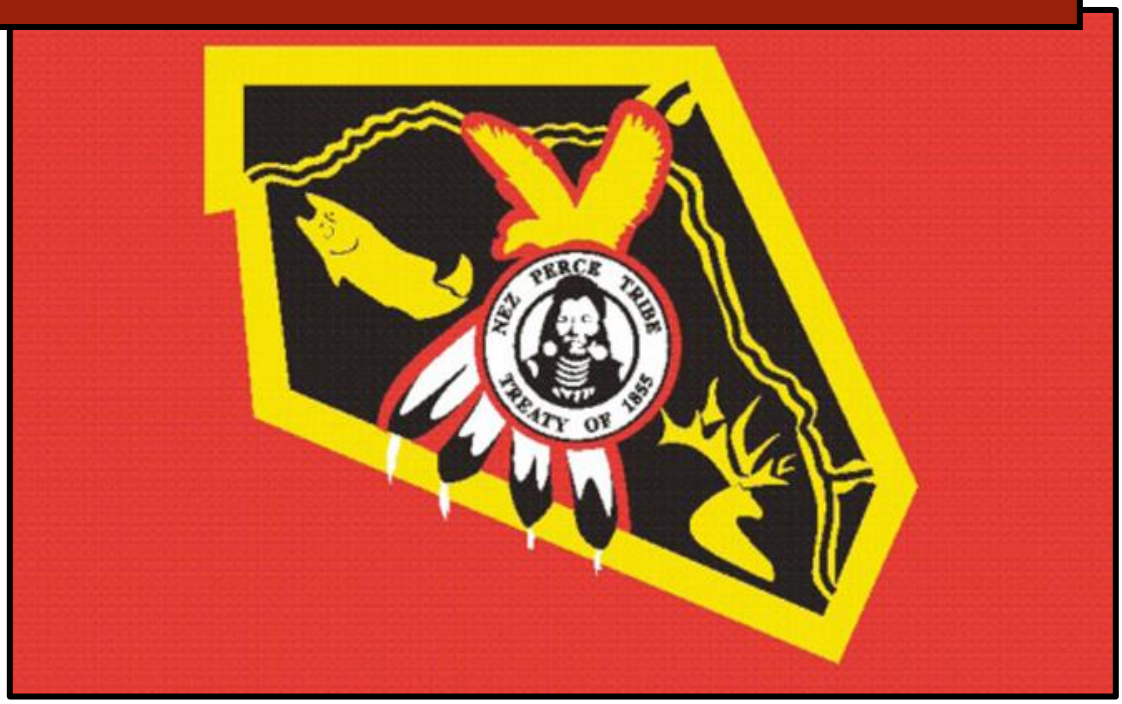
Nez Perce Tribe

Natural Hazard Mitigation Plan 2019 Revision



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Forward

Nez Perce Tribal Emergency Management is dedicated to the protection of life, property, economic and environmental resources throughout the Reservation. Seeking to inform and educate citizens, provide training and resource coordination and ultimately reduce the vulnerability of Tribal citizens through comprehensive disaster planning and mitigation.

"Hazard mitigation is sustained action to reduce or eliminate the long-term risk to human life and property from hazards. Natural hazard mitigation planning is a process used by state, tribal, and local governments to engage stakeholders, identify hazards and vulnerabilities, develop a long-term strategy to reduce risk and future losses, and implement the plan, taking advantage of a wide range of resources. A state mitigation plan demonstrates commitment to reduce risks from natural hazards and serves as a guide for decision makers for reducing the effects of natural hazards as resources are committed"[1]

The **Nez Perce Tribe Natural Hazard Mitigation Plan** was updated in 2017-19 by the Nez Perce Tribe Hazard Mitigation Steering Committee in cooperation with Northwest Management, Inc. of Moscow, Idaho. This Plan satisfies the requirements for a local natural hazard mitigation plan under 44 CFR Part 201.6, in addition this plan fully integrated the processes of FEMA's Natural Hazard Mitigation Plan with the Community Wildfire Protection Plan as outlined in the Healthy Forest Restoration Act.

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

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Acronyms

AFG	Assistance to Firefighters Grant
ANA	Administration for Native Americans
DMA 2000	Disaster Mitigation Act of 2000
CFR	Code of Federal Regulations
cfs	cubic feet per second
EHS	Extremely Hazardous Substance
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
IDWR	Idaho Department of Water Resources
NFIP	National Flood Insurance Program
NPT	Nez Perce Tribe
NPTEC	Nez Perce Tribal Executive Committee
PDM	Pre-Disaster Mitigation grant program
Reservation	Nez Perce Reservation
SFHA	Special Flood Hazard Area
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
HMP Committee	Hazard Mitigation Planning HMP Committee
Tribe	Nez Perce Tribe
NMI	Northwest Management Inc.

Chapter 1

Background

Natural hazards are inherent properties of the Earth that can influence and impact both living and non-living features of the natural environment. Natural hazards vary in scale and potential impact; localized windstorms are capable of damaging and uprooting individual trees while volcanic eruptions can impact or destroy hundreds of square miles of terrain and cause widespread mortality of plants and animals. Certain types of natural disasters are far more common in some regions of the United States than in others. The Pacific Northwest is associated with wildfire, earthquake, and volcanic hazards; the central plains often experience severe storms that are capable of producing tornados up to one mile wide; while the Atlantic coast is periodically exposed to tropical storms and hurricanes.

These different landscapes are resilient in the face of a natural disaster but humans and human development are much less so. Humans have always lived with the consequences of natural disasters which often include displaced residents, loss of property, costly clean up and repairs, and lost time which is often measured in years. In response to increasing populations and expansion of development, communities are identifying steps that can be taken to mitigate the impacts of natural hazards. Mitigation measures are preventative actions that make communities and individuals more resilient to natural hazards and reduce the cost of recovery.

The goal of this document is to accurately identify risks to the people and property on the Nez Perce Reservation and provide a plan for mitigation efforts in accordance with the Disaster Mitigation Act of 2000. The Federal Emergency Management Agency (FEMA) provides funding opportunities for mitigation actions and requires a hazard mitigation plan (HMP) that identifies risks and vulnerabilities, proposes mitigation strategies and a planning process that includes multi-jurisdictional participation along with public outreach. Additionally, the HMP Committee desires to create a document that is easy to use, actively referenced and is a key component in making the Nez Perce Reservation more resilient to natural hazards.

This Reservation-wide 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 threat posed by natural hazards to people, structures, infrastructure, and unique ecosystems on the Nez Perce Reservation. The Nez Perce Hazard Mitigation Plan was originally approved by Idaho Office of Emergency Management and FEMA in 2006 and was updated in 2009 and again in 2019. This document serves as an update of the Multi-Hazard Mitigation Plan under the Pre-Disaster Mitigation program and will be in effect until 2022. This

document assists with the identification and assessment of various potential hazards and helps maintain the Tribe's eligibility for grants and other funding.

The Multi - Hazard Mitigation Plan is developed in accordance with the requirements of FEMA and the Idaho Office of Emergency Management for a reservation-level pre-disaster mitigation plan. The State of Idaho Hazard Mitigation Plan identifies seven natural hazards affecting the State. In an effort to be consistent, the Steering Committee chose six natural hazard annexes from the state-identified natural hazards that pose the highest risk for the Tribe. The hazardous materials annex from the previous plan will also be carried over to this plan.

The hazards annexes that will be updated for this plan include:

- ✓ Flood
- ✓ Landslide
- ✓ Volcanic Eruption
- ✓ Wildland Fire
- ✓ Severe Weather
  - Drought
  - Hailstorm
  - Windstorm

It should be noted that the planning committee decided to exclude earthquake as a separate hazard in the plan as the Reservation is in a relatively stable seismic zone. Although geologists have discovered several regional faults and acknowledge the potential for earthquakes as a result of volcanic activity, earthquakes are considered a low-level threat to life and property on the Nez Perce Reservation due to the low probability of occurrence; mirroring sentiments of the 2006 and 2009 versions of the HMP.

Goals and Guiding Principles

HMP Mission Statement

To make Tribal residents, communities, 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 construction and placement, 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.

Federal Emergency Management Agency Philosophy

Effective November 1, 2004, a Natural 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 Natural 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 Natural Hazard Mitigation Plans must meet the minimum requirements of the Stafford Act-Section 322, as outlined in the criteria contained in 44 CFR Part 201. The plan criteria cover the planning process, risk assessment, mitigation strategy, plan maintenance, and adoption requirements.

FEMA will only review a Tribal Natural Hazard Mitigation Plan adopted by the tribal governing body §201.7(c)(5). Draft versions of local Natural 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.

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

- Adoption by the Tribal 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

Plan Overview

Plan Update Process (Chapter 2) describes the process by which the plan will be updated and maintained once it is adopted. This includes both committee and community involvement in all stages of the process.

The following outlines the planning process as described in §201.7(c)(1):

> **(i)** An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Tribal government defined "public;"
>
> **(ii)** As appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process;
>
> **(iii)** Review and incorporation, if appropriate, of existing plans, studies, and reports; and
>
> **(iv)** Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.

Chapter 2 also describes the HMP Committee's formal plan maintenance process to ensure that the HMP remains an active and applicable document. The process includes monitoring, evaluating, and updating the HMP, monitoring the mitigation measures and project closeouts, and incorporating public input throughout the HMP's 5-year lifespan.

History and description of the Reservation (Chapter 3) provides a general history and background of the Tribe and historical trends for population, demographic, and economic conditions that have shaped the area. Trends in land use and development are also discussed. For public participation in the planning process the Tribal Government defines "public" as current Tribal members.

Risk Assessment Overview (Chapter 4) details the process of identifying hazards and describes the process through which the HMP Committee identified and compiled relevant data on all potential natural hazards that threaten the Reservation and the immediately surrounding area. Information collected includes historical data on natural hazard events that have occurred in and around the Reservation and how these events impacted tribal members and their property.

The descriptions of natural hazards that could affect the Reservation are based on historical occurrences and best available data from agencies such as FEMA, the U.S. Geological Survey, the Idaho Geologic Survey, and the National Weather Service. Detailed hazard profiles include

information on the frequency, magnitude, location, and impact of each hazard as well as probabilities for future hazard events.

In addition, Chapter 4 identifies potentially vulnerable assets such as people, housing units, critical facilities. These data were compiled by assessing the potential impacts from each hazard using U.S. Census data, and the Nez Perce Tribe Land Services Program and Housing Authority, and GIS. The resulting information identifies the full range of hazards that the Reservation could face and potential social impacts, damages, and economic losses.

Mitigation Strategy (Chapter 5) first provides an overview of the Tribe's resources in the following areas for addressing hazard mitigation activities:

- Existing ordinances, plans, and codes that affect the physical or built environment
- The current and potential financial resources to implement the mitigation strategy

Chapter 5 also describes the process in which the HMP Committee:

- Verified mitigation goals based upon the findings of the risk assessment and the capability assessment
- Reevaluated a comprehensive range of appropriate mitigation actions from the 2009 HMP
- Reconfirmed mitigation actions to be included in the 2019 HMP's Action Plan

The appendices include the Adoption Resolution, maps and figures, HMP Committee agendas, and public involvement process.

Update and Adoption Requirements

Adoption by the governing body demonstrates a community's commitment to fulfilling the mitigation goals and objectives outlined in the HMP. Adoption legitimizes the HMP and authorizes responsible agencies to execute their responsibilities. Following adoption by the Nez Perce Tribal Council, the plan was reviewed and approved by the Idaho Office of Emergency Management and FEMA. A copy of the resolution, adopted by the NPTEC, assures FEMA that the Tribe will comply with both of the CFR requirements. The resolution is presented in Appendix 2.

The following is a brief summary of the plan update requirements for Tribes:

- *Deadlines and Requirements for Regular Plan Reviews and Updates*: In order to apply for a FEMA PDM project grant, Tribal and local governments must have a FEMA-approved mitigation plan. Tribal and local governments must have a FEMA-approved mitigation

plan in order to receive HMGP project funding for disasters declared on or after November 1, 2004. States and Tribes must have a FEMA-approved Standard or Enhanced Mitigation Plan in order to receive non-emergency Stafford Act assistance (i.e., Public Assistance Categories C-G, HMGP, and Fire Management Assistance Grants) for disasters declared on or after November 1, 2004. State mitigation plans must be reviewed and reapproved by FEMA every three years. Local Mitigation Plans must be reviewed and reapproved by FEMA every five years.

- *Plan updates*. In addition to the timelines referenced above, the Rule includes the following paragraphs that pertain directly to the update of State, Local, and Tribal plans;
    - ***§201.3(b)(5) [FEMA Responsibilities]*** …Conduct reviews, at least once every three years, of State mitigation activities, plans, and programs to ensure that mitigation commitments are fulfilled….
    - ***§201.7(c)(4) [Indian tribal governments]*** …A system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.
    - ***§201.7(d)(3) [Tribal]*** must review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for non-emergency Stafford Act assistance and FEMA mitigation grant funding, with the exception of the Repetitive Flood Claims program.

Plan updates must include a system for reviewing the progress on mitigation activities that were identified within the plan. This will involve a comprehensive review and evaluation of each section of the plan and a discussion of the results of evaluation and monitoring activities detailed in the Plan Maintenance section of the previously approved plan. Updates to the plan may validate the information in the previously approved plan, or may involve a major plan rewrite. In any case, a plan update is NOT an annex to the previously approved plan; it must stand on its own as a complete and current plan.

The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure on the Nez Perce reservation while facilitating new opportunities for pre-disaster mitigation funding and cooperation.

Chapter 2

Documentation of the planning process, including public involvement, is required to meet FEMA's DMA 2000 ***(44CFR§201.7(b)*** and ***§201.7(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 involved agencies participated.

Plan Update Process

The Tribal Multi - Hazard Mitigation Plan was developed through a collaborative process with outreach to many of the organizations within the jurisdictional boundaries of Tribal lands. Nez Perce Tribe Emergency Management invited stakeholders to planning meetings throughout the planning process, including personnel from wildlife management, historical preservation, forestry and fire, emergency management, air quality, and others. The planning effort began by organizing and convening a Tribal Steering Committee that incorporated all departments of the Tribal Government as well as outside agencies and neighboring jurisdictions.

The Tribe utilized members of the Tribal Emergency Response Planning Team (TERPT) to develop the Hazard Mitigation Plan Committee and begin the update process. HMP Committee meetings began in July of 2017, with meetings held in October, December, January, and March.

The planning process included seven distinct steps which were in some cases sequential (step 1 then step 2) and in some cases intermixed (step 5 completed throughout the process):

1. **Organization of Resources** – The Tribe and Northwest Management Inc. (NMI) worked together to develop a comprehensive list of potential participants as well as a project timeline and work plan. The HMP Committee served as the basis for identifying stakeholders that could provide valuable insight into risk assessments and mitigation strategies during the update process.

2. **Collection of Data –** Nez Perce Tribal GIS Department collected all data performed in the risk assessment and ancillary data for background information.

3. **Field Observations and Estimations –**Nez Perce Tribal GIS Department developed risk models and identified problem areas in order to better understand risks, juxtaposition of structures and infrastructure to risk areas, access, and potential mitigation projects. Many of the analyses used in the 2009 plan were reviewed and updated to incorporate new hazard vulnerabilities or changes in development. Additionally, several new risk models and analyses were included in the 2017-19 update process to better represent actual conditions on the Reservation.

4. **Mapping –** Nez Perce Tribal GIS Department developed mapping products as visual tools to support various analyses. All of the maps and databases were updated as part of the 2019 plan update.

5. **Public Involvement –** the HMP committee with NMI developed a plan to involve the public from the formation of the committee through public meetings and workshops, public review of draft documents, and acknowledgement of the final updated plan by the signatory representatives.

6. **Strategies and Prioritization** – NMI and the HMP Committee representatives worked together to review the risk analyses and develop realistic mitigation strategies. As part of the 2019 plan update, a record of completed action items as well as a status report of projects was included in the revised mitigation strategies for each jurisdiction.

7. **Drafting of the Report –** NMI drafted a final updated report document and worked with members of the planning team to review each section, incorporate public comments, proceed with the state and federal review processes, and adopt the final document.

Tribal Involvement

Individuals that were a part of the HMP Committee, their roles within the planning team, and the jurisdiction they represent are highlighted in Table 1. The HMP Committee made efforts to include individuals, tribal departments, outside state and federal agencies, neighboring counties, and others that have an interest in hazard management on the Reservation.

Table 1) Nez Perce Reservation HMP Steering Committee members.

Name	Department & Title	Role in the Planning Process
John Wheaton	Emergency Management, EM Planner	Project Coordinator
Aaron Miles Sr.	Natural Resources, Manager	EOC Wildland Fire Experience
Alexis Walker	Human Resources, Risk Management	Personnel and Building Safety
Anthony Broncheau	Finance, Grants Coordinator	Finance Review
Antonio Smith	ERWM, Communications Specialist	Public Information Officer Alt.
Danae Wilson	Information Technology, Director	Interoperability
Darren Williams	Legal, Attorney	Provided policy and legal information
Dave Arther	NMPH, Nurse	Update Health Information
Dave Johnson	Fisheries, Manager	Fisheries protection and resources
Dean Neufeld	Public Health, Emergency Management	Training and Public Health Expertise
Debbie Henry	Former Safety Coordinator	Critical Infrastructure Safety
Ferris Paisano	NPT Executive Committee Law and Order Chair	Emergency Management Rep.

Name	Department & Title	Role in the Planning Process
Jack Bell	ERWM, Director	Damage Assessment
Jackie McArthur	Social Services, Director	Vulnerable Populations
Jeff Handel	Forestry and Fire Management (FFM), FMO	Wildland fire expert
John Degroot		
Julie Simpson	Air Quality Program, Coordinator	Weather and air quality expertise
Kayeloni Scott	Communications Director	Communications Expertise
Keith Baird	Tribal Historic Preservation	Cultural Analysis
Ken Clark	Water Resources, Director	Waterways expertise
Kerey Barnowe-Meyer	Wildlife Biologist	Integrated Resources Planning
Kim Cannon	Land Services, Director	Tribal Lands Expertise
Kip Kemak	FFM, Fire Prevention Specialist	Wildland fire expert
Laurie Ames	GIS Department, Coordinator	Mapping & risk analysis
Laurie Ann Cloud	Housing, Manager	Housing Assistance
Mark Reaney Jr.	NMPH, Facilities Manager	Health Facilities Expertise
Marty Antone	NPT Chief of Police	Law Enforcement
Neil Thagard	Wildlife, Director	Wildlife Expertise
Rebecca Miles	Nez Perce Tribe, Executive Director	Coordinates Logistics
Rob Feeley	Idaho Office of Emergency Management, AFO	State Resources Expertise
Ryan Bender	Public Health, Specialist	Coordinated trainings and plans
Stefanie Krantz	Water Resources, Climate Change Coordinator	Provide information on the influence of climate change to hazards.
Tim Droegmiller	FFM, Acting Fuels Specialist	Provide information on the current fuels conditions across the Reservation.
Mark Corrao	Northwest Management Inc.	Project Lead for NMI
Tera King	Northwest Management Inc.	Project Support for NMI
Eric Nelson	Northwest Management Inc.	Project Support for NMI

Public Involvement

Public involvement in this plan was made a priority from the inception of the project. There were a number of ways that public involvement was sought and facilitated. In some cases, this led to members of the public providing information and seeking an active role in protecting their own homes and businesses, while in other cases it led to the public becoming more aware of the process without becoming directly involved in the planning.

Nez Perce Tribe Emergency Management and NMI worked together to develop a brochure to help educate and inform the public on the process the HMP Committee was involved in and what that meant for Tribal members. Two public meetings were used to facilitate information sharing to the public on the various risk analyses and mitigation action items. During these meetings, discussions were led and forms were provided to help gather feedback about the plan components and emergency management issues in general.

The workshops were held in the following locations:

- Public Workshop #1 was an evening meeting hosted at the Wa-A'Yas Community Center in Kamiah.Public
- Workshop #2 was a full day event held at the Clearwater Casino near Lapwai.

Following the approval by the HMP committee and NPTEC of the draft document, a period of public comment was provided to further incorporate input on the process and results of the updated Hazard Mitigation Plan.

Incorporation of Existing Plans

During the planning process, and in particular when preparing the hazard analysis and vulnerability analysis, the HMP Committee consulted various hazard and mitigation-related plans and studies, including the following:

1. ***Nez Perce Tribe Hazard Mitigation Plan*** (2009): Review of the previous HMP provided a base for reviewing and updating community profiles, hazards, risks, and mitigation action progress.

2. ***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.

3. ***Idaho County, Idaho Multi-Hazard Mitigation Plan*** (2015): The Idaho County HMP was referenced for updating hazard profiles and potential mitigation efforts that may overlap with Tribal mitigation strategies. Other counties that fall within the Reservation were in the process of updating their Hazard Mitigation Plans and were therefore not reviewed.

After the adoption of the HMP, the Steering Committee will ensure that elements of the HMP are incorporated into other existing planning mechanisms. The processes for incorporating the HMP into various planning documents will occur as (1) other plans are updated and (2) new plans are developed. Accordingly, the Steering Committee will ensure that:

- As the Emergency Operations Plan is updated, mitigation action 2.D (emergency evacuation programs) is addressed.
- As the Hazard Analysis Priorities is updated, mitigation action 3.B (dam inundation maps) is addressed.
- New GIS hazard and asset information from the HMP is integrated into the Tribe's GIS program.

Plan Maintenance

Evaluating and Updating the Plan

The HMP update was prepared as a collaborative effort among Tribal members on the Steering Committee. The Tribe will continue to use the Steering Committee to monitor, evaluate, and update the HMP. The Emergency Management Coordinator (Steering Committee leader) will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and revise the HMP.

Over the past three years, the HMP has not been reviewed. In order to ensure that the HMP will be reviewed on an annual basis, a more streamlined plan maintenance approach will be followed. Every July, the Steering Committee leader will email the Steering Committee and ask each member to review the plan and submit any updates or changes that may need to be made to the plan based on changes to the Hazard Profile, Tribal assets, or the Action Plan. The Steering Committee leader will collect all correspondence and determine if changes need to be made to the plan immediately or should be made prior to the plan update in 2014.

During the third year of adoption, the Steering Committee will undertake the following activities to evaluate the plan and ensure that the HMP is readopted in a timely manner:

- Review all annual email correspondence regarding plan maintenance.
- Thoroughly analyze and update the Risk Assessment.
- Prepare a new Action Plan with prioritized actions, responsible parties, and resources.
- Prepare a new draft HMP and submit it to the Tribal General Council for adoption.
- Submit an updated HMP to the FEMA for approval.

Obtaining Continued Public Involvement

The Steering Committee is dedicated to involving the public directly in the continual reshaping and updating of the HMP. A copy of the plan will be available at the Tribe's Main Office.

The Steering Committee will also identify opportunities to raise community awareness about the HMP and the hazards that affect the Tribe. This effort could include attendance and provision of materials at Tribal emergency preparedness and response special events.

Chapter 3

This section describes the history, location, and geography of the Tribe and the Reservation as well as its government, demographic information, and current land use and development trends.

History and Description of the Reservation

The Nez Perce Indians, who call themselves NiMiiPuu, have resided in what is now north-central Idaho, southeastern Washington, and northeastern Oregon for thousands of years. Until the mid-1800s, the tribe's aboriginal territory included over 13 million acres. The territory centered on the middle Snake and Clearwater Rivers and the northern Salmon River.

In 1855 the Nez Perce Indians signed a treaty with the U.S. Government reserving 7.5 million acres of land for the Nez Perce Reservation. However, the discovery of gold by the early 1860s prompted the U.S. Government to reduce the Reservation by almost 90 percent, to its current size of 770,000 acres[2] (Figure 1).

Figure 1) Historical and current day boundaries of the Nez Perce Reservation.

By 1877, with continued pressure to sell off the Nez Perce lands, the U.S. Government tried to persuade a band of Nez Perce Indians to leave Oregon and move to the Reservation. While the tribal chiefs began to make preparations to comply, a handful of young warriors attacked some white ranchers in revenge for the rancher killing a warrior's father, thus beginning the 3-month Nez Perce War.

[2] "Gold and the Nez Perce." *Native American Netroots*, 19 Apr. 2011, nativeamericannetroots.net/diary/929. Accessed 14 Sept. 2018

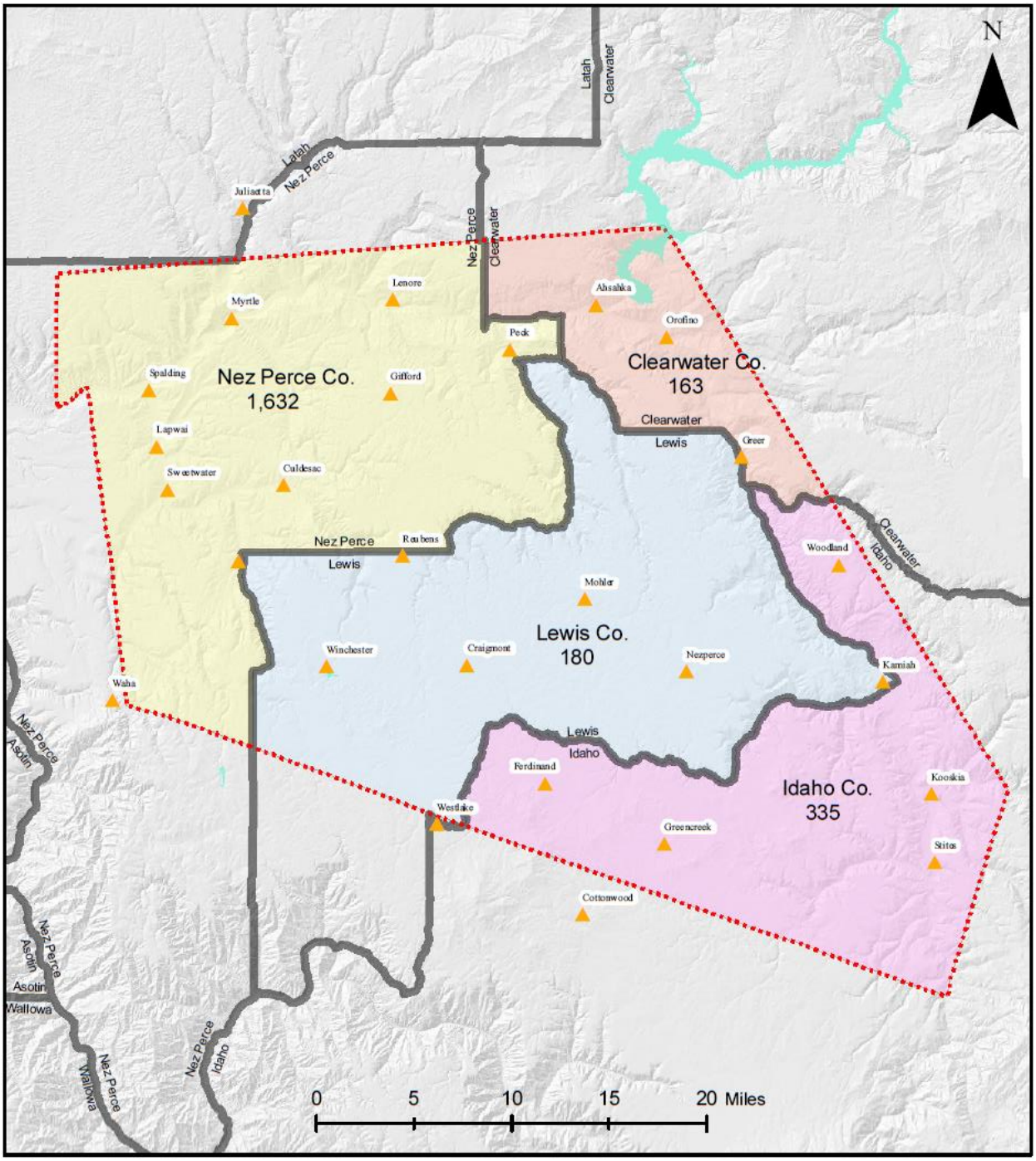

Figure 2) Map of towns and communities on the Nez Perce Reservation and Native American population by County per the 2010 Census.

The Nez Perce first fled to Montana and then to Idaho before heading north toward Canada. On September 30, about 40 miles from the Canadian border, a bitter battle ensued and 5 days later, Chief Joseph surrendered with over 400 other tribal members. During the surrender, the U.S. Government promised to return the Nez Perce Indians to the Reservation, but instead, they were sent to Oklahoma. Most of the Nez Perce War survivors returned to the Northwest in

1885. Ten years later, the Dawes Severalty Act opened the Reservation to non-Indians. As a result, by 1975, less than 80,000 acres of “checkerboard” land remained under Nez Perce and individual tribal member ownership. Since 1980, a land acquisition program has resulted in an increase of Nez Perce ownership to approximately 100,000 acres, with an additional 40,000 acres held by individual tribal members.

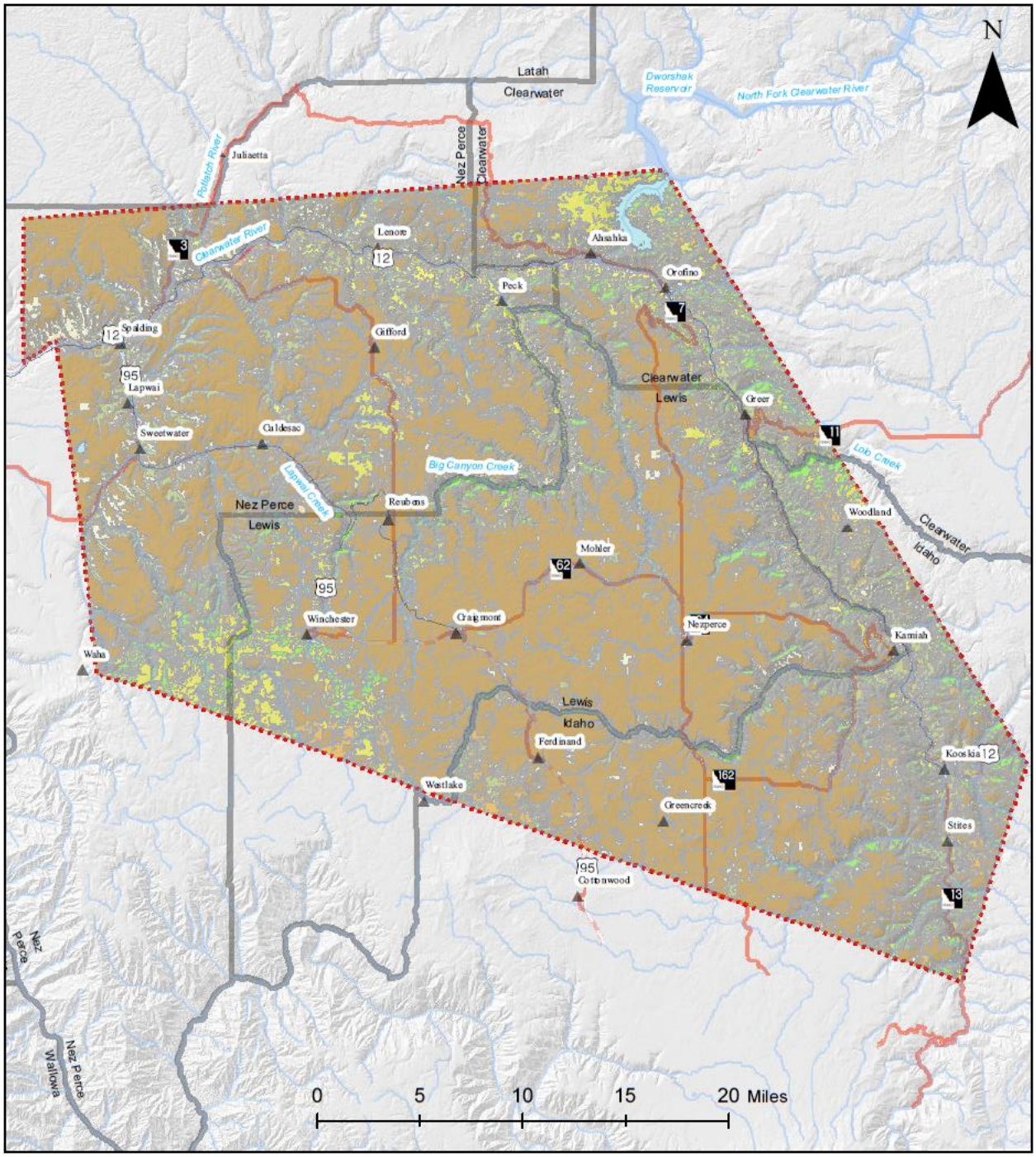

Figure 3) Different land use areas on the Nez Perce Reservation.

The 1,195.10 square miles of land and 9.22 square miles of water in the current Nez Perce Reservation are located in Nez Perce, Lewis, Latah, Clearwater, and Idaho counties. Communities and towns within the Nez Perce Reservation include Myrtle, Lenore, Ahsahka, Orofino, Spalding, Lapwai, Gifford, Sweetwater, Culdesac, Greer, Reubens, Winchester, Craigmont, Nezperce, Kamiah, Ferdinand, Greencreek, Kooskia, Stites, Peck, Cottonwood Creek, Jacques Spur, Slickpoo Mission, Mohler, and Clear Creek. Figure 2 shows the locations of towns and communities and population by county. Cottonwood, Waha, and Westlake are located off of the reservation but they are close to the boundary.

Government

The Tribe is governed by the Nez Perce Constitution and By-laws established in 1948 and revised in 1961. The constitution established the Nez Perce Tribal Executive Committee (NPTEC) and a council of all adult tribal members, known as the Tribal General Council. The Executive Committee, consisting of nine members, has the authority to represent the Tribe in negotiations, promote and protect the health, education, and general welfare of Tribal members, administer unrestricted Tribal funds, and set rules governing Executive Committee nominations and elections.

Demographics

Historically, the Tribe had a population around 6,000, which fell to roughly 1,800 by the 1900s. The decrease in population was due to epidemics from and conflicts with white settlers. Today, the Tribe's population is 4,082. This includes 1,372 children (up to 19 years old) and 543 elders (55 years and older).

With focuses on natural resources, the Tribe's economic base has traditionally centered around fisheries and forestry. With the construction of the It'se-Ye-Ye and the Clearwater River Casinos the Tribe has diversified its economic base significantly.

Land Use and Development Trends

The Nez Perce Tribe Land Enterprise Subcommittee is responsible for the generation of revenue through land leasing for the benefit of the Nez Perce Tribe as well as the acquisition of land both on and near the Nez Perce Reservation. Over the past 23 years the Tribe has acquired over 62,300 acres of land on and off the Nez Perce Reservation for economic development, timber management, and wildlife management (Figure 3). In 2004-2006, as part of the Nez Perce Snake River Basin Agreement on water rights, approximately 11,297 acres of scattered tracts of public domain (i.e. Trust lands) were identified for transfer to the Nez Perce Tribe. The total acreage of land administered by the Land Enterprise is 110,000 acres with 55,000 acres in Tribal Trust

(i.e. no Individual Trust in this total) and 12,000 acres of fee land on the reservation and 39,000 acres of fee land off the reservation. Figure 4 shows land by ownership on the reservation.

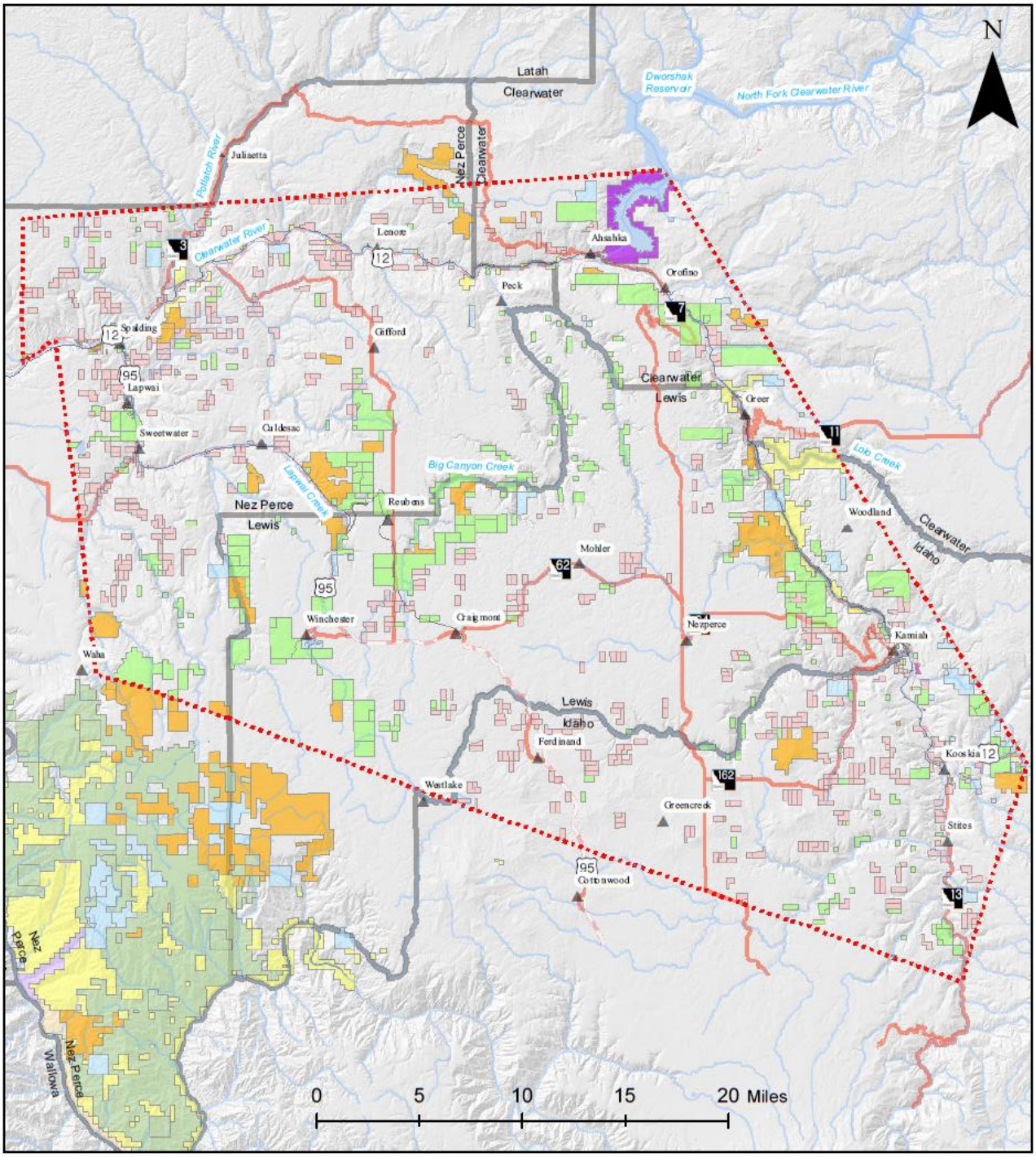

Figure 4) Land ownership on the Nez Perce Reservation.

