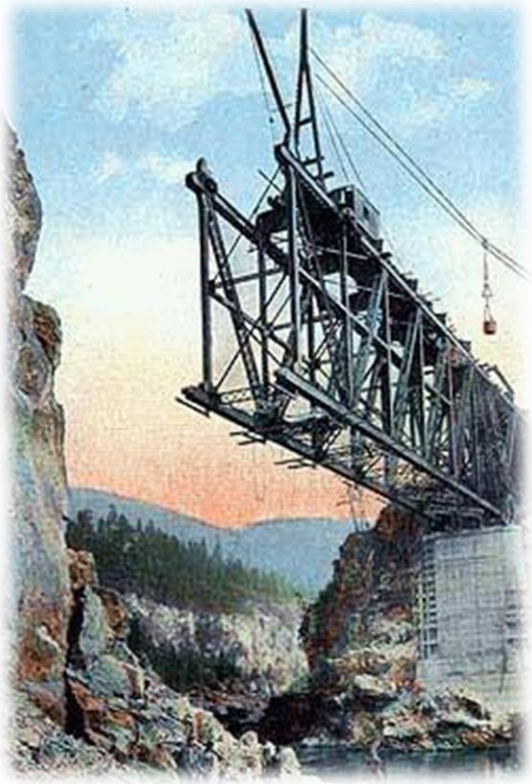
Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan



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EXECUTIVE SUMMARY

The Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan (AHMP), also referred to as the "Plan", has been developed to meet the requirements of the Disaster Mitigation Act of 2000 and the Federal Emergency Management Agency (FEMA) amendments to floodplain management of 2009. In the Disaster Mitigation Act of 2000, Section 322, FEMA established procedures for hazard mitigation planning on the local, state, and federal levels. In order for states, counties, and local jurisdictions to receive disaster relief grant money in the future, FEMA requires states and counties to develop hazard mitigation plans. To comply with FEMA's requirements Pend Oreille County is reviewing and updating their 2004 countywide hazard mitigation plan. The Plan identified the hazards that threaten the participating jurisdictions, the areas and facilities that are at risk, and the projects that need to be carried out to reduce the consequences of these hazards to the community. This review and update of the 2004 Plan will again identify the hazards that threaten the County, the areas and facilities that are at risk, and the projects that have not been completed. It will also identify new projects that will reduce the risk to the community. The planning process brought together the local jurisdictions having mitigation authority within the geographic planning area. Participation by the public was encouraged and the status of the mitigation planning process was shared with the public at several public meetings throughout the process.

The jurisdictions participating in the planning process include:

- Pend Oreille County (County)
- Pend Oreille County Public Utility District #1
- Town of Cusick
- Town of Ione
- City of Newport
- Town of Metaline
- Town of Metaline Falls
- Cusick School District
- Newport School District
- Selkirk School District
- Port of Pend Oreille
- South Pend Oreille Fire & Rescue
- Fire District #2
- Fire District #4
- Fire District #5
- Fire District #6
- Fire District #8
- Health District #1 Newport Hospital and Health Services.

The Kalispel Tribe was also consulted throughout the process however; the Tribe will be completing a separate Kalispel Tribe All Hazard Mitigation Plan. The aforementioned jurisdictions were consulted throughout the process and assisted in completing the hazard identification and vulnerability assessments that applied to their specific jurisdiction.

The planning process used in this Plan is flexible in meeting the analysis and documentation needs of the planning participants. The planning process assisted the Planning Committee by utilizing a full range of information in the technical analysis and the formulation of proposed mitigation initiatives for incorporation into this Plan. Individual sections of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan 2010 update present the detailed information to support the planning process. The Plan provides a description of the mitigation-related characteristics of each participating jurisdiction, such as its land uses and population growth trends, the mitigation-related policies already in place, identified critical facilities present

in the community, and whether there are properties that have been repetitively damaged by past disasters.

The Plan further addresses the mitigation goals and objectives established by the Planning Committee as well as the actions to be taken to maintain and update the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan. The Plan then summarizes the results of the hazard identification and vulnerability assessment process, and addresses the adequacy of the current policy basis for hazard management by the participating jurisdictions and organizations. The Plan also documents the mitigation initiatives proposed by the participating jurisdiction to address the identified vulnerabilities. Finally, the Plan documents efforts of the Planning Committee to engage the community and its neighbors in the mitigation planning process.

PEND OREILLE COUNTY WASHINGTON

MULTI-JURISDICTIONAL

ALL HAZARD MITIGATION PLAN

PROMULGATION OF ADOPTION

Be it known that the Pend Oreille County, Washington Board of County Commissioners do hereby approve the Adoption of the Pend Oreille County, Washington Multi-Jurisdictional All Hazard Mitigation Plan and direct its implementation through the Pend Oreille County All Hazard Mitigation Planning Committee.

Be it also known that the Board of County Commissioners hereby directs the Director of Emergency Management, to continue to lead the implementation of this Plan as the Pend Oreille County All Hazard Mitigation Committee Chair.

This Plan has been developed in the interest of providing all hazard mitigation protection to populations living in Pend Oreille County and the incorporated cities within its boundary. Through adoption of this Plan, all county, city and town agencies are requested to develop directives, Standard Operating Procedures, checklists or other supplemental guidance to ensure its maximum effectiveness.

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Pend Oreille County Commissioner	5-23-11 Date
Pend Oreille County Commissioner	05 23-11 Date
Pend Oreille County Commissioner	5/23/2011 Date
Attest: Pend Oreille County Clerk & The Board	05-23-11 Date
Endorsed: JoAnn Boggs, Director of Emergency Management	5/23/11 Date

Region X
130 228th Street, SW
Bothell, WA 98021-9796

FEMA

RECEIVED
EMD
APR - 1 2011

March 30, 2011

Ms. Heather Kowalski
HMGP Planning Coordinator
Washington State Emergency Management Division
Building 20, MS TA-20
Camp Murray, Washington 98430-5122

Dear Ms. Kowalski:

As requested, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) has completed a pre-adoption review of the ***Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan***. The plan successfully contains the required criteria, excluding the adoption, for hazard mitigation plans, as outlined in 44 CFR Part 201. This letter serves as Region 10's commitment to approve the plan upon receiving documentation of its adoption by the city.

The plan will not be formally approved by FEMA until it is adopted. The participating jurisdictions are not eligible for mitigation project grants until the plan is formally approved by FEMA.

Please contact our Regional Mitigation Planning Manager, Kristen Meyers, at (425) 487-4543 with any questions.

Sincerely,

Ryan Ike
Risk Analysis Branch Chief
Mitigation Division

KM:bb

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SECTION 1: INTRODUCTION

2010 Revision Summary

The introduction to the 2010 Plan update has been expanded to incorporate narrative from both the Introduction and a summary of the Purpose sections of the 2004 Plan. The Plan organization subsections have been updated to reflect organizational changes within the Plan. The introduction has also been expanded to include a Planning Committee subsection and includes an extensive Planning Process subsection.

The AHMP identifies the County, cities, and districts hazards and examines their impact to vulnerable populations and infrastructure. With that understanding, the Plan sets forth solutions that, if implemented, have the potential to significantly reduce threat to life and property. The Plan is based on the premise that hazard mitigation works! With increased attention to managing natural hazards, communities can reduce the threats to citizens, and through proper land use and emergency planning avoid creating new problems in the future. Many solutions can be implemented at minimal cost and social impact. An important focus of this Plan update was to involve the relevant stakeholders. This was done through a community survey and public meetings.

Hazard mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, culture, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures which can be used to eliminate or minimize the risk to life, culture, and property fall into three categories:

1) Keep the hazard away from people, property, and structures;
2) Keep people, property, or structures away from the hazard; and
3) Reduce the impact of the hazard on victims, i.e., insurance.

Hazard mitigation measures must be practical, cost effective, as well as culturally, environmentally, and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not, in themselves, be more costly than the anticipated damages.

The primary focus of hazard mitigation planning must be at the point at which capital investment and land use decisions are made, based on vulnerability. Capital investments, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability of a community. Once a capital facility is in place, very few opportunities will present themselves over the useful life of the facility to correct any errors in location or construction with respect to the hazard vulnerability. It is for this reason that zoning and other ordinances, which manage development in high vulnerability areas, and building codes, which ensure that new buildings are built to withstand the damaging forces of the hazards, are often the most useful tools in mitigation that a jurisdiction can implement.

Since the priority to implement mitigation activities is usually very low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved, however, if accurate information is portrayed

through complete hazard identification and impact studies, followed by effective mitigation management.

PURPOSE

The purposes of this Plan are to:

- Fulfill federal and local mitigation planning responsibilities;
- Promote pre- and post-disaster mitigation measures with short/long range strategies that minimize suffering, loss of life, impact on traditional culture, and damage to property and the environment resulting from hazardous, or potentially hazardous, conditions to which citizens and institutions within the County are exposed;
- Eliminate or minimize conditions which would have an undesirable impact on people, culture, the economy, the environment, and the well being of the County at large; and
- Aid in enhancing elected officials, departments, and the public awareness to the threat that hazards have on the community's way of life, and what can be done to prevent or reduce the vulnerability and risk.

SCOPE

This Plan covers the areas within Pend Oreille County, Washington including:

- Pend Oreille County (County)
- Pend Oreille County Public Utility District #1
- Town of Cusick
- Town of Ione
- City of Newport
- Town of Metaline
- Town of Metaline Falls
- Cusick School District
- Newport School District
- Selkirk School District
- Port of Pend Oreille
- South Pend Oreille Fire & Rescue
- Fire District #2
- Fire District #4
- Fire District #5
- Fire District #6
- Fire District #8
- Health District #1 Newport Hospital and Health Services.

Natural Hazards covered in this Plan include:

- Avalanches
- Biological
- Drought
- Earthquake
- Flood
- Landslide
- Severe Weather
- Volcano
- Wildland Fire

Technological Hazards covered in this Plan include:

- Structural Fire
- Hazardous Materials
- Riot/Demonstrations/Civil Disobedience
- Terrorism

This is not an emergency response or management plan. Certainly, the Plan can be used to identify weaknesses and refocus emergency response planning. Enhanced emergency response planning is an important mitigation strategy. However, the focus of this Plan is to support both better decision making directed toward avoidance of future risk, and the implementation of activities or projects that will eliminate or reduce the risk for those that may already have exposure to a natural hazard threat.

PLAN ORGANIZATION

The Plan update and revision meets, and in some instances exceeds the requirements, set forth by FEMA in the FEMA Pre-Disaster Mitigation Grant (PDM) Criteria Crosswalk. Plan drafts were presented in hard and electronic copy as requested by the Committee. The finished Plan includes information on Plan adoption, including a promulgation page for the County and an agreement to participate for each incorporated city or town, public district, and fire district.

- **Section 1** of the Plan provides an introduction or general overview of the process, a layout of Plan organization, the planning process, public involvement and planning integration. This section also includes a review of the County Land Use Ordinances and Comprehensive Plan.
- **Section 2** of the Plan gives a County overview, including a description of the County's demographic, economic, cultural, and physiographic characteristics.
- **Section 3** gives a summary of countywide hazard profiles.
- **Section 4** is the Risk Assessment section which lists vulnerabilities for the County and participating jurisdictions. All hazards identified as affecting the County will be analyzed at the County and incorporated city or jurisdiction level and then summarized.
- **Section 5** lists the Mitigation Strategy, Goals, and Objectives for the County and participating jurisdictions that are designed specifically to address risks posed by natural and man-made hazards.

PLANNING COMMITTEE

The Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Planning Committee, which is comprised of the Local Emergency Planning Committee (LEPC), has been established to protect the population, neighborhoods, businesses, and institutions of Pend Oreille County, Washington and the incorporated cities or towns that lie within the County boundaries, from natural, technological, and man-made hazards that have the possibility of causing serious threat to the health, welfare, and security of its residents.

The Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Planning Committee was formed on January 13, 2010. Committee membership is comprised of representatives from Pend Oreille County and Pend Oreille County Emergency Management, representatives from

incorporated cities, school districts, fire districts, the Pend Oreille County Public Utility District, the Kalispel Tribe, the Port of Pend Oreille, interested media and members of the public. Minutes of the committee meetings are provided in the Appendices'. Individual cities and districts participants were also engaged in the development of their individual jurisdiction AHMP updates. The participants are listed in the individual jurisdiction plans located in the appendices. In addition, the Pend Oreille County All Hazard Mitigation Committee Roster is provided below:

Agency	Representative	Position
Town of Metaline	Dennis Flannigan	Acting Mayor
Kalispel Tribe of Indians	Jim Wynecoop	Kalispel Tribe Public Safety Director
Town of Metaline Falls	Tara Leininger	Mayor
Selkirk School District	Nancy Lotze	Superintendent
City of Newport	Ray King	City Administrator
Port of Pend Oreille	Kelly Driver	Manager
P.U.D.	Chuck Frandrup	Director of Construction & Engineering
Fire District #5	Jay Foster	Chief
South Pend Oreille Fire & Rescue & Fire District #4	Mark Havener	Chief
Town of Ione	Terry Borden	Fire Chief
Newport School District	Bob Mitchell	Business Manager
Fire District #2	Larry Pollock	Fire Chief
Fire District #6	Duane Mauro	Fire Chief
Fire District #8	Chris Smith	Fire Chief
Town of Cusick	Bernice Smith	Councilmember
Cusick School District	Mike Phillips	K-12 Asst. Principal
County of Pend Oreille	Mike Lithgow	Director, Community Development
County of Pend Oreille	JoAnn Boggs	Emergency Management Director
US Forest Service	Will Markwardt	Fire/Fuels
City of Newport	Bill Jackson	Public Works Field Supv.
PUD Water	Mark Scott	Manager
City of Newport	Bubba Hedricks	Building Official
SPOFR	Mark Havener	Chief
Ione FD	Jerry Spalding	Firefighter
WSU Extension	Carol Mack	Natural Resource Educator
Pend Oreille County 911	Steve West	Chief of Comm.
Pend Oreille County 911	Darlin Sanchez	Deputy Chief Comm
Pend Oreille County Sheriff	Alan Botzheim	Inspector

Agency	Representative	Position
Pend Oreille Valley RR	Cliff Bauer	Road Master
DNR	Forrest Ownbey	Fire Prevention Forester
WA DNR	Andrew Stenbeck	District Manager
USDA Forest Service	Candy Eighme	Fire Management Officer
Ione Fire Department	Penny Smith	EMS Officer
Pend Oreille-PUD	Dale Weathers	Distribution Engineer
WSU Extension	Dixie Chichester	Firewise Outreach
Fire District #2	Sandie Durand	Fire Commissioner Prevention Specialist
WA DNR	Matt Castle	Forrester.Fuels
R & B Excavating	Billy Lambright	Owner/foreman
R & B Excavating	Wes Miller	Employee
Washington Department of Fish and Wildlife	Jay Shepherd	Wildlife Biologist
Washington DNR	Steve Harris	Landowner Assistance
Washington DNR	Cliff Thresher	Landowner Assistance
N/A	Paul Sieraczi	Private Citizen
Pend Oreille County	Diane Wear	Commissioner
Pend Oreille County	John Hankey	Commissioner
Pend Oreille County OEM	Laura Hiakkila	Assistant
P. O. Fire District #2	Rick Stone	Assistant Chief
Port of Pend Oreille	Bob Shanklin	Commissioner

Table 1.1: AHMP Committee Members

PLAN USE

The AHMP is used by County, city, and district officials to design, and implement programs and projects that will help reduce the individual jurisdictions vulnerability to natural, technological, and man-made hazards. The Plan also facilitates inter-jurisdiction coordination and collaboration related to all hazard mitigation planning and implementation. Lastly, the Plan should be used on a hazard and vulnerability assessment basis for local emergency response planning. When adopted, this Plan achieves compliance with the Disaster Mitigation Act of 2000.

PLAN MAINTENANCE

The AHMP maintenance process includes a schedule for annual monitoring and evaluation of the programmatic outcomes established in the Plan and for producing a formal Plan revision every five years. Updates or revisions to the Plan are issued under the direction of the Director of Emergency Management using the following guidelines.

- An **Annual Natural Hazards Mitigation Assessment** will be completed at least once a year by the AHMP Committee. The Committee will include a special work session

dedicated to an assessment of this Plan. All Plan partners and participants will be invited to attend the meeting, during which the following will be assessed:

1. Progress towards the Plan's goals and objectives.
2. Progress towards county wide and individual jurisdiction mitigation projects.
3. Implementation problems such as funding, coordination, or technical issues.
4. Financing of the multi-jurisdiction Five-Year-Plan update.
5. Ongoing public involvement activities.
6. Mitigation project coordination for multi-jurisdiction projects.

- The Plan will be Reviewed and Assessed after a Significant Disaster Event. The Pend Oreille Local Emergency Planning Committee (LEPC) LEPC will conduct an after action review within 60 to 80 days following a Federal Disaster Declaration or a significant emergency event that has occurred within the County. The LEPC will assess:
    1. The characteristics and severity of the hazard to determine if an updated risk assessment for that hazard is needed.
    2. Both direct and indirect damages as well as document any response and recovery costs.
    3. Identify any new mitigation projects that should be included in this Plan to avoid losses due to similar hazard events.
- General Plan Maintenance should be an ongoing task. Properly maintaining this AHMP will ensure that the information is current and accurate. By revising the Plan regularly the five year update process will be simplified. Changes to this AHMP will be based on outcomes of the yearly review meeting, after a major disaster, or as needed to suit the needs of individual jurisdictions. Changes will also be made when new planning partners join the hazard mitigation planning process and adopt their plans. Each individual jurisdiction is responsible for maintaining their portion of the Plan. Pend Oreille Department of Emergency Management assumes the responsibility of revising the core multi-jurisdiction plan (all sections except for local appendices).

FORMAL REVIEW PROCESS

The Pend Oreille County Multi-Jurisdiction Plan (AHMP) will be evaluated on an annual basis, as well as following a natural disaster, to determine the effectiveness of programs and to reflect changes that may affect mitigation priorities. The evaluation process includes an annual schedule and timeline, and identifies the local agencies and organizations participating in Plan evaluation. The Director of Emergency Management, or designee, will be responsible for contacting the Mitigation Committee members and organizing the annual review. Committee members will be responsible for monitoring and evaluating the progress of the mitigation strategies in the Plan.

The Committee will review the goals and action items to determine their relevance to changing situations in the County, as well as changes in federal policy, and to ensure they are addressing current and expected conditions. The Committee will also review the risk assessment portion of the Plan to determine if this information should be updated in light of any new data. The coordinating organizations responsible for the various action items will report on the status of

their projects, the success of various implementation processes, difficulties encountered, success of coordination efforts, and which strategies should be revised or removed.

Every five years the updated AHMP will be submitted to the State of Washington Emergency Management Division's (EMD's) Mitigation Program and the Federal Emergency Management Agency (FEMA) for review.

PLANNING PROCESS

2010 Revision Summary

The following planning process details the steps followed to update the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan (Plan) in 2010. In each of the steps, the 2004 Plan was reviewed and updated to meet current FEMA guidelines. To be consistent with the 2004 hazard rankings, the Mitigation 20/20 processes were used where possible. In many instances, the structure of information was altered to make the Plan more useable.

IDENTIFY HAZARDS

Pend Oreille County hazards were identified in the 2004 Pend Oreille County Local Mitigation Plan. The occurrences of hazardous events were evaluated and updated in the Plan. Data evaluated includes:

- Hazard planning documents developed by state, federal, and private agencies;
- Disaster Declaration documents;
- National Weather Service weather data from the past 50 years, and;
- A100 year historical analysis of hazardous event occurrences published in local, state, and federal documents.

IDENTIFY VULNERABILITIES

The Committee examined the potential effects on the County of the listed raw hazards by identifying vulnerable populations, infrastructure, critical services, facilities, and the environment. To expand the vulnerabilities section of the 2004 Plan, vulnerabilities were geographically identified using Geographical Information System (GIS) technology and then linked to a GIS database describing the vulnerable target, including potential damage and estimates of losses.

HAZARD MAPPING

As described above, hazard maps are extremely important in illustrating the juxtaposition of hazards and vulnerabilities. Information used to conduct the risk assessment and to make loss estimates was linked electronically to the maps using GIS technology. The electronic versions of these maps were provided to the Mitigation Committee, and other reviewing agencies.

RISK ANALYSIS

Using the *Mitigation 20/20* process to ensure consistency, the risk analysis was updated using the information gathered in the steps above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability,

expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

Table 1.2: Historical Occurrence Ranking Table

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence = one chance in the next 50+ years
2	Low	• Probability of occurrence = at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence = at least one chance in the next 10-25 years
4	High	• Probability of occurrence = at least one chance in the next 1 to 10 years

Table 1.3: Probability Ranking Table

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

Table 1.4: Vulnerability Ranking Table

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

Table 1.5: Spatial Extent Ranking Table

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

Table 1.6: Magnitude Ranking Table

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the eight natural hazards, with the priority hazards scoring highest and appearing in the light red rows, medium hazards appear in light yellow, and the hazards ranking lowest appear in green.

Natural Hazards Qualitative Risk Assessment EXAMPLE

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Flood	3	4	3	3	3	16	H
Earthquake	3	3	3	3	3	15	H
Severe Storm	3	4	2	2	3	14	H
Wildland Fire	3	4	[illegible]	2	2	13	H
Volcano	1	1	2	2	2	8	M
Landslide	3	3	2	1	2	11	M
Avalanche	3	4	1	1	1	10	M
Drought	1	2	1	1	2	7	L

Example

Table 1.7: Risk Ranking Table

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

RETURN INTERVALS – The determination of event return intervals is critical to the FEMA prescribed Benefit Cost Analysis (BCA) process. This is the process whereby the frequency is determined and then expressed in an expected reoccurrence interval (see Table 1.8 below for an illustration) is based on research conducted at the University of South Carolina[1]. For hazards where a large amount of detailed data is available, the Log Pearson III calculation which is frequently used to predict the statistical probability of an event occurrence based on historical data

The estimated occurrence of the hazard is a useful element in the hazards assessment so one can distinguish between infrequent hazards, like hurricanes, from frequent hazards, such as flooding. This calculation provides a useful indicator of the relative importance of each of the hazards that affect the jurisdictions, individually or collectively. The frequency of occurrence is a straight-forward calculation from the historical data and the length of that record in years. The number of

[1] Cutter, et al. 1997. Handbook for conducting a GIS-Based Hazards Assessment at the County Level. Prepared for the South Carolina Emergency Preparedness Division Office.

hazard occurrences is divided by the number of years in the record. This yields the probability of the event occurring in any given year. For instance, if a hypothetical hazard "A" occurred 17 times in the County over the past 23 years, the probability of occurrence for that hazard in a given year would be 17 / 23 = .739, or 73.9%. The reverse of this equation results in a reoccurrence interval in years. For example the reoccurrence interval of this hazard is calculated as 23 / 17 = 1.35. Hazard "A" can be expected to occur every 1.35 years. These return intervals are then correlated with magnitude to define the risk of a given hazard.

Location	No. of Years	No. of Events	Frequency	Reoccurrence Interval
County	23	17	73.9%	1.35

Table 1.8: Hazard Frequency Example Table

REPETITIVE LOSS – Repetitive loss designation**s** are used to eliminate or reduce the damage to property and the disruption of life caused by repeated damage, such as flooding of the same properties. The criteria to determine repetitive loss includes the following[2]:

- Four or more losses of more than $1,000 each in a 5 year period; or
- Two losses within a 10-year period that, in the aggregate, equal or exceed the current value of the insured property; or
- Three or more paid losses that, in the aggregate, equal or exceed the current value of the insured property.

LOSS ESTIMATES - The development of loss estimates is key in determining the magnitude of hazards within Pend Oreille County. In order to develop loss estimates this Plan uses standard FEMA methodologies and default values. Detailed loss estimates were performed for Wildfire, Flood, and Earthquake. Losses for these hazards were calculated for both critical facilities and general building stock. The losses include both structural loss and loss of contents. All of the loss estimates were annualized for comparison purposes. The following equation was used to annualize losses:

Annualized Loss = Event Loss / Return Interval

Wildfire losses were calculated using the LANDFIRE Consortium Mean Fire Return Interval Dataset. Each of the critical facilities were mapped and assigned their specific fire return interval. Using the County parcel layer, the return interval was calculated for each parcel that has a structure. Assuming a total loss of the structure, the annualized loss was then calculated. It is noted that this model does not incorporate fire protection into the equation.

Earthquake losses were calculated using FEMA's loss estimation methodology, Hazards United States (HAZUS). A level I HAZUS loss estimate was run assuming a probabilistic magnitude 7 Earthquake with a 100 year return period. The losses generated by HAZUS were then annualized for comparison purposes.

[2] NFIP repetitive loss definitions

Flood losses were calculated by overlaying the mapped critical facilities and parcels with improvements over the current Flood Insurance Rate Map (FIRM). The structures that were identified as being within the Zone A floodplain were noted and losses were calculated assuming a two foot flood depth with no basement using FEMA standard values. The results were then annualized. Flash Flooding and Dam Failure hazards were also analyzed in the same manner. The Flash Flooding model assumes that the flood depth is greater than 0 feet and less than 1 foot. The Dam Failure model assumes flooding of greater than 3 feet and a return interval of 500 years.

PUBLIC INVOLVEMENT

A community survey was mailed to 150 randomly selected property owners in Pend Oreille County. The lists were evaluated to ensure that a representative sample was taken from each participating jurisdiction. A copy of the survey and its results are located in the Appendices. Additionally, the members of the Planning Committee were requested to provide, through a short worksheet instrument, their opinions as private citizens regarding the risk posed to the County. This was done at the first AHMP Committee meeting. This tool was used to determine if there were biases towards any individual hazard and as a measure of changes as the process ensued. After mitigation projects were identified, public meetings were held to educate and involve the public in the mitigation process.

LAWS AND ORDINANCES REVIEW

The Pend Oreille County Comprehensive Plan and land use ordinances were reviewed against the list of ranked hazards to determine if there were any restrictions or enabling powers that affect possible hazard mitigation alternatives. The review of the land use ordinances for each jurisdiction is included in the respective planning document.

DEVELOPMENT OF GOALS AND OBJECTIVES

As required by FEMA, the planning effort was centered on community supported hazard reduction goals to be implemented and evaluated based on measurable objectives. Mitigation projects are assessed against the established goals and objectives to ensure that the selected projects reduce risk as desired. The goals and objectives of the 2004 Plan were updated to reflect changes in the needs of individual jurisdictions.

DEVELOP MITIGATION ALTERNATIVES

Potential projects to address identified risk were developed and listed in Section 5. This section reviews the status of the mitigation projects identified in the 2004 Plan and provides a summary of mitigation activities over the past 5 years. Using the projects that haven't been completed from the 2004 Plan and new projects that have been identified, a new mitigation project list has been developed. The project descriptions and associated roadmap address approximate costs, possible returns on investments, environmental, and socioeconomic benefits. Engineering cost estimates based on the conceptual design will be included if provided by the County.

DEVELOP IMPLEMENTATION ROADMAP

Road mapping is essentially the development of a high level project schedule. The Mitigation Roadmap in Section 5 of the Plan provides the necessary steps to be taken and the order in which they should occur to ensure project implementation. The Implementation Roadmap addresses the four highest priority mitigation projects identified during the planning effort and includes

possible funding options. Other possible mitigation projects were identified in list form linking them to the Plan Goals and Objectives, desired outcome, and assigned agency or department. Individual jurisdiction project lists can be found in their individual plans in the appendices.

PLAN REVIEW

The Plan review occurred at two distinctly different times. The initial review was conducted by the Director of Emergency Management and the Committee during development. Once the Plan was completed, it was submitted along with the completed FEMA PDM Criteria Cross Walk, to the Washington Emergency Management's Hazard Mitigation Strategist, and then to FEMA Region 10's Hazard Mitigation Officer for review. The Pend Oreille County Board of County Commissioners also reviewed the Plan in a parallel time frame.

PLAN ADOPTION

The Pend Oreille County Director of Emergency Management will make a formal public presentation to the Pend Oreille County Board of County Commissioners seeking their approval of the Plan. A Letter of Promulgation is provided in the Plan. In addition, each participating jurisdiction will be requested to adopt the Plan by resolution with the respective representatives signing the appropriate multi-jurisdiction participation document.

IMPLEMENTATION

By using this process, the Committee has developed a fully implementable All Hazard Mitigation Plan to be presented for approval to the County Board of Commissioners and to the representatives of the respective participating districts and jurisdictions. Upon approval of the Plan, the implementation process can and should begin.

PUBLIC INVOLVEMENT

2010 Revision Summary

In the 2010 update, the public involvement subsection has been included in the introduction with two distinct parts, risk perception and public meetings. This section includes a summary of these two parts, while expanded documentation is available in the appendices.

Public Involvement in the AHMP Process has three distinct objectives: documenting risk perception, development of risk reduction requirements, and solicitation of support for mitigation actions. Information gathering tools were utilized to gain a subjective measure of how the public believes the risks impact their community. These results were then used to assist in the development of requirements for risk reduction projects. This involvement of the public serves to validate and raise awareness of the planning process, thus generating support for elected and appointed officials as they seek to implement the mitigation actions identified in the AHMP.

RISK PERCEPTION

Risk perception is the subjective judgment that people make about the characteristics and severity of a risk. This phrase is most commonly used in reference to natural hazards and threats to the environment or health, such as nuclear power. Several theories have been proposed to explain why different people make different estimates of the magnitude of risks. Risk perception is a significant part of the Public Involvement Section of the AHMP Process. Two distinct tools were used to gather public input and to measure, at least subjectively, the public attitudes

towards the risk posed by the hazards in Pend Oreille County. The more quantitative Committee Perception Tool was used to access the expertise of the members of the All Hazard Mitigation Committee while the Public Questionnaire gathered more subjective opinions from a representative segment of the general public.

Committee Perception Tool

Members of the Committee, in reality play, two important roles. First, in the role of agency representative, each member: 1) ensures that the interests of their agency are expressed and included in the planning process, 2) acts as a subject matter expert on issues and matters managed by the agency and, 3) identifies methods to reduce or mitigate risk. Second, each member serves as an individual with certain expertise, but also with certain attitudes, knowledge and biases that qualify them as excellent "expressers" of public perception.

	What is the probability (%) that the hazard event will occur in the County in the next ten years? (Mark 1 for each hazard)										What would be the impact or Consequence if the hazard event did Occur? (Mark 1 for each hazard)				
	<10	20	30	40	50	60	70	80	90	100	Low		Med		High
Biological	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Dam failures	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Droughts	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Earthquakes	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Extreme heat	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Fires	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Floods	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Hazardous materials events	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Landslides/Mudslides	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Nuclear accidents	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Rioting or Large demonstrations	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Sever winter storms	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Snow avalanches	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Terrorism	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Thunderstorms, Hailstorms, Lightening, High Winds and Tornadoes	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Volcanoes	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Wildland fires	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

[1] Low = Little or no impact to life or property. Mod = Some property damage or impact to health. High = Significant property damage or loss of life.

Figure 1.1: Risk Perception Tool Example

Hazard Type	Probability of Occurrence in Next 10 Years By Percentage	Level of Impact if Event Occurred
Biological	Low	Low-Medium
Dam Failure	Low	High
Droughts	Medium	Medium
Earthquakes	Low	Medium
Extreme Heat	Medium	Medium
Fire (Structure)	High	High
Floods	Medium	High
Hazardous Materials Events	Low-Medium	Medium-High
Landslides/Mudslides	Medium	Medium
Nuclear Accidents	Low	Medium-High
Rioting or Large Demonstrations	Low	Low
Severe Winter Storm	High	High
Snow Avalanches	High	Low
Terrorism	Low	Low-Medium
Thunderstorms, Hailstorms, Lightning, High winds, Tornadoes	High	Medium
Volcanoes	Low	Low
Wildland Fires	High	High

Table 1.9: AHMP Committee Perceptions of Hazards

The Risk Perception Tool was used in the first committee meeting to measure the committee's, as individuals, perception of the hazards posed, and their perception of the severity of the impact from those hazards upon their personal life situations. An example of the Perception Tool is shown in Figure 1.1. This process is used to determine if there is existence of individual biases towards hazards which might affect the risk analysis and to also compare the committee's perception against the communities to determine appropriate approaches to public education.

The results from the Committee Perception Survey are in the Appendices in the Meeting Minutes. Table 1.9 summarizes the perceptions held by the committee.

The Committee's perception of the top five hazards in terms of probability of occurrence (from highest to lowest) was expressed as follows:

1. Thunderstorms, Hailstorms, Lightning, High Winds and Tornadoes
2. Fires (Structural)
3. Wildland Fires
4. Severe Winter Storms
5. Snow Avalanches

The Committee's perception of the top five hazards in terms of level of impact (from highest to lowest) is as follows:

1. Dam Failures
2. Fires (Structural)
3. Severe Winterstorms
4. Wildland Fires
5. Floods

PUBLIC QUESTIONNAIRE

A public questionnaire was provided to 150 residents of the County. The participants were randomly selected through a computer sorting of the County's tax assessment data base. The list was evaluated to determine if a representative sample of each participating jurisdiction was included.

Of the one hundred and fifty mailed, 39 were returned for a return rate of 26% and five or 3.5% were returned as undeliverable. This return rate is very similar to the return rate experienced on twenty other AHMP Projects. The complete text and results of the questionnaire are provided in the appendices.

The results of Question 4 are provided in this section for comparison to the Committee's perception. Question 4 states: "Please select the five highest hazards facing your neighborhood".

The results from this survey show the residents listed the five highest hazards facing the community as:

1. Blizzard/Ice Storms/Winter Storms
2. Volcanoes
3. Insect Infestations
4. Lightning
5. Extreme Cold

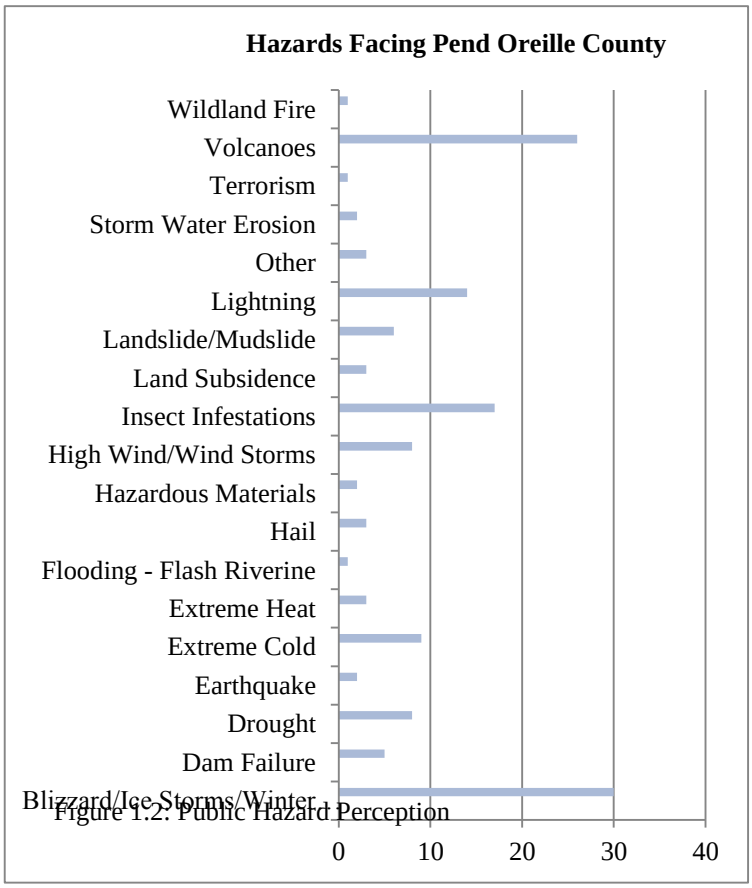


Figure 1.2: Public Hazard Perception

PUBLIC MEETINGS

In addition to meetings and briefings to the Pend Oreille County All Hazard Mitigation Planning Committee and the Pend Oreille County Wildfire Working Group, two local mitigation workshops were held in the County on April 21, 2010. The announcement (see side bar) was published in the newspaper two weeks prior.

The first meeting was held in Newport at the Emergency Management Offices and one at Fire District #2's Fire Station in Ione. The workshops were the culminating event of the County's Multi-Jurisdiction All Hazard Mitigation Planning Project which began in the fall of 2009. Invited attendees at the workshop included the County Commissioners, City Council members from Cusick, Ione, Metaline, Metaline Falls, and Newport, the Mayors of these cities, and representatives from County and City Planning and Zoning, Road & Bridge, Public Works, and Community Development departments as well as the Kalispel Indian Tribe. Others invited are representatives from the following: Pend Oreille County Public Utility District, Newport School District, Selkirk School District, Cusick School District, Port of Pend Oreille, South Pend Oreille Fire and Rescue, Fire District #2, Fire District #4, and Whisper Mountain Professional Services, Inc. The County's Emergency Management Consultant facilitated the workshop.

County hazard plans to be discussed April 21

NEWPORT – The last step in revising Pend Oreille County's disaster plans is a pair of workshops in Newport and Tiger Wednesday, April 21.

The county started revising its hazard mitigation plan in the Mitigation Plan in fall 2009. The hazard plan describes likely disasters to strike the county, any impacts to be expected from them, and plans for agency responses. The public is invited to attend either the Newport workshop or the Tiger workshop Wednesday, April 21. The Newport workshop is held at 1 p.m. at the Emergency Management Office on South Garden Avenue in Newport. The Tiger workshop is held at 6:30 p.m. at the Pend Oreille Fire District No. 2 station on Highway 20.

Invited attendees at the workshop include the county commissioners, council members and mayors from Cusick, Ione, Metaline, Metaline Falls and Newport, the Kalispel Tribe of Indians and representatives from county, city and towns planning and zoning, [illegible] the community development department. Invitations have also gone out to members of the Pend Oreille Public Utility District, the county's school districts, and the county's fire districts.

Emergency management director JoAnn Boggs and Whisper Mountain Professional Services, Inc., will be facilitating the workshops. Any additional projects identified during the revision process will be prioritized.

A draft of the present version of the hazard mitigation plan is available at www.whispermountain.net/PendOreilleCountyAHMPDraft.pdf.

Figure 1.3: Public Meeting Announcement

The County's hazard profiles and the potential impacts of those hazards were presented. Each jurisdiction was then asked to identify mitigation projects to lessen the impacts from the identified hazards. Participants were reminded that the overall goal of hazard mitigation is to save lives and reduce property damage.

Whisper Mountain
Professional Services, Inc

Pend Oreille County Holds Local Community Hazard Mitigation Workshop

Press Release

Pend Oreille County Emergency Management will be hosting two local community hazard mitigation workshops in the County. The first workshop will be held on April 21, 2010 at1:00 pm at the Emergency Management Offices in Newport. The second workshop will be held that evening April 12, 2010 at 6:30 pm at the Fire Station in Ione. The public is invited and encouraged to attend.

The workshop, as scheduled, will be the culminating event of the County's 2010 revision of the Pend Oreille County Multi-jurisdiction All Hazard Mitigation Plan which began in the fall of 2009. Invited attendees at the workshop include the County Commissioners, City Council members from Cusick, Ione, Metaline, Metaline Falls, and Newport, the Mayors of these cities, and representatives from County and City Planning and Zoning, Road & Bridge, Public Works, and Community Development departments as well as the Kalispel Indian Tribe. Others invited are representatives from the following: Pend Oreille Public Utility District, Newport School District, Selkirk School District, Cusick School District, Port of Pend Oreille, South Pend Oreille Fire and Rescue, Fire District #2, Fire District #4, Fire District #5, Fire District #6, Fire District #8.

Whisper Mountain Professional Services, Inc., the County's Emergency Management Consultant, will be facilitating the workshop. Whisper Mountain will present the hazard profiles completed for the County along with potential impacts to county, city, and private property. Each jurisdiction will then be requested to approve the goals and objectives developed by the mitigation committee to lessen impacts on the community from the risks posed by the hazards. Additionally projects identified during the revision process as well as those identified in the initial committee meeting will be prioritized.

A draft of the revised Pend Oreille County Multi-jurisdiction All Hazard Mitigation Plan can be found on the Whisper Mountain website at: http://www.whispermountain.net/PendOreilleCountyAHMPDraft.pdf. Whisper Mountain would appreciate your feedback. Comments can be emailed to derrick@whispermountain.net.

A draft of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan was posted for community review (see Sidebar for the announcement) on the internet at: http://www.whispermountain.net/Pend OreilleCountyAHMP.pdf. Comments were received and considered during subsequent revisions.

CONTINUED PUBLIC INVOLVEMENT

Pend Oreille County Emergency Management is dedicated to involving the public directly in the review and updates of the Plan. The Director is responsible for the annual review and update of the Plan. The public will also have the opportunity to provide input into Plan revisions and updates. Copies of the Plan will be catalogued and kept at all of the appropriate County departments and outside agencies. The existence and location of these copies will be publicized in the local newspaper following each annual review and update.

Public meetings will be held when deemed necessary by the Director. These meetings will provide the public with a forum where they can express concerns, opinions, or new alternatives that can then be included in the Plan. The Board of County Commissioners will be responsible for using County resources to publicize the annual public meetings and maintain public involvement.

PLANNING INTEGRATION

This section of the AHMP examines the relationship between the County's Comprehensive Plan, Land Use or Zoning Ordinances, and the AHMP. Incorporating hazard mitigation practices into land use planning is extremely important as future developments are planned and constructed. Through proper planning within the individual jurisdictions, risk to property owners can be reduced and future disaster related economic losses avoided. Land Use and Mitigation Planning Integration are seen as critical components of the mitigation program in Pend Oreille County.

The State of Washington requires that each town or city complete a Comprehensive Plan as part of the State Growth Management Act. Building codes/ordinances are decided based on the town's plans for growth management. The State of Washington has also established a Shoreline Management Plan to protect the many shorelines and waterways in the state. Towns or cities are to incorporate this Shoreline Management Plan into their Comprehensive Plans if they have any of these shorelines or waterways in their jurisdictions. The Pend Oreille River is considered part of the Shoreline Management Plan.

