are generally difficult and dangerous for firefighters to suppress.

Homes located on mid or upper slopes are in danger of becoming threatened by rangeland fire spreading rapidly up slope. These homes generally have poor access and would be difficult to protect in a wildfire situation. The receptive nature of the fuels in the area increases the likelihood of a fire start. Residences exhibiting these traits have an increased fire risk. However, most homeowners maintain a defensible space around structures by watering their yards and mowing grass and weeds.

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.

- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Development of evacuation plans for the residents located in the small creek drainages west of Riggins is necessary to assure orderly evacuations in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Most residents would benefit from the construction of additional escape routes to Highway 95. Community safety zones should also be established in the event of a compromised evacuation. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Grazing generally works positively towards reducing the fine fuels in the vegetation types surrounding Riggins, particularly in rangeland areas and open forest stands with grass and brush in the understory. Many landowners already graze livestock in areas that would otherwise be more susceptible to carrying a wildland fire. Grazing is a relatively inexpensive fire mitigation tool that typically works very well with little negative impact on the land.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The Riggins City Volunteer Emergency Services has equipment and a station in Riggins, which provides for city fire protection and the protection of homes within the ten-mile mutual aid area with Salmon River Rural Fire Department. This station also houses two ambulances. The Nez Perce National Forest is responsible for wildland fire control west and north of the Salmon River, while the Payette National Forest is responsible for wildland fire control east and south of the river.

Probability of Future Occurrence

The probability of a wildland fire threatening Riggins on an annual basis is moderate to high. Homes and other structures located adjacent to rangelands within or surrounding the community have a high wildfire risk. Rangeland or 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 appropriate 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. The rangeland areas surrounding Riggins have historically had a fire frequency of less than 35 years with low to mixed severity. The current vegetation condition class surrounding Riggins suggests that there has been a moderate to high alteration of the vegetation in this area. This is likely attributed to grazing practices and the associated effects, such as, invasive plant outbreaks.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in Riggins are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the rangelands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Riggins to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of Riggins has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Riggins from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Riggins would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

Cities of Kooskia and Stites

The cities of Kooskia and Stites are located three miles from each other on State Highway 13. Kooskia is located at the confluence of the Middle Fork and the South Fork of the Clearwater River. Stites is located three miles upstream on the South Fork. The elevation in Kooskia is 1,260 feet, and Stites is approximately 60 feet higher. Both communities are located in the valley bottom immediately adjacent to the South Fork of the Clearwater River. Kooskia has a population in town of 675 that triples outside the city limit. Stites has a population of 226 that increases only slightly outside the city limit.

Fuels Assessment

Much of the landscape immediately surrounding Kooskia and Stites is dominated by grasses and shrubs with a few open stands of ponderosa pine and Douglas-fir randomly interspersed. Heavier timber conditions can be found on the more northerly and east slopes and in moist draws. Several of these areas are adjacent to the Kooskia and Stites city limits creating a significant wildland-urban interface fuel hazard. Grand fir and Douglas-fir with a small cedar component are common in these areas

Due to the steeper topography of the river corridor, fires in the light grass fuels would be expected to move very rapidly, especially under the influence of up canyon winds. The transition of native fuels to agricultural or pastureland around homes serves to break up fuel continuity and slow the spread. Additionally, fires in cultivated fields can be more quickly controlled by fuel modification.

Fires in denser fuel types are highly variable ranging from low intensity surface fires to very destructive; stand replacing wildfires depending on the fuel build up, topography, and local weather. Fire suppression over the past few decades has led to increased brush, regeneration, and other surface fuels in the understory, which can lead to more intense fires. Torching, crowning, and spot fires tend to occur more frequently under these conditions.

Infrastructure

One of the key components of the economy in Kooskia and Stites is the existence of Clearwater Forest Industries. The wood products industry has been one of the chief employers in this area for many decades. The loss of productive timber ground because of a large wildfire may affect the industry's ability to continue operating efficiently, especially in today's shrinking log markets.

The Clearwater Valley High School and Junior High School campus is located in the rural area adjacent to Clearwater Forest Industries along State Route 13.

Tourism is also an important component of Kooskia's economy. Travelers seeking adventure along the Lewis and Clark Trail pass through Kooskia on U.S. 12. Lodging, dining, and other recreational facilities have become relatively dependent on the flow of travelers during the warmer months. Warm weather also tends to bring campers, hikers, and other recreationalists into the area. Restricted access due to wildfires may negatively affect this cash flow.

Camas Prairie Railroad still transports logs and a few other products between Kooskia and Lewiston. The track mimics the path of the Clearwater River along its eastern bank. There has been no recent fire starts due to the passage of the train, yet the potential of ignition from sparks or hot brake shoes exists.

The Stites municipal water system has two wells that are located adjacent to the wildland interface on the east side of the community of Stites. The Kooskia municipal water system has four wells. Wells #1 and #2 are along the Middle Fork of the Clearwater River off Beach Drive. Well #3 is on Stewart Drive adjacent to the timbered north facing slope of Mount Stewart and Well #4 sits on the corner of the city park at Fourth Avenue and Front Street.

A set of power supply lines parallel the South Fork of the Clearwater River from the power substation on Depot Street in Kooskia. These cross an east aspect slope that is partly timbered and could be threatened by fire.

Escape

Kooskia is located at the junction of State Highways 13 and 12, both of which are two lane highways. Stites is accessed by traveling south from Kooskia on State Route 13. These highways follow the path of the river corridor and can be narrow and windy in several areas. These roadways are the sole paved routes between Kooskia and Stites and other population centers in Idaho County. Although much of these passages are bordered by light grass fuels, the river canyon is narrow enough that a fire on either side could restrict access due to extreme heat and fumes. In the event of a wildfire along the river, it is likely that this escape route would become impassable.

The most direct alternative escape route is the Winona Grade Road leading up to the Camas Prairie; however, this road is only suitable for high clearance vehicles and is located partially in a draw that has heavy fuel loadings and could be hazardous during a fire. There are numerous other secondary roads in the area that may serve as potential escape routes depending on the location of the fire.

Community Assessment

Like many valley-bottom communities, Kooskia and Stites are not considered to be at high risk of wildfire due to the lack of heavy fuels and a readily available water source. However, residences located on the steeper slopes surrounding both towns have an increased risk for wildfire loss. A huge contributing factor is the lack of good access. Roads accessing these hillsides are primarily located in narrow draws, which may act as a funnel for heat and gases during a wildfire.

Generally speaking, homes east of the South Fork of the Clearwater River, have a higher fire risk. Structures are scattered on nearby slopes extending from the valley floor to the ridge top. Many of these slopes have aspects oriented south to west, further increasing the risk of loss due to rapidly spreading wildfires.

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

Many landowners in the Kooskia-Stites area are grazing cattle, horses, and other livestock around homes, in pastures, and in the forest-range interface. These animals serve to eat the fine, porous grasses and shrubs, trample fine woody fuels, and keep the ladder fuels trimmed and thus reduce the fire risk in this

interface area. Although this practice helps deflate the fire risk in this area, many other mitigation activities would significantly improve the survivability of this community in the event of a wildland fire.

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Development of a community evacuation plan is necessary to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape route signage would reduce chaos and escape times for fleeing residents. A community safety zone should also be established in the event of compromised evacuation. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Other specific mitigation activities are likely to include improvement of emergency water supplies and management of trees and vegetation along roads and power line rights-of-way. Furthermore, building codes should be established to provide for more fire conscious construction techniques such as using fire resistant siding, roofing, and decking.

Recreational facilities near the community and along the Middle Fork and the South Fork of the Clearwater River should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting controlled burns. Other actions that would reduce the fire hazard would be thinning and pruning timbered areas, creating a fire resistant buffer along roads and power line corridors, and strictly enforcing fire-use regulations.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have

turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The Kooskia Fire Department and Stites Volunteer Fire Department provide local fire protection and primary response. These departments have Mutual aid agreements with each other, BPC Rural Fire District, and the Idaho Department of lands. The local departments have primary responsibility for structural fire protection. The Idaho Department of Lands has primary responsibility of wildland fire suppression. The local departments provide initial wildland response in the area they cover. The Kooskia Fire Department station is located at 4th and Front Streets in Kooskia and has six bays housing seven vehicles. The Stites Volunteer Fire Department operates out of a station located on Main Street in Stites. Both departments are equipped for both structural and wildland fire suppression.

Probability of Future Occurrence

The probability of a wildland fire threatening Kooskia or Stites on an annual basis is moderate to high. Homes and other structures located adjacent to forestlands within or surrounding the community have a higher wildfire risk. Forestland fires generally have low to moderate rates of spread but can exhibit extreme fire behavior and intensity because of the fuel loads. Fires in this fuel type are considered difficult to suppress due to heavy fuels and access. Homes along the perimeter of the community would have the highest risk due to their adjacency to heavy fuel loads. The grasslands surrounding Kooskia and Stites have historically had a fire frequency of less than 35 years with low to mixed severity. While the forested areas surrounding Kooskia and Stites have historically had a fire frequency of 35 to 200 years with stand replacing severity. The current vegetation condition class surrounding both Kooskia and Stites suggests that there has been a moderate to high alteration of the vegetation in this area. This is likely attributed to grazing and logging uses and the associated effects, such as, invasive plant outbreaks.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in either Kooskia or Stites are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the forestlands surrounding these communities may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within these communities due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Stites to other communities; thus, travel and commerce may be interrupted.

Development Trends

The populations of Kooskia and Stites have decreased over the previous decade and therefore much of the demand for development has decreased in these communities. There have been no changes in development that affect these jurisdictions' vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Kooskia or Stites from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Kooskia or Stites would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

City of Kamiah

Kamiah is located at the junction of U.S. Highway 12 and State Highways 162 and 64 approximately seven miles north of Kooskia. Although many of the local businesses and infrastructure associated with the community are on the western bank of the Clearwater River, which is part of Lewis County, there are also many structures and significant infrastructure on the eastern bank in Idaho County. As Kamiah grows, more and more homes are being built along the steep slopes of the river canyon. Particularly noteworthy is the abundance of homes along the Beaver Slide Road, the Tom Taha Grade Road, and the Woodland Road. The economy in this part of the County is more focused on the lumber and tourism industries than agriculture.