Chapter 4

Risk Assessment Overview

*The requirement of 44 CFR **201.7(c)(2)** for conducting a risk assessment is listed below.* Understanding the risk to the Tribe requires the identification of each natural hazard that occurs within the jurisdictional boundaries of the Reservation. Profiling each hazard's spatial extent, frequency, likelihood of future occurrence, and duration will help emergency management better understand the potential impacts associated with natural hazards. Recognizing the Tribe's level of exposure to a hazard provides a measure of risk and vulnerability from a given hazard to specific locations within the Reservation (Figure 5).

(c)(2) A ***risk assessment*** that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

i. A description of the type, location, and extent of all-natural hazards that can affect the tribal planning area. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

ii. A description of the Indian tribal government_vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the tribe. The plan should describe vulnerability in terms of:

   A. The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

   B. An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;

   C. A general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions; and

   D. Cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.

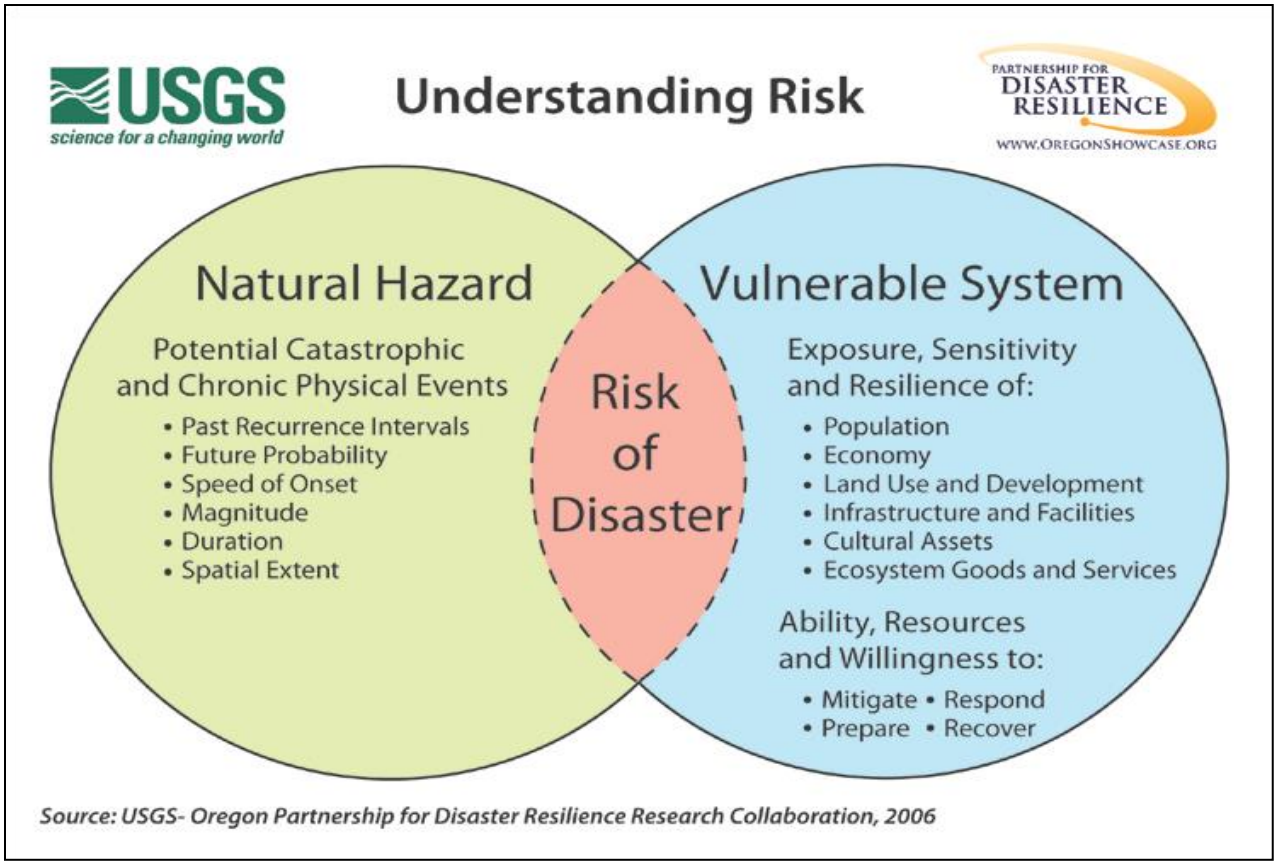

Figure 5) Components of risk per the USGS-Oregon Partnership for Disaster Resilience Research Collaboration, 2006.

Flood Hazard Profile

Hazard Description and History

Floods can be divided into two major categories on the Reservation: river and flash flood. River flooding is associated with a river's watershed, which is the natural drainage basin that conveys water runoff from rain and snowmelt. River flooding occurs when the flow of runoff is greater than the carrying capacities of the natural drainage systems. Rain water and snowmelt runoff that is not absorbed by soil or vegetation seeks surface drainage paths 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 much more dangerous and flow much faster than river floods. Flash floods are caused by the introduction of a large amount of water into a limited geographic extent (e.g. extreme precipitation events in watersheds less than 50 square miles). They also tend to peak quickly (e.g. eight hours or less) and more commonly occur in hilly or otherwise confined terrain. Flash floods occur in both urban and rural settings, principally along smaller rivers and drainage ways that do not typically carry large amounts of water. This type of flood poses more significant safety risks than river floods because of the rapid onset, the high-water velocity, the potential for channel scour, and the debris load.[3]

River Floods

The most commonly reported flood magnitude measure is the "base flood." This is the magnitude of a flood having a one-percent chance of being equaled or exceeded in any given year. Although unlikely, "base floods" can occur in any year, even successive ones. This magnitude is also referred to as the "100-year Flood" or "Regulatory Flood". 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.

[3] Statewide Regional Evacuation Study Program. Central Florida Region Technical Data Report. Volume 1-7, Chapter II – Regional Hazards Analysis. Available online at http://www.cfrpc.org/EVACUATION%20MASTER%20DVD%20-%20PDF%20VERSION/VOLUME%201/Chapter%202/CFRPC%20Chapter%20II%20-%20Hazards%20Analysis.pdf.

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."*[4]

The nature and extent of a flood event is the result of the hydrologic response of the landscape. Factors that affect this hydrologic response include soil texture and permeability, land cover and vegetation, land use and land management practices. Precipitation and snow melt, known collectively as runoff, follow one of three paths, or a combination of these paths, from the point of origin to a stream or depression: overland flow, shallow subsurface flow, or deep subsurface ("ground water") flow. Each of these paths delivers water in differing quantities and rates. The character of the landscape will influence the relative allocation of the runoff and will, accordingly, affect the hydrologic response. Unlike precipitation and ice formation, steps can be taken to mitigate flooding through manipulation or maintenance of the floodplain. Insufficient natural water storage capacity and changes to the landscape can be offset through water storage and conveyance systems that run the gamut from highly engineered structures to constructed wetlands. Careful planning of land use can build on the natural strengths of the hydrologic response. Re-vegetation of burned slopes diverts overland flow (fast and flood producing) to subsurface flow (slower and flood moderating). 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.

Winter weather conditions are the main driving force in determining where and when floods will occur. The type of precipitation that a winter storm produces is dependent on the vertical temperature profile of the atmosphere over a given area.[5] Unusually heavy snow packs and/or unusual spring temperature regimes (e.g. rapid warming) may result in the generation of runoff volumes significantly greater than can be conveyed by the confines of the stream and river

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

[5] "Snowstorms". Rampo College. Resource Section for Meteorology. Available online at http://mset.rst2.edu/portfolios/k/khanna_n/meteorology/snowstorms.htm. October 2006.

channels. Such floods are often the ones that lead to widespread damage and disasters. Floods caused by rapid spring snow melt tend to last for a period of several days to several weeks, longer than the floods caused by other meteorological events.

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

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

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

Flash Flooding

There are three types of flash flooding:

- Extreme precipitation and runoff events
- Inadequate urban drainage systems that become overwhelmed by runoff
- Dam failures

Events that may lead to flash flooding include significant rainfall and/or snowmelt on frozen ground in the winter and early spring months, high intensity thunderstorms (usually during the summer months), and rainfall onto burned areas where high heat has caused the soil to become hydrophobic or water repellent which dramatically increases runoff and flash flood potential.

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 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 infiltration on any terrain. Flash floods are most common in Washington during the spring and summer months due to thunderstorm activity.

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

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.[6]

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

Dam failures also pose a potential flood hazard. A dam failure is the structural collapse of a dam that releases the water stored in the reservoir behind the dam. A dam failure is usually the result of the age of the structure, inadequate spillway capacity, or structural damage caused by an earthquake or flood. The sudden release of water has the potential to cause human

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

casualties, economic loss, and environmental damage. This type of disaster is dangerous because it can occur rapidly, providing little warning and evacuation time for people living downstream. The flows resulting from dam failure generally are much larger than the capacity of downstream channels and can, therefore, lead to extensive flooding. Flood damage occurs as a result of the momentum of the flood caused by the sediment-laden water, flooding over the channel banks, and impact of debris carried by the flow.

Probability of Future Occurrence

The probability of flood events occurring on Tribal lands is high. Low magnitude flood events can be expected several times each year. 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 Laiwai, Kamiah, Kooskia, Stites and other communities/infrastructure located near natural floodplains. Minor flash flood events are expected annually most likely as a result of summer thunderstorms or rain-on-snow events.

The South Fork of the Clearwater River runs along the southeastern edge of the Reservation through Stites and Kooskia before joining with the main stem of the Clearwater River. The Clearwater River then runs along the eastern edge of the reservation through Kamiah, Greer, and Orofino. Turning west, the Clearwater River then runs near the northern boundary of the Reservation and passes through Ahsahka, Lenore, and various other small communities and outlying residences. 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, it is clear that 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; Table 2 summarizes major flood events on the Reservation. Due to the density of development as well as the lack of structurally sound levees, the communities of Kooskia, and Stites as well as several individual residences along the South Fork of the Clearwater have a high risk to flood events. Lawyer Creek also poses a flooding threat to nearby communities. In May of 2018 Lawyer Creek flooded Lawyer Canyon which resulted in the closure of State Highway 162 between Nezperce and Greencreek. Figure 6 shows areas of the reservation that have been identified as flood hazard areas.

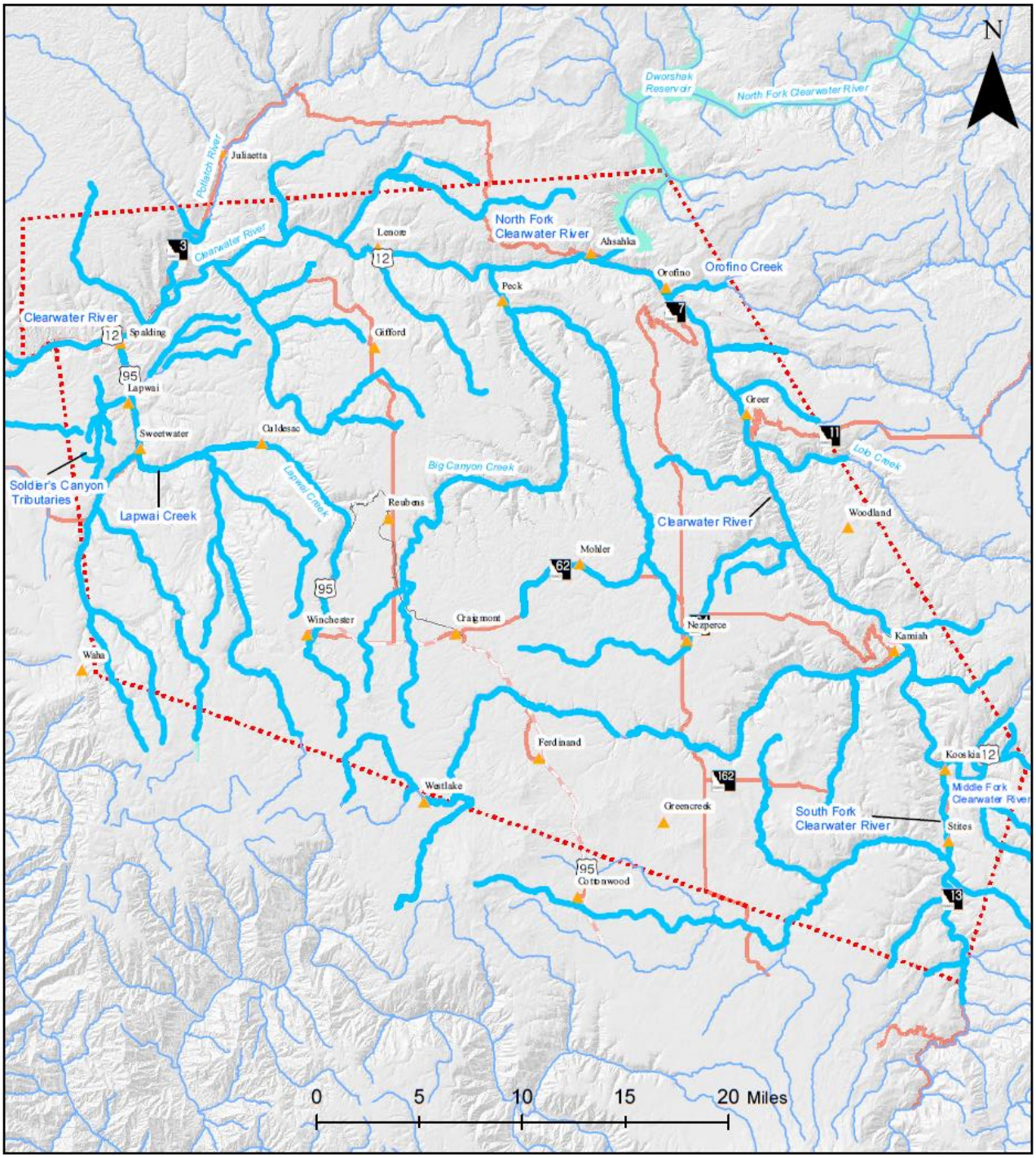

Figure 6) Identified flood hazard areas on the Nez Perce Reservation.

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 in Kooskia. 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 U.S. Army Corps of Engineers (USACE) 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 USACE 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 (Figure 7).

Figure 7) The 1948 flood in Kooskia, ID.

Table 2) History of FEMA-declared floods on the reservation and in surrounding areas.

Year	Disaster	Location	Description
1964	Flood	Idaho, Clearwater, Lewis, and Nez Perce Counties	Heavy rains and flooding
1974	Flood	Clearwater County	Severe storms, snowmelt, and flooding
1996	Severe Storm	Idaho, Clearwater, Lewis, and Nez Perce Counties	Severe storms and flooding
1997	Severe Storm	Idaho, Clearwater, and Nez Perce Counties	Severe storms, flooding, mud and landslides
2005	Flood	Nez Perce County and Reservation	Heavy rains and flooding
2010	Severe Storm	Idaho and Lewis Counties	Severe storms and flooding
2011	Flood	Nez Perce Reservation Idaho, Clearwater, and Nez Perce Counties	Flooding, landslides, and mudslides
2017	Flood	Idaho and Clearwater Counties	Severe storms, flooding, landslides, and mudslides

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 in Kooskia 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. Table 2 displays FEMA declarations of disaster for flood events on the reservation and in surrounding counties.

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 river banks will likely protect the city from most flood events; however, most of these levees were built over 50 years ago, need maintenance, and may not hold during a large event. There are three major dams are located in the vicinity of the Nez Perce Reservation: Dworshak Dam, Winchester Dam, and Soldiers Meadow Dam. None of these structures has failed or been subject to significant damage. However, a threat of potential dam failure occurred for Winchester Dam following a severe flood/winter storm event in February 1996.

Impacts of Flood Events

Due to several swift bodies of water on the Reservation, the probability of a flood-related fatality is moderate. Flash flood events in particular, 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 Tribal residents.

The continuity of operations for the Tribe is rarely 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 on the Reservation 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. 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 on the Reservation 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.

Changes in the timing and intensity of precipitation is an expected result of a changing climate, the Idaho State Hazard Mitigation Plan (SHMP) states that areas within the United States that are prone to flooding will increase by up to 45% by 2100[7]. In addition, by 2050 snowmelt is projected to occur three or four weeks earlier than the 20th century average. The Clearwater Sub-basin is expected to shift from a snow-dominant basin to a rain-snow and rain dominant basin by mid-century, and heavy downpours are projected to increase by 13% (Hamlet et. Al 2013, U.S. Global Change Research Program[8]). Heavy downpours in rain-snow mix and rain dominant basins could increase flood risk, and stormwater management challenges. In addition, the dry season, and the fire season, is expected to be longer and more intense in the Pacific Northwest, leading to a greater probability of erosion, mud-slides, and landslides during precipitation events that could exacerbate the severity of floods (U.S. Global Change Research Program, 2014, National Climate Assessment).

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.[9]

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[7] FEMA U.S. (2013). The Impact of Climate Change and Population Growth on the NFIP through 2100.

[8] Alan F. Hamlet , Marketa McGuire Elsner , Guillaume S. Mauger , Se-Yeun Lee , Ingrid Tohver & Robert A. Norheim (2013) An Overview of the Columbia Basin Climate Change Scenarios Project: Approach, Methods, and Summary of Key Results, Atmosphere-Ocean, 51:4, 392-415, DOI: 10.1080/07055900.2013.819555

[9] Planning and Flood Risk. Planning Policy Statement 15. The Planning Service, Department of Environment. June 2006. Available online at http://www.planningni.gov.uk/index/policy/policy_publications/planning_statements/pps15-flood-risk.pdf.

Dam Failure

Three major dams are located in the vicinity of the Nez Perce Reservation: Dworshak Dam, Winchester Dam, and Soldiers Meadow Dam (Figure 8). None of these structures has failed or been subject to significant damage. However, a threat of potential dam failure occurred for Winchester Dam following a severe flood/winter storm event in February 1996.

Three of the dams are regulated by the Idaho Department of Water Resources (IDWR). Dams regulated by the IDWR include concrete and earthen structures that are 10 feet higher or store more than 50-acre feet of water. The largest dam located within the Reservation is Dworshak Dam. Dworshak Dam, which is fed by the North Fork Clearwater River, is located in Clearwater County, 5 miles north of Orofino. As the biggest concrete dam in the State, it is over 633 feet high and has a storage capacity of 3,453,000 acre-feet.

The second, smaller dam, Soldiers Meadow Dam, is located 6 miles southeast of Waha in Nez Perce County. This earthen dam, which is fed by Webb Creek, is 50 feet high and has a water storage capacity of 2,370 acre-feet. The smallest dam located near Winchester in Lewis County is Winchester Dam. Winchester Dam, which is also an earthen dam, is 36 feet high and can hold more than 850 acre-feet of water.

The IDWR classifies potential losses and damages anticipated to downstream areas during a dam failure. Dworshak Dam, Soldiers Meadow Dam, and Winchester Dam are all classified as high risk. Dams rated in this classification can potentially inundate downstream areas with floodwater levels with depths of more than 2 feet and/or a velocity of 2 feet or more per second.

Failure of Dworshak Dam would likely be contained without causing failure of McNary Dam, near Umatilla, Oregon. However, dam failure would cause property damage to rail lines along the Clearwater and Snake rivers; Highways 12 and 730; and the Nez Perce Tribal Fish Hatchery on the Clearwater River and numerous other structures in the flood plain. Flooding would occur at Orofino within 45 minutes, with a peak flood time of 3 hours and 45 minutes and a peak water level of 80 feet. Flooding would also affect the Nez Perce National Historical Park within 2 hours, with a peak time of 5 hours and 30 minutes and a peak water level of 55 feet. Floodwater arrival at the confluence of the Snake and Clearwater rivers in Lewiston would be 3 hours and 15 minutes, with a peak water level of 52 feet at 6 hours and 30 minutes. In addition, floodwaters would affect the communities of Mrytle, Lenore, Spalding, and Ahsahka. Floodwaters would not directly impact the city of Lapwai.

Failure of Soldiers Meadow Dam would have a significant impact on the city of Lapwai and the Tribal Headquarters. In a sudden failure, floodwaters would reach the city of Lapwai within an hour and affect the entire valley floor at Sweetwater, Lapwai, and Spalding. The depth and duration of the flood is also dependant upon conditions.

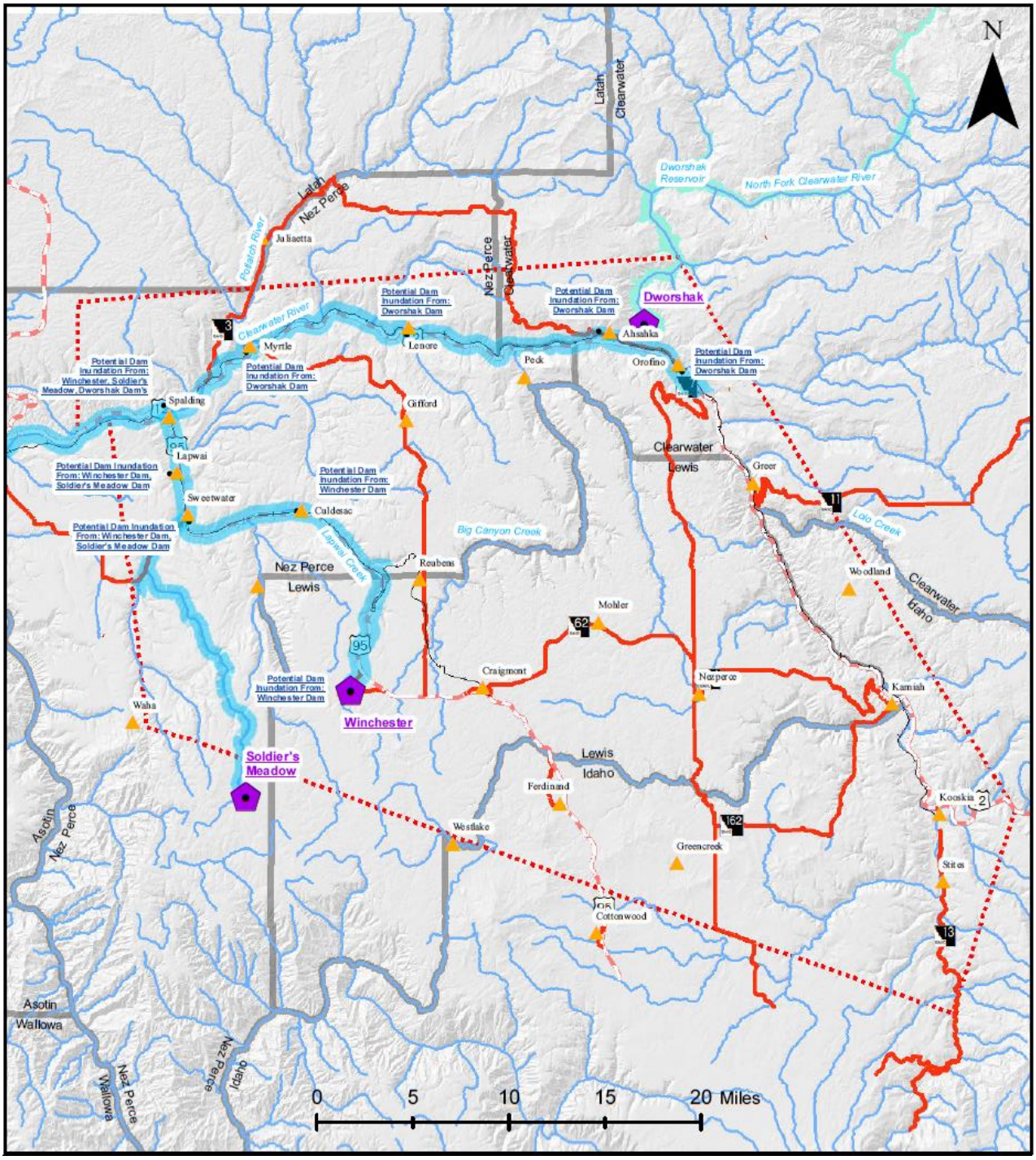

Figure 8) Dam location and areas likely to be inundated in the event of a dam failure on the Nez Perce Reservation.

In a sudden failure, floodwaters from Winchester Dam could reach the city of Lapwai fairly soon. Floodwaters would impact Culdesac, Sweetwater, Lapwai, and Spalding. The depth and duration of the flood is dependant upon conditions and are not absolutely certain. It has been determined that a series of culverts leading this stream through Highway 95 would slow the progress of floodwaters significantly and buffer the impact of dam failure.

All three dams are inspected annually by the IDWR to ensure that they are in good operating condition. An imminent dam failure for any of the three dams is not expected due to structural damage caused by earthquakes or flooding. In addition, all three dams are considered to be at low-risk to terrorists' attacks.

Value of Resources at Risk

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 of these bridges were built to withstand a major flood event.

At the time of the development of this plan, an analysis of the value of structures at risk was not performed due to data limitations. However, Table 3 displays the type and number of structures found in different flood and inundation zones identified on the reservation (hazard zone acronyms are defined below the table). Reservation-wide, more than 1,700 structures are located in tributary flood zones and in the event that the Clearwater River Dam failed, more than 1,700 structures would be at risk. Refer to the maps in this section and the ***Vulnerable Areas and Infrastructure*** section for *total* values at risk on the Nez Perce Reservation.

Table 3) Type and number of structures located in both tributary flood zones (all areas within 500ft of tributaries) and Clearwater River dam inundation zones as identified on the Nez Perce Reservation. A count of outbuildings could not be made but the quantity was estimated to be several hundred.

Structure Type	Count of Structures in Designated Hazard Zones			
	F.Z.'s	C.R. Dam	L.C. Dam	WC/SWC
Homes/Residential	1,302	1,462	738	64
Commercial and Commercial-type	385	297	85	4
Other School Buildings	16	15	21	
Churches	5	-	-	
Schools	3	2	6	
Historical Structures	1	1	3	
Children's Home	1	-	1	
Hospital	-	1	-	
Health Clinic	-	-	1	
Senior Citizen Facility	-	-	1	
Prison	-	1	-	
Outbuildings	Hundreds	Hundreds	Hundreds	Several
Total	**1,713***	**1,779***	**856***	**68***

F.Z.'s –Flood Zones (all areas within 500 feet of tributaries)

C.R. Dam –Clearwater River Dam Inundation Zone

L.C. Dam –Lapwai Creek Dam Inundation Zone

WC/SWC –Webb/Sweetwater Creek Inundation Zone

***Value includes countable structures only (outbuildings were not included).**

Severe Weather Hazard Profile

Severe weather is a serious hazard that can and does affect the Nez Perce Reservation on a regular basis. Severe weather affects the entire state of Idaho with varying degrees, due to the complex landscape and the influence from the Pacific Ocean. Although Idaho's severe weather is minimal in comparison with the rest of the nation, severe weather poses a significant hazard to the state and local communities. Storm-related Presidential Disaster declarations were made for Idaho in 1964, 1972, 1974, 1996, 1997, 2005, 2006, and 2010; Most of these storms resulted in flood damages. Severe weather within the Reservation consists of droughts, hailstorms, and windstorms; Figure 9 is a map of past major storm occurrences in Idaho.

The pattern of average annual temperatures for the Reservation indicates the effects of altitude on temperature. The highest annual averages are found in the lower elevations of the Clearwater and downstream to Lewiston. The range between the mean temperature of the coldest and warmest months of the year varies from less than 40°F, to well over 50° F at stations in the higher elevation. In summer, periods of extreme heat extending beyond a week are quite rare; the same can be said of periods of extremely low temperatures in winter. In both cases the normal progress of weather systems across the Reservation usually results in a change at rather frequent intervals. Extreme temperatures, when coupled with low precipitation for extended periods of time, can lead to a drought.

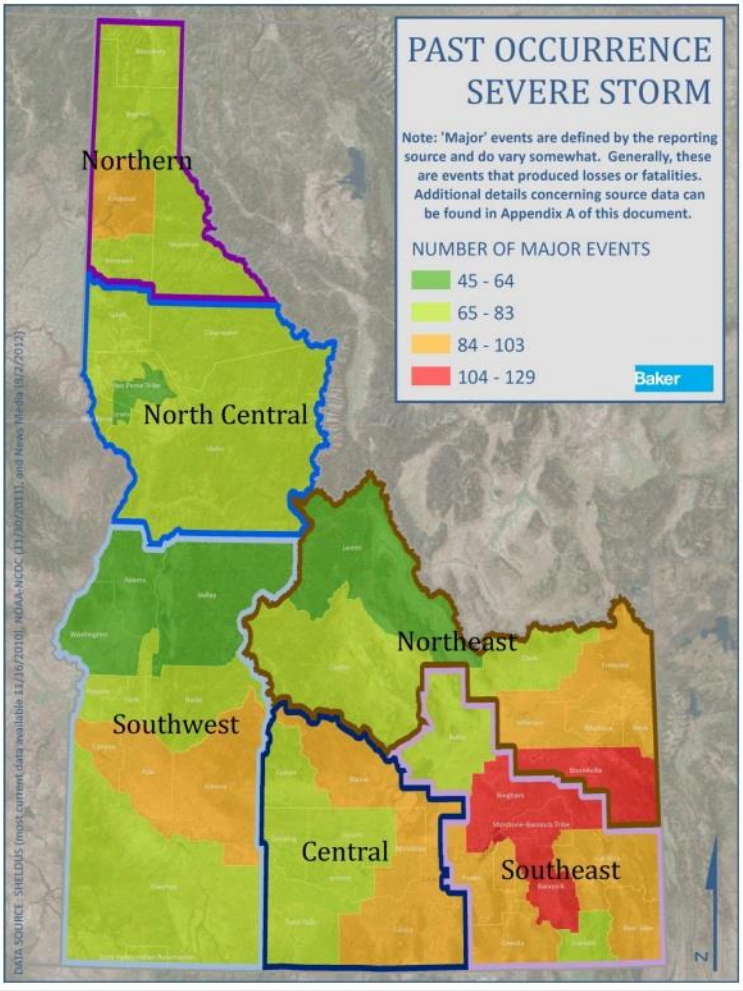

Figure 9) Past Occurrence of severe storms across Idaho (Idaho Hazard Mitigation Plan, 2013).

Thunderstorms are a common occurrence across the Reservation and with them comes the potential for a variety of other severe weather phenomenon. Due to their relative frequency and minimal severity, severe thunderstorms are not well documented across the Reservation.

Typically, their impacts are fairly limited and do not significantly affect the communities. The secondary effects of thunderstorms can be widespread and include hail, high winds, and lightning events.

Past weather patterns show that severe weather conditions are likely to happen in any part of the Nez Perce Reservation in any given year. The topographical features of the area contribute greatly to the various weather patterns that occur. All areas within this region are vulnerable to severe local storms.

Drought

Drought is an expected phase in the climactic cycle of almost any geographical region. Objective, quantitative definitions for drought exist but most authorities agree that, because of the many factors contributing to it and because its onset and relief are slow and indistinct, none are entirely satisfactory. According to the National Drought Mitigation Center, drought originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. What is clear is that a condition perceived as "drought" in a given location is the result of a significant decrease in water supply relative to what is "normal" in that area.[10]

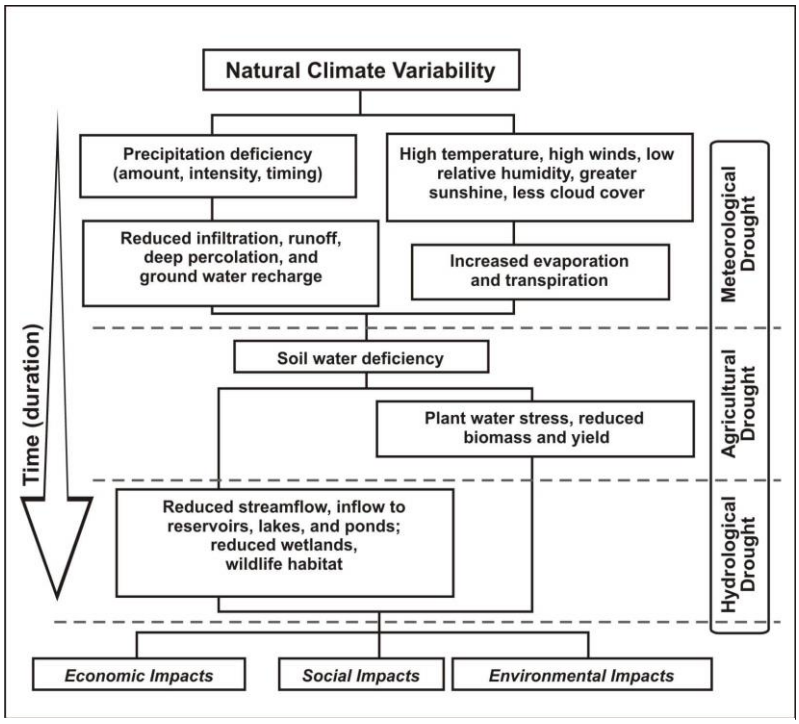

Figure 10) Types of drought (National Drought Mitigation Center).

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 (Figure 10). Drought in Idaho is generally associated with a sustained period of low winter snowfall. This results from a

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

temporary, yet significant, change in the large-scale weather patterns in the western U.S. The limited snow packs result in reduced stream flows and ground water recharge. Idaho's system of reservoirs and natural storage can buffer the effects of minor events over a few years, but a series of dry winters (or an especially pronounced single low snowfall event) will result in a shortage of available water. Extended periods of above-average temperatures during the spring and summer can increase the impacts of low snow packs. Flash droughts are another type of drought that are associated with climate change, and are produced from increased temperatures and/or reduced precipitation resulting in rapidly decreasing soil moisture.

In every drought, agriculture is adversely impacted, especially in non-irrigated areas such as the dry land farms and rangelands in and throughout the Nez Perce Reservation. Droughts impact individuals (farm owners, tenants, and farm laborers), the agricultural industry, and other agriculture-related sectors. The severity of drought is measured by the Palmer Index in a range of 4 (extremely wet) to -4 (extremely dry). The Palmer Index incorporates temperature, precipitation, evaporation and transpiration, runoff and soil moisture when designating the degree of drought.[11]

Probability of Future Occurrence

The Idaho Department of Water Resources reports that meteorological drought conditions (a period of low precipitation) existed in the State approximately 30% of the time during the period 1931-1982. Principal drought in Idaho, indicated by stream flow records, occurred during 1929-41, 1944-45, 1959-61, 1977, and 1987-92.[12] According to the State of Idaho, a drought from 1987-1992 resulted in the worst water shortage in 10 years. Additionally, below-capacity reservoirs resulted in reduced irrigation capacity, plowed-under crops, high water temperatures, and starvation of wildlife due to the lack of perennial grass growth. The Nez Perce Reservation, along with much of Idaho, experienced another seven year drought from 1999 to 2005. While 2006 and 2008 were not drought years, 2007 had severe drought most of the year with extreme drought from August to October.

The historical records demonstrate a cyclical pattern that shows drought is likely to occur on the Reservation about every 10 years and last from 1 to 7 years with varying degrees of severity (Figure 11). The effects of droughts will be compounded by the influences of a climate change; altered weather and precipitation patterns, and increased average annual temperatures could lead to prolonged periods of drought.

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[11] "Drought Monitoring". National Weather Service Climate Prediction Center. NOAA. February 2011. Available online at http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml.

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

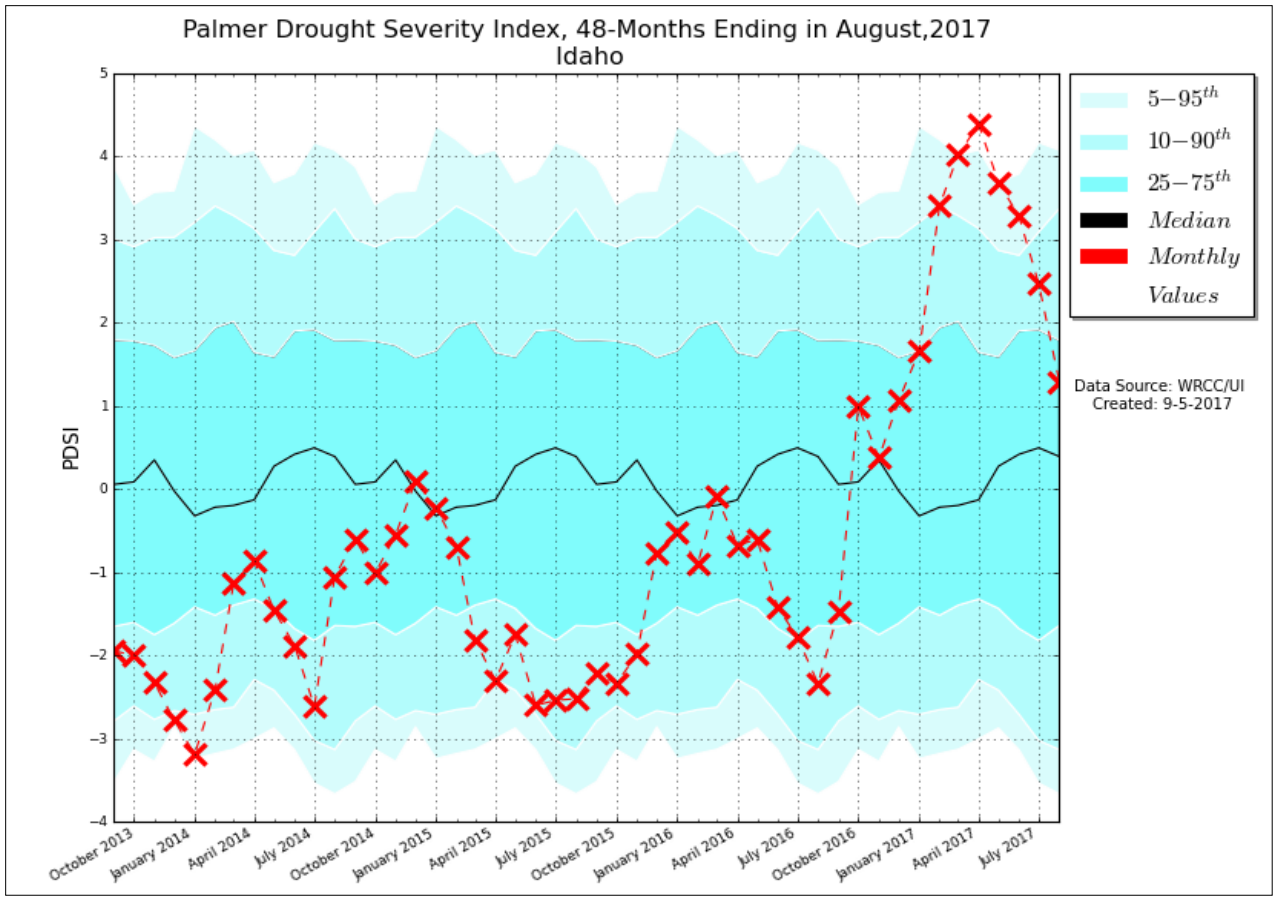


Figure 11) Palmer Drought Severity Index for the Nez Perce Reservation in 2017.