PEND OREILLE COUNTY COMPREHENSIVE PLAN

The Pend Oreille County Comprehensive Plan was last updated in October 2005. The Comprehensive Plan seeks to protect valuable natural resources and guide land use policies in the growth of the County. Land Use goals and policies are set to protect and conserve the natural environment in the County.

The Critical Areas portion of the Pend Oreille County Comprehensive Plan states that all state and federal regulations will be followed by developments that use or generate hazardous materials, including the notification of emergency services personnel as to the types of hazardous materials in use. The Pend Oreille County Comprehensive Plan also identifies the need to keep new development away from areas subject to flooding. The County Shoreline Master Plan sets guidelines for flood management in keeping with the State Shoreline Management Act.

Pend Oreille County consists of coniferous forest, with most of the towns and cities in the County surrounded by forestland or agricultural land. The current County Comprehensive Plan mentions in the General Land Use Policy that the local fire districts and other public services should be actively involved in planning activities. There is no reference to the wildland urban interface in the County Comprehensive Plan. However, the Urban Growth Act includes encouragement of development in urban areas "where adequate public facilities and services exist or can be provided in an efficient manner."

The County's Development Code is presently under revision. The Code contains specific requirements for development in geological and flood hazard areas. The flood hazard portion of the Code meets the requirements under NFIP for a floodplain ordinance. Other ordinances examine drainage issues and wetlands. However, there is no Wildland Fire Hazard Ordinance. It is recommended that the County identify areas where wildland urban interface protection measures might be implemented and adopt an implementing ordinance.

TOWN OF CUSICK

The Town of Cusick adopted a Shoreline Master Plan in August of 2006 to protect lands adjacent to the Pend Oreille River and the Calispel River. A procedure was put in place for the placement of boat docks, paths of access, and any other disturbance of the natural resources area to protect these areas from development. The adoption of this Shoreline Master Plan meets a requirement by the Town to adopt a Shoreline Management Program in view of the fact that the Town consists of shorelines identified by the State of Washington.

TOWN OF IONE

The Town of Ione provided portions of their Comprehensive Plan consisting of the Shoreline and Floodplain Management. Development along the Pend Oreille River could adversely affect water quality, and may expose areas to a flood hazard. The City's Comprehensive Plan states that any development along the river must provide a corridor in which existing and restored vegetation may provide effective filter for surface runoff and wildlife habitat. Concern is expressed regarding the stabilization of the river bank along the Pend Oreille River. "The Ione Development Code should require that bank stabilization be accomplished using an appropriate combination of sloping the bank, protecting its toe with large rocks, and planting native vegetation for further stabilization."

The Comprehensive Plan also states that the Town of Ione continues to participate in the County's Shoreline Master Plan and current state regulations.

CITY OF NEWPORT

The City of Newport's Comprehensive Plan was last updated and approved in 2008 and was written to ensure coordination with the Pend Oreille County Comprehensive Plan. The City of Newport applied for a Planning Only Community Development Block Grant to fund the update of their City Comprehensive Plan in 2000. This Plan was approved in 2001.

There were two references to critical areas in the City of Newport's Comprehensive Plan. Flood areas are mentioned in regards to mapping in the Comprehensive Plan; however, the City of Newport is disputing the designation with FEMA. The Comprehensive Plan also lists in the transportation goals and objectives section that the City of Newport will work with emergency services in dealing with hazardous materials spills as quickly as possible.

TOWN OF METALINE

The Town of Metaline submitted an amendment and land use ordinance update to the Town Comprehensive Plan. The land use ordinance was dated June 2007. The original Comprehensive Plan was adopted in September of 1996 and the Development Code was adopted in March of 1997. The amendment changes wildlife habitat to critical areas and identifies that these areas are more prone to aquifer protection, frequently flooded areas, and geologically hazardous areas. Wildlife and natural resources are considered economic assets to the area and are therefore critical to protect.

A plan to upgrade the water system was recorded as a capital facilities project dated 2007-2008.

TOWN OF METALINE FALLS

The Town of Metaline Falls Comprehensive Plan was last updated in September of 1996. The Metaline Falls Town Comprehensive Plan represents a Town that is dedicated to the protection of the natural resources which surround it. Floodplain management strategies refer to the County's Shoreline Master Plan and state regulations of the State Shoreline Master Plan. The goal of these two plans is to protect natural habitat and water quality along the shorelines of the vast waterways in the County, as well as the State of Washington. Metaline Falls seeks assistance from Pend Oreille County in addressing any floodplain management.

The Town Comprehensive Plan suggests that the Town "should incorporate hazardous waste control into the Town development codes", as well as adopting a clear set of rules for location of hazardous waste disposal sites. It is recommended that the Town incorporate hazardous waste handling guidelines, emergency procedures, as well as hazardous waste disposal sites. By incorporating these recommendations in the Comprehensive Plan the Town will be able to set regulations and ordinances to protect the public and natural resources in Metaline Falls from hazardous waste materials.

Metaline Falls does not have their own building ordinances; they have adopted the Building Ordinances of Pend Oreille County.

NEWPORT SCHOOL DISTRICT COMPREHENSIVE PLAN

The Newport School District identified three schools as critical facilities: Stratton Elementary, Sadie Halstead Middle School, and Newport High School. These schools are heavily used by the community in the evenings, weekends, and during the summer. These school facilities have also been identified by the Red Cross and the Newport Hospital as emergency centers in the event of a crisis in the community.

The Newport School District Comprehensive Plan identified three hazards, based on relative risk. These three hazards are High Winds, Severe Winter Storm, and Major Fire/Wildfire. In addition, the Comprehensive Plan identified economic crisis and crime as risks. Due to the terrain of the area, as well as the fact that high winds and severe winter storms have occurred annually, these two threats would pose the most risk.

Wildfires occurred in 1900 and 1930 with major damages to the town of Newport. A firestorm in 1991 was relatively better controlled.

The Newport School District Comprehensive Plan identifies areas of concern, critical facilities, and sets in place goals and objectives to mitigate these hazards.

SECTION 2: COUNTY DESCRIPTION

2010 Revision Summary

The County description has been greatly expanded and enhanced from the 2004 Plan. It now includes the following subsections: Location, Topography & Geography, Vegetation, Geology, Soils, Climate, Land Ownership, Land Use & Natural Resources, History, Demographics, and Economic Profile. Information from the 2004 Plan was integrated with local, state, federal, and private sources.

Pend Oreille County is a rural County located in the northeast corner of Washington State. It covers an area of 1,400 square miles and is ranked 25th in size among Washington State's counties. There are large areas of forest, mountains, valleys, lakes, and open pastures with widely dispersed homes and ranches within the County. The County consists of beautiful landscapes, rugged wilderness, and outdoor recreation areas. The Pend Oreille River runs the entire length of the County providing electric power and recreational opportunities.

Pend Oreille County is named after the Pend d'Oreille tribe, a local tribe whose name was derived from the French-Canadian fur traders who visited the area. The name Pend Oreille is French and means "hangs in the ear". It is believed that the fur traders gave the tribe this name because of their ear pendants. Pend Oreille County was formed out of Stevens County on March 1, 1911. Newport was established as the County seat in 1912 after defeating three other contenders. Pend Oreille County is a blend of "pioneer spirit, visitor amenities, and small town hospitality".

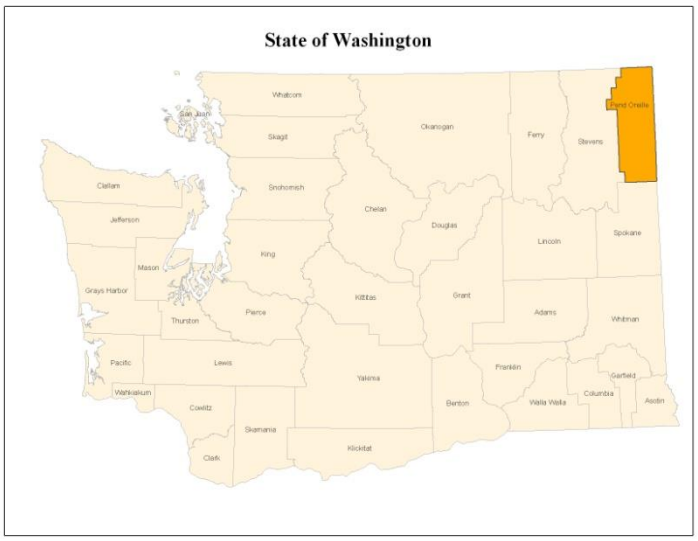


Figure 2.1: Pend Oreille County Location Map

LOCATION

Pend Oreille County is located in the northeastern corner of Washington. It is bordered on the east by both Boundary County and Bonner County, Idaho. On the south it is bordered by Spokane County, Washington and on the west by Stevens County, Washington. The northern border is shared with Central Kootenay Regional District, British Columbia, Canada.

TOPOGRAPHY & GEOGRAPHY

Pend Oreille County consists of 1,400 square miles of land and 25 square miles of water. The southern portion of the County is made up of rolling hills while the central and northern portions of the County comprise high hills and valleys. The most prominent area of the County is the valley along the Pend Oreille River. This valley has areas which stretch for miles and areas which are very narrow. One-half mile north of Newport the Pend Oreille River enters Washington State from Idaho and then flows north to join the Columbia River in British

Columbia, Canada. The river runs northwest for 72 miles and is one of only two rivers in the North American hemisphere that runs north. The watershed in the Newport area is very limited which is due to a small depression beginning one-half mile to the southwest of the river. There are 55 lakes that are located within the County. Surface water in the County is used for hydroelectric power.

Total withdrawal of fresh water for public supply is 0.72 million of gallons per day, 82% of which is from ground water and 18% from surface water.

In some areas benches extend above the river with steep timber-covered mountains. The Selkirk Mountain Range runs parallel to the River and extends from the City of Newport to the Canadian border. The Selkirk Mountain Range is geologically older than the Rocky Mountains, and consists of mellow, rounded peaks rather than the mountainous crags of the Rocky Mountains.

The County is also home to two National Forests; the Colville and Kanisku, as well as Little Pend Oreille National Wildlife Refuge.

VEGETATION

The bottomlands of the Pend Oreille River Valley are well suited for both grassland and agricultural vegetation. Over the past century, much of the “native riparian vegetation” has been replaced with agricultural fields and areas for livestock grazing and feed crops, such as hay. Hay is the primary crop grown in the County. Coniferous forest vegetation, associated with national forests, cover over 80 percent of the County. Ponderosa Pine and Douglas Fir typically cover the lower timberline area on the hills and low mountains. A mix of Douglas Fir, Grand Fir, Lodge Pole Pine, Western Red Cedar and Western Larch dominate the mid-elevations. The higher elevations are home to Subalpine Fir and Engelmann Spruce. The native vegetation is mainly conifers, shrubs, forbs, and grasses.

GEOLOGY

The rocks over a considerable portion of the County are metamorphosed sedimentary and consist of shale and dolomite limestone. Large deposits of alluvial clay are found in many areas along the Pend Oreille River. These deposits are usually bluish, grayish, or yellowish in color, and fine grained. Precambrian Phyllite interbedded carbonate rocks, quartzite, volcanic, and gritstone rocks are confined to the northeastern portion of Pend Oreille County. Southeastern portions of the County contain dark-gray diorite sills from 3 to 1200 feet thick. Quartzite sandstone is present in the upper part, with dark-gray argillite mixed with sandstone and limestone in the middle, and sandstone with argillite in the lower part of the County.

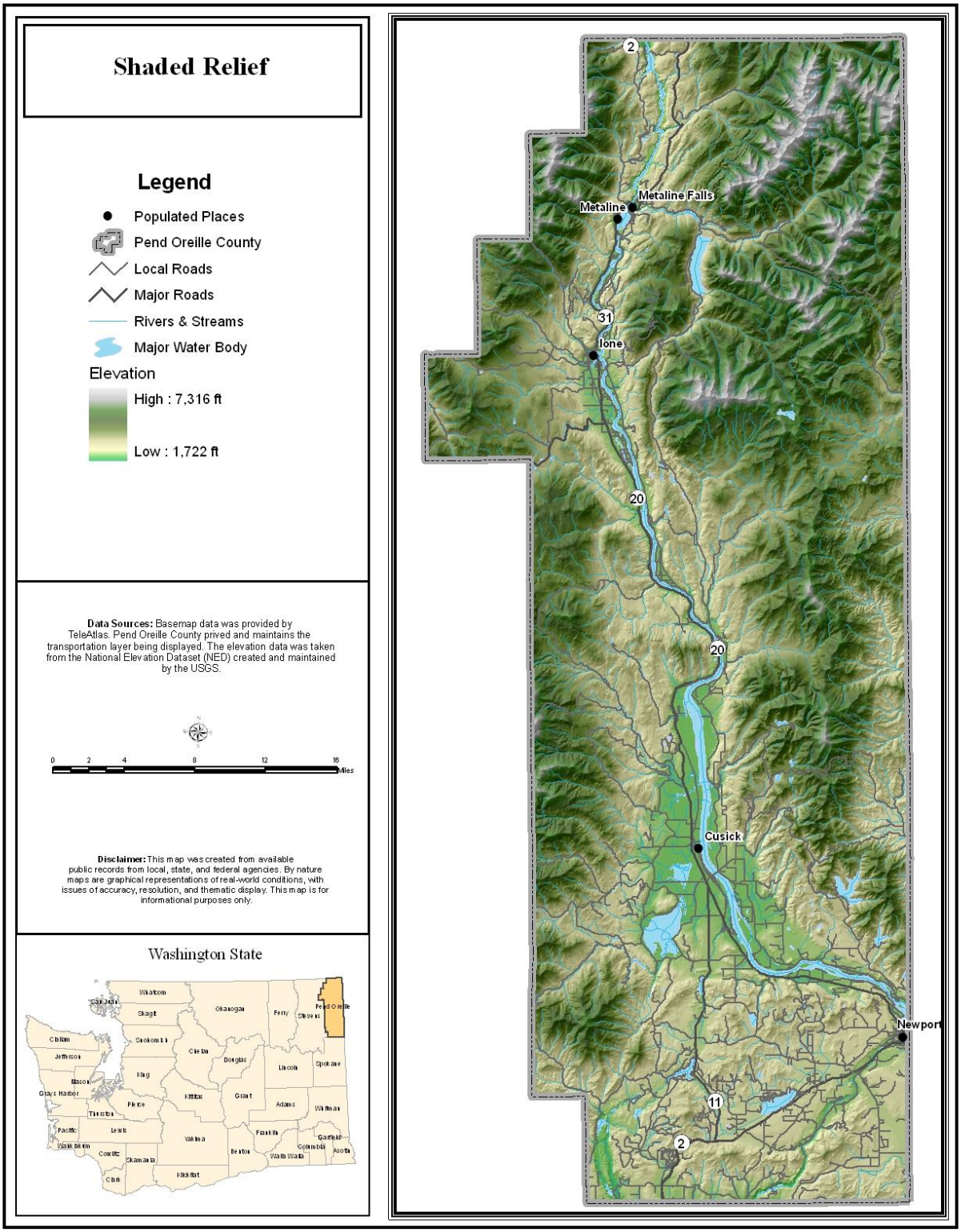


Figure 2.2: Shaded Relief Map of Pend Oreille County, WA

SOILS

The soils in the County range in texture, natural drainage and other characteristics. Soils along the major drainage areas are suited to small grain and hay crops, pasture, recreation, and watershed and wildlife habitat. Due to seasonal high water tables and overflow, crop production is limited. Soils on terraces in the County are suited to grain crops, pasture, recreation, timber production, grazeable woodland, as well as watershed and wildlife habitat. The main limitation in these areas is the low availability of water capacity. Soils on the uplands, foothills and mountainous areas, are suited for crops, hay, pasture, timber production, recreation, grazeable woodland, and watershed and wildlife habitat. The soils in this area have few limitations but the growing season varies.

Ahren loam soils are found on slopes of 2 to 20 percent. This is a very deep, well drained soil and is located on the toe slopes of the foothills and mountains. It formed in a mantle of volcanic ash and loess over calcerous, fine textured glacial till derived from shaly rock and limestone. Also included in the upper parts of the slopes are Blezar silt loam, Boundary silt loam, and Hartill silt loam. Permeability is moderately low in this Ahren soil. Ahren loam also covers the foot slopes of the foothills and mountains on 20 to 40 percent slopes and 40 to 65 percent slopes. Included in the toe slopes is another type of soil, the Aits loam that has a slope of more than 15 percent, with Newbell silt loam, Smackout loam, and Waits loam. Included in this soil mix are Bonner silt loam, and Martell silt loam on terraces, Hartill silt loam on the upper slopes, and Inkler gravely silt loam on south and west facing slopes. Poorly drained soils exist in draws and adjacent to steep slopes and springs.

Aits stony loam is found on toe slopes and foot slopes of foothills and mountains, generally with north or east aspects at the lower elevations and south and west aspects on the higher elevations.

Anglen silt loam is another soil type found in the County on slopes of 0 to 7 and 7 to 40 percent. Dalkena fine sandy loam, Kaniksu sandy loam, Martella silt loam, Sacheen loamy fine sand and Scotia fine sandy loam are also found in this unit in small areas. Also included in the unit are Blueslide silt loam in depressions and adjacent to streams as well as poorly drained areas. Areas included make up about 20 percent of the unit. Permeability is moderately slow in this Anglen soil and available water capacity is high.

Belzar silt loam is a moderately deep, well-drained soil that is found on foot slopes and ridgetops of the foothills and mountains. As with the other soils in the County this soil is formed in a mantle of volcanic ash and loess over residuum and colluviums derived from calcerous rock and limestone.

Blueslide silt loam is a very deep, somewhat poorly drained soil on floodplains. It formed in alluvium derived dominantly from granitic rock, lacustrine sediments, volcanic ash, and loess.

Also present in the County is the Buhrig Rock outcrop complex found on 25 to 40 percent slopes, and Buhrig very stony loam found on 40 to 65 percent slopes, with both of these being convex and generally have north and east aspects. Elevation for these soils is between 3,000 and 6,500 feet. Clayton fine sandy loam is a very deep and well-drained soil found on terraces. It is formed in glaciofluvial material of mixed mineralogy. The elevation for this soil is between 1,800 and 2,200 feet.

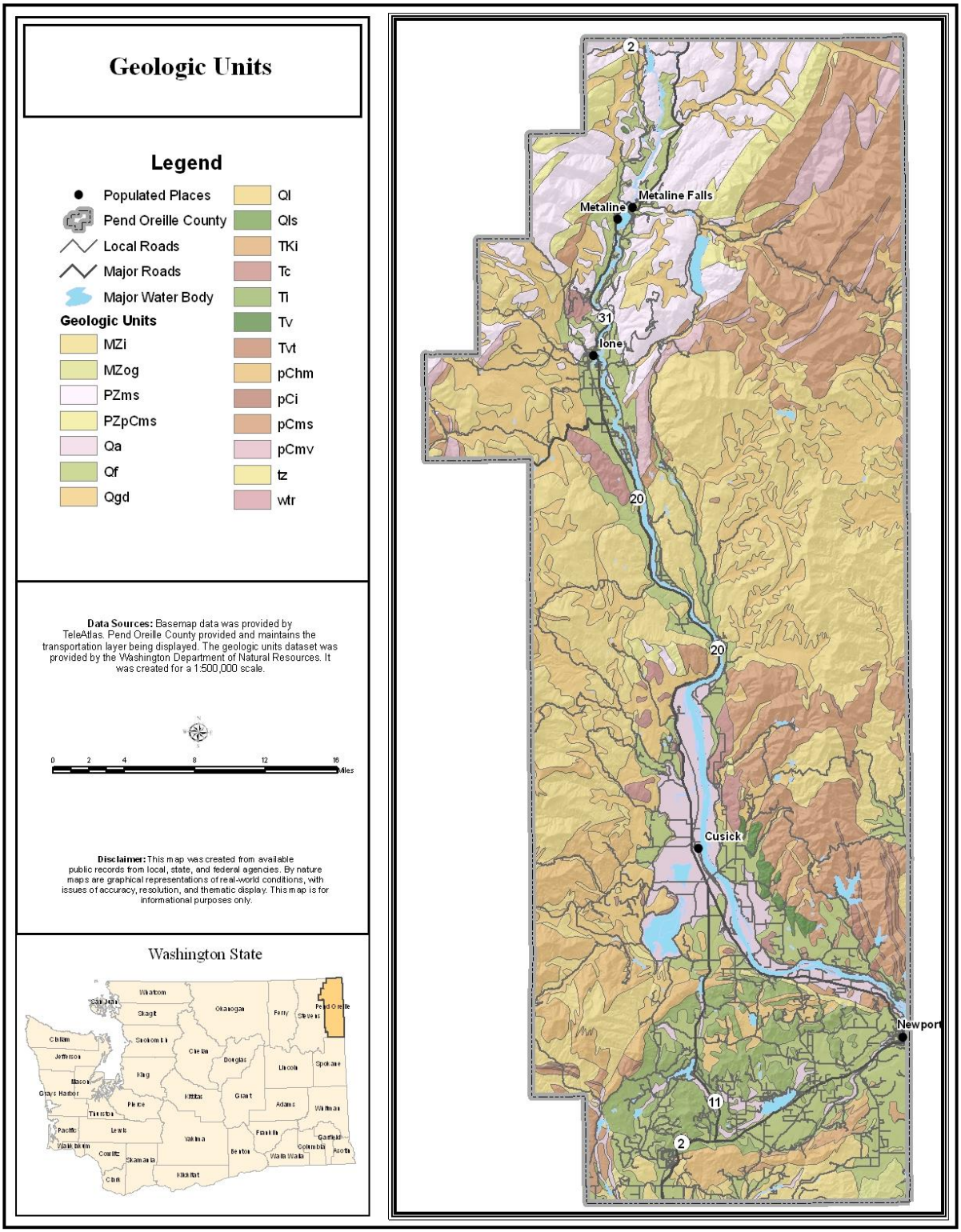


Figure 2.3: Geologic Units of Pend Oreille County

CLIMATE

Pend Oreille County's average winter temperature is 28 degrees, with an average low of 21 degrees. The average summer temperature is 63 degrees with an average daily high of 79 degrees. Total annual precipitation for the County averages 27 inches with 30-40 percent of the precipitation falling in the months of April through September. Seasonal snowfall averages 62 inches at Boundary Dam and 70 inches in the City of Newport[3].

Average	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
Max Temp	31.8	38.2	47.5	57.8	65.7	71.5	81.4	82.6	72.0	55.9	40.3	32.0	56.4
Min Temp	18.0	20.6	26.0	32.3	39.9	46.8	50.04	48.5	41.4	33.6	27.3	19.7	33.7
Total Precipitation in inches	2.92	1.99	2.11	2.05	2.63	2.81	1.60	1.43	1.39	2.00	3.09	3.46	27.48
Total Snowfall in inches	21.0	8.9	3.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	6.3	21.1	60.7
Snow Depth in inches	14	13	4	0	0	0	0	0	0	0	1	7	3

Table 2.1: Percent of Monthly Climate Summary: 7/1/1965 to 4/30/2009

LAND OWNERSHIP

The major land owners in the County are the National Forest Service, the State of Washington, the Kalispel Native American Reservation, and the Bureau of Land Management. Only about 25% of the land in the County is used for harvested cropland or livestock grazing.

LAND USE & NATURAL RESOURCES

The chief use of land and natural resources are logging, mining and farming. The lumber industry relies on the federal forests. The major timber species are Douglas-fir, Western Larch, and Ponderosa pine.

One of Washington's most important mining areas was the Pend Oreille/Metaline Mining District, which produced lead, zinc and silver from 1911 to 1977. The mine was allowed to flood to the 1350 foot level in 1977. In 1988 the Pend Oreille Mine was pumped out and more reserves were discovered. The mining District was purchased by Teck Cominco American Inc. in 1996, which refitted the buildings and prepared the mine for production to begin again in 2004. The mine was then operated for five years under the name Teck Washington, Inc. In February of 2009, the mine was transitioned to care and maintenance by Teck Washington, Inc.

[3] Western Regional Climate Center

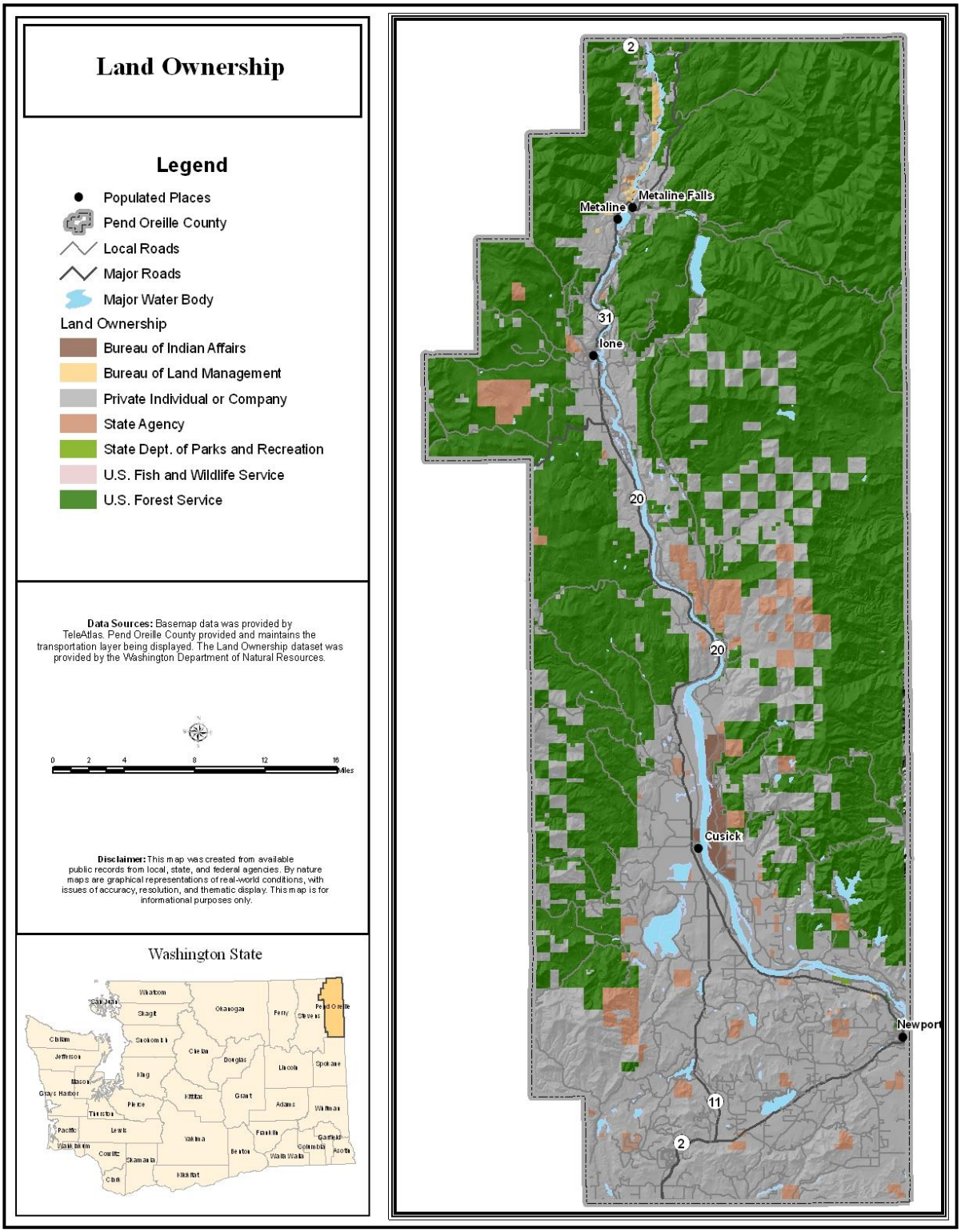


Figure 2.4: Land Ownership

HISTORY

Pend Oreille County is in the extreme northeast corner of Washington and was the last County created in the State. Early inhabitants of the County were Native Americans, then fur traders and explorers, missionaries, miners, loggers, and finally homesteaders. The economy was based on timber, mining, and cement manufacture. Most of these businesses profits flowed to outside investors, leaving the local economy little for local development.

In 1809 David Thompson, an English fur trader from the North West Company, made his first trip down the Pend Oreille River. He came upon two tribes of Native Americans: the Kalispels, a tribe known as "camas people" because of the root that was their food staple, and the Pend Oreille, named by French-Canadian trappers due to the large ear pendants they wore. The Kalispels currently live in the County on the Kalispel Reservation while most of the Pend Oreille Tribe now lives in the State of Montana. In 1950, the Bureau of Indian Affairs combined the Kalispel Tribe and the remaining Washington Pend Oreille Tribe tribal members into a single tribe, the Kalispels.

Protestant missionaries came to the area with an austere version of Christianity and little understanding of traditional Native American ways; they were not successful among the Kalispels. The Jesuits fared better, but two Catholic missionaries arrived in 1844 and built the St. Ignatius Mission near Usk on the present day Kalispel Reservation. These missionaries were more successful and introduced gardening and livestock husbandry to the Valley. The Kalispel Tribe raised horses of the Cayuse type, which provided a good market throughout the area during the fur trading and early prospecting period. Perhaps due to the tensions with the different groups of missionaries, settlement by white settlers was discouraged from 1840 to 1870 because of general Native American hostility in the area.

The first major influx of non-Native Americans and fur traders came in 1850 with the discovery of gold and silver in the Metaline area in the northern portion of the County. Many of these miners were those who had failed in the California mines; however, permanent settlement of the Metaline area did not actually begin until 1884. From 1928 to the early 1950's "the real mining bonanza" was in lead and zinc mined in the Metaline Mining District. "During World War II, 'soldier-miners' were deployed to the Metaline mines to help produce lead and zinc for the war effort."[4]

The Lehigh Portland Cement Company of Metaline Falls was one of the State's most successful operations in providing cement for the construction of the Grand Coulee Dam and other such projects in eastern Washington. The cement industry in the County was prosperous until the 1990's; this industry was made possible by the limestone and quartz in the Metaline Falls area.

Timber was the second leading extractive industry in the County. The first sawmill was built by Edwin Winchester to supply settlers in the Calispell (variant spelling of Kalispel) Valley. The most successful local company was named the Panhandle Lumber Company, which was owned by Frederick A. Blackwell, who also owned 65,000 acres in the northern portion of the County by 1909. This sawmill was the first all-electric sawmill in the Inland Northwest and was of particular importance due to the cedar pole industry which was being used to supply poles for the

[4] http://www.pendoreilleco.org/about/history.asp)

growing electric, telephone and telegraph industry. Logging was a difficult and dangerous lifestyle, as the hours were long and the pay was low. Some loggers lived in the County with their families while others traveled from camp to camp living in bunkhouses. "By the 1920's, efforts by the Industrial Workers of the World (IWW), commonly called the Wobblies, were somewhat successful in bringing about better conditions" for the loggers, including shorter hours and higher wages. Another leading company in the 1920's was the Diamond Match Company, using 80 percent of the counties Pend Oreille White Pine to meet the demand for matches. Throughout the years there have been more than 250 sawmills operating at various times in Pend Oreille County.

The railroad reached Newport in 1892 enabling rail shipments for the logging industry, which until this time had been using the river to transport their shipments. Since the river runs north through the County, shipping of logging materials to the south was not possible. In 1910 Frederick A. Blackwell completed his "Idaho & Washington Northern Railroad running from near Post Falls, Idaho north to Metaline Falls via Newport". This railroad not only benefitted the logging industry but became the main source of transport for lead, zinc, and cement, as well as supplies necessary for the area settlers.

Pend Oreille County homesteaders soon learned that the area was not necessarily conducive to farming; it was found to be better for dairy farming. By 1944 seventy-five commercial dairies had been established in the County. Today there are none. After the completion of the railroad, the area saw new homesteaders and land seekers enter the valley. One of the earliest successful farm products was wild grass hay. Oats also became an important pioneer crop in the valley. Hay, feed grains, and wheat were the primary crops. Grazing of livestock was also successful.

The construction of the Box Canyon Dam in the 1950's was a major achievement for the Pend Oreille County Public Utility District. It provides hydroelectric power, as well as recreational opportunities. Seattle City Light's Boundary Dam was built in 1967 near the Canadian border; it provides hydroelectric power to Seattle and recreational use to Pend Oreille County.

DEMOGRAPHICS

The 2008 U.S. Census reported the population of Pend Oreille County at 12,859 which was a 9.6% increase in population from the year 2000.[5] The following chart shows that from 1970 to 2005 the population grew by 6,518 people, a 107% increase in population. At an annual rate, this represents an increase of 2.1%. Over the past 35 years, population growth in Pend Oreille County, Washington has outpaced that of the State and the nation.

[5] http://quickfacts.census.gov/qfd/states/53/53051.html

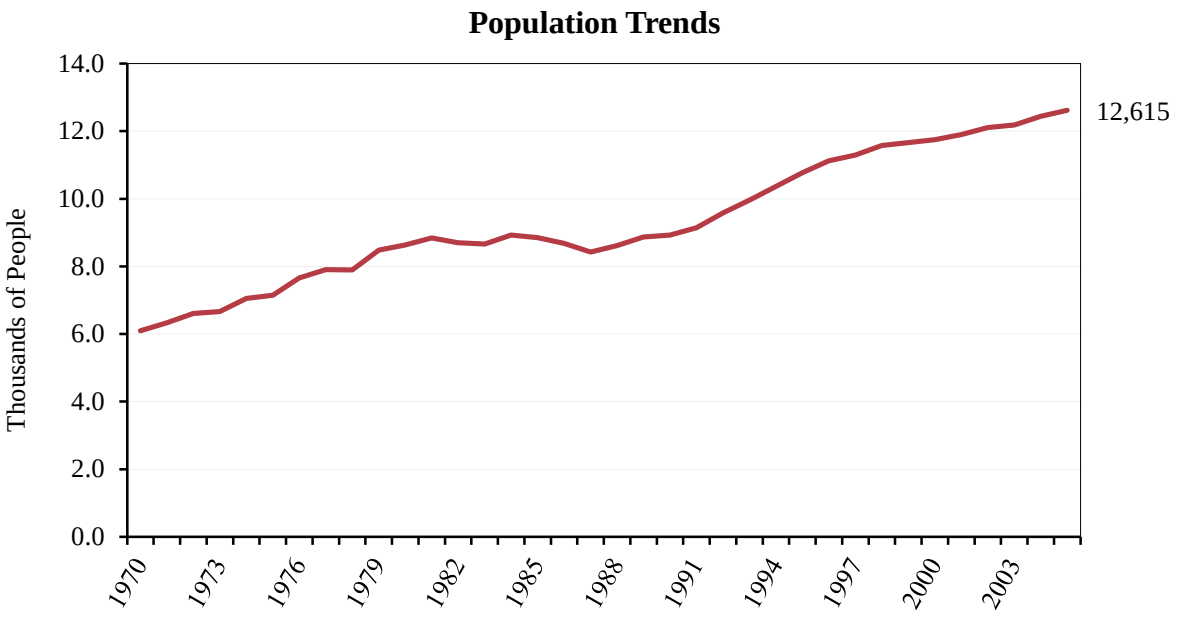


Figure 2.5: Pend Oreille County Population Trends

The County is fairly homogenous with 90.8% of the population identifying themselves as white-non Hispanic. In the same census report 2.7% of the population was reported as Hispanic and 2.4 % of the population reported two or more races. Native Americans make up 3.0% of the County population.

The 2007 U.S. Census reported 7,088 housing units in the County with a home ownership rate of 77.4% and a renter-occupied percentage rate of 23%. The median age of residents in Pend Oreille County was 45 in 2008, while the median age for a State of Washington resident in the same year was 35.3.

The 2007 U.S. Census Report[6] lists 7,088 housing units in Pend Oreille County with a home ownership of 77.4% and a renter's rate of 23%. The median value for a home in the County in 2007 was $188,821. The median age of housing structure in 2007 was thirty three years. The average home in Pend Oreille County has 4.9 rooms. In 2007, renters were paying an average rent of $431 a month.

[6] http://quickfacts.census.gov/qfd/states/53/53051.html

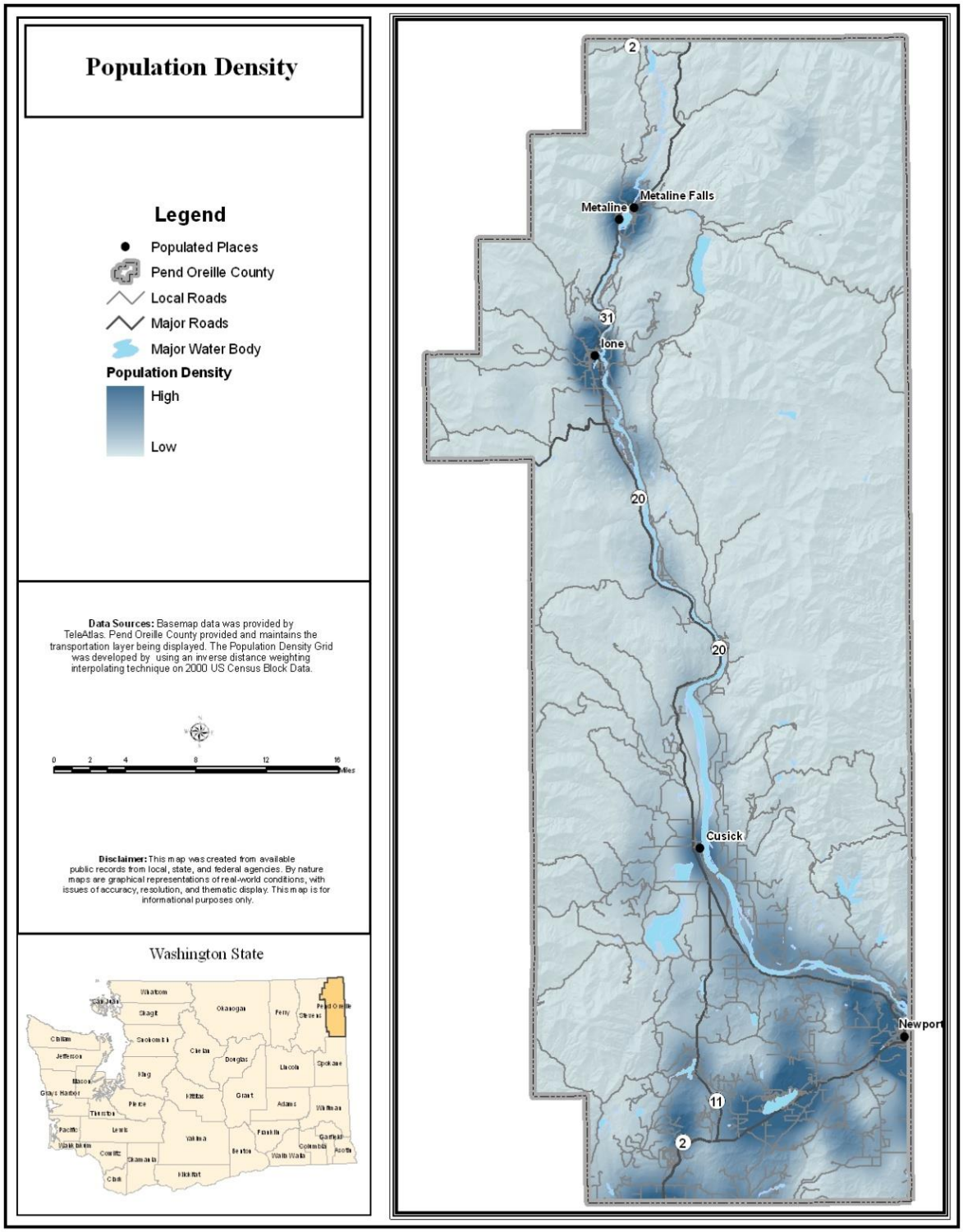


Figure 2.6: Population Density Map

TRANSPORTATION

Pend Oreille County residents travel an average of 31.5 minutes to work each day. Of the total population of Pend Oreille County, 62% of the residents live and work within the County.

ROADWAYS

Pend Oreille County roads fall into three types; U.S. Interstate Highway (Highway No. 2), state maintained, and local streets.

Pend Oreille County has five state-maintained routes, and they are: Washington State Route 20; Washington State Route 31, which connects to British Columbia and Washington State Highway 20; Idaho State Highway 41, an Idaho highway that has a 0.41 mile section partially in Washington; Washington State Route 211, which is a short connector route; and State Route 2, also known as U. S. Interstate Highway 2. Together these five roads total 115 miles of highway system. The longest highway in Washington is State Route 20, which runs 53.76 miles within Pend Oreille County.

AIRPORTS

Spokane International Airport is the closest regional commercial and freight airport to Pend Oreille County. Private plane service is operated south of Ione from the Robert Davis Airport. River Bend Airport is a privately owned airport located in Usk. Onserud Airfield is another small airstrip located near Usk in Pend Oreille County. The airport has grassy, uneven surface runways. Sullivan Lake State Airport sits on the shore of Sullivan Lake near the community of Metaline Falls. The approach to the airport is over the lake and the runway is short with a rough field. There is a landing area near Newport as well. These small airports and landing strips are for private plane use only.

The County also has two Heliports, one at Boundary Substation, Boundary Dam, and the other at the Newport Community Hospital.

RAILROADS

The Port of Pend Oreille is operated by the citizens of Pend Oreille County, who formed together in 1979 to create the Port. The sole purpose of the Port was to save the railroad and two mills, which were dependant on the railroad for service. Due to poor economic times the two mills have since been closed. The only service currently on this rail line is the Ponderay (variation of spelling) Newsprint Company.