Fuels Assessment

The Idaho County portion of Kamiah is spread along the base of the west aspect slope that defines the Clearwater River canyon. This slope is characterized by very patchy timber intermixed with grass and pasture lands. Drier habitat species such as ponderosa pine and Douglas-fir grow in open stands on this steep slope. Fires in this fuel type were historically frequent, but generally burned at low to moderate intensities. Fire suppression over the past few decades has led to increased brush, regeneration, and other surface fuels in the understory, which can lead to more intense fires. Torching, crowning, and spot fires tend to occur more frequently under these conditions. More moist and dense forest types are found in the Tom Taha Creek drainage. Douglas-fir, ponderosa pine, grand fir, and western red cedar with an abundance of ladder fuels in the understory are common along the creek and extending upwards on the north and south aspect slopes. Fires in these fuels are less frequent, but typically burn at much higher intensities than open forest stands.

The timber component of the system becomes much more continuous to the north and east, but transitions to a grassland habitat to the west. Fires in these grassland ecosystems cure early in the summer and become increasingly prone to ignition.

Infrastructure

Kamiah has both a municipal surface water system and ground water sources. Landowners outside of the city water district are generally supplied by personal or multiple home wells. The Kamiah Watershed could potentially be negatively impacted by a wildfire event; however, ground water sources would not likely be affected by a wildfire event.

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

One of the key components of the economy in Kamiah is the existence of Empire Lumber Company and a few small sawmills. The wood products industry has been one of the chief employers in this area for many decades. The loss of productive timber ground because of a large wildfire may affect the mill's ability to continue operating efficiently, especially in today's shrinking log markets.

Camas Prairie Railroad still transports logs and a few other products between Kamiah and Lewiston. The track mimics the path of the Clearwater River along its eastern bank. This transportation route heavily influences Kamiah's economy. There have been no recent fire starts due to the passage of the train, yet the potential of ignition from sparks or hot brake shoes exists.

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

Escape

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

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

Community Assessment

The community of Kamiah is at moderate to high risk of experiencing a wildland fire, which has been recently demonstrated by the 2003 Milepost 59 Fire. Homes built on steep slopes or with timber directly abutting or overhanging structures are at the highest risk. Fires in these timber fuel types are generally

much more intense and difficult to control than rangeland fires. Dry grasses on the steep slopes rising from the community center would support very rapidly spreading wildfires, leaving little time for residents to escape. Additionally, the abundance of recreational and other human activities in the area drastically increases potential ignition sources. Preparing a home prior to a wildfire event will significantly increase its chance of survival.

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

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Development of a community evacuation plan is necessary to assure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape route signage would reduce chaos and escape times for fleeing residents. A community safety zone should also be established in the event of compromised evacuation. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Other specific mitigation activities are likely to include improvement of emergency water supplies and management of trees and vegetation along roads and power line rights-of-way. Furthermore, building codes should be established to provide for more fire conscious construction techniques such as using fire resistant siding, roofing, and decking.

Recreational facilities near the community and along the Middle Fork and the South Fork of the Clearwater River should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting controlled burns. Other actions that would reduce the fire hazard would be thinning and pruning timbered areas, creating a fire resistant buffer along roads and power line corridors, and strictly enforcing fire-use regulations. Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

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

Probability of Future Occurrence

The probability of a wildland fire threatening Kamiah on an annual basis is moderate to high. Homes and other structures located adjacent to forestlands within or surrounding the community have a higher wildfire risk. Forestland fires generally have low to moderate rates of spread but can exhibit extreme fire behavior and intensity because of the fuel loads. Fires in this fuel type are considered difficult to suppress due to heavy fuels and access. Homes along the perimeter of the community would have the highest risk due to their adjacency to heavy fuel loads. The grasslands surrounding Kamiah have historically had a fire frequency of less than 35 years with low to mixed severity. While the forested areas surrounding Kamiah have historically had a fire frequency of 35 to 200 years with stand replacing severity. The current vegetation condition class surrounding Kamiah suggests that there has been a moderate to high alteration of the vegetation in this area. This is likely attributed to grazing and logging uses and the associated effects, such as, invasive plant outbreaks.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in Kamiah are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the forestlands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Stites to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of Kamiah has increased over the previous decade and therefore the demand for development has slightly increased. However, there have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in Kamiah from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of Kamiah would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

City of White Bird

This small town is located one mile off the Salmon River along White Bird Creek at about 1,600 feet in elevation. The mountains surrounding it quickly rise to 5,000 feet with the timber line down to 2,000 feet on north slopes and 3,800 feet on south slopes. Ponderosa pine grows along the river in the shade of the mountains. The rangeland is plagued by yellow star-thistle and cheat grass, but there are still native grasses mixed throughout.

Deer Creek Road takes off from the Swiftwater Bridge on the west side of the canyon west of White Bird. This road travels southwest over the ridge, then drops down to the Snake River on the other side. There are numerous homes and ranches all along this roadway up to the National Forest Boundary.

The Twin Rivers Subdivision, which is still under development, lies on the west side of the Salmon River in the Hammer Creek and lower Deer Creek area. These lots are typically riverfront views with limited access.

Fuels Assessment

The rangeland vegetation that covers most of the Salmon River canyon, including the slopes rising from the White Bird Creek drainage, is primarily made up of cured grasses with hay fields and pasture ground intermixed. Fires in rangeland fuels typically burn at low intensities, but spread very rapidly, especially under the influence of up canyon winds.

Ponderosa pine is present on the mid and upper slopes of the western canyon wall of the Salmon River. These stands tend to be relatively open with a grass and light brush understory. Over the past several years, this east aspect slope has been systematically logged in order to continue development of the Twin River subdivision. This area is at high risk for wildfire due to the increased human activity in combination with highly flammable rangeland fuels, slash build up from logging activity, and steep slopes. Rangeland in the Salmon River canyon historically burned very frequently, which restored nutrients to the ecosystem and eradicated invasive species. Due to recent suppression policies and severe soil disturbance cheat grass and other nonnative species have become established. The fine structure of cheatgrass and its ability to completely dominate disturbed sites, provides a dry, consistent fuel bed for fire. In areas where this exotic has out competed native species, there is a consistent bed of fine fuels that can actively carry fire without the effect wind. These characteristics allow cheatgrass to support fire during times of the year, and under conditions, in which native vegetation would not typically sustain a wildland fire.

Infrastructure

Residents of city of White Bird rely on a community well system, while homeowners in the surrounding areas have personal or multiple home wells. These water resources are not likely to be severely affected by wildfire.

Escape

The old U.S. Highway 95 passes directly through the White Bird community center. The reroute of Highway 95 bypasses the town site to the west via a large bridge across the White Bird Creek drainage. The primary access into the community center is a short spur road off the new U.S. 95 that connects to the old highway. The new U.S. 95 is the most direct route to and from the Salmon River canyon; however, the old highway can still be used to gain access to the Camas Prairie to the north. Both of these roadways are bordered by rangeland fuels; thus, it is unlikely that both would be disabled at the same time due to the short duration of fires typical in these fuels. Nevertheless, the Free Use Road and the Canfield Road could be used as alternative escape routes. These roads are also at low risk due to the lack of heavy fuels.

The Deer Creek Road is the sole access route for residents in the Deer Creek area. Most of this gravel route is fairly narrow and winding, traveling through rangeland fuels or pasture ground until it reaches the Nez Perce National Forest boundary near the summit.

The Twin Rivers Subdivision is accessed by Deer Creek Road and Canfield Road off the Old Highway 95 loop through Swift Water. Both of these access routes are narrow gravel roads, which may not support two-way truck traffic in several spots. Additionally, most homeowners have narrow private driveways with inadequate turnaround or turnout areas, which may limit emergency vehicle admittance.

Community Assessment

Although the White Bird town site is at relatively low risk of experiencing a wildfire; homes located along the steep slopes rising from either Salmon River or the White Bird Creek drainage are at much higher risk. Many homeowners in the Deer Creek area would be threatened in the event of a fire burning upslope on the west side of the river. If access to the river via the Deer Creek Road were compromised, residents would be forced to travel up the grade either to be airlifted or jet boated out of Pittsburg Landing or take Forest Road 672 along the ridge to either Lucile or Riggins.

The Twin River Subdivision on the west side of the Salmon River is at particularly high risk. Since the development of the subdivision several years ago, there have been numerous fires in the area, and on at least four of those occasions, structures were threatened. On one occasion, a fire came so close that scorch marks were left on a home. Idaho County currently has no planning and zoning laws in place;

however, cooperation through local fire response agencies has resulted in a small fire education program for Twin River residents. The combination of light fuels and high fire occurrence on these steep slopes make it imperative that homeowners implement fire mitigation measures to protect their structures and families prior to such an event. The Hells Canyon National Recreation Area lies only two air miles south of the subdivision. The Wallowa-Whitman National Forest has jurisdiction over these lands; however, the less than aggressive initial attack that is practiced in natural areas could become a significant threat to homeowners in the Twin River development. A fire spreading over the ridge from the Hells Canyon area could result in multiple spot fires on the Salmon River side.

In 2000, landowners in the White Bird Creek drainage northeast of White Bird realized the importance of defensible space as the Burnt Flats Fire nearly caused an evacuation of the entire town. This fire burned 25,000 acres of forest and rangeland before it was contained. Additionally, the Poe-Cabin fire in 2007 threatened numerous homes and structures in the Salmon-River canyon south of White Bird. A fuels mitigation project started in 2004 and finished two years later resulted in all treated homes surviving a severe crown fire event. Evaluations of home sites conducted after the fire led to the production of the video, "Are We Safe from Fire?", currently being used nationally and on the internet.

As more and more homes are built in the wildland urban interface, particularly in the Twin River subdivision, pre-fire mitigation activities will become increasingly important. Due to the nature of the topography, many of these structures are accessed by one-way in, one-way out driveways, which are not conducive to effective fire protection and dramatically increases the likelihood of loss of life or property in the event of a wildland fire. These homes and other buildings are at much higher risk of experiencing a fire.

The primary fire risk is associated with the abundance of human activity and the use of machinery near dry, flashy fuels. The receptive nature of these fuels increases the likelihood of a fire start.