Impacts of Drought Events

Drought affects water levels for use by industry, agriculture, and individual consumers. Water shortages affect firefighting capabilities through reduced flow and pressure. 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 vulnerable to heat-related injuries. Crops can be vulnerable as well. In the past, droughts within the Reservation resulted in significantly lessened crop yields. Drought increases the danger of wildland fires. Fires in rangeland areas are particularly dangerous due to typically high rates of spread and the scattered nature of structures and infrastructure.

Compounding the effects of droughts are the impacts from a changing climate. Following the assessment of the Idaho State Hazard Mitigation Plan that recognized the potential to experience more frequent and severe droughts to communities in Idaho, the Tribe recognizes the need to protect water and food resources.

Value of Resources at Risk

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 throughout the Reservation are at increased risk to wildfires as a result of drought conditions. Reservation lands have 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.

Due to the nature of the hazard, it is difficult to quantify potential loses as a result of drought. However, the tangible losses are most clearly seen in the agriculture and livestock ranching sectors of the Reservation'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.

Hailstorms

Hail can occur in any strong thunderstorm, which means hail is a threat throughout the Reservation. Hail is precipitation that is formed when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere. Formation of larger hail stones can fall at speeds faster than 100 miles per hour. 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.

Probability of Future Occurrence

In July of 1995 several severe thunderstorms moved through the state of Idaho. One thunderstorm in Northern Idaho produced hail .75 inch to 1.50 inches in diameter and high winds that downed power lines and trees in Nez Perce, Lewis, Latah, Shoshone, and Idaho Counties. One-inch hail fell near Cottonwood and 1.50 inches hail fell near Grangeville. This storm damaged the wheat and barley crops at a 100 percent loss in the Cottonwood area. Just south of Cottonwood, trees were uprooted and the roof of an apartment building was torn off causing extensive property damage. This area also suffered a power outage. Winds at Fenn and Cottonwood shattered windows and hail dented automobiles. Large hailstones, 2-3 inches in diameter, were observed throughout some areas of the Pacific Northwest in early spring of

1997. Thunderstorms in spring of 2006 and 2007 produced hailstones that were reported at 1.75" in diameter near Culdesac and Lenore.

These types of damaging hailstorms are typically infrequent and localized to a fairly small area. Based on previous occurrences, the likelihood of a hailstorm event within the Reservation occurring is every 5 years. The more common hailstorms that often accompany thunderstorms generally occur several times each year, but cause limited to no damage.

Impacts of Hailstorms

The effects are generally transportation accidents 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 Nez Perce Reservation will always dictate when and where severe storms will occur.

The potential impacts of a severe hail storms include crop damage, downed power lines, downed or damaged trees, broken windows, roof damage, and vehicle damage. Hail storms can, in extreme cases, cause death by exposure. The most common direct impact from ice storms to people is traffic accidents. Over 85% of ice storm deaths nationwide are caused by traffic accidents. Hail storms also have the potential to cause losses among livestock. The highest potential damage from hail storms is the economic loss from crop damage. Even small hail can cause significant damage to young and tender plants.

Value of Resources at Risk

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. Potential losses to agriculture can be disastrous. They can also occur locally; thus, individual farmers can have significant losses, but the event may not drastically affect the economy of the Reservation. 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 with declared hail disasters resulting in significant loss to local farmers as well as the regional economy. Homeowners 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.

Windstorms

The National Weather Service defines high winds as sustained winds of 40 mph or gusts of 58 mph or greater, expected to last for an hour or more.[13] Windstorms are frequent across all of the Reservation and they have been known to cause substantial damage (Table 4). Under most conditions, the area'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 on the Reservation, 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, and tractor-trailers overturned. Wind damages will generally be categorized into three groups: 1) structure damage to roofs, 2) structure damage from falling trees, and 3) damage from wind-blown dust on sensitive receptors. Structural injury from damaged roofs is not uncommon. Airborne particulate matter increases during high wind events, especially under drier conditions, which can lead to reduced visibility and increased transportation related accidents. When wind blowing dust events occur, sensitive receptors including the elderly, children, and those with asthma are at increased risk of breathing complications.

Table 4) Records of wind gust at the Lewiston Airport, historical maximum recorded wind gust for each month by year recorded.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	44	38	52	36	37	46	36	39	33	56	44	35
2004	43	28	55	52	31	33	40	43	39	37	36	41
2005	43	33	52	32	26	37	49	37	28	24	41	32
2006	49	43	40	41	52	38	35	39	35	53	48	48
2007	47	38	37	41	39	44	33	52	41	43	48	40
2008	47	59	39	39	36	52	40	49	38	46	44	59
2009	43	31	45	36	41	33	48	52	41	49	37	38
2010	36	28	41	51	51	46	41	47	39	39	63	47
2011	41	43	51	43	47	44	43	85	44	36	52	48
2012	46	56	48	45	37	39	47	32	40	51	36	47
2013	40	37	52	47	47	39	41	60	37	43	38	48
Historic Max	**60**	**59**	**55**	**54**	**52**	**52**	**63**	**85**	**47**	**58**	**63**	**59**
Year	**2000**	**2008**	**2004**	**2002**	**2006**	**2001**	**1998**	**2011**	**2000**	**2001**	**2010**	**2008**

Microbursts are columns of cold sinking air within a thunderstorm and is typically less than 2.5 miles across and can reach speeds of up to 100 mph. Microburst progress through a series of stages; contact stage is when the descending air makes contact with the surface and the

[13] http://www.nhc.noaa.gov/aboutgloss.shtml#h. Accessed October, 2012.

highest windspeeds are observed, outburst stage occurs as the air moves outward from the point of contact, and cushion stage is the final stage where winds along the surface begin to slow due to increased friction. Wind speeds from microbursts can cause significant damage and are potentially life threating.

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 within the Reservation, damage could be widespread. Businesses could be forced to close for an extended period, and routine services such as telephone or power could be disrupted. The National Weather Service defines a tornado as a violently rotating column of air that contacts the ground; tornados usually develop from severe thunderstorms.[14] Areas most vulnerable to tornados are those subject to severe thunderstorms or those with a recurrence rate of 5 percent or greater, meaning the Reservation experiences one damaging severe thunderstorm event at least once every 20 years (Table 5).

Table 5) List of tornadoes that have touched down in and around the Nez Perce Reservation.

ID	Date	Time	Dead	Inj.	F-Scale	Beg. Coord	End Coord.	County
150	11-Apr-79	14:00	0	0	0	45.92, -116.13	0.00, 0	Idaho
1099	7-Oct-10	17:20	0	0	0	46.13, -116.42	46.13, -116.42	Idaho
1100	7-Oct-10	17:41	0	0	0	46.19, -116.36	46.19, -116.37	Lewis
124	8-May-62	16:00	0	0	2	46.40, -116.80	46.40, -116.60	Nez Perce
280	20-Jun-69	16:35	0	0	1	46.50, -116.80	0.00, 0	Nez Perce
707	31-May-97	15:10	0	0	0	46.42, -116.97	46.42, -116.97	Nez Perce

Probability of Future Occurrence

On May 31, 1997, six tornadoes touched down in Washington and Idaho in one day. In nearby Lewiston, an F0 tornado along with 70 mph+ winds was observed. In 1999, an intensified thunderstorm produced wind gusts over 50 mph on the Nez Perce Reservation. In December 2006 winter storms produced windstorms of 76 kts (F1 is 73 kts) in Lewis County and several

[14] http://www.noaawatch.gov/themes/severe.php. Accessed October, 2012

occurrences over 50 kts were reported across the reservation. In May 2008 a funnel cloud was spotted near Grangeville.

Throughout the Nez Perce Reservation, the strongest windstorms are generally associated with rapidly moving weather systems that occur between October and March. Generally these south and southwesterly winds can remain at 20–30 mph for several hours and reach peak speeds of more than 50 mph. In the summertime, windstorms are often associated with thunderstorm activity. Based on previous occurrences, the likelihood of a significant windstorm (wind speeds of in excess of 50 mph) occurring on the Reservation is every 4 years.

Impacts of Windstorms

The impacts of an extreme wind event to the community are usually minimal; however, the area affected by extreme wind events can be widespread making response difficult. Utilities and transportation are usually impacted by extreme wind events, either by poor road conditions to downed trees that block roadways and disrupt power distribution. Damage to structures, largely the loss of roofing materials, does occur on a more localized scale and is influenced by building materials and age of structure. Depending on the season of the event, severe winds may result in a loss of agricultural crops.

Value of Resources at Risk

It is difficult to estimate potential losses to the Reservation due to windstorms and tornadoes. Construction 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. Refer to the ***Vulnerable Areas and Infrastructure*** for more information about *total* values at risk on the reservation.

Winter Storms

Summer water supplies are dependent on winter storms brining snow packs to the mountains that surround the Reservation. While winter snow is a necessary component of life on the Reservation it also brings with it many potential disasters. Winter weather can impact transportation, disrupt utility services, cutoff remote residents from services, and reduce emergency services effectiveness.

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

In any discussion about winter storms, terminology and the general characteristics of the causes and impacts of winter storms need to be defined. Natural winter storm events are grouped into the following categories:

- **Showers** – Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Squalls** – Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant. Snow squalls are best known in the Great Lakes Region.
- **Blowing Snow** – Wind-driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground picked up by the wind.
- **Blizzard** – A winter storm with winds over 35 mph and temperatures of 20 degrees F., Accompanied by blowing snow that reduces visibility to near zero.
- **Sleet** – Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorists.
- **Freezing Rain** – Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coat or glaze of ice. Even small accumulations of ice can cause a significant hazard.
- **Severe Winter Storm** - defined as one that drops four or more inches of snow during a twelve-hour period, or six or more inches during a twenty-four-hour period.
- **Ice storm** - occurs when cold rain freezes immediately on contact with the ground, structures, and vegetation.

Snow plowing on the Reservation 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 county road departments. Cities and towns are maintained by their respective road maintenance program and BIA/Tribal roads are maintained by the Tribal Road Maintenance Program. Roads that are not public access, such as roads on private property, are the responsibility of the landowner.

Probability of Future Occurrence

Historical accounts of past severe winter weather demonstrate the likelihood of future occurrence. The following is a non-comprehensive list of events that occurred within or around the Reservation.

Severe Storms, Flooding, Landslides, and Mudslides – FEMA-4313-DR (2017)

Much of northern Idaho was declared a major disaster due to severe storms that caused flooding, landslides, and mudslides beginning on March 6 and running through March 28 of 2017. Damage was primarily to roadways and bridges. An estimated cost was $9,625,389 and covered 8 counties in northern Idaho.

Severe Winter Storms – FEMA-2452-DR (2016)

Counties just north of the reservation in Idaho experienced severe winter storms from December 16-27, 2015. Governor Butch Otter requested a disaster declaration for the three counties effected (Benewah, Bonner, and Kootenai). The storm resulted in damage to public utilities with an estimated cost of $5,290,887.

Severe Storms, Flooding, Landslides, and Mudslides – FEMA-1987-DR (2011)

March 31 to April 11, 2011 brought flooding that resulted in landslides and mudslides leading to damaged roadways and bridges. The estimated cost to the public was $4,602,005, with a per capita cost for the Tribe at $75.72. Disaster declaration by President Obama allowed for a cost share of emergency work and repair of damaged infrastructure.

Heavy Rains and Flooding – FEMA-186-DR (1964)

Nicknamed the Christmas Flood of 1964, claiming 47 lives and roughly $4 billion in damage (today's cost). Areas affected by the storm included ~200,000 square miles in Idaho, Washington, Oregon, and California. Intense rainfall, producing as much as 15 inches in 24 hours in some locations, coupled with frozen ground and melting snow produced increased runoff in streams that were already running high due to snow melt[15].

Winter storms occur annually with varying degrees of intensity, but are mostly likely to be damaging in the higher elevation communities of Winchester, Craigmont, Greencreek, Nezperce, and Reubens where colder temperatures and limited windbreaks exacerbate the effects of snow accumulation. More extreme winter weather with long term cold temperatures, high winds, and/or snow accumulation occurs about every 3-5 years affecting some or all of the Reservation at one time.

Impacts of Winter Storms

Winter storms damage roofs by heavy snow accumulations with extent of the damage depending on the moisture content of the snow and the structural characteristics of the buildings. Blowing snow can cause vehicle and other types of accidents and can contribute to

[15] The Christmas Flood of 1964. (2014). USGS. Retrieved from: https://www.usgs.gov/news/christmas-flood-1964

livestock losses from exposure. Ice can cause damage to powerlines, trees, and some structures and is likely to cause vehicle accidents or at least make driving conditions hazardous.

Power outages often occur during winter storms lasting from several hours to days. 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.

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 Reservation 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.

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.

Value of Resources at Risk

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. Refer to the ***Vulnerable Areas and Infrastructure*** for more information about *total* values at risk on the reservation.

Landslide Hazard Profile

Hazard Description and History

Landslide is a general term for a wide variety of down slope movements of earthen materials that result in the perceptible downward and outward movement of soil, rock, and vegetation under the influence of gravity. The materials may move by falling, toppling, sliding, spreading, or flowing. Some landslides are rapid, occurring in seconds, whereas others may take hours, weeks, or even longer to develop. Although landslides usually occur on steep slopes, they also can occur in areas of low relief.[16]

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.

Landslides can occur naturally or be triggered by human-related activities. Naturally-occurring landslides can occur on any terrain, given the right condition of soil, moisture content, and the slope's angle. They are caused from an inherent weakness or instability in the rock or soil combined with one or more triggering events, such as heavy rain, rapid snow melt, flooding, earthquakes, vibrations, and other natural causes. Other natural triggers include the removal of lateral support through the erosive power of streams, glaciers, waves, and longshore and tidal currents; through weathering, wetting, drying, and freeze-thaw cycles in surficial materials; or through land subsidence or faulting that creates new slopes. Long-term climate change can influence landslide occurrences through increased precipitation, ground saturation, and a rise in groundwater level, which reduces the strength and increases the weight of the soil.

Landslides can also be induced, accelerated or retarded by human actions. Human-related causes of landslides can include grading, slope cutting and filling, quarrying, removal of retaining walls, lowering of reservoirs, vibrations from explosions, machinery, road and air traffic, and excessive development. Normally stable slopes can fail if disturbed by development activities. Often, a slope can also become unstable by earthmoving, landscaping, or vegetation clearing activities. Changing drainage patterns, groundwater level, or slope and surface water through agricultural or landscape irrigation, roof downspouts, septic-tank effluent, or broken water or sewer lines can also generate landslides. Due to the geophysical or human factors that

[16] "Landslides". SAARC Disaster Management Center. New Delhi. Available online at http://saarc-sdmc.nic.in/pdf/landslide.pdf. Accessed March 2011.

can induce a landslide event, they can occur in developed areas, undeveloped areas, or any areas where the terrain was altered for roads, houses, utilities, buildings, and even for lawns.[17] 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.

The frequency of landslides, particularly cut and fill slopes along roads, is due to the geology, vegetation, climate, soils, and other human factors. There are, on occasion, severe landslide events that occur in Idaho. There have been eight declared disasters since 1990.[18] Since 1976, major events have had a significant impact on transportation, communities, and natural resources in 1982, 1986 (x2), 1991, 1996-97, 1997, 1998 (x2), 2000, and 2017 (Table 6).

Table 6) Landslide disaster declarations from 1982-2011 for Idaho counties.

Year	Month	Federal	Counties Affected	Year
1982	July		Boise	1982
1986	February		Boise	1986
1986	March		Boise, Elmore, Lewis, Nez Perce, Owyhee	1986
1991	April		Bonner	1991
1996-1997	November-January	X	Adams, Benewah, Boise, Bonner, Boundary, Clearwater, Elmore, Gem, Idaho, Kootenia, Latah, Nez Perce, Owyhee, Payette, Shoshone, Valley, Washington	1996-1997
1997	March-June	X	Benewah, Bonner, Boundary, Kootenia, Shoshone	1997
1998	May & October		May: Lemhi, Nez Perce, Washington; Oct: Boundary	1998
2000	June		Kootenai	2000
2010	April		Bonner, Idaho, Shoshone	2010
2011	April-May	X	Bonner, Boundary, Clearwater, Idaho, Nez Perce, Shoshone and Nez Perce Tribe	2011
2017	May	X	Boundary, Bonner, Kootenia, Benewah, Shoshone, Latah, Clearwater, Idaho, Valley	2017

[17] Tetra Tech. DMA 2000 Hazard Mitigation Plan. Onondaga County, New York. April 2010.

[18] Idaho Bureau of Homeland Security. April 2011. Available online at www.bhs.idaho.gov.

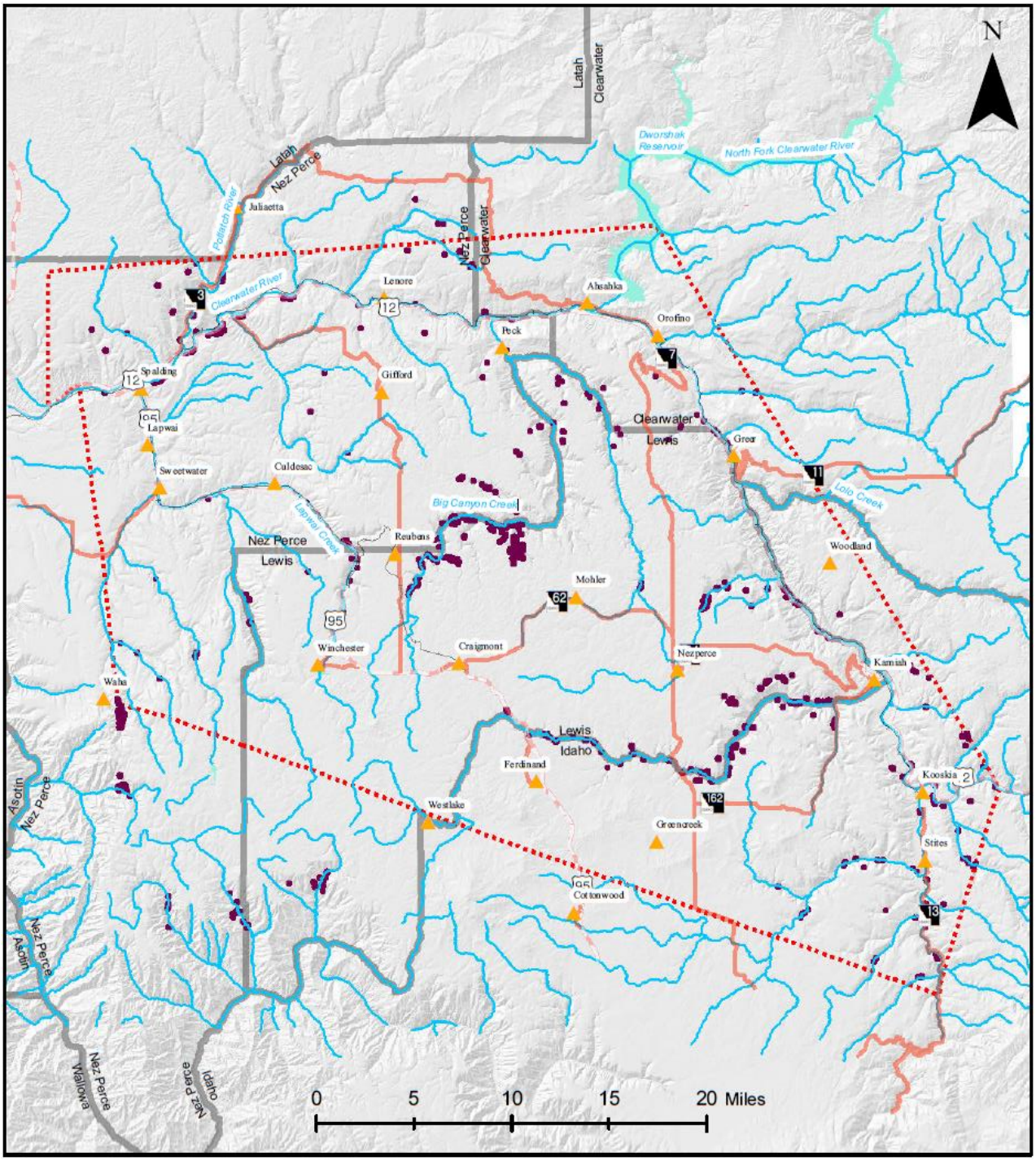


Figure 12) Landscapes prone to landslides (slopes greater than 55%) on the Nez Perce Reservation.

Probability of Future Occurrence

As a frequent natural process, it is likely that landslides across the Reservation will continue to occur, and with altered weather patterns that are expected from climate change we could see an increase from historical frequency of major events. Additionally, there may be compounding

effects from increased wildfire activities due to a changing climate and an increase in the number and extent of landslides. Many factors will contribute to increased landslide events including the removal of vegetation causing soils to become more susceptible to erosion, water resistance of post-fire soils, and loss of root structures. All of these factors are commonly associated with second order fire effects, but with prolonged fire seasons and larger wildland fires as is predicted with our changing climate landslides, mudslides and debris flows will likely increase as well.

Impacts of Landslide Events

Landslides are a recurrent threat to waterways and highways and a danger to homes, schools, businesses, and other facilities. The unimpeded movement over roads—whether for commerce, public utilities, school, emergencies, police, recreation, or tourism—is essential to the normal functioning of the Reservation. The disruption and dislocation of these or any other routes caused by landslides can quickly jeopardize travel and vital services. Although small slumps on cut and fill slopes along roads and highways are relatively common, nearly all of the more significant landslide risks on the Reservation are associated with the steeper, mountainous slopes.

Population centers and individual homes in the Clearwater River corridors (Stites, Kooskia, Kamiah, Greer, Ahsahka, Orofino, Spalding) and Lapwai Creek (Lapwai, Culdesac) have the highest risk of experiencing slides. However, most of the damage from slides on the Reservation 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. U.S. Highways 95 and 12 have experienced numerous slides of varying severity that have blocked one or both lanes for several days.

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 on the Reservations parallel the streams and rivers.

Value of Resources at Risk

Slides in the identified Clearwater 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. A number of structures lie within the Impact Zone as well as sections of U.S. Highway 12 and State Route 13. U.S. Highway 95 only has a short section of landslide prone slopes in the canyon south of Culdesac, and many of the other highly prone areas within the Reservation are on secondary roadways. At the time of the development of this plan, an analysis of the value of structures at risk was not performed. However, Table 7 shows the type and number of structures found in designated landslide areas across the reservation. In total, there are only about 20 homes/residential structures and several outbuildings that are in landslide risk areas. Refer to the maps in this section and the ***Vulnerable Areas and Infrastructure*** for *total* values at risk on the Nez Perce Reservation.

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 road maintenance shop. Other factors that could affect the cost of the damage may include culverts, streams, and removal of debris.

Table 7) Structures at risk to landslides on the Nez Perce Reservation.

Structure Type	Count
Homes/Residential Structures	20
Outbuildings	Several
Total	**20***

***Value includes countable structures only (outbuildings were not included).**

Wildland Fire Profile

Wildland Fire Characteristics

In general, wildland fire behavior describes how fire reacts to available fuels, local topography, and current weather conditions. The relationships between these three components are dynamic; changing one condition can often exacerbate the affects that the other conditions have on fire behavior. As such, fire behavior is often modeled as a triangle with fuels, topography, and weather serving as the three sides (Figure 13). Understanding the relationships between the fire behavior components has important implications for not only managing an active wildfire but also mitigating wildfire risk. Since fuel is the only component that can be managed directly, management decisions regarding fuel types and fuel loading across the landscape need to be made based on characteristics that are inherent of the region -climate and topography. Strategic fuel breaks, conservation and restoration of native species, and prescribed burns are examples of management activities that can reduce wildfire risk and simplify the process of assessing potential wildfire behavior.

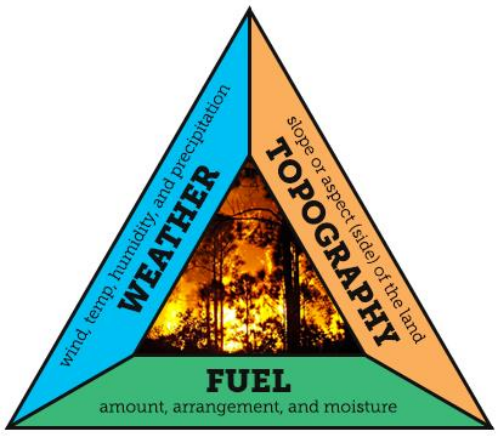


Figure 13) Fire Behavior Triangle (www.weatherstem.com)

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

Weather

Fire behavior is largely influenced by weather conditions. Wind, moisture levels, temperature, and relative humidity are all factors that determine the rates and which fuels dry and vegetation cures. The ignition potential of fuels is also determined by these factors; weather patterns and trends can be analyzed to determine how likely or easily a certain fuel type will ignite and if a fire will be sustained. Once started, the behavior of a wildfire is further determined by atmospheric stability and local and regional weather. As temperature, wind speed, wind direction, precipitation, storm systems, and prevailing winds all influence fire behavior, weather is the most difficult component of the fire triangle to predict and interpret. As observed in the Yarnell Hill fire in Arizona that killed 19 firefighters, a storm cell can cause a flaming front to change direction abruptly, 90 degrees in the case of the Yarnell Hill fire, and rapidly accelerate up to speeds of 10 to 15 mph.

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. In General, north slopes tend to be cooler, wetter, more productive sites. This typically results in heavy fuel accumulations, high fuel moistures, lower rates of curing for fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun and therefore 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 which means they tend to be "available to burn" for a greater portion of the year. Slope also plays a significant role in the rate of spread of a fire as fuels upslope from the flaming front are subjected to preheating which means that they readily combust as the fire draws closer. The preheating process is exacerbated as slope increases which results in greater rates of spread and increased flame lengths. Therefore, steep slopes with a south –southwest aspect generally promote intense fire behavior due to dry fuels and the likelihood of predominant, westerly winds.

Fuels

In the context of wildfire, 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 of fuel types. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size and shape, moisture content, and continuity and arrangement all have an effect on fire behavior. In general, 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. Fine fuels, those with high surface to volume ratios, are considered the primary carriers of surface fire. 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.

Fuels are classified by diameter as that has important implications for fuel moisture retention. The smaller the diameter, the more quickly the moisture content of a given fuel type changes while larger diameter fuels take longer to change. In terms of fire potential on the landscape and fire suppression, the amount of time that is required for a fuel type to become volatile is critical which is why instead of referring to fuels by size, they are referred to as either one hour, ten hour, 100 hour, or 1000 hour fuels. This method of classifying fuels describes the amount of

time required for a particular fuel's status to change from non-combustible to combustible as a result of altered moisture levels in the surrounding environment.

History and Extent

In the 1930s, wildfires consumed an average of 40 to 50 million acres per year in the contiguous United States, according to US Forest Service estimates. By the 1970s, the average acreage burned had been reduced to about 5 million acres per year. Accounting for the substantial reduction in burned acreage was an increase in fire suppression efforts and development of firefighting equipment and strategy. Since 1970, about 3.5 million acres burn annually in the western U.S.

The potential volatility of a fire season can be predicted from winter snowfall, snowpack longevity, spring temperatures, and totals precipitation. When winter snowfall is limited and snowpack melts early due to warm spring temperatures, conditions begin to favor fire activity as fine fuels dry out and spring storms generate lighting and high winds. Additionally, human activity increases in natural areas and recreation areas in warm weather months; typically April through October. This increases the likelihood of a human-caused ignition, particularly in natural areas where fuels are abundant, that could result in a wildfire, threatening both populated areas and natural resources.

Fire History

Historically, most plant communities in the state of Idaho were fire-adapted and regularly burned. Frequent, low intensity fires limited fuel accumulation across the landscape and contributed to the distribution of native, fire-adapted plant communities. In contrast to modern day conditions, fire return intervals (the amount of time between fires in a defined area) were shorter but fires burned with less intensity.

Shorter return intervals between fire events often resulted in less dramatic changes in plant composition. Across the landscape, fire typically burned 1 to 50 years apart in a given areas with most fire returning between 5 and 20 years. With infrequent return intervals, plant communities tended to burn more severely and were replaced by vegetation different in composition, structure, and age. Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels.

State of Idaho Fire History

The figures in this section only include large or significant wildfires that occurred in the state of Idaho between 2000 and 2017; it is likely that fire personnel responded to a far greater number of fires in each county during that time period. The narrative in this section was developed around the values displayed in the maps that follow and therefore is not representative of all fire activity that occurred in Idaho from 2000 to 2017.

Historically, the State of Idaho has had very active fire seasons. Long periods of hot and dry weather in summer months exacerbate fire conditions with some years being more extreme than others. In the last decade, the 2012 fire season was the most significant as large fires burned more than 2.5 million acres across the state. However, several years, specifically 2009, were relatively mild and fewer than 250,000 acres burned as a result of large fires. Figure 14 shows the locations and perimeters of large wildfires that occurred in Idaho between 2000 and 2017.

Some counties experienced more large fires than other counties between 2000 and 2017. Of the 44 counties in Idaho, 16 counties, half of which are located in the Panhandle, experienced 1 to 25 wildfires (Figure 15). Elmore and Owyhee counties in southwest Idaho experienced the greatest number of fires during that time period at 312 and 306 large fires, respectively. Also experiencing a significant number of large wildfires was Idaho County with 257 fires and Cassia County with 201 fires. The counties in the southeastern part of the state appeared to have the greatest number of large fires while those in the northern portion experienced the fewest.

In addition to having the greatest number of large fires between 2000 and 2017, the most acreage also burned in Owyhee and Idaho counties at over 2.1 million and 2.0 million acres, respectively. The histogram in Figure 16 shows county frequency by acreage burned during that time period. Eight different counties fell in the 250,001 to 500,000 acres-burned category, and only two counties fell in the 2.25 million acres or more range.

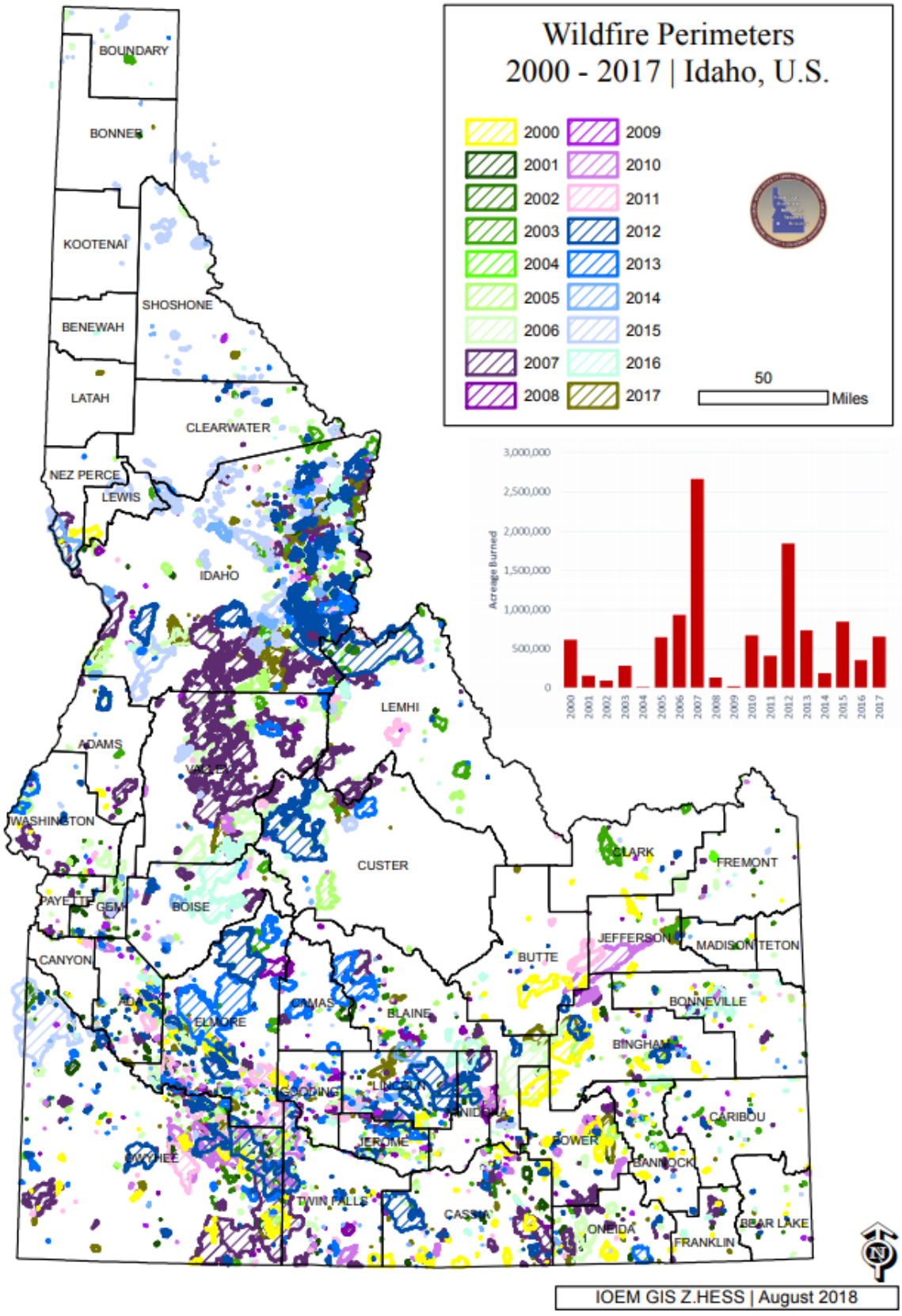


Figure 14) Locations and perimeter of large wildfires that occurred in Idaho between 2000 and 2017.

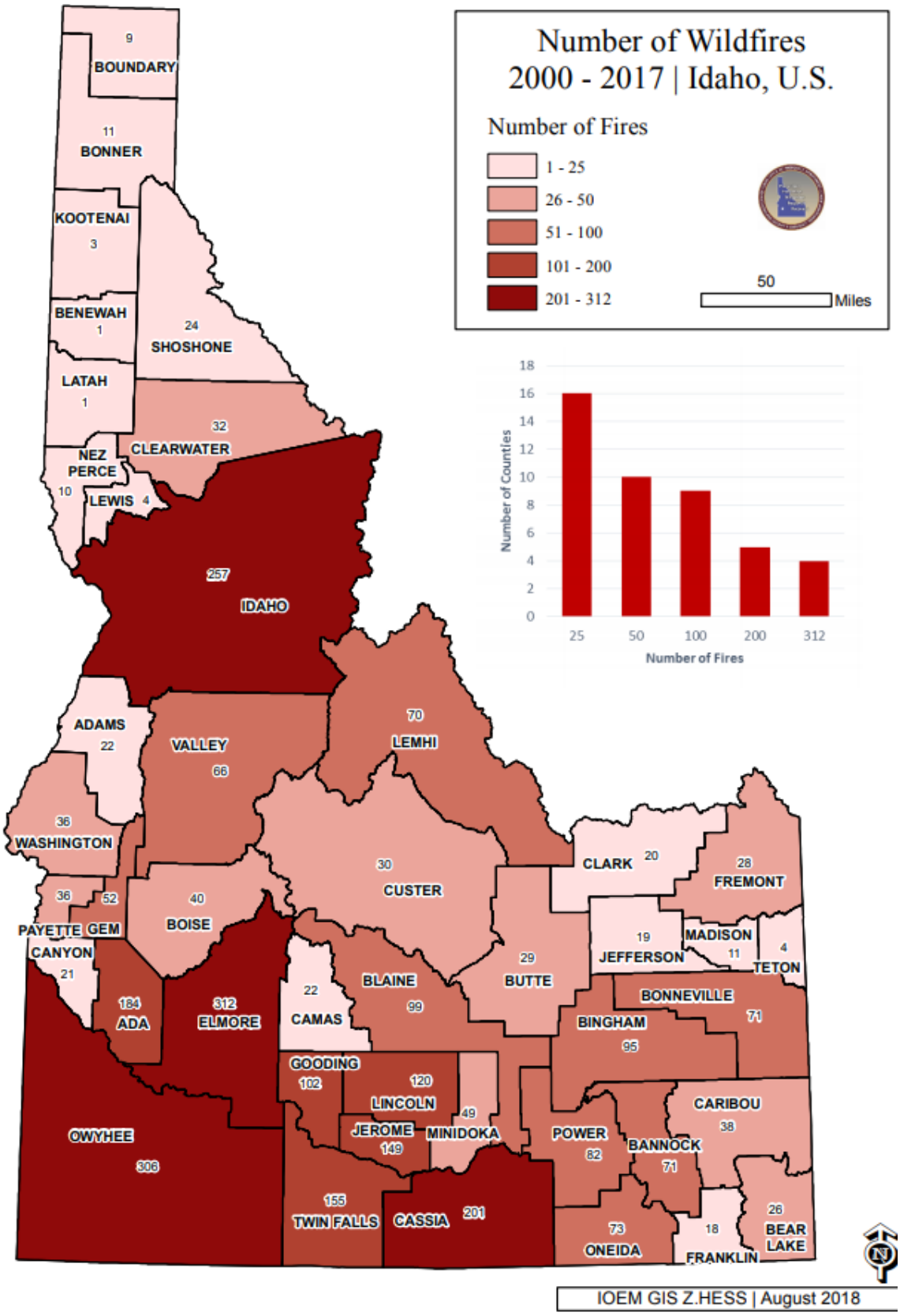


Figure 15) Number of fires by county in the State of Idaho from 2000 to 2017.