The Port of Pend Oreille owns and operates the Pend Oreille Valley Railroad which interchanges with the Burlington Northern Railroad at Newport. Products that are shipped into and out of Pend Oreille County from the Newport interchange are newsprint, wood chips, and lumber. Rail service is provided into Cusick and Usk that serves Ponderay Newsprint Company and Vaagen Brothers Lumber, formerly Ponderay Valley Fibre. There is no passenger rail service in the County. On occasion the Pend Oreille Lions Club operates the Lions Club Excursion Train, a re-enactment of the old passenger line from Ione to Metaline Falls. This ride follows the Pend Oreille River and affords views that are only available to train passengers.

PUBLIC SAFETY

FIRE PROTECTION

Pend Oreille County Fire Protection District is a private company divided into eight districts under the County Government to protect the residents of the County in various sections/parcels. Fire Protection District #8 and District #1 cover the southern end of the County. Fire District #1 was merged with Fire District #3 in February 2008; these two districts then merged with Fire District #7 and became the South Pend Oreille Fire and Rescue. Fire Protection District #2 is located in Metaline Falls and covers the Northeastern portion of the County. Fire Protection District #5 is just below District #2 and follows State Route 20. Fire Protection District #3 spans west from Newport to the Stevens County border. Fire Protection District #4 is just above District #3 and covers only the western portion with District #6 covering the eastern portion. Overall, Fire Protection Districts #2 and #6, as well as South Pend Oreille Fire and Rescue cover the largest areas.

South Pend Oreille Fire and Rescue is an organization made up of volunteers who operate under the leadership of a professional fire chief. The area is served by five fire stations and nearly 70 volunteers. There are 36 certified EMS personnel that provide primarily Basic Life Support response. All volunteer firefighters are trained in CPR and first aid.

The City of Newport has its own Fire Department with one staff member and fifteen volunteers. The towns of Cusick, Ione, Metaline and Metaline Falls have their own volunteer fire departments as well.

The US Forest Service also provides wildland protection in Pend Oreille County.

The Kalispel Reservation is served by the newly developed Kalispel Fire Department.

Ambulance services are provided by Newport Ambulance Service to Newport and the southern end of the County. North Pend Oreille Ambulance covers the communities of Ione, Metaline, and Metaline Falls. Northwest Med-Star Air Ambulance of Spokane Washington, in cooperation with North Pend Oreille Ambulance and the Ione airport, is available for transport of emergency patients to Sacred Heart and Deaconess Medical Centers in Spokane. Pend Oreille County Fire District #2 provides ambulance service in the northern half of the County with three ambulances, one career firefighter/paramedic, and 20 volunteer personnel.

HEALTH CARE

Newport Hospital and Health Services is located in Newport, WA. The facility is owned and operated by the Pend Oreille County Public Hospital District #1. The facility is a 24 bed Acute Care Hospital with a 50 bed Short Term/Long Term Restorative Care Skilled Nursing Facility and a Heliport. The Newport Hospital Long Term Care facility is adjoined to the Newport Hospital and Health Services and is located on West Pine Street. The Newport Hospital and Health Services also is associated with two Family Practice Clinics; the Family Health Center Newport located at the hospital location on West Pine Street and Family Medicine Newport on Scott Avenue in Newport.

The Assisted Living Complex, River Mountain Village, is a 42 unit studio and one-bedroom apartment community located in Newport on West 2nd Avenue. This Complex is also associated with the Newport Hospital and Health Services.

The Selkirk Family Medical Center in Ione provides medical care to the northern portion of the County; including 911 emergency care, North Pend Oreille Ambulance, Basic Life Support, and Advanced Life Support, with the closest hospitals being located in Colville, WA (40 miles) and Newport, WA (50 miles).

Pend Oreille County is part of the Northeast Tri-County Health District. The Health District's Pend Oreille County Office, Newport Community & Environmental Health is located at 605 Hwy 20 in Newport.

The County's Developmental Disability, Mental Health, Substance Abuse and Prevention Programs offer Counseling services in Newport. Outreach services are also available in the Cutter Theater in Metaline Falls and the Selkirk School District. This program also provides a crisis line for after hours crisis services.

EMERGENCY SERVICES

Pend Oreille County Sheriff's Office Communication/E911 provides dispatch services to Pend Oreille County. Overseen by a Chief of Communications and a Deputy Chief of Communications, the Center is located in Newport and has a staff of ten full-time communication officers. The Center is a vital part of the Sheriff's Department as the County's Communication Center. It not only provides service for the Sheriff's Department but also serves the towns and cities of Cusick, Ione, Newport, Metaline, and Metaline Falls, as well as the Kalispel Reservation, Kalispel Tribal Police, and County Fire Districts. The County's Communication Center serves over 12,000 residents by answering fire, emergency medical, and law enforcement calls. They dispatch for two of the ambulance services in the County; Newport Ambulance and Fire District #2. The County's Communications Center also works closely with the following agencies:

- Washington State Patrol
- Washington State Department of Fish and Wildlife (WSDFW)
- US Border Patrol
- US Forest Service
- US Department of Fish and Wildlife
- Washington State Department of Natural Resources (WSDNR).

Pend Oreille County Emergency Management is under the Direction of JoAnn Boggs.

LAW ENFORCEMENT

Law Enforcement is provided to the County by the Pend Oreille County Sheriff's Office, and the Washington State Patrol. The Sheriff's Office is located in Newport. Law Enforcement for the Kalispel Reservation is provided by the Kalispel Tribal Police.

The U.S. Border Patrol also assists in law enforcement near the Canadian Border.

PUBLIC SERVICE FACILITIES

A listing of Pend Oreille County Facilities has been developed which includes structure value and physical location to aid in the development of loss estimates for critical facilities. The list is shown in Table 2.2.

Address	Description	Value
625 W. 4th St. Newport	Courthouse	$7,584,600
418 S. Scott, Newport	Old County Courthouse/Annex	$ 673,800
1000W. 1st, Newport	Newport Garage/Shop	$ 109,600
9362 Deer Valley Rd. , Newport	Road District #1	$1,319,000
13571 Hwy 211, Usk	Road District #2	$ 698,000
161 Sullivan Lake Rd., Ione	Road District #3	$ 619,500
419152 Hwy. 20, Cusick	Pend Oreille County Fairgrounds/Office	$ 192,300
419152 Hwy. 20, Cusick	4-H Building	$ 110,800
419152 Hwy. 20, Cusick	Antique Machinery Building	$ 7,400
419152 Hwy. 20, Cusick	Arts and Crafts Building	$ 110,800
419152 Hwy. 20 Cusick	Cattle Exhibit (Beef)	$ 97,300
419152 Hwy. 20 Cusick	Cattle Exhibit (Dairy)	$ 129,500
419152 Hwy. 20 Cusick	Concession #1	$ 36,400
419152 Hwy. 20 Cusick	Concession #2	$ 70,700
419152 Hwy. 20 Cusick	Exhibit	$ 237,400
419152 Hwy. 20, Cusick	Food Exhibit	$ 68,000
419152 Hwy. 20, Cusick	General Exhibit	$ 95,100
419152 Hwy. 20, Cusick	Grandstand #1	$ 41,900
419152 Hwy. 20, Cusick	Grandstand #2	$ 291,500
419152 Hwy 20, Cusick	Historic Lindsey House	$ 36,600
419152 Hwy 20 Cusick	Historic Log Post Office	$ 7,400
419152 Hwy. 20 Cusick	Home and Hearth	$ 13,100
419152 Hwy. 20, Cusick	Horse Exhibit #1	$ 237,400
419152 Hwy. 20, Cusick	Horse Exhibit #2	$ 237,400
419152 Hwy. 20 Cusick	Poultry Exhibit	$ 96,800
419152 Hwy. 20 Cusick	Restroom #1	$ 97,300
419152 Hwy. 20 Cusick	Restroom #2	$ 81,000
419152 Hwy. 20 Cusick	Sheep Exhibit	$ 58,200
419152 Hwy. 20 Cusick	Show Ring Grandstand	$291,500
419152 Hwy. 20 Cusick	Stage	$ 31,000
419152 Hwy. 20 Cusick	Storage Building #1	$ 3,400
419152 Hwy. 20 Cusick	Storage Building #2	$ 3,400
419152 Hwy. 20 Cusick	Storage Building #3	$ 4,800

Address	Description	Value
419152 Hwy. 20 Cusick	Swine Exhibit	$ 77,700
419152 Hwy. 20 Cusick	Ticket Booth	$ 6,300
105 S. Garden Avenue, Newport	Pend Oreille County- Counseling Services Center	$2,070,600
105 s. Garden Avenue, Newport	Pend Oreille County-Counseling Services Annex	$ 658,000
231 S. Garden Avenue, Newport	Newport Community & Environmental Health Office	$1,143,600
302 Park St. Metaline Falls	Cutter Theater Counseling Office	No value listed
229 S. Garden Avenue, Newport	Hall of Justice	$2,651,420
103 Skookum St. Cusick	Cusick Sheriff Substation	$ 18,000
111 N. Central Avenue Ione	Ione Sheriff Substation	$ 18,000
331 S. Garden Avenue, Newport	Sheriff's Office-Jail	$290,300
9382 Deer Valley Rd. Newport	Scale Building	$383,800
9382 Deer Valley Rd., Newport	Deer Valley Hazardous Waste Facility	$122,900
9322 Deer Valley Rd. Newport	Deer Valley Recycling	$517,700
661 Jared Rd. Usk	Usk Transfer Station	$ 59,600
1712 Sullivan Lake Road, Ione	Ione Transfer Station	$228,700
318341 Highway 2	Pend Oreille Park/Restrooms/Showers	$197,600
Highway 37 mile post 10.73 (PO-70-25-1?)	Sweet Creek Rest Area/Restrooms	$ 26,300
(PO 80-10-1?) Sec 36	Abercrombie Mountain Radio Transmitter	$342,000
(PO-80-11-1?) Sec 22	Calispel Peak Radio Transmitter	$600,300
(PO-80-12-?) Sec 2	Cooks Mountain Radio Transmitter	$ 58,700
423 W. 3rd, Newport	Newport Radio Transmitter	$225,000
(PO-80-14?) Sec 13	Ruby Mountain Radio Transmitter	$402,400
Total Value		**$22,354,220**

Table 2.2: Pend Oreille County Facilities

ELECTRICITY

Pend Oreille County Public Utility District is a consumer owned and locally controlled electric, water, and communication utility district. The home office is located in Newport, with service provided in both the north and south portions of the County. Box Canyon Dam is a hydroelectric project which is owned by the people of Pend Oreille County and operated by the Pend Oreille

Public Utility District. This Public Utility District (PUD) was the first one in the state to build its own dam.

TELECOMMUNICATIONS

The Cusick and Usk areas are served by three Internet Service Providers. The Ione area is also served by three Internet Service Providers. In addition, Frontier Communications provides landline telecommunication service and Verizon Wireless provides wireless communication service in Newport. The Pend Oreille Telephone Company serves the County from the Town of Dalkena throughout the rest of northern Pend Oreille County with landline telecommunication service. Metaline and the Metaline Falls area are served by Verizon Wireless and Unicel for wireless telecommunication service. The Northstar Broadband Cable Company serves the Diamond Lake, Ione, Metaline, and Metaline Falls areas; Concept Communications Corporation Cable Company serves the Newport area; and Dish Network, Comcast Cable and DirecTV serve all the other areas with cable and satellite service.

SEWER AND WATER

Pend Oreille County residents are served by four water and sewer districts. The City of Newport, West Bonner Water, and Sewer District #1 provide water and sewer services to the community of Newport. This Water District contracts with the City of Newport to use up to 30% of the sewer system capacity. The Diamond Lake Water and Sewer District provides services to the residents of the Diamond Lake community and some surrounding areas. The Sacheen Lake Water & Sewer District works with the Tri County Health District to meet health regulations in the Sacheen Lake area by working on water quality. This water and sewer district does not have any sewer or water facilities, residents in this area are on individual septic systems. Ponderay Shores Water and Sewer District provides service to the small area of Ponderay Shores Road and Open Skies Road, which is on the opposite or east side of the Pend Oreille River from the Dalkena community. The Chippewa Water and Sewer District provides service to the community of Ione. The Lenora Water and Sewer District provides service to the Skookum Rendevous (Camelot) area in the community of Usk. The Town of Cusick provides water service to its residents with in-town user rates as well as outside of town limits user rates. The Pend Oreille Mine Water System serves the Teck Mine and related facilities north of Metaline Falls. Lastly, the Pend Oreille Public Utility District provides water service to all of the following water system communities:

- Granite Sacheen Shore, Newport (Sacheen Lake)
- Greenridge, Newport Area
- Sandy Shores, Newport Area
- Riverview, Newport Area
- River Bend, Cusick Area (Just north of Lost Creek)
- Holiday Shores, Cusick Area (Just north of Ruby)
- Sunvale-Abbie Acres, Cusick Area (Just north of Lost Creek)
- Lazy Acres, Cusick Area (Just north of Tiger)
- Metaline Falls, City of Metaline Falls

WASTE MANAGEMENT

Pend Oreille County has three transfer stations in the County. The South County Station is five miles west of Newport off of Highway 2 and Gray Road. The Central County Station is off of Highway 211 at Jared Road in Usk ,and the North County Station is east of Ione. Pend Oreille County Solid Waste Division completed a new Recycling Building in 2009. It is located at the South County Station west of Newport. The County also has developed Electronics Recycling (e-cycling) of electronics equipment at the South County Station; this station is the only site available for e-cycling in the County.

EDUCATIONAL FACILITIES

Pend Oreille County has three school districts within its boundaries. The **Selkirk School District** is in Metaline Falls and consists of a Junior/Senior High School and one elementary school. The Junior/Senior High School provides services to 194 students in grades 7 through 12. The Selkirk School District decided to combine the Ione Primary School and Lillian Bailey Elementary School; the new school is now known as Selkirk Elementary School and is located in the former Lillian Bailey Elementary School in Metaline Falls. Selkirk Elementary provides education to 104 students in grades Pre-K to 6.

The **Newport School District** in Newport has a total of three schools: The Stratton Elementary School, Sadie Halstead Middle School, and Newport High School. Stratton Elementary School has an enrollment of 419 students in grades K through 4. Sadie Halstead Middle School has an enrollment of 253 students in grades 5 through 8, and the Newport High School has an enrollment of 399 students in grades 9 through 12.

The **Cusick School District** consists of the Cusick Junior/Senior High School and the Bess Herian Elementary School. Cusick Junior/Senior High School has an enrollment of 143 students covering grades 7 through 12. Bess Herian Elementary School provides service to 133 students in grades PreK to 6.

Headstart is available in Cusick, Newport, and Metaline Falls.

Community Colleges of Spokane has a campus in the City of Newport.

The **Washington State University Extension Office** is located in the Courthouse annex in Newport and offers clinics, consultation, and workshops on agriculture, forestry, horticulture, family living, and community development to residents of the County.

RECREATION AREAS

Pend Oreille County has a wealth of recreational areas and natural resources. Fantastic trout, bass, and other “pan fish” are available in the fifty-five lakes, as well as streams and rivers, in the County. The **Pend Oreille River** flows through the **Colville National Forest**. From Box Canyon Dam to Boundary Dam, the Pend Oreille River is 22 miles of once fast, rough water which has been tamed by dams, and is now pristine and perfect for kayaking, canoeing, rafting, and riding a jet boat. The river has boat access and beach use near the Towns of Cusick and Usk. Colville National Forest offers campgrounds as well as wildlife viewing. The forest is home to the last remaining herd of Caribou in the lower 48 states.

Marshall Lake is a beautiful lake with a campground and several smaller lakes close by. There is also a good hiking trail, the Chipmunk Rapids National Recreation Trail. **North Skookum Lake** and Campground is close by as well and is a nice adventure. The campground is not far from Cusick and is near the **Kaniksu National Forest**. Outpost Resort is another popular camping spot; it is near the town of Cusick and the Kanisku National Forest.

The **Sullivan River**, near Wolf Lake in the northeastern portion of the County offers whitewater rafting. **Wolf Lake** offers natural beauty, hiking, and camping. **Brown's Lake** Campground is an 18 campsite campground located in the Kaniksu National Forest on the shores of Brown Lake. These campgrounds and National Forests are just some of the many outdoor activities offered in Pend Oreille County.

Little Pend Oreille National Wildlife Refuge is a wildlife preserve operated by the US Fish and Game east of Colville in Stevens County, but a small portion extends into the western portion of Pend Oreille County. Public use includes wildlife viewing, hunting, fishing, hiking, and horseback riding.

CULTURAL & HISTORIC SITES

Tiger Historical Center Museum was built at its present location in 1912. This general store was once part of the busy town of Tiger, Washington. Currently, it is the only remaining building in Tiger and is operated by the Tiger Historical Center as a museum. The museum is the south gateway to the North Pend Oreille Scenic Byway.

The **Pend Oreille County Museum** is located in a complex of buildings that includes the historic 1908 depot building. Other buildings in the complex include; the Stuart B. Bradley Memorial Building and three log cabins. The museum is located in Newport.

National Historic Register Listings:

Larson, Lewis P., House (added 1979 - **Building** - #79002549)
5th and Pend Oreille Blvd., Metaline Falls

Idaho and Wash. Northern RR Bridge (added 1982 - **Structure** - #82004270)
Spans Pend Oreille River, off WA 31, Metaline Falls

Metaline Falls School (added 1988 - **Building** - #88001518)
302 Park, Metaline Falls

Pend Oreille Mines and Metals Building (added 1997 - **Building** - #97001081)
(Also known as **Lewis Larson Apartments)**
103 S. Grandview St., Metaline Falls

Phillips, Dr. John and Viola, House and Office
S. 337 Spokane Ave., Newport, WA 050011501, Listed 1/03/2006

United States Border Station (added 1997 - **Building** - #96001634)
Roughly bounded by the Washington State Highway 31 and the U.S.--Canadian border, Colville National Forest, Metaline Falls

Washington Hotel (added 1979 - **Building** - #79002550)
5th and Washington St., Metaline Falls

ECONOMIC PROFILE

The long term employment trend for Pend Oreille County is shown in Figures 2.7 and 2.8. From 1970 to 2005, 1,983 new jobs were created in the County. The majority of job growth, 71% of new jobs, was in wage and salary employment (people who work for someone else). In 1970, proprietors represented 26.2% of the total employment; by 2005, they represented 27.4%.

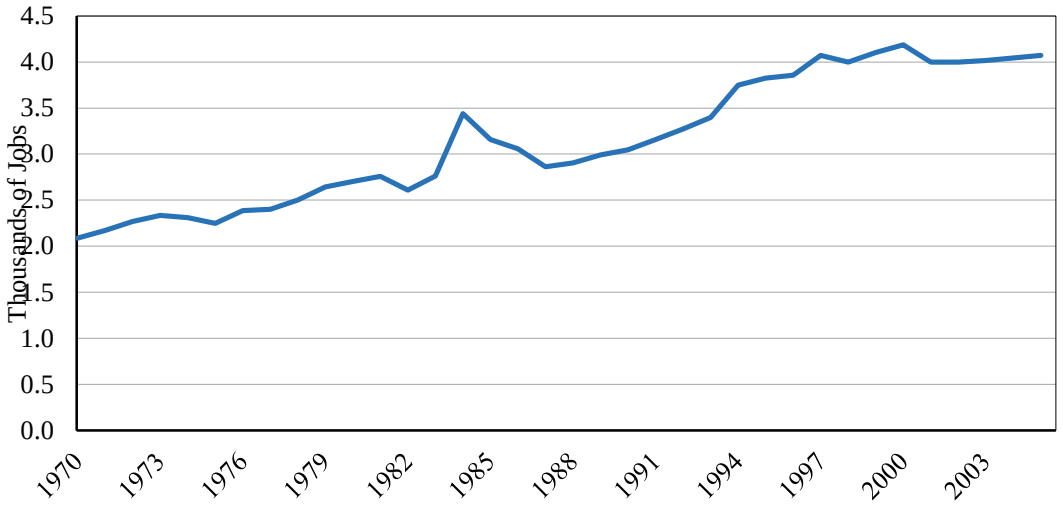


Figure 2.7: Number of Jobs in Pend Oreille County

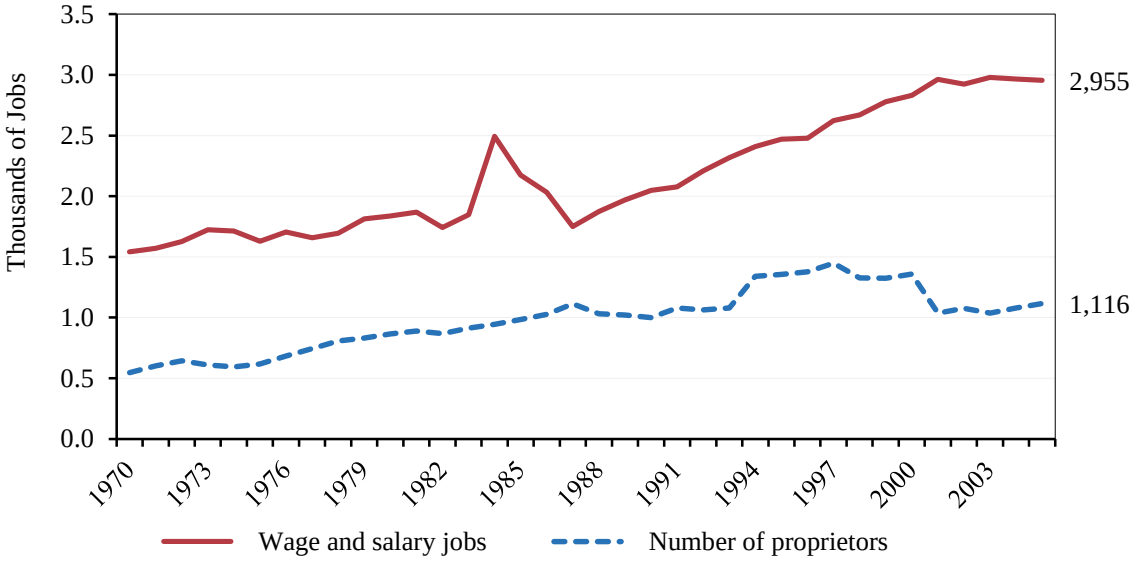


Figure 2.8: Proprietor vs. Wage & Salary Jobs

The average earnings per job, adjusted for inflation, increased from $28,892 in 1970 to $35,705 in 2005. In 2005, the average earnings per job for Pend Oreille County were lower than the State

of Washington ($47,057) and the nation ($45,817). Figure 2.9 shows the recovery of earnings per job after recessions. It is apparent that the earnings per job are affected by recessions, but appear to recover within a few years.

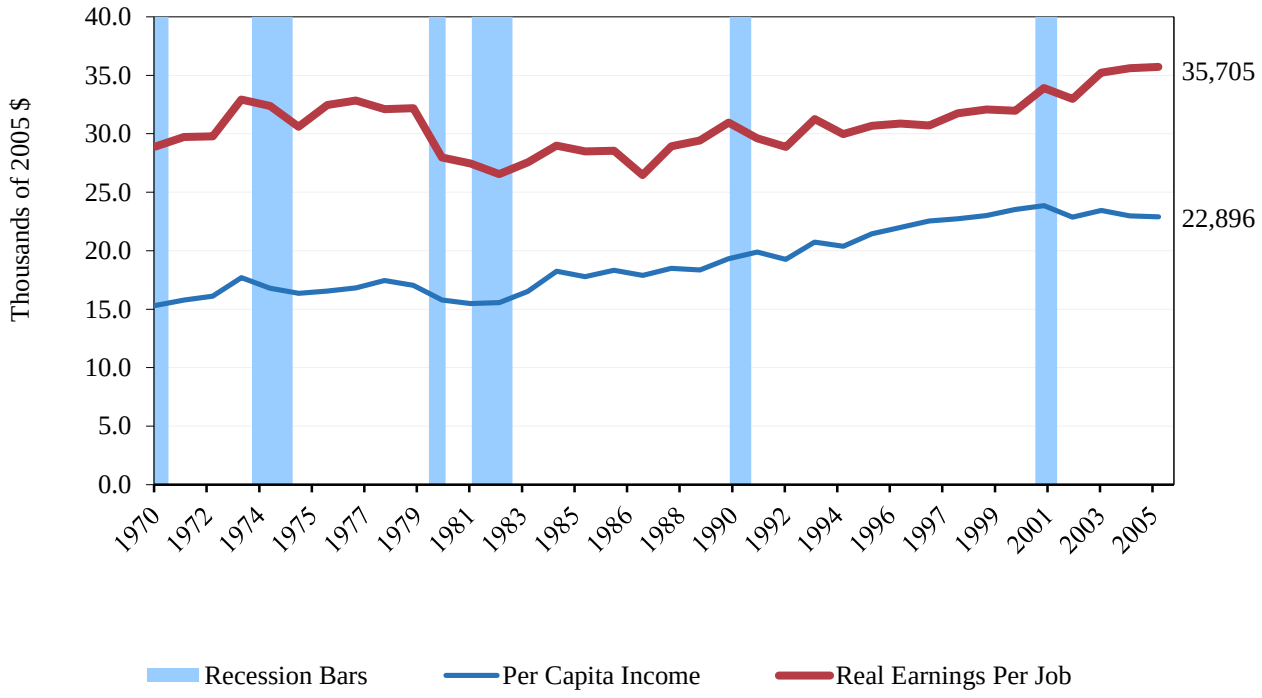


Figure 2.9: Earnings per Job & Per Capita Income

The number of establishments demonstrated in Figure 2.10 highlights an increase in the number of firms overall in the 1990's. Retail and service jobs maintain the highest number of establishments. The construction industry has gained the most firms, rising from 5.9% of the total share in 1977 to 17.4% in 1997. Manufacturing firms have declined the most, from 20.4% to 10% in the twenty year period analyzed.

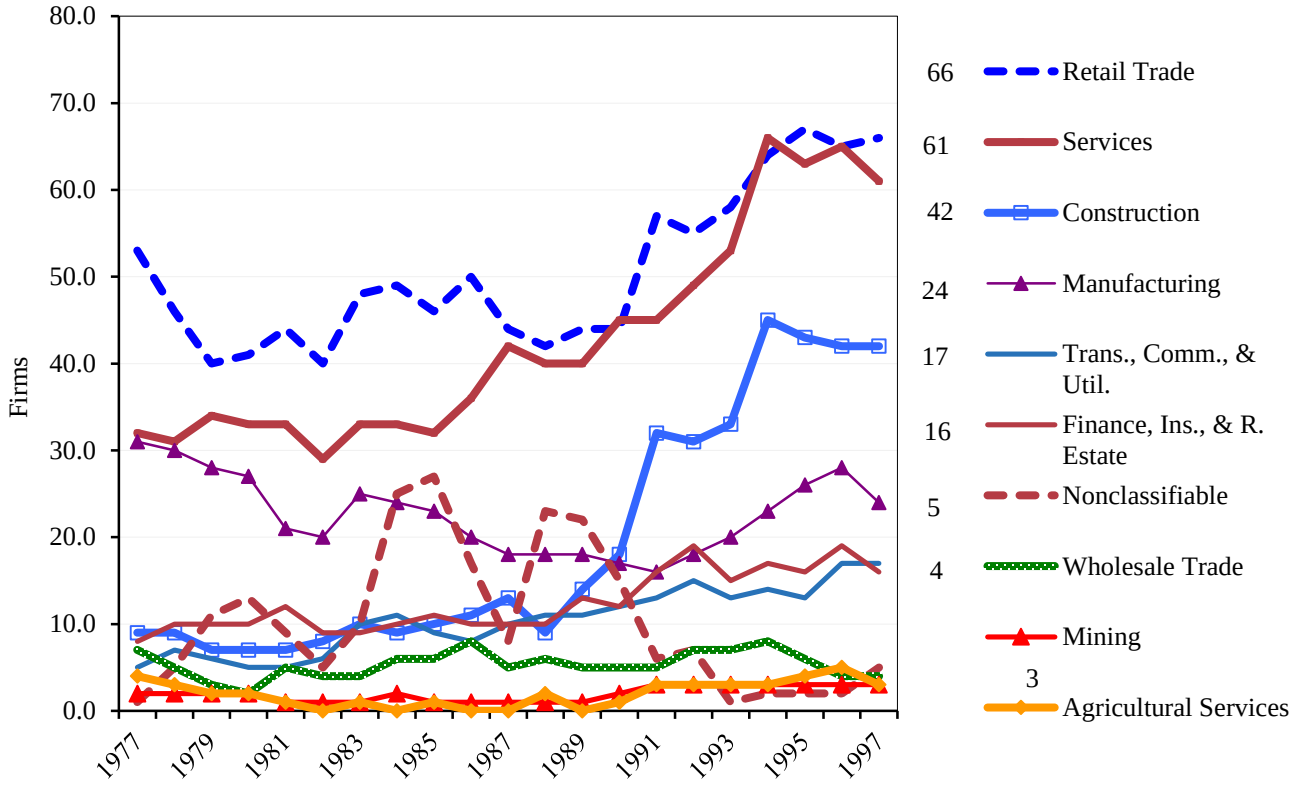


Figure 2.10: Number of Establishments by Industry

Figure 2.11 shows employment and wages by sector. Local Government provides the most jobs at just over 1,500, but ranks below the state average for wages. The highest wage jobs in the County are in the manufacturing sector, which is one of two sectors that have a higher wage than the state average.

The main employers in Pend Oreille County include; Ponderay Newsprint Company, Vaagen Bros Lumber Inc., Pend Oreille County, Cusick School District, Newport School District, and Selkirk School District. (County and District facilities are listed in separate sections.)

Ponderay Newsprint Company is located at 422737 Hwy 20 in Usk and employs approximately one hundred and seventy eight people.

Vaagen Bros. Lumber Inc. purchased Ponderay Valley Fibre, located in Usk in October 2009.

The Usk location employs eighty-five workers, which were previously employed by Ponderay Valley Fibre and retained as employees after the purchase of the company.

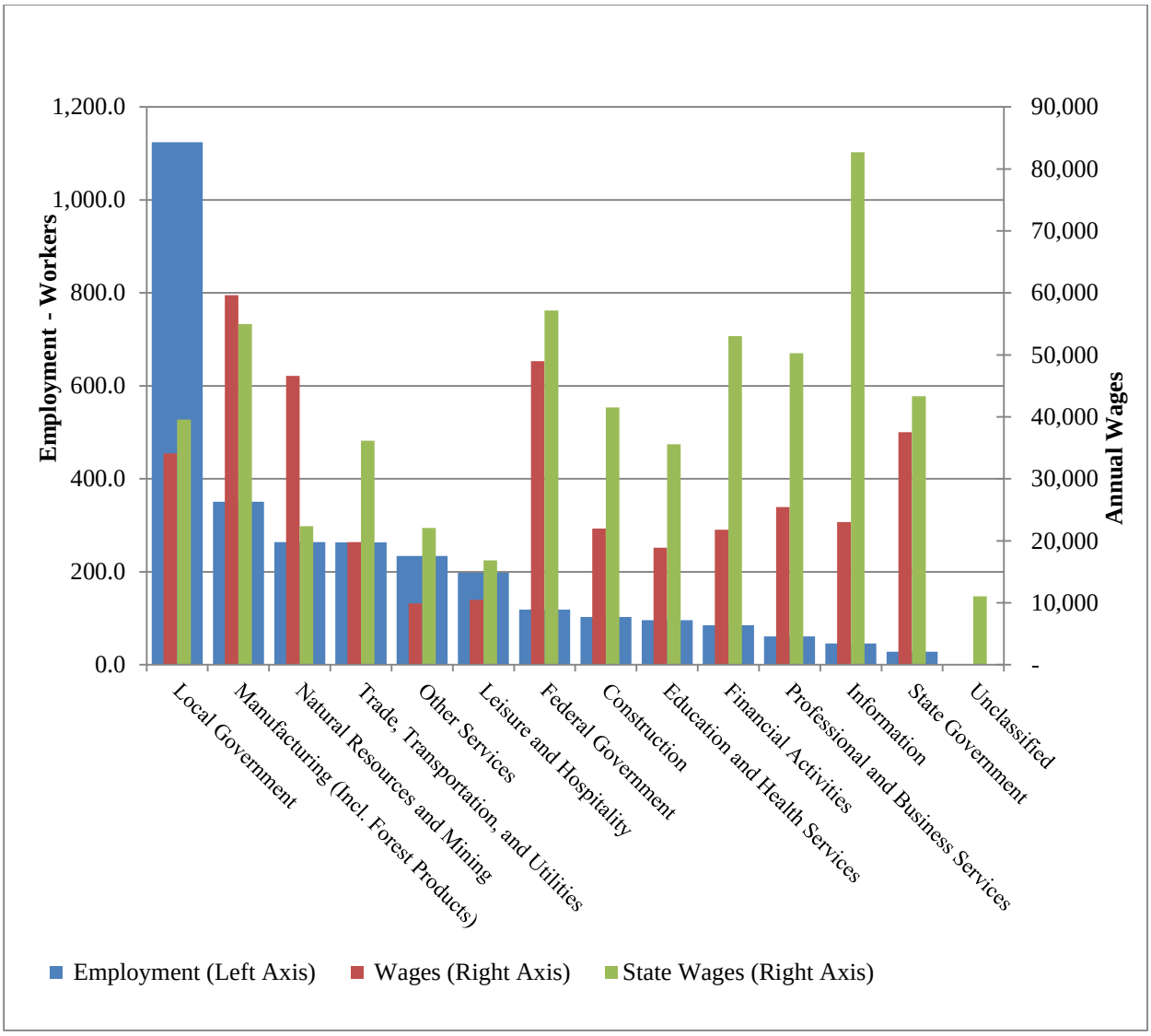


Figure 2.11: 2005 Wages & Employment

The unemployment rate in the County is higher than in the state and nation. In 2006, the County unemployment rate was 7.4%, compared to 5% in the State of Washington, and 4.6% in the nation. Since 1990, the unemployment rate varied from a low of 7.4% in 2006 to a high of 14.3% in 1996. The aforementioned numerical figures are illustrated in Figure 2.12.

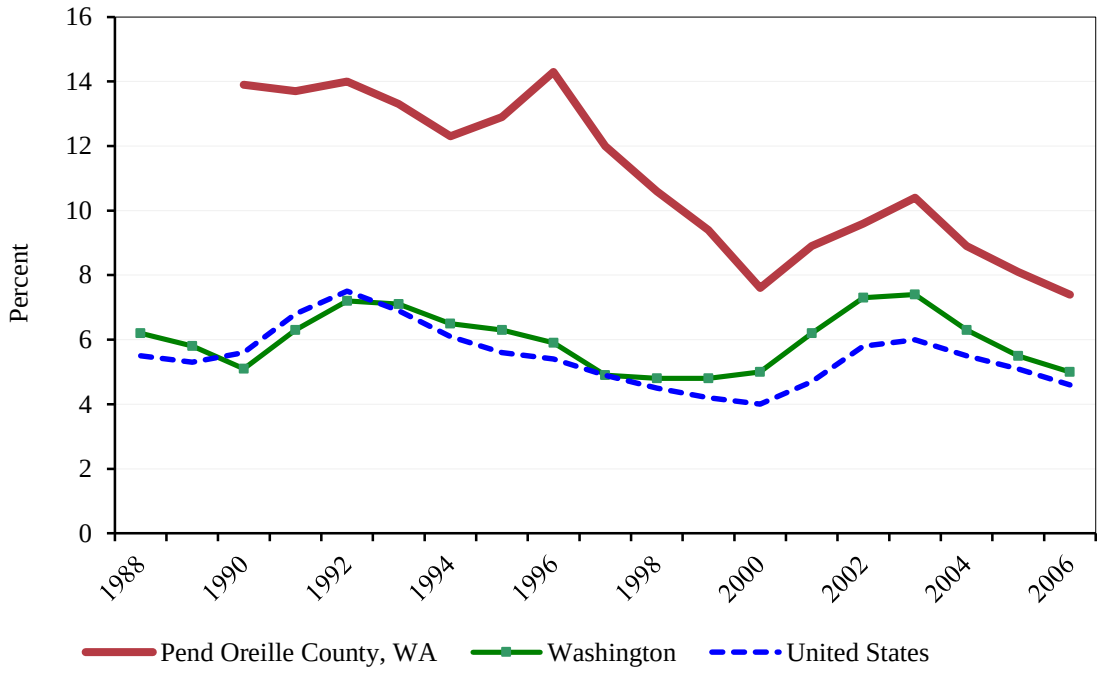


Figure 2.12: Unemployment Rate

SECTION 3: HAZARD PROFILES

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented below. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. The hazard profiles developed in this section guide the final Risk Analysis found in Section 4.

SECTION 3.1: FLOOD

2010 Revision Summary

The flood section of the 2004 Plan has been expanded to specifically include dam failure and flash flooding as subsections. Additionally, new data was collected to augment the historical frequency data for each flood hazard. New FEMA requirements for the flood mitigation assistance program were also incorporated into this section.

Flooding is defined by the National Weather Service (NWS) as "the inundation of normally dry areas as a result of increased water levels in an established water course." River flooding, the condition where the river rises to overflow its natural banks, may occur due to a number of causes including: prolonged, general rainfall, locally intense thunderstorms, snowmelt, and ice jams. In addition to these natural events, there are a number of factors controlled by human activity that may cause or contribute to flooding. These include dam failure, levee failure, and activities that increase the rate and amount of runoff such as paving, reducing ground cover, and clearing forested areas. Flooding is a periodic event along most rivers with the frequency depending on local conditions and controls such as dams and levees. The land along rivers that is identified as being susceptible to flooding is called the floodplain. The federal standard for floodplain management under the National Flood Insurance Plan (NFIP) is the "100-year floodplain." This area is chosen using historical data such that in any given year there is a one percent chance of a "Base Flood" (also known as "100-year Flood" or "Regulatory Flood"). A Base Flood is one that covers or exceeds the 100-year floodplain. There have been 30 Presidential Major Disaster Declarations for floods in Washington State from 1956 through 2006. Every county has received a Presidential Disaster Declaration for flooding since 1970. While not every flood creates enough damage to merit a declaration, most are severe enough to warrant intervention by local, state, or federal authorities. Since 1980, federal, state, and local governments have invested more than $522 million to repair public facilities, help individuals recover from flood disasters, and pay for measures to prevent future flood damage. This is nearly 40 percent of the more than $1.37 billion amount spent on disaster relief and hazard mitigation during this time.

The amount of damage caused by a flood is influenced by the speed and volume of the water flow, the length of time the impacted area is inundated, the amount of sediment and debris carried and deposited, and the amount of erosion that may take place. Flooding is a dynamic natural process. Along rivers, streams, and coastal bluffs a cycle of erosion and deposition is

continuously rearranging and rejuvenating the aquatic and terrestrial systems. Although many plants, animals, and insects have evolved to accommodate and take advantage of these ever-changing environments, property and infrastructure damage often occurs when people develop coastal areas and floodplains, and natural processes are altered or ignored.

Flooding can also threaten life, safety, and health and often results in substantial damage to infrastructure, homes, and other property. The extent of damage caused by a flood depends on the topography, soils, vegetation in an area, the depth and duration of flooding, velocity of flow, rate of rise, and the amount and type of development in the floodplain.

Flood Terminology

A number of flood-related terms are frequently used in this Plan and are defined below.

Flood Insurance Study (FIS): A *Flood Insurance Study* is the official report provided by the Federal Insurance Administration, which provides flood profiles, the flood boundary-floodway map, and the water surface elevation of the estimated 100-year base flood.

Flood Insurance Rate Map (FIRM): The Flood Insurance Rate Maps (FIRM), are the official maps on which the Federal Insurance Administration has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

100-year Base Flood: Base Flood means the flood having a 1% chance of being equaled or exceeded in any given year. (Also referred to as the “100-year flood”.)

Floodplain: A floodplain is land adjacent to a lake, river, stream, estuary or other water body that is subject to flooding. If left undisturbed, the floodplain serves to store and discharge excess floodwater. In riverine systems, the floodplain includes the floodway.

Floodway: “Floodway” means the channel of a river or other watercourse and the adjacent areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

Types of Flooding

Flooding can occur in a number of ways, and many times are not independent of each other and can occur simultaneously during a flood event. The Types of Flooding considered for this Plan include:

- heavy rainfall;
- urban storm water overflow;
- rapid snowmelt;
- rising ground-water (generally in conjunction with heavy prolonged rainfall and saturated conditions);
- riverine ice jams;
- flash floods;
- fluctuating lake levels;
- alluvial fan flooding

Floodplain Management

Pend Oreille County participates in the National Flood Insurance Program (NFIP), as do the communities of Cusick, Ione, Metaline, Metaline Falls, and the City of Newport. Flood

Insurance Rate Maps (FIRM's) were established for each of the communities in 1974, with the most recent effective dates for these maps having been updated on March 4, 2002, although the Town of Cusick's map was updated in 2005. The County's Development Code has a Floodplain Management Ordinance contained in it. The ordinance meets the requirements of the NFIP.

There are 188 NFIP Policies in the County, with the majority (166) being in the unincorporated areas of Pend Oreille County. The Town of Cusick has 15 policies, while Ione has 2, and Newport has 5 policies in their community. There have been 68 claims paid for a total of $1,099,055, with 11 of those being for substantial damage. The table below shows the communities with their date of participation in the National Flood Insurance Program, the date of their recent FIRM Maps, the total number of policies, the total premiums and the amount of claims paid. There are only two repetitive loss properties in Pend Oreille County. Table 3.1.1 details the NFIP participation of the County and participating cities and towns.