Potential Mitigation Activities

Vegetation in this area should be managed to increase the effectiveness of fire suppression equipment in the event of a wildland fire. Plantings near homes should use fire resistant landscaping and be well spaced. Grass surrounding homes and other buildings should be kept short and watered if possible. Other possible management actions include:

- Remove weak, dying, and sick trees, thin standing trees to create crown openings spaced to approximately 10 feet between crowns.
- Prune trees to a minimum of 12 feet of all branches.
- Prune 1/3 of the live crown of smaller trees.
- Remove ladder fuels that may carry fire into the crowns of larger, overstory trees.
- Dispose of all excess vegetative material by chipping or hand-piling and burning when conditions are favorable.

Development of evacuation plans for the residents located in the small creek drainages around White Bird is necessary to assure orderly evacuations in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Most residents would

benefit from the construction of additional escape routes to Highway 95. Community safety zones should also be established in the event of a compromised evacuation. Efforts should be made to educate homeowners through existing homeowners associations or creation of such organizations to act as conduits for this information.

Grazing generally works positively towards reducing the fine fuels in the vegetation types surrounding White Bird, particularly in rangeland areas and open forest stands with grass and brush in the understory. Many landowners already graze livestock in areas that would otherwise be more susceptible to carrying a wildland fire. Grazing is a relatively inexpensive fire mitigation tool that typically works very well with little negative impact on the land.

Access roads in these areas require additional treatments to ensure a viable escape route for residents while simultaneously providing for access by emergency vehicles. The majority of the homes in the wildland-urban interface (situated within the range and forest lands) have multiple entrances and exits from their homes and businesses. The vegetation surrounding these access points should be trimmed and disposed of in such a way to allow easy access to and from homes. Site specific treatments should be developed for each home and subdivision.

In addition, some of the housing developments in this area have access roads that cannot support water trucks used by fire fighters (rural and wildland). Some roads have steep adverse grades, while others have turning radii that would be difficult for large trucks to navigate. Some roads have both limitations. The vast majority of the bridges observed in the area would support water-laden trucks. Roads in developments should be signed to allow emergency vehicles to plot a route over navigable roads while responding to an emergency. High visibility address markers at driveways would improve accurate emergency vehicle response during fire or other incidents.

Fire Protection

The White Bird Volunteer Fire Department is responsible for structural fire protection in the city of White Bird. Salmon River Rural Fire Department and White Bird Volunteer Fire Department have an automatic response agreement for the area surrounding the city.

Probability of Future Occurrence

The probability of a wildland fire threatening White Bird on an annual basis is moderate to high. Homes and other structures located adjacent to rangelands within or surrounding the community have a high wildfire risk. Rangeland or 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 appropriate 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. The rangeland areas surrounding Riggins have historically had a fire frequency of less than 35 years with low to mixed severity. The current vegetation condition class surrounding White Bird suggests that there has been a moderate to high alteration of the vegetation in this area. This is likely attributed to grazing practices and the associated effects, such as, invasive plant outbreaks.

Impacts of Wildland Fire Events

The potential impacts from a wildfire in White Bird are similar to the impacts described for Idaho County as a whole. All fires pose a significant safety risk to residents and emergency service personnel. Individual structures, property, and livelihoods could be severely damaged or lost as a result of a fire; however, the community is not likely to suffer severe or long-term economic losses.

A fire in the rangelands surrounding the community may benefit the ecological environment as nutrients are recycled into the soil. Generally, grass and forbs are rejuvenated by a low intensity fire and grow back quickly; however, heavy rains immediately after a fire could cause erosion.

Smoke from a nearby wildland fire may impact sensitive populations within the community due to degraded air quality conditions. Smoke and/or flames will also impact transportation corridors connecting Riggins to other communities; thus, travel and commerce may be interrupted.

Development Trends

The population of White Bird has decreased over the previous decade and therefore much of the demand for development has decreased. There have been no changes in development that affect this jurisdiction's vulnerability regarding this hazard.

Value of Resources at Risk

It is difficult to estimate potential losses in White Bird from wildland fire due to the unpredictability of wildfire behavior and the nature of ignition sources. It is unlikely that more than a few structures or other properties within the city limits of White Bird would be lost or damaged by a wildland fire; however, residents in the immediate vicinity may be directly impacted. 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.

CHAPTER 9 – MITIGATION STRATEGY

Administration and Implementation of Action Items

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

All risk assessments were made based on the conditions existing during 2021/2022; thus, the recommendations in this section have been made considering those conditions. However, it may 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.

Mechanisms to Incorporate Mitigation Strategies

Idaho 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 team throughout the update process, 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 serve as a tool for decision-makers as new policies, plans, and projects are evaluated.

There are several planning processes and mechanisms in Idaho County that will either use the risk assessment information presented in this document to inform decisions or will integrate the mitigation strategy directly into capital improvement, infrastructure enhancement, and training projects; prevention campaigns; and land use and development plans. Although not inclusive, the following is a summary of how previous MHMPs have been incorporated into other planning mechanisms available to each jurisdiction.

Idaho County Hazard Mitigation Strategy

Idaho County has incorporated past iterations of the Hazard Mitigation Plan in various planning documents and efforts, including the 2020 Idaho County Comprehensive Plan. The updated comprehensive plan defers directly to the Idaho County Multi-Hazard Mitigation Plan as the primary reference document for hazards and hazardous areas. Several city ordinances were amended or rescinded, and the information presented in the 2016 MHMP was considered and referred to in the discussion and planning involved.

Idaho County adopted the 2016 MHMP with Resolution No. 2016-09. Since then, Idaho County has implemented several projects outlined in the 2016 plan, completing 12 and partially completing or beginning work on several more. Another way that the 2016 plan has been incorporated into other county planning

efforts is through the periodic delivery of information to the public regarding the natural hazards residents of Idaho County might face. This is a past and current mitigation action item (IC-1). An example of how this has been implemented is through the Idaho County Fire Mitigation program meeting with individuals and communities to share information about Title III cost share funding opportunities for fuel reduction projects. In 2021 and 2022 the Idaho County Airport conducted an update to the Idaho County Airport (GIC) Master Plan. This planning effort looks at coordination with Idaho County Disaster Management, including considerations outlined in the 2016 MHMP, to ensure improvements are compatible with area needs.

Idaho County will utilize the information within this plan update when creating or updating other plans and planning mechanisms. Among the action items identified in this MHMP, several Community Evacuation Plans have been developed or begun and Idaho County has made it a high priority to continue with these plans. Other action items include updating the Idaho County THIRA, Emergency Operations Plan, and Hospitality Plan. The county also has prioritized a project to develop a Population Protection Plan. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all other pertinent county plans, ordinances, policies, regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Additional Potential Idaho County Mechanisms

- 1. Subdivision Ordinances
- 2. Zoning Ordinances
- 3. Departmental Budgets
- 4. Site Master Plans (wastewater treatment, landfill, etc.)
- 5. Personnel Training Programs

Cottonwood

The City of Cottonwood adopted the 2016 version of the MHMP through City Resolution #2016-5. The City of Cottonwood began the process of updating the 2000 Comprehensive Plan in 2018. Representatives from the city of Cottonwood provided information from the 2016 MHMP to be incorporated into the comprehensive plan update. In 2021, the city updated their city code with significant amendments to Chapter 15.04 regarding flood control. The 2016 Multi-Hazard Mitigation Plan is not directly mentioned; however, general hazard mitigation goals and flood hazard mitigation goals from the 2016 MHMP are reflected in the amended city code (Ord. 254, 7-12-2021). Amending the flood ordinance also meets the requirements of Mitigation Action Item 9.13-5 from the 2016 MHMP.

The City of Cottonwood will utilize the information within this plan update when creating or updating other plans. Cottonwood also has an Emergency Response Plan that covers general logistics in the event of a disaster. This plan is updated as needed and the Idaho County MHMP will be incorporated into the next update of the City's Emergency Response Plan. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Ferdinand

The City of Ferdinand has not updated nor created any plans during the term of the current mitigation plans eligibility. The City of Ferdinand adopted the 2016 version of the MHMP through City Resolution #2016-1. In 2021 the City of Ferdinand amended their flood ordinance for compliance purposes, also aligning with projects 9.12-2 and 9.12-6 of the previous MHMP. No other ordinances have been adopted or amended and no plans have been written or updated. Therefore, the City of Ferdinand has not had any other opportunities to incorporate the current mitigation plan into other planning mechanisms.

The City of Ferdinand will incorporate pertinent information from this Multi-Hazard Mitigation Plan into any future planning documents or policies. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Grangeville

The City of Grangeville adopted the 2016 version of the MHMP through City Resolution No. 251. Since then, the City of Grangeville amended their City Ordinances in 2018 and in 2021. The city made significant amendments to Title 4, Chapter 5 regarding flood hazard regulations. The 2016 Multi-Hazard Mitigation Plan is not directly mentioned; however, general hazard mitigation goals and flood hazard mitigation goals from the 2016 MHMP are reflected in the amended city code (Ord. 954, 12-20-2021). In 2018 the city amended code 4-4-1 to ensure that the city clerk's office will maintain at least one copy of the current International Fire Code "...for use and examination of the public..." (Ord. 917, 1-2-2018). This ordinance is consistent with several goals and the mitigation strategy from the 2016 MHMP. City code 7-3-1 addresses fire hazards on properties and was amended in 2019 to empower the city to enforce fire hazard abatement on properties within the city limits (Ord. 933, 5-6-2019). This ordinance is consistent with several planning goals from the 2016 MHMP as well as Mitigation Action Items 9.11-18 and 9.11-20.

The City of Grangeville will incorporate pertinent information from this Multi-Hazard Mitigation Plan into the next update of the City's Comprehensive Plan and any other plans that are updated in the proceeding five years. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Kooskia

The City of Kooskia adopted the 2016 version of the MHMP through City Resolution No. 140. In 2022 the city completed a ten-year update of the City of Kooskia Comprehensive Land Use Plan. The 2016 MHMP was incorporated into that plan in several ways. In Chapter 15, *Goals and Objectives*, Goal 13 includes language stating that the comprehensive plan will "Support the implementation of strategies outlined in the Idaho County Multi-Hazard Mitigation Plan..." Also, in the comprehensive plan's action plan, items 98 and 104 address working with Idaho County to establish and support the implementation of the Idaho County Multi-Hazard Mitigation Plan.