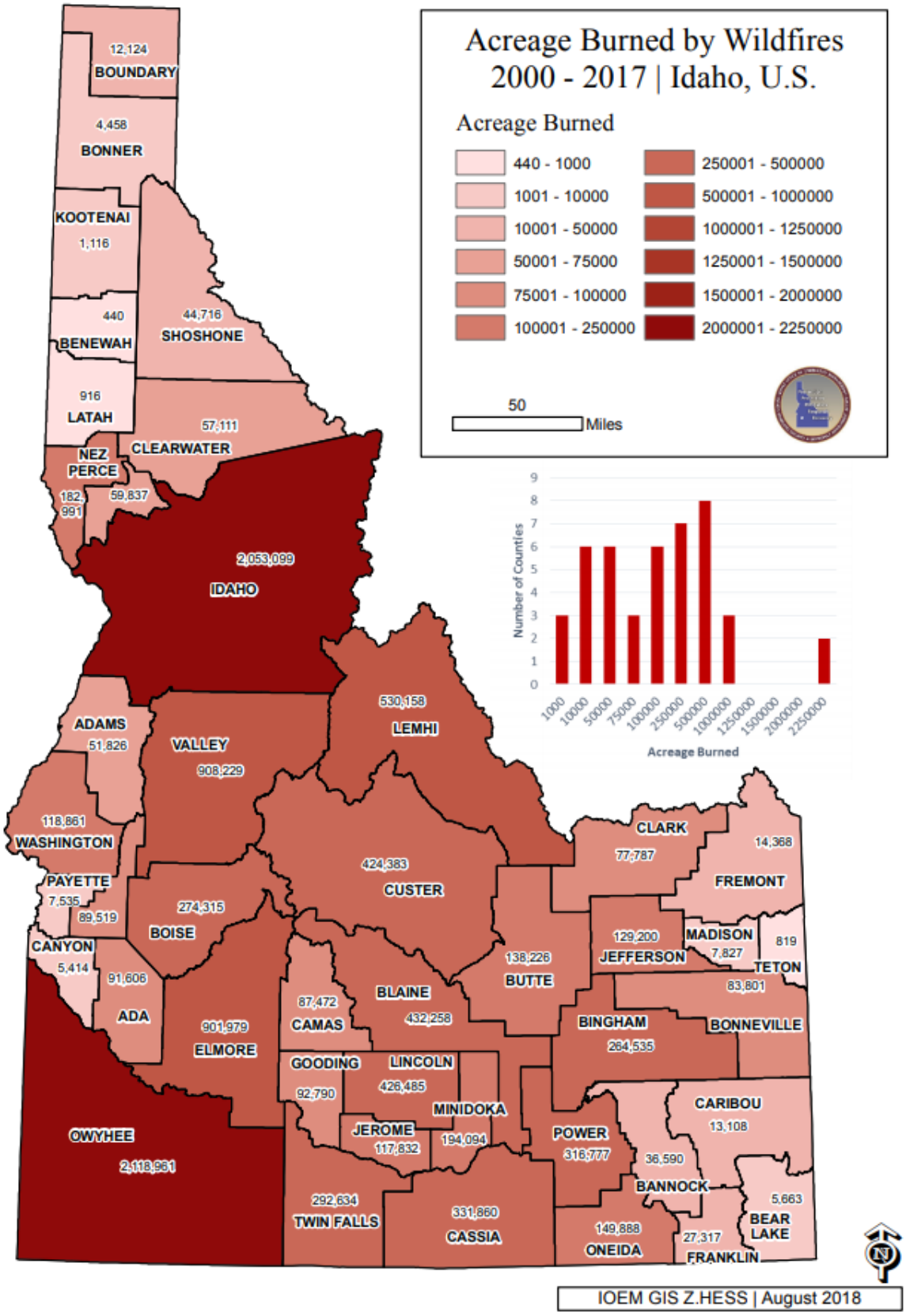


Figure 16) Acreage burned by wildfire by county for the State of Idaho from 2000 to 2017.

History of Fire on the Nez Perce Reservation

In 2015 there were a number of large fires in and around the Reservation; the fires included in the Clearwater and Municipal Complex fires burned 68,127 acres in total: the Fisher Fire located south of Orofino burned in the canyons before reaching agricultural lands and burned 18,889 acres, in the Kamiah area the Lawyer 2 Fire consumed 41,195 acres, the Municipal Fire burned 1,770 acres, the Lolo 2 Fire burned 6,200 acres, and the Old Greer Fire burned 73 acres. Because these fires occurred primarily in the wildland urban interface, lives, homes, and property value were threatened. Numerous buildings were destroyed along with millions of board feet of privately owned timber, livestock fences, crops, and other infrastructure. As a secondary effect, there have been and continue to be erosion issues along roadways and in the canyonlands. Figure 17 shows historical fires that have occurred on the Reservation.

Reservation fires in 2007 included the Russell Ridge (Hatwai) Fire at 4,800 acres, Coyote Creek (Grade) Fire near Spaulding at 3,300 acres and the loss of one tribal residence, and the Central Grade Fire at 100 acres. Multiple fires have also occurred in the Craig Mountain area, including the Chimney Creek Complex (51,000 acres) in 2007, Dry Creek (5,700 acres), and the Kurby Fire (550 acres). In 2000 as a result of a large fire season, the Federal government declared several counties, including Clearwater, Idaho, and Lewis, disaster areas.

Local knowledge suggests that Native Americans did frequently perform burns which played an important role in shaping the vegetation throughout the county. During the public meetings, participants shared information about previous fire events. This information is consistent with DOI ignition data for the reservation which suggests that the majority of the ignitions reported on the Reservation from 2007 to 2017 were human caused (265) and that natural ignition sources (lighting strikes) were less common (96). Refer to Table 8 for more detailed ignition source information for the reservation.

Wildland Fire Risk

Using data such as slope, aspect, vegetation type, and density, an assessment of wildland risk was completed by the Nez Perce Tribe GIS Department. While the entire Reservation is at risk to various types of ignitions, the communities along the Clearwater River drainage including Stites, Kooksia, Kamiah, Woodland, Greer, Orofino, Ahsahka, Peck, and Lenore have the greatest potential for impacts. Fires in these areas are more likely to grow beyond initial attack due to access and topography and will likely have higher rates of spread due to topography and fuel type. Nonetheless, scattered homes and other outlying structures located in the lower risk areas are not without risk entirely. Fires in agricultural or rangeland dominated areas can also spread very quickly. Lower population may also increase the risk of an ignition going unreported for a longer period of time and it may take longer for firefighters to respond.

Table 8) Number of fires and acreage burned by ignition source from 2007 to 2017 on the Nez Perce Reservation, ID. Data is from the Department of the Interior Wildland Fire Information Management System.

	Cause	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total	Percentage
Number of Fires	Campfire	3	1	1	0	1	1	0	1	1	1	1	11	3%
	Smoking	4	0	0	0	0	4	0	0	0	1	3	12	3%
	Fire Use	10	2	2	4	2	0	2	7	1	2	9	41	11%
	Incendiary	12	5	3	4	5	0	5	6	0	0	2	42	12%
	Equipment	11	10	3	3	6	3	9	7	9	0	1	62	17%
	Railroads	0	1	0	0	1	0	1	0	0	3	0	6	2%
	Juveniles	15	9	4	0	3	1	2	3	2	0	0	39	11%
	Miscellaneous	7	4	5	1	0	2	4	8	8	2	11	52	14%
	Human Sub-total	62	32	18	12	18	11	23	32	21	9	27	265	73%
	Natural (Lightning)	5	8	11	15	4	3	1	10	30	2	7	96	27%
	Total	**67**	**40**	**29**	**27**	**22**	**14**	**24**	**42**	**51**	**11**	**34**	**361**	**100%**
Acres Burned	Campfire	3.5	0.1	2	0	0.1	0.1	0	0.1	0.2	0.1	0.1	6	0%
	Smoking	0.5	0	0	0	0	3.3	0	0	0	0.1	5.2	9	0%
	Fire Use	289	7.7	27.5	574.6	5.8	0	10.2	10.8	2	5.4	35.1	968	1%
	Incendiary	21.6	1.2	5.5	1.8	231.6	0	676.5	3.9	0	0	11.1	953	1%
	Equipment	4013.3	13.9	5.5	98.2	132.3	277.6	339.2	2265.6	162.4	0	0.1	7308	9%
	Railroads	0	2	0	0	4.5	0	299	0	0	8	0	314	0%
	Juveniles	4.8	1.5	0.6	0	1.5	0.1	0.9	1.6	0.2	0	0	11	0%
	Miscellaneous	13.2	4963.8	0.9	4	0	1.1	2.2	227.5	1765.1	0.2	33.2	7011	8%
	Human Sub-total	4345.9	4990.2	42	678.6	375.8	282.2	1328	2509.5	1929.9	13.8	84.8	16580	19%
	Natural (Lightning)	35.5	804.1	45	9	3.2	26.1	10	7.9	60795.6	1829.2	5043	68608	81%
	Total	**4381.4**	**5794.3**	**87**	**687.6**	**379**	**308.3**	**1338**	**2517.4**	**62725.5**	**1843**	**5127.8**	**85188**	**100%**

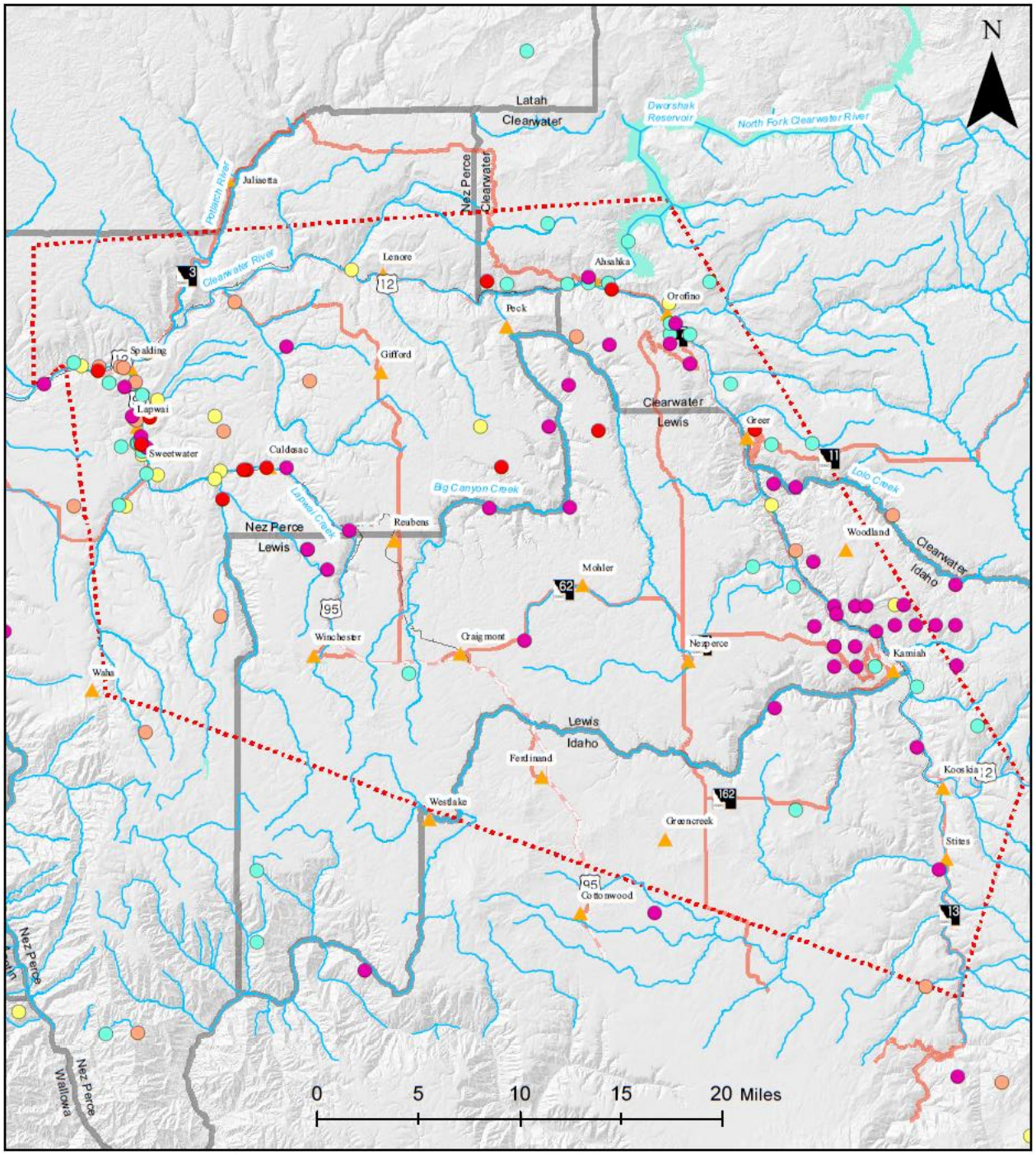


Figure 17) Fire history map of the Nez Perce Reservation.

Fire susceptibility throughout northern Idaho dramatically increases in late summer and early autumn as vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type, and topography, can contribute to the intensity and spread of wildland fires. Figure 18 shows high risk fire areas on the Nez Perce Reservation.

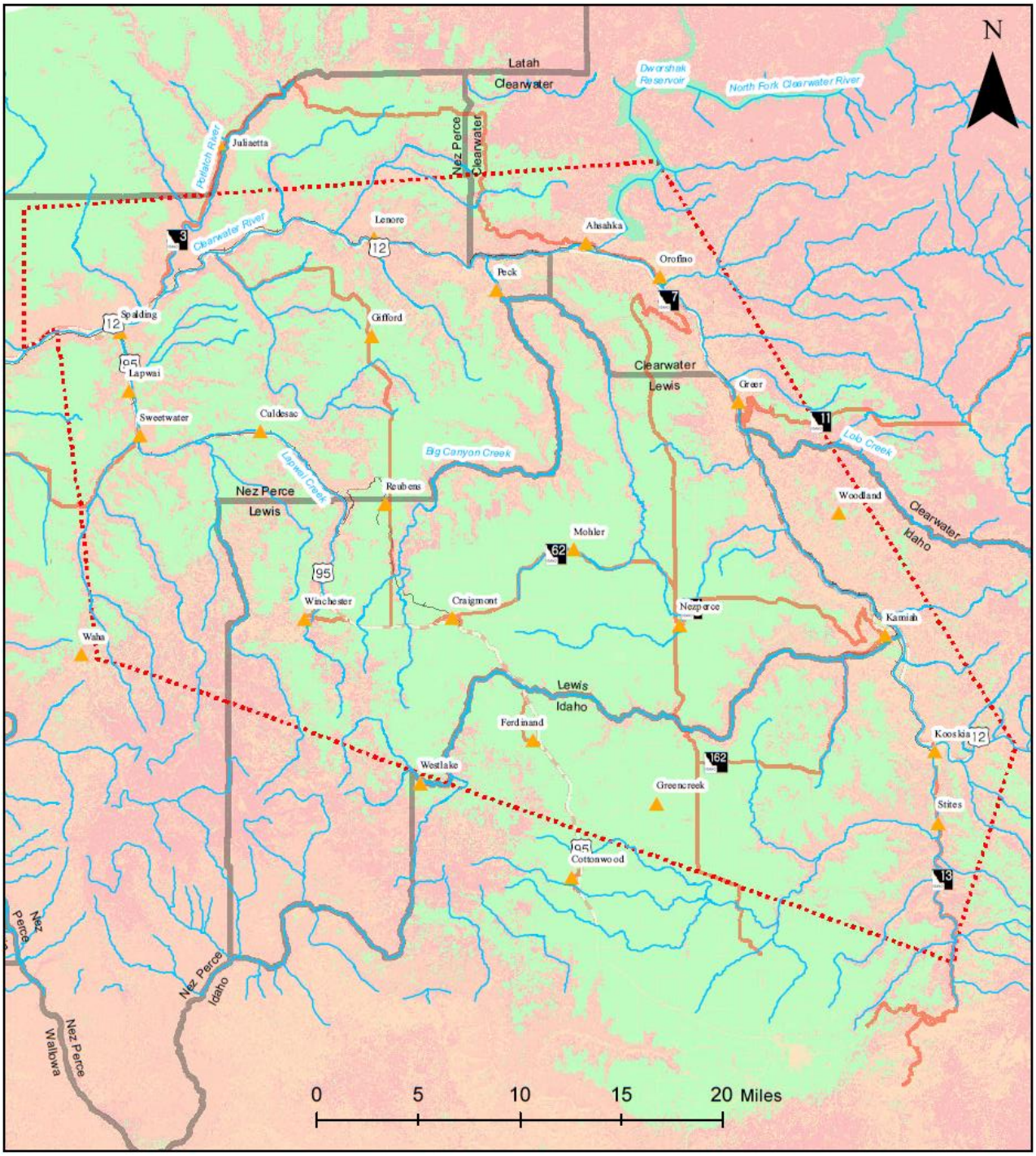


Figure 18) Wildland fire risk map for the Nez Perce Reservation.

Probability of Future Occurrence

Lightning ignitions are common on the Reservation and typically occur along ridgetops, but negligence and arson, as well other human causes, account for the majority of ignitions that occur on the Reservation. These fires are often quickly controlled by local resources and rarely grow beyond an acre in size.

Larger fires, requiring additional resources beyond initial attack, are less common, but can occur annually. Based on past history, this type of fire is likely to occur on and/or near the Reservation approximately every 3 years.

Impacts of Wildfire Events

Unlike other natural disasters, the effects of a wildfire, with the exception of smoke and fire brands, are localized and can be contained with an effective management strategy. However, even if a fire is successfully contained, communities in proximity to the fire may still experience disruptions as municipal resources are diverted to suppression efforts. Should a wildfire grow beyond the capabilities of local fire agencies, other in-state resources as well and federal resources may be requested for additional support. Local residents with property in the path of wildland fire will likely suffer the greatest impacts through loss of structures, personal property, and/or the value of any timber or agricultural crops on their land.

In the event that a wildfire exhibits extreme behavior, it may be necessary for some communities to evacuate. The evacuation of densely populated areas will require extensive traffic control, safe routes that are capable of accommodating high traffic volumes, and additional resources and facilities will be required should evacuees need emergency shelter in the event that they do not have alternate lodging options. Accommodations for evacuees will place additional demand on community resources and may further disrupt neighboring communities. Local businesses could be affected in several ways, particularly if access to business districts are limited or restricted altogether. In addition to heavy smoke, closures of natural or recreational areas may also have adverse impacts on the tourist industry.

Wildland fires, big and small, are dangerous to both Tribal 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 often result in a multi-department and agency response effort; thus, coordinating activities and ensuring everyone's safety is paramount.

The Reservation has sensitive populations such as elders 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, emergency rooms, or the need to find locations with clean air.

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 on the Reservation are adapted to periodic fire events and benefit from occasional, low intensity burns. On the other hand, overcrowded forest conditions or areas infested with more susceptible weeds 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 potentially resulting in species conversion and often adversely impact soil conditions. High intensity fires are also much more dangerous and difficult to suppress. Vegetation on the Nez Perce Reservation is currently 92% coniferous forest. Under fire suppression, coniferous forest cover is expected to increase[19].

Table 9) Projected change in vegetation composition under fire suppression is reported as the percent of the Nez Perce Reservation covered by different vegetation types for 20 models of vegetation.

Time Period	20-Model Median Vegetation Class
1971-2000	92% Conifer Forest 8% Woodland Savanna
2010-2039 (Higher Emissions)	96% Conifer Forest 4% Woodland/Savanna
2040-2069 (Higher Emissions)	98% Conifer Forest 2% Woodland Savanna
2070-2099 (Higher Emissions)	98% Conifer Forest 1% Woodland/Savanna

In addition, climate change is expected to increase annual summer temperatures up to 7.5 degrees Fahrenheit by mid-century, and up to 12.1 degrees Fahrenheit by the end of the century, lengthen the wildfire season, increase the annual days of extreme fire danger, and decrease summer soil moisture resulting in drier, hotter, more vulnerable forests, and more extreme fire danger (Table 10, Figure 19). With an increase in average annual summer temperature, it is also likely that the region will experience a greater number of extreme fire danger days (Figure 20); this is also reflected in the projected annual heat accumulation over 50 degrees Fahrenheit which is also expected to increase through 2099 (Figure 21).

[19] Krosby, M.B., Hegewisch, Norheim, R.,Mauge, G., Yazzie,K., Morgan, H.,"Tribal Climate Tool" web tool. Climate Impacts Group(https://cig.uw.edu/our-work/decision-support/building-tribal-capacity-for-climate-change-vulnerability-assessment/) and NW Climate Toolbox (https://climatetoolbox.org/) accessed on [October 4, 2018].

Additionally, the fire season is expected to intensify and become more extreme in surrounding states and California. Wildfire suppression and control in the western United States is a coordinated interagency effort in which resources are distributed on a first-come, first-served basis. The earlier and more extreme fire seasons in California have already impacted the availability of fire-fighting equipment and personnel in the Northwest because the fire season starts earlier in California than it does in the northwest. This could impact the ability of local fire-fighters to access assistance during wildfire events (Nez Perce Forestry and Fire).

Table 10) Maximum projected daily temperatures and net temperature change for July through August for the Nez Perce Reservation, ID per the Tribal Climate Change Tool.

Time Period	Model Average Temperature	Change from Historical
Historical	**80.0 °F**	
2010-2039 (Higher Emissions)	**83.5 °F**	**+ 3.5°F**
2040-2069 (Higher Emissions)	**87.5 °F**	**+ 7.5°F**
2070-2099 (Higher Emissions)	**92.0 °F**	**+ 12.1°F**

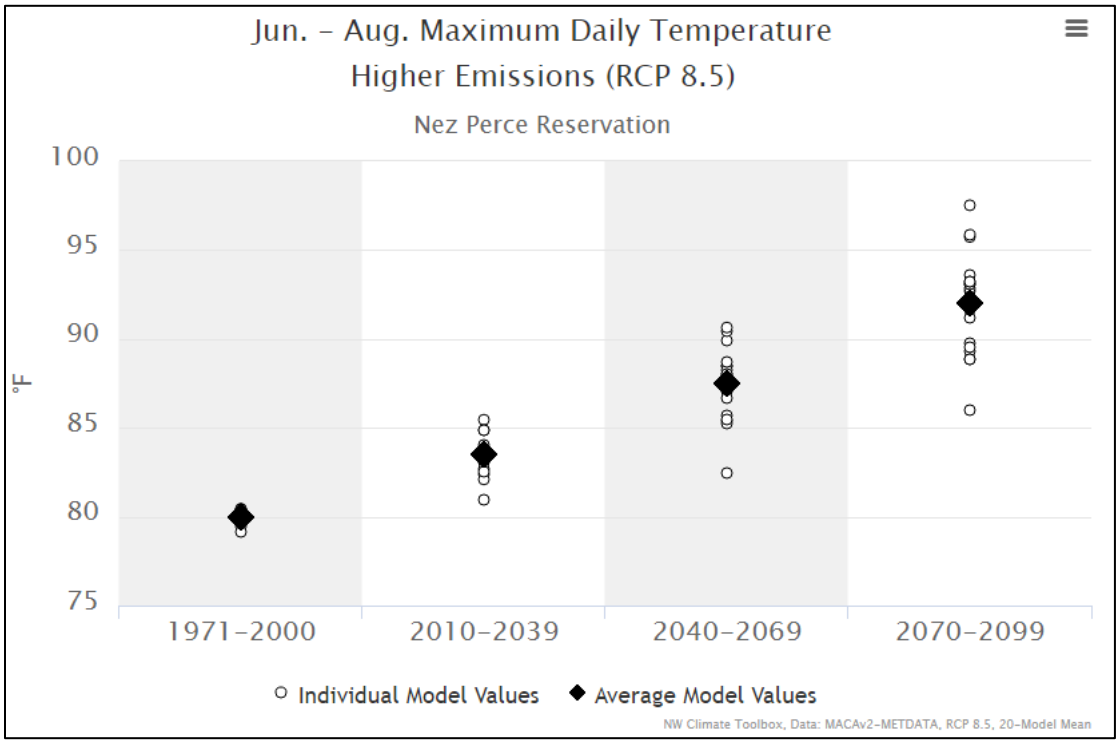


Figure 19) Maximum projected daily temperatures for July through August for the Nez Perce Reservation, ID per the Tribal Climate Change Tool.

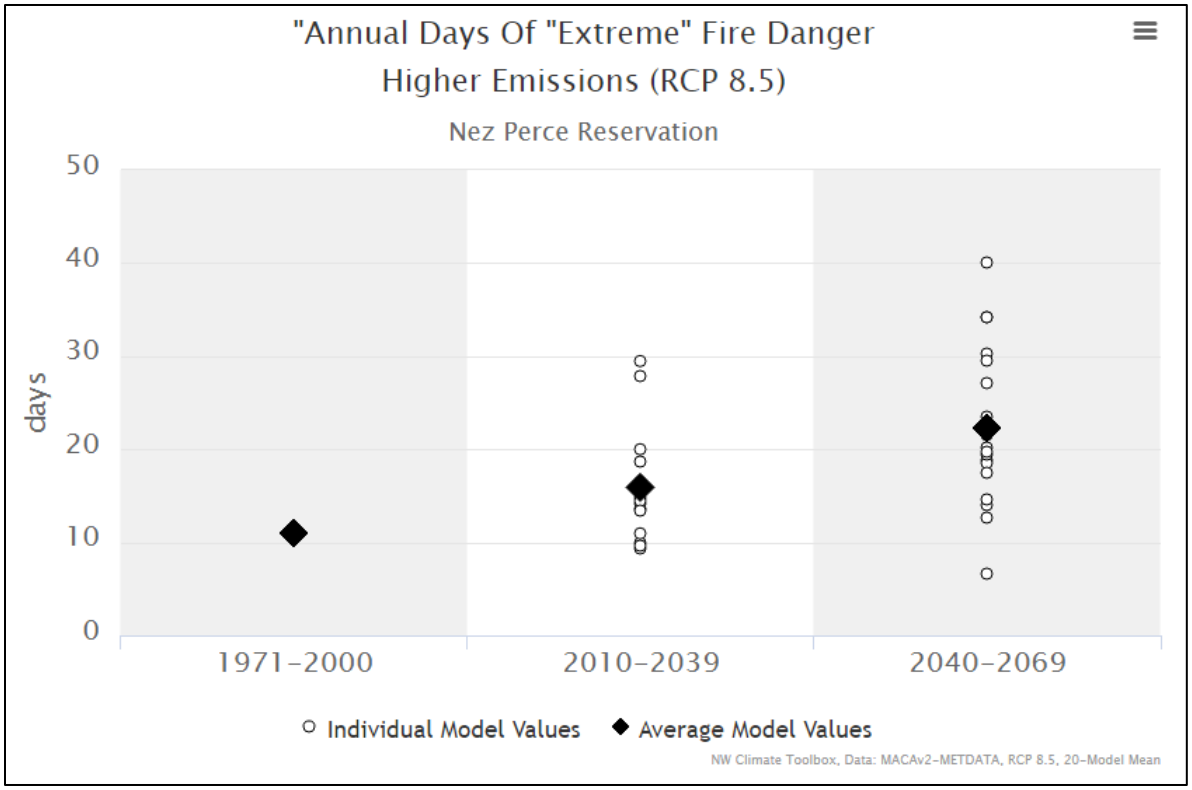


Figure 20) Number of extreme fire danger days by time period projected for the Nez Perce Reservation, ID per the Tribal Climate Change Tool.

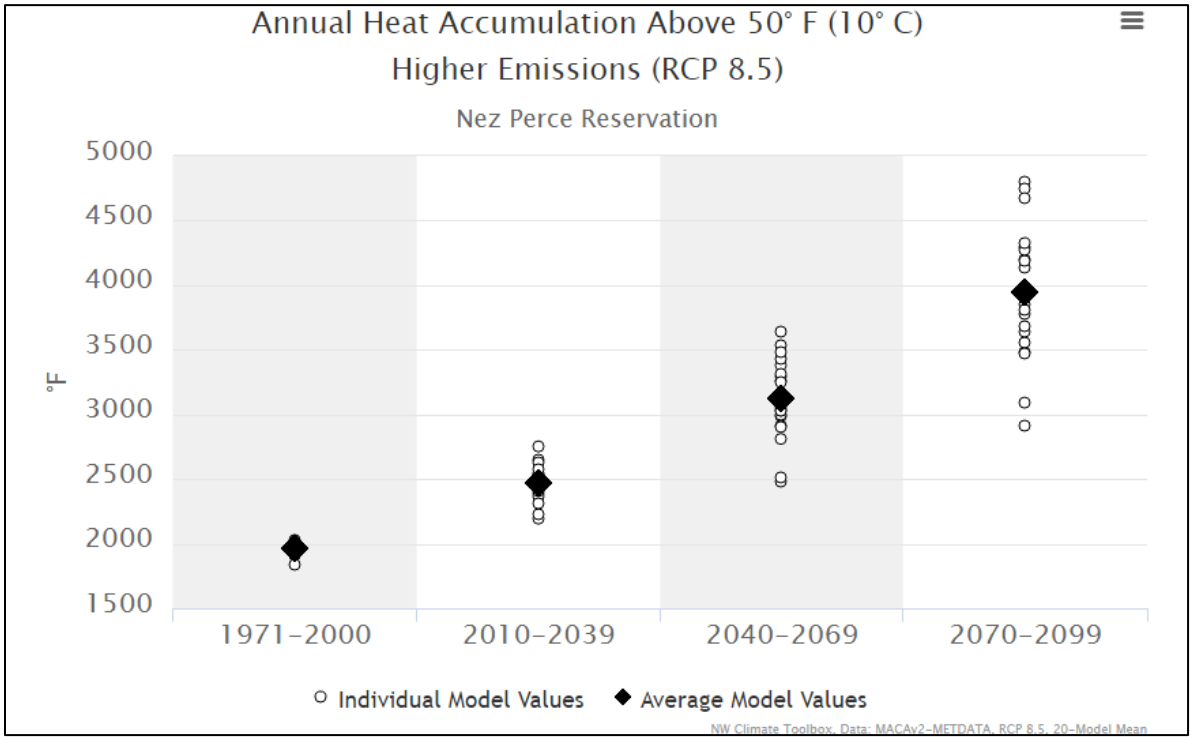


Figure 21) Annual heat accumulation above 50 degrees Fahrenheit projected for the Nez Perce Reservation, ID per the Tribal Climate Change Tool.

Climate change will also affect seasonal soil moisture levels which are expected to steadily decline. Compared to a historic value of 23.9 inches, average soil moisture levels for July through September are expected to drop to 20.8 inches by 2069, a 13% decrease (Table 11). Soil moisture levels are projected to continue to decrease, averaging less than 20 inches per year by 2099 (Figure 22). Figure 23 is a map that compares historic soil moisture values to those projected for the period 2010 to 2039 while Figure 24 displays differences between historic values and projections for 2040 to 2069.

Table 11) Projected change in Jul. - Sept. total soil moisture was averaged over the Clearwater Basin, and reported as an average over 10 models of hydrology.

Years (Emission Scenario)	Model Average Soil Moisture	Change
1971-2000 (Past)	23.9 inches	
2040-2069 (Higher Emissions)	20.8 inches	-3.1 (-13%)

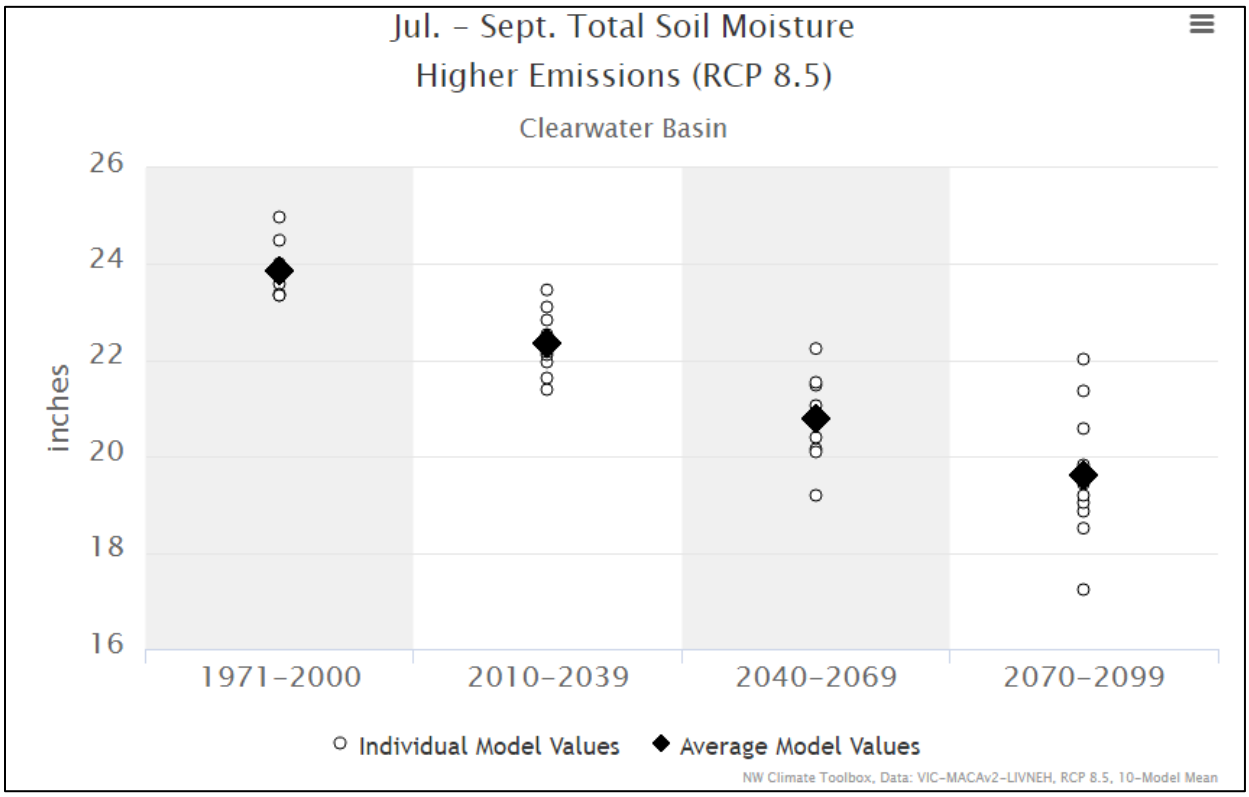


Figure 22) Projected change in Jul. - Sept. total soil moisture was averaged over the Clearwater Basin, and reported as an average over 10 models of hydrology.

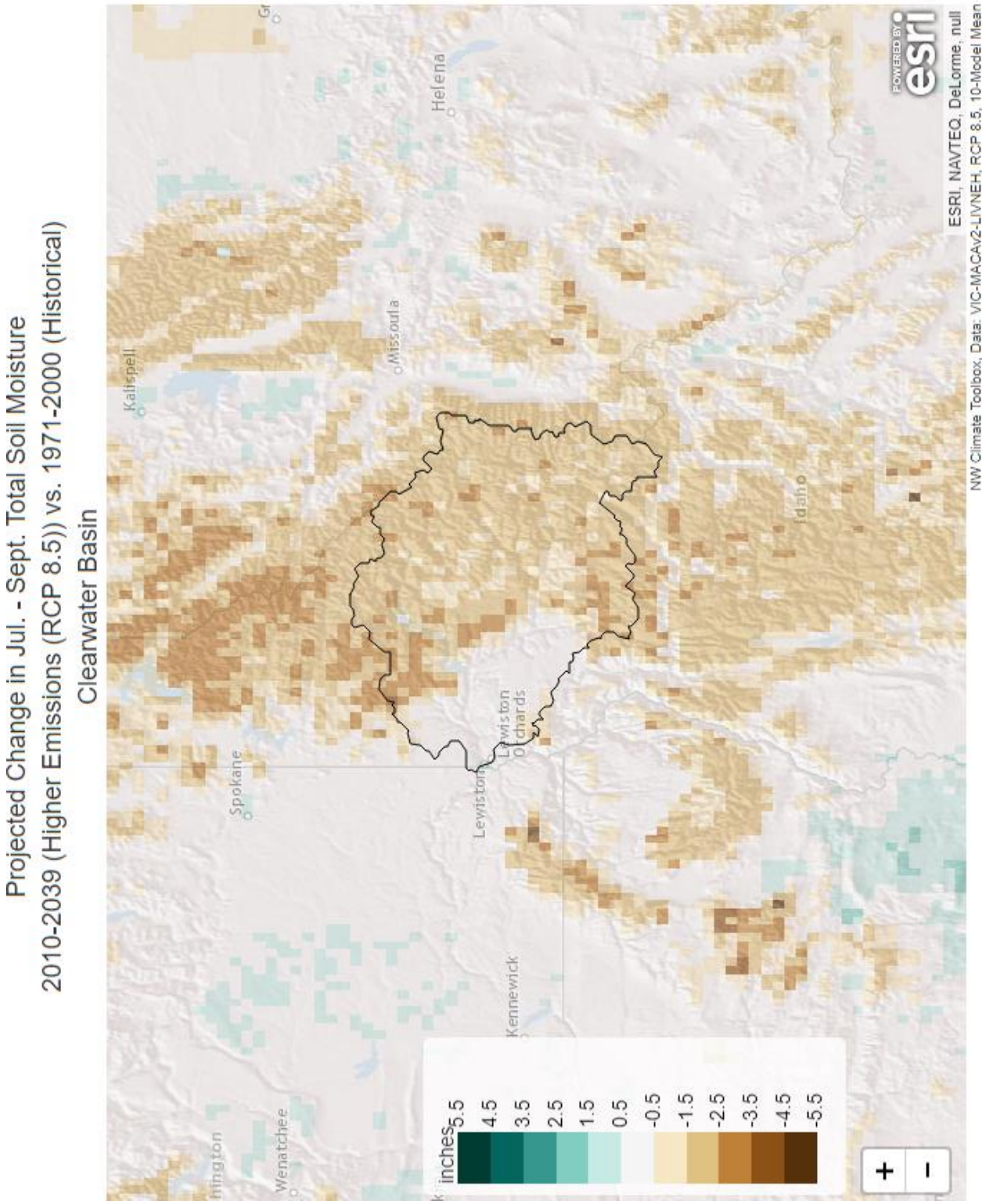


Figure 23) Projected change in Jul. - Sept. total soil moisture was averaged over the Clearwater Basin for 2010-2039, and reported as an average over 10 models of hydrology

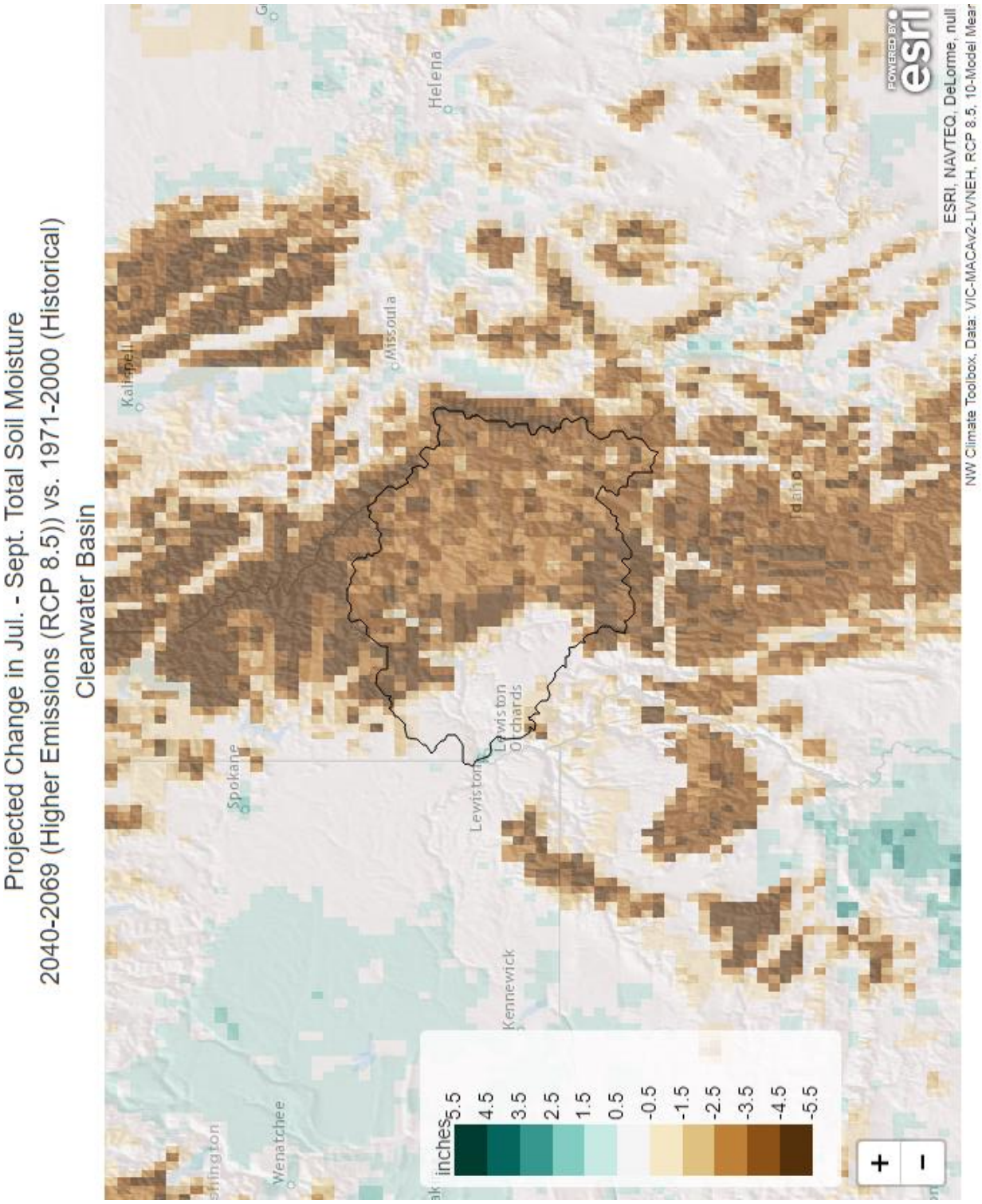


Figure 24) Projected change in Jul. - Sept. total soil moisture was averaged over the Clearwater Basin for 2040-2069, and reported as an average over 10 models of hydrology

Value of Resources at Risk

It is difficult to estimate the potential losses across the Reservation, typically structures located in forested areas without an adequate defensible space or fire-resistant landscaping have the highest risk of loss. Nevertheless, homes and other structures located in the grasslands or agricultural regions are not without wildfire risk. Grass fires are often the most dangerous due to high rates of spread. Fires in this fuel type are considered somewhat easier to suppress given the right resources, but they can also be the most destructive. Homes along the perimeter of the community would have the highest risk due to their adjacency to wildland fuels. Table 12 summarizes the type and number of structures located in high risk wildfire areas. Most of the structures at risk, approximately 5,400 structures, are classified as homes/residential while almost 500 commercial and commercial-type structures are at risk.