Community	*Number of properties in the community (please see community for this number)	Date Participating in Regular Phase of NFIP	Participating in CRS (class)	Date of current FIRM	Number of NFIP Policies	Insurance in Force (Total coverage)	Total Premiums	Number Claims Paid	$ Total Claims Paid	# Substantial Damage Claims	Rep Loss Properties	Severe Rep Loss Properties
Pend Oreille County	14,295	4/17/1985	N/A	3/4/2002	166	$29,225,600	$108, 157	64	$973,319	11	2	0
Cusick	359	6/19/1985	N/A	3/4/2002	15	$2,361,400	$18,918	2	$1,000	0	0	0
Metaline Falls	202	4/17/1985	N/A	3/4/2002	0	0	0	0	0	0	0	0
Metaline	153	4/17/1985	N/A	3/4/2002	0	0	0	1	$1,907	0	0	0
Newport	1,165	6/30/1976	N/A	3/4/2002	5	$864,400	$4,844	1	$122,829	0	0	0

Table 3.1.1: NFIP Participation Detail[7]

RIVER OR STREAM FLOODING

Description

A flood is the inundation of land from rising or overflowing of a body of water. The type that occurs in Pend Oreille County most often is river flooding. River flooding occurs when heavy rains and mountain snowmelt from upstream sources produce more than can be conveyed through a river channel. Flooding in the County occurs along the Pend Oreille River and its tributaries.

[7] FEMA Region 10 FMA Program

Historical Frequencies

Certain low lying areas around rivers and lakes are prone to flooding in Pend Oreille County. The Pend Oreille River has experienced flooding on three occasions in a five year period.

In 1948, flooding caused damages of more than $2 million when the Calispel Valley was submerged under six to eight feet of water. The town of Cusick was almost completely flooded.

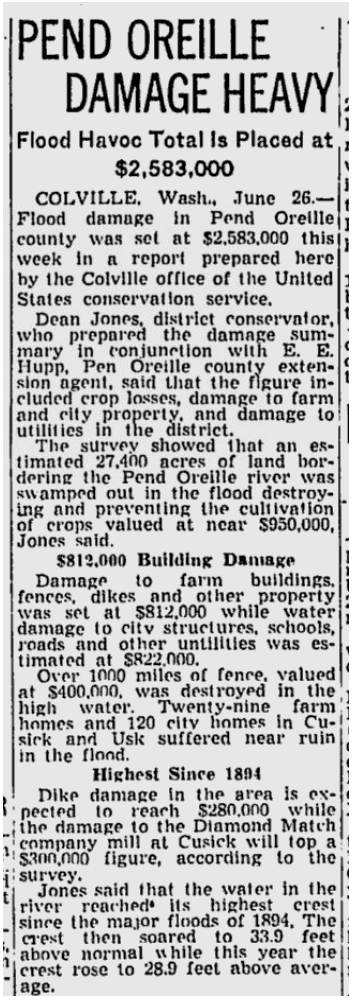
In mid June 1972, flooding occurred along the Pend Oreille River. It was stated that several summer cabins had reported flooding[8].

In April 1997, a presidential disaster declaration was declared for flooding occurring along the Pend Oreille River and also Diamond Lake[9].

In June 1997, a presidential disaster declaration was declared for flooding occurring along the Pend Oreille River. It is estimated that there was nearly $5 million in damages[10].

The following presidential disasters have been declared for flooding in Pend Oreille County[11].

- 414 – January 1974
- 1159 – December 1996 to February 1997
- 1172 – March 1997
- 1182 – April to June 1997
- 1641 – January to February 2006



PEND OREILLE DAMAGE HEAVY

Flood Havoc Total Is Placed at $2,583,000

COLVILLE, Wash., June 26.—Flood damage in Pend Oreille county was set at $2,583,000 this week in a report prepared here by the Colville office of the United States conservation service.

Dean Jones, district conservator, who prepared the damage summary in conjunction with E. E. Hupp, Pen Oreille county extension agent, said that the figure included crop losses, damage to farm and city property, and damage to utilities in the district.

The survey showed that an estimated 27,400 acres of land bordering the Pend Oreille river was swamped out in the flood destroying and preventing the cultivation of crops valued at near $950,000, Jones said.

$812,000 Building Damage

Damage to farm buildings, fences, dikes and other property was set at $812,000 while water damage to city structures, schools, roads and other untilities was estimated at $822,000.

Over 1000 miles of fence, valued at $400,000, was destroyed in the high water. Twenty-nine farm homes and 120 city homes in Cusick and Usk suffered near ruin in the flood.

Highest Since 1894

Dike damage in the area is expected to reach $280,000 while the damage to the Diamond Match company mill at Cusick will top a $300,000 figure, according to the survey.

Jones said that the water in the river reached its highest crest since the major floods of 1894. The crest then soared to 33.9 feet above normal while this year the crest rose to 28.9 feet above average.

SPOKESMAN-REVIEW Sun., June 27, 1948.

Vulnerabilities

The following table lists the critical facilities that are located in the 100 year FIRM floodplain, or within 100 feet of it. A 10 foot buffer was chosen to compensate for map error. The table details the loss for each facility assuming a 2 foot flood depth.

Facility	Address	Structural Value (Insured)	Structural Loss	Contents Loss	Total Loss
Cusick					
Fire Station	1st & Monumental	$180,388	$23,450	$17,588	$41,038
Community Building	121 1st St.	$564,461	$73,380	$55,035	$128,415
Restrooms @ Boat Launch	1st St & Monumental	$146,751	$19,078	$14,308	$33,386
Water Treatment Plant & Fencing	Riverside Ave & Tacoma	$32,363	$4,207	$3,155	$7,363

[8] Spokesman Review. June 12, 1972.
[9] 1172-DR-WA
[10] Pend Oreille County Hazard Identification and Vulnerability Analysis, E-1, Flooding
[11] FEMA, http://www.fema.gov/news/disasters_state.fema?id=53

Facility	Address	Structural Value (Insured)	Structural Loss	Contents Loss	Total Loss
Lift Station (RR Tracks)	Monumental 100 ft E of RR tracks	$48,544	$6,311	$4,733	$11,044
Lift Station (M. Koegh)	214 River RD	$9,710	$1,262	$947	$2,209
Town Shop	66 2nd Avenue	$267,909	$34,828	$26,121	$60,949
Lift Station (Rhiney Stehr)	3rd St. - 100 ft W of River Rd	$24,272	$3,155	$2,367	$5,522
Cusick School District					
Baseball Diamond	305 Monumental Way	$75,464	$9,810	$7,358	$17,168
Schools	305 Monumental Way	$10,162,595	$1,321,137	$990,853	$2,311,990
Pend Oreille County					
Road District #2	13571 Hwy 21	$698,000	$90,740	$68,055	$158,795
Pend Oreille County Fairgrounds	419152 Hwy 20	$2,772,400	$360,412	$270,309	$630,721
Cusick Sheriff Substation	103 Skookum St	$18,000	$2,340	$1,755	$4,095
Kalispell Tribe					
Our Lady of the Sorrows Catholic Church	1981 LeClerc Creek RD	Not reported	Not reported	Not reported	No value reported
Wellness Center	1821 LeClerc Creek RD	Not reported	Not reported	Not reported	No value reported
Camas Learning Center	109 First St	Not reported	Not reported	Not reported	No value reported

Table 3.1.2: Critical Facilities in the FIRM Floodplain

Erosion can be a problem for bridges, especially during a flooding event. The following table lists bridges located in the FIRM 100 year floodplain. The cost field in table 3.1.3 represents the replacement cost in thousands of dollars[12].

ID	Name	Owner	Year Built	Traffic	Cost
WA000461	State Route 20	Washington DOT	1936	1,314	$3,685
WA000602	State Route 20	Washington DOT	1946	993	$6,214
WA004120	State Route 20	Washington DOT	1986	1,314	$18,827
WA004846	County Road No. 9216	County Road Department	1982	200	$4,751
WA006327	County Road No. 35000	County Road Department	1961	121	$972
WA007630	County Road No. 33890	County Road Department	1964	2,020	$106,541
WA007850	County Road No. 91110	County Road Department	1960	360	$5,875
WA000339	State Route 31	Washington DOT	1927	1,568	$7,615
WA000603	State Route 31	Washington DOT	1946	1,878	$8,782

[12] Bridge inventory taken from Level I HAZUS Database.

ID	Name	Owner	Year Built	Traffic	Cost
WA000725	State Route 31	Washington DOT	1950	1,500	$38,930
WA005264	County Road No. 93250	County Road Department	1932	1,282	$39,674
WA000428	State Route 20	Washington DOT	1934	1,017	$2,849
WA004085	State Route 20	Washington DOT	1986	1,017	$4,058
WA005324	County Road No. 35030	County Road Department	1956	100	$1,080

Table 3.1.3: Bridges in the FIRM Floodplain

The following table lists dams located within the FIRM 100 year floodplain. When flooding occurs around the dam, erosion can weaken the dam structure and increased holdings can also put stress on the dam. Each dam lists the nearest downstream population and its distance from the dam.

Dam ID	Name	Owner	River	Near City	Distance from City	Purpose	Year Completed
WA000357	Heather Lake Dam	Crandall, Gary J	Meadow Creek	Aladdin	7	R	1974
WA000527	Ione Mill Pond	Louisiana Pacific Corp	Big Muddy Creek	Ione	0	R	1914
WA000250	Duncan Dam No. 2	Duncan, John S	Pend Oreille River	Usk	13	IR	1966
WA000373	Kettwig Wildlife Dam	Kettwig, D R	Spring Heel Creek	Milan	12	FRS	1979
WA000176	Marshall Lake Dam	Miller, Tom	Marshall Creek	Dalkena	18	RI	1912

Table 3.1.4: Dams within the FIRM Floodplain

Impacts

Human death and injury sometimes occur as a result of river flooding but are not common. Human hazards during flooding include drowning, electrocution due to downed power lines, leaking gas lines, fires and explosions, hazardous chemicals, and displaced wildlife. Economic loss and disruption of social systems are often enormous. Floods may destroy or damage structures, furnishings, business assets including records, crops, livestock, roads and highways, and railways. They often deprive large areas of electric service, potable water supplies, wastewater treatment, communications, and many other community services including medical care, and may do so for long periods of time.

Loss Estimates

Losses for flood were calculated using two separate methods. The first method uses the current FIRM overlain on the County parcel layer, assuming a 2 foot flood depth. The total annualized losses for critical infrastructure is $34,127. The total annualized loss for other structures is $324,055. Loss estimates were not performed on dams and bridges located in flood areas. Losses for these structures could be as high as $1,000,000.

The second method used is HAZUS. A HAZUS Level I Assessment was run to determine losses for a 100 year flood event in Pend Oreille County.

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses on a regional scale. These loss estimates are used primarily by local, state, and regional officials to plan and stimulate efforts to reduce risks from earthquakes, and to prepare for emergency response and recovery. The following is a summary of the HAZUS Global Report.

- HAZUS estimates that about 7 buildings will be at least moderately damaged. This is over 24% of the total number of buildings in the scenario. There are an estimated 3 buildings that will be completely destroyed.
- HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.), and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.
- The model estimates that a total of 509 tons of debris will be generated. Of the total amount, finishes comprise 48% of the total, and structure comprises 18% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 20 truckloads (@25 tons/truck) to remove the debris generated by the flood.
- HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 45 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 9 people (out of a total population of 9,900) will seek temporary shelter in public shelters.
- The total economic loss estimated for the flood is 3.68 million dollars, which represents 2.21 % of the total replacement value of the scenario buildings.
- The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

- The total building-related losses were 3.66 million dollars. Zero percent (0%) of the estimated losses were related to the business interruption of the region. The residential occupancies made up 81.58% of the total loss.
- The total annualized loss for the HAZUS Level I Analysis is $36,600.

The large difference in the two annualized loss estimates can be attributed to the floodplain used in the analysis. The FIRM floodplain is much broader than the HAZUS delineated floodplain. The difference can be seen in Figures 3.1.1 and 3.1.2. The difference can be attributed to the use of different scales of elevation data. The HAZUS model uses a 1 arc-second digital elevation model. It is assumed that the FIRM floodplain is more accurate than the HAZUS delineated floodplain. HAZUS was also unable to delineate a floodplain for the area north of Ione because of the lack of Digital Elevation Model (DEM) north of the Canadian border available in the National Elevation Dataset.

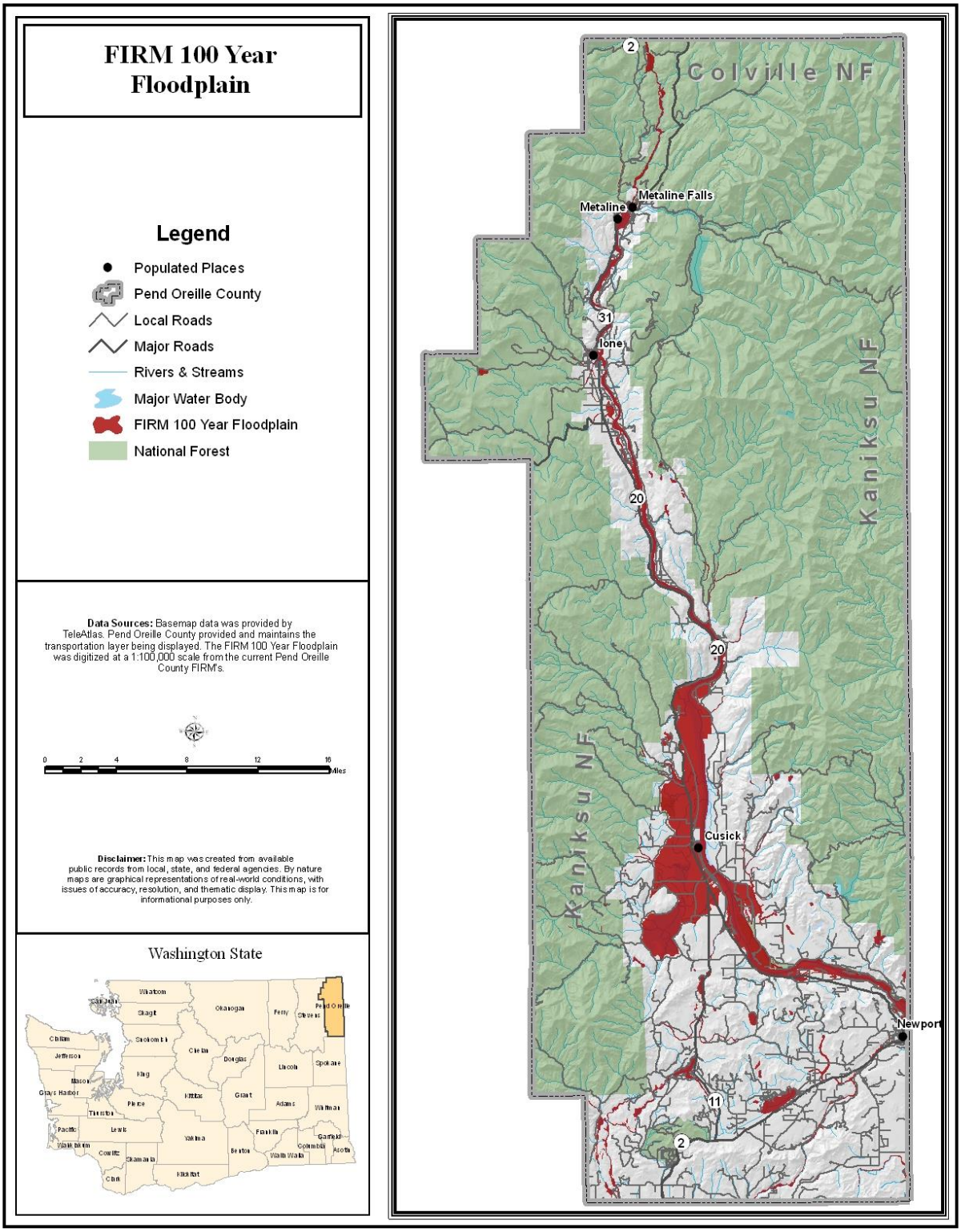


Figure 3.1.1: FIRM Floodplain

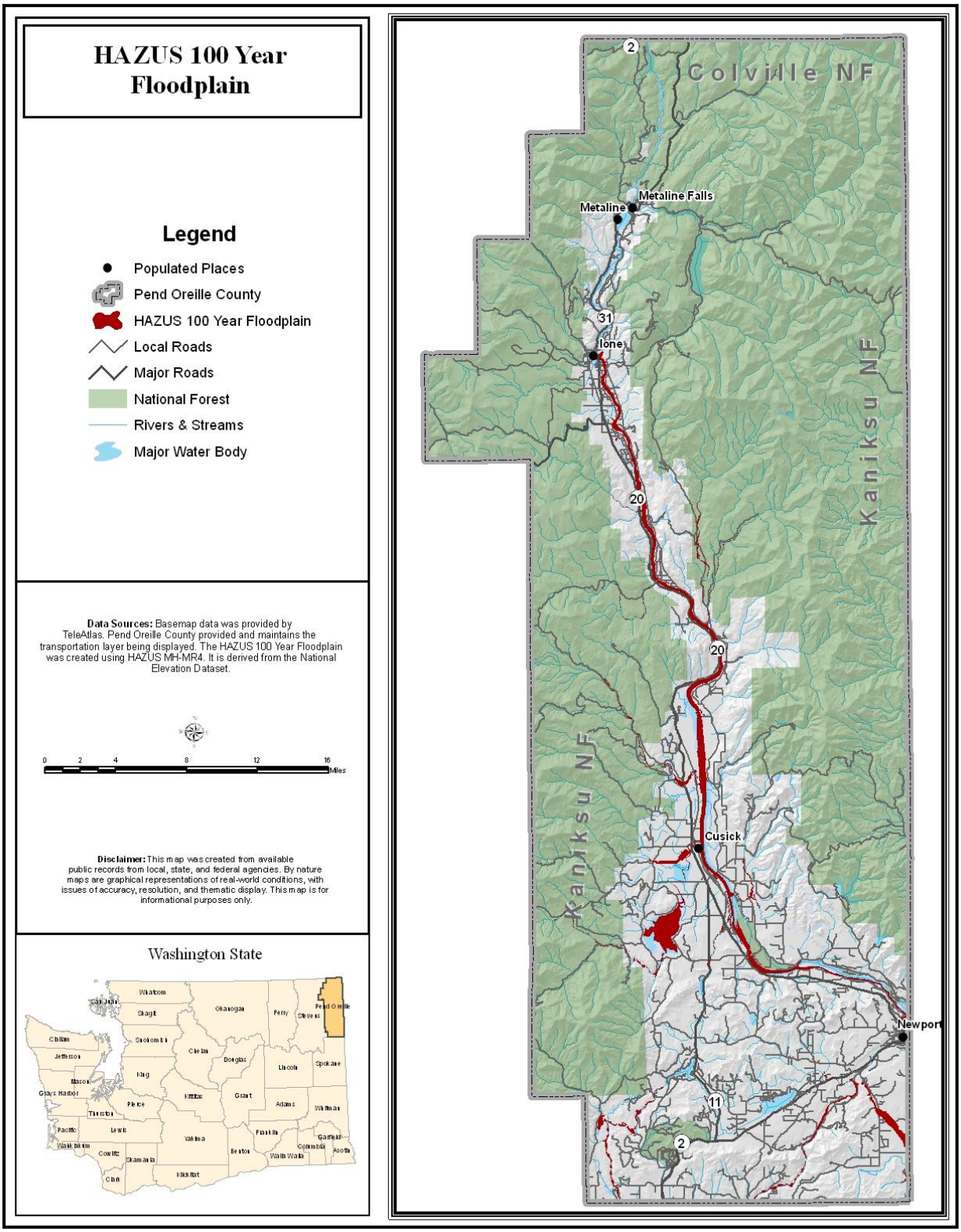


Figure 3.1.2: HAZUS Floodplain

Hazard Profile Flooding

Repetitive Loss: There are two repetitive loss properties in Pend Oreille County. The first is located in the Diamond Lake area in the southern end of the County. The property is located in a Zone A 100 year flood plain. Both losses occurred in the first quarter of 1997, a year of heavy flooding throughout the Pacific Northwest. The second repetitive loss property is located near the Pend Oreille River between the City of Newport and the Town of Cusick. Losses were claimed in 1997 and in 2002. This property is located in a Zone C floodplain on the County FIRM. Both properties are single family dwellings.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 17

SECTION 3.2: WILDFIRE

Description

Wildfire is defined by the United States Department of Agriculture (USDA) Forest Service as, "A fire naturally caused or caused by humans, that is not meeting land management objectives.[13]" It is generally thought of as an uncontrolled fire involving vegetative fuels occurring in wildland areas. Such fires are classified for hazard analysis purposes as either "Wildland" or "Wildland Urban Interface" Fires. Wildland Fires occur in areas that are undeveloped except for the presence of roads, railroads, and power lines, while Wildland Urban Interface Fires occur where structures or other human development meets or is intermingled with the wildland or vegetative fuels. Wildland Fires are currently considered a natural and necessary component of wildland ecology and, as such, are most often allowed to progress to the extent that they do not threaten inhabited areas or human interests and well-being. At the Wildland Urban Interface (WUI) level of fire, vigorous attempts are made to control fires but this becomes an increasingly difficult challenge as more and more development for recreational and living purposes takes place in wildland areas. Some Wildland Fires are ignited naturally (almost exclusively by lightning) but most ignitions are a result of human activities, either careless or intentional. The rapidity with which a wildland fire spreads and the intensity with which it burns is controlled by a number of factors including:

1) Weather - wind speed and direction, temperature, precipitation
2) Terrain - fires burn most rapidly upslope
3) Type of vegetation
4) Condition of vegetation - dryness
5) Fuel load - the amount and density of vegetation
6) Human attempts to suppress

In Washington, fire was once an integral function of the majority of ecosystems. The seasonal cycling of fire across the landscape was as regular as the July, August, and September lightning storms plying across the canyons and mountains. Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Shorter return intervals between fire events often resulted in less dramatic changes in plant composition[14]. The fires burned from 1 to 47 years apart, with most at 5 to 20-year intervals[15]. With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age[16]. Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels. Fire history data (from fire scars and charcoal deposits) suggest fire has played an important role in shaping the vegetation in the Columbia Basin for thousands of years[17].

The maps in Figure 3.2.1, 3.2.2, and 3.2.3 below show the Wildland Urban Interface of Pend Oreille County, Mean Fire Return Interval, and Historic Fire Locations, respectively.

[13] http://www.fs.fed.us/fire/fireuse/education/terms/fire_terms_pg5.html
[14] Johnson 1998
[15] Barrett 1979
[16] Johnson *et al.* 1994
[17] Steele *et al.* 1986, Agee 1993

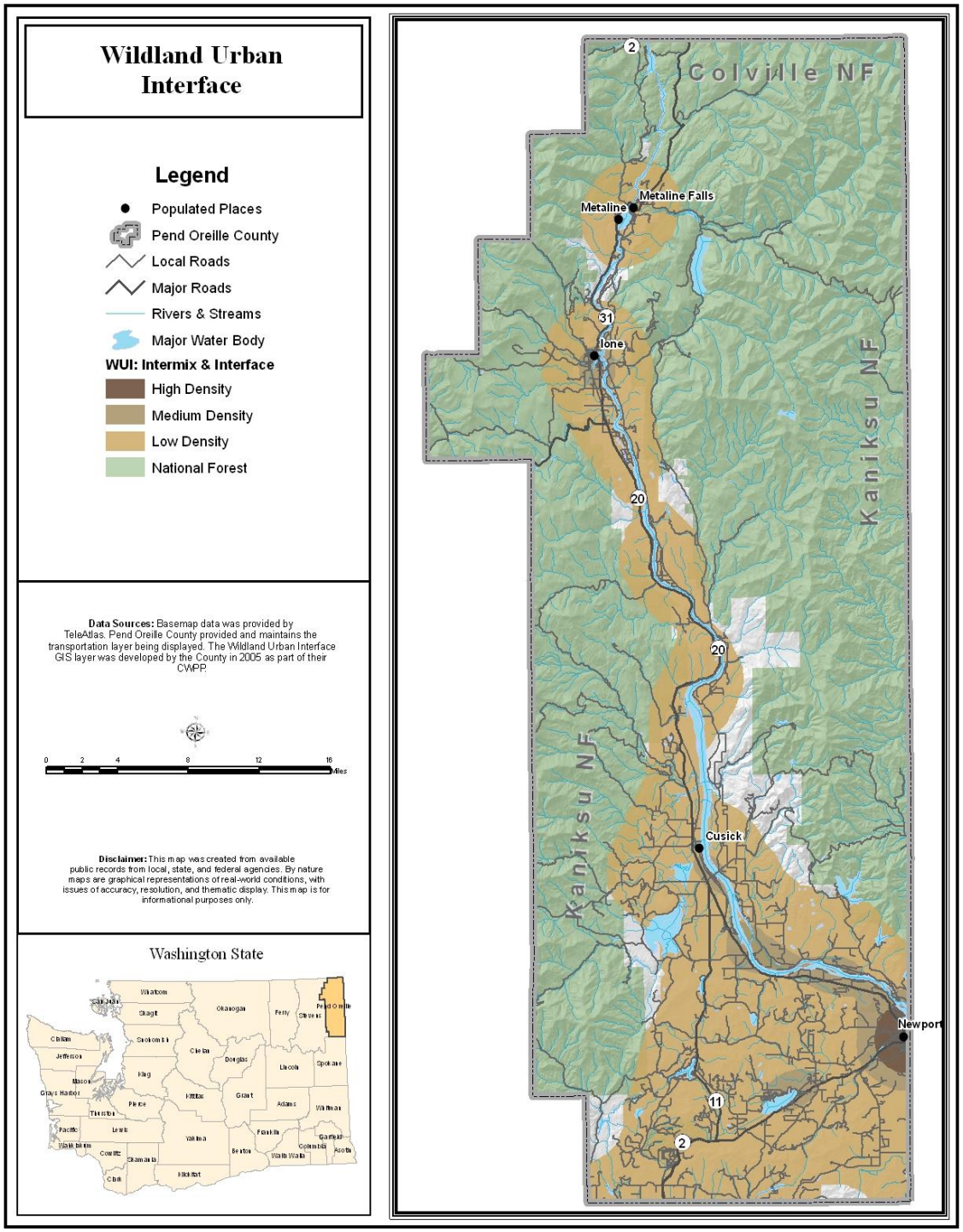


Figure 3.2.1: Wildland Urban Interface Map

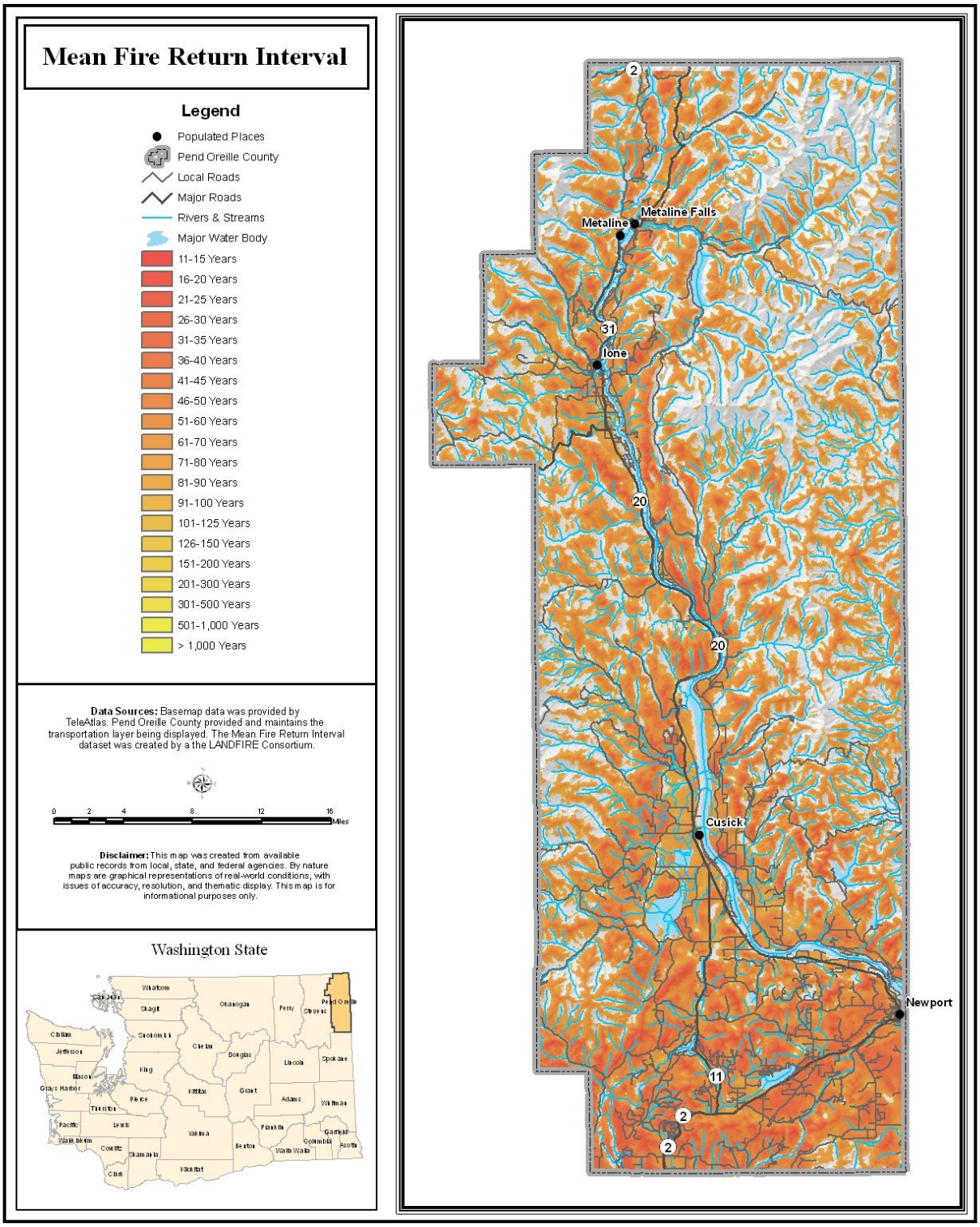


Figure 3.2.2: Mean Fire Return Interval Map

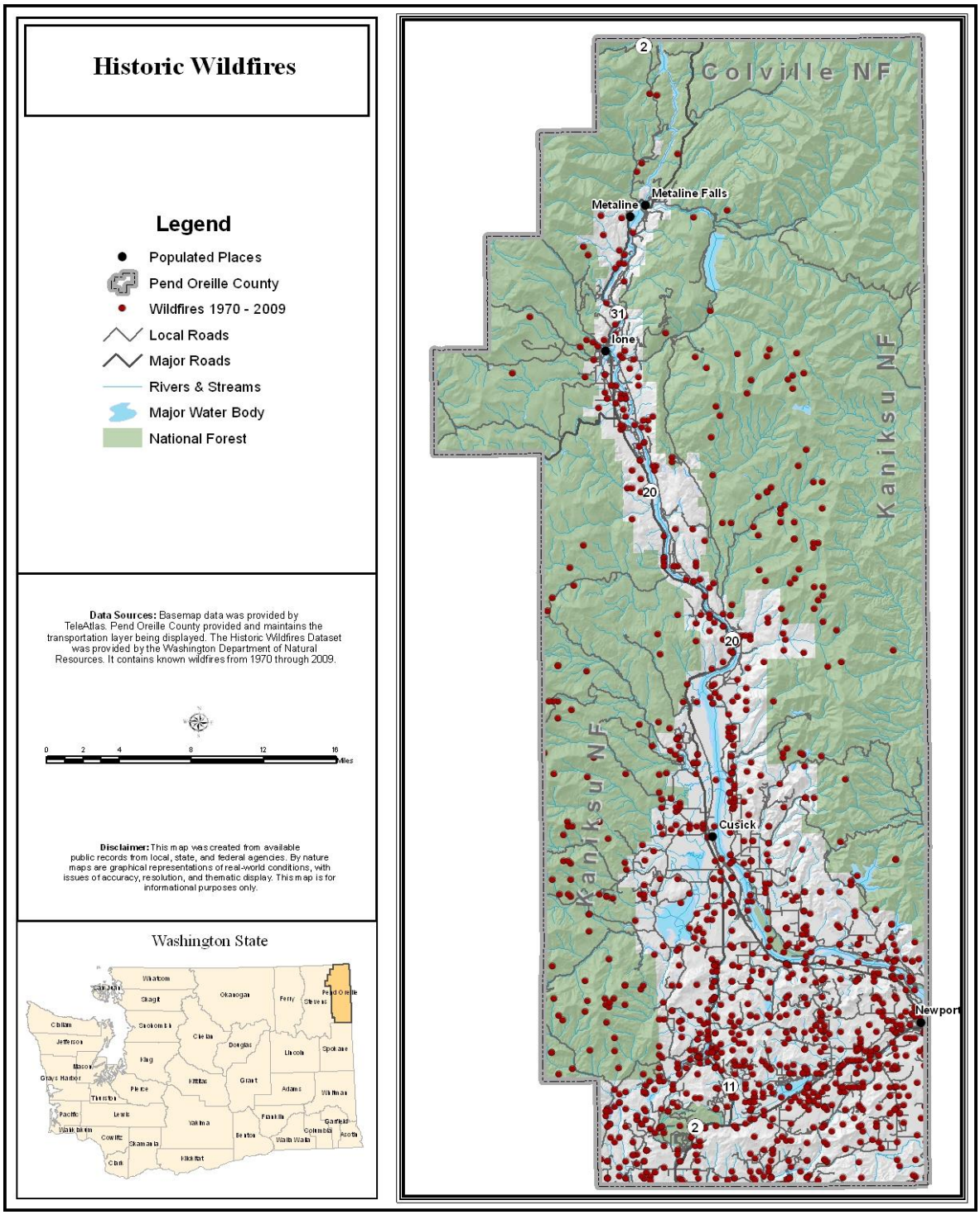


Figure 3.2.3: Wildfire History Map

Historical Frequencies

Wildfires occur yearly in Pend Oreille County. The Washington Department of Natural Resources (WSDNR) maintains a database of wildfires, their cause and extent from 1970 to the present. There have been 1,176 wildfires in Pend Oreille County catalogued by WSDNR since 1970, averaging over 29 per year. The largest fire burned 892 acres, with a total of over 4,800 acres burnt in the last 40 years.

The cause of wildfires in the County ranges from arson, to electric fences, to lightning. Figure 3.2.4 shows the number of fires by causation. Lightning causes the most fires, but human causes outweigh natural causes.

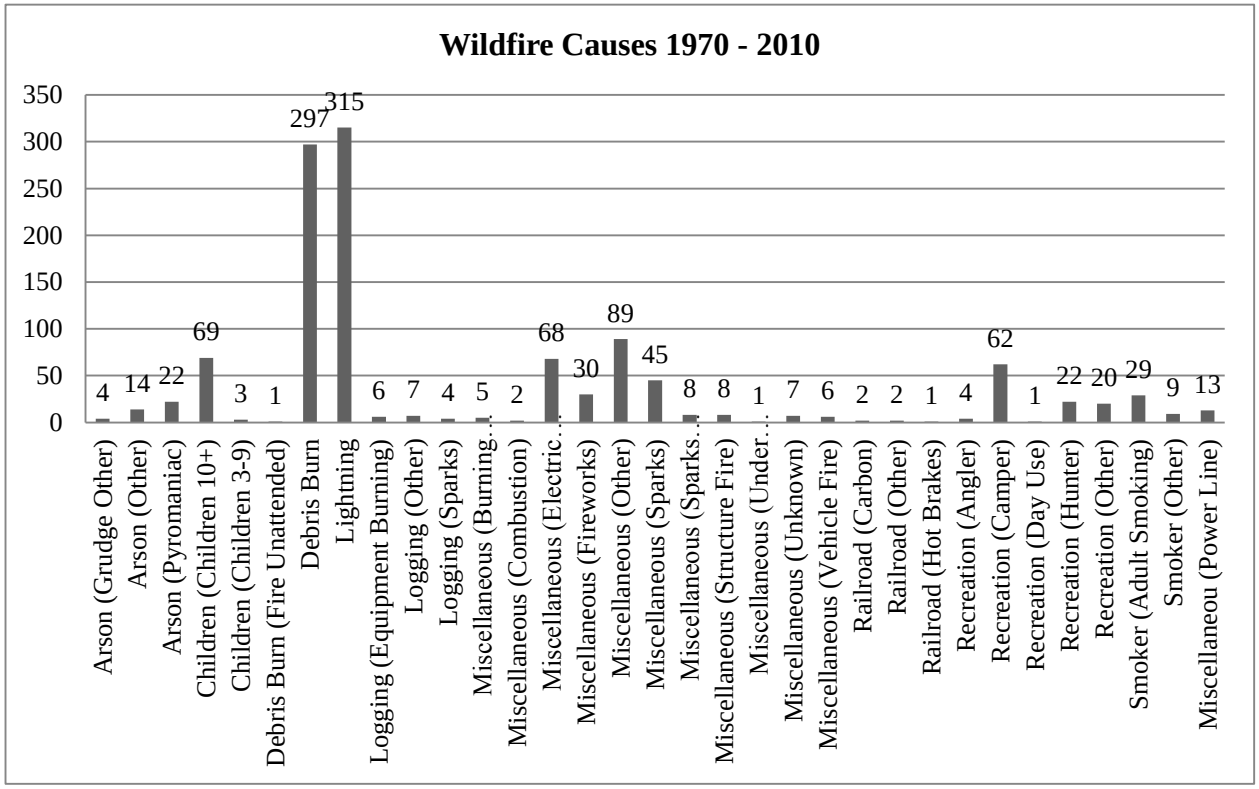


Figure 3.2.4: Wildfire Causes

Large Historic Fires

- The great fire of 1910 burned over 150,000 acres of land in Spokane and Pend Oreille Counties, while taking over 200 lives. It is considered one of the nation's historically significant fires[18].
- 1926 – 31: A large number of fires burned thousands of acres in Pend Oreille, Stevens, and Ferry Counties. Over half of the Coleville national forest was burnt. A drought coupled with wind aggravated these fires[19].

[18] 2004 Pend Oreille County Hazard Mitigation Plan.
[19] 2004 Pend Oreille County Hazard Mitigation Plan.

- 1943: A series of small wildfires burned large portions of the Coleville National Forest[20].
- The 1991 Fire Storm destroyed 114 homes and 40 other buildings in Ferry, Lincoln, Stevens, Spokane, Pend Oreille, and Whitman Counties. At least 2 fatalities were reported. The primary cause of the 93 separate fires was due to arcing electrical connections from downed power lines caused by high winds. The winds precipitated the spread of the fires[21]. Federal Disaster Declaration #922 was declared in October 1991.

Return Intervals

Wildfires occur on a yearly basis in Pend Oreille County. Using historic wildfire data provided by WSDNR, the annual peak burn acreage was calculated using the Pearson Log III algorithm. The results of that analysis are in Table 3.2.1. Though fires occur on a yearly basis the severity of those fires differs[22].

Return Period (Years)	Burn Area (Acres)
1.05	<1
2	3
5	20
10	54
25	155
50	304
100	551
200	947

Table 3.2.1 Annual Wildfire Maximum Burn Area

The return interval for lightning strikes causing wildfire events was calculated using the Log Pearson III method, which is frequently used to predict the statistical probability of an event occurrence based on historical data. Using this method, the number of lightning strikes causing wildfire return interval was calculated. The data used to calculate the return interval in years was based on frequencies taken from the United States Forest Service (USFS) wildfire data in Pend Oreille County for the years 1938 – 2004, a 66 year period.

[20] 2004 Pend Oreille County Hazard Mitigation Plan.
[21] 2004 Pend Oreille County Hazard Mitigation Plan.
[22] Wildfire Data provided by Washington DNR

Return Period (Years)	Probability (%)	Number of Lightning Strikes Per Year Causing Wildfires
1.05	95.20%	2
2	50%	7
5	20%	15
10	10%	22
25	4%	33
50	2%	43
100	1%	55
200	0.50%	69

Table 3.2.2: Lightning Caused Wildfire Frequency

Vulnerabilities

Using the LANDFIRE Mean Fire Return Interval Model, the return interval in years for wildfires was calculated for identified critical infrastructure in Pend Oreille County and the participating jurisdictions for this Plan. The insured value of each structure and its address are also noted in the following table.