The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Riggins

The City of Riggins adopted the 2016 version of the MHMP through City Resolution #17-1. The City of Riggings will incorporate pertinent information from this Multi-Hazard Mitigation Plan into the City's Comprehensive Plan (1994) which is currently being updated. City Ordinance #127 (dated 1994 J) cites the MHMP – uses and authorities and should be updated once this new version of the MHMP is adopted. The City's Emergency Plan will incorporate information from this MHMP, which is updated by Public Works Department on an 'as needed' basis. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Stites

The City of Stites adopted the 2016 version of the MHMP through City Resolution #11-14-2016. The city of Stites has not created nor amended any city ordinances during the term of the current mitigation plan's eligibility. Therefore, the City of Stites has not had the opportunity to incorporate the current mitigation plans information into other planning mechanisms.

The city of Stites is currently working with the Clearwater Development Association to draft a city comprehensive plan that will incorporate pertinent information from this Multi-Hazard Mitigation Plan into said plan. The city also has an Emergency Plan that will incorporate information from this MHMP, which is updated by Public Works Department on an 'as needed' basis. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent City plans, Ordinances, Policies, Regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

White Bird

The city of White Bird has not updated nor created any plans during the term of the current mitigation plans eligibility. The city incorporated the 2016 MHMP during the term of that plan's eligibility when White Bird adopted a flood zone ordinance. This completed project 9.18-3 identified in the previous iteration of the Idaho County Multi Hazard Mitigation Plan. The White Bird Volunteer Fire Department also completed project 9.18-2 with the construction of a truck storage building and the addition of a structure truck.

The City of White Bird has an outdated comprehensive plan and will discuss updating that plan with the Clearwater Development Association. The goal would be to update the city's comprehensive plan and incorporate pertinent information from this Multi-Hazard Mitigation Plan into said plan. The city also has an Emergency Plan that will incorporate information from this MHMP, which is updated by Public Works Department on an 'as needed' basis. The information provided in this plan is based on the best available science and technology at the time of the update and should be utilized to update all additional pertinent city plans, ordinances, policies, regulations, etc. scheduled for update within five years from adoption of this Multi-Hazard Mitigation Plan.

Plan Monitoring and Maintenance

As part of the policy of Idaho County in relation to this planning document, this entire Multi-Hazard Mitigation Plan should be reviewed annually, from the 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. Idaho County Disaster Management (or an official designee of the joint committee) 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. Reevaluation 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 joint 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.
- 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?
- Incorporate additional hazard chapters as funding allows.

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

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 all risk analysis models incorporating new information such as an updated County parcel master database, new construction projects, development trends, population vulnerabilities, changing risk potential, etc.

• Update county risk profiles and individual community assessments based on new information reflected in the updated models.

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

Continued Public Involvement

Idaho County is dedicated to keeping the public informed of reviews and updates of the Multi-Hazard Mitigation Plan. A public announcement will go out as part of each annual evaluation or when deemed necessary by the planning team.

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 Idaho County Disaster Management office in the basement of the Idaho County Courthouse. The Plan also includes contact information for the Disaster Management Coordinator, who 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 team. The meetings will provide the public a forum for which they can express concerns, opinions, or ideas about the Plan. The County Commissioner's Office will be responsible for using county resources to publicize the annual meetings and maintain public involvement through the County's webpage and local newspapers.

Prioritization of Action Items

The prioritization process includes a special emphasis on benefit-cost analysis review. The process reflects that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the costs. Projects will be administered by local jurisdictions with overall coordination provided by the Idaho County Disaster Management Coordinator.

The prioritization of new projects and deletion of completed projects will occur annually and be facilitated by the Idaho County Disaster Management Coordinator and the joint planning team. All mitigation activities, recommendations, and action items mentioned in this document are dependent on available funding and staffing.

Prioritization Scheme

All the action items and project recommendations made in this Plan were prioritized by each respective jurisdiction in coordination with their governing body. Each jurisdiction's representative on the planning team met with their governing bodies and prioritized their own list of projects and mitigation measures. Projects were ranked on a "High", "Moderate", or "Low" scale with emphasis on project feasibility and the benefit/cost correlation. Once completed, the individual jurisdiction's rankings were discussed and approved at the planning team level.

Idaho County Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood, Wildfire, Earthquake, and Landslide	IC-1. Develop and deliver public information programs regarding Idaho County natural hazards and threats.	Goal #1,3,4,5, & 8 Priority Ranking: High	Idaho County Disaster Management, LEPC, Chief's Assoc.	Continued from previous plans	County funding	On-going
Severe Weather, Flood, Wildfire, Earthquake, and Landslide	IC-2. Improve Disaster Resiliency- Promote Family/Individual Preparedness & Self- Sufficiency: 2 weeks of food, water, and capability to care for pets and livestock.	Goal #1,3,5,6, & 8 Priority Ranking: High	Idaho County Disaster Management	New project	County & Grant Funding	Implement by 2023
Landslide	IC-3. Map Primary Landslide Prone Areas and any Mitigation Projects completed.	Goal #1,4,5,6, & 8 Priority Ranking: High		Continued from previous plan	County & Grant Funding	Implement in 2023
All Hazards	IC-4. Update the Idaho County THIRA.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management	New project	County and grant funding	Begin project in 2023

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-5. Revise and update the Idaho County Emergency Operations Plan.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management, LEPC	New project	County and grant funding	Begin project in 2023
All hazards	IC-6. Revise and update Hospitality and Information Center Plan.	Goal #1,3,5, & 8 Priority Ranking: Medium	Idaho County Disaster Management, LEPC	New project	County and grant funding	Begin project in 2024
All Hazards	IC-7. Develop a Population Protection Plan.	Goal #1,3,5, & 8 Priority Ranking: Medium	Idaho County Disaster Management, LEPC, Chief's Assoc.	New Project	County and grant funding	Begin project in 2024
All Hazards	IC-8. Draft remaining Community Evacuation Plans.	Goal #1,4,5,6, & 8 Priority Ranking: High	Idaho County Disaster Management, LEPC	Continued project	County and grant funding	2027
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
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All Hazards	IC-9. Improve/Revise Recovery Plan, including coordinating structures to accomplish faster individual disaster recovery- emergency housing and economic sustainability and resiliency.	Goal #1,3,5, & 8 Priority Ranking: Medium	Idaho County Disaster Management, LEPC, PHD2, IOEM, NGOs	New project	County and grant funding	2027
All Hazards	IC-11. Revise and Update County Communications Plan.	Goal #1,3,5, & 8 Priority Ranking: Medium	Dis. Mgm't, LEPC, Chief's Assoc., ICSO, ICRD, DIGB2	New project	County & FAA funding	2027
All Hazards	6.10-12. Build Redundant Fiber Connection between Dispatch Centers in District II.	Goal #1,3,5, & 8 Priority Ranking: High	DIGB2, CEDA, BoCCs, Port of LWS, IPSCC	New project	Counties, State and Federal funds	2027
All Hazards	IC-13. Procure and implement Portable Remote Dispatch Position.	Goal #1,3,5 & 8 Priority Ranking: High	PSAP, Idaho County Disaster Management, ICSO	New project	Grants, E.C. Fund, County Funds	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-14. Establish NG-911 PSAP Operating System consistent with Regional, State and Federal Standards supported by resident & regional GIS staffing.	Goal #1,3,5 & 8 Priority Ranking: Medium	County, IPSCC, DIGB2, ICSO	New project	County & IPSCC Grant Funds	2027
All Hazards	IC-15. Develop Multi-agency Land Mgm't. / Public Safety (911) Dispatch / Aviation Center at Idaho County Airport to include Airport Mgr., Aviation Officer, Pilot's Lounge.	Goal #1,3,5 & 8 Priority Ranking: Medium	Idaho County, IDL, NP Tribe, USFS	New project	County, State, Federal (Grant funds?)	2027
Severe Weather	IC-16. Complete Fiber Feasibility Study, Finalize RFP & Business Plan, and Install Fiber Optic Cable to bridge the existing fiber gap between and southern Idaho.	Goal #1,3,5 & 8 Priority Ranking: Medium	Idaho County Disaster Management. Multiple Local, Regional, State, NGO, Private Entities	New project	Local, State, Federal	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-17. Continue Build-out of County Communication System, adding Repeater Sites in under covered community areas: Elk City, Cottonwood Butte, Glenwood, Pollock – Pinehurst.	Goal #1,3,5 & 8 Priority Ranking: Moderate	DIGB2, Idaho County Disaster Management, ICSO	Continued projects	County and Grant Funds	On-going 2027
All Hazards	IC-18. Improve Public Messaging Coordination between IMT PIOs and Idaho County Sheriff's Office- Joint Information System.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Disaster Management, IMTs, Delegating Agencies	Incomplete	County & Agency/Incident Funds	Immediate On-going
Wildfire	IC-19. Develop a Multi- County MOA for out-of- county structure protection/suppression fire response modeled on Idaho County MOA.	Goal #1,3,5,8,9,10, &11 Priority Ranking: High	District II E.M.s and Chief's Assoc.	New project	County funds	Immediate On-going