Table 12) Structures located in high risk wildfire areas on the Nez Perce Reservation.

Structure Type	Count
Homes/Residential	5,345
Commercial and Commercial-type	493
Other School Buildings	25
Schools	9
Historical Structures	2
Health Clinic	1
Prison	1
Outbuildings	Hundreds
Total	**5,876**

***Value includes countable structures only (outbuildings were not included).**

Volcanic Eruption Profile

Hazard Description and History

An explosive eruption from a composite volcano blasts solid and molten rock fragments (tephra) and volcanic gases into the air with tremendous force. The largest rock fragments (bombs) usually fall back to the ground within 2 miles of the vent. Small fragments (less than about 0.1 inch across) of volcanic glass, minerals, and rock (ash) rise high into the air, forming a huge, billowing eruption column.

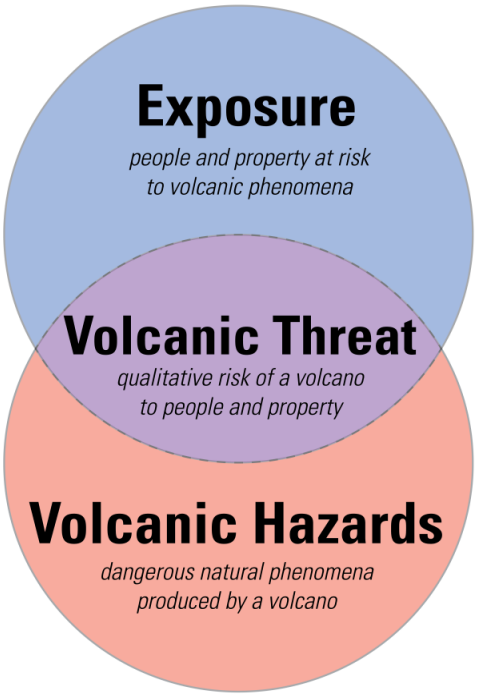


Figure 25) USGS Volcanic Hazards and Exposure

Eruption columns can grow rapidly and reach more than 12 miles above a volcano in less than 30 minutes, forming an eruption cloud. The volcanic ash in the cloud can pose a serious hazard to aviation. Ash related engine failures have led to restriction on travel through ash clouds. Following the eruption of Eyjafjallajökull in 2010, which disrupted one of the busiest airways in the world, over 100,000 flights were cancelled, leading to billions in economic losses.[20] During the 56 years between 1953 and 2009 there were 94 occasions when aircraft encountered ash, with 79 of those incidents caused some degree of engine damage and 26 resulted in significant engine damage.[21] Figure 25 demonstrates the relationship between volcanic hazards and the exposure of people and property and how those factors are used to quantify risk.

Large eruption clouds can extend hundreds of miles downwind, resulting in ash fall over enormous areas; the wind carries the smallest ash particles the farthest. Ash from the May 18, 1980, eruption of Mount St. Helens, Washington, fell over an area of 22,000 square miles in the Western United States. Heavy ash fall can collapse buildings, and even minor ash fall can damage crops, electronics, and machinery.

Volcanoes emit gases during eruptions. Even when a volcano is not erupting, cracks in the ground allow gases to reach the surface through small openings called fumaroles. More than ninety percent of all gas emitted by volcanoes is water vapor (steam), most of which is heated

[20] Morton, M.C., 2017. "Of airplanes and ash clouds: What we've learned since Eyjafjallajökull." Earth. Available online at: https://www.earthmagazine.org/article/airplanes-and-ash-clouds-what-weve-learned-eyjafjallaj%C3%B6kull

[21] Guffanti, M., et al., 2010. "Encounters of Aircraft with Volcanic Ash Clouds: A Compilation of Known Incidents, 1953—2009." USGS Data Series 545, ver. 1.0, 12 p., Available online at: http://pubs.usgs.gov/ds/545

ground water. Other common volcanic gases are carbon dioxide, sulfur dioxide, hydrogen sulfide, hydrogen, and fluorine. Sulfur dioxide gas can react with water droplets in the atmosphere to create acid rain, which causes corrosion and harms vegetation. Carbon dioxide is heavier than air and can be trapped in low areas in concentrations that are deadly to people and animals. Fluorine, which in high concentrations is toxic, can be adsorbed onto volcanic ash particles that later fall to the ground. The fluorine on the particles can poison livestock grazing on ash-coated grass and also contaminate domestic water supplies.[22]

Table 13) List of active volcanos of Highest Priority and High Priority within the U.S., Source: USGS

Region	Highest Priority	High Priority
Alaska	Akutan, Amak, Amukta, Bogoslof, Cleveland, Fourpeaked, Kasatochi, Kiska, Makushin, Recheshnoi, Redoubt, Seguam, Vsevidof, Yantarni, Yunaska	Black Peak, Chignagak, Churchill, Dana, Douglas, Dutton, Edgecumbe, Hayes, Kaguyak, Kupreanof, Spurr, Wrangell
Washington	Glacier Peak, Mount Baker, Mount Ranier, Mount St. Helens	Mount Adams
Oregon	Crater Lake, Mount Hood, Newberry, Three Sisters	
California	Lassen Volcanic Center, Mount Shasta	Clear Lake, Mono-Inyo Craters, Mono Lake Volcanic Field, Medicine Lake
Wyoming		Yellowstone

While there are numerous volcanos of concern in the U.S. (Table 13), the volcanoes of the Cascade Range, which stretches from northern California into British Columbia, have produced more than 100 eruptions, most of them explosive, in just the past few thousand years. However, individual Cascade volcanoes can lie dormant for many centuries between eruptions, and the great risk posed by volcanic activity in the region is therefore not always apparent. When Cascade volcanoes do erupt, high-speed avalanches of hot ash and rock (pyroclastic flows), lava flows, and landslides can devastate areas 10 or more miles away; and huge mudflows of volcanic ash and debris, called lahars, can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions can disrupt human activities hundreds of miles downwind, and drifting clouds of fine ash can cause severe damage to jet aircraft even

[22] Myers, Bobbie, et al. "What are Volcano Hazards?" U.S. Geological Survey. Vancouver, Washington. July 2004.

thousands of miles away. Erupting Cascade volcanoes are more prone than other U.S. volcanoes to explosive volcanic activity, resulting in pyroclastic flows. These are hot, often incandescent mixtures of volcanic fragments and gases that sweep along close to the ground at speeds up to 450 mph.

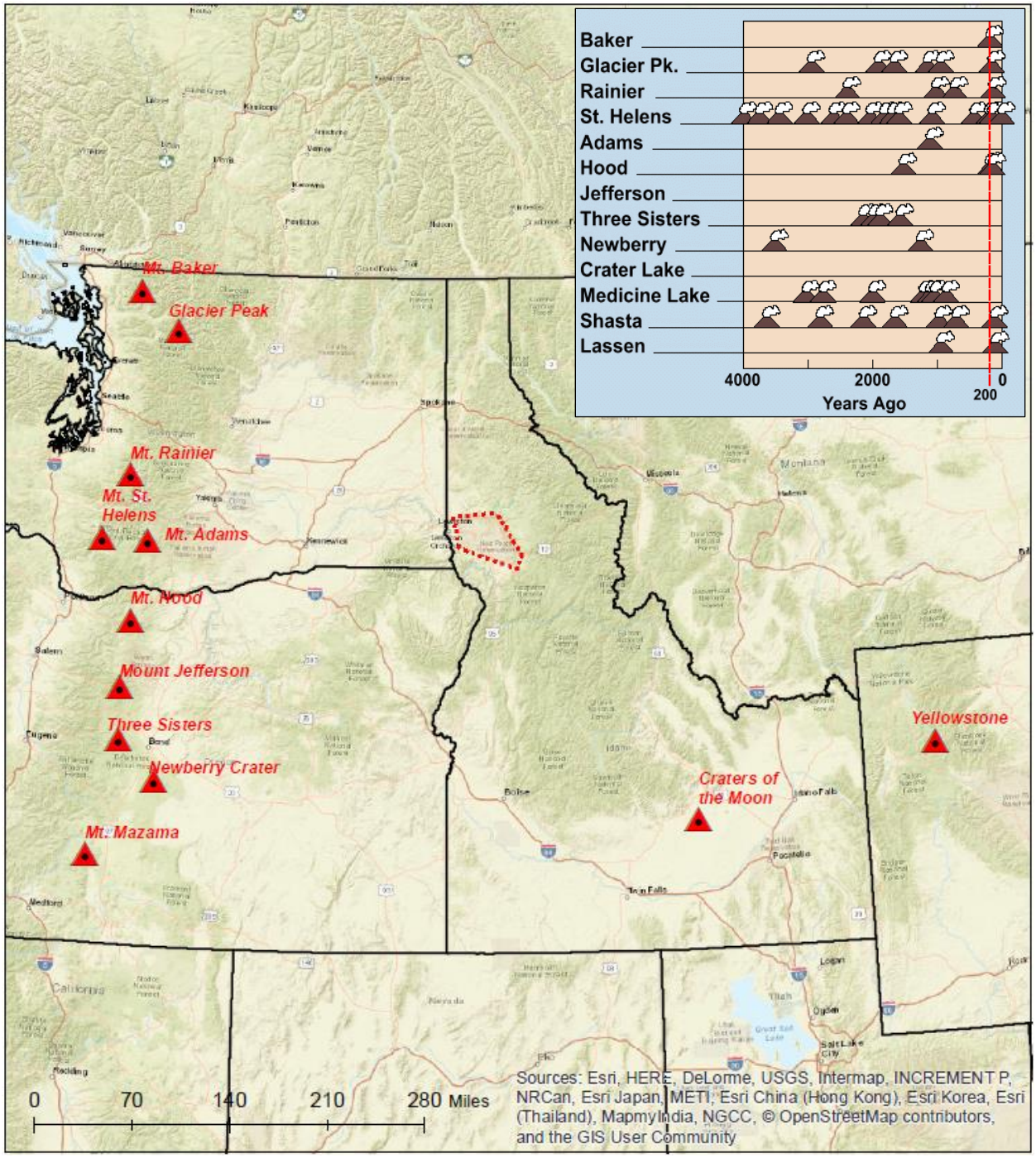


Figure 26) Location and eruption-frequency of volcanos in the Cascade Mountain Range.

Because the population of the Pacific Northwest is rapidly expanding, the volcanoes of the Cascade Range in Washington, Oregon, and northern California are some of the most dangerous in the United States. Although Cascade volcanoes do not often erupt (on average, about two erupt each century), they can be dangerous because of their violently explosive behavior, their permanent snow and ice cover that can fuel large volcanic debris flows (lahars), and their proximity to various critical infrastructure, air routes, and populated areas.[23]

The Cascade Range has more than a dozen potentially active volcanoes (Figure 26). Cascade volcanoes tend to erupt explosively, and on average two eruptions occur per century—the most recent were at Mount St. Helens, Washington (1980–86 and 2004–8), and Lassen Peak, California (1914–17). On May 18, 1980, after 2 months of earthquakes and minor eruptions, Mount St. Helens, Washington, exploded in one of the most devastating volcanic eruptions of the 20th century. Although less than 0.1 cubic mile of molten rock (magma) was erupted, 57 people died, and damage exceeded $1 billion. Fortunately, most people in the area were able to evacuate safely before the eruption because public officials had been alerted to the danger by U.S. Geological Survey (USGS) and other scientists. To help protect the Pacific Northwest's rapidly expanding population, USGS scientists at the Cascades Volcano Observatory in Vancouver, Washington, monitor and assess the hazards posed by the region's volcanoes.[24]

Probability of Future Occurrence

The Pacific Coast lies along the Ring of Fire which has produced 22 of the 25 largest volcanic eruptions over the last roughly 11,000 years[25]. The USGS studies and monitors many of the active volcanos in Washington State. Studies have shown that Glacier Peak has erupted an estimated 5 times in the last 13,000 years, likewise. Figure 26 shows the location and eruption-frequency of each volcano along the Cascade Mountains for the past 4000 years. While not a common occurrence eruption from the Cascade Volcanos occur, on average, two every century.

[23] Dzurisim, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997.

[24] Dzurisim, Dan, et al. "Living with Volcanic Risk in the Cascades." U.S. Geological Survey – Reducing the Risk from Volcano Hazards. USGS. Vancouver, Washington. 1997.

[25] Oppenheimer, Clive. 2011. Eruptions that Shook the World. University of Cambridge.

Impacts of Volcanic Eruption

The most likely impact from a volcanic eruption that would affect the Nez Perce Tribe would be ash fall from one of the many active volcanoes along the Cascade Mountain Range. Volcanic ash is a mixture of small particles of rock and glass fragments, winds can carry ash thousands of miles from the eruption site[26]. Prolonged exposure to ash can poses a health risk to people with respiratory conditions, children, and the elderly, leading to increased hospital visits and increased need/access to medications. Ash build up on rooftops of building can cause collapse, potentially causing injury or death. Water quality and wastewater management can be impacted or disrupted by ashfall. In addition to the risk to human health, ash can cause disruption to everyday activities; vehicle engines can become clogged with ash causing them to stall, power distribution systems can fail, communication systems may be disrupted due to the scattering or absorption of radio signals, crop damage and effects on livestock can range from minimal to severe[265]. Disruption to transportation systems through the closing of roadways and airports, can potentially result in an economic loss and stranded citizens.

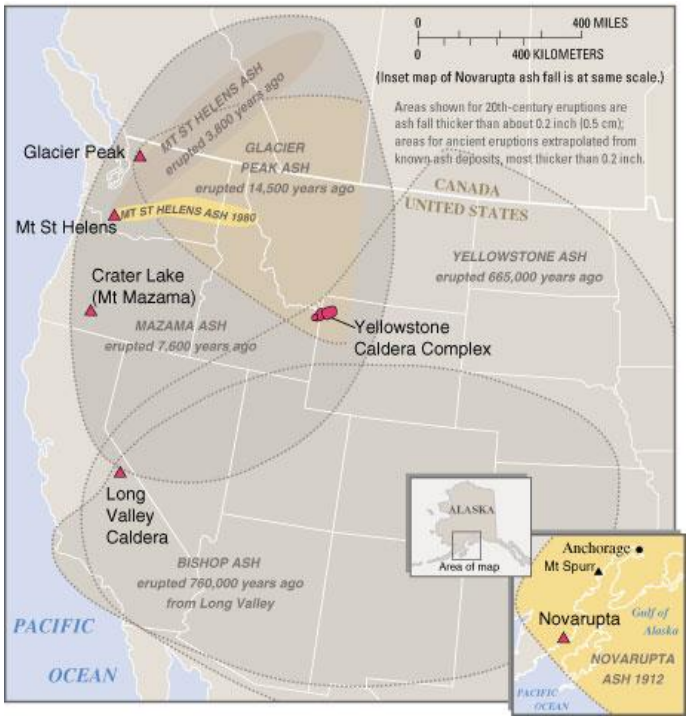


Figure 27) Historic ash fall map for the Pacific Northwest. Kenedi, C.A. et al. USGS 2000.

There are no active volcanoes on the Reservation; however, communities in this area could be directly affected by an eruption from any one of the Cascade volcanoes. During an eruption, such as the 1980 eruption of Mount St. Helens, the Reservation is not likely to be directly affected by lava flows, pyroclastic flows, landslides, or lahars; however, this region may be indirectly impacted due to damming of waterways, reduced air and water quality, acid rain, and ash fallout (Figure 27).

[26] Kenedi, C. A., Brantley, S.R. Hendley II, J.W., Stauffer, P.H., (2000). Volcanic Ash Fall – A "Hard Rain" of Abrasive Particles. USGS. Retrieved from: https://pubs.usgs.gov/fs/fs027-00/

Value of Resources at Risk

It is difficult to estimate the potential losses across the Reservation from a volcanic eruption, the main impact to eastern Washington, Idaho and Oregon from Mount St. Helens in 1980 eruption was ash accumulation on the roadways. Interstate 90 that runs from Spokane to Seattle was closed for a week, and multiple highways closed throughout northern Idaho. In addition to road closures the Portland International Airport had to stop flights for a few days. Towns, including Moscow and St. Maries, Idaho enacted 10 mph speed limits and in many areas transportation came to a complete standstill leaving travelers stranded. Disruption to the transportation systems also lead to economic losses as business slows and transportation of merchandise are either slowed or stopped. In Idaho alone the cost to businesses, clean-up, and vehicle damage was estimated in the tens of millions of dollars.[27] Structural damage to buildings is not common from ashfall, but depending on thickness of ash and structural design of the build it can occur. A layer of ash four inches thick can weigh between 120 to 200 pounds per square yard, and wet ash can weigh double[25].

Sensitive populations; elderly, children, and those that have respiratory issues, are susceptible to the fine particulates from the ash fall. The effects of inhaled ash are dependent on the composition of ash, size distribution of the inhaled material, the inhaled dose, and whether the individual had pre-existing respiratory conditions[28]. Refer to the ***Vulnerable Areas and Infrastructure*** for more information about *total* values at risk on the reservation in the event of an eruption.

[27] Volcano, 1980 Mount St. Helens: Idaho Office of Emergency Management. Retrieved from: https://ioem.idaho.gov/Pages/History/VolcanoHistory.aspx

[28] Buist, S.A., et al. (1986). The Development of a Multidisciplinary Plan for Evaluation of Long-term Health Effects of the Mount St. Helens Eruptions.

Hazardous Materials

The following information was excerpted from the 2009 Nez Perce Tribe HMP.

Hazard Description and History

Hazardous materials may include hundreds of substances that pose a significant risk to humans. These substances may be highly toxic, reactive, corrosive, flammable, radioactive, or infectious. Numerous Federal, State, and local agencies including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation, National Fire Protection Association, FEMA, U.S. Army, and the International Maritime Organization regulate hazardous materials.

Hazardous material releases may occur from any of the following:

- Fixed site facilities (such as refineries, chemical plants, storage facilities, manufacturing, warehouses, wastewater treatment plants, dry cleaners, automotive sales/repair, gas stations, etc.)
- Highway and rail transportation (such as tanker trucks, chemical trucks, railroad tankers)
- Air transportation (such as cargo packages)
- Pipeline transportation (liquid petroleum, natural gas, and other chemicals)

Unless exempted, facilities that use, manufacture, or store hazardous materials in the United States fall under the regulatory requirements of the Emergency Planning and Community Right to Know Act (EPCRA) of 1986, enacted as Title III of the Federal Superfund Amendments and Reauthorization Act (42 United States Code 11001–11050; 1988). Under EPCRA regulations, hazardous materials that pose the greatest risk for causing catastrophic emergencies are identified as EHSs. These chemicals are identified by the EPA in the *List of Lists – Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112 of the Clean Air Act*. Releases of EHSs can occur during transport and from fixed facilities. Transportation-related releases are generally more troublesome because they may occur anywhere, including close to human populations, critical facilities, or sensitive environmental areas. Transportation-related EHS releases are also more difficult to mitigate due to the variability of locations and distance from response resources.

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-off of response personnel and equipment. In addition, the risk of terrorism

involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities and the frequently limited antiterrorism security at these facilities.

On behalf of several Federal agencies including the EPA and U.S. Department of Transportation, the National Response Center serves as the point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment within the United States.

The National Response Center Web-based query system of non-Privacy Act data shows that between 2005 and 2009, three oil and chemical spills have occurred in the incorporated communities within the Reservation boundaries.

Probability of Future Occurrence

A facility must report to the EPA's Toxics Release Inventory data annually if the facility has:

- Has 10 or more full-time employees, and
- Manufactures or processes over 25,000 pounds of the approximately 600 designated chemicals or 28 chemical categories specified in the regulations, or uses more than 10,000 pounds of any designated chemical or category, and
- Engages in certain manufacturing operations in the industry groups specified in the U.S. Government Standard Industrial Classification Codes (SIC) 20 through 39, or
- Is a federal facility which are all now required to report per the August, 1995 Executive Order signed by President Clinton.

According to the EPA's Toxic Release Inventory data and as shown in Table 14, the EPA currently regulates 21 facilities within the above 12 communities that are permitted to discharge to water. 39 facilities are also permitted to handle hazardous waste. However, while several of the small, fixed facilities (e.g., body shops) have varying uses of hazardous chemicals, in general these facilities do not pose a significant risk to the Reservation.

In addition to fixed facilities, hazardous material events have the potential to occur along Highway 95, Highway 12, and railroads. The trucks and trains that use these transportation arteries commonly carry a variety of hazardous materials including gasoline, other crude oil derivatives, and other chemicals known to cause human health problems. The Clearwater River and Lapwai Creek are the two waterways most vulnerable to hazardous material transportation incidents.

Based on previous occurrences, the likelihood of a small oil or chemical spill occurring within the Reservation is every 2 years. However, more comprehensive information on the probability and magnitude of hazardous material events from all types of sources (such as fixed facilities or

transport vehicles) is not available. Wide variations among the characteristics of hazardous material sources and among the materials themselves make such an evaluation difficult.

Table 14) EPA-regulated facilities in the incorporated communities within the Reservation boundaries.

Location	Permitted Discharges to Water	Toxic Releases Reported	Hazardous Waste Handler	Active or Archived Superfund	Air Releases Reported
Ahsahka	2	0	2	0	0
Craigmont	1	0	5	0	0
Culdesac	6	0	3	0	0
Ferdinand	1	0	1	0	0
Kamiah	3	1	12	0	4
Kooksia	0	0	0	0	0
Lapwai	4	0	5	0	0
Nez Perce	0	0	1	0	0
Orofino	2	0	7	0	2
Reubens	0	0	2	0	0
Spalding	1	0	1	0	0
Stites	1	0	0	0	0
Source: EPA Environmental Facts Multisystem, 2009					

Impacts of Hazardous Materials Release

While it is beyond the scope of this HMP to evaluate the probability and magnitude of hazardous material events in the incorporated communities within the Reservation in detail, it is possible to determine the exposure of population, buildings, and critical facilities should such an event occur. Of the facilities that were required to file an annual EPA Tier II Material Inventory Report because of the presence of hazardous materials, 11 were identified as having EHSs. The substances recorded at these facilities include common hazardous substances, mainly sulfuric acid. EHSs, as shown in Figure 28, pose the greatest risk for causing catastrophic emergencies. Areas at risk for hazardous material events include any community that has an EHS facility and any area within a 1-mile radius of Highway 95, Highway 12, and railroads.

Values of Resources at Risk

Per the analysis performed for the 2009 HMP:

Within the community-wide buffer around the 11 EHS sites approximately 15 percent of the tribal population is exposed. This includes 349 tribal members, 100 residential buildings (worth $7.4 million), and 1 critical facility (worth $102,700). These figures are for all 11 EHS facilities and, therefore, overstate the exposure since the probability of all 11 facilities having an event

simultaneously is very low. These facilities are predominantly located within industrial and public facility zoned areas.

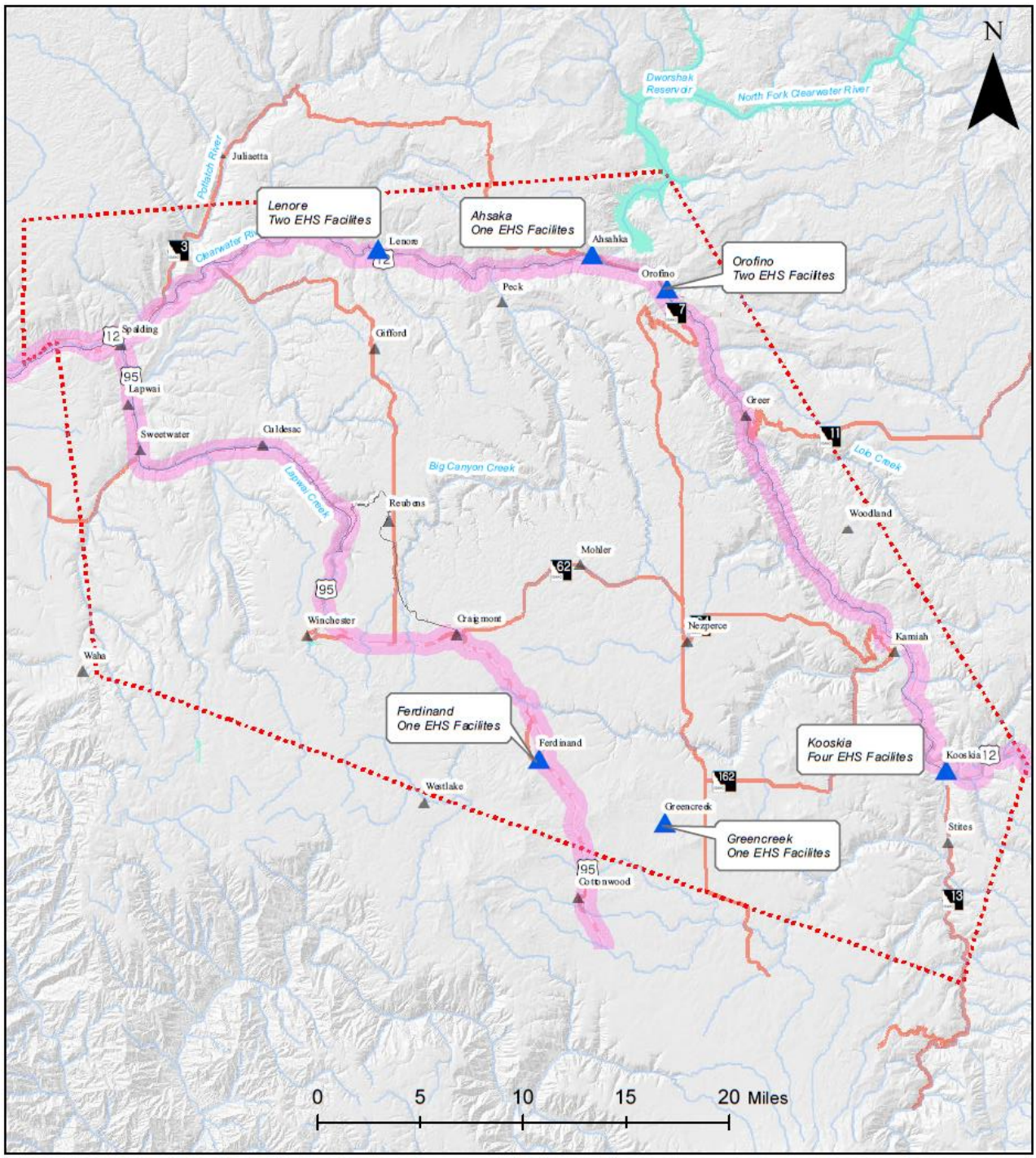


Figure 28) Environmentally hazardous substance (EHS) facilities and transportation routes on the Nez Perce Reservation.

Within the 1-mile buffer around the transportation facilities, over 80 percent of the tribal population is exposed to a hazardous material transport event. This buffered transport area includes 1966 tribal members, 418 residential buildings (worth $30.7 million), and all 21 critical

facilities (worth $28.8 million). As above, these figures are for the entirety of the transportation corridors and, therefore, overstate the exposure since a hazardous material event along the corridors is unlikely to affect all of the area within the 1-mile buffer.

Vulnerable Areas and Infrastructure

This section summarizes all areas and infrastructure on the Nez Perce Reservation that are vulnerable to natural hazard events. The tables and figures in the section show the collective value of all vulnerable infrastructures on the Reservation. Refer to each hazard annex for information about specific areas and infrastructures that are particularly vulnerable to a given hazard.

At the time of the update of this plan, residential building count data and population data was unavailable so the original table could not be updated. However, the table from the 2009 HMP was included in this update of the HMP and was expanded to include the total number structures in select cities and communities (Table 15). Of all of the cities and communities on the Nez Perce Reservation, Orofino has the most structures at 943, Kamiah has the second most structures at 482, and Lapwai has the third most structures at 374. Between the 12 cities and communities included in the total number of structures column, there are 3072 total structures on the Nez Perce Reservation. These cities and communities are mapped in Figure 29.

Tribal cities and communities contain critical infrastructure that could be at risk to the natural hazards identified in this plan. At the time of this update current data for the value or addition of new critical infrastructure was unavailable. Consequently, the table from the 2009 update is included in this plan but was expanded to include estimated structure values inflated to 2018 dollars (Table 16). Assuming that no new critical infrastructure has been constructed on the Nez Perce Reservation since 2009, the total inflated 2018 value of all critical infrastructure is just over $62 million. Figure 30 shows the location of critical infrastructure on the Nez Perce reservation.

Residential Structures

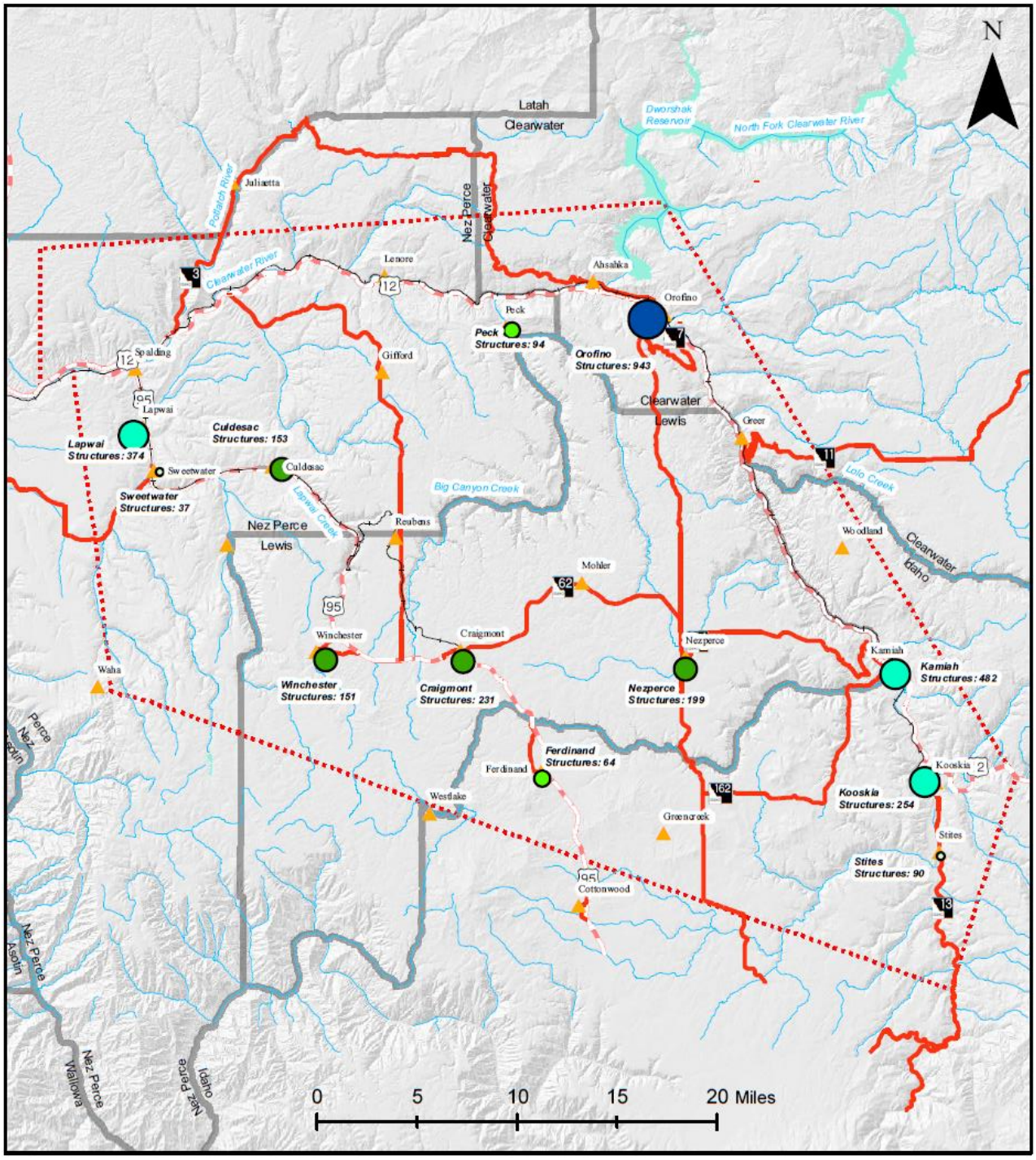


Figure 29) Map of communities and cities and total number of structures for select communities and cities on the Nez Perce Reservation.

Table 15) Nez Perce Tribe Estimated Population and Residential Building Inventory[1]

Location[2]	Population	Residential Buildings[3]	Total # of Structures[4]
Lapwai	1,149	193	374
Ahsahka	150	50	-
Culdesac	10	2	153
Craigmont	8	2	231
Ferdinand	1	1	64
Gifford	30	10	-
Greer	25	8	-
Greencreek	50	16	-
Kamiah	279	66	482
Kooskia	15	3	254
Lenore	20	7	-
Mohler	20	7	-
Myrtle	1	1	-
Nezperce	10	3	199
Orofino	113	23	943
Peck	3	1	94
Reubens	0	0	-
Slickpoo	1	1	-
Spalding	150	50	-
Sweetwater	40	10	37
Stites	5	1	90
Winchester	4	1	151
Woodland	300	100	-
Total	**2,384**	**556**	**3072**

Source: Nez Perce Tribe, U.S. Census

[1] The estimated population may include Native Americans that are not members of the Nez Perce Tribe

[2] The location may include neighborhoods immediately adjacent to the city limits / community boundaries.

[3] Residential building inventory from 2009 HMP.

[4] Total number of structures at the time of this plan update. Data was not available for some towns/communities.