Facility	Address	Value (Insured)	Return Interval (Years)
Cusick			
Lift Station (RR Tracks)	Monumental 100 ft E of RR tracks	$48,544	81 - 90 Years
Lift Station (Ben Nelson)	2101 Black Rd	$9,710	91 - 100 Years
Community Building	121 1st St.	$564,461	101 - 125 Years
Lift Station (M. Koegh)	214 River Rd	$9,710	101 - 125 Years
Town Shop	66 2nd Avenue	$267,909	101 - 125 Years
Fire Station	1st & Monumental	$180,388	126 - 150 Years
Lift Station (Rhiney Stehr)	3rd St. - 100 ft W of River Rd	$24,272	126 - 150 Years
Restrooms @ Boat Launch	1st St & Monumental	$146,751	151 - 200 Years
Water Treatment Plant & Fencing	Riverside Ave & Tacoma	$32,363	151 - 200 Years
Cusick School District			
Schools	305 Monumental Way	$10,162,595	71 - 80 Years
Baseball Diamond	305 Monumental Way	$75,464	91 - 100 Years
Fire District #2			
Fire Station 23	390442 State Hwy 20	$249,778	51 - 60 Years
Fire Station 24	20281 N LeClerc Rd	$84,400	71 - 80 Years
Fire Station 21	13501 Sullivan Lake Rd	$92,083	91 - 100 Years
Fire Station 22	103 Grandview Ave	$15,292	101 - 125 Years
Fire District #4			
Cusick Meadows Station 44	1602 Cusick Meadows Rd	$117,500	51 - 60 Years

Facility	Address	Value (Insured)	Return Interval (Years)
Cooks Mountain Station 42 & Maint Shop	433171 Hwy 20	$308,821	61 - 70 Years
Dalkena Station 41 & Training Bldg & Admin Bldg	11 Dalkena St	$726,714	101 - 125 Years
Fire District #5			
Station 51	406722 Hwy 20	$200,000	126 - 150 Years
Fire District #8			
District Building	4941 Spring Valley Rd	$95,167	46 - 50 Years
Hospital District			
Newport Community Hospital	714 Pine Street	$0	51 - 60 Years
Ione			
Water Treatment Plant	511 W Houghton Street	$1,500,000	61 - 70 Years
Ione Sheriff Substation	111 Central Street	$159,913	81 - 90 Years
Master Meter Station	Hwy 31 & Riverside Ave	$36,671	91 - 100 Years
Community Center/Library	210 Blackwell	$764,792	91 - 100 Years
Town Hall	207 Houghton Street	$233,589	101 - 125 Years
500,000 Gallon Reservoir	Cedar Creek Rd	$475,500	126 - 150 Years
City Park, Covered Picnic Area, Pump House Station	104 E Main Street	$490,863	151 - 200 Years
Library District			
Newport Public Library	116 N Washington Ave	$0	71 - 80 Years
Major Employers			
Ponderay Newsprint Company	422767 Hwy 20	$330,304	61 - 70 Years
Metaline			
City Hall	101 Housing Drive, Hwy 6	$291,048	151 - 200 Years
Shop/Fire Hall	101 Housing Drive, Hwy 6	$103,605	151 - 200 Years
Newport			
City of Newport - Big Park	First St & Calispel	$2,000,000	51 - 60 Years
City Hall	200 S Washington Ave	$358,500	71 - 80 Years
Fire Hall	2nd & Union	$275,000	71 - 80 Years
Little People's Park	436 S Union Ave	$300,000	71 - 80 Years
Newport School District			
Newport High School	1400 W Fifth	$12,194,862	51 - 60 Years
Portable Classroom & Fire Science Bldg	1300 W Fifth	$488,686	51 - 60 Years
Admin Bldg; Maintenance Shop	1380 W Fifth	$1,221,009	51 - 60 Years
Halstead Middle School	331 S. Calispel	$9,126,497	51 - 60 Years
Bus Garage #1	1020 W First	$131,947	51 - 60 Years
Stratton Elementary	1201 W Fifth	$8,318,385	61 - 70 Years
Bus Garage #2	1624 W Seventh	$341,250	301 - 500 Years

Pend Oreille County			
Road Dist #1	9362 Deer Valley Rd	$1,319,000	36 - 40 Years
Scale Building	9382 Deer Valley Rd	$383,800	36 - 40 Years
Deer Valley Hazardous Waste Facility	9322 Deer Valley Rd	$122,900	36 - 40 Years
Deer Valley Recycling	9322 Deer Valley Rd	$517,700	36 - 40 Years
Newport Garage/Shop	1000 W 1st	$109,600	51 - 60 Years
Pend Oreille County Counseling Services	105 S Garden Ave	$2,070,600	51 - 60 Years
Newport Community & Environmental Health Office	605 Hwy 20	$1,143,600	51 - 60 Years
Hall of Justice	229 S Garden Ave	$2.651,420	51 - 60 Years
Sheriff's Office, Jail	331 S Garden Ave	$290,300	51 - 60 Years
Usk Transfer Station	661 Jared Rd	$59,600	51 - 60 Years
Court House	625 W 4th S St.	$7,584,600	61 - 70 Years
Old County Courthouse	418 S Scott	$673,800	61 - 70 Years
Pend Oreille County Fairgrounds	419152 Hwy 20	$192,300	61 - 70 Years
Newport Radio Transmitter	423 W 3rd	$225,000	71 - 80 Years
Road District #2	13571 Hwy 21	$698,000	81 - 90 Years
County of Pend Oreille Counseling Services	307 Park St.	$658,000	81 - 90 Years
Road District #3	161 Sullivan Lake	$619,500	91 - 100 Years
Cutter Theater Counseling Office	302 Park St	No Value Listed	91 - 100 Years
Ione Transfer Station	1712 Sullivan Lake Rd	$228,700	91 - 100 Years
Cusick Sheriff Substation	103 Skookum St	$18,000	151 - 200 Years
Port of Pend Oreille			
Railroad Satellite Office	137 S Newport Ave	$30,000	71 - 80 Years
Port District / Railroad Depot	4th & Washington	$11,000	71 - 80 Years
Storage Facility	100 W 2nd Street	$50,000	71 - 80 Years
Railroad Office & Shop & Machine Shed	1981 Black Road, Usk	$1,529,000	91 - 100 Years
Selkirk School District			
Bus Garage Storage Building	Houghton & 7th	$15,225	61 - 70 Years
Selkirk Elementary School	219 Park Ave	$1,902,093	81 - 90 Years
District Office & Selkirk Senior/Junior High	10372 Hwy 31	$7,155,988	151 - 200 Years
Elementary Gym/Bus Garage	201 Pend Oreille Blvd	$652,135	91 - 100 Years
South Pend Oreille Fire & Rescue			
Fertile Valley Station 71	11 Jermain Rd	$792,000	41 - 45 Years
Sacheen Fire Station 32	6131 Hwy 211	$790,000	51 - 60 Years
Deer Valley Fire Station 33	8165 Deer Valley Rd	$280,000	51 - 60 Years
Camden Fire Station 11	4210 Allen Rd	$500,000	61 - 70 Years
Diamond Lake Station 31 & Maint Facility	325272 Hwy 2	$590,000	71 - 80 Years

National Historic Register			
Idaho and Wash. Northern RR Bridge	Spans Pend Oreille River, off WA 31	UNK	Water
Washington Hotel	5th and Washington St.	UNK	71 - 80 Years
Larson, Lewis P., House	5th and Pend Oreille Blvd.	UNK	126 - 150 Years
Metaline Falls School	302 Park	UNK	91 - 100 Years
United States Border Station	Roughly bounded by WA 31 and the U.S.--Canadian border, Colville National Forest	UNK	Indeterminate
Pend Oreille Mines and Metals Building	103 S. Grandview St.	UNK	91 - 100 Years

Table 3.2.3: Facilities by Jurisdiction

Impact

Wildland Fires threaten the lives of anyone in their path, including hikers, campers, other recreational users and, where suppression efforts are made, firefighters. Enormous volumes of smoke and airborne particulate materials are produced that can affect the health of persons for many miles downwind. Nearer to the fire, smoke reduces visibility, disrupts traffic, and increases the likelihood of highway accidents. As a result of wildland fire there may be changes in water quality in the area, erosion rates may increase, along with increased rainfall runoff, flash flood threats, and decreased rainfall interception and infiltration. Indirect impacts include losses to tourism, recreational and timber interests, and loss of wildlife habitat. Wildland Urban Interface Fires have most or all of the above impacts, as well as those of structural fires including: injury, loss of life, and loss of structures and contents. Agricultural losses may also be sustained, including livestock, crops, fencing, and equipment.

Loss Estimates

Losses were calculated by identifying the mean fire reoccurrence interval for each critical facility and structure in the County and dividing the total value of the facility/structure by the annual return interval in years. The annualized loss for critical facilities is $1,333,619. The annualized loss for residential and commercial structures is $7,605,872. The total annualized loss for Pend Oreille County is $8.94 million.

Hazard Profile for Wildfire

Repetitive Loss: None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 17

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SECTION 3.3: GEOLOGICAL

EARTHQUAKE

The U.S. Geological Survey (USGS) defines earthquake as: "Ground shaking caused by the sudden release of accumulated strain by an abrupt shift of rock along a fracture in the Earth or by volcanic or magmatic activity, or other sudden stress changes in the Earth." The hazards associated with earthquakes are essentially secondary to ground shaking (also called seismic waves) which may cause buildings to collapse, displacement or cracking of the earth's surface, flooding as a result of damage to dams or levees, and fires from ruptured gas lines, downed power lines and other sources. Earthquakes cause both vertical and horizontal ground shaking which varies both in amplitude (the amount of displacement of the seismic waves) and frequency (the number of seismic waves per unit time), usually lasting less than thirty seconds. Earthquakes are measured both in terms of their inherent "magnitude" and in terms of their local "intensity."

The magnitude of an earthquake is essentially a relative estimate of the total amount of seismic energy released and may be expressed using the familiar "Richter Scale" or using the "Moment Magnitude Scale" now favored by most technical authorities. Both the Richter scale and the Moment Magnitude Scale are based on logarithmic formulae, meaning that a difference of one unit on the scales represents about a thirty-fold difference in amount of energy released (and, therefore, potential to do damage). On either scale, significant damage can be expected from earthquakes with a magnitude of about 5.0 or higher. What determines the amount of damage that might occur in any given location, however, is not the magnitude of the earthquake but the intensity at that particular place. Earthquake intensity can decrease due to distance from the earthquake's "epicenter" (its focal point) and local geologic features, such as depth of sediment and bedrock layers. Intensity is most commonly expressed using the "Modified Mercalli Intensity Scale." This measure describes earthquake intensity on an arbitrary, descriptive, twelve degree scale (expressed as Roman numerals from I to XII) with significant damage beginning at around level VII. Mercalli Intensity is assigned based on eyewitness accounts. More quantitatively, intensity may be measured in terms of "peak ground acceleration" (PGA) expressed relative to the acceleration of gravity (g) and determined by seismographic instruments.

The major fault of concern is the Newport Fault Zone identified in Figure 3.3.1. There have been only a few instrumental earthquakes recorded with epicenters in the County over the past thirty years, but earthquakes are felt from epicenters outside of the County in Idaho, Montana, and western Washington. Seismic intensities of IV to V on the Modified Mercalli Scale had been felt as recently as 1985 and a Level II quake was experienced in late 2003 that was centered in Spokane, Washington[23].

[23] Pend Oreille County AHMP, 2004.

Figure 3.3.1: Newport Fault Zone Map

Historical Frequencies

Historically, Pend Oreille County has not been considered a high seismic risk for earthquake activity and has only recorded minor damages from past earthquakes. According to the USGS Earthquake Catalog, only one earthquake with an epicenter in Pend Oreille County, above 2.5 on the Richter Scale, has been recorded in Pend Oreille County since 1950. Though earthquakes don't occur frequently in the County, there have been 19 earthquakes felt in Pend Oreille County during the period 1935-1985[24]. Unfortunately, the National Oceanic and Atmospheric Administration (NOAA) Earthquake Intensity database only contains data up to 1985. For this reason more recent data was not used in the felt earthquake historic analysis. The Modified Mercalli Intensity (MMI) Scale is used to quantify the shaking felt by an earthquake in a specific location. The following table (Table 3.3.1) defines the MMI Scale and Table 3.3.2 details the earthquakes felt in Pend Oreille County and their accompanying score on the MMI Scale. Figure 3.3.2 is a map showing earthquakes from Washington, Montana, and Idaho that have been felt in Pend Oreille County. Figure 3.3.3 illustrates Relative Ground Motion in the County. High acceleration is shown in red, with medium-high acceleration in gold, and medium acceleration in blue.

I. Instrumental	Not felt by many people unless in favorable conditions.
II. Feeble	Felt only by a few people at best, especially on the upper floors of buildings. Delicately suspended objects may swing.
III. Slight	Felt quite noticeably by people indoors, especially on the upper floors of buildings. Many do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Duration estimated.
IV. Moderate	Felt indoors by many people, outdoors by few people during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rock noticeably. Dishes and windows rattle alarmingly.
V. Rather Strong	Felt outside by most, may not be felt by some outside in non-favorable conditions. Dishes and windows may break and large bells will ring. Vibrations like large train passing close to house.
VI. Strong	Felt by all; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Damage slight.
VII. Very Strong	Difficult to stand; furniture broken; damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by people driving motor cars.
VIII. Destructive	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture moved.

[24] Data taken from the NOAA Earthquake Intensity Database. http://www.ngdc.noaa.gov/hazard/int_srch.shtml.

IX. Ruinous	General panic; damage considerable in specially designed structures, well designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X. Disastrous	Some well built wooden structures destroyed; most masonry and frame structures destroyed with foundation. Rails bent.
XI. Very Disastrous	Few, if any masonry structures remain standing. Bridges destroyed. Rails bent greatly.
XII. Catastrophic	Total damage - Almost everything is destroyed. Lines of sight and level distorted. Objects thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move position.

Table 3.3.1: Modified Mercalli Intensity Scale

Date	Magnitude	Modified Mercalli Intensity	Location
1935/10/19	6.3	3	Helena Montana
1935/10/31	6	4	Helena Montana
1936/7/16	5.8	4	Walla Walla, Washington
1939/11/13	5.3	3	Near Olympia Washington
1942/11/1	UNK	5	Northeast of Spokane, Washington
1944/7/12	6.1	UNK	Sheep Mountain, Idaho
1945/2/14	6	UNK	Sheep Mountain, Idaho
1945/4/29	5.5	UNK	Near North Bend, Washington
1946/2/15	5.8	UNK	Puget Sound Washington
1946/6/23	7.3	5	Puget Sound Washington
1949/4/13	7	4	Puget Sound Washington
1959/8/6	UNK	3	Near Chalen, Washington
1959/8/18	7.1	5	Hebgen Lake, Montana
1965/4/29	6.5	5	Puget Sound Washington
1980/5/18	4.7	3	Mt. St. Helens, Washington
1983/10/28	7.3	5	Borah Peak, Idaho
1984/2/11	4.5	3	14 Miles North of Glacier National Park
1985/2/10	3.9	4	15 Miles West of Hermiston, OR
1985/8/6	4	4	Near Kootenay Lake, Canada

Table 3.3.2: Historic Earthquakes Felt in Pend Oreille County

Earthquakes Felt in Pend Oreille County

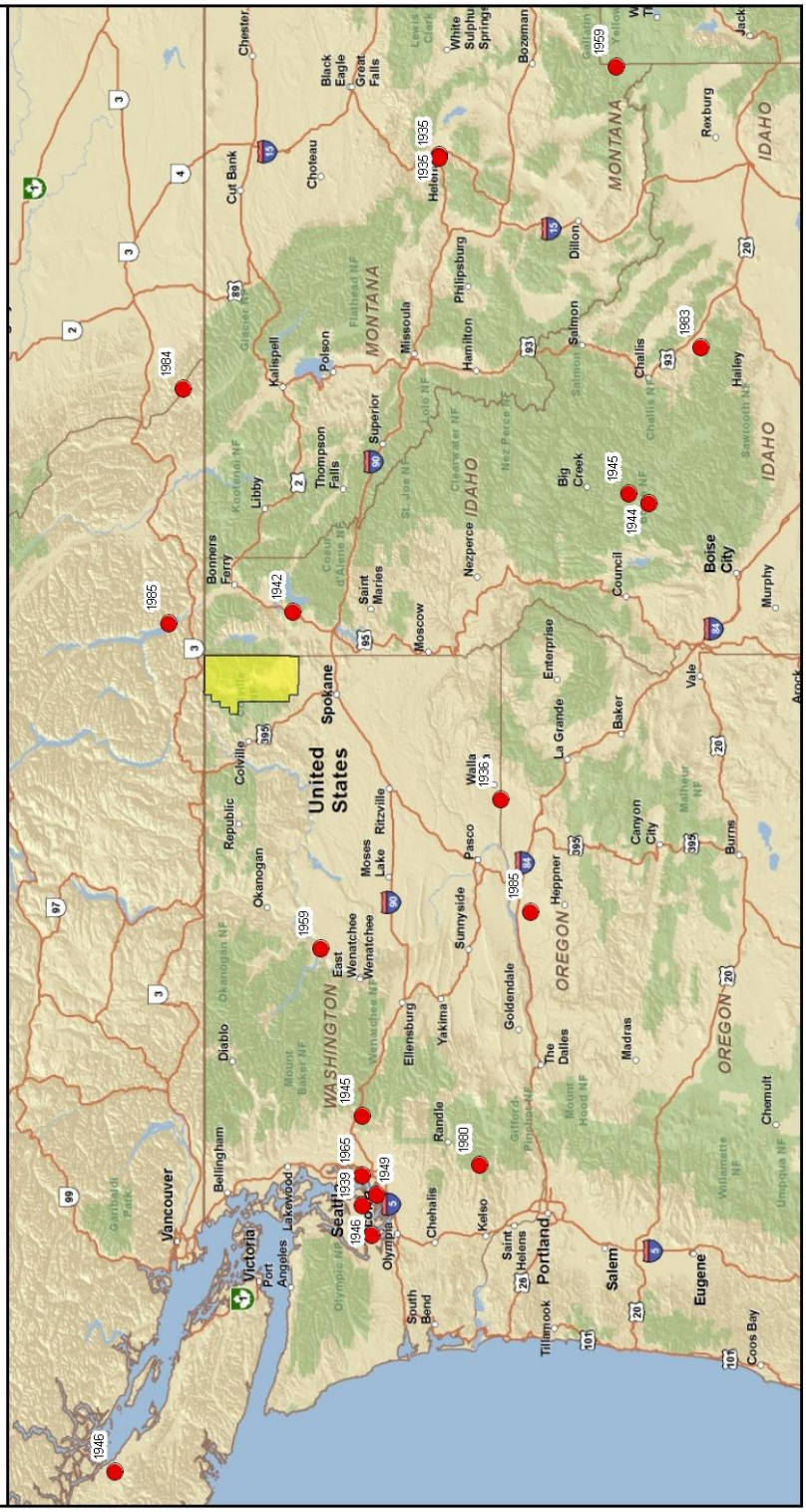


Figure 3.3.2: Felt Earthquake Map

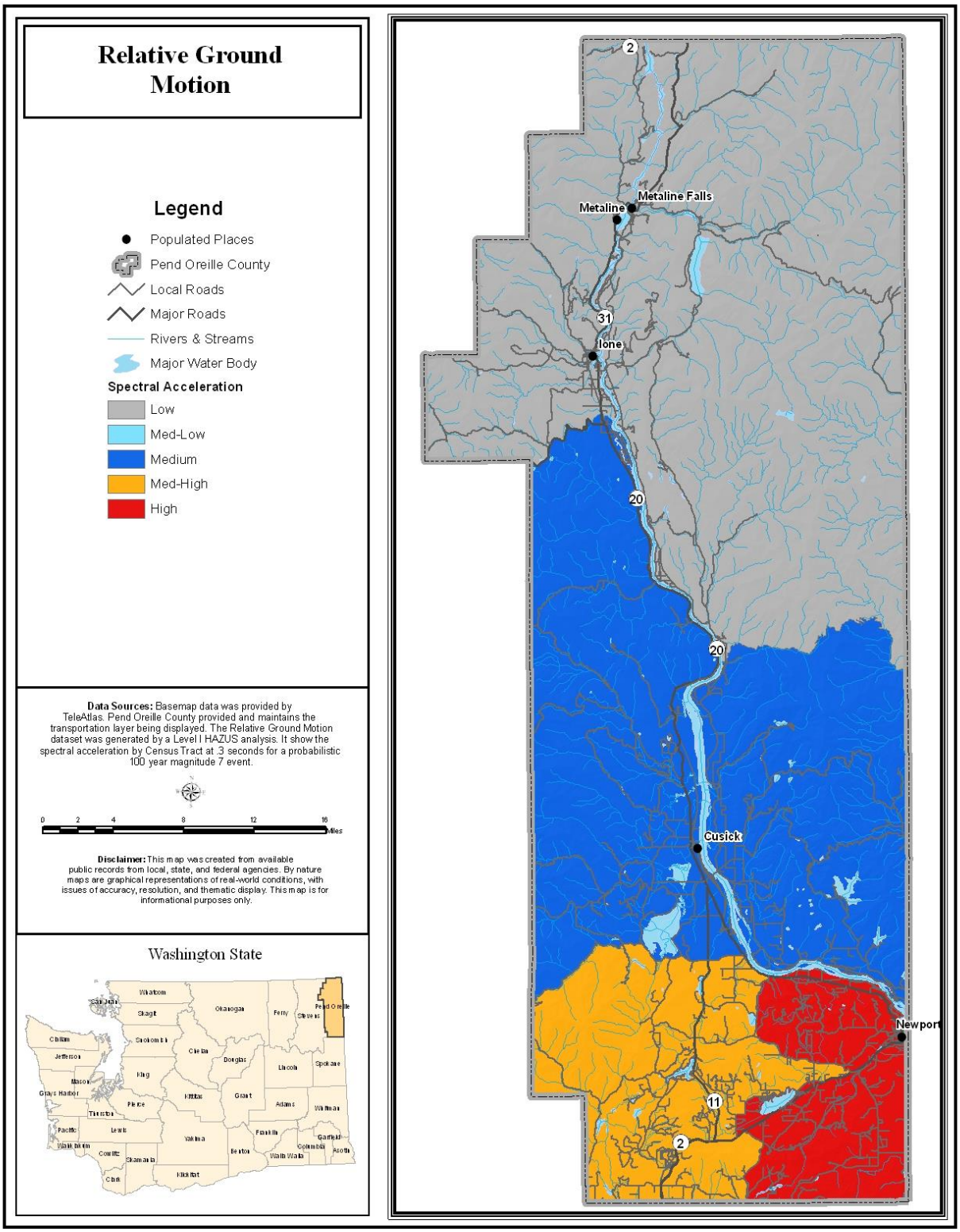


Figure 3.3.3: Relative Ground Motion Map

Impacts

Earthquakes are capable of catastrophic consequences, especially in urban areas. Worldwide, earthquakes have been known to cost thousands of lives and enormous economic and social losses. In minor earthquakes, damage may be done only to household goods, merchandise, and other building contents; however, people are occasionally injured or killed by falling objects. More violent earthquakes may cause the full or partial collapse of buildings, bridges and overpasses, and other structures. Fires due to broken gas lines, downed power lines, and other sources are common following an earthquake and often account for much of the damage. Economic losses arise from destruction of structures and infrastructure, interruption of business activity, and innumerable other sources. Utilities may be lost for long periods of time and all modes of transportation may be disrupted. Disaster Services, including medical services, may be either disabled or overwhelmed. In addition to broken gas lines, other hazardous materials may be released.

Vulnerabilities

Structural damage related to earthquakes is heavily dependent on the age of the structure and its ability to withstand ground motion. Pend Oreille County has adopted the International Building Code and all new structures adhere to that code. Those that were constructed before the adoption of a building code may have structural components that will not withstand ground motion. Figure 3.3.2 shows the areas in the County that are most susceptible to ground motion, the Newport area being the most susceptible. The critical infrastructure in this area is most at risk during an earthquake event. It is noted that the ground motion in Pend Oreille County is relatively small compared to the rest of the State of Washington. The most shaking that has historically been felt registered a 5 on the Modified Mercalli Intensity (MMI) Scale, which has the potential to break windows and dishes.

Loss Estimates

A HAZUS Level I Analysis was run to identify the cost of an earthquake event. The scenario is a probabilistic magnitude 7 earthquake with a 100 year return interval.

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses on a regional scale. These loss estimates are used primarily by local, state, and regional officials to plan and stimulate efforts to reduce risks from earthquakes, and to prepare for emergency response and recovery. The following is a summary of the HAZUS Global Report.

The geographical size of the region is 1,420.55 square miles and contains 5 census tracts. There are over 4 thousand households in the region with a total population of 12,859 people[25] . There are an estimated 7 thousand buildings in the region with a total building replacement value (excluding contents) of 824 (millions of dollars). Approximately 94.00 % of the buildings (and 84.00% of the building value) are associated with residential housing. The replacement value of

[25] 2000/2008 est. Census Bureau data

the transportation and utility lifeline systems is estimated to be 1,456 and 388 (millions of dollars), respectively.

In terms of building construction types found in the region, wood frame construction makes up 73% of the building inventory. The remaining percentage is distributed between the other general building types.

The total economic loss estimated for the earthquake is 0.09 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

- The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake.
- The total building related losses were 0.09 (millions of dollars) with 24 % of the estimated losses being related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 59 % of the total loss.
- The total economic annualized loss for the 100 year earthquake is $90,000.

Hazard Profile for Earthquakes

Repetitive Loss: None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** – Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 12

VOLCANIC ACTIVITY

The definition of a volcano in one dictionary is "a vent in the earth's crust through which rock or lava is ejected." Another dictionary describes a volcano as "a cone-shaped hill or mountain built around a vent." More completely, a volcano is a structure/mountain which contains a vent or cluster of vents fed by magma rising from a great depth directly to the surface. Some volcano vents are not as deep as others and are fed by other greater volcanoes in the string. Volcanoes can change shape drastically and quickly. One year's cone can be the next year's caldera; for example, Mount St. Helens before the 1980 eruption and Mount St. Helens after the eruption do not look like the same mountain. Mount St. Helens was considered a beautiful and peaceful mountain and many did not consider it a dangerous volcano before it erupted in 1980. Mount St. Helens began a dome-building eruption in September of 2004 which continued, although sluggish at times, until January of 2008. The volcano has been quiet since that time.

The United States Geological Survey (USGS) monitors earthquake and volcano activity. Volcanic activity is normally preceded by earthquake activity in the region of the volcano.

Historical Frequencies

The Cascade Mountain Range is a 1,000 mile string of volcanoes which extend from northern California to southern British Columbia. There are five known volcanoes within Washington State. They include: Glacier Peak, Mount Adams, Mount Baker, Mount St. Helens, and Mount Rainier. Any of these volcanoes can become active at any time with little or no warning. The most recent example is Mt. St. Helens' eruption in 1980. After the eruption of Mt. St. Helens in 1980, Pend Oreille County experienced heavy ash fall due to prevailing westerly winds.

A Federal Disaster Declaration (#623) was declared in May 1980 for Pend Oreille County due to the eruption of Mount St. Helens.

Impacts

Volcanic threats to humans include: lava flows, debris flows, ash fall, toxic gases, and sometimes associated earthquake activity. Pend Oreille County is located in the eastern portion of the state, a vast distance from any of these volcanoes. With the considerable distance between the County and the volcanoes, the threat to the County of lava flows, debris flows, pyroclastic blast, or toxic gases is unlikely. However, there is a threat of volcanic ash fall.

Vulnerabilities

The ash distribution from a volcanic eruption can be devastating to the health of the population. It can have severe consequences for those with lung conditions, such as asthma. Ash distribution also affects farm production.

Loss Estimates

Losses due to volcanoes in Pend Oreille County are tied to ash distribution.

Hazard Profile for Volcano

Repetitive Loss – None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 6

LANDSLIDE/MUDSLIDE

Description

The term "landslide" encompasses several types of occurrence (including mudslides) in which slope-forming materials, such as rock and soil, move downward under the influence of gravity. Such downward movement may occur as the result of an increase in the weight of slope-forming materials, an increase in the gradient (angle) of the slope, a decrease in the forces resisting downward motion (friction or material strength), or a combination of these factors. Factors that may trigger a landslide include: weather related events such as heavy rainfall (one of the most common contributors); erosion, and freeze-thaw weakening of geologic structures; human causes such as excavation and mining; deforestation; vibration from explosions or other sources; and such geologic causes as earthquakes, volcanic activity, and shearing or fissuring. The speed of descent ranges from sudden and rapid, to an almost imperceptibly slow creep where effects are only observed over a period of months or years.

THE SPOKESMAN-REVIEW
saturday, april 9, 1983
page 6

Historical Frequencies

The Washington State Department of Natural Resources (WSDNR) maintains a geographic database of known landslide events from 1954 to 2000. According to this dataset there have been 48 reported landslides in Pend Oreille County in the 46 year analysis interval. It is noted that those 48 landslides occurred in only 7 years: 1954, 1971, 1984, 1993, 1994, 1996, and 2000. The majority of these landslides, 34, occurred in 1954. It is assumed that landslides occurring before 1954 are recorded at that date. There have been two Federal

Emergency status asked for Pend Oreille County

Three members of the Washington congressional delegation sent President Reagan a telegram Friday urging him to approve Gov. John Spellman's request that a state of emergency be declared in Pend Oreille County.

Sens. Slade Gorton and Henry M. Jackson and Rep. Tom Foley asked in the telegram that the request be given "expeditious consideration."

"In early March, warm temperatures, heavy rains and the resulting landslides caused extensive damage to county roads and to the track and roadbed of the port of Pend Oreille Valley Railroad," they wrote.

"More than 120 feet of the Pend Oreille Railroad track was completely destroyed, forcing the railroad to halt all service to a major county employer, the Lehigh Portland Cement Co. in Metaline Falls.

"We respectfully ask that our request be given expeditious consideration in order to mitigate the impact of this emergency," the letter said.

Spokane Chronicle
Saturday, May 12, 1984
Page 3

Slide hits railroad trestle, covers tracks

By DAVID LEDFORD
Staff writer

A mudslide ripped the top off a railroad trestle and covered 200 yards of track with mud and rock Friday near Metaline Falls in Pend Oreille County.

The track serves the Lehigh-Portland Cement plant.

Sheriff Tony Bamonte said no one is believed to have been in the slide area a half-mile south of town at the time of the 12:50 p.m. incident.

Jim Young, manager of the county's port district, said engineers estimated 100,000 yards of mud and rock slid down the mountain.

Bamonte said mud was 10 to 12 feet deep in places.

"It made my heart stop," said Merritt Rice, a Lehigh truck driver who witnessed the slide from the other side of the Pend Oreille River while driving on a county road.

"I saw what I thought was trees moving, which they were, but I couldn't believe it," an excited Rice said. "The next thing I knew it was kind of like water and the whole thing washed out till it hit the Pend Oreille River and made a big splash.

"It was quite an awesome sight."

The rail line, owned by the port district, likely will be unusable for at least two weeks while crews clean up the debris and repair the bridge, Young said.

Franz Laska, Lehigh plant manager, said the slide will not hamper cement production. The company will ship by truck while the rail line is being repaired, he said.

Young said the port district's two locomotives are between the Lehigh plant and the slide, so can't be used to serve four other commercial customers south of Metaline Falls until the slide is cleared. He said the port hopes to borrow engines from Burlington Northern.

The port district spent $700,000 last year on the hillside between the rail bed and the river in an effort to prevent slides, Young said. Holes were drilled in the rock and pipe was inserted to create drain fields so the hillside wouldn't become too heavy and collapse, he said.

Disaster Declarations due to Landslides in Pend Oreille County, as well as two Landslide/Mudslides that were declared Federal Disasters. Landslides can be expected to occur in Pend Oreille County on a 5 to 10 year return interval.

Table 3.3.3 Federal Disaster Declarations in Pend Oreille County-due to Landslide or Mudslide

Federal Disaster Declaration #	Date
1159	Dec 1996-Feb 1997
1172	March 1997
1641	Jan-Feb 2006
1682	December 2008

Clusters of landslides occur along transportation corridors which include: Rocky Creek Road, Horseshoe Lake Road, Dry Canyon Road, Fort LeClerc Creek, and Yokum Lake Road. Figure 3.3.4 indicates the location of potential landslide events based upon slope[26].

Damage in the County consists of blockages on the railroad tracks in the Metaline Falls area, Outpost, and Dalkena areas, with blockage of another roadway in the Sullivan Lake area. One dwelling was also destroyed in the Town of Ione due to a landslide. Seven (7) landslides occurred in the County in 1997, a year in which serious flooding also occurred.

Landslides are a regular occurrence on the railroad tracks north of Ione and along Sullivan Lake Road[27].

Of particular concern is the Blueslide Tunnel. Over the past forty years, the mountain that the Blueslide Tunnel goes through has been shifting towards the Pend Oreille River. The Washington State Department of Transportation (WSDOT) has reported that the highway above the tunnel has not experienced movement. The following data in Table 3.3.4 and the charts in Figure 3.3.4 were provided by the WSDOT. They illustrate the movement of the mountain below the surface. The cause of the movement is currently unknown, but it is hypothesized that the movement is caused by either sub water pressure or an undercutting of the mountain in the Pend Oreille River. There has been a movement of 4.7 feet over the 10 year period from 2000 to 2010.

	H-1A-99	(DEPTH = 48.7')
DATE	W.T. FEET	CHANGE FT.
7/10/1999	25.3	
4/24/2000	25.1	0.2
5/26/2010	29.8	-4.7

Table 3.3.4: MS-3456 SR 20 Blueslide Tunnel Standpipe Piezometer Data

[26] 2002. Ramakrishnan, etal. Landslide Disaster Management and Planning. Indian Cartographer. 192-195.
[27] Conversation With Cliff Bauer of Pend Oreille Valley Railroad.

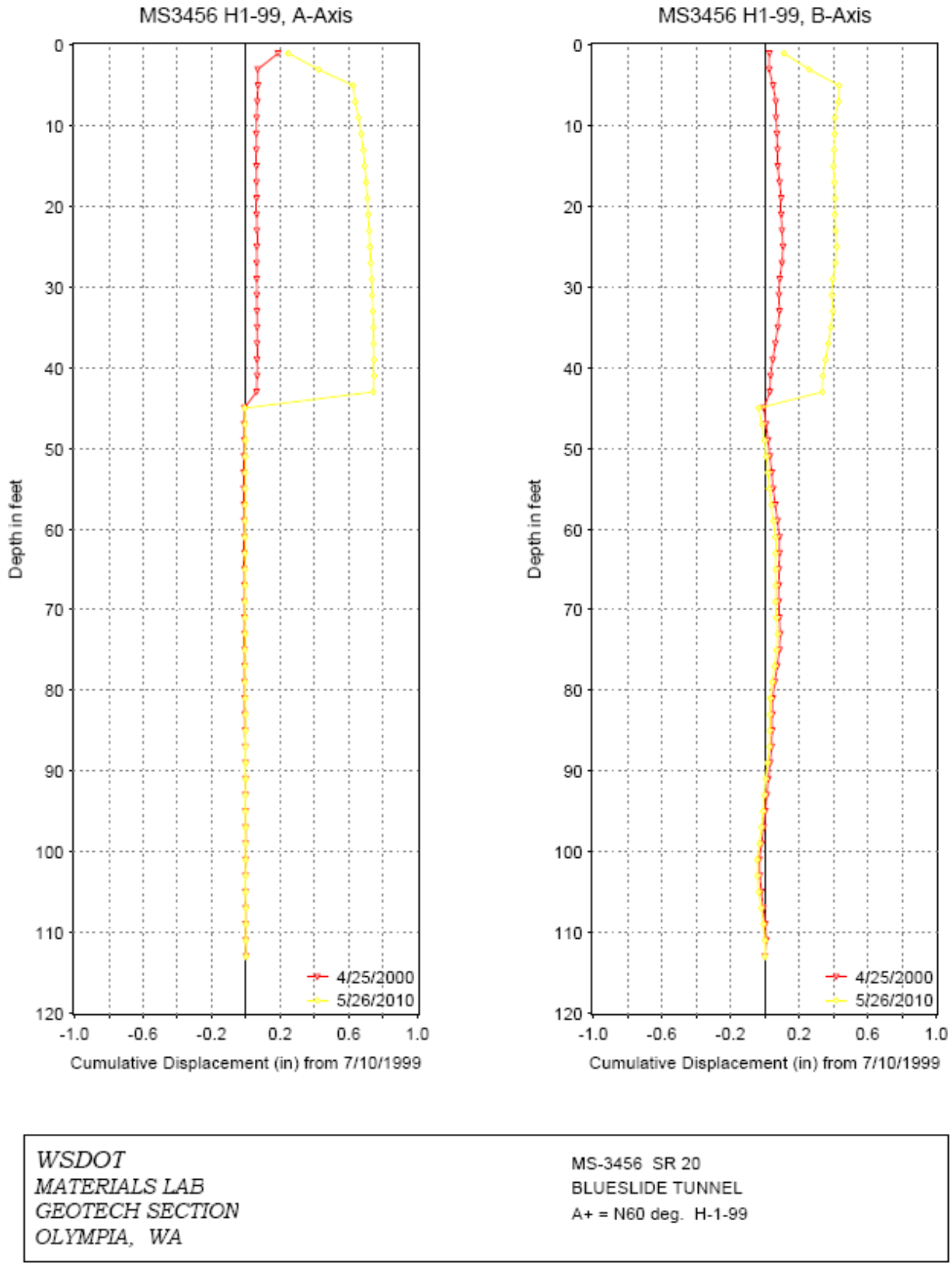
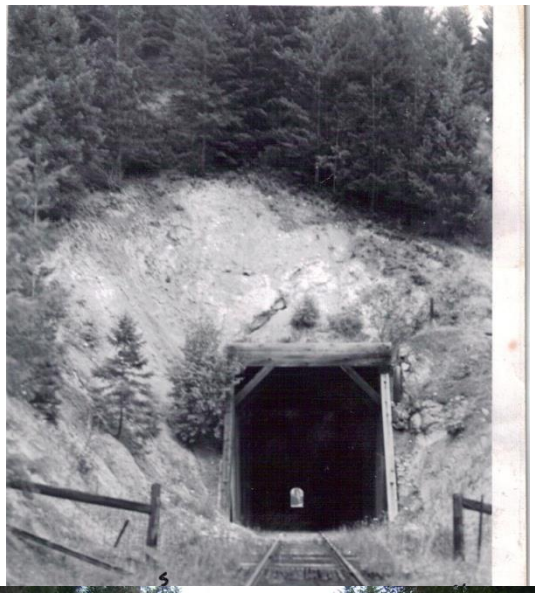
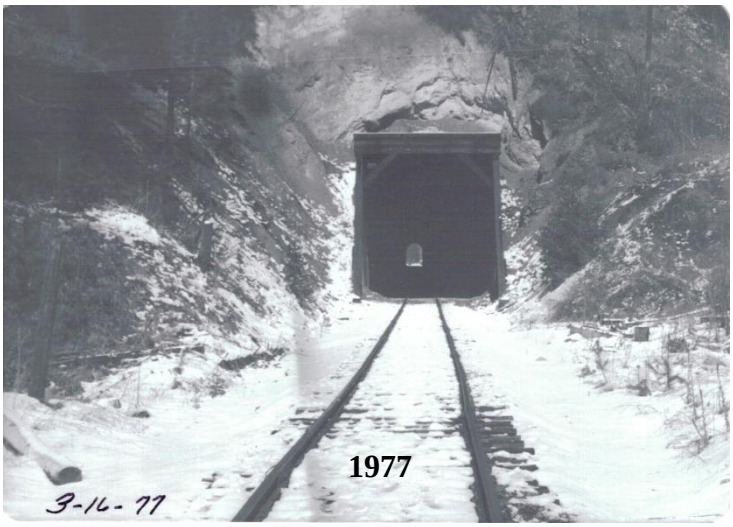


Figure 3.3.4: MS-3456 SR 20 Blueslide Tunnel Standpipe Piezometer Depth Movement Charts

The following images show the movement of the Blueslide Tunnel from 1948 to 2010. It is noted that the railroad tracks have been straightened or repaired numerous times in the past 62 years. The last straightening and repairs were done in 2009.





Not only does the movement of the Blueslide Tunnel affect the railroad, it also has the potential to affect Washington State Route 20 and the Pend Oreille County Public Utility District's major transmission line that runs on top of the mountain. A major slide into the river could also cause flooding and environmental damage.

According to the Pend Oreille Valley Railroad, the movement is getting larger each year.

Impacts

Some of the many direct and indirect impacts of landslides are:

- Human and animal deaths and injuries, and resulting productivity losses.
- Damage or destruction of structures.
- Destruction or blockage of roadways and resulting transportation interruption.
- Loss of, or reduced, land usage.
- Loss of industrial, agricultural, and forest productivity.
- Reduced property values in areas threatened by landslide.
- Loss of tourist revenues and recreational opportunities.
- Damage or destroyed infrastructure and utilities.
- Damming or alteration of the course of streams and resulting flooding.
- Reduced water quality.

In Pend Oreille County, landslides routinely affect road and railroad traffic. Figure 3.3.5 shows the landslide potential in Pend Oreille County, most of the northern areas are on the medium to high potential slope, with medium slopes throughout the County. The areas with least potential are in the mid-southern portion of the County.

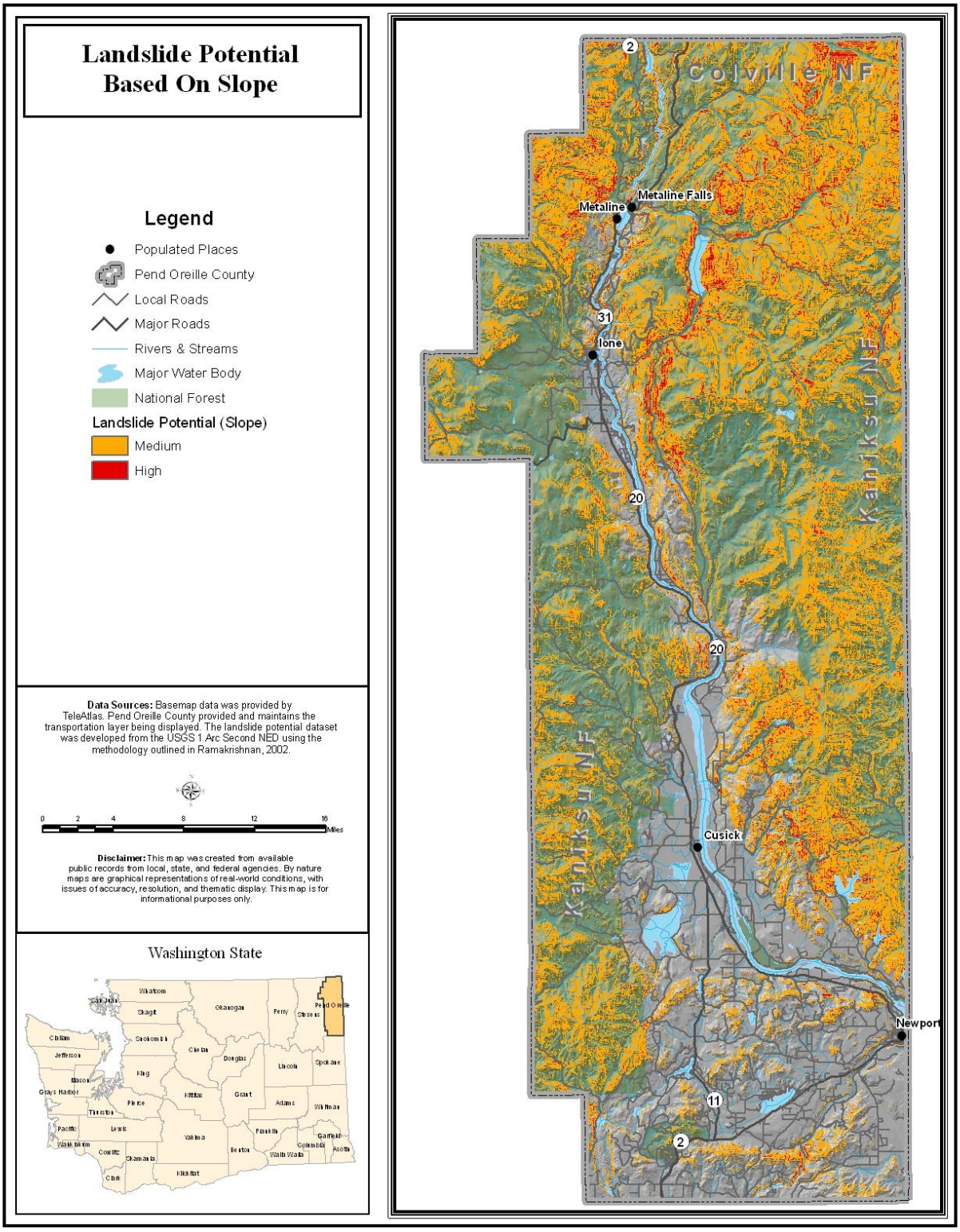
Loss Estimates

Losses from landslide events in Pend Oreille County come from clearing and repairing the roadways. There are 17 miles of roadway that are within ¼ mile of known landslide locations. If the landslide were severe enough to completely destroy the roadway, the cost of replacement would be in the $10,000,000's range. That scenario is unlikely and the annual cost of landslide damage is in the $10,000's range.