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-20. Enhance GIS Data Collection and Utilization to align County Information ESRI/ARC GIS and NG-911 Standards to enable reliable/accurate data transfer between counties, PSAPs and IMTs.	Goal #1,3,5 & 8 Priority Ranking: High	DIGB2, Idaho County, IPSCC, IOEM, Land Management Agencies	New project	County & Grant Funds	Immediate On going
All Hazards	IC-21. Support Regionalization and shareability of GIS, Data, Mapping Programs and Projects.	Goal #1,3,5 & 8 Priority Ranking: High	DIGB2, Idaho County, District 2 GIS Entities	New project	Multi-County & Grant Funds	Immediate Ongoing
All Hazards	IC-22. Accomplish Parcel Map Property Alignments.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Mapping, GIS	Incomplete	County funds	2027
All Hazards	IC-23. Establish County Information Technology Position / Capability.	Goal #1,3,5 & 8 Priority Ranking: Medium	Idaho County Disaster Management	New project	County funds	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-24. Enhance QRU and Ambulance emergency response capabilities- equipment, supplies, personnel.	Goal #1,3,5 & 8 Priority Ranking: Medium	County EMS Districts/Depts.	New project	Federal grants	Immediate Ongoing
All Hazards	IC-25. Build Capacity in Utilizing ICS for Emergency / Incident Response and Management	Goal #1,3,5,8,9,10, &11 Priority Ranking: High	Idaho County Disaster Management, LEPC, Emergency Responders & Organizations	New project	Grant Funding	Immediate Ongoing
All Hazards	IC-26. Improve Unified Command Capability in Emergency Response Organizations.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Disaster Management, LEPC, Emergency Responders & Organizations	New project	Grant Funding	Immediate Ongoing
Severe Weather, Flood	IC-27. Modernize, Upgrade and Replace deteriorating and undersized waste-water collection and storm drain systems.	Goal #1,3,5 & 8 Priority Ranking: Medium	Municipalities: Cottonwood, Ferdinand, Grangeville, Kooskia, Riggins, Stites, White Bird	Incomplete	City, State, Federal and Grant Funds	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood	IC-28. Modernize, Upgrade and Replace deteriorating and undersized waste-water collection and storm drain systems.	Goal #1,3,5 & 8 Priority Ranking: Medium	Elk City Water Assoc, Pine Ridge W/S, Rapid River W/S, Valley View W/S, Clearwater Water District	Incomplete	Local, State, Federal and Grant Funds	Ongoing
Severe Weather, Flood	IC-29. Modernize, Upgrade, Increase Capacity and Replace deteriorating, sub- standard and undersized waste-water treatment facilities	Goal #1,3,5 & 8 Priority Ranking: Medium	Municipalities: Cottonwood, Ferdinand, Grangeville, Kooskia, Riggins, Stites, White Bird	Incomplete	City, State, Federal and Grant Funds	Ongoing
Severe Weather, Flood	IC-30. Modernize, Upgrade, Increase Capacity and Replace deteriorating, sub- standard and undersized District waste-water treatment facilities.	Goal #1,3,5 & 8 Priority Ranking: Medium	Elk City Water Assoc, Pine Ridge W/S, Rapid River W/S, Valley View W/S, Clearwater Water District	Incomplete	Local District, State, Federal and Grant Funds	Ongoing
Severe Weather, Flood, Wildfire	IC-31. Realign, Repair and upgrade/modernize community water distribution canal.	Goal #1,3,5 & 8 Priority Ranking: Medium	City of Riggins	New project	City, State, Federal and Grant Funds	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood, Wildfire	IC-32. Replace aging, undersized and deteriorating Municipal Water Distribution/Delivery Systems.	Goal #1,3,5 & 8 Priority Ranking: Medium	Municipalities: Cottonwood, Ferdinand, Grangeville, Kooskia, Riggins, Stites, White Bird	Incomplete	City, State, Federal and Grant Funds	Ongoing
Severe Weather, Flood, Wildfire	IC-33. Replace aging, undersized and deteriorating District Water Distribution/Delivery Systems.	Goal #1,3,5 & 8 Priority Ranking: High	Elk City Water Assoc, Pine Ridge W/S, Rapid River W/S, Valley View W/S, Clearwater Water District	Incomplete	Local District, State, Federal and Grant Funds	Ongoing
Severe Weather, Flood, Wildfire, Earthquake, Landslide	IC-34. Identify, Prioritize, Schedule and Fund deteriorating, unsafe, undersized, and poorly aligned / designed culverts, bridges, and road systems within the Idaho County Road Department jurisdiction.	Goal #1,3,5 & 8 Priority Ranking: Medium	ICRD, LHTAC, Fed. Hwy. Admin, Nez Perce Tribe, other State/ Federal entities	Continued Incomplete	County, State, Federal and Grant funds	Immediate Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood, Wildfire, Earthquake, Landslide	IC-35. Identify, Prioritize, Schedule and Fund deteriorating, unsafe, undersized, and poorly aligned / designed culverts, bridges and road systems within the highway districts' jurisdiction.	Goal #1,3,5 & 8 Priority Ranking: Medium	Hwy. Districts, LHTAC, Fed. Hwy Admin, Nez Perce Tribe, other State / Federal entities	Continued Incomplete	District, State, Federal and Grant funds	Immediate Ongoing
Severe Weather, Flood, Wildfire, Earthquake, Landslide	IC-36. Schedule, Fund, and Replace inadequate poorly performing and aging specialized equipment: Graders, Trucks, Pup & Transport Trailers, Plows, and Loaders.	Goal #1,3,5 & 8 Priority Ranking: Medium	Idaho County Road Department	Continued Incomplete	County, State, Federal and Grant funds	Immediate Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	IC-37. Continue to develop and maintain existing mutual aid agreements between rural fire districts, finalize the countywide cooperative rural fire memorandum of understanding, and promote agreements with adjoining counties and federal and state land management agencies with jurisdictions in Idaho.	Goal #1,3,5,8,10, & 11 Priority Ranking: High	Idaho County Disaster Management & Rural Districts	Continued from previous plan Completed in Idaho County but county-to-county MOUs/MOAs still needed	Local fire departments and districts, EMS units, BLM, USFS, BIA, IDL, Nez Perce Tribe, Lewis County, and State Fire Marshal's office.	Ongoing
Wildfire	IC-38. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8,10, & 11 Priority Ranking: High	Local fire departments	Partially completed Regularly continuing project	Idaho County and cities of; Stites, Ferdinand, Riggins, White Bird, Kamiah, Cottonwood, Grangeville, and Kooskia.	Ongoing
All Hazards	IC-39. Address and obtain funding for fire department resource and capability enhancements through Federal Excess Property.	Goal #1,3,5,8, 10, & 11 Priority Ranking: High	Local fire departments/ districts and Idaho Department of Lands	On-going	Idaho County Disaster Management	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-40. Address and obtain funding for each highway districts' resource and capability enhancements.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Idaho County Highway Districts	Regularly continuing project	Idaho County	Ongoing
Flood, Landslide	IC-41. Work with local landowners and agencies to implement a strategy to remove excess vegetation and other debris and improve channel stability on Graves Creek to help prevent flooding and erosion.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Keuterville Highway District	Some work has been accomplished Regularly continuing project	Idaho County, Fenn Highway District, Conservation District, and private landowners	Ongoing
Landslide	IC-42. Fix recurring sloughing that occurs at the intersection of Rice Creek Grade and Center Canyon.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Doumecq Highway District	Some work completed, including debris clearing	Idaho County and Idaho Transportation Department	2027
Flood	IC-43. Raise the top elevation of the existing Elk City lagoon dikes to prevent structural and environmental damage during a flood event or relocate the lagoons away from Big Elk Creek	Goal #1,3,5 & 8 Priority Ranking: High	Elk City Water and Sewer Association	Carried over from previous plan	Idaho County, Department of Commerce, USDA- RD, IDEQ, and Army Corps of Engineers	Began in 2018 Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	IC-44. Rapid River subdivision needs to update their water system to include new well, distribution system, and hydrants.	Goal #1,3,5 & 8 Priority Ranking: High	Rapid River subdivision	Carried over from previous plan	Idaho County, Salmon River Rural VFD	2025
All Hazards	IC-45. Develop fire and emergency prevention plans for local communities.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Rural Fire District	Incomplete	Fire prevention specialists, Local communities and Home Owners' Associations	Ongoing
All Hazards	IC-46. Enhance both retention and recruitment of volunteer firefighters.	Goal #1,3,5,8, & 10 Priority Ranking: Moderate	Rural Fire Districts	Regularly continuing project	Idaho County Disaster Management	Ongoing
All Hazards	IC-47. Increase training opportunities and expand capabilities of firefighters.	Goal #1,3,5,8, & 10 Priority Ranking: Moderate	Rural Fire Districts	Many accomplishments to date Regularly continuing project	USFS, BLM, IDL, and State Fire Marshal's Office FEMA grants	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire, Severe Weather, Landslide, and Flood	IC-48. Post fire rehabilitation on private land countywide in coordination with state, federal and tribal agencies.	Goal #1,3,5, 6, 8, 9, & 10 Priority Ranking: Moderate	Idaho County Disaster Management	Regularly continuing project	IDL, US Forest Service, BLM, Nez Perce Tribe	Ongoing
All Hazards	IC-49. Identify the need for additional fire districts throughout the county to ensure that all uncovered parts of the county have fire response.	Goal #1,3,5,8, & 10 Priority Ranking: Moderate	Idaho County Disaster Management	Carried over from previous plan	Idaho County Commissioners, rural fire districts	Ongoing
All Hazards	IC-50. Incorporate and improve upon Unified Command knowledge, skills, and abilities in all fire response training exercises.	Goal #1,3,5,8, & 10 Priority Ranking: Moderate	Rural fire districts	Regularly continuing project	Idaho County Disaster Management and Iocal Iaw enforcement	Ongoing
All Hazards	IC-51. Replace old water storage tanks with larger capacity tanks where needed.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Public Utility Districts of Stites, Ferdinand, Riggins, White Bird, Kooskia Cottonwood, Elk City, Grangeville, and Kamiah.	Incomplete	Idaho County Disaster Management	Long Term

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	IC-52. Improve radio infrastructure and communication capability between Riggins and White Bird and Idaho County Sheriff's Office. Potentially add an additional repeater south of Riggins along US-95 by 2025.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Idaho County Sheriff's Office	Completed by adding White Bird repeater. Plan to add Fire Tac on Salmon Point above Riggins.	City of Riggins and city of White Bird	Begin the Fire Tac repeater in 2022

Completed Projects

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
All Hazards	6.10-4. Update County's list of available emergency shelters.	Idaho County	Completed the American Red
		Disaster	Cross list in 2022
		Management	
All Hazards	6.10-10. Consider development of a countywide Resource	Idaho County	Completed, 2017
	Management Plan to help guide land use and development	Commissioners	

throughout Idaho County.