Critical Infrastructure

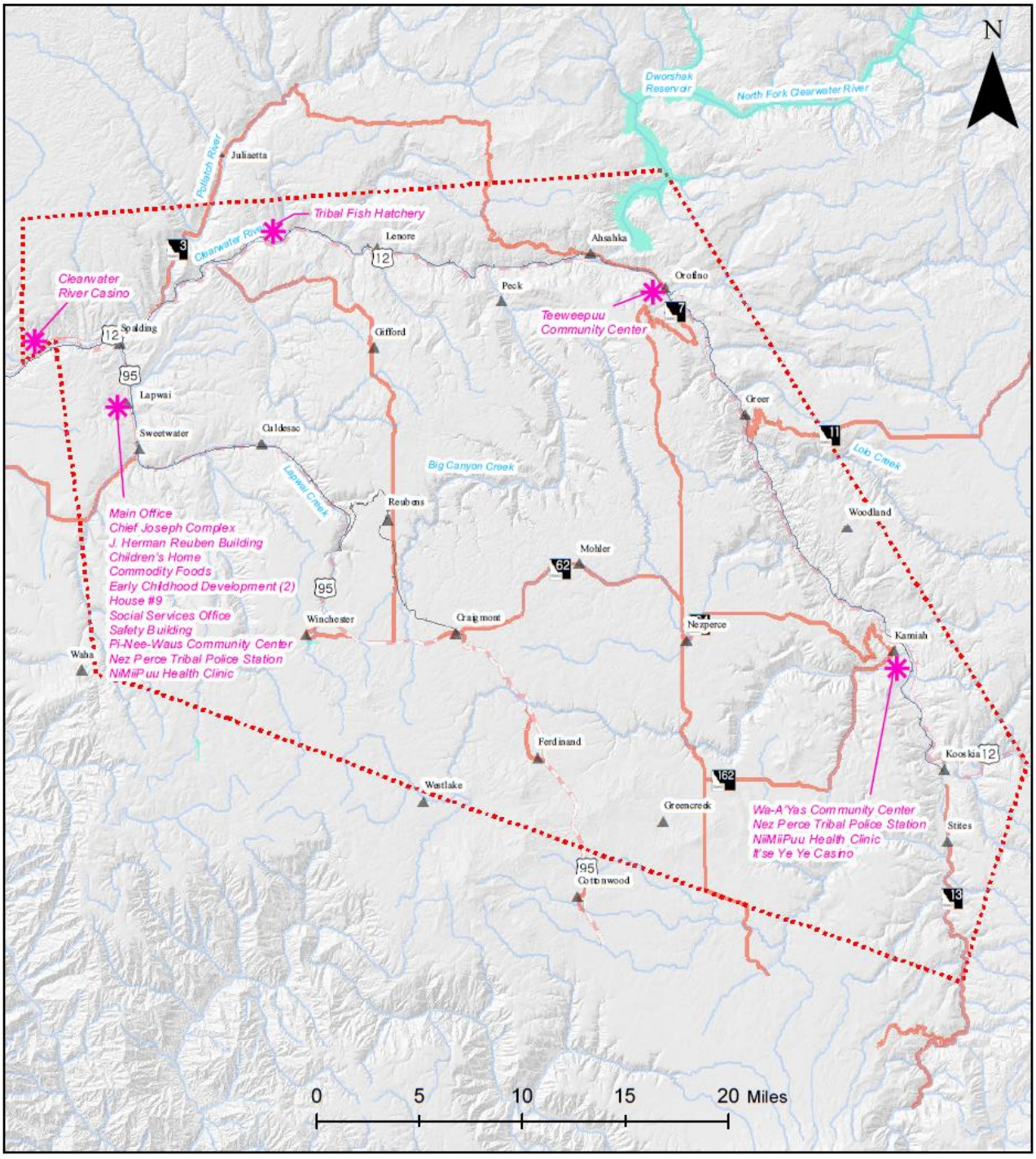


Figure 30) Map of critical infrastructure on the Nez Perce Reservation.

Table 16) Nez Perce Tribe critical infrastructure as identified in the 2009 Nez Perce Reservation HMP and estimated 2009 values inflated to 2018 dollars.

Category	Facility	Location	2009 Estimated Value	Value Inflated to 2018 dollars
Tribal Offices and Facilities	Main Office	Lapwai	$1,935,400	$2,265,800
	Chief Joseph Complex	Lapwai	$1,581,900	$1,851,000
	J. Herman Reuben Building	Lapwai	$347,000	$406,100
	Children's Home	Lapwai	$128,700	$150,600
	Commodity Foods	Lapwai	$656,400	$768,100
	Early Childhood Development	Lapwai	$70,200	$82,100
	Early Childhood Development	Lapwai	$70,200	$82,100
	House #9	Lapwai	$70,200	$82,100
	Social Services Office	Lapwai	$91,000	$106,500
	Safety Building	Lapwai	$44,100	$51,600
	Tribal Fish Hatchery	Near Lenore	$4,969,000	$5,814,800
Gathering Places and Community Center	Teweepuu Community Center	Orofino	$102,700	$120,200
	Wa-A'Yas Community Center	Kamiah	$2,445,700	$2,862,000
	Pi-Nee-Waus Community Center	Lapwai	$1,935,400	$2,265,000
Police and Fire Stations	Nez Perce Tribal Police Station	Lapwai	$1,170,200	$1,369,400
	Nez Perce Tribal Police Station	Kamiah	$2,445,700	$2,862,000
Health Clinics	NiMiiPuu Health Clinic	Lapwai	$6,050,000	$7,079,800
	NiMiiPuu Health Clinic	Kamiah	$1,452,000	$1,699,146
Enterprises	Clearwater River Casino & Resort Hotel	Ahtway	$21,600,000 **	$25,272,000
	CRC Events Center	Ahtway	$2,661,700 **	$3,114,189
	Nez Perce Express	Ahtway	$1,860,500 **	$2,176,785
	Camas Express	Winchester	$508,000 **	$594,360
	It'se Ye Ye Casino	Kamiah	$935,000	$1,093,950
	Total		**$44,635,300**	**$62,169,630**

Source: **Nez Perce Tribe (insured value, parcel improvement value) and FEMA HAZUS-MH (estimated values)**

** Includes value of Contents According to Argus Insurance Inc.

Cultural and Sacred Sites

Requirement §201.7(c)(2)(ii)(D): [The plan should describe vulnerability in terms of] cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.

An inventory of historic and culturally significant properties is maintained by the Nez Perce Tribal Historic Preservation Office and is not included in this plan. However, Tribal historic and culturally significant sites on the Reservation which are part of Nez Perce National Historic Park have been identified as follows and in Figure B-13, Nez Perce National Historic Park. In addition, their associated hazard risks are discussed.

- **Nez Perce National Historic Trail**: The Nez Perce National Historic Trail stretches from Wallowa Lake, Oregon, to the Bear Paw Battlefield near Chinook, Montana, crossing the southeastern portion of the Nez Perce Reservation. Forced to abandon hopes for a peaceful move to the Lapwai reservation, the Nez Perce chiefs saw flight to Canada as their last promise for peace. This route was used in its entirety only once; however, component trails and roads that made up the route bore generations of use prior to and after the 1877 flight of the nontreaty Nez Perce. Within the Nez Perce Reservation, the trail is vulnerable to floods, landslides, and wildland fires.

- **Coyote's Fishnet**: Historical marker located in the Spalding area that commemorates the legend of Coyote and Black Bear's argument whereby Coyote threw his fishing net on a hill and tossed Black Bear to another and turned him into stone. The Spalding area is vulnerable to dam failure inundation and flooding.

Ant and Yellowjacket: Historical marker located in the Spalding area that commemorates the legend of Ant and Yellowjacket's argument whereby Coyote turned them into a stone arch. The Spalding area is vulnerable to dam failure inundation and flooding.

Chapter 5

Critical to the implementation of this Natural 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 across the Nez Perce Reservation.

Mitigation Strategy

All risk assessments were made based on the conditions existing during 2017/2018; thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the Tribe's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

Mitigation Goals

Requirement §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. The Tribe's Steering Committee reviewed the mitigation goals identified in the 2006 HMP and determined that they were still applicable (Table 17).

Table 17) Mitigation Goals for the Nez Perce Reservation HMP.

Priority	Description
1	Promote disaster-resistant development.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3	Reduce the possibility of damage and losses due to dam failures.
4	Reduce the possibility of damage and losses due to drought.
5	Reduce the possibility of damage and losses due to floods.
6	Reduce the possibility of damage and losses due to hailstorms.
7	Reduce the possibility of damage and losses due to hazardous materials events.
8	Reduce the possibility of damage and losses due to landslides.
9	Reduce the possibility of damage and losses due to volcanic eruptions.
10	Reduce the possibility of damage and losses due to wildland fires.

11	Reduce the possibility of damage and losses due to windstorms.
12	Reduce the possibility of damage due to heavy snowfall and widespread freezing.

Mechanisms to Incorporate Mitigation Strategies

The Nez Perce Tribe encourages the philosophy of instilling disaster resilience 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 Steering Committee, 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 for the Tribe that will either use the risk assessment information presented in this document to inform decisions or will integrate the mitigation strategy directly into capital improvements, infrastructure enhancements, training projects, prevention campaigns, and land use and development plans.

Development of Mitigation Action Items

Selection of Items for Plan Update

To help select action items for inclusion in the 2019 plan update, the Steering Committee reviewed the following list of questions to help evaluate new action items as well as action items to be carried over from the 2009 plan:

- Does the action mitigate assets identified as vulnerable in the HMP's Risk Assessment?
- Do the actions identified help achieve the goals identified in the Mitigation Strategy?
- Is the action economically feasible (either through current or potential funding sources)?
- Is the action culturally and environmentally sensitive?
- Are proper laws and/or resolutions in place to implement the action?
- Is political and public support enough to implement the action and ensure its success?
- Does the action enforce and/or enhance current mitigation actions?

Through this evaluation process, which was first developed for the 2006 version of the plan, the Steering Committee identified mitigation actions to be included in the 2019 HMP plan update (Table 18). The table of action items includes a description of each action item and associated administrative information, including which departments or agencies will be responsible, potential cost of implementation, and time frame for completion.

Categorization of Mitigation Action Items

This section provides a brief overview of how the different fields in the MAI table were populated and the criteria used to assign ratings and values.

Priority: As part of the preparation process, all action items were prioritized by representatives from the different Tribal departments who were directly involved with the development of the action item; most departments prioritized items based on departmental goals, project feasibility, cost, and overall impact on the Tribe. The overall priority of an action item was determined and agreed upon by the advisory group as a whole and assigned a rating of **LOW, MEDIUM, or HIGH**; these rankings were largely determined while considering the immediate needs of the Tribe, total project benefits, likelihood that funds will be available, and the strategy described in other Tribal documents and policies (The numerical labeling in the "MAI #" column and ordering of the initiatives does not have any implications for priority).

Time Frame: An estimation was made regarding the number of years required to fully implement and complete each project. The number of years does not reflect when the project will be completed as that is dependent on the availability of funding and other resources.

Lead Agency: The agencies listed in the table are responsible for the implementation, status update, and close-out of the respective action item.

Cost: Since the exact cost of each project is unknown, a cost-rating of **LOW, MEDIUM, and/or HIGH** was assigned to each action item. These ranges were taken from Worksheet 7 in the Tribal Mitigation Planning Handbook and are as follows:

- Low: $0 to $25,000
- Medium: $25,000 to $100,000
- High: $100,000 or more

Process to Monitor and Evaluate Mitigation Action Items

As part of the annual review process, the Steering Committee will update the status of mitigation projects and identify any projects that could potentially be funded through grants. New projects not included in the plan will be noted and opportunities to accomplish projects through other planning mechanisms will also be identified. The status of any completed projects will also be updated to reflect when the project was completed and if it was or is yet to be officially "closed out" by the responsible agency. The list of MAI's will be fully revised during the next five-year update of the plan.

Information and resources that can be used for the annual review can be found in Appendix 2.

Project Start-Up and Closeout Procedures

After the adoption of the 2019 HMP by the Tribe, the Tribe's Emergency Management Planner (EM) and Tribal Emergency Response Planning Team (TERPT) will continue to monitor, evaluate and update the plan. Additionally, the EM and representatives of the TERPT will be responsible for monitoring and implementing assigned mitigation activities from the HMP and will report project-status changes at monthly TERPT meetings. The Tribe will also apprise the public about the HMP and hazards that affect the Tribe through various platforms and outreach efforts.

In the interest of facilitating grant-funded projects on the Reservation, the Tribe's day-to-day operations include researching grant opportunities, developing applications, routing them through a carefully developed practice including, the originator, the program manager, the program department director, the finance department head, the Tribe's legal department and the Executive Director. Once the application passes the routing procedure it is submitted to Tribal Council and if they approve it, it is sent to the funding entity. Copies of the application are kept at the program/department and finance department. When the application is chosen for funding, an award document is processed internally and submitted to the Chairman for approval. Funds can be directly transmitted to the Tribe or are collected by the Tribe on a reimbursement basis. Finance staff works with the department managing the grant/project to ensure close out reports and all required narrative reports are sent to the funding entity, according to their terms. Financial reports and drawdowns are completed by the Tribe's Finance department.

2019 Mitigation Action Items

Requirement §201.7(c)(3)(ii): [The mitigation strategy shall include] a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Table 18 outline the mitigation strategies identified by the Steering Committee and will remain in effect for at least the next five years. A thorough review and project assessment of the action items from the previous plan allowed the committee to incorporate mitigation strategies from the last plan as indicated by "2009 HMP Item" in the *Description of Potential Actions* column.

Table 18) Mitigation Action Items as identified by the Nez Perce Tribe for the 2019 Hazard Mitigation Plan update.

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
Category 1) Promote disaster-resistant development.						
1.A	Expand the Tribal Building Code to include residential structures.	**Medium**	4 years	NPTEC, Housing, Maintenance	Low	**2009 HMP Item:** A uniform building code was adopted but it only applies to commercial buildings.
1.B	Develop a comprehensive/general plan that addresses natural and human-made hazards.	**High**	2 years	EM, Natural Resources, PD	Medium	**2009 HMP Item**
1.C	Explore the need for hazard zoning and high-risk hazard land use ordinances.	**Low**	4 years	EM, GIS, NPTEC	Low	**2009 HMP Item:** This has not been done.
1.D	Incorporate hazard prone areas into land use planning.	**Medium**	2 years	EM, Land, GIS, Housing	Low	**New item for 2019 update**
1.E	Develop educational tools that promote safety and reduce hazard risk.	**High**	1 year	EM, Safety, Fire, Water Resources, Air Quality	Low	**New item for 2019 update**

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
1.F	Incorporate inline fire suppression into future building codes.	**High**	2 years	NPTEC, EM, Safety, Fire, Maintenance		**2009 HMP Item:** A uniform building code was adopted but it only applies to commercial buildings.
1.G	Incorporate climate change considerations into building codes.	**Low**	2 years	EM, Climate Change Coordinator, NPTEC	Low	**New item for 2019 update**
Category 2) Build and support local capacity to enable the public to prepare for, respond to and recover from disasters.						
2.A	Expand data collection, hazard risk and vulnerability analysis, and make information available through interactive online mapping.	**High**	Always	EM, GIS, All departments	Medium	**2009 HMP Item:** Updated
2.B	Create a mitigation outreach program that helps tribal members prepare for disasters.	**High**	2 years	EM, Safety, Fire, PD, All Departments	Medium	**2009 HMP Item**
2.C	Develop a plan and seek funding for backup electric and telecommunications systems in tribal-owned critical facilities.	**Medium**	3 years	IT, EM, PD	High	**2009 HMP Item**
2.D	Develop emergency evacuation programs for neighborhoods in hazard prone areas.	**High**	1 year	PD, GIS, EM	Medium	**New item for 2019 update**
2.E	Continue to support and fund Community Emergency Response Team (CERT) programs that also include a mitigation component.	**High**	Now	EM, Water Resources, Fisheries	Medium	**2009 HMP Item**
2.F	Create a library that contains all technical studies, particularly related to natural resources.	**Medium**	1 year	All Departments	Low to Medium	**2009 HMP Item:** Updated

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
2.G	Seek funding for the development of an inventory and mapping of culturally significant sites, for the planning of hazard mitigation and disaster response protocol.	**High**	1 year	Cultural, EM, GIS, PD, Fire	Medium	**New item for 2019 update**
2.H	Provide for inspection and enforcement of tribal codes and ordinances.	**Low**	3 year	Safety, EM, PD, All Departments	Low	**2009 HMP Item:** A Tribal Occupational and Safety Hazard position (TOSHA) has been established.
Category 3) Reduce the possibility of damage and losses due to flood.						
3.A	Join the National Flood Insurance Program.	**Medium**	5 years	NPTEC, ED, Safety, EM, Water Resources	Low to Medium	**2009 HMP Item:** We have not joined. Still would need to establish a flood plain ordinance.
3.B	Implement best management practices for floodplain areas. Provide community flood preparedness drills. Incorporate flood levels for community notifications.	**High**	2 years	ED, EM, Land, Safety, Water Resources	Low to Medium	**New item for 2019 update**
3.C	Map and document repetitively flooded properties. Explore mitigation opportunities for repetitively flooded properties, and if necessary, carry-out acquisition, relocation, elevation, and flood-proofing measures to protect these properties. Incorporate extreme precipitation events in flood mapping, and scenario planning for the 500-year floodplain.	**Medium**	2 years	EM, GIS, Land, PD, Water Resources	Medium to High	**2009 HMP Item:** Updated

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
Category 4) Reduce the possibility of damage and losses due to drought.						
4.A	Develop an educational program that focuses on public awareness of water conservation techniques for: landscaping, irrigation, and reducing household usage.	**Medium**	2 years	Water Resources, Housing, EM	Low to Medium	**New item for 2019 update**
4.B	Develop and adopt a water conservation ordinance that may stipulate landscaping requirements, hours for irrigation, retrofitting households for low-flow toilets and shower, and penalties for wasting water.	**Low**	4 years	Water Resources, Housing, EM	Low to Medium	**2009 HMP Item:** The development of a water code is underway, but it would not apply to these scenarios.
4.C	Develop and promote sustainable building codes for both residential and commercial properties. Provide incentives and technical support for tribal members to transition to water saving technology/practices such as irrigation timers, low flow toilets and showerheads, rain barrels, or bioswales.	**Medium**	3 years	Climate Change, Water Resources, NPTEC, ED	Low to Medium	**2009 HMP Item:** Not done.
4.D	Expand source-water assessment and protection program.	**Medium**	3 years	Water Resources	Low to Medium	**2009 HMP Item**
Category 5) Reduce the possibility of damage and losses due to hailstorms.						
5.A	Provide assessment of trees and branches that pose a risk to structure and/or powerlines and provide free curbside removal of debris.	**Medium**	2 years	Fire, Forestry, Utilities	Low to Medium	**2009 HMP Item:** Updated
5.B	Ensure that all critical facilities are adequately insured for hailstorms.	**High**	1 year	Finance, Safety, EM	Low	**2009 HMP Item**

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
5.C	Explore and promote building materials that can withstand hailstorm events.	**Medium**	2 years	Housing, Maintenance, ED	Low	**2009 HMP Item**
Category 6) Reduce the possibility of damage and losses due to winter storms.						
6.A	Develop a rescue operation plan.	**High**	2 years	PD, EM	Low to Medium	**New item for 2019 update**
6.B	Structure risk and vulnerability mapping.	**Medium**	3 years	ED, GIS, EM, PD, Social Services	Low to Medium	**New item for 2019 update**
6.C	Infrastructure protective best management practices.	**Medium**	3 years	Maintenance, ED, Housing	Low	**New item for 2019 update**
Category 7) Reduce the possibility of damage and losses due to landslides.						
7.A	Create a comprehensive geological mapping to areas prone to landslides and rockslides.	**Medium**	2 years	EM, GIS, ID	Medium	**2009 HMP Item**
7.B	Identify high landslide hazard areas and limit future development.	**Medium**	2 years	EM, Land, Housing, ED	Low	**2009 HMP Item**
7.C	Develop a public outreach program that addresses the economic impacts of landslides on personal property. Coordinate forest fire damage assessment and mitigation efforts with landslides prevention efforts.	**Low**	4 years	EM, ED, NPTEC, Forestry	Low	**2009 HMP Item:** Updated
Category 8) Reduce the possibility of damage and losses due to wildfire.						
8.A	Continue to conduct current fuel management programs and investigate and apply new and emerging fuel management techniques.	**High**	On-going	Fire, Forestry	Medium to High	**2009 HMP Item**
8.B	Develop and provide funding and/or incentives for defensible space around structures in wildland fire hazard areas.	**High**	On-going	NPTEC, ED, Fire, Forestry, Finance	Low to High	**2009 HMP Item**

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
8.C	Develop and enhance fire mutual aid.	**Low**	On-going	Fire, EM	Low	**2009 HMP Item**
8.D	Ensure fire stations are not within known hazard areas and retrofit/mitigate structures if necessary.	**Low**	5 years	Fire, EM, GIS	Low to High	**2009 HMP Item**
8.E	Inventory water storage and capacity.	**Medium**	3 year	Fire, Water Resources, PD, Maintenance	Low	**2009 HMP Item**
8.F	Indoor air quality filtration for clean air ready communities.	**High**	1 year	Air Quality, EM, Health, Safety	Low to High	**New item for 2019 update**
8.G	Cache of air quality filtration systems that can be provided to residents of vulnerable populations or commercial buildings for shelter in place purposes.	**High**	2 years	Air Quality, EM, Health, Safety	Low to High	**New item for 2019 update**
Category 9) Reduce the possibility of damage and losses due to volcanic eruption.						
9.A	Provide information to the public about volcanic ash, including instructions for keeping ash out of buildings and participating in clean-up operations.	**Low**	4 years	EM, Public Health, Health, Air, Safety	Low	**2009 HMP Item**
9.B	Ensure that emergency vehicles carry extra air and oil filters, extra oil, windshield wiper blades and windshield washer fluid to be used during and after an ash fall.	**Medium**	2 years	PD, Fire, All departments with vehicles	Low to Medium	**2009 HMP Item**
9.C	Develop communication plans and procedures for notifying tribal employees of potential ash fall warnings, reducing or shutting down operations, and accelerating maintenance of buildings and machinery during cleanup operations.	**High**	1 years	Communications, ED, EM, PD, IT	Low	**2009 HMP Item:** A mass text system is being developed.

MAI #	Description of Potential Actions	Priority	Time Frame	Lead Agency	Cost	Status
Category 10) Reduce the possibility of damage and losses due to windstorms.						
10.A	Develop restrictions on planting large or rapidly growing trees near power lines and major arterials.	**Low**	5 years	NPTEC, ED, Land, Utilities	Low	**2009 HMP Item**
10.B	Consider underground utilities ordinance as part of building code.	**Medium**	4 years	NPTEC, Utilities, Housing	Low	**2009 HMP Item**

Capability Assessment

Requirement §201.7(c)(3)(iv): [The mitigation strategy shall include] a discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of Tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas.

The Tribe currently supports pre- and post- disaster hazard mitigation through its regulations, plans, and programs. Tribal mitigation policies include a forest fire protection ordinance, burn permits, and mutual aid agreements. Mitigation planning includes a hazard mitigation administration plan and an emergency operations plan. In addition, the Tribe participates in several hazard mitigation programs including a fuel management program, a wildfire outreach program, and a GIS-based hazard mapping program. Since 2006, the Tribe has not implemented any new pre- or post-disaster regulations, plans, or programs but continues to enforce its existing regulations, plans, and programs. The hazard management capabilities of the Tribe have improved with the hiring of a full time Emergency Management Coordinator and nineteen ICS and NIMS trainings for Emergency Operations Center and Emergency Response personnel. Table 19 summarizes the Tribe's hazard mitigation legal and regulatory capabilities.

Table 19) Legal and Regulatory Resources Available for Hazard Mitigation

Type of Mitigation	Regulatory Tool	Name/Type	Evaluation of Regulatory Tool on Hazard Mitigation
Pre-Disaster Mitigation	Plans	Hazard Mitigation Administration Plan	The purpose of this plan is to establish the management procedures that the Tribe will use for the administration of the HMGP. It outlines management, financial, and administrative procedures to implement the HMGP.
		Geographic Response Plan	Engages the region's partnerships and regulatory agencies of the Clearwater, Snake river, and Columbia River Basin Corridors to collaborate on emergency responses to toxic releases into the waterways.
		FOG	Field Operations Guide for frequencies to first responders.
	Polices	Forest Protection Fire Ordinance	This ordinance is designed to limit fires by regulating the use of materials that can cause wildland fires, such as the proper use of campfires, the disposal or use of ignited substances, and the use of instruments such as chainsaws that need spark protectors.

Type of Mitigation	Regulatory Tool	Name/Type	Evaluation of Regulatory Tool on Hazard Mitigation
		Water and Waste Management Ordinance	Brownfields assessment and underground storage tanks are identified and tracked throughout the Tribe's Environmental Protection Agency compliance of identifying and potential removal of toxic releases.
		Burn Permits	This policy is currently used to limit burning during bad air quality days. However, it could be used to limit burning during the summer and autumn, when the Reservation is most susceptible to wildland fires.
	Programs	Geographical Information Systems	The Land Services Program GIS-database contains land cover and hazard information for the Tribe. This information is useful for identifying hazard-prone areas and areas of current and future development.
		Forest Department Fuel Management Program	The Forestry Department is involved in fuel management for wildland fire hazard areas on the Reservation. This program reduces fuel load and therefore wildland fire potential.
		Student Conservation Association Program	Student Conservation Association conducts wildland urban-interface outreach and fuel management programs. This program educates the public about wildland fires. In addition, it reduces fuel load and therefore wildland fire potential.
		Water Resources Groundwater	This program oversees the Hazardous Environmental Response Team to respond to toxic releases.
Post-Disaster Mitigation	Plans	Emergency Operations Plan	This document is National Incident Management System compliant. This system standardizes incident management and response to human-made and natural hazards.
	Policies	Mutual Aid Agreements	Mutual Aid Agreement with Lapwai Fire Department. Mutual Aid for firefighting includes fire responders and their equipment. Mutual Aid ensures the efficient utilization of all available resources needed to mitigate an extraordinary event.
Development in Hazard-Prone Areas	Policies	Nez Perce Tribal Commercial Building Code	Enforces the Uniform Building Code for commercial buildings only. Structures built to code are less likely to be vulnerable to hazardous conditions, including windstorms, wildland fires, etc.

Funding Sources

Requirement §201.7(c)(3)(v): [The mitigation strategy shall include an] identification of current and potential sources of Federal, Tribal, or private funding to implement mitigation activities.

The fiscal capability assessment lists the specific financial and budgetary tools that are currently available, as well as potentially available, to the Tribe for hazard mitigation actions. These capabilities, which are listed in Table 20, include Federal entitlements. Tribal funds are currently not available for hazard mitigation. The Tribe has not used any source of mitigation funding to implement the activities identified in the 2009 mitigation strategy.

Table 20) Financial Resources for Hazard Mitigation

Type	Sub-Type	Administrator	Purpose	Amount/Availability
Federal	Hazard Mitigation Grant Program	Federal Emergency Management Agency (FEMA)	Supports pre- and post-disaster mitigation plans and projects	Available to communities after a Presidentially declared disaster has occurred in Washington Grant award based on specific projects as they are identified
	Pre-Disaster Mitigation Grant Program	FEMA	Supports pre-disaster mitigation plans and projects	Available on an annual basis as a nationally competitive grant. Grant award based on specific projects as they are identified.
Federal (cont'd.)	Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provides equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards	Available to fire departments and non-affiliated emergency medical services. Grant award based on specific projects as they are identified
	Community Block Grant Program (CBGP) Entitlement Communities Grants	U.S. Department of Housing and Urban Development (USHUD)	Acquisitions of real property, relocation/demolition, rehabilitation of residential and non-residential structures, construction of public facilities, such as water and sewer facilities, streets, neighborhood centers, and the conversion of school buildings for eligible purposes	Available to entitled communities. Grant award based on specific projects as they are identified

	Indian Community Development Block Grant Program	USHUD	Provides critical housing and community development resources to aid disaster recovery	Available to entitled Tribes. Grant award based on specific projects as they are identified
	Imminent Threat, Indian Community Development Block Grant Program	USHUD	Alleviates or removes imminent threats to health or safety (e.g., drought)	Available to entitled Tribes. Grant award based on specific projects as they are identified
	Indian Reservation Roads Transportation Funding	Federal Highway Administration	Constructs and improves roads, bridges, and transit facilities leading to, and within, Indian Reservations or other Indian lands to provide safe access through hazard-prone areas	Available to entitled Tribes. Grant award based on specific projects as they are identified
	Administration for Native Americans Grant Programs	U.S. Department of Health and Human Services	Funds a variety of environmental management programs, including the identification and assessment of human-caused and natural hazards and their associated risks and the development and implementation of plans, policies, and ordinances	Available to entitled Tribes. Grant award based on specific projects as they are identified
Federal (cont'd.)	Clean Water State Revolving Fund	U.S. Environmental Protection Agency (EPA)	Funds water quality projects, including all types of nonpoint source projects, watershed protection or restoration projects, estuary management projects, and more traditional municipal wastewater treatment projects	Available to entitled communities. Grant award based on specific projects as they are identified. Provides more than $5 billion annually
	Aid to Tribal Governments	Bureau of Indian Affairs (BIA)	Supports general Tribal government operations, maintain up-to-date Tribal enrollment, conduct Tribal elections, and develop appropriate Tribal policies, legislation, and regulations	Available to entitled Tribes. Grant award based on specific projects as they are identified

	Forestry on Indian Lands	BIA	Maintains, protects, enhances, and develop Indian forest resources through the execution of forest management activities	Available to entitled Tribes. Awards depend upon the amount that has been prioritized by the individual tribe through Tribal participation in the BIA's budget formulation process
	Housing Improvement Program (HIP)	BIA	Eliminates substantially substandard Indian owned and inhabited housing for very low income eligible Indians living in approved Tribal service areas	Available to entitled Tribes who have eligible applicants with identified housing needs. Award maximum is $35,000 for repairs and renovations, new housing does not have a specified amount
	Community Action for a Renewed Environment	EPA	Funds the removal or reduction of toxic pollution (i.e., storm water)	Competitive grant program. Grant award based on specific projects as they are identified
	Emergency Watershed Protection Program	U.S Department of Agriculture, Natural Resources Conservation Services	Removes silt and debris from stream channels, road culverts, and bridge abutments, reshapes and protects (e.g., rip rap) eroded stream banks; reseeds of damaged areas, deflects of potential flood or mudslide material away from private or public structures (e.g., sand bags, k-rails), etc.	Varies, dependent on number of natural disasters. Must submit request within 60-days of a natural disaster or within 60-days of access to site
Federal (cont'd.)	Flood Control and Coastal Emergency Act	U.S. Army Corps of Engineers (USACE)	Provides disaster preparedness services and advanced planning measures designed to reduce the amount of damage caused by an impending disaster	Varies, dependent on number of floods. Must submit request within 30-days of flood or coastal storm event
Federal	Tribal Homeland Security Grant	FEMA	Provides Tribes for the emergency capabilities of 1) Infrastructure systems 2) Mass Care Services 3) Mass Search and Rescue Operations 4) On-Scene Security, Protection, and Law Enforcement 5) Operational Communications 6) Planning 8) Public Information and Warning	$10,000,000 available to Tribes nationwide for FY18.
Tribal	General Fund	Department specific	Provides operational and program-specific funding	Limited to no availability

Appendices

Appendix 1 – Agendas and Sign-in Sheets

Committee Involvement Documentation

Kickoff Meeting Sign-In Sheet

All Hazards Mitigation Meeting
December 13th, 2016
J.Herman Reuben Bldg. 9:00 am - 11:00 pm

	Program	Name	Attendee Signature
1	John Wheaton E.M.	John Wheaton	
2	Office of Legislative Council	Darren Williams	
3	Finance	Anthony Bronchean	
4	ERWM	Antonio Smith	
5	ERWM	Gabriel Bohnee	
6	NTYPH	DAVE ARTHUR	
7	Land Services - GIS	Laurie Ames	
8	FEMA Tribal Relations	Jay LaPlante	
9			
10			
11			

THIRA/TERPT Sign-In Sheets

TERPT Meeting
March 9th, 2017
J.Herman Reuben Bldg. 1:30 am - 4:00 pm

	Program	Name	Funding Source	Attendee Signature
1	Forestry & Fire	Kip Kemak	BIA 638	
2	Tewelepuu Center	Alexis Cooper	General Fund/Grant	Alexis Cooper
3	Wa-A-'Yas Community Center	Etta L. Axtell	General Fund/Grant	Etta L. Axtell
4	ERWM - AQ Program	Julie Simpson	Fed - EPA	
5	U.S.D.A. Food + Nutrition	Thunder Garcia	Fed-USDA	
6	Community Centers	Agua Greene	[illegible]	
7	NATEC	~~Sam Penney~~ Sam Penney	General Fund/Grant	Sam Penney
8	ERWM	Antonio Smith	Fed DOE	
9	OLC	Julie Kane		Julie Kane
10	ERWM	John Wheaton		
11	CRP	Pat Baird		
12	E.D. Office	Rebeqah Miles	Fed IDC	
13	DNR Admin		BIA 638	
14	Gabriel Bohnee	ERWM		
15	~~Rebecca Arango~~ HR	Debbie Henry		
16				

TERPT FEMA/THIRA Meeting
Ocotber 17th, 2017
J.Herman Reuben Bldg. 1:30 am - 4:00 pm

	Program	Name	Attendee Signature
1	NORTHERN MARIANA ISLANDS HEALTH	MARK REANEY JR	
2	NPTHA	KETTA REUBEN	
3	Public Health	Chelsee Jurgensmeier	
4	Public Health	Kim Monson	
5	FEMA	Andrew Hendrickson	
6	Emergency Management	John Wheaton	
7	FRWM	Antonio Smith	
8	Office of Legal Counsel	Darren Williams	
9			

TERPT Meeting
November 9th, 2017
J.Herman Reuben Bldg. 1:30 am - 4:00 pm

	Program	Name	Attendee Signature
1	Communications	Kayeloni Scott	
2	Housing	Ketta Reuben	
3	HR	Debbie Henry	
4	OLC	Darren Williams	
5	Public Health	Ryan Bender	
6	ERWM-AQ Program	Julie Simpson	
7	ERWM - PIO	Antonio Smith	
8	Finance	Anthony Branchcau	
9	CRP	PAT BAIRD	
10			

Other Committee Meeting Sign in Sheets and Agendas

All Hazards Mitigation Meeting with NW Management
July 20th, 2017
J.Herman Reuben Bldg. 1:30 - 4pm

	Title	Name	Attendee Signature
1	John Wheaton Emergency Planner		
2	Julie Simpson, AQ Pgm Coordinator		
3	Rob Rodgers, NCAFO, IOEM		
4	Grants/Coordinator	Anthony Branchcau	
5	EMER. PREPAREDNESS	DAVID ARTHUR	
6	GIS Coordinator	Laurie Ames	
7	Analyst	Bill Mathews	
8	Environmental Planning	MACK COCCAO	
9	Staff Attorney	Darren Williams	
10	~~Stefanie Kranta~~ Climate change coor /	Stefanie Kranta	
11	Fire Prevention Specialist	Kip Kemak	
12			

AGENDA

Nez Perce Hazard Mitigation Plan

September 14, 2017
10:00am – 12:00pm

Meeting called by John Wheaton

Opening Remarks and Introduction	
Hazard Identification	Work through old hazard list to identify any changes to th hazards effecting the Tribe.
Vulnerability Assessment	Identify and update structures, cultural sites, critical infrastructure (power, water) that could be effected by ea hazard. HAZUS: Flooding, Earthquake? If not HAZUS, what method of determining vulnerability a loss estimates.
Response Resource Lists	Provide a list of resources by each department: Nimiipuu Health, Emergency Services, Tribal Police, Fire Departm Transportation Department, etc.
GIS Analysis	Risk assessment progress

Establish the next meeting time:

All Hazards Mitigation Meeting with NW Management
September 14th, 2017
J.Herman Reuben Bldg. 10am-12pm

	Title	Name	Attendee Signature
	NURSING/MEDICAL NMPH	DAVE ARTHUR	
1	DIRECTOR / WILDLIFE DIV.	NEIL HAGARD	
2	Consultant	Bill Mathews	
3	Staff Attorney	Darren Williams	
4	Fuel Management Specialist	Tom Droegmiller	
5	Fire Prevention Specialist	Kip Kalmak	
6	Climate Change	Stefanie Krantz (CC coordinator)	
7	Comm Spl. / PIO	Antonia Smith	
8	FACILITIES MANAGER	MARK REANEY	
9	Transportation/Fleet Dev Manager	MARGARETH FRANK CHIEF	
10	ERWM AG Program Coordinator	Julie Simpson	
11	ERWM - Emerg Mngmt	John Wheaton	
12	Northwest Management	Tera Ring	
13			
14			

AGENDA

Nez Perce Hazard Mitigation Plan

December 11, 2017
9:00am – 11:00pm

Meeting called by John Wheaton

Opening Remarks and Introduction	
Document Review	A quick overview of the current draft of the document.
Vulnerability Assessment	Another quick overview of what our options are and what of detail/time frame each will take. Updated information on the vulnerability to each commur based on each hazard. Structures at risk using GIS Risk Maps and location of structures.
Project List	Review the comments from the previous plans projects a decide which project we need to carry over to the new pla Based on the risk assessments develop project lists for e hazard/mitigation goal.
Public Outreach Plan	Discuss current plans on public outreach, decide timeline outreach and public comment period.