Vulnerabilities

The largest vulnerabilities to landslide events in Pend Oreille County are the transportation systems. Roads can become blocked, which impedes traffic. Of great concern is the blockage of the railroad, which provides a large economic benefit to business in the County.

Figure 3.3.5: Landslide Potential Map



Hazard Profile for Landslide

Repetitive Loss – Repetitive losses occur along the railroad track north of Ione, along Sullivan Lake Road and along Washington State Route 31 one mile south of Metaline.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 12

SNOW AVALANCHE

Description

Snow avalanches are common in mountainous terrain where heavy snowfall accumulates on steep slopes. Avalanches generally occur on slopes between 30 and 45 degrees with 38 degrees being the "ideal" slope for development of avalanche conditions. They are often categorized as either "loose snow" or "slab" types. While the exact moment of an avalanche cannot be predicted, avalanche conditions are readily recognizable, and avalanches tend to recur on the same slopes year after year.

Historical Frequencies

Washington State Route 20, which connects to US Interstate Highway 2 in Newport, is regularly closed from November to April due to heavy snowfall and is prone to avalanches by leaving over 20 feet of snow at times on the roadway[28].

The only avalanche death and injury recorded occurred on Saturday, April 5, 1997, when one snowmobiler was killed and another injured on South Baldy Mountain near Newport by an avalanche[29].

Impacts

It is common for avalanche impacts to be somewhat limited. Because avalanches usually occur in remote areas, the most frequent victims are recreational users of the slopes on which they occur.

Vulnerabilities

Of those who die in avalanches, approximately one third of the deaths are as a result of trauma, while the remaining two thirds are from suffocation. Trauma may be the result of being carried

[28] Pend Oreille AHMP, 2004.
[29] The Spokesman-Review. April 6, 1997.

into obstructions such as boulders and trees or over cliffs, or from rocks, trees, or large chunks of snow being carried downward at high speed. Avalanches may also damage or destroy structures, break power lines, block roadways and railroads, and damage trees and vegetation.

Loss Estimates

Losses due to avalanche in Pend Oreille County can be grouped into two categories, Loss of Life and Loss of Service. For Loss of life, there have been injuries and deaths attributed to avalanches in the County. Back country snow recreationists are particularly vulnerable. For Loss of Service, avalanches that flow over roadways can close the route for days, interfering with service to affected areas while the snow is cleared from the roadway.

Hazard Profile for Snow Avalanche

Repetitive Loss - none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
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4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
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3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 8

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SECTION 3.4: SEVERE WEATHER

2010 Revision Summary

The severe weather hazard section of the Plan has been augmented with new historic hazard data. The descriptions of the hazards have also been improved with more in depth descriptions.

The impact of weather hazards may be widespread (drought) or more localized (lightning), but all have the potential to be severe and directly life-threatening. Historical weather data is generally available in good detail, over long time periods, allowing for reasonably accurate risk assessment for planning purposes.

SEVERE WINTER STORM

Description

Severe Winter Storms was reported as one of the top five hazard threats in Pend Oreille County in the Local Mitigation Plan of 2004. Severe Winter Storms are a significant risk to life and property in all areas of the County. These storms may create conditions that disrupt essential regional systems, such as public utilities, telecommunications, and transportation routes. These storms may also produce rain, freezing rain, ice, snow, cold temperatures, and wind. Ice storms accompanied by high winds can have destructive impacts, especially to trees, power lines, and utility services. Heavy snowfall is characterized as 4 inches or more in a 12-hour period in non-mountainous areas, and 12 inches or more in a 12-hour period, or 18 inches or more in a 24-hour period in mountainous areas. Severe ice storms occur more frequently in areas exposed to the north winds blowing out of Canada. Severe freezes, where temperatures remain below freezing for five or more days, occur every three to five years in Pend Oreille County, while severe snow events occur less frequently, or about every 5 years. Widespread impacts from these weather hazards affect people and property in the County.

Weather patterns in Pend Oreille County are harsh, with Severe Winter Storms having historically hit the County on a regular basis. Air from the lower elevations, along the Columbia Basin, moves east toward the Selkirk Mountains resulting in a gradual increase in precipitation in the higher elevations in the County. This frequently causes storms that are accompanied by large amounts of ice, snow, and high winds. Late fall and winter brings winds and snowfall, which average 49.43 a year. In the spring, snow continues, along with much stronger winds and hail.

In reviewing the 2004 Plan and current weather information, it is common in Pend Oreille County to experience harsh weather conditions, particularly in the winter months. The National Weather Service (NWS) has rated Pend Oreille County one of the areas of the state most vulnerable to blizzards.

Blizzards are defined as having considerable falling and/or blowing snow that is combined with a sustained high wind, or frequent gusts of 35 mph or greater, often resulting in reduced visibility of less than one-quarter mile.

Historical Frequencies

Severe Winter Storms occur frequently in Pend Oreille County. The following Severe Winter Storm disaster declarations have been made for Pend Oreille County.

- 1152: November – December 1996
- 1159: December 1996 – February 1997
- 1641: January – February 2006
- 1682: December 2006
- 1825: December 2008 – January 2009

The loss of electricity is the largest concern during winter storms in the County. The following excerpts from newspapers detail loss caused by Severe Winter Storms in Pend Oreille County.

THE REGISTER-GUARD CITY/REGION FRIDAY, FEBRUARY 1, 2008

Washington governor declares emergency over severe weather

The proclamation will help 15 counties respond to heavy snowstorms

BY JOHN WILEY
The Associated Press

SPOKANE — Gov. Chris Gregoire declared a state of emergency Thursday for 15 counties, mostly in snowbound Eastern Washington, which has been nearly cut off from the state's west side by mountain avalanches and paralyzed by inability to get all the snow off streets and highways.

"The snowfall this month has been relentless and this proclamation will help counties with response efforts," Gregoire said in a statement.

A lengthy shutdown of Interstate 90 over Snoqualmie Pass, the main east-west route across the Cascade Mountains, was causing major disruption to the state's economy, the governor said. Transportation Secretary Paula Hammond said 7,000 trucks cross the pass each day, about one quarter of total traffic on the pass.

The pass was closed Wednesday afternoon after an avalanche and relentless snowfall. Transportation Department officials said it would remain closed at least until this morning. Crews were working to remove as much as 5 feet of snow that accumulated over the past five days.

The pass also was closed for 28 hours earlier this week by heavy snowfall and a different avalanche.

The governor's announcement, after briefings by municipal and county officials in Spokane, allows local governments and the state Transportation Department to bypass normal bidding requirements so they can quickly hire private companies to help with snow removal.

The emergency proclamation includes Spokane, Adams, Clark, Columbia, Kittitas, Klickitat, Lincoln, Okanogan, Pend Oreille, Skamania, Stevens, Walla Walla, Whitman, Yakima and King counties.

The governor noted that several Western Washington counties adjoining mountain passes are covered under her proclamation.

Highway 2 over Stevens Pass was closed for seven hours Thursday as crews cleared the wreckage of several tractor-trailer rigs. The other main winter route across the Cascades, White Pass, remained open Thursday with traction tires required on cars and chains on trucks.

The National Weather Service issued a heavy-snow warning for the west slopes of the Cascades, North Cascades and the Olympic Mountains until this morning with as much as 3 more feet of snow expected.

Winter storm warnings for accumulations of 8 to 14 inches of new snow through this afternoon were issued for the Palouse area south of Spokane.

December 4, 1996: "The Pend Oreille County Public Utility District reduced the number of customers without electricity from about 500 to 200 Tuesday with the help of several contract crews… PUD spokesman Mark Cauchy said it may take several more days to restore service completely because the remaining outages are widely scattered in the southern part of the county."[30]

December 2, 2001: "A punishing winter storm has left thousands of residents without electricity in Stevens and Pend Oreille Counties as well as in North Idaho. Utility officials are comparing the scope of the damage to the infamous ice storm of 1996 that left tens of thousands without power. Seventy-five percent of the Pend Oreille County Public Utility District's power grid wasn't functioning on Saturday."[31]

Return Interval

The return intervals for extreme winter storm events were calculated using the Log Pearson III method, which is frequently used to statistically predict hazardous event occurrences. Using this method, the Annual Maximum 24 hour Snowfall return interval was calculated. The data used to calculate the frequencies was taken from daily weather observations at the Newport Cooperative Weather Station for the years 1979 – 2009, a 30 year period. Unfortunately, wind data was not available to include in this analysis. Winter storms have a 2-3 year return interval.

[30] The Spokesman Review. December 4, 1996
[31] The Spokesman Review, December 2, 2001

Return Period	Probability (%)	Annual Maximum 24 Hour Snowfall (Inches)
1.05	95.20%	4
2	50%	7
5	20%	10
10	10%	11
25	4%	13
50	2%	15
100	1%	16
200	0.50%	18

Table 3.4.1: Severe Winter Storm Frequency

Impacts

The impacts of the very cold temperatures that may accompany a Severe Winter Storm are discussed above. Other life threatening impacts are numerous. Motorists may be stranded by road closures or may be trapped in their automobiles in heavy snow and/or low visibility conditions. Bad road conditions cause automobiles to go out of control. People can be trapped in homes or buildings for long periods of time without food, heat, and utilities. Those who are ill may be deprived of medical care by being stranded, or through loss of utilities and lack of personnel at care facilities. Use of heaters in automobiles and buildings by those who are stranded may result in fires or carbon monoxide poisoning. Fires during winter storm conditions are a particular hazard because fire service response is hindered or prevented by road conditions, and because water supplies may be frozen. Disaster Services may also not be available if telephone service is lost. People who attempt to walk to safety through winter storm conditions often become disoriented and lost. Downed power lines not only deprive the community of electricity for heat and light, but pose an electrocution hazard. Death and injury may also occur if heavy snow accumulation causes roofs to collapse.

Vulnerabilities

Severe Winter Storms frequently cause disruption of transportation and electrical service in Pend Oreille County. They also have the capability to cause substantial damage to structures.

Loss Estimates

Economic impacts arise from numerous sources including: hindered transportation of goods and services, flooding due to burst water pipes, forced closing of businesses, inability of employees to reach the workplace, damage to homes and structures, automobiles and other belongings by downed trees and branches, loss of livestock and vegetation, and many others.

Hazard Profile for Winter Storms

Repetitive Loss – none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 18

EXTREME COLD

Description

"Extreme Cold" is another of the terms describing hazards that must be defined relative to what is considered normal in a given locale. What might be considered Extreme Cold varies considerably in the State of Washington, where normal winter temperatures in the southwest are appreciably more moderate than those in the northwest and far north. Very cold temperatures become a particular hazard when accompanied by winds of 10 mph or greater. The National Weather Service (NWS) has developed a formula for calculating "wind chill" based on temperature and wind speed (see Figure 3.4.1). In this region the NWS issues wind chill advisories when the wind chill temperatures are predicted to be -10°F or less with winds of 10 mph or higher for one hour or more. Wind Chill warnings are issued when wind chill temperature will be -20°F or less with winds of 10 mph or higher for one hour or more. As with extreme heat, extreme cold is of greatest concern when the condition persists for an extended period of time.

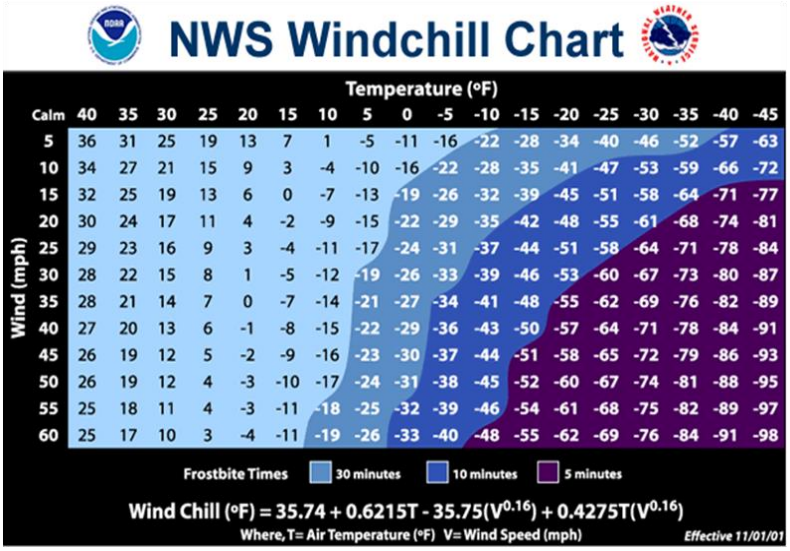


Figure 3.4.1: National Weather Service Windchill Chart

Historical Frequencies

A survey of historic cold weather data from the Newport Cooperative Weather Station shows annual minimum temperatures ranging between 5 and -30 degrees Fahrenheit. Temperatures in excess of -20 F degrees have caused an immense amount of additional load on the Pend Oreille County Public Utility District's electric grid because of increased electrical consumption. The

annual minimum temperature is shown in the figure below for the past twenty-nine years, listing annual minimums from 1979 to 2008.

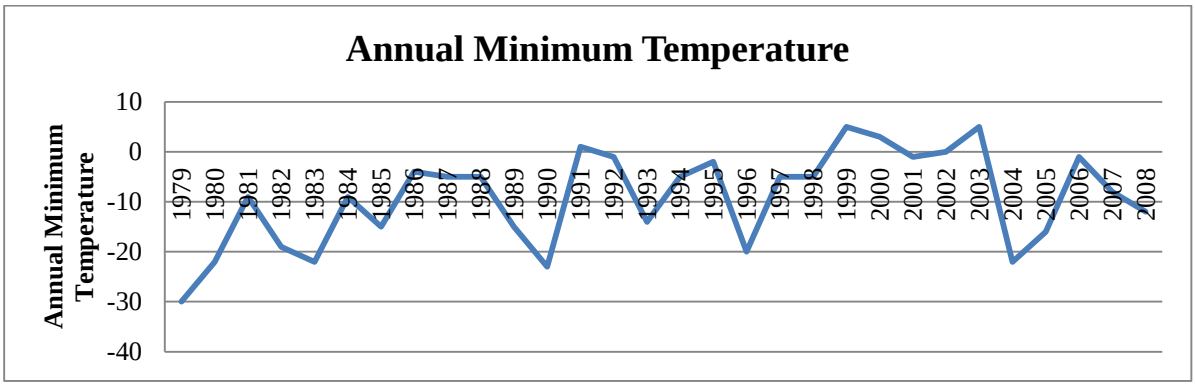


Figure 3.4.2: Annual Minimum Temperature

Return Interval

The return intervals for extreme cold events were calculated using the Log Pearson III method, which is frequently used to statistically predict hazardous event occurrences. Using this method, the Annual Minimum Temperature return interval was calculated. The data used to calculate the frequencies was taken from daily weather observations at the Newport Cooperative Weather Station for the years 1979 – 2009, a 30 year period.

Return Period (Years)	Probability (%)	Minimum Annual Temperature (Degrees Fahrenheit)
1.05	95.20%	-1
2	50%	-6
5	20%	-16
10	10%	-25
25	4%	-41
50	2%	-54
100	1%	-69
200	0.50%	-86

Table 3.4.2: Return Interval for Extreme Cold

Unfortunately, wind speed data wasn't available to include in a wind chill calculation. By comparing the frequency of minimum temperature events and the NWS Windchill Chart (Figure 3.4.1), it is apparent that extreme cold is a concern in Pend Oreille County. A 10 year event with no wind has a 30 minute frostbite time, and a 50 year event with no wind has roughly a 10 minute frost bite time. It is noted that in the past 30 years, the absolute minimum temperature is recorded at -30 ºF in 1979.

Impacts

Health effects of exposure to extreme cold include hypothermia and frostbite, both of which can be life-threatening. Infants and the elderly are most susceptible. In the United States, nearly 700 deaths are directly attributed to hypothermia annually. When temperatures reach -20 degrees Fahrenheit, a large amount of electrical consumption on the existing electric system occurs.

Vulnerabilities

When the temperatures remain extremely cold for multiple days under severe weather conditions that cause electrical outages, there is a danger of customers being separated from the power grid for several days until power can be restored. Under these conditions, the impacts would be far reaching if the affected customers were unable to get to an emergency shelter or other means of housing or lodging.

Loss Estimates

Extreme cold may cause loss of wildlife, vegetation, and kill livestock and other domestic animals. Economic loss may result from flooding due to burst pipes and diminished business activity. River flooding may take place as a result of the formation of ice jams.

Hazard Profile for Extreme Cold

Extreme cold affects the individual, families, cities, and the County. Damage typically occurs to individual properties, especially water systems; city water systems are also vulnerable to extreme cold. Repairs to water line freeze ups and breaks typically require the roadways to be excavated, necessitating additional maintenance and repairs during the warmer months. The record low temperature documented in Pend Oreille County is -41 ºF degrees for Newport, Washington on January 30, 1950 as recorded by the NWS in Spokane, Washington.

Extreme Cold can cause death and injury, especially to those working or stranded outside for prolonged periods. Economic loss is related to private individuals, businesses, and government agencies in heating homes and facilities. Additional losses can be expected to the livestock industry. During extreme cold periods, the schools are closed to protect children traveling to and from school.

During the spring, summer, and fall, temperatures can drop low enough to produce frost. While such temperatures are not low enough to damage infrastructure or require extra heating costs, they can be devastating to crops. Extreme minimum temperatures can fall below freezing much of the spring, summer, and fall.

Warning lead times in Pend Oreille County usually are a day or two, based on forecasts made from the National Weather Service in Spokane.

Repetitive Loss – Pend Oreille County does experience repetitive loss related to extreme cold events. The losses are primarily associated with freezing and breaking of municipal water lines. Economic losses are not repetitive.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 17

THUNDERSTORM, HAIL AND TORNADO

The National Weather Service (NWS) defines a severe thunderstorm as having large hail of at least 1 inch (2.5 cm), high winds of 58 miles per hour (93 km/h) or greater and producing tornadoes, or any combination of the three.[32] Prior to January 2010, the size in which hail in a severe thunderstorm would be considered severe was ¾ of an inch. The reason for the hail size upgrade in definition was public complacency due to both overly frequent issuances of severe thunderstorm warnings and recent studies stating that hail does not produce damage until it reaches one inch in diameter.

The NWS describes a tornado as, "a violently rotating column of air, usually pendant to a cumulonimbus, with circulation reaching the ground. It nearly always starts as a funnel cloud and may be accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena." Like hail, most tornadoes are spawned by supercell thunderstorms (see figure 3.4.3). They usually last only a few minutes, although some have lasted more than an hour and traveled several miles. Wind speeds within tornadoes are estimated based on the damage caused, and expressed using the Enhanced Fujita (EF) Scale.

F scale	Class	Wind speed		Description
		mph	km/h	
F0	weak	65-85	105-137	Gale
F1	weak	86-110	138-177	Moderate
F2	strong	111-135	178-217	Significant
F3	strong	136-165	218-266	Severe
F4	violent	166-200	267-322	Devastating
F5	violent	> 200	> 322	Incredible

Table 3.4.3:Enhanced Fuji (EF) Scale for Estimation of Tornado Wind Speeds

A severe thunderstorm warning means there is significant danger for the warned area. Occasionally, severe thunderstorms can and do produce a tornado without warning. [33] While not all severe thunderstorms produce tornadoes, they can produce serious wind damage as severe as a tornado. A severe thunderstorm warning can be

[32] http://www.crh.noaa.gov/dvn/?n=oneinchhail
[33] Howerton, Paul (2008-06-12). "Severe Thunderstorm Warning". *Iowa Environmental Mesonet NWS Product Archive*. http://mesonet.agron.iastate.edu/vtec/#2008-O-NEW-KICT-SV-W-0294.

upgraded to a tornado warning if a tornado is detected on radar or actually spotted. Generally, but not always, a severe thunderstorm watch or tornado watches will precede a warning.If a Tornado Warning is issued, based on Doppler Radar, it means strong rotation has been detected. Usually if a Severe Thunderstorm is producing weak rotation, it will only be a Severe Thunderstorm Warning; however, the public will usually be advised that this rotation has been detected, and the storm should be watched closely.

Figure 3.4.3: Thunderstorm Supercell

Historical Frequencies

Only 1 tornado and 1 funnel cloud have been recorded by the National Weather Service (NWS) in Pend Oreille County since 1958. The tornado was an F2 on the Enhanced Fujita Scale.

The following table, Table 3.4.4, shows Historic Thunderstorm Events, with details of the damage done by thunderstorms and hail[34].

Date	Hazards	Property Damage	Crop Damage
11/20/1962	Severe Storm/Thunder Storm - Wind	$13,158	$0
8/13/1963	Severe Storm/Thunder Storm	$1,282	$1,282
12/23/1964	Severe Storm/Thunder Storm - Winter Weather	$128,205	$0
7/27/1965	Severe Storm/Thunder Storm	$128	$13
12/4/1968	Severe Storm/Thunder Storm - Wind	$1,282	$0
6/8/1969	Severe Storm/Thunder Storm	$313	$313
7/28/1971	Severe Storm/Thunder Storm	$6,250	$6,250
8/30/1971	Hail - Lightning - Severe Storm/Thunder Storm - Wind	$3,125	$313
7/10/1975	Hail - Severe Storm/Thunder Storm - Wind	$8,333	$8,333
7/11/1975	Hail	$417	$417
7/12/1975	Severe Storm/Thunder Storm - Wildfire - Wind	$4,167	$4,167
7/14/1975	Hail	$417	$417
4/28/1980	Hail - Severe Storm/Thunder Storm - Wind	$10,000	$0
1/23/1982	Severe Storm/Thunder Storm	$13,158	$0
12/9/1987	Severe Storm/Thunder Storm	$1,282	$25
5/12/1988	Severe Storm/Thunder Storm - Wind	$4,167	$0
6/28/1992	Hail - Severe Storm/Thunder Storm - Wind	$41,667	$0
7/11/1998	Severe Storm/Thunder Storm - Wind	$20,000	$0

[34] SHELDUS Database. University of South Carolina. http://webra.cas.sc.edu/hvri/products/sheldus.aspx

Date	Hazards	Property Damage	Crop Damage
6/25/1999	Severe Storm/Thunder Storm	$5,000	$0
7/9/2000	Severe Storm/Thunder Storm - Wind	$50,000	$0
8/2/2004	Severe Storm/Thunder Storm - Wind	$1,000	$0
7/16/2005	Hail	$1,000	$0
7/1/2008	Hail	$1,000	$0
8/18/2008	Severe Storm/Thunder Storm - Wind	$0	$0
Total		**$315,350**	**$21,528**

Table 3.4.4: Historic Thunderstorm Events

Return Intervals

The return intervals for severe thunderstorm events were calculated by dividing the number of events by the number of years on record. Table 3.4.5 details the return interval with its accompanying annual probability of occurrence.

Number of Events	Number of Years on Record	Return Interval (Years)	Annual Probability
24	46	1.9	52%

Table 3.4.5: Thunderstorm Return Interval

Impacts

Deaths and injuries due to severe thunderstorms have occurred but are rare. Economic loss can be extensive, especially to agricultural based economies. Hail is very damaging to crops. Severe hail may cause extensive property damage including damage to vehicle paint and bodywork, glass, shingles and roofs, plastic surfaces, etc. Hail loss nationally is estimated at over one billion dollars annually.

Vulnerabilities

The most vulnerable assets to hail are agricultural crops and vehicles. Large hail can destroy crops and greatly affect the economy of the area. Car windows are especially vulnerable to severe hail storms, especially in large parking lots. Loss of utilities (primarily due to fallen trees) is common following severe thunderstorms or tornadoes and, depending on circumstances, communities might be deprived of almost any kind of goods and services including food, water, and medical care. Agriculturally, crop and livestock loss is also possible, as is loss of timber production.

Loss Estimates

Economic loss can be extensive, especially to agricultural based economies. Hail is very damaging to crops. Severe hail may cause extensive property damage, including damage to vehicle paint and bodywork, glass, shingles and roofs, plastic surfaces, etc. Hail loss nationally is estimated at over one billion dollars annually. Over the past 14 years (8 events) there has been $2,000 of damage reported due to hail storms. It is apparent that the loss is severely under

reported. In 1997, 1-3 inch hail was spotted in the Newport and Cusick areas, but no loss was reported.

Hazard Profile for Severe Thunderstorm

Repetitive Losses: None. There are no repetitive losses to individual properties from severe thunderstorms, though they do cause widespread damage frequently.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 11

FLASH FLOODING

Description

Flash flood is defined by NWS as "a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters." Flash floods differ from floods (discussed below under River Flooding) in the rapidity with which they develop. Floods generally develop over a period of several days, providing more warning time and time for preparation and evacuation. Flash floods occur with little or no warning. They may occur during thunderstorms due to rapid runoff from steep terrain, from areas where the soil is already saturated, or in urban areas where vegetation has been removed and pavement has replaced exposed soil. Flash floods may also arise as the result of dam failure (discussed below) or the breakup of ice jams.

Figure 3.4.4: Home destroyed by Flash Flood

Historical Frequencies

Flash floods occur with regularity in Pend Oreille County as they do in Eastern Washington, usually in dry wash areas during brief, intense rainstorms. In April of 1996 flash floods washed out sections of State Highway 20 between Ione and Metaline Falls and Sullivan Lake Road was also washed out in a number of places[35]. Flash flooding washed out a 300-foot section of the

[35] Spokane Spokesman-Review. April 25, 1996.

Sullivan Lake Road in the spring of 1997 washing out a 100-foot section of roadway and 200 feet of road shoulder on LeClerc Road in the spring of 1998.

A flash flood on April 13th 2008 devastated the trailer home shown in Figure 3.4.4. "It busted the paneling away from the house and poured over inside, took a lot of dirt and mud in," the owner commented. "The water swallowed up everything in its path, including abandoned cars, heavy appliances and even a barn. It pushed with such force that it even washed away a huge chunk of nearby road."[36]

Return Interval

The following table, Table 3.4.6, details the return interval for maximum annual 24 hour precipitation amounts. The baseline for a flash flooding event is based upon the precipitation that caused the May 1998 flooding, which recorded 2.5 inches of precipitation in a 24 hour period. This was between a 10 and 25 year event; probably a 15 year event.

Return Period	Probability (%)	Maximum Annual 24 Hour Precipitation (Inches)
1.05	95.20%	0.86
2	50%	1.43
5	20%	2.16
10	10%	2.18
25	4%	3.86
50	2%	4.83
100	1%	6
200	0.50%	7.42

Table 3.4.6: Flash Flood Pearson Log III Analysis

[36] Spokane Spokesman-Review. April 14th 2008.

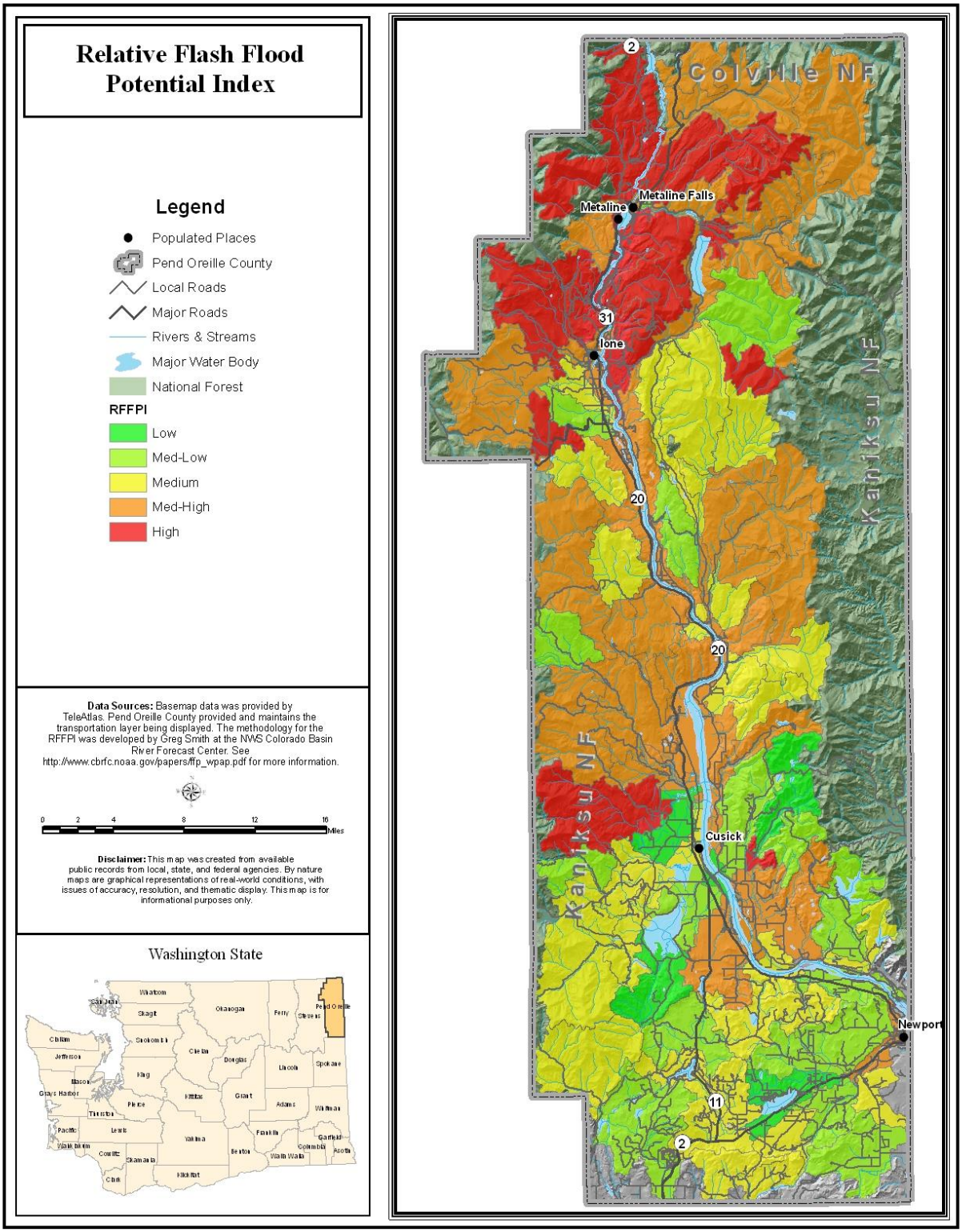


Figure 3.4.5: Relative Flash Flood Potential Index Map

Impacts

Because flash floods develop so rapidly, people on foot or in automobiles may be stranded or may be swept away and injured or drowned. They are characterized by high velocity water flow and large amounts of debris, both of which cause damage to or destroy structures and other objects in their path. Other impacts are discussed below under River Flooding.

Vulnerabilities

The following table lists the vulnerabilities in flash flood prone areas and their associated value. Losses were also calculated for a 1-foot flash flood event that includes structural and contents damage.

Facility	Address	Value	Structural Loss	Contents Loss	Total Loss
Ione					
500,000 Gallon Reservoir	Cedar Creek Rd	$475,500	$42,795	$32,096	$74,891
Metaline					
City Hall	101 Housing Drive, Hwy 6	$291,048	$26,194	$19,646	$45,840
Shop/Fire Hall	101 Housing Drive, Hwy 6	$103,605	$9,324	$6,993	$16,318
Selkirk School District					
District Office & Selkirk Senior/Junior High	10372 Hwy 31	$7,155,988	$644,039	$483,029	$1,127,068
Selkirk Elementary School	219 Park Ave	$1,902,093	$171,188	$128,391	$299,580
Elementary Gym/Bus Garage	201 Pend Oreille Blvd	$652,135	$58,692	$44,019	$102,711
Fire District #2					
Fire Station 21	13501 Sullivan Lake Rd	$92,083	$8,287	$6,216	$14,503
Pend Oreille County					
Cutter Theater (Listed on National Historic Register, includes outreach office for Pend Oreille County Counseling Services)	302 Park St.	$36,000	$3,240	$2,430	$5,670
Ione Transfer Station	1712 Sullivan Lake RD	$228,700	$20,583	$15,437	$36,020

Table 3.4.7: Flash Flood Critical Infrastructure

Loss Estimates

Losses from flash flooding were calculated using Geographical Information Systems (GIS) software. The parcels within medium-high to high flash flood prone areas were analyzed assuming a 1-foot flood depth and a 50 year event. The annualized loss for critical facilities is $34,452. The annualized loss for other structures is $148,191. The total annualized loss for flash flooding is $182,643.

Hazard Profile Flash Flood

Repetitive Loss: None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 13

STRAIGHT LINE WINDS

Description

The term "straight line wind" is used to describe any wind not associated with rotation, particularly tornadoes. Of concern is "high wind", defined by the NWS as, "sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration." Like tornadoes, strong, straight line winds are generated by thunderstorms and they can cause similar damage. Straight line wind speeds can approach 150 mph, the equivalent to those in an F3 tornado.

They are most often associated with both severe winter storms and summer thunderstorms. Downburst winds from a thunderstorm usually result when an area of air within the storm is cooled by chilly raindrops or hailstones, or by the evaporation of the raindrops, which quickly cools the air. This pocket of cooled air is heavier than the surrounding air and accelerates downward to the ground. As the cool air slams into the ground, it spreads out from the area of impact. The varied terrain in Pend Oreille County and the surrounding region can enhance downburst winds.

Historical Frequencies

The National Weather Service has forecasted that there is a 73% chance of high winds occurring annually in Pend Oreille County[37].

There have been 25 years over the past 48 years in which damaging wind events in Pend Oreille County have been recorded. It is apparent that damaging wind events occur frequently in Pend Oreille County, on an approximate 2 year basis.

[37] Pend Oreille County AHMP 2004.

SHELDUS, a hazard database maintained by the University of South Carolina, provided the following data about losses experienced due to high wind events[38]. High wind events occur on a yearly basis.

Date	Hazard Type	Property Damage	Crop Damage	Total Damage
9/28/1961	Wind	$128	$128	$256
12/21/1961	Wind	$1,282	$0	$1,282
4/27/1962	Wind	$128	$128	$256
11/25/1962	Wind	$1,316	$0	$1,316
10/24/1963	Wind	$1,282	$1,282	$2,564
1/19/1964	Wind	$1,282	$0	$1,282
2/5/1965	Wind	$2,941	$0	$2,941
2/27/1965	Wind	$128	$0	$128
5/16/1965	Wind	$128	$0	$128
10/5/1965	Wind	$128	$0	$128
1/29/1967	Wind	$1,282	$0	$1,282
2/17/1967	Wind	$1,282	$0	$1,282
3/9/1967	Wind	$128	$0	$128
3/16/1967	Wind	$128	$0	$128
3/23/1967	Wind	$128	$13	$141
10/3/1967	Wind	$128	$128	$256
3/22/1969	Wind	$1,282	$0	$1,282
9/12/1970	Wind	$128	$12,821	$12,949
2/24/1971	Wind	$0	$128	$128
3/26/1971	Wind	$12,821	$0	$12,821
1/11/1972	Wind	$12,821	$128	$12,949
2/16/1972	Wind	$12,821	$128	$12,949
3/6/1972	Wind	$333	$33	$367
2/19/1975	Wind	$1,282	$0	$1,282
5/16/1975	Wind	$10	$10	$20
5/18/1975	Wind	$385	$4	$388
11/15/1981	Wind	$128,205	$0	$128,205
5/13/1986	Wind	$3,571	$0	$3,571
12/9/1987	Wind	$12,821	$0	$12,821
11/23/1990	Wind	$12,821	$0	$12,821
10/16/1991	Wind	$416,667	$0	$416,667
9/12/1992	Wind	$3,571	$0	$3,571
4/3/1997	Wind	$2,000	$0	$2,000

[38] For more information about the SHELDUS Database visit: http://webra.cas.sc.edu/hvri/products/sheldus.aspx

Date	Hazard Type	Property Damage	Crop Damage	Total Damage
2/2/1999	Wind	$363,636	$0	$363,636
9/25/1999	Wind	$5,000	$3,333	$8,333
1/9/2000	Wind	$4,545	$0	$4,545
3/13/2001	Wind	$1,556	$0	$1,556
8/16/2002	Wind	$66,000	$5,040,000	$5,106,000
11/19/2003	Wind	$142,857	$0	$142,857
12/15/2006	Wind	$207,692	$0	$207,692
7/10/2008	Wind	$22,400	$0	$22,400
Total		**$1,447,045**	**$5,058,265**	**$6,505,310**

Table 3.4.8: Historic Straight Line Wind Losses

The following descriptions of historic wind events illustrate the damage that wind events can cause:

- September 6, 2009: "Mature Pines were uprooted along Highway 31 north and south of Metaline. Two, one and a half-foot diameter trees, were uprooted and 4 ten-inch diameter trees were snapped 15 feet up" near Ione.
- July 28, 2009: "Several trees were blown down on structures in Newport after a severe thunderstorm tracked through the area."
- August 18, 2008: Six miles west northwest of Diamond Lake "a man was killed after a tree fell on him during a thunderstorm. The man was trying to keep a dock from floating away during the high winds… Winds caused damage to several trees and knocked down power lines."
- July 13, 2007: "Several trees were knocked down with dozens of homeowners reporting damage to their homes and docks."
- June 21, 2005: "In Pend Oreille County, numerous power outages and downed trees were reported. A barn and a truck were damaged at the fairgrounds at Newport."[39]

Impacts

The impacts of straight line winds are virtually the same as those from tornadoes with similar wind speeds. The damage is distinguishable from that of a tornado only in that the debris is generally deposited in nearly parallel rows. Downbursts are particularly hazardous to aircraft in flight.

Vulnerabilities

Public power services can be affected by straight line winds. Winds knock limbs into power lines, frequently cutting electrical service for a number of residents for various amounts of time. This can be extremely dangerous if power outages occur during cold months.

Loss Estimates

[39] All of the event descriptions were taken from the NCDC Storm Event Database.

The annualized loss for straight line wind events is $135,527, though it is known that damages for these types of events are extremely under reported. It is noted that the crop damage from the August, 2002 event was in excess of $5 million. The next highest reported event was $416,667. If the August, 2002 event is excluded from the calculation, then the annualized loss is $29,152.

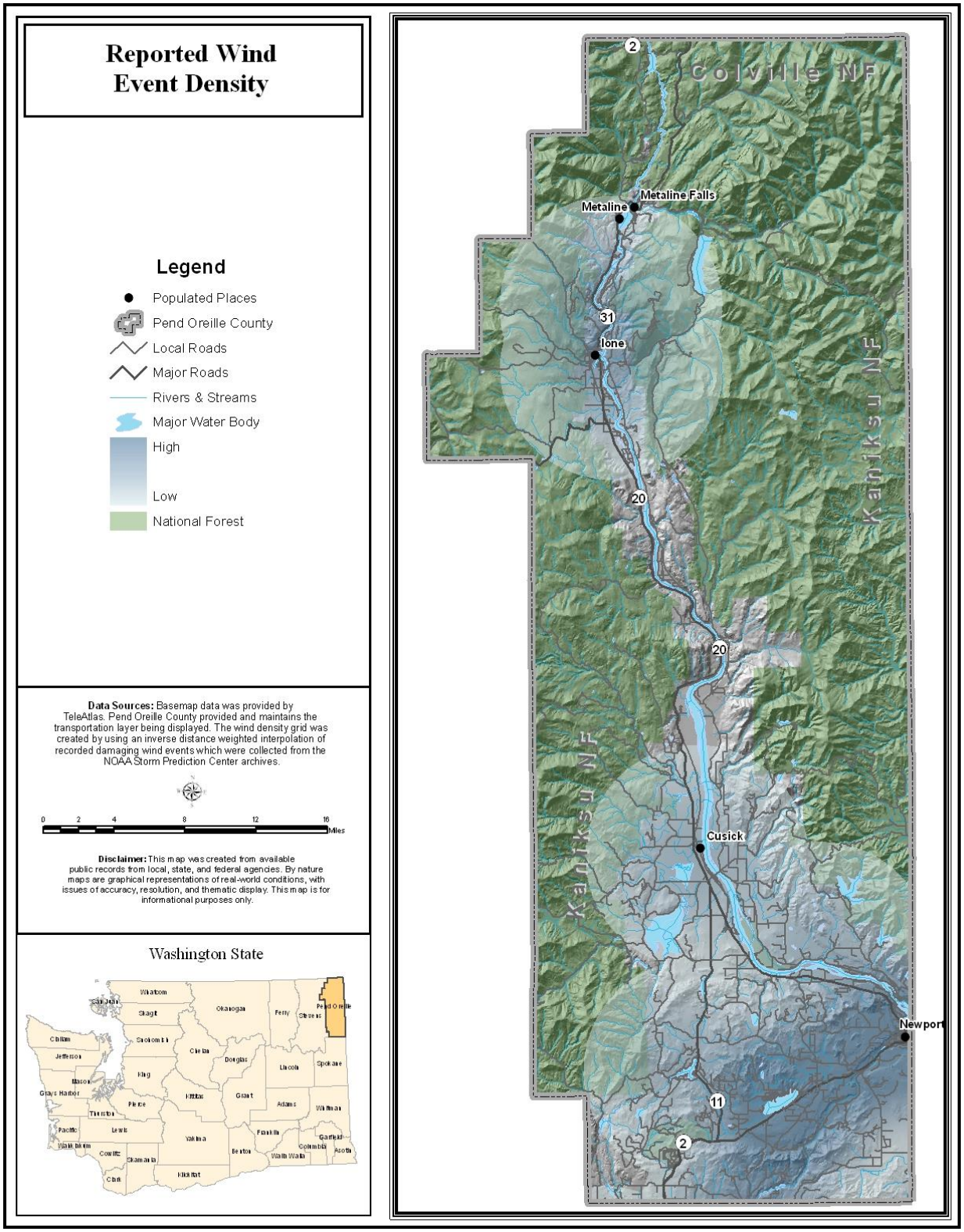


Figure 3.4.6: Damaging Wind Event Density Map

Hazard Profile for Straight Line Wind

Repetitive Loss – none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 11

DROUGHT

Description

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

It should be noted that water supply is not only controlled by precipitation (amount, frequency, and intensity), but also by other factors including evaporation (which is increased by higher than normal heat and winds), transpiration, and human use. According to the National Oceanic and Atmospheric Administration (NOAA) National Climactic Data Center (NCDC) much of the State of Washington most recently experienced moderate to extreme drought conditions from the years 2000 through 2005.