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
All Hazards	6.10-22. Develop a process to identify and update emergency shelters throughout the county.	Idaho County Disaster Management	American Red Cross list is current as of 2022
All Hazards	6.10-24. Obtain backup power generators for public water systems.	Public Utility Districts of Stites, Ferdinand, Riggins, White Bird, Kamiah.	Completed
Flood	6.10-34. Conduct evaluation and implement a strategy to manage ice and debris jams along the South and Middle Forks of the Clearwater River.	Idaho County and City Public Works, and Highway Districts.	A new ITD culvert at Red River Road now allows ice to pass.
Wildfire	6.10-64. Develop a multijurisdictional Prevention Coop to support the numerous fire prevention and education efforts throughout the five-county area.	Idaho County Disaster Management RC&D	Completed
Severe Weather, Flood, Wildfire, Earthquake, TCU	6.10-66. Fuels reduction project for power line corridor between Grangeville and Elk City.	Avista Utilities	Completed in 2021

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
All hazards	6.10-72. Acquire construction materials for Elk City Volunteer Fire Department.	Elk City VFD	Completed
All hazards	6.10-73. Acquire six-wheel drive structural engine, drop tank, hoses, a 500-gpm pump, updated rolling stock, and training videos for Elk City Volunteer Fire Department.	Elk City VFD	Completed
All hazards	6.10-80. Acquire new heated building, pumper truck, and 3,000-gallon water tender for Elk City Volunteer Fire Department.	Elk City Fire Department	Completed
All Hazards	6.10-83. Obtain mobile repeater stations with backup power source.	Idaho County Commissioners	Completed for Idaho County Sheriff
Wildfire, Flood, Landslide, Earthquake, and Severe Weather	6.10-91. Develop and adopt a comprehensive Natural Resource Management Plan to guide land management issues in unincorporated portions of the county and to focus the deliberative process in collaboration with land management agencies and departments.	Idaho County Commissioners	Completed in 2016

City of Cottonwood Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood, Wildfire, Earthquake, TCU	C-1. Establish backup power supply for city hall, community center	Goal #1,3,5,8, & 9 Priority Ranking: Moderate	Cottonwood City Council	Ongoing Working out funding situation	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Flooding	C-2. Planning and engineering solutions for flooding in downtown area.	Goal #1,3,5,8, & 9 Priority Ranking: Moderate	Cottonwood City Council	Project carried over from previous plan	Idaho County Disaster Management Pre-Disaster Mitigation Program	2025
Wildfire	C-3. Obtain additional training, PPEs, hand tools, portable radios, communications base station, and a Type 6 crew cab engine for the Cottonwood Volunteer Fire Department and Rural Fire District.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Cottonwood Volunteer Fire Department and Cottonwood Rural Fire District	Partially Complete Engine still needed	Cottonwood City Council Volunteer Fire Department Assistance	2025
Flood	C-4. Request FEMA update of Flood Insurance Rate maps.	Goal # 1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	C-5. Develop and deliver public education programs on hazard mitigation.	Goal #1,3,4,5, & 8 Priority Ranking: High	Idaho County Disaster Management	Incomplete	Idaho County, USFS, BLM, IDL, Public Health Dept, fire depts., and local schools. Pre-Disaster Mitigation Program	Ongoing
Flood	C-6. Improve program application and coordination with county floodplain ordinance.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Incomplete	Idaho County Disaster Management. Pre-Disaster Mitigation Program	Ongoing
All Hazards	C-7. Update City's list of available emergency shelters.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Completed (continue)	Idaho County Disaster Management Local Budgets	Ongoing
All Hazards	C-8. Develop action plan for dealing with special needs populations during emergencies.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	C-9. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Partially completed	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	C-10. Coordinate Cottonwood Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Partially completed	Idaho Transportation Department and Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Severe Weather	C-11. Continue participation in StormReady program and recertify every third year.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Cottonwood City Council	Current	Idaho County Disaster Management <i>Potential Funding</i> : City Budget	Ongoing
All Hazards	C-12 . Identify, assess, and hardwire most appropriate critical facilities and shelters throughout the County and Cities (particularly Cottonwood and Grangeville) for use with a portable generator.	Goal #1,3,5,8, & 9 Priority Ranking: Moderate	Cottonwood Public Works	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	C-13. Identify and promote the acquisition of necessary resources designed to protect critical facilities from hazards and enhance sheltering capacity and capability.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Immediate Ongoing
Wildfire	C-14. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects.	Goal #1,3,5,8,9, 10, & 11 Priority Ranking: High	Idaho County Disaster Management	Incomplete	City of Cottonwood, local fire districts, Bureau of Land Management, US Forest Service, and Idaho Department of Lands. Western States Fire Managers Wildland Urban Interface Grant Program	Immediate Ongoing
Floods and Severe Weather	C-15. Install or replace storm water drains and/or systems where needed throughout the County and Cities to help reduce flooding potential.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	2025

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildland Fire	C-16. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	Goal #1,3,5,8,9, 10, & 11 Priority Ranking: High	Idaho County Fire Mitigation Committee	Incomplete	Idaho County, utility companies, Bureau of Land Management, US Forest Service, Idaho Department of Lands, and City of Cottonwood Western States Fire Managers Wildland Urban Interface Grant Program	Ongoing
Flood and Earthquake	C-17. Assess location and stability of well intakes located in the flood zone. Reinforce well intakes where needed.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Earthquake	C-18. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary.	Goal #1,3,5,8, & 9 Priority Ranking: Low	Cottonwood City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Long Term

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	C-19. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8, & 9 Priority Ranking: High	Local fire department/ district	Partially completed	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	C-20. Address and obtain funding for fire department resource and capability enhancements through the Federal Excess Property program.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire departments and districts	Partially completed	Idaho County, IDL, BLM, & USFS Volunteer Fire Department Assistance	Ongoing
All Hazards	C-21. Support continued development of Cottonwood's school district's Emergency Response Plans.	Goal #1,3,5, & 8 Priority Ranking: High	Cottonwood Joint District #242	Partially completed	Idaho County Disaster Management Local budgets	Short Term

Completed Projects

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
Flood	9.13-5. Develop county and city policies to restrict development in	Cottonwood City	Ordinance 254, 7/12/2021
	flood zone to help prevent losses.	Council	

City of Ferdinand Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather, Flood, Wildfire, Earthquake, TCU	F-1. Backup power supply for municipal water supply.	Goal #1,3,5, & 8 Priority Ranking: Moderate	City of Ferdinand	Partially Completed	City of Cottonwood and Idaho County Disaster Services Pre-Disaster Mitigation Program	Ongoing (2022)
Flood	F-2. Increase County and City of Ferdinand participation in National Flood Insurance Program.	Goals #1,3,5, & 8 Priority Ranking: High	City of Ferdinand	Partially Completed	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	F-3. Develop and deliver public education programs on hazard mitigation.	Goal #1,3,4,5, & 8 Priority Ranking: High	City of Ferdinand	Incomplete	Idaho County, USFS, BLM, IDL, Public Health Dept, fire depts., and local schools. Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	F-4. Update City's list of available emergency shelters.	Goal #1,3,5, & 8 Priority Ranking: High	City of Ferdinand	Completed (continue)	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	F-5. Develop action plan for dealing with special needs populations during emergencies.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management	Incomplete	Ferdinand City Council Pre-Disaster Mitigation Program	2027
All Hazards	F-6. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management	Partially completed	Cities of; Stites, Ferdinand, Riggins, White Bird, Cottonwood, Grangeville, Kamiah, and Kooskia. Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	F-7. Coordinate Ferdinand Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal # Priority Ranking: High	Idaho County Disaster Management	Partially completed	Idaho Transportation Department and the cities of; Stites, Ferdinand, Riggins, White Bird, Cottonwood, Grangeville, Kamiah, and Kooskia. Pre-Disaster Mitigation Program	Ongoing
Severe Weather	F-8. Continue participation in StormReady program and recertify every third year.	Goal #1,3,5, & 8 Priority Ranking: Moderate	City of Ferdinand	Current	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	F-9 . Identify, assess, and hardwire most appropriate critical facilities and shelters throughout Ferdinand for use with a portable generator.	Goal #1,3,5, & 8 Priority Ranking: Moderate	City of Ferdinand	Incomplete	Idaho County Disaster Management and Iocal fire district. Pre-Disaster Mitigation Program	2027

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	F-10. Identify and promote the acquisition of necessary resources designed to protect critical facilities from hazards and enhance sheltering capacity and capability.	Goal #1,3,5, & 8 Priority Ranking: High	City of Ferdinand	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Immediate Ongoing
Wildfire	F-11. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Disaster Management	Incomplete	City of Ferdinand, local fire districts, Bureau of Land Management, US Forest Service, and Idaho Department of Lands. Western States Fire Managers Wildland Urban Interface Grant Program	Immediate Ongoing
Floods and Severe Weather	F-12. Install or replace storm water drains and/or systems where needed throughout Ferdinand to help reduce flooding potential.	Goal #1,3,5, & 8 Priority Ranking: High	City of Ferdinand	Incomplete	Idaho County Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildland Fire	F-13. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Fire Mitigation Committee	Incomplete	Idaho County, utility companies, Bureau of Land Management, US Forest Service, Idaho Department of Lands, and city of Ferdinand	Ongoing
					Western States Fire Managers Wildland Urban Interface Grant Program	
Flood and Earthquake	F-14. Assess location and stability of well intakes located in the flood zone. Reinforce well intakes where needed.	Goal #1,3,5, & 8 Priority Ranking: Moderate	City of Ferdinand	Incomplete	Idaho County Pre-Disaster Mitigation Program	Ongoing
Earthquake	F-15. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary.	Goal #1,3,5, & 8 Priority Ranking: Low	Ferdinand Public Works	Incomplete	Idaho County Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	F-16. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8,9, & 10 Priority Ranking: High	Local fire departments/district	Partially completed	Idaho County and City of Ferdinand Pre-Disaster Mitigation Program	Ongoing
All Hazards	F-17. Address and obtain funding for fire department resource and capability enhancements through Federal Excess Property program.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire department/ districts	Incomplete	Idaho County, City of Ferdinand, IDL, BLM, and USFS Volunteer Fire Department Assistance	Ongoing

Completed Projects

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
Flood	9.12-2. Develop city policies to restrict development in flood zone to	City of Ferdinand	Completed in 2021
	help prevent losses.		