Establish the next meeting time:

General Council, Mitigation Planning
December 11th, 2017 9AM-12PM
J.Herman Reuben Building

	Title	Federal?	Name	Attendee Signature	Contact Info (optional)
1	Fire Prevention	NPT	Kip Kemak		
2	Red Cross		Autumn St Amand		
3	AQ Program Coordinator	NPT	Julie Simpson		
4	IRMP Coordinator	NPT	Keren K. Barnowe-Meyer		
5	Analyst	NMI	Bill Mathews		
6	Analyst	NMI	Adam Herrenbrack		
7	Analyst - Land	NMI	Mark Correo		
8	Staff Attorney	NPT	Darren Williams		
9	GIS Coordinator	NPT	Laurie Ames		
10	FIELD ARCHAEOLOGIST	NPT	Jenifer Quadez		
11	Fire Mgt. officer	NPT	Jeff Handel		
12	Climate change coordinator	NPT	Stefanie Krantz		
13	THPO	NPT	Pat Baird		
14	PIO	NPT	Antonia Smith		
15	Emerg. Management Planner	Indirect	John Wheaton		
16					
17					

AGENDA

Nez Perce Hazard Mitigation Plan

January 8, 2018
9:00am – 11:00pm

Meeting called by John Wheaton

Opening Remarks and Introduction	
Document Review	A quick overview of the current draft of the document.
Mitigation Items	Addition of any new mitigation items. Review of and prioritization of mitigation items, including estimate, timeframe and leading jurisdiction.
Vulnerability Assessment	Method for valuation for vulnerability assessment.
Public Outreach Plan	Discuss current plans on public outreach, decide timeline outreach and public comment period. ☐ Public Meetings ☐ Survey ☐ Access to document after Tribal Council review

Establish the next meeting time:

Public Involvement Documentation

Kamiah Public Outreach Workshop Agenda

Nez Perce Tribe Public Outreach for All Hazard Mitigation Planning
Agenda
March 19th, 2018
Wa-A-'Yas Community Center in Kamiah, Idaho: Kitchen Room

Monday, March 19th

5:00 pm	Sign-in, Dinner Provided
5:30 – 5:45 pm	Opening ○ Invocation ○ Introductions
5:45 – 6:45 pm	Discussion of Idaho Office of Emergency Management • Why an All Hazards Mitigation Plan is needed? • Why we are all meeting, how can you help to make your community safer and more resilient? • How does FEMA and the State respond in the event of a disaster? • Who are the stakeholders?
6:45 – 7:15 pm	Feedback
7:15 – 8:00 pm	**Discuss further public outreach planned the next Monday at Clearwater Casino Event Center**

Kamiah Public Outreach Workshop Sign-In Sheet

Nez Perce Tribe AHMP Public Outreach Meeting
March 19th, 2018
Kamiah, Idaho, Wa-A-'Yas Kitchen 5pm - 8pm

		Federally Funded?	Community	Name	Attendee Signature	
132 miles	1	Yes	NPC OEM	Grant DiCiana		after hours participation
188 miles	2	YES	Utah Co Em	Mike Nielson		
	3			Izi Tallbull		
	4		Kamiah	Travis Elkins	TravisE@nezperce.org	
	5		Kamiah	Marci Bailey		
	6		Kamiah	Wayde White Eagle		
	7		Kamiah	Robin Blackeagle - Division	robinb@nezperce.org	
	8		Kamiah	Katy Bashaw		
	9		Kamiah	Nicole Bashaw		
	10	Yes	Moscow, ID	John Wheaton		facilitator
	11					
	12					

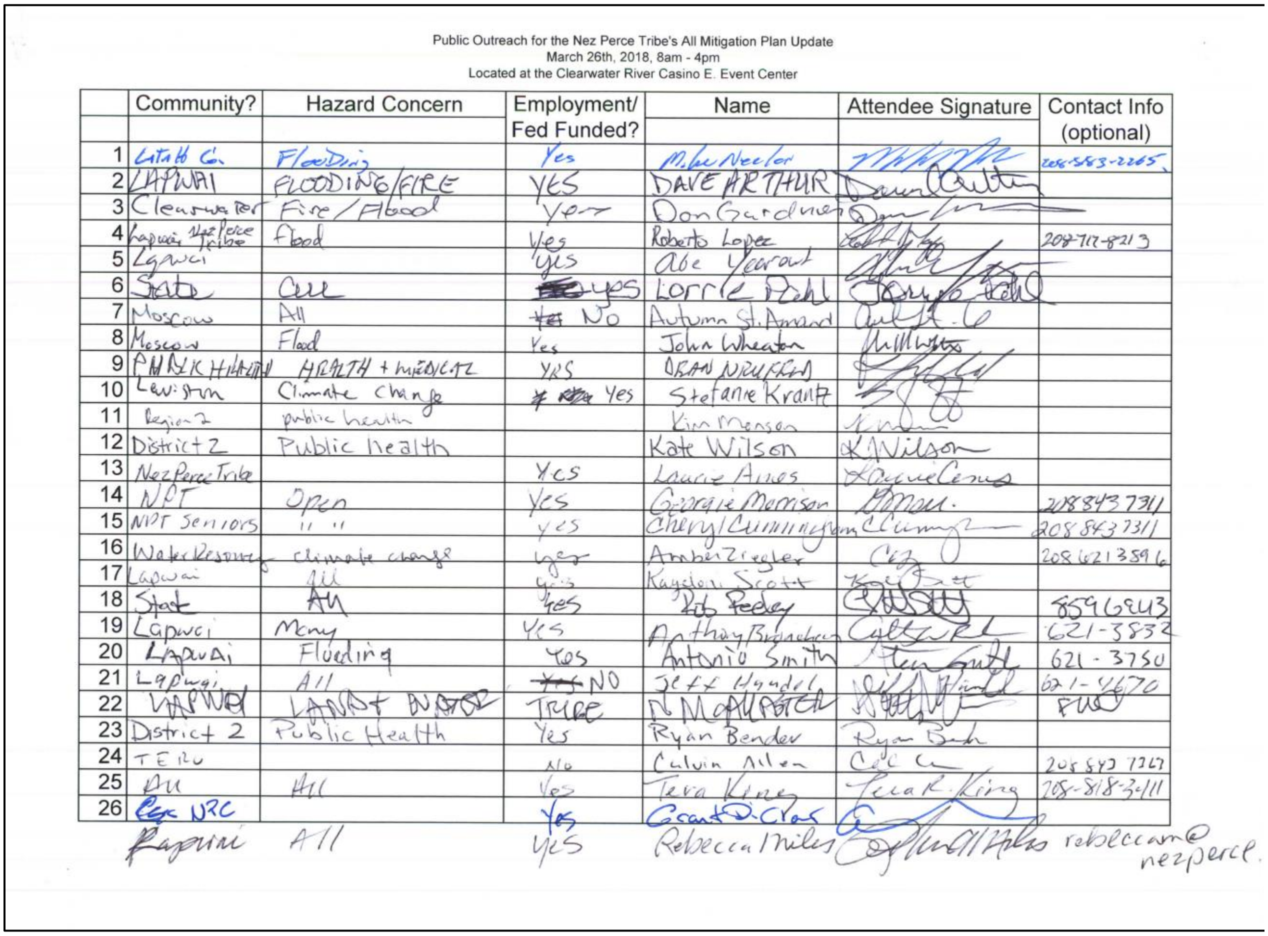
Clearwater River Casino Public Outreach Workshop Agenda

Nez Perce Tribe Public Outreach for All Hazard Mitigation Planning
Agenda
March 26th, 2018
Clearwater River Casino in Lewiston, Idaho: Event Center East

Monday, March 26th

8:00 am	Sign-in, Breakfast pastries, fruit, coffee, and juice provided.
8:30 – 9:00 am	Opening ○ Invocation ○ Introductions
9:00 – 9:45 am	Idaho Office of Emergency Management: Laurie Pahl and Rob Feeley • Why an All Hazards Mitigation is needed? • Why we are all meeting, how can you help to make your community safer and more resilient? • How does FEMA and the State response in the event of a disaster? • Who are the stakeholders?
9:45 – 10:00 am	Break
10:00 – 11:30 am	**Meeting with District II of Idaho's County Emergency Managers: Latah, Clearwater, Nezperce, Lewis, and Idaho**
11:30 – 11:45 pm	Meeting with our Public Health
11:45 – 12:00 pm	Introduce Northwest Management and their role in providing updates
12:00 – 1:00 pm	Lunch provided to attendees only, Italian pasta
1:00 – 2:00 pm	All Hazards Mitigation Document Work
2:00 – 2:30 pm	Break out into table workgroups, work through 1st scenario
2:30 – 2:45 pm	Discussion of feedback
2:45 – 3:15 pm	Break out into table workgroups, work through 2nd scenario
3:15 – 3:45 pm	announcing projected final draft, closing remarks

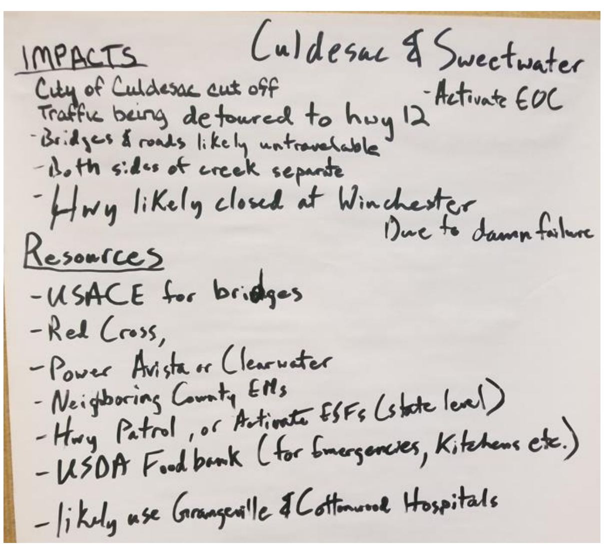
Clearwater River Casino Public Outreach Workshop Sign-In Sheet

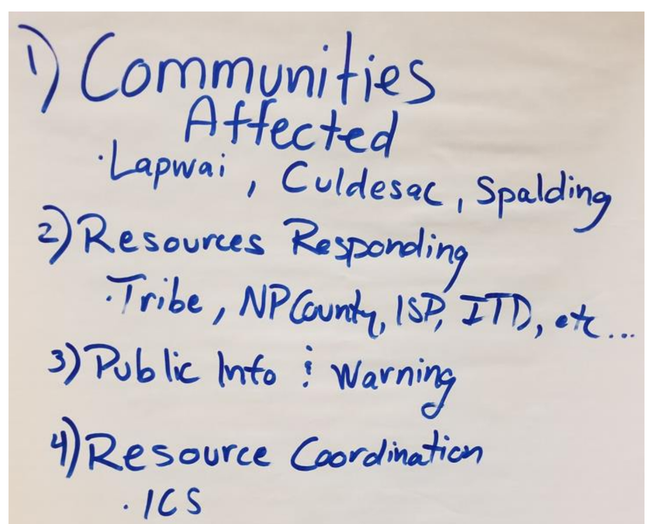


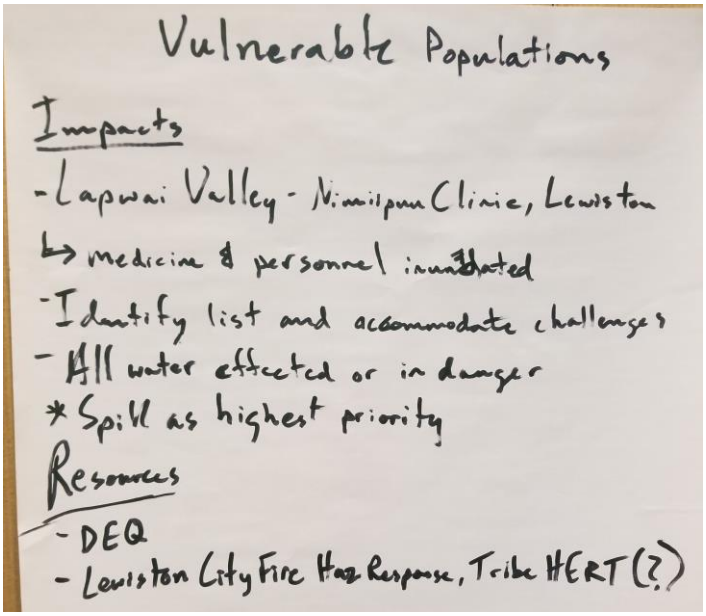
Public Outreach for the Nez Perce Tribe's All Mitigation Plan Update
March 26th, 2018, 8am - 4pm
Located at the Clearwater River Casino E. Event Center

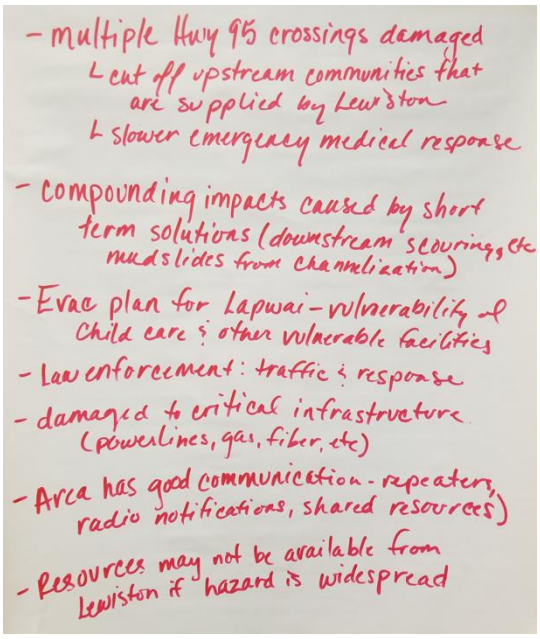
	Community?	Hazard Concern	Employment/ Fed Funded?	Name	Attendee Signature	Contact Info (optional)
1	Latah Co.	Flooding	Yes	Mike Neeler	[illegible]	208-583-2265
2	LAPWAI	FLOODING/FIRE	YES	DAVE ARTHUR	[illegible]	
3	Clearwater	Fire/Flood	Yes	Don Gardner	[illegible]	
4	Lapwai Nez Perce Tribe	flood	Yes	Roberto Lopez	[illegible]	208 717-8213
5	Lapwai		yes	Abe Yearout	[illegible]	
6	State	all	yes	Lorrie Pahl	[illegible]	
7	Moscow	All	No	Autumn St. Amand	[illegible]	
8	Moscow	Flood	Yes	John Wheaton	[illegible]	
9	PUBLIC HEALTH	HEALTH + MEDICAL	YES	[illegible]	[illegible]	
10	Lewiston	Climate change	Yes	Stefanie Krantz	[illegible]	
11	Region 2	public health		Kim Menson	[illegible]	
12	District 2	Public health		Kate Wilson	K Wilson	
13	Nez Perce Tribe		Yes	Laurie Ames	[illegible]	
14	NPT	Open	Yes	Georgie Morrison	[illegible]	208 843 7311
15	NPT Seniors	" "	yes	Cheryl Cunningham	[illegible]	208 843 7311
16	Water Resources	climate change	yes	Amber Ziegler	[illegible]	208 621 3896
17	Lapwai	All	yes	Kaydon Scott	[illegible]	
18	State	All	Yes	Rob Feeley	[illegible]	859 6843
19	Lapwai	Many	Yes	Anthony Bronchea	[illegible]	621-3832
20	Lapwai	Flooding	Yes	Antonio Smith	[illegible]	621-3750
21	Lapwai	All	NO	Jeff Handel	[illegible]	621-4670
22	LAPWAI	LAND + WATER	TRIBE	[illegible]	[illegible]	[illegible]
23	District 2	Public Health	Yes	Ryan Bender	Ryan Bender	
24	TERO		No	Calvin Allen	[illegible]	208 843 7367
25	All	All	Yes	Tera King	Tera R. King	208-818-3411
26	Co NRC		Yes	Grant D. Crow	[illegible]	
	Lapwai	All	Yes	Rebecca Miles	[illegible]	rebeccam@nezperce.

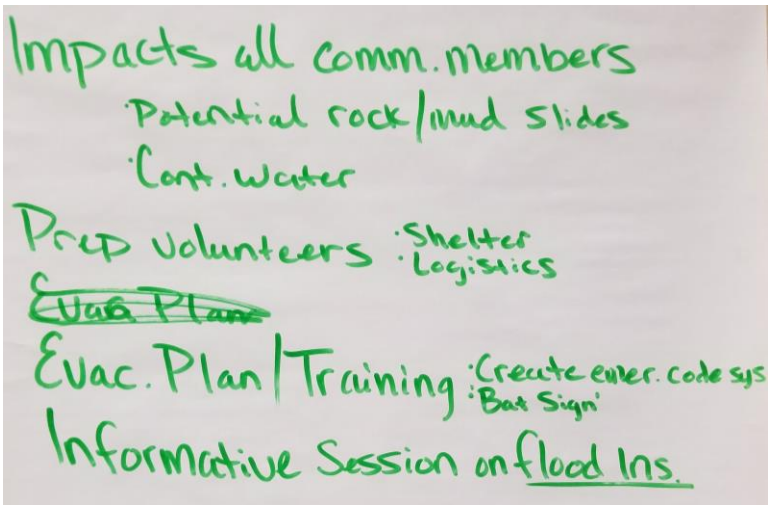
Workshop Group Exercise Responses

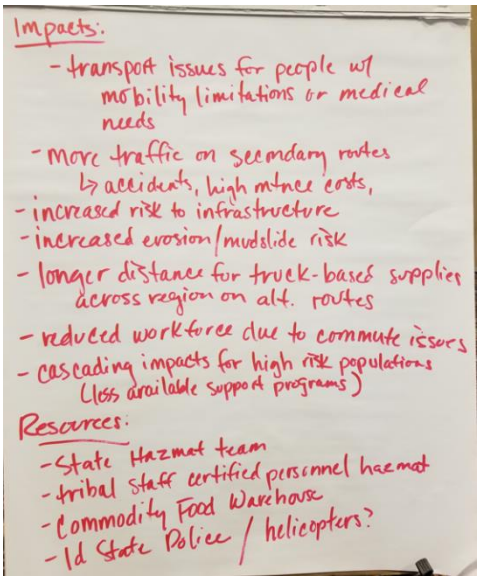


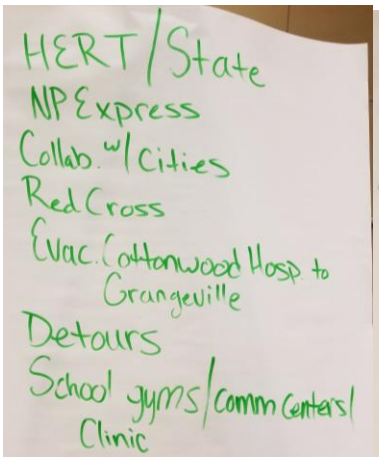


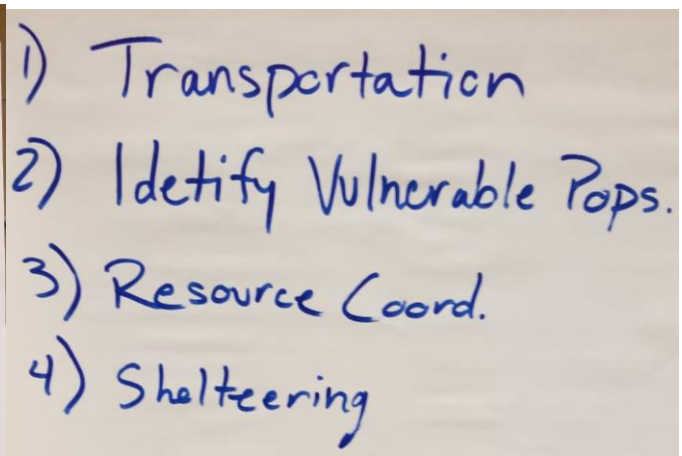

Vulnerable Populations
Impacts
- Lapwai Valley - Nimiipuu Clinic, Lewiston
↳ medicine & personnel inundated
- Identify list and accommodate challenges
- All water effected or in danger
* Spill as highest priority
Resources
- DEQ
- Lewiston City Fire Haz Response, Tribe HERT (?)


- multiple Hwy 95 crossings damaged
↳ cut off upstream communities that are supplied by Lewiston
↳ slower emergency medical response
- compounding impacts caused by short term solutions (downstream scouring, etc mudslides from channelization)
- Evac plan for Lapwai - vulnerability of Child care & other vulnerable facilities
- Law enforcement: traffic & response
- damaged to critical infrastructure (powerlines, gas, fiber, etc)
- Area has good communication - repeaters, radio notifications, shared resources)
- Resources may not be available from Lewiston if hazard is widespread


Impacts all comm. members
·Potential rock/mud slides
·Cont. water
Prep volunteers ·Shelter
·Logistics
Evac Plans
Evac. Plan/Training ·Create emer. code sys
·Bat Sign
Informative Session on flood Ins.


Impacts:
- transport issues for people w/ mobility limitations or medical needs
- more traffic on secondary routes
↳ accidents, high mtnce costs,
- increased risk to infrastructure
- increased erosion/mudslide risk
- longer distance for truck-based supplies across region on alt. routes
- reduced workforce due to commute issues
- cascading impacts for high risk populations (less available support programs)
Resources:
- State Hazmat team
- tribal staff certified personnel hazmat
- Commodity Food Warehouse
- Id State Police / helicopters?


HERT/State
NP Express
Collab. w/ Cities
Red Cross
Evac. Cottonwood Hosp. to Grangeville
Detours
School gyms/comm centers/ Clinic


1) Transportation
2) Idetify Vulnerable Pops.
3) Resource Coord.
4) Shelteering

Record of Survey Respondents

Nez Perce Tribe Hazard Mitigation Plan Survey SurveyMonkey

Q1 What is the name of your community and zip code?

Answered: 35 Skipped: 0

#	RESPONSES	DATE
1	Lapwai and 83540 areas Lapwai 83540	3/26/2018 9:03 AM
2	Lapwai and 83540 areas Lapwai 83540	3/25/2018 11:53 AM
3	Lapwai and 83540 areas Lapwai 83540	3/23/2018 3:13 PM
4	Asotin Anatone, WA 99401	3/23/2018 3:02 PM
5	Lewiston Lewiston 83501	3/23/2018 2:45 PM
6	Lewiston Lewiston 83501	3/23/2018 2:29 PM
7	Lapwai and 83540 areas 83540	3/23/2018 2:23 PM
8	Lapwai and 83540 areas Nez Perce Tribe Lapwai, ID 83540	3/23/2018 2:13 PM
9	Moscow Moscow, Idaho 83843	3/23/2018 2:07 PM
10	Lapwai and 83540 areas Lapwai 83540	3/23/2018 1:55 PM
11	Moscow Moscow 83843	3/23/2018 1:41 PM
12	Lewiston Lewiston 83501	3/22/2018 3:45 PM
13	Kamiah Kamiah, Idaho 83536	3/22/2018 2:38 PM
14	Lapwai and 83540 areas Lapwai 83540	3/19/2018 2:03 PM
15	Asotin Asotin County 99403	3/19/2018 9:43 AM
16	Lewiston Lewiston 83501	3/12/2018 8:56 AM
17	Lapwai and 83540 areas 83540	3/9/2018 10:04 PM
18	Lapwai and 83540 areas 83540	3/9/2018 9:50 AM
19	Lapwai and 83540 areas 83540	3/9/2018 3:55 AM
20	Lapwai and 83540 areas Lapwai 83540	3/8/2018 5:13 PM
21	Lapwai and 83540 areas 83540	3/8/2018 10:34 AM
22	Moscow Moscow 83843	3/6/2018 4:24 PM
23	Lapwai and 83540 areas 83540	3/6/2018 11:07 AM
24	Lapwai and 83540 areas 83540	3/6/2018 10:36 AM
25	Lapwai and 83540 areas 83540	3/6/2018 10:12 AM
26	Lapwai and 83540 areas Lapwai	3/6/2018 9:32 AM
27	Lapwai and 83540 areas Lapwai, ID	3/5/2018 5:26 PM
28	Lapwai and 83540 areas Lapwai 83540	3/5/2018 9:44 AM
29	Lapwai and 83540 areas Lapwai 83540	3/5/2018 9:36 AM
30	Boise Boise 83705	2/22/2018 1:27 PM
31	Deary deary, 83823	2/20/2018 1:06 PM
32	Kamiah Kamiah, 83536	2/20/2018 10:56 AM
33	Moscow Moscow 83843	2/16/2018 4:08 PM
34	Princeton Princeton 83857	2/16/2018 3:55 PM
35	Grangeville Grangeville 83530	2/16/2018 3:28 PM

Appendix 2 – Future Plan Update Guidelines

The Nez Perce Tribe sets public involvement as a top priority and believes that public awareness is key to the mitigation process. Continued public involvement will be accomplished through the dissemination of information from multiple channels. The plan will be available on the Emergency Management's website for review, along with notification of plan update meetings and updates on the progress of mitigation activities. It is the goal of the HMP Committee to develop a web-based interactive map that will allow the public to view their risk and vulnerability from a given hazard. Distribution of informative brochures through mailings, and the hosting of a booth at public events with information regarding mitigation efforts homeowners can do on their own to become more resilient to disasters.

Suggested agenda items for the annual plan update or following a declared disaster:

- 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 5 will need updated as projects are completed and as new needs or issues are identified.
- Address Emergency Operations Plans, how can the two plans be dovetailed to make them work in unison? Specifically, how to incorporate the Tribes Emergency Operation Plan into the action items for the NHMP.
- Work through the Planning Update Evaluation Worksheet to identify areas of the plan that need to be addressed.
- Address how the public will be given the opportunity to provide feedback on the annual updates.

During the third year following the adoption of the plan an agenda item addressing funding for updating the plan should begin. Allow one year for grant writing and funding, and an additional year for the plan update process. Start the renewal process in the third year allows time to receive funding and complete the update with the goal of never having an outdated plan.

The following worksheets help identify potential items requiring updates or review:

Table 21) Hazard mitigation plan update evaluation worksheet.

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision- maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	

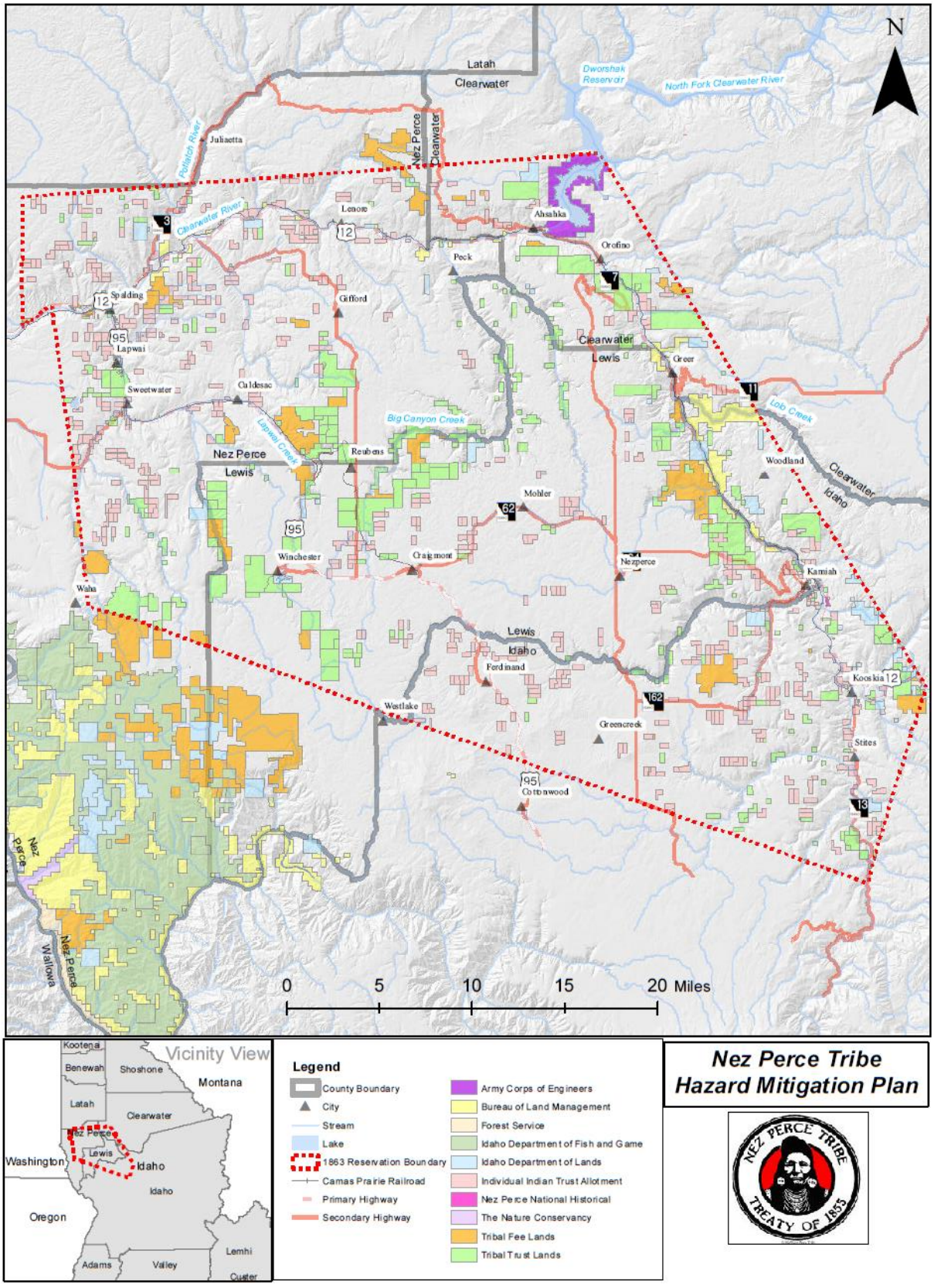
Plan Section	Considerations	Explanation
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	

Appendix 3 – Maps with Legends Included

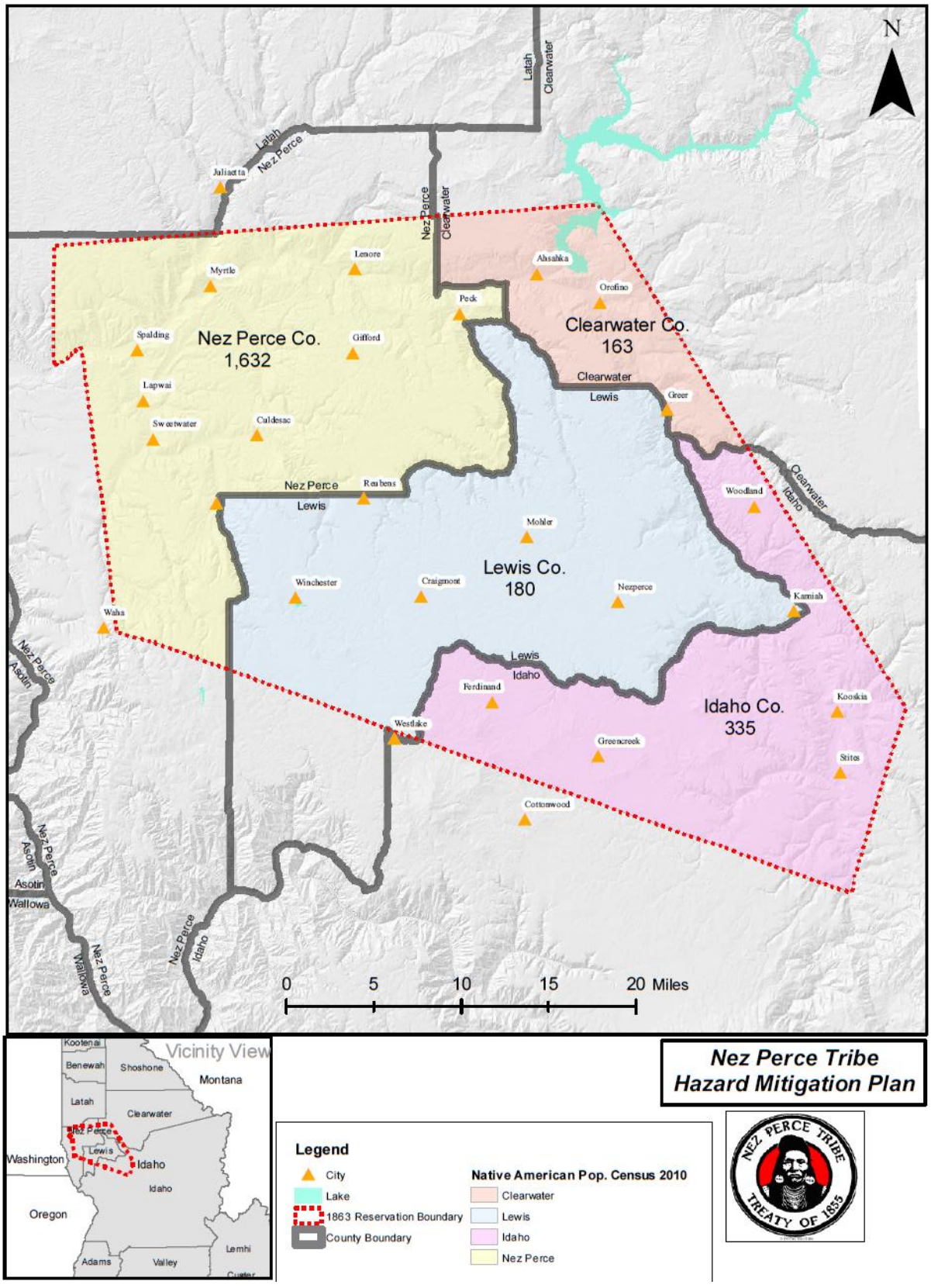
Appendix 3 contains the same maps that are included in the body of the document with the differencing being the inclusion of map legends, logos, and vicinity view pane. The following maps are included in this section of the document:

- **Location and Demographic Maps**
    - Reservation Location and Land Ownership
    - Demographics
    - Land Use
    - Location of Residential Structures
    - Locations of Critical Facilities
    - Hazardous Materials Facilities and Transport
- **Natural Hazard Maps**
    - Potential Flood Area
    - Dam Failure and Inundation Zones
    - Landslide Risk Areas
    - Wildfire Risk
    - Locations of Active Volcanos