Figure 3.4.7 illustrates the precipitation conditions for Pend Oreille County using the Palmer Modified Drought Index. The data depicted is from the National Weather Service (NWS) and covers the years 1978 to the present. The Palmer Modified Drought Index (PMDI) is a means of quantifying drought in terms of moisture demands, versus moisture supply. Moisture demands include plant requirements and water needed for recharge of soil moisture supplies. An allowance is also included for runoff amounts necessary for recharging both ground water and surface water supplies, such as rivers, lakes, aquifers, and reservoirs. The PMDI balances the moisture demands against the moisture supply available.

The PMDI expresses this comparison of moisture demand to moisture supply on a numerical scale that usually ranges from positive six to negative six. Positive values reflect excess moisture supplies, while negative values indicate moisture demands in excess of supplies.

Unlike most states, Washington has a statutory definition of drought consisting of two parts[40]:

- An area has to be experiencing, or projected to experience, a water supply that is below 75 percent of normal.
- Water users within those areas will likely incur undue hardships as a result of the shortage.

The State of Washington issued a "drought emergency" on March 14, 2001, for all rivers in Washington. The 1993 drought in Washington State was the worst on record, although the 2001 drought came close to surpassing that drought.

Historical Frequencies

Figure 3.4.7 illustrates the precipitation conditions for Pend Oreille County using the Palmer Modified Drought Index. The data depicted is from the National Weather Service (NWS) and covers the years 1978 to the present. Table 3.4.9 illustrates the approximate cumulative frequency, in percentages and categories, of wet and dry periods in Pend Oreille County according to the Palmer Modified Drought Index. The Palmer Modified Drought Index (PMDI) is a means of quantifying drought in terms of moisture demands versus moisture supply. Moisture demands include plant requirements and water needed for recharge of soil moisture supplies. An allowance is also included for runoff amounts necessary for recharging both ground water and surface water supplies, such as rivers, lakes, aquifers, and reservoirs. The PMDI balances the moisture demands against the moisture supply available.

The PMDI expresses this comparison of moisture demand to moisture supply on a numerical scale that usually ranges from positive six to negative six. Positive values reflect excess moisture supplies, while negative values indicate moisture demands in excess of supplies.

[40] Washington State Department of Ecology, Publication # 06-11-001

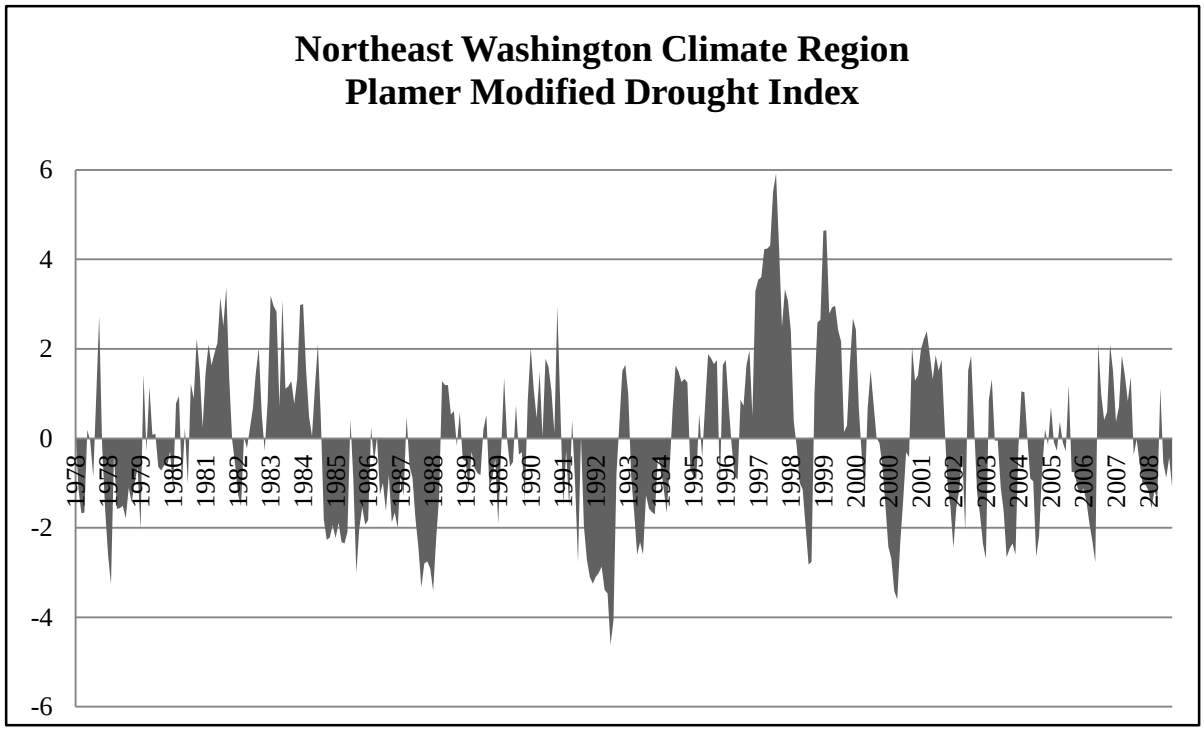


Figure 3.4.7: Palmer Modified Drought Index

Approximate Cumulative Frequency %	Category	Range PDMI
> 96	Extreme Wetness	> 3.50
90-95	Severe Wetness	2.50 – 3.49
73 – 89	Mild to Moderate Wetness	1.00 – 2.49
28 – 72	Near Normal	-1.24 - .099
11 -27	Mild to Moderate Drought	-1.25 - -1.99
5 – 10	Severe Drought	-2.00 – 2.74
1 – < 4	Extreme Drought	< -2.75

Table 3.4.9
PMDI Classes for Wet and Dry Periods

According to the State of Washington Hazard Mitigation Plan, Pend Oreille County has experienced drought conditions throughout its' history. From 1885 – 1995 the County was in a drought condition 10-15% of the time, from 1985 to 1995 the County was in a drought condition 5-10% of the time, and from 1976-1977 the County was in a drought condition > 50% of the time.[41] In 1977 the Governor of Washington, Booth Gardner, designated several counties, including Pend Oreille County, eligible for drought assistance. Federal Disaster Declaration #WA3037 was declared in March of 1977.

[41] http://www.emd.wa.gov/plans/documents/DroughtNov2007Tab5.3.pdf

In 1989, the Washington State Legislature assigned permanent drought relief authority to the Department of Ecology, enabling this agency to issue orders for declaring drought emergencies in the state.

In 2001, Governor Locke authorized the Department of Ecology to declare a statewide drought emergency. Washington was the first Northwest state to make a drought declaration that year.

On March 10, 2005, Governor Gregoire authorized the Department of Ecology to declare a statewide drought emergency. The declaration expired on December 31, 2005.

On June 3, 2010, Governor Gregorie and the Department of Ecology issued a statement that due to wetter than normal spring there would be no drought declaration in 2010 as projected.

Impacts

Drought is agriculture's most expensive, frequent, and widespread form of natural disaster. The current drought in the interior West is part of a multi-year drought that began in 1999, worsened in 2000, and has continued to present, with some interruptions in 2004. As a result, the drought in the West was slow to develop, and likewise, will be slow to recede.

Drought produces a complex web of impacts that spans many sectors of the economy and reaches well beyond the area experiencing physical drought. This complexity exists because water is integral to our ability to produce goods and provide services.

Impacts are commonly referred to as direct or indirect. Reduced crop, rangeland, and forest productivity; increased fire hazard; reduced water levels; increased livestock and wildlife mortality rates; and damage to wildlife and fish habitat are a few examples of direct impacts. The consequences of these impacts illustrate indirect impacts. For example, a reduction in crop, rangeland and forest productivity may result in reduced income for farmers and agribusiness; while increasing prices for food and timber, leading to unemployment, reduced tax revenues because of reduced expenditures, increased crime, foreclosures on bank loans to farmers and businesses, migration, and disaster relief programs. Direct or primary impacts are usually biophysical. Conceptually speaking, the more removed the impact from the cause, the more complex the link to the cause. In fact, the web of impacts becomes so diffuse that it is very difficult to come up with financial estimates of damages. The impacts of drought can be categorized as economic, environmental, or social.

Many economic impacts occur in agricultural and related sectors because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Vulnerabilities

Drought risk is based on a combination of the frequency, severity, and spatial extent of drought (the physical nature of drought), and the degree to which a population or activity is vulnerable to the effects of drought. The degree of a region's vulnerability depends on the environmental and social characteristics of the region and is measured by their ability to anticipate, cope with, resist, and recover from drought.

Society's vulnerability to drought is determined by a wide range of factors, both physical and social, such as demographic trends and geographic characteristics.

Loss Estimates

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect. Retailers and others who provide goods and services to farmers face reduced business. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue for local, state, and federal government. Less discretionary income affects the recreation and tourism industries. Prices for food, energy, and other products increase as supplies are reduced. In some cases, local shortages of certain goods result in the need to import these goods from outside the stricken region. Reduced water supply impairs the navigability of rivers and results in increased transportation costs because products must be transported by rail or truck. Hydropower production may also be curtailed significantly.

The following chart, in Figure 3.4.8, illustrates the net farm income in Pend Oreille County from 1970 through 2005. Note the income drops during the late 1970's when Washington declared a drought disaster, as well as counties neighboring Pend Oreille County. There is also significant income drops beginning in the early 1990's with no recovery.

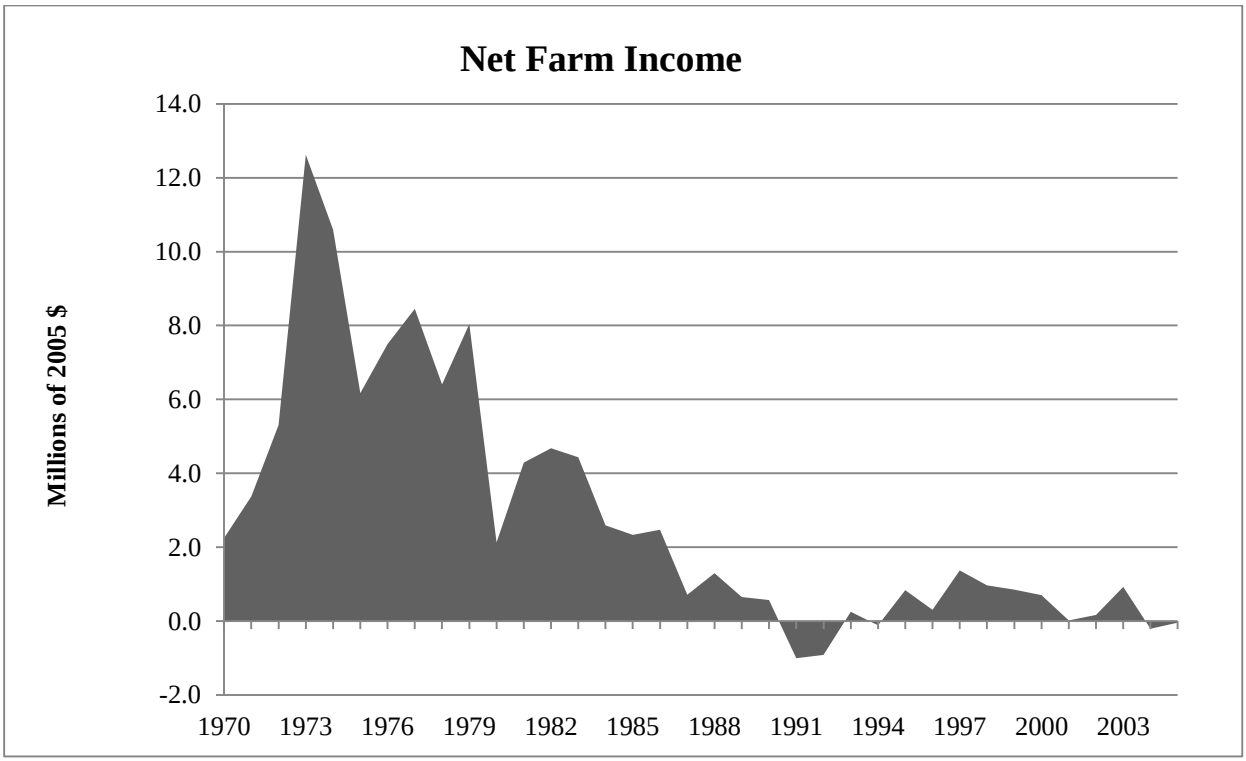


Figure 3.4.8: Net Farm Income

A drought affecting the communities of Ione, Metaline, Metaline Falls, and the unincorporated areas of the County would affect 50% of the population, while a drought in the Newport area would affect 20% of the population. The Cusick Floodplain and Diking District would see 75% of the population affected by a drought.

In 2001 and 2005 the State of Washington expenditures for drought response and recovery exceeded $7.9 million and $8 million, respectively.

Hazard Profile for Drought

Repetitive Loss

Pend Oreille County experiences repetitive loss due to drought. Losses are related primarily to crop production, hydroelectric power, and the associated economics. Other losses are linked to a loss of grazing capacity on public lands.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

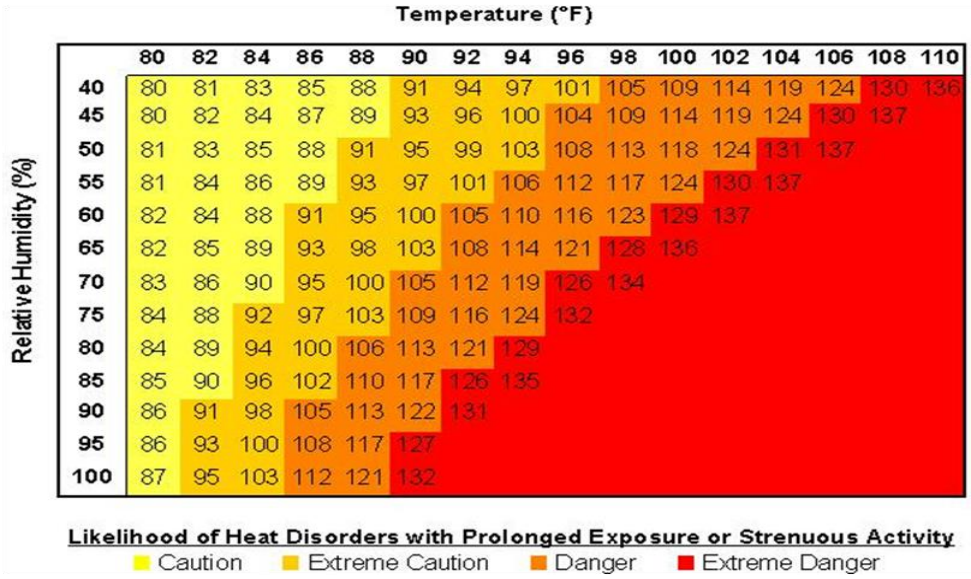
Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 15

EXTREME HEAT

Description

The term "Extreme Heat", sometimes called "heat wave", is to some extent a relative one. It describes a period when weather conditions include temperatures and humidity that are significantly higher than those usual for a particular geographic area. The National Weather Service (NWS) issues alerts to the public based on its Heat Index, which takes both temperature and humidity into account (see Figure 3.4.9). The NWS will initiate alert procedures when the HIGH is expected to exceed 105°F-110°F (depending on local climate) for at least two consecutive days. The effects of extreme heat are often exacerbated in large urban areas due to the heat island effect and because stagnant atmospheric conditions may trap pollutants. Extreme heat conditions are not common to Washington where, in general, humidity is low and weather patterns variable.



Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Figure 3.4.9: National Weather Service Heat Index Chart

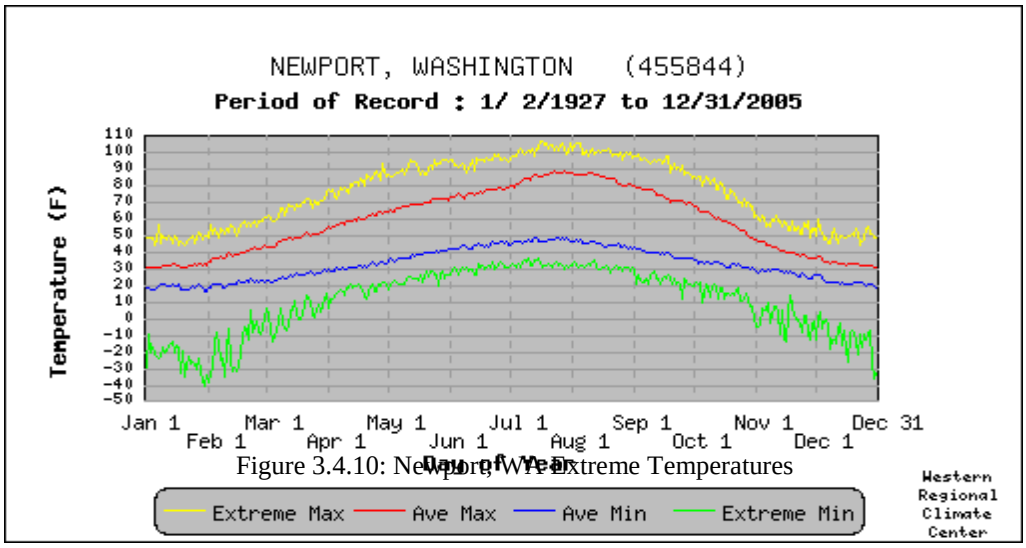


Figure 3.4.10: Newport, WA Extreme Temperatures

Historical Frequencies

The following chart shows the annual maximum temperature for the Newport Cooperative Weather Station for the years 1979 to 2008.

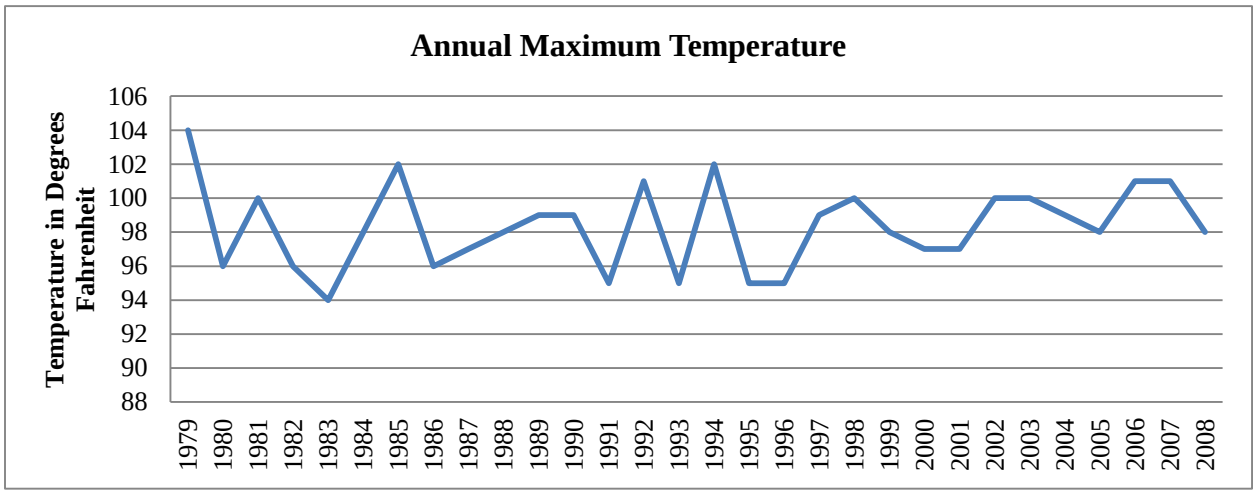


Figure 3.4.11: Newport, WA Annual Maximum Temperatures

Maximum temperatures range from 94 to 104 degrees Fahrenheit. The temperature has reached or exceeded 100 degrees 10 times in the past 30 years.

Return Intervals

The return intervals for extreme heat events were calculated using the Log Pearson III method, which is frequently used to statistically predict hazardous event occurrences. Using this method the Annual Maximum Temperature return interval was calculated. The data used to calculate the frequencies was taken from daily weather observations at the Newport Cooperative Weather Station for the years 1979 – 2009, a 30 year period. Based upon the frequencies and the chart in Table 3.4.10 extreme caution should be exercised on a yearly basis for extreme heat, and danger is present at the 100 year return interval. There is no data to suggest that Pend Oreille County will reach temperatures that fall into the extreme danger range.

Return Period (Years)	Probability	Temperature (Degrees Fahrenheit)
1.05	95.20%	94
2	50%	98
5	20%	100
10	10%	102
25	4%	103
50	2%	104
100	1%	105
200	0.50%	105

Table 3.4.10: Extreme Heat Return Interval

Impacts

The primary impact of extreme heat is on human health, causing such disorders as sunstroke, heat exhaustion, and heat cramps. Particularly susceptible are the elderly, small children, and persons with chronic illness. There are also undoubtedly indirect and chronic health effects from extreme heat, the magnitude of which are difficult or impossible to estimate. Environmental effects can include loss of wildlife and vegetation, and increased probability of wildfires.

Vulnerabilities

The magnitude of the effects of extreme heat is centered on the individual citizen. Shelters might be opened for the elderly and/or homeless who do not have a means of relief from the heat. Heat related illnesses could cause death if shelter and hydration are not provided. Because the higher elevations are typically five to ten degrees cooler than the valleys, extreme heat would most likely affect only that portion of the County at the lower elevations. Economic loss would primarily be related to the cost of energy consumption and to agricultural impacts. Extreme heat would exacerbate drought conditions and make response to wildfire more hazardous.

Loss Estimates

Extreme heat places high demand on electrical power supplies that can lead to blackouts or brownouts, which is not an issue in Pend Oreille County. Economic impacts result from such factors as increased energy prices, loss of business as people avoid leaving their homes to avoid the heat, and agricultural losses. The magnitude of these and other more indirect impacts is, again, difficult to assess, but for severe heat waves the loss is estimated to be in the billions to hundreds of billions of dollars.

Hazard Profile for Extreme Heat

Repetitive Loss – None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 14

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SECTION 3.5: BIOLOGICAL

COMMUNICABLE DISEASE

Description

Communicable Disease is defined as a disease that appears as new cases in the human population at a rate, during a given time period and location, that substantially exceeds the number expected. It is, thus, a relative term, and there is no quantitative criterion for designating a health crisis as an epidemic. In addition to its application to infectious diseases, the term is sometimes used to describe outbreaks of other adverse health effects, including those stemming from chemical exposure, sociological problems, and psychological disorders. A "pandemic" is a worldwide epidemic, while the term "outbreak" may be applied to more geographically limited medical problems as, for instance, in a single community rather than statewide or nationwide. The term "cluster" is often used with reference to non-communicable diseases.

Health agencies closely monitor diseases that have the potential to cause an epidemic, and seek to develop immunizations and eliminate vectors. While this effort has been remarkably successful, there are many diseases of concern. Since recognition of the disease in 1981, the HIV/AIDS pandemic is still not controlled, despite more than 25 years of effort.

Pandemic influenza versus regular influenza season

A flu pandemic has little or nothing in common with the annual flu season. A pandemic flu would be a new strain, and a much more serious and contagious flu virus. Humans would have no natural resistance to a new strain of influenza. Also, there is a vaccine for seasonal flu, but there is no vaccine available at this time for a pandemic flu.

Tri County District Health is currently working on a plan to limit the spread of a pandemic influenza, and to maintain essential health care and community services if an outbreak should occur. In fact, governments all around the world are preparing for the possibility of a pandemic outbreak.

Although the federal government is stockpiling large quantities of medical supplies and antiviral drugs, no country in the world has enough anti-viral drugs to protect their citizens. There currently is no vaccine to protect humans against a pandemic influenza virus; however, vaccine development efforts are under way to protect humans against the H5N1 bird flu virus.

Pandemic Flu

H5N1 "Bird Flu"

Efforts are currently underway to develop a vaccine to protect humans from the H5N1 Bird Flu virus. While it has so far affected few humans, there is the danger that the Bird Flu virus may mutate into a new form of human flu that would be easily spread person to person. Some migratory waterfowl carry the H5N1 virus with no apparent harm, but transmit the virus to susceptible domestic poultry. The highly lethal H5N1 outbreak among domestic poultry is widespread and uncontrolled and has directly infected a small number of humans. (See Figure 3.5.1)

People who have close contact with infected birds, or with surfaces that have been contaminated with droppings from infected birds, are at risk of becoming infected. In infected countries, poultry consumption has not been shown to be a risk factor if food is thoroughly cooked, nor are travelers in these countries at increased risk of infection, provided the person

does not visit live poultry markets, farms, or other environments where exposure to diseased birds may occur. More than 200 million birds in affected countries have either died from the disease or were killed in order to try to control the outbreak.

Many Asian countries are currently dealing with bird flu outbreaks (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam). Bird flu continues to spread geographically from its original focus in Asia. Further spread of the virus along migratory routes of wild water fowl is anticipated. So far, there has been no sustained person-to-person spread of the disease. However, a few isolated cases of human-to-human spread between family members are currently under investigation.

The reported symptoms of bird flu in humans range from typical influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches), to eye infections (conjunctivitis), pneumonia, acute respiratory distress, viral pneumonia, and other severe and life threatening complications. Diarrhea, vomiting, abdominal pain, chest pain, and bleeding from the nose and gums have also been reported as early symptoms in some cases. In many cases, health deteriorates rapidly leading to a high percentage of death in those infected.

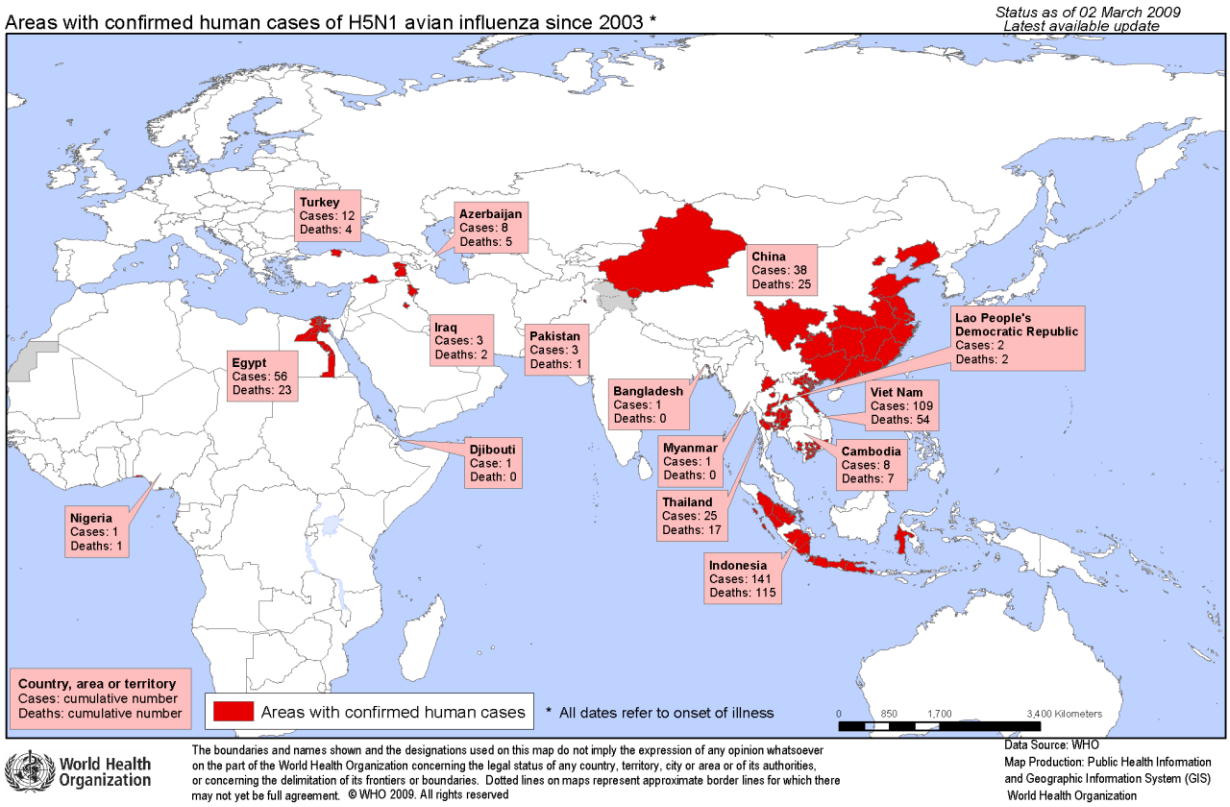

Figure 3.5.1: Reported Bird Flu Cases

The following countries that have reported cases of bird flu infection since 2003

-- Albania
-- Austria
-- Azerbaijan *(human cases confirmed)*
-- Bosnia and Herzegovina
-- Bulgaria
-- Burma
-- Cambodia *(human cases confirmed)*
-- Cameroon
-- China *(human cases confirmed)*
-- Croatia
-- Cyprus
-- Denmark
-- Egypt
-- France
-- Georgia
-- Germany
-- Greece
-- Hungary
-- India
-- Indonesia *(human cases confirmed)*
-- Iran
-- Iraq *(human cases confirmed)*
-- Italy
-- Japan
-- Kazakhstan
-- Kuwait
-- Laos
-- Malaysia
-- Mongolia
-- Niger
-- Nigeria
-- Poland
-- Pakistan
-- Romania
-- Russia
-- Serbia and Montenegro
-- Slovakia
-- Slovenia
-- South Korea
-- Sweden
-- Switzerland
-- Thailand *(human cases confirmed)*
-- Turkey *(human cases confirmed)*
-- Ukraine
-- Vietnam *(human cases confirmed)*

Humans Infected With Bird Flu
Azerbaijan
Cases 7
Deaths 5
Cambodia
Cases 4
Deaths 4
China
Cases 15
Deaths 10
Indonesia
Cases 29
Deaths 22
Iraq
Cases 2
Deaths 2
Thailand
Cases 22
Deaths 14
Turkey
Cases 12
Deaths 4
Vietnam
Cases 93
Deaths 42
Total Cases 184
Total Deaths 103
(The H5N1 virus was first detected in Hong Kong in 1997)[42]

42 http://www.medicalnewstoday.com/articles/40062.php

Severe Acute Respiratory Syndrome (SARS)

Severe Acute Respiratory Syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-Associated Coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months, the illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.

According to the World Health Organization (WHO), a total of 8,098 people worldwide became sick with SARS during the 2003 outbreak. Of these, 774 died. In the United States, only eight people had laboratory evidence of SARS-CoV infection. All of these people had traveled to other parts of the world where SARS was present. SARS did not spread more widely in the community in the United States.

In general, SARS begins with a high fever (temperature greater than 100.4°F [>38.0°C]). Other symptoms may include headache, an overall feeling of discomfort, and body aches. Some people also have mild respiratory symptoms at the outset. About 10 to 20 percent of patients have diarrhea. After 2 to 7 days, SARS patients may develop a dry cough. Most patients develop pneumonia.

The main way that SARS seems to spread is by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets (droplet spread) produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 3 feet) through the air and deposited on the mucous membranes of the mouth, nose, or eyes of persons who are nearby. The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose, or eye(s). In addition, it is possible that the SARS virus might spread more broadly through the air (airborne spread) or by other ways that are not now known.

Historic Epidemic/Pandemic Events

The 1918 -1920 Spanish Flu:

The first cases of Spanish Flu were reported in Washington State in October, 1918. Within three weeks, the disease was raging all across the state. The numbers of deaths in the state and in Pend Oreille County are unknown, but it is estimated that 675,000 Americans died in the United States during the epidemic and that 20 to 40 million people died worldwide.

Asian Flu 1957 -1958:

The Asian Flu was first identified in China; this virus caused roughly 70,000 deaths in the United States during the 1957-58 seasons. Because this strain has not circulated in humans since 1968, no one under 30 years old has immunity to this strain.

Hong Kong Flu 1968-1969:

The Hong Kong Flu was first detected in early 1968 and spread to the United States later that year. The Hong Kong Flu killed about 34,000 people in the United States and one million people worldwide.

Swine Flu – 2009

Novel Influenza A (H1N1) is a new flu virus of swine origin that was first detected in April, 2009. The virus is infecting people and is spreading from person-to-person, sparking a growing outbreak of illness in the United States. An increasing number of cases are being reported internationally as well.

It's thought that Novel Influenza A (H1N1) flu spreads in the same way that regular seasonal influenza viruses spread; mainly through the coughs and sneezes of people who are sick with the virus.

It's uncertain at this time how severe this Novel Influenza A (H1N1) outbreak will be in terms of illness and death compared with other influenza viruses. Because this is a new virus, most people will not have immunity to it, and illness may be more severe and widespread as a result. A new vaccine for the H1N1 flu virus has been developed, and distribution began in mid-October of 2009.

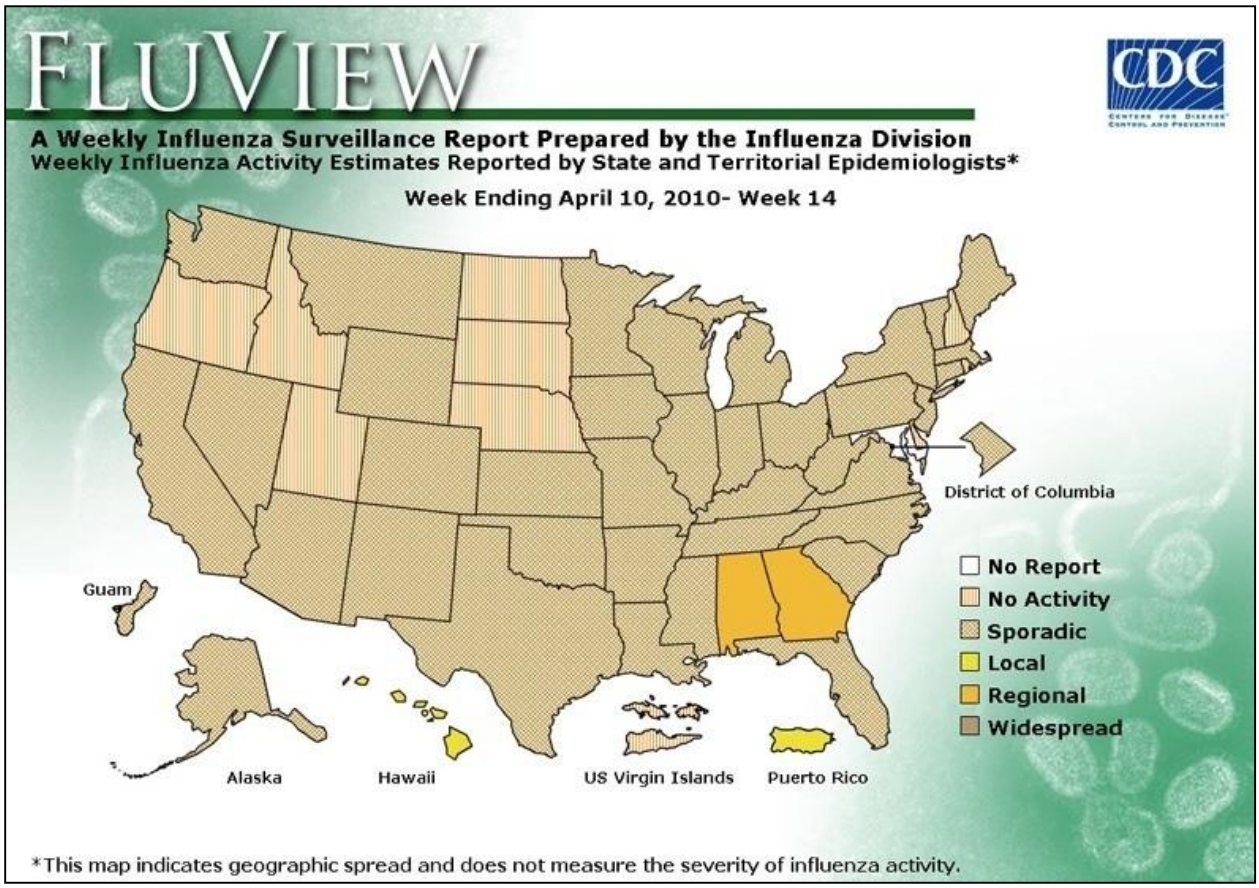

Figure 3.5.2: Swine Flu Estimates

Impacts

The following are potential impacts from a worldwide pandemic event. The impacts in Pend Oreille County would be similar on a local level.

- Rapid Worldwide Spread
- Health Care Systems Overloaded
- Medical Supplies Inadequate
- Economic and Social Disruption

Vulnerabilities

If a highly contagious virus begins to infect humans, it would likely cause widespread illness and death within a matter of months, and could last up to two years. The Centers for Disease Control and Prevention (CDC) predict that as much as 25% to 30% of the U.S. population could be sick, hospitalized, and many may die as a result of severe illness.

Loss Estimates

Historically, epidemics have claimed far more lives than any other type of disaster. While modern epidemiology and medical advances make the decimation of populations much less likely, new forms of diseases continue to appear. The potential, therefore, exists for an epidemic to cause widespread loss of life and disability, overwhelm medical resources, and have tremendous economic impacts.

Hazard Evaluation

Repetitive Loss - none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) VULNERABILITY –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) SPATIAL EXTENT –The geographical area of the community that might be impacted

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) MAGNITUDE (SEVERITY OF IMPACT) – Assessment of severity in terms of fatalities, injuries, property/economic losses

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 14

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SECTION 3.6: TECHNOLOGICAL & MANMADE HAZARDS

STRUCTURAL FIRE

Description

Structural fires produce high heat, toxic gases, and particulate material as smoke and soot. The heat produced or burning debris can, in turn, cause additional fires. Toxic gases and smoke are extreme hazards in the interior of burning structures and may also be a threat downwind of the structure. Where the building contents include toxic materials, the downwind threat can extend a mile or more. Burning structures may collapse, injuring persons inside or nearby, and floors or roofs may give way beneath those walking on them. Burning structures present electrical, explosion, and flashover hazards, and partially burned structures may, themselves, be physical hazards even after the fire is extinguished.

Historical Frequencies

The 2008 Washington State Fire Marshall Report details the number of incidents and loss reported by each fire district within the state. The following table summarizes the reported number of incidents and losses for 2008 for each fire district. It is noted that two districts reported no incidents, while three others do not show any incidents; this could be due to a lack of reporting. In 2008 there were almost $1.5 million in losses reported.

Department Name	Total Incidents Reported	Total Loss Reported
Pend Oreille #1*	0	$0
Pend Oreille #2	25	$355,000
Pend Oreille #3	191	$0
Pend Oreille #4	88	$405,000
Pend Oreille #5	6	$3,700
Pend Oreille #6	15	$205,100
Pend Oreille #7	6	$0
Pend Oreille #8	21	$5,000
Cusick Fire Department	0	$0
Ione Fire Department	0	$0
Metaline Fire Department	17	$0
Metaline Falls Fire Department	0	$0
Newport Fire department	41	$497,300
Kalispel Tribal Public Safety*	0	$0
Total	**410**	**$1,471,100**

Table 3.6.1: Structural Fire Losses 2008
* Fire agency submitted one or more no activity reports or a statement of no fire activity in 2008

Impacts

Indirect dollar losses, as is often the case, may be much larger than direct losses. Costs also include those for development and enforcement of fire codes, and maintaining fire response capabilities.

Vulnerabilities

Firefighters are at risk from such hazards as; physical exhaustion, cardiac stresses, heat exhaustion or heat stroke, acute and chronic health effects from toxic exposures, hearing damage, and injuries from many sources. Also, all critical facilities are at risk for structural fire.

Loss Estimates

In 2008, there were almost $1.5 million in property losses due to structural fires reported.

Hazard Evaluation

Repetitive Loss - None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 12

HAZARDOUS MATERIAL EVENT

Description

Substances that, because of their chemical or physical characteristics, are hazardous to humans and living organisms, property, and the environment, are regulated by the U.S. Environmental Protection Agency (EPA) and, when transported in commerce, by the U.S. Department of Transportation (DOT). EPA regulations address “hazardous substances” and “extremely hazardous substances”.