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
Flood	9.12-4. Request FEMA update of Flood Insurance Rate maps.	City of Ferdinand	Completed in 2021

 Flood
 9.12-6. Improve program application and coordination with county
 City of Ferdinand
 Completed in 2021

 floodplain ordinance.
 floodplain continuation
 floodplain contin
 floodplain continuation

City of Grangeville Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Severe Weather and Flood	G-1. Three culverts that cross main (95 and 13, 13 and Hall, and 13 and Meadow) that need	Goal #1,3,5, & 8 Priority	City of Grangeville and ITD	Carried over	Idaho County Road & Bridge	2027
	inspected and possibly replaced.	Ranking: High		Not yet completed	Pre-Disaster Mitigation Program	
All Hazards	G-2. Emergency backup power supply for City Hall, Police	Goal #1,3,5, & 8 Priority	City of Grangeville	Carried over	Idaho County Disaster Services	2027
	Station, and the Department	Ranking: Low		Not yet completed	Pre-Disaster Mitigation Program	

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	G-3. Continue developing emergency plans with schools, nursing homes, and hospitals	Goal #1,3,5, & 8 Priority Ranking: Moderate	City of Grangeville	Carried over Not yet completed	Idaho County Disaster Services Pre-Disaster Mitigation Program	Ongoing, annually update
Flood	G-4. Develop county and city policies to restrict development in flood zone to help prevent losses.	Goal #1,3,5,6, & 8 Priority Ranking: High	City of Grangeville	Not yet completed	Idaho County Disaster Management Pre-Disaster Mitigation Program	2023
Flood	G-5. Request FEMA update of Flood Insurance Rate maps.	Goal #1,3,5, & 8 Priority Ranking: High	City of Grangeville	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	2027
Flood	G-6. Improve program application and coordination with county floodplain ordinance.	Goal #1,3,5, & 8 Priority Ranking: High	City of Grangeville	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	G-7. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County, especially regarding fire and police.	Goal #1,3,5, & 8 Priority Ranking: High	ldaho County	Partially completed	Cities of; Stites, Ferdinand, Riggins, White Bird, Cottonwood, Grangeville, Kamiah, and Kooskia. Pre-Disaster Mitigation Program	Ongoing
All Hazards	G-8. Coordinate Grangeville Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5, & 8 Priority Ranking: High	City of Grangeville	Partially completed	Idaho County Disaster Management, Idaho Transportation Department and the cities of; Stites, Ferdinand, Riggins, White Bird, Cottonwood, Grangeville, Kamiah, and Kooskia. Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	G-9 . Identify, assess, and hardwire most appropriate critical facilities and shelters throughout the County and Cities (particularly Cottonwood and Grangeville) for use with a portable generator.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Grangeville Public Works	Incomplete	Idaho County Pre-Disaster Mitigation Program	Ongoing
All Hazards	G-10. Identify and promote the acquisition of necessary resources designed to protect critical facilities from hazards and enhance sheltering capacity and capability.	Goal #1,3,5, & 8 Priority Ranking: High	City of Grangeville	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Wildfire	G-11. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management Idaho County Fire Mitigation	Incomplete	Grangeville, local fire district, Bureau of Land Management, US Forest Service, and Idaho Department of Lands.	Ongoing
					Western States Fire Managers Wildland Urban Interface Grant Program	

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Floods and Severe Weather	G-12. Install or replace storm water drains and/or systems where needed throughout Grangeville to help reduce flooding potential.	Goal #1,3,5, & 8 Priority Ranking: High	City of Grangeville	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	2017 Ongoing
Wildland Fire	G-13. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	Goal #1,3,5,8,9, 10, 11 Priority Ranking: High	Idaho County Fire Mitigation Committee	Incomplete	Idaho County, utility companies, Bureau of Land Management, US Forest Service, Idaho Department of Lands, and Grangeville. Western States Fire Managers Wildland Urban Interface Grant Program	In-progress and ongoing
Earthquake	G-14. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary.	Goal #1,3,5, & 8 Priority Ranking: Low	Grangeville Public Works	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	G-15. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8, 10, & 11 Priority Ranking: High	Local fire department	In progress	Idaho County and Grangeville Pre-Disaster Mitigation Program	Ongoing
All Hazards	G-16. Address and obtain funding for fire department resource and capability enhancements through Federal Excess Property program.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire department and district	Incomplete	Idaho County, IDL, BLM, and USFS Volunteer Fire Department Assistance	Ongoing

Completed Proj	iects		
Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
All Hazards	9.11-11. Update Grangeville's list of available emergency shelters.	Idaho County City of Grangeville	Completed through American Red Cross list

Flood and	9.11-21. Assess location and stability of well intakes located in the	City of Grangeville	Completed
Earthquake	flood zone. Reinforce well intakes where needed.		

City of Kooskia Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	Koos-1. Purchase PPE and Turnout Gear that meets current standards.	Goal Priority Ranking: High	City of Kooskia Kooskia Fire Department	New project	Volunteer Firefighter Assistance Other grants with KFD match	End of 2024
All Hazards	Koos-2. Recruit and train new firefighters and EMTs.	Goal Priority Ranking: High	KFD and Ambulance	New project	Kooskia Fire and EMS State and federal training organizations	Ongoing project
Wildfire	Koos-3. Locate and develop sites for dry hydrants and draft sites.	Goal Priority Ranking: High	Kooskia Fire Department	New project	Landowners, grants, and donations	Ongoing project
Wildfire	Koos-4. Educate residents on Firewise-type principles and hazards in local communities.	Goal Priority Ranking: High	Kooskia and Stites Fire Departments	New project	Local budgets USFA	Ongoing project

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	Koos-5. Improve knowledge in recognition of fire setting behavior.	Goal Priority Ranking: Moderate	KFD and schools	New project	Local budgets, schools, and private foundations	Ongoing project
Wildfire	9.17-1. Obtain updated rolling stock, portable pump, hand tools, PPE, handheld radios, and other miscellaneous equipment for the Kooskia Volunteer Fire Department.	Goal #1,3,5, 8 & 10 Priority Ranking: Moderate	Kooskia VFD	Partially Complete	Idaho, IDL, BLM, and USFS <i>Potential Funding</i> : Appendix 7 - #24	2017
Flood	9.17-2. Develop city policies to restrict development in flood zone to help prevent losses.	Goal #1,3,5,6, & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	2018
Flood	9.17-3. Increase City of Kooskia participation in National Flood Insurance Program.	Goals #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - # 20	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Flood	9.17-4. Request FEMA update of Flood Insurance Rate maps.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : City Budget	2018
All Hazards	9.17-5. Develop and deliver public education programs on hazard mitigation.	Goal #1,3,4,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County, USFS, BLM, IDL, Public Health Dept, fire depts., and local schools. <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
Flood	9.17-6. Improve program application and coordination with county floodplain ordinance.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management. <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
All Hazards	9.17-7. Update City's list of available emergency shelters.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Completed (continue)	Idaho County Disaster Management <i>Potential Funding</i> : City Budget	Ongoing
Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
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All Hazards	9.17-8. Develop action plan for dealing with special needs populations during emergencies.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Short Term
All Hazards	9.17-9. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Disaster Management	Partially completed	Kooskia City Council <i>Potential Funding</i> : Appendix 7 - # 20	Ongoing
All Hazards	9.17-10. Coordinate Kooskia Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Partially completed	Idaho Transportation Department and Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
Severe Weather	9.17-11. Continue participation in StormReady program and recertify every third year.	Goal #1,3,5 & 8 Priority Ranking: Moderate	Idaho County Disaster Management	Current	Kooskia City Council <i>Potential Funding</i> : Appendix 7 - #20	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	9.17-12 . Identify, assess, and hardwire most appropriate critical facilities and shelters throughout the City of Kooskia for use with a portable generator.	Goal #1,3,5, 8 & 9 Priority Ranking: Moderate	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Immediate Short Term
All Hazards	9.17-13. Identify and promote the acquisition of necessary resources designed to protect critical facilities from hazards and enhance sheltering capacity and capability.	Goal #1,3,5 & 8 Priority Ranking: High	Idaho County Disaster Management	Incomplete	Kooskia City Council <i>Potential Funding</i> : Appendix 7 - #20 & 2	Immediate Ongoing
Wildfire	9.17-14. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Disaster Management	Incomplete	Kooskia City Council, local fire districts, Bureau of Land Management, US Forest Service, and Idaho Department of Lands. <i>Potential Funding</i> : Appendix 7 - #25	Immediate Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Floods and Severe Weather	9.17-15. Install or replace storm water drains and/or systems where needed throughout the County and Cities to help reduce flooding potential.	Goal #1,3,5 & 8 Priority Ranking: High	Kooskia City Council	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
Wildland Fire	9.17-16. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Fire Mitigation Committee	Incomplete	Idaho County, utility companies, Bureau of Land Management, US Forest Service, Idaho Department of Lands, and City of Kooskia <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
Flood and Earthquake	9.17-17. Assess location and stability of well intakes located in the flood zone. Reinforce well intakes where needed.	Goal #1,3,5,8 & 9 Priority Ranking: Moderate	Kooskia Public Works	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Ongoing
Earthquake	9.17-18. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary.	Goal #1,3,5,8 & 9 Priority Ranking: Low	Kooskia Public Works	Incomplete	Idaho County Disaster Management <i>Potential Funding</i> : Appendix 7 - #20	Long Term

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	9.17-19. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8 & 9 Priority Ranking: High	Local fire department/ district	Partially completed	Idaho County and Kooskia City Council <i>Potential Funding</i> : Appendix 7 - #20 & 24	Ongoing
All Hazards	9.17-20. Address and obtain funding for fire department resource and capability enhancements through the Federal Excess Property program.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire department/ district		Idaho County, Kooskia City Council, IDL, BLM and USFS <i>Potential Funding</i> : Appendix 7 - #24	Ongoing
Completed	projects					
Hazards addressed	2015 Pr	oject ID and Descr	iption	Responsible Organization	e Detail	S