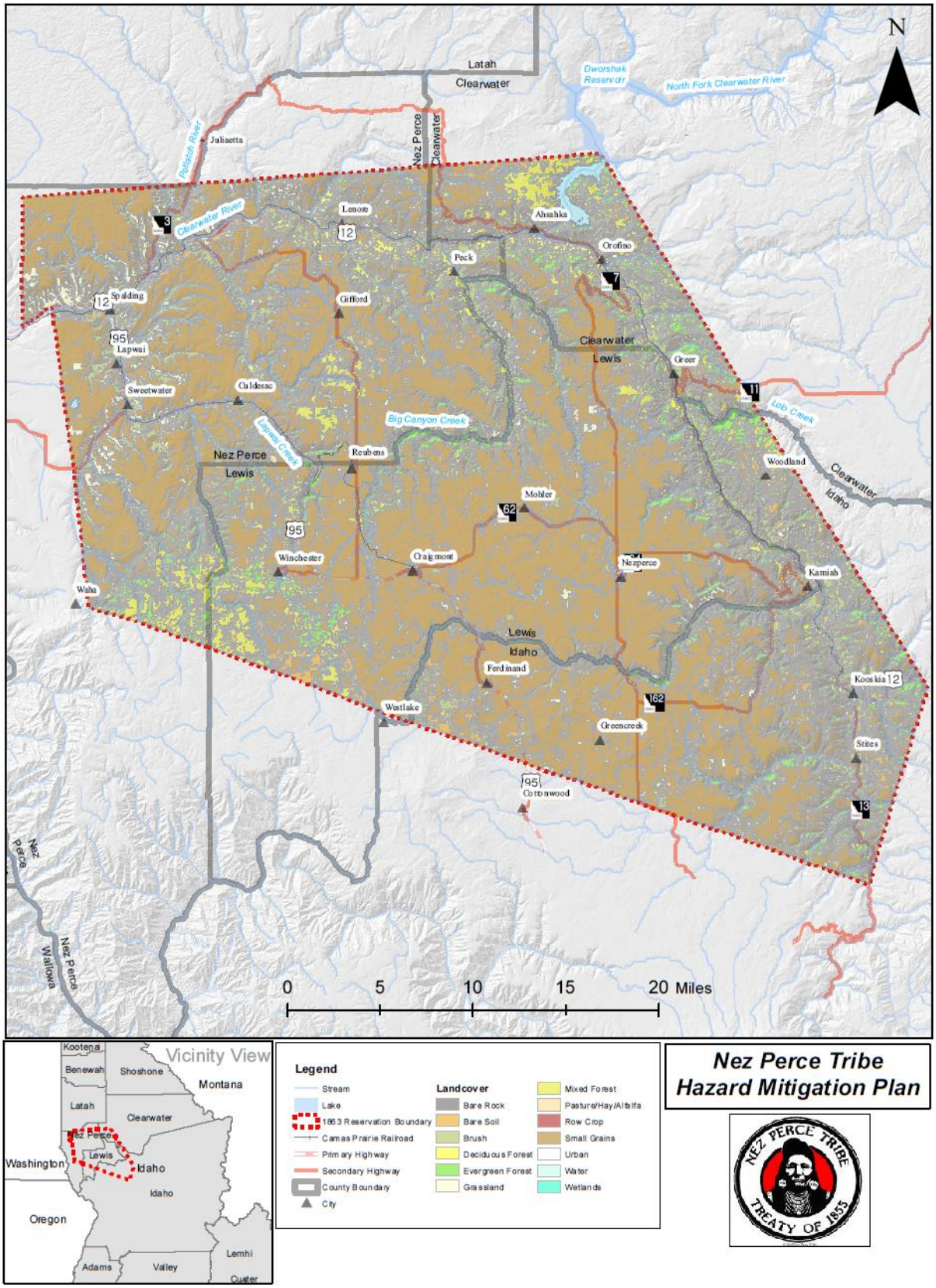
Reservation Location and Land Ownership



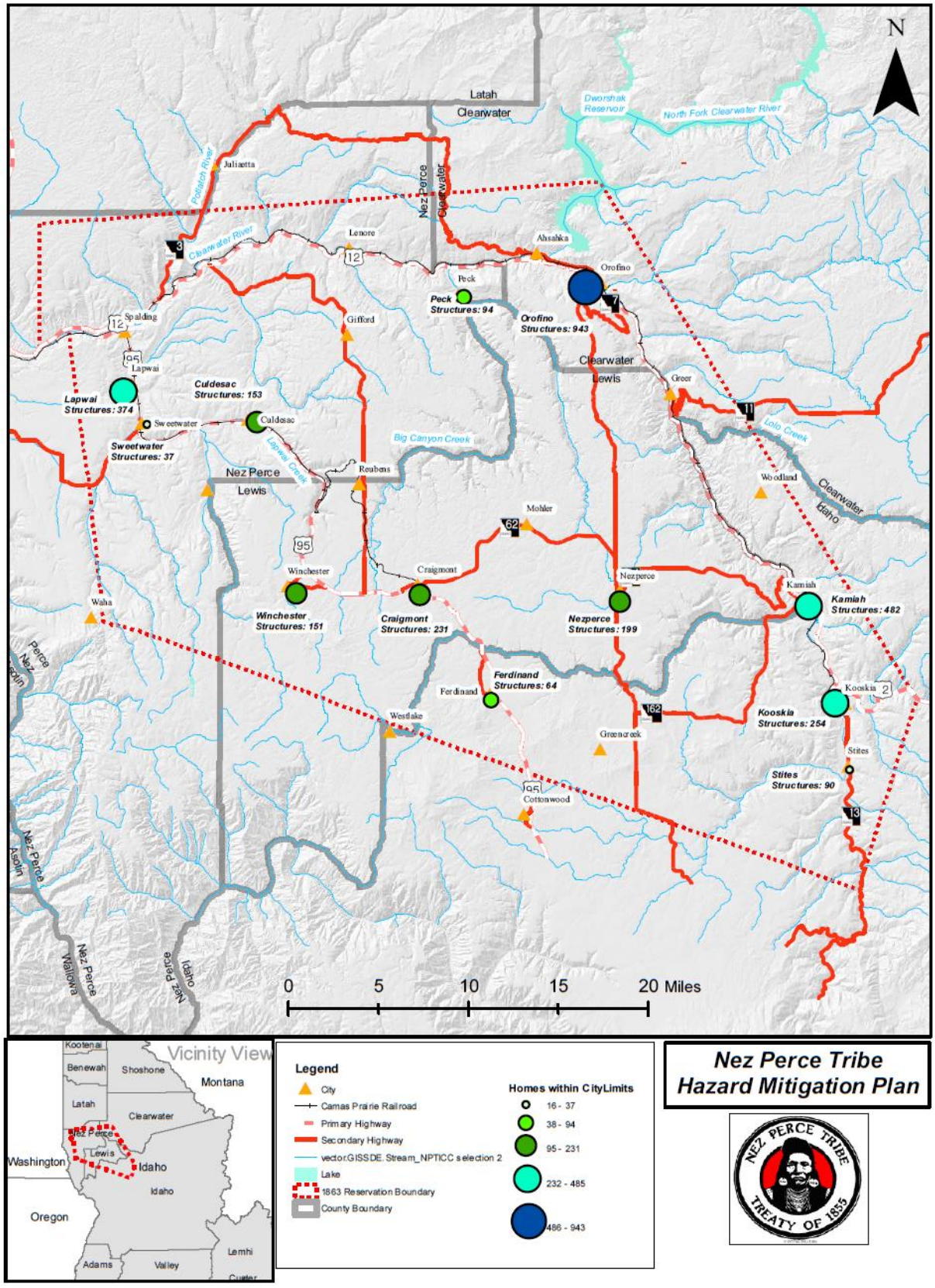
Demographics



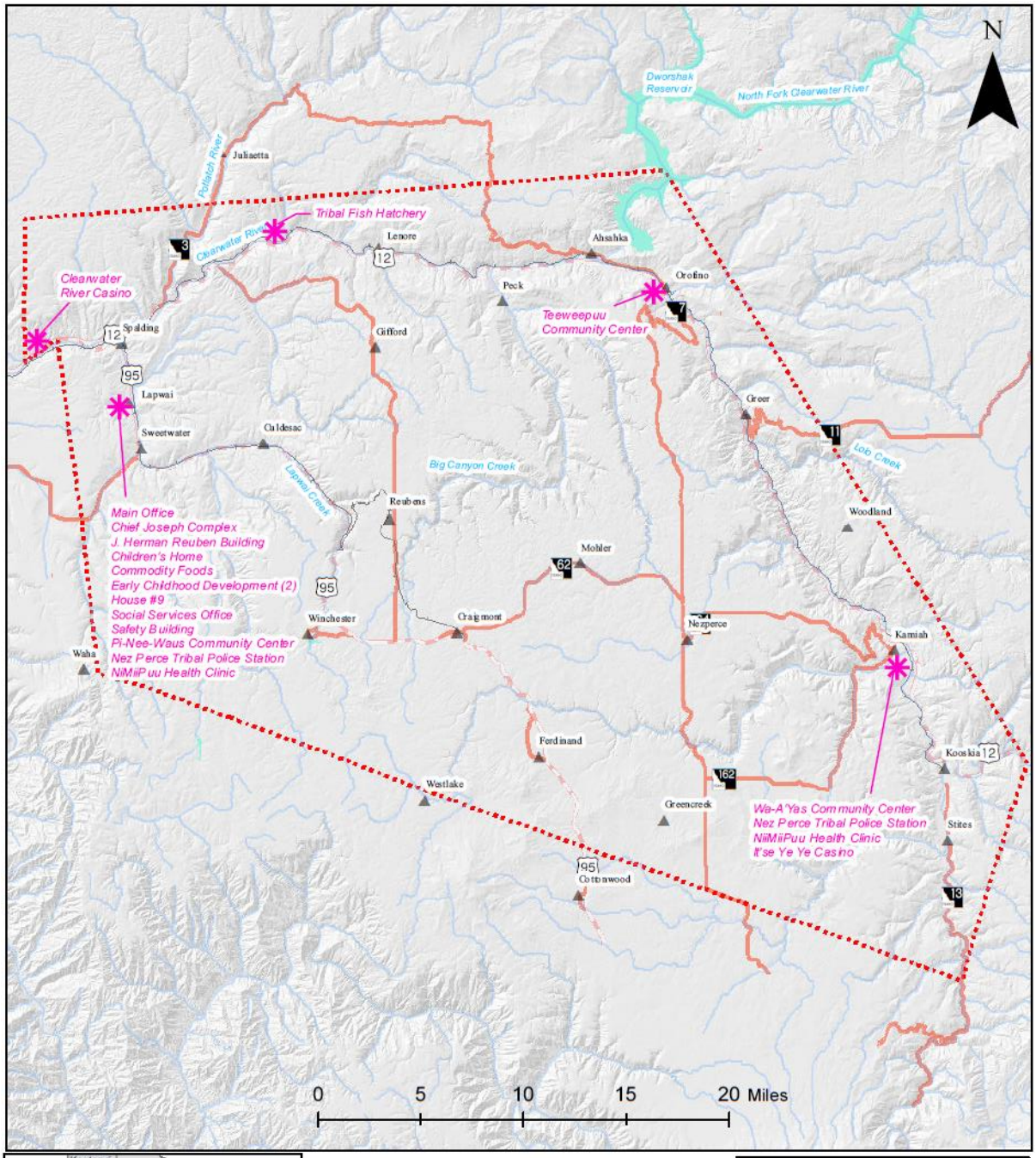
Land Use


N
Latah
Clearwater
Dworshak Reservoir
North Fork Clearwater River
Potlatch River
Juliaetta
Nez Perce
Clearwater
Clearwater River
Lenore
Ahsahka
Orofino
Peck
Gifford
Spalding
Lapwai
Sweetwater
Caldesac
Lapwai Creek
Big Canyon Creek
Reubens
Nez Perce
Lewis
Clearwater
Lewis
Greer
Lolo Creek
Woodland
Clearwater
Idaho
Mohler
Winchester
Craigmont
Nezperce
Kamiah
Waha
Lewis
Idaho
Ferdinand
Kooskia
Westlake
Greencreek
Stites
Cottonwood
Nez Perce
Wallowa
Nez Perce
0
5
10
15
20 Miles
Vicinity View
Kootenai
Benewah
Shoshone
Montana
Latah
Clearwater
Nez Perce
Lewis
Washington
Idaho
Idaho
Oregon
Adams
Valley
Lemhi
Custer
Legend
Stream
Lake
1863 Reservation Boundary
Camas Prairie Railroad
Primary Highway
Secondary Highway
County Boundary
City
Landcover
Bare Rock
Bare Soil
Brush
Deciduous Forest
Evergreen Forest
Grassland
Mixed Forest
Pasture/Hay/Alfalfa
Row Crop
Small Grains
Urban
Water
Wetlands
Nez Perce Tribe
Hazard Mitigation Plan
NEZ PERCE TRIBE
TREATY OF 1855

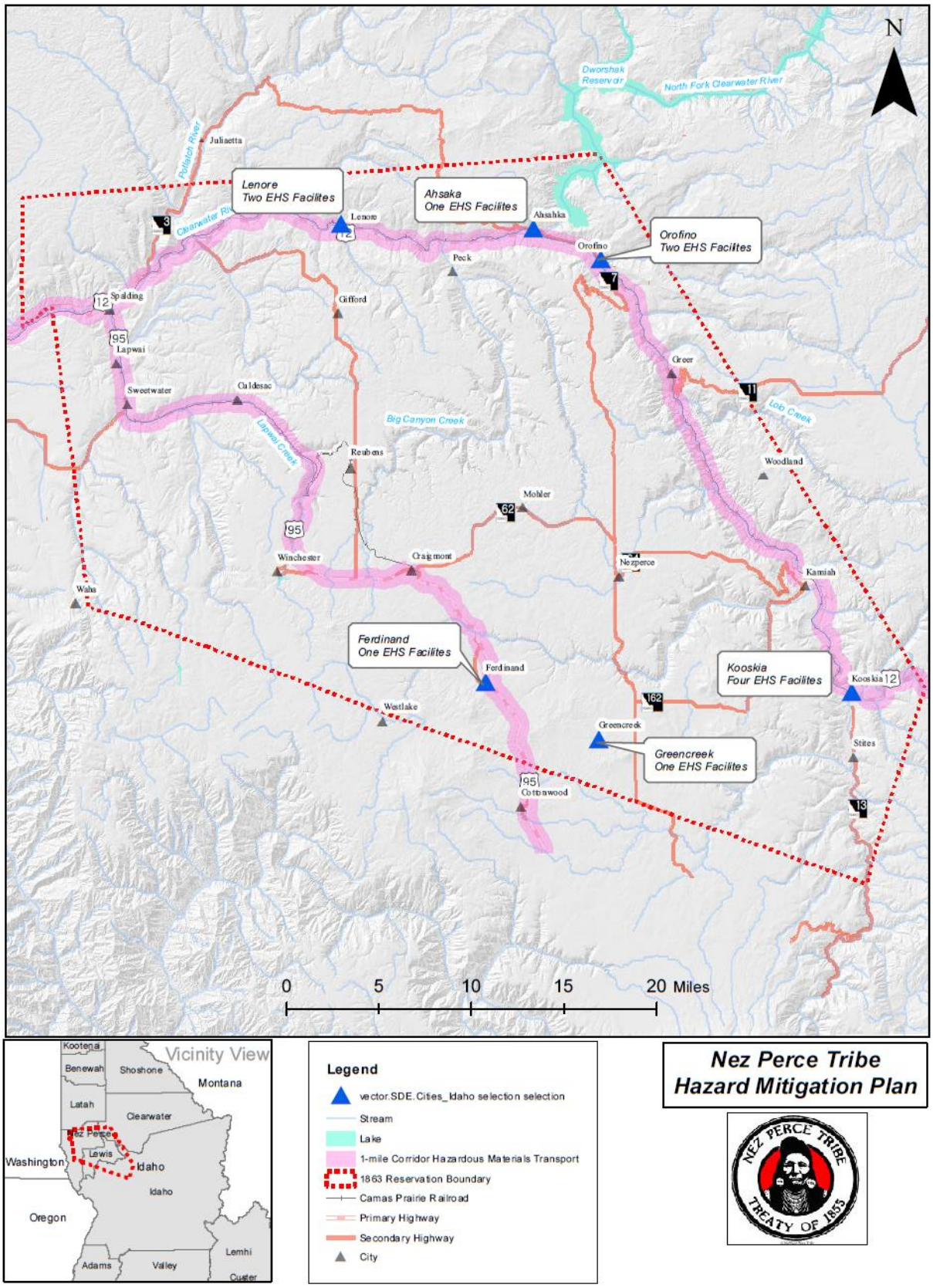
Location of Residential Structures



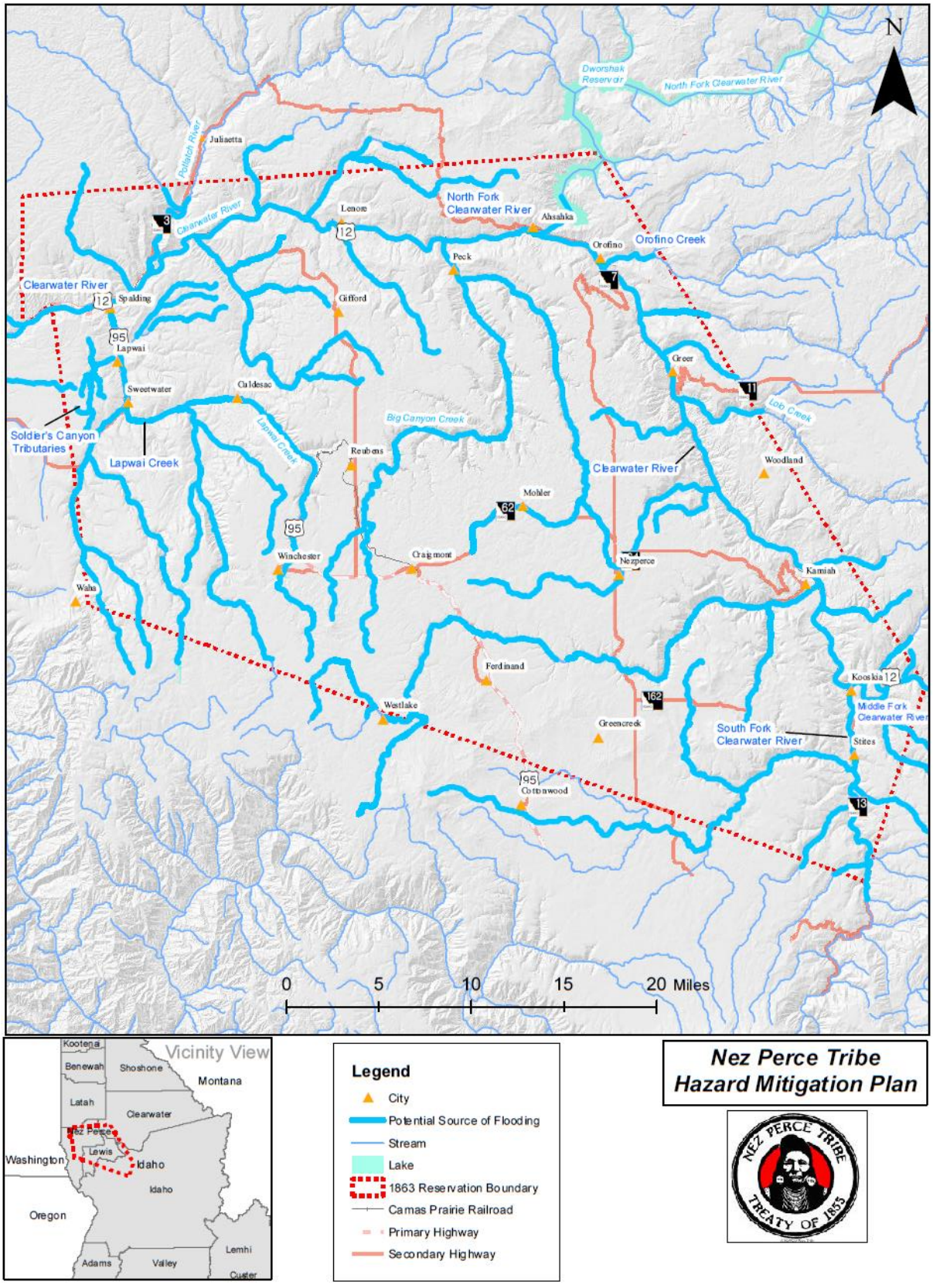
Locations of Critical Facilities



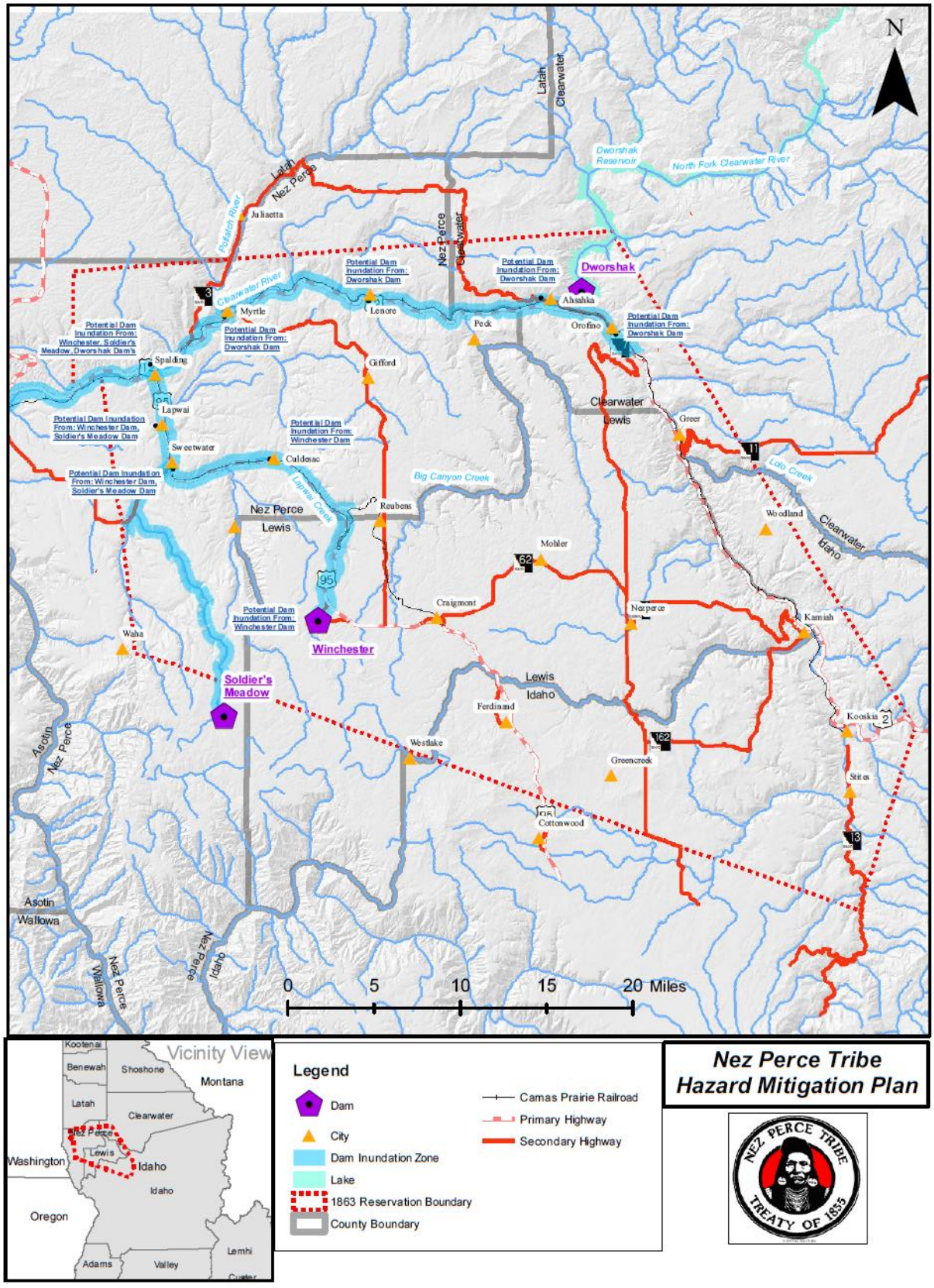
Hazardous Materials Facilities and Transportation



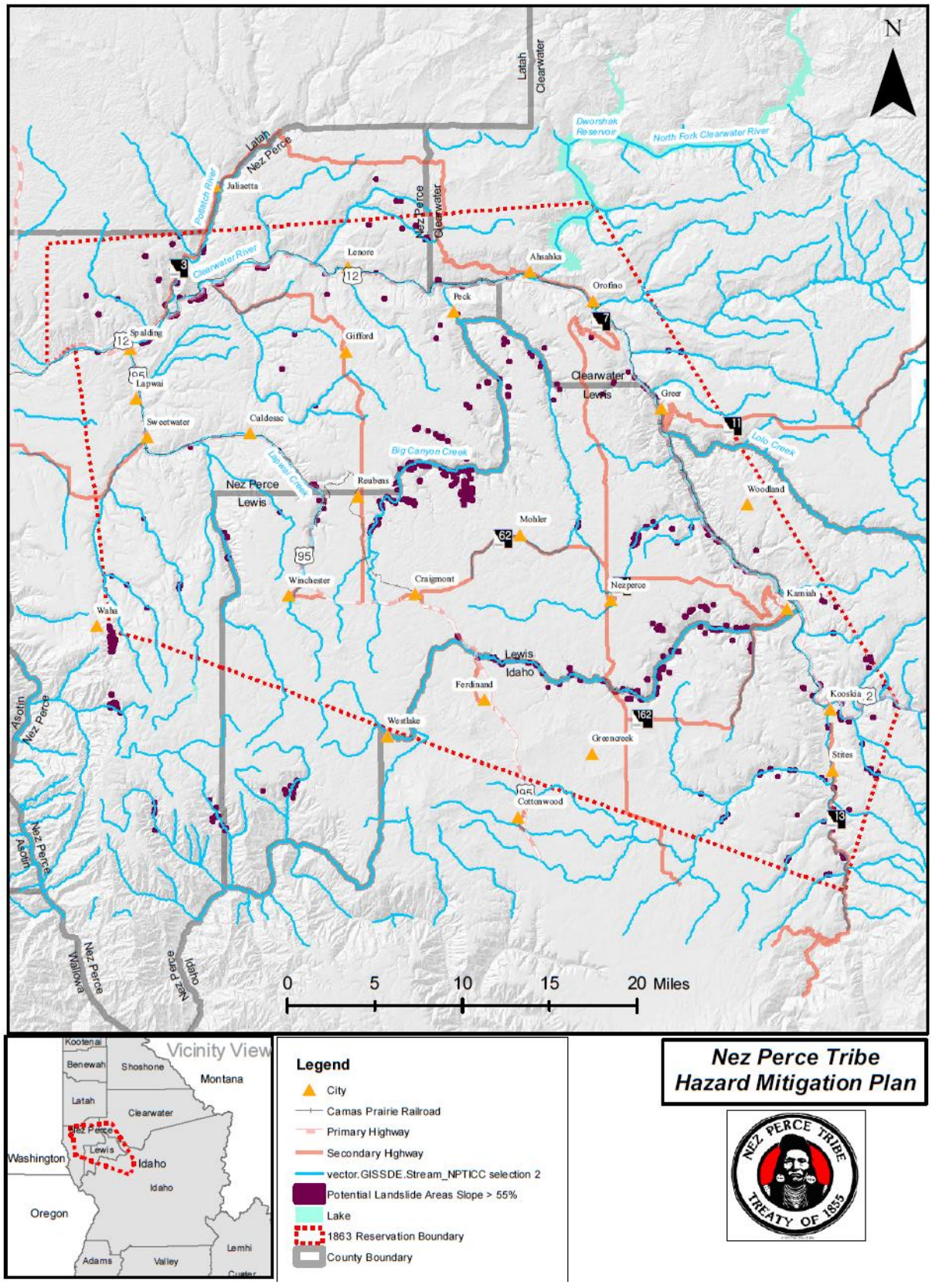
Potential Flood Area



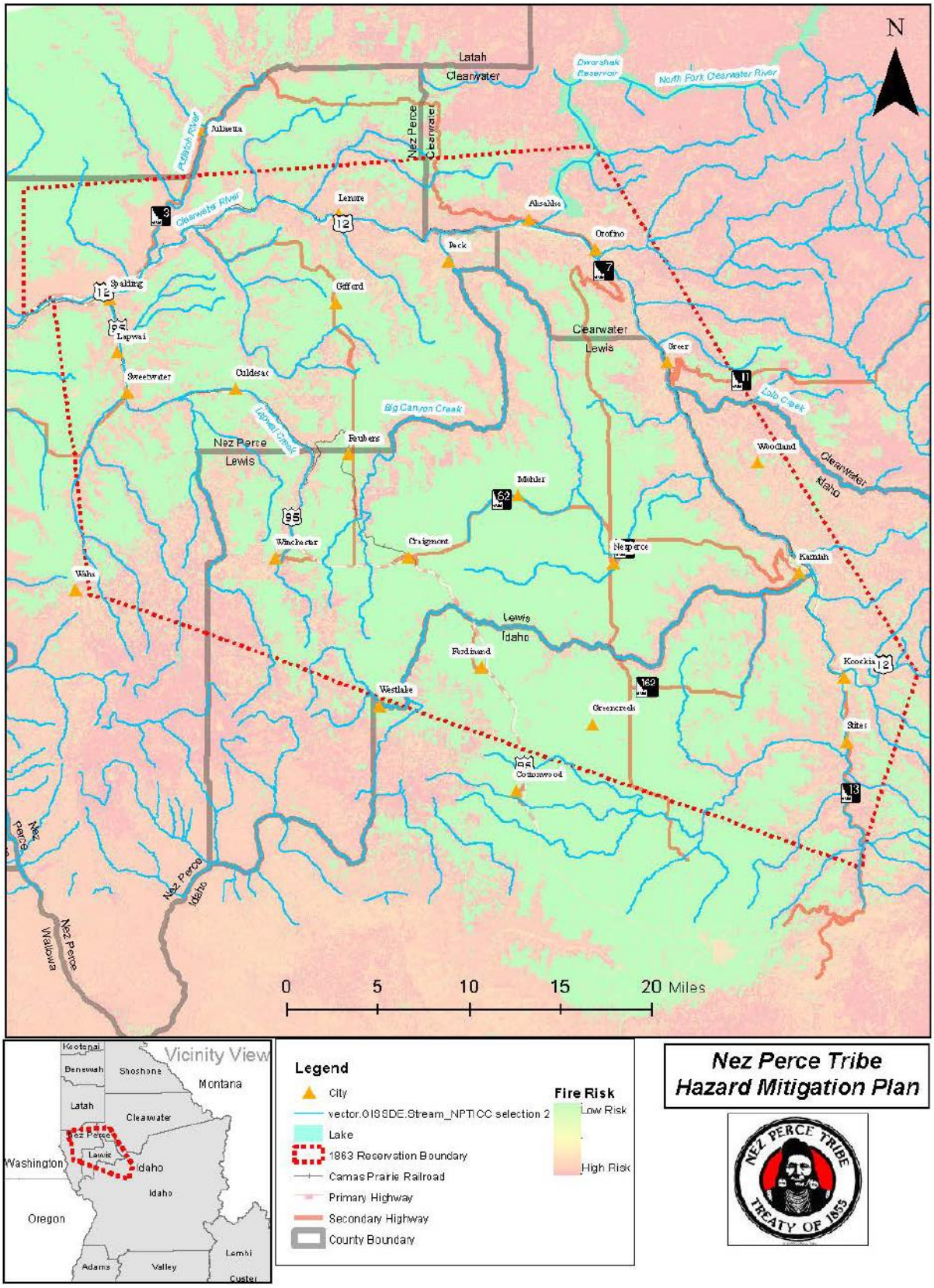
Dam Failure and Inundation Zones



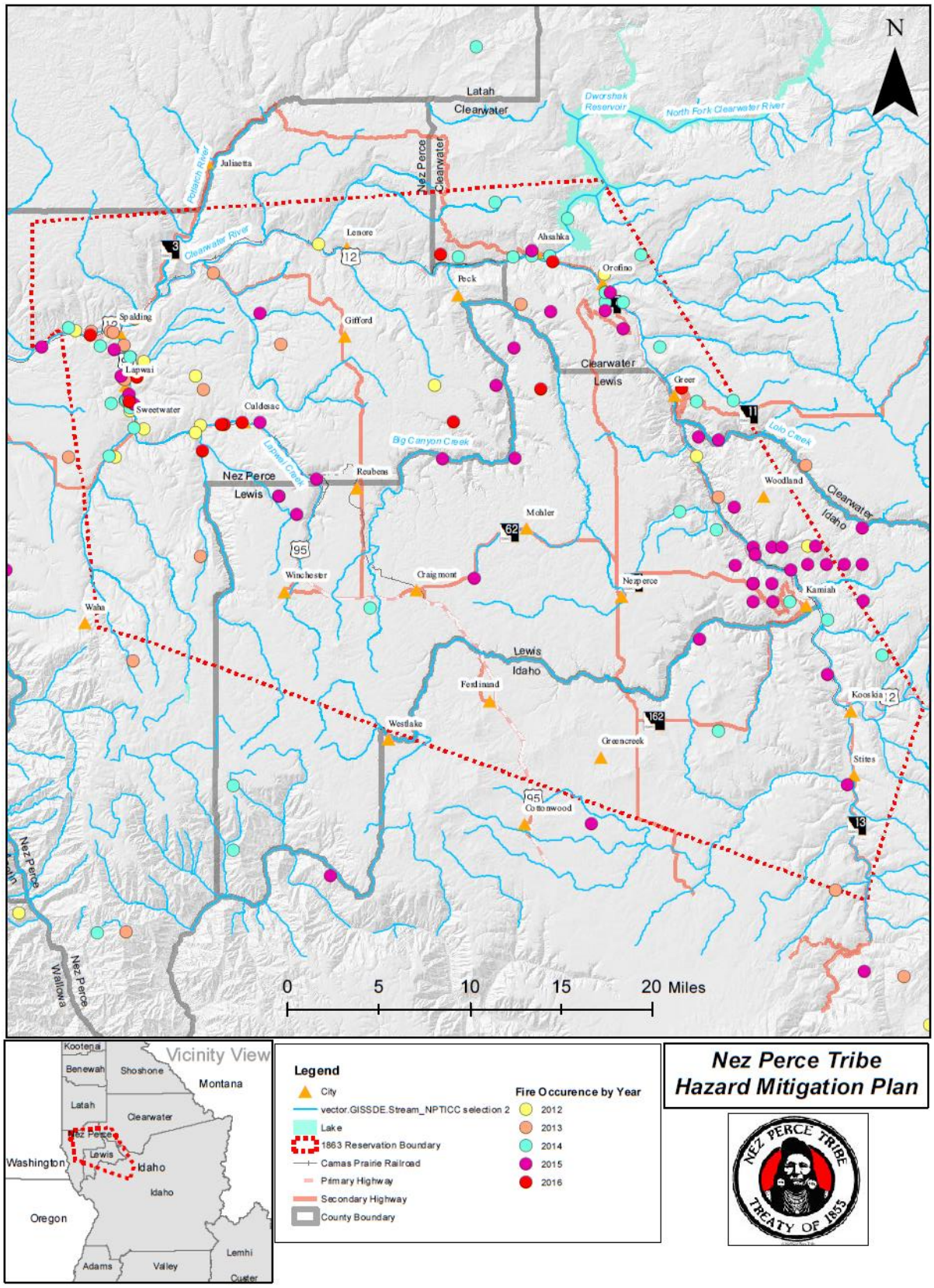
Landslide Risk Areas



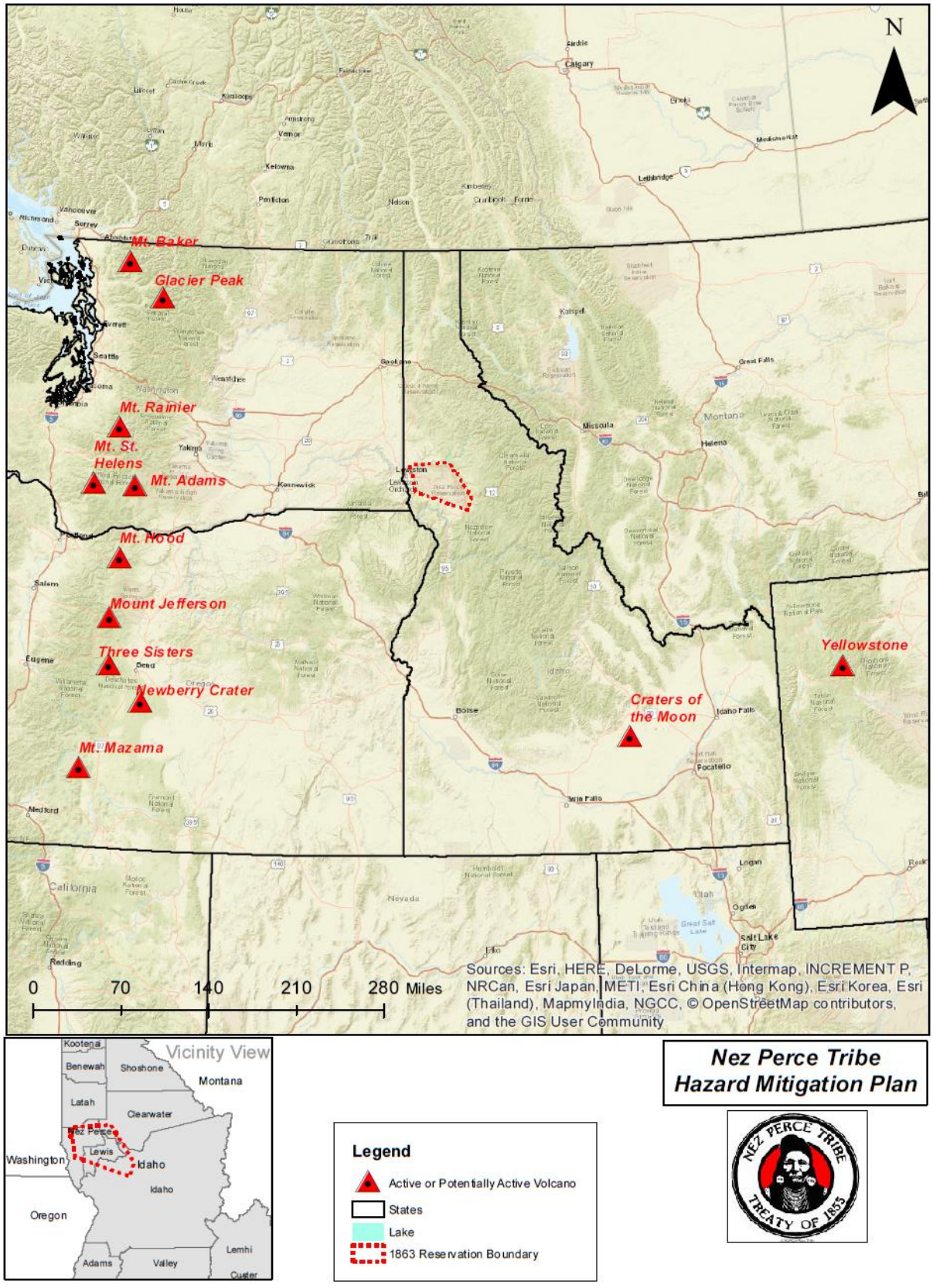
Wildfire Risk



Wildfire History



Locations of Active Volcanos



Appendix 4 – FEMA HMP Requirements

This section contains the FEMA regulations that pertain to the content of this plan. They were carried over as they appeared in the 2009 update.

The following is excerpted from the 2011 FEMA Local Mitigation Plan Review Guide.

This section provides detailed guidance on how FEMA interprets the various requirements of the regulation for all Local Mitigation Plan reviews through a Regulatory Checklist. The guidance is limited only to the minimum requirements of what must be in a Local Mitigation Plan, and does not provide guidance on how the community should develop a plan. The Regulation Checklist includes the following Elements:

- 4.1 ELEMENT A: Planning Process
- 4.2 ELEMENT B: Hazard Identification and Risk Assessment
- 4.3 ELEMENT C: Mitigation Strategy
- 4.4 ELEMENT D: Plan Review, Evaluation, and Implementation
- 4.5 ELEMENT E: Plan Adoption
- 4.6 ELEMENT F: Additional State Requirements

DMA 2000 REQUIREMENTS: PLANNING PROCESS

Documentation of the Planning Process

Requirement §201.7(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Element

Does the new or updated plan provide a narrative description of the process followed to prepare the plan?

Does the new or updated plan indicate who was involved in the current planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)

Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)

Does the new or updated plan indicate that an opportunity was given for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?

Does the updated plan document how the planning team reviewed and analyzed each section of the plan?

Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?

DMA 2000 REQUIREMENTS: RISK ASSESSMENT – IDENTIFYING HAZARDS

Identifying Hazards

Requirement §201.7(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the Tribal planning area.

Element

Does the new or updated plan provide a description of the types of all natural hazards that can affect the Tribal planning area? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the Tribal planning area, this part of the plan cannot receive a Satisfactory score.

Source: FEMA 2008.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Element

Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?

Does the new or updated plan address the impact of each hazard on the jurisdiction?

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Identifying Structures

Requirement §201.7(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

Element

Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Estimating Potential Losses

Requirement §201.7(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Element

Does the new or updated plan estimate potential dollar losses to vulnerable structures?

Does the new or updated plan reflect changes in development in loss estimates?

Does the new or updated plan describe the methodology used to prepare the estimate?

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Assessing Cultural and Sacred Sites

Requirement §201.7(c)(2)(ii)(D): [The plan should describe vulnerability in terms of] cultural and sacred sites that are significant, even if they cannot be valued in monetary terms.

Element

Does the new or updated plan discuss cultural and sacred sites?

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Trial Hazard Mitigation Goals

Requirement §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Element

Does the new or updated plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards?

Does the updated plan demonstrate that the goals were assessed and either remain valid or have been revised?

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Identification and Analysis of Mitigation Actions

Requirement §201.7(c)(3)(ii): [The mitigation strategy shall include] a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Element

Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?

Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?

Does the mitigation strategy identify actions related to the participation in and continued compliance with the NFIP?

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Implementation of Mitigation Actions

Requirement: §201.7(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the Indian Tribal government

Element

Does the new or updated mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)

Does the new or updated mitigation strategy address how the actions will be implemented and administered? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Tribal Capability Assessment

Requirement §201.7(c)(3)(iv): [The mitigation strategy shall include] a discussion of the Indian Tribal government's pre- and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including an evaluation of Tribal laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas.

Element

Does the new or updated plan include an evaluation of the Tribe's pre-disaster hazard management policies, programs, and capabilities?

Does the new or updated plan include an evaluation of the Tribe's post-disaster management policies, programs, and capabilities?

Does the new or updated plan include an evaluation of the Tribe's policies related to development in hazard prone areas?

Does the new or updated plan include a discussion of Tribal funding capabilities for hazard mitigation projects?

Does the updated plan address any hazard management capabilities of the Tribe that have changed since approval of the previous plan?

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Funding Sources

Requirement §201.7(c)(3)(v): [The mitigation strategy shall include an] identification of current and potential sources of Federal, Tribal, or private funding to implement mitigation activities.

Element

Does the new or updated plan identify current sources of Federal, Tribal, or private funding to implement mitigation activities?

Does the new or updated plan identify potential sources of Federal, Tribal, or private funding to implement mitigation activities?

Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring Project Implementation

Requirement §201.7(c)(4)(ii): [The plan maintenance process shall include a] system for monitoring implementation measures and project closeouts.

Element

Does the new or updated plan describe how mitigation measures and project closeouts will be monitored?

Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Incorporation into Existing Planning Mechanisms

Requirement §201.7(c)(4)(iii): [The plan maintenance process shall include a] process by which the Indian Tribal government incorporates the requirements of the mitigation plan into other planning mechanisms such as Reservation master plans or capital improvement plans, when appropriate.

Element

Does the plan identify other planning mechanisms available for incorporating the requirements of the mitigation plan?

Does the plan include a process by which the Indian Tribal government will incorporate the requirements in other plans, when appropriate?

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Continued Public Involvement

Requirement §201.7(c)(4)(iv): [The plan maintenance process shall include a] discussion on how the Indian Tribal government will continue public participation in the plan maintenance process.

Element

Does the plan explain how continued public participation will be obtained? (For example, will there be public notices, an ongoing mitigation plan committee, or annual review meetings with stakeholders?)

DMA 2000 REQUIREMENTS: PREREQUISITES

Adoption by the Tribal Governing Body

Requirement §201.7(c)(5): The plan must be formally adopted by the governing body of the Indian Tribal government prior to submittal to FEMA for final review and approval.

Element

Has the governing body of the Indian Tribal government adopted the new or updated plan?

Is supporting documentation, such as a resolution, included?

Does the plan provide assurances that the Tribe will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes as required in 44 CFR 13.11(d).

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring, Evaluating and Updating the Plan

Requirement §201.7(d)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan.

Element

Does the plan describe the method and schedule for monitoring the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)

Does the plan describe the method and schedule for evaluating the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)

Does the plan describe the method and schedule for updating the plan?

Copies of this Plan can be obtained by contacting:

Nez Perce Emergency Management Coordinator

Emergency Management Planner

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