City of Riggins Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Landslide	R-1. Continue improvement of Salmon River Road to help prevent slides and improve safety.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Idaho County Road and Bridge	Partially complete in some locations- Idaho County jurisdiction.	Riggins City Council Pre-Disaster Mitigation Program	Long Term
All Hazards	R-2. Develop and deliver public education programs on hazard mitigation.	Goal #1,3,4,5, & 8 Priority Ranking: High	Riggins City Council	Incomplete	Idaho County, USFS, BLM, IDL, Public Health Dept, fire depts., and local schools. Pre-Disaster Mitigation Program	Ongoing
All Hazards	R-3. Develop action plan for dealing with special needs populations during emergencies.	Goal #1,3,5, & 8 Priority Ranking: High	Riggins City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Short Term

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	R-4. Coordinate a Riggins Evacuation Plan with existing or future plans developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5, & 8 Priority Ranking: High	Riggins City Council	Not completed	Idaho Transportation Department and Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	R-5 . Identify, assess, and hardwire most appropriate critical facilities and shelters throughout Riggins for use with a portable generator.	Goal #1,3,5,8, & 9 Priority Ranking: Moderate	Riggins City Council	Not completed	Idaho County Disaster Management Pre-Disaster Mitigation Program	Immediate Short Term
Floods and Severe Weather	R-6. Install or replace storm water drains and/or systems where needed throughout the County and Cities to help reduce flooding potential.	Goal #1,3,5, & 8 Priority Ranking: Moderate	Riggins City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Long Term
Earthquake	R-7. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary.	Goal #1,3,5, & 8 Priority Ranking: Low	Riggins	Not completed	Riggins Public Works Community Disaster Loans	Long Term Contingent on funds

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	R-8. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Goal #1,3,5,8 & 9 Priority Ranking: High	Riggins Public Works	Partially completed	Idaho County Rural Fire Districts Pre-Disaster Mitigation Program	Ongoing
All Hazards	R-9. Address and obtain funding for both Riggins Fire and Salmon River Rural VFDs. Funding is for resource and capability enhancements through Federal Excess Property program and other means of enhancing capabilities.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire departments and districts	Partially Complete	Idaho County, IDL, BLM, and USFS Volunteer Fire Department Assistance	Ongoing

Completed projects

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
Earthquake	9.14-3. Evaluate Race Creek bridge to insure seismic stability.	Idaho	ITD evaluated and made
		Transportation	improvements
		Department	

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
All Hazards	9.14-9. Update Riggins' list of available emergency shelters.	City and Idaho County	Completed along with school and American Red Cross
All Hazards	9.14-11. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County.	Idaho County Disaster Management	Completed – IPAWS and Reverse Calling (Alert Sense)
Severe Weather	9.14-13. Continue participation in StormReady program and recertify every third year.	Idaho County Disaster Management	Completed to the extent the program is still administered by NOAA-Missoula

City of Stites Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildfire	S-1. Obtain or construct fire station for the Stites Fire Department and provide training. Acquire updated rolling stock, P25 radios, PPEs, tools, and miscellaneous other equipment.	Goal #1,3,5,8 & 10 Priority Ranking: Moderate	Stites Fire Department	Plans for it, working on funding	Idaho County, IDL, BLM, and USFS Volunteer Fire Department Assistance	Ongoing
Flood	S-2. Develop county and city policies to restrict development in flood zone to help prevent losses.	Goal #1,3,5,8 & 9 Priority Ranking: High	Stites City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Long-term
Flood	S-3. Increase County and City of Stites participation in National Flood Insurance Program.	Goals #1,3,5, & 8 Priority Ranking: High	Stites City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Flood	S-4. Request FEMA update of Flood Insurance Rate maps.	Goal #1,3,5, & 8 Priority Ranking: High	Stites City Council	Incomplete	Idaho County Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	S-5. Develop and deliver public education programs on hazard mitigation.	Goal #1,3,4,5, & 8 Priority Ranking: High	Stites City Council	Incomplete	Idaho County, USFS, BLM, IDL, Public Health Dept, fire depts., and local schools. Pre-Disaster Mitigation Program	Ongoing
Flood	S-6. Improve program application and coordination with county floodplain ordinance.	Goal #1,3,5, & 8 Priority Ranking: High	Stites City Council	Incomplete	Idaho County Disaster Management. Pre-Disaster Mitigation Program	Ongoing
All Hazards	S-7. Develop action plan for dealing with special needs populations during emergencies.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management	Incomplete	Stites City Council Pre-Disaster Mitigation Program	Long-term
All Hazards	S-8. Develop hazard event communication and coordination strategy with all municipalities and jurisdictions in Idaho County.	Goal #1,3,5, & 8 Priority Ranking: High	Idaho County Disaster Management	Partially completed	Cities of; Stites, Ferdinand, Riggins, White Bird, Cottonwood, Grangeville, Kamiah, and Kooskia. Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	S-9. Coordinate Stites Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5, & 8 Priority Ranking: High	Stites City Council	Partially completed	Idaho Transportation Department and Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
Wildfire	S-10. Plan, fund, and implement home and community defensible space and hazardous fuels reduction projects.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Disaster Management	Incomplete	City of Stites, local fire districts, Bureau of Land Management, US Forest Service, and Idaho Department of Lands. Western States Fire Managers Wildland Urban Interface Grant Program	Ongoing
Floods and Severe Weather	S-11. Install or replace storm water drains and/or systems where needed throughout the city to help reduce flooding potential.	Goal #1,3,5,8 & 9 Priority Ranking: High	Stites Public Works	Incomplete Some progress by analyzing the issue, developing a plan	Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Wildland Fire	S-12. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	Goal #1,3,5,8,9, 10 & 11 Priority Ranking: High	Idaho County Fire Mitigation	Incomplete	Idaho County, utility companies, Bureau of Land Management, US Forest Service, Idaho Department of Lands, and City of Stites Western States Fire Managers Wildland Urban Interface Grant Program	Ongoing
Earthquake	S-13. Inspect highest risk public buildings for unreinforced masonry and seismic stability. Retrofit as is deemed necessary. As new buildings are constructed, build for seismic stability.	Goal #1,3,5,8 & 9 Priority Ranking: Low	Stites City Council	Incomplete	Idaho County Disaster Management Pre-Disaster Mitigation Program	Long Term
All Hazards	S-14. Address and obtain funding for fire department resource and capability enhancements through Federal Excess Property program.	Goal #1,3,5, & 8 Priority Ranking: High	Local fire departments and districts	Incomplete	Idaho County, IDL, BLM, and USFS Volunteer Fire Department Assistance	Ongoing

Completed Projects

Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details
Flood and	9.15-17. Assess location and stability of well intakes located in the	Stites Public	Completed
Earthquake	flood zone. Reinforce well intakes where needed.	Works	
Wildfire	9.15-19. Assess and replace inadequate water main lines where needed to improve fire protection capabilities.	Local fire department/ district	Upgraded water lines to 8" Added several hydrants

Increased capacity to 175,000 gallons

City of White Bird Mitigation Action Items

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
Flood	WB-1. Identify mitigation and maintenance measures deemed appropriate for the White Bird levee and seek appropriate implementation funding.	Goal #1,3,5,8 & 9 Priority Ranking: High	Flood District #6	Incomplete	Idaho County Disaster Services Pre-Disaster Mitigation Program	Short Term
Flood	WB-2. Increase City of White Bird participation in National Flood Insurance Program.	Goals #1,3,5,8 & 9 Priority Ranking: High	White Bird City Council	Incomplete	Idaho County Disaster Management City Budget	Ongoing
Flood	WB-3. Request FEMA update of Flood Insurance Rate maps.	Goal #1,3,5, & 8 Priority Ranking: High	White Bird City Council	Incomplete	Idaho County Disaster Management City Budget	Ongoing
All Hazards	WB-4. Update City's list of available emergency shelters.	Goal #1,3,5, & 8 Priority Ranking: High	White Bird City Council	Completed (continue)	Idaho County Disaster Management City Budget	Ongoing

Hazard	Action Item	Goals Addressed	Responsible Departments or Organizations	2022 Status	Potential Resources	Project Target Year
All Hazards	WB-5. Coordinate White Bird Evacuation Plan with existing Plan developed by the Idaho Transportation Department acknowledging the lack of alternate routes in many communities.	Goal #1,3,5, & 8 Priority Ranking: High	White Bird City Council	Partially completed	Idaho Transportation Department and Idaho County Disaster Management Pre-Disaster Mitigation Program	Ongoing
All Hazards	WB-6 . Identify, assess, and hardwire most appropriate critical facilities, such as drinking water system or fire station, throughout the City of White Bird for use with a portable generator.	Goal #1,3,5,8 & 9 Priority Ranking: Moderate	White Bird City Council	Carried over from previous plan but contingent on funding	Idaho County Disaster Management Pre-Disaster Mitigation Program	Immediate Short Term
Wildfire	 WB-7. Some areas are lacking for water storage, storage is inadequate for fire trucks hook up. Some hydrants aren't working, Fire hydrants are hooked up to main line. Build a separate water system for emergency use only including specific fire suppression water tanks. 	Goal #1,3,5,8,9 & 10 Priority Ranking: High	Local fire department/ district	New project	Pre-Disaster Mitigation Program Volunteer Fire Department Assistance	Long Term

Completed Projects						
Hazards addressed	2015 Project ID and Description	Responsible Organizations	Details			
All Hazards	9.18-2. Construct a new two-story building to house equipment and provide a training facility for firefighters. Acquire everything required to operate an effective fire department including two structural engines, one brush truck, a water tender, hand and shop tools, PPE's, hoses, nozzles, foam capabilities, etc.	White Bird Volunteer Fire Department	Built a 4-bay building for four trucks in 2018 Picked up one structure truck donated from McCall Fire			
Flood	9.18-3. Develop city policies to restrict development in flood zone to help prevent losses.	White Bird City Council	Flood ordinance created			
Wildland Fire	9.18-17. Plan, fund, and implement fuels reduction projects along roads, power lines, municipal watersheds, and other infrastructural components.	White Bird	Regular maintenance is being done on city jurisdiction			
All Hazards	9.18-23. Upgrade City Water Treatment Facility	White Bird City Council	Recently upgraded the piping and pumps in existing wells, using a USDA grant. Will drill a new well to put online with the existing wells. Also paid for telemetry, new piping, new pumps, and in the process of drilling a new well. Also have a new chlorination system.			