The EPA chooses to specifically list hazardous substances and extremely hazardous substances rather than providing objective definitions. Hazardous substances, as listed, are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. They are primarily chronic, rather than acute health hazards. Regulations require that spills of these materials into the environment, in amounts at or above their individual “reportable quantities”, must be reported to the EPA. Extremely hazardous substances, on the other hand, while also generally toxic materials, are acute health hazards that, when released, are immediately dangerous to the life of humans and animals, as well as causing serious damage to the environment. There are currently 355 specifically listed extremely hazardous substances listed along with their individual “Threshold Planning Quantities” (TPQ). When facilities have these materials in quantities at or above the TPQ, they must submit “Tier II” information to appropriate state and/or local agencies to facilitate emergency planning.

DOT regulations provide the following definition for the term "hazardous material":

> *Hazardous Material* means a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table (see 49 CFR 172.101), and materials that meet the defining criteria for hazard classes and divisions in part 173 of subchapter C of this chapter.

When a substance meets the DOT definition of a hazardous material, it must be transported under safety regulations providing for appropriate packaging, communication of hazards, and proper shipping controls.

In addition to EPA and DOT regulations, the National Fire Protection Association (NFPA) develops codes and standards for the safe storage and use of hazardous materials. These codes and standards are generally adopted locally, and include the use of the NFPA 704 standard for communication of chemical hazards in terms of health, fire, instability (previously called "reactivity"), and other special hazards (such as water reactivity and oxidizer characteristics). Diamond-shaped NFPA 704 signs, ranking the health, fire, and instability hazards on a numerical scale from zero (least) to four (greatest), along with any special hazards, are usually required to be posted on chemical storage buildings, tanks, and other facilities. Similar NFPA 704 labels may also be required on individual containers stored and/or used inside facilities.

While somewhat differently defined by the above organizations, the term "hazardous material" may be generally understood to encompass substances that have the capability to harm humans and other living organisms, property, and/or the environment. There is also no universally accepted objective definition of the term "hazardous material event." A useful working definition, however, might be framed as: any actual or threatened uncontrolled release of a hazardous material, its hazardous reaction products, or the energy released by its reactions that poses a significant risk to human life and health, property, and/or the environment.

Historical Frequencies

According to the Washington State Department of Ecology's (WSDOE's) hazardous materials release data base, there have been no hazardous materials released in Pend Oreille in the past 12 months.

Impacts

Because hazardous materials are so widely used, stored, and transported, a hazardous material event could take place almost anywhere. Further, many hazardous materials are used, stored, and transported in very large quantities, so that the impacts of an event may be widespread and powerful. Regulations and safety practices make such large scale events unlikely, but smaller scale incidents may have severe impacts, including:

- Human deaths, injuries, and permanent disabilities
- Livestock/animal deaths
- Destruction of vegetation and crops
- Property damage and destruction

- Pollution of groundwater, drinking water supplies, and the environment
- Contamination of foodstuffs, property, land, and structures
- Temporary or long-term closure of transportation routes and/or facilities
- Loss of business and industrial productivity
- Utility outages
- Clean-up and restoration costs
- Losses and inconvenience due to evacuation
- Loss of valuable chemical product

Vulnerabilities

The following table lists the critical facilities that lie within all of the Protective Action Distances (PAD) of Tier II facilities. Facilities that house populations are of specific concern. They are highlighted in yellow.

Facility	Address	Jurisdiction
Fire Station	1st & Monumental	Cusick
Community Building	121 1st St.	Cusick
Restrooms @ Boat Launch	1st St & Monumental	Cusick
Water Treatment Plant & Fencing	Riverside Ave & Tacoma	Cusick
Lift Station (Ben Nelson)	2101 Black Rd	Cusick
Lift Station (RR Tracks)	Monumental 100 ft E of RR tracks	Cusick
Lift Station (M. Koegh)	214 River Rd	Cusick
Town Shop	66 2nd Avenue	Cusick
Lift Station (Rhiney Stehr)	3rd St. - 100 ft W of River Rd	Cusick
City Hall	200 S Washington Ave	Newport
Fire Hall	2nd & Union	Newport
Schools	305 Monumental Way	Cusick School District
Storage Facility	100 W 2nd Street	Port of Pend Oreille
Railroad Satellite Office	137 S Newport Ave	Port of Pend Oreille
Railroad Office & Shop & Machine Shed	1981 Black Road, Usk	Port of Pend Oreille
Dalkena Station 41 & Training Bldg & Admin Bldg	11 Dalkena St	Fire District #4
Road District #2	13571 Hwy 21	Pend Oreille County
Cusick Sheriff Substation	103 Skookum St	Pend Oreille County
Usk Transfer Station	661 Jared Rd	Pend Oreille County
Newport Radio Transmitter	423 W 3rd	Pend Oreille County
Camas Learning Center	109 First St	Kalispell Tribe
Ponderay Newsprint Company	422767 Hwy 20	Major Employers
Newport Public Library	116 N Washington Ave	Library District
Newport Community Hospital	714 Pine Street	Hospital District

Table 3.6.2: Tier II Facilities

Loss Estimates

Losses from hazardous materials incidents include the loss of health and life. To determine the potential loss to residents, the population of residents within the PAD's was calculated using 2000 Census data.

Census Blocks	Population	Households
223	1512	602

Table 3.6.3: Tier II Population Affected

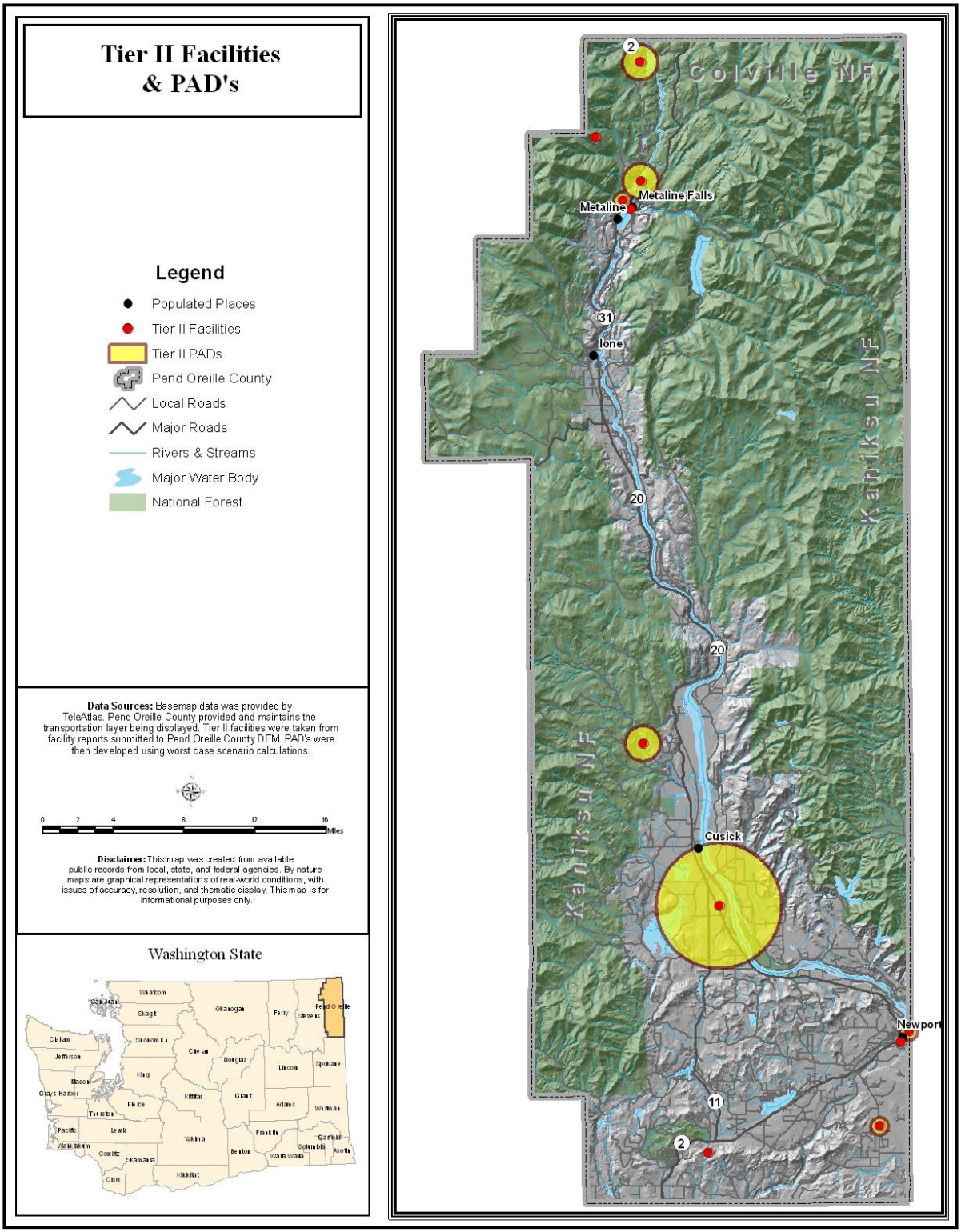

Figure 3.6.1
Tier II Facilities & PAD's

Hazard Profile for Hazardous Materials

Repetitive Loss - none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 12

DAM FAILURE

Description

Dam failure is the unintended release of impounded waters. Dams can fail for one or a combination of the following reasons:

- Overtopping caused by floods that exceed the capacity of the dam.
- Deliberate acts of sabotage.
- Structural failure of materials used in dam construction.
- Poor design and/or construction methods.
- Movement and/or failure of the foundation supporting the dam.
- Settlement and cracking of concrete or embankment dams.
- Piping and internal erosion of soil in embankment dams.
- Inadequate maintenance and upkeep.

Size Classification	Dam Height
Small Dam	Less than 15 feet
Intermediate Dam	15 feet or greater but less than 50 feet
Large Dam	50 feet or greater

Table 3.6.4:-Dam Size Classification

Failures may be categorized into two types: component failure of a structure that does not result in a significant reservoir release, and uncontrolled breach failure that leads to a significant release. With an uncontrolled breach failure there is a sudden release of the impounded water, sometimes with little warning. The ensuing flood wave and flooding have enormous destructive power. The Washington Department of Ecology (WSDOT) "RCW86.16.035, gives the Department of Ecology supervision and control over all dams and stream obstructions, and authorizes the making of regulations necessary for protection of life and property." The Department of Ecology is responsible for inspections of new dams, modified dams, and the periodic inspections of existing dams. The Department is also responsible for whatever actions they deem necessary to protect lives and property of downstream populations. Washington State experiences a dam failure on a frequency of approximately once every two years. These dam failures tend to be related to small privately owned dams, which are the result of a failure to

perform adequate maintenance and monitoring. There are thirty-nine dams in Pend Oreille County.

Dam Classifications (Compiled by the Association of State Dam Safety Officials-Washington State, July 2000)

"Dam means any artificial or combined artificial and natural barrier or controlling works, together with appurtenant works, which can or does impound or divert water.

Dam Height means the effective hydraulic height of a dam as measured by the vertical distance from the natural bed of the stream or watercourse at the downstream toe of the barrier to the maximum storage elevation.

For purposes of state regulation, jurisdictional dams are those with a maximum storage volume at the dam crest level of 10 or more acre-feet. An exemption is provided for low hazard dams with height 6 feet and under, to be determined by Department."

Historical Frequencies

There have been no recorded dam failures in Pend Oreille County.

Vulnerabilities

The following bridges are in the dam failure inundation zones. There are no critical facilities in those inundation areas.

Bridge ID	Name	Owner	Year Built	Traffic Count	Cost
WA000339	State Highway 31	Washington DOT	1927	1568	$761,500
WA000725	State Highway 31	Washington DOT	1950	1500	$3,893,000

Table 3.6.5-Bridges in Inundation Zone

Impacts

Metaline and Metaline Falls are the only incorporated communities affected by dam failure. Impacts include loss of property, economic loss, and injuries. There are no critical facilities in the inundation zones of high risk dams. Also, there are only 20 structures within the same inundation zones.

Dam Name	River or Stream	State ID	Purpose	Year Completed	Hazard Class	Crest Length (ft)	Dam Height (ft)	Storage (acre-ft)	Max Storage (acre-ft)	Max Discharge (cfs)
Baker Lake Dam	Tr-Deer Creek	PO 62-1314	I, R	1966	3	110	10	20	61	0
Big Meadow Lake Dam	Meadow Creek	PO 61-337	R	1974	3	700	12	500	500	0
Box Canyon Dam	Pend Oreille River	PO 62-13	H, R	1955	1A	200	106	60000	100000	350000
Cedar Lake Dam	Tr-Deer Creek	PO 62-46	I,R	1967	1C	280	19	21	50	0
Conger Lake Dam	Trimble Creek	PO 62-336	R	1926	3	75	22	50	150	0
Conger Pond Dam	Trimble Creek	PO 62-1292	R	1926	3	75	10	20	35	0
Decie Lake Dam	Tr-Little Spokane River	PO 55-1029	I,R	1960	3	190	22	25	33	0
Diamond Lake Aeration Lagoon No. 2	Tr-Little Spokane River-Offstr	PO 55-568	Q	1987	1C	800	17	51	61	20
Diamond Lake Aeration Lagoon No. 3	Tr-Little Spokane River-Offstr	PO 55-567	Q	1987	1C	1570	18	51	61	20
Diamond Lake Sewage Lagoon No. 1	Tr-Little Spokane River-Offstr	PO 55-1632	Q	1988	1C	500	16	10	12	20

Dam Name	River or Stream	State ID	Purpose	Year Completed	Hazard Class	Crest Length (ft)	Dam Height (ft)	Storage (acre-ft)	Max Storage (acre-ft)	Max Discharge (cfs)
Duncan Dam No. 1	Tr-Pend Oreille River	PO 62-45	I,R	1966	3	176	16	96	150	0
Duncan Dam No. 2	Tr-Pend Oreille River	PO 62-44	I,R	1966	3	325	18	95	150	139
Flying Goose Ranch-Wetland Dam No. 1		PO 62-1735	F, Q	1995	3	358	10	60	100	140
Heater Pond Dam	Tr-Pend Oreille River	PO 62-1290	P, R	1952	3	2000	10	18	40	0
Homestead Lake Dam	Tr-Ione Mill Pond	PO-55-35	R	1971	3	420	22	30	52	20
Ione Mill Pond	Big Muddy Creek	PO 62-333	R	1914	3	1050	35	500	557	0
Isabelle Lake Dam	Tr-Little Spokane River	PO 55-1028	I,R	1960	3	180	22	10	16	0
Kettwig Wildlife Dam	Spring Heel Creek	PO 55-385	F, R, S	1979	3	550	13	100	180	0
Koenig Dam	Tr-Otter Creek	PO 55-1014	R	1968	3	80	16	15	35	5
Little Spokane River Dam	West Branch Little Spokane River	PO 55-1293	R	1960	3	290	12	20	35	0

Dam Name	River or Stream	State ID	Purpose	Year Completed	Hazard Class	Crest Length (ft)	Dam Height (ft)	Storage (acre-ft)	Max Storage (acre-ft)	Max Discharge (cfs)
Locke Dam	Tr-Pend Oreille River	PO 62-19	C	1973	2	158	30	1000	1860	174
Lynda Lake Dam	Tr-Little Spokane River	PO 55-1027	I,R	1960	3	170	22	9	17	0
Marshall Lake Dam	Marshall Creek	PO 62-353	I,R	1912	1C	565	10	1292	1919	133
Metaline Falls Wastewater Lagoon No. 3	Offstream-Pend Oreille	PO 62-1823	O	1964	2	610	12	12	10	1
Mountain Meadows Lake Dam	Kent Creek	PO 62-30	R	1959	2	120	10	1000	1000	0
Pend Oreille County PUD Dam	Tr-Pend Oreille River	PO 62-1291	R	1973	3	250	18	15	18	0
Pend Oreille Mine-NE Tailings Dam	Offstream, Pend Oreille River	PO 62-641	T	2001	2	500	72	4000	4100	0
Pend Oreille Mine-NW Tailings Dam	Offstream-Pend Oreille River	PO 62-640	T	2002	2	800	67	4000	4100	0
Pend Oreille Mines Pond No. 1		PO62-1793		1977	3	1600	38	10	11	0
Ponderay Newsprint Mill Setting Lagoon	Pend Oreille River-Offstream	PO 62-598	Q	1989	3	2250	24	82	105	1

Dam Name	River or Stream	State ID	Purpose	Year Completed	Hazard Class	Crest Length (ft)	Dam Height (ft)	Storage (acre-ft)	Max Storage (acre-ft)	Max Discharge (cfs)
Power Lake Dam	North Fork Calispell Creek	PO 62-10	H	1922	1C	150	56	1000	1450	11300
Seattle City Light Boundary Hydroelectric Dam	Pend Oreille River	PO 62-9	H, R	1967	1A	740	340	95000	122000	360000
Sullivan Lake Dam	Harvey Creek	PO 62-12	H, R	1931	1A	210	32	29700	47000	4000
Tacoma Sportsman Pond	Tr-Tacoma Creek	PO 62-335	R	1954	3	50	10	12	50	0
Vaagen Mitigation Control Structure	Pend Oreille River-Offstream	PO 62-1688	C	1990	3	9	18	50	120	65
Willy O Lake Dam	Tr-Pend Oreille River	PO 62-1024	R	1959	3	1155	19	28	42	0
Woods Lake Dam	Tr-Little Spokane River	PO 57-1294	R	1930	3	225	7	35	35	0
Yergens & Anselmo Dam No.1	Tr-Pend Oreille River	PO 62-76	R	1970	3	245	15	45	51	47
Yergens & Anselmo Dam No.2	Tr-Pend Oreille River	PO 62-1025	R	1970	3	150	15	16	24	26

Table 3.6.6: Pend Oreille County Dams

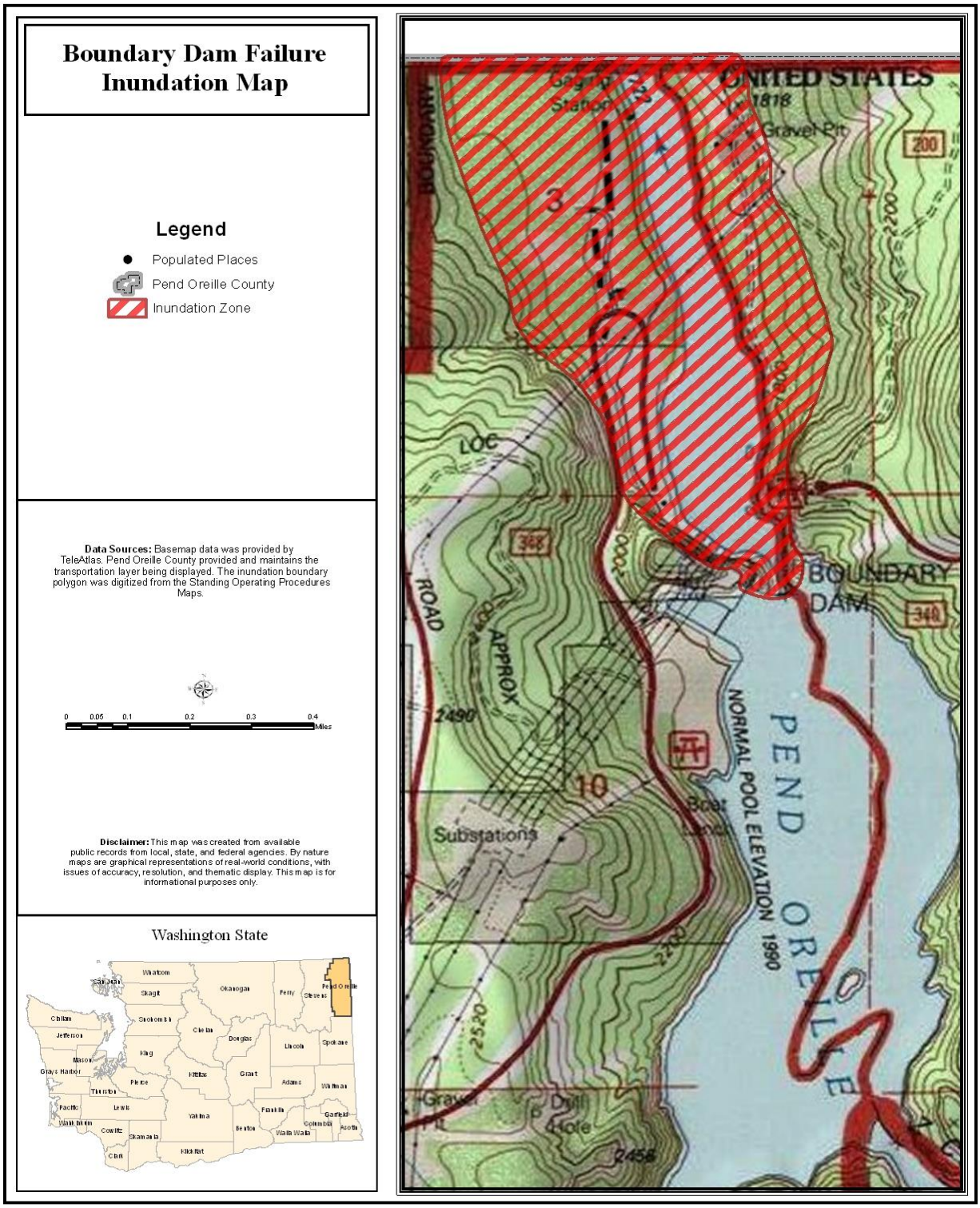

Figure 3.6.2: Boundary Dam Failure Inundation Map

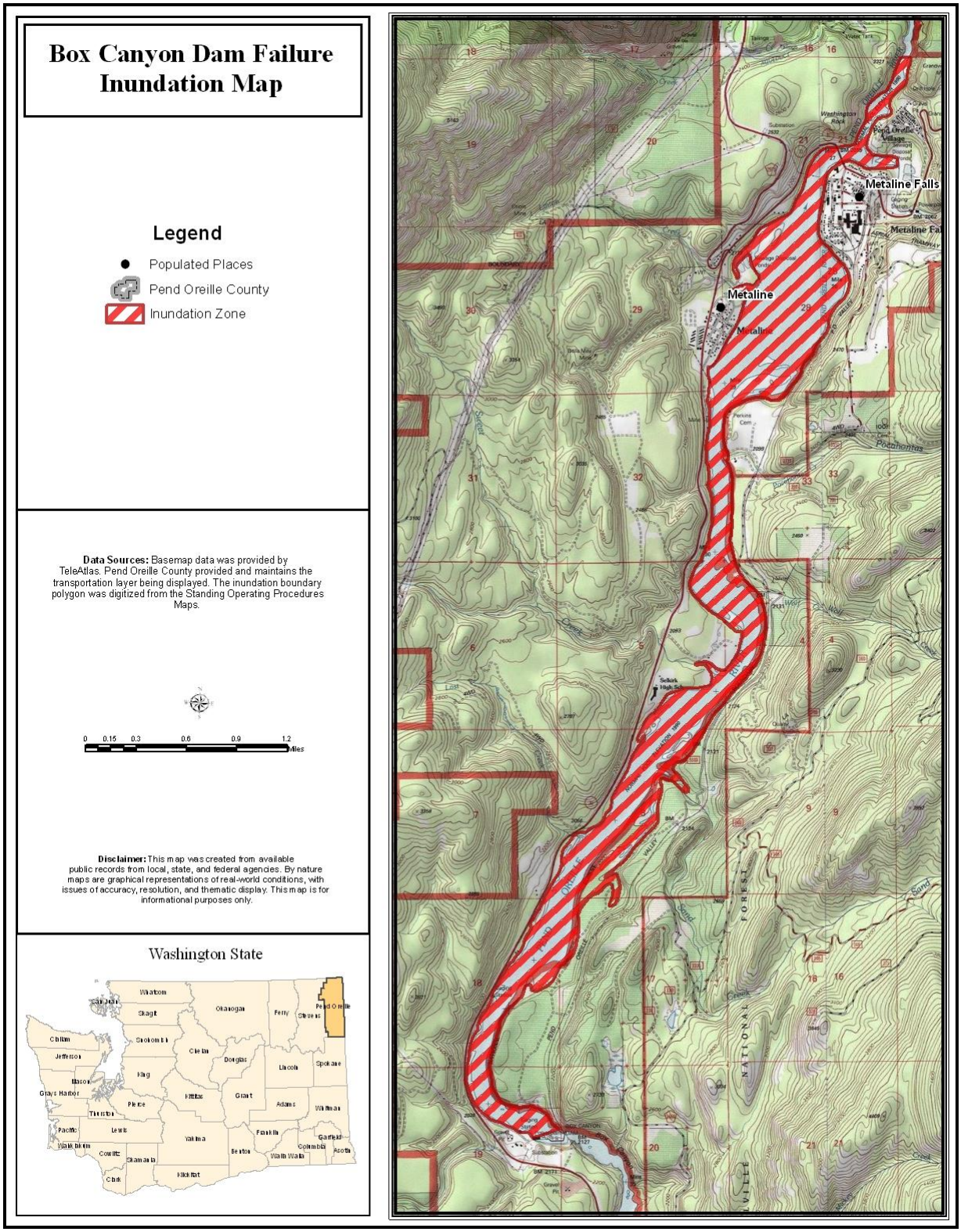

Figure 3.6.3: Box Canyon Dam Failure Inundation Map

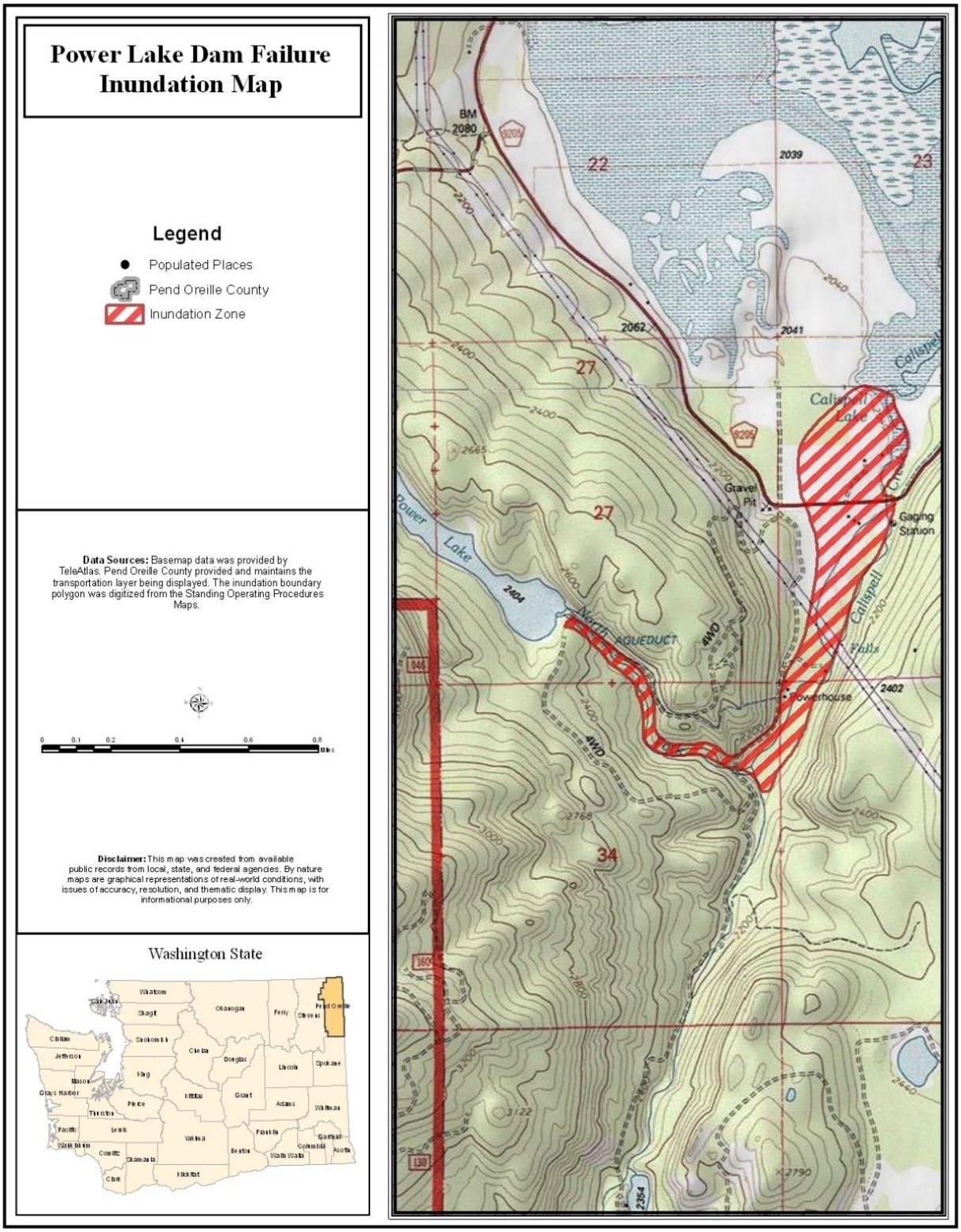

Figure 3.6.4: Power Lake Dam Failure Inundation Map

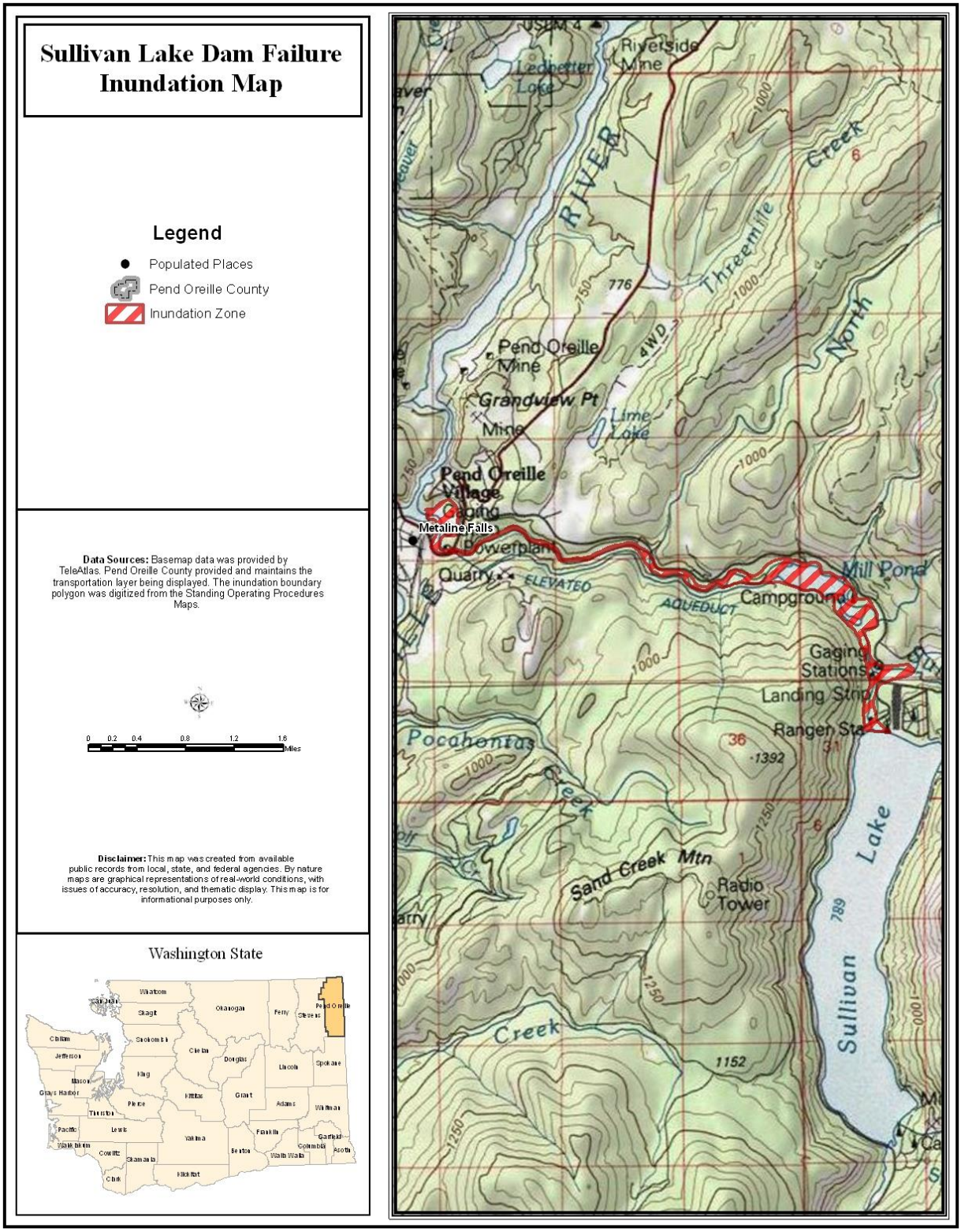

Figure 3.6.5: Sullivan Lake Dam Failure Inundation Map

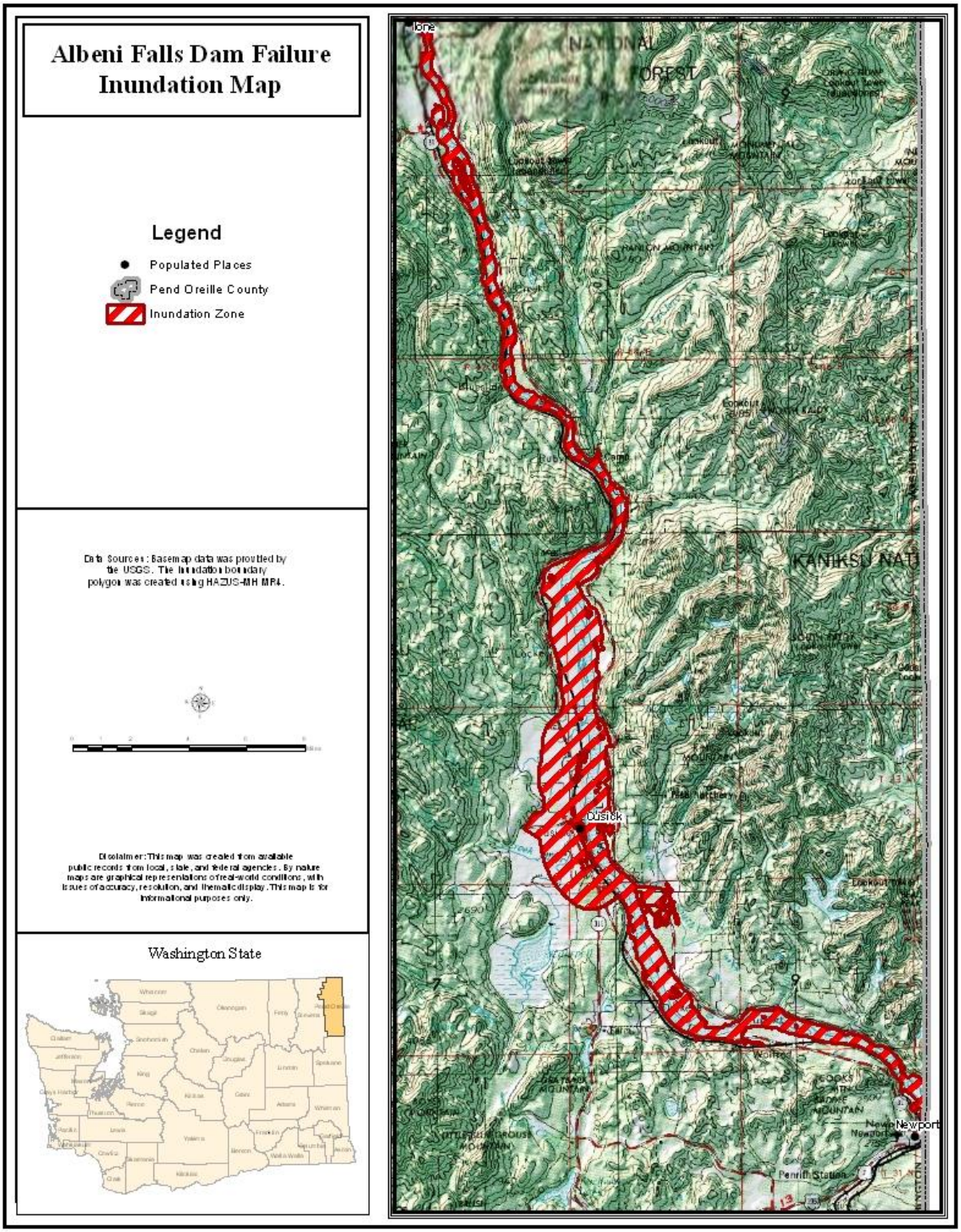

Figure 3.6.6: Albeni Falls Dam Failure Inundation Zone

Loss Estimates

The annualized loss estimate for dam failure, assuming a 500 year event and 5 foot flood depth, is $220,000.

Hazard Profile Dam Failure

Repetitive Loss: None

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 10

RIOT/DEMONSTRATION/CIVIL DISORDER

Description

State of Washington statutes define "riot" as (QUOTE):

Statute # RCW 9A.84.010

(1) A person is guilty of the crime of riot if, acting with three or more other persons, he or she knowingly and unlawfully uses or threatens to use force, or in any way participates in the use of such force, against any other person or against property.

(2) (a) Except as provided in (b) of this subsection, the crime of riot is a gross misdemeanor.
(b) The crime of riot is a class C felony if the actor is armed with a deadly weapon.

The State of Washington Statute referred to in HB 3286 by Representatives Schual-Berke, Pedersen, Appleton and Lantz-defines Civil Disorder as (QUOTE):

". . . any public disturbance involving acts of violence that is intended to cause an immediate danger of, or to result in, significant injury to property or the person of any other individual."

And Statue # RCW 9A.48.120 describes civil disorder training as (QUOTE):

"(1) A person is guilty of civil disorder training if he or she teaches or demonstrates to any other person the use, application, or making of any device or technique capable of causing significant bodily injury or death to persons, knowing, or having reason to know or intending that same will be unlawfully employed for use in, or in furtherance of, a civil disorder.

(2) Civil disorder training is a class B felony.

(3) Nothing in this section makes unlawful any act of any law enforcement officer that is performed in the lawful performance of his or her official duties.

(4) Nothing in this section makes unlawful any act of firearms training, target shooting, or other firearms activity, so long as it is not done for the purpose of furthering a civil disorder.

(5) For the purposes of this section:

> (a) "Civil disorder" means any public disturbance involving acts of violence that is intended to cause an immediate danger of, or to result in, significant injury to property or the person of any other individual.
> (b) "Law enforcement officer" means any law enforcement officer as defined in RCW 9A.76.020 (2) including members of the Washington national guard, as defined in RCW 38.04.010."

Riots are generally thought of as being spontaneous, violent events, whereas demonstrations are usually planned events and are usually intended to be non-violent. Riots seem often to be motivated by frustration and anger, usually over some real or perceived unfair treatment of some group. There are instances, however, where riots have begun during celebrations and other events where the only initiating factor seems to have been the gathering of a crowd of people. The potential for rioting, then, exists any time people gather, but a number of factors are associated with the increased probability that one will occur, including:

- Drug and alcohol use
- Youth of crowd members
- Low socio-economic status of members
- High level of emotions
- A history of rioting on the same or similar previous occasions
- Initiating event, person, or persons

Once violent or illegal activity is initiated, it escalates possibly, at least partly, because of the perception that, because all are acting together there is little probability that any given individual will be arrested or otherwise suffer consequences. Riots may range in scope from a very few people in a small area to thousands over an entire city. Once initiated, large riots are very difficult to suppress, particularly in the United States where law enforcement is constrained by constitutional guarantees as well as personnel limits. Early and decisive action by law enforcement may be effective in suppressing a riot, but police actions may also lead to further escalation.

Historical Frequencies

There have been no recorded riot events in Pend Oreille County.

Impacts

Riots may result in loss of life, injury, and permanent disability (to participants, bystanders, and law enforcement personnel). as well as looting, vandalism, setting fires, and other property destruction. Law enforcement, emergency medical services, and medical facilities and personnel, firefighting, and other community resources may be overwhelmed and unavailable to the community at large.

Vulnerabilities

Transportation routes may be closed, infrastructure and utilities damaged or destroyed, and public buildings attacked, damaged, or destroyed. Social and psychological effects may also cause great impacts. Lingering fear and resentment can be long-lasting and can greatly impair the ability of a community to function politically, socially, and economically.

Loss Estimates

If a riot were to occur, losses could include destruction of personal and public property and/or bodily harm.

Hazard Profile for Riot/Demonstration/Civil Disorder

Repetitive Loss - none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 5

TERRORISM

Terrorism is an unlawful act under both federal and State of Washington statutes. Definitions are as follows:

U.S. Code: Title 18: Section 2331. Definitions

(5) the term "domestic terrorism" means activities that -

(A) involve acts dangerous to human life that are a violation of the criminal laws of the United States or of any State;

(B) appear to be intended -

(i) to intimidate or coerce a civilian population;

(ii) to influence the policy of a government by intimidation or coercion; or

(iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and

(C) occur primarily within the territorial jurisdiction of the United States.

The Federal Emergency Management Agency (FEMA) gives the following as general information on terrorism[43]:

"Terrorism is the use of force or violence against persons or property in violation of the criminal laws of the United States for purposes of intimidation, coercion, or ransom.

Terrorists often use threats to:

- Create fear among the public.
- Try to convince citizens that their government is powerless to prevent terrorism.
- Get immediate publicity for their causes.

[43] http://www.fema.gov/hazard/terrorism/info.shtm

Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber attacks (computer-based); and the use of chemical, biological, nuclear, and radiological weapons.

High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail."

Acts of terrorism, then, are essentially the intentional initiation of the sorts of hazard events that have been discussed in previous sections.

Historical Frequencies

There are no recorded terrorism events in Pend Oreille County.

Impacts

Since the events of September 11, 2001, no citizen of the United States is unaware of the enormous potential impacts of terrorist acts. The emotional impacts; fear, dread, anger, outrage, etc., serve to compound the enormous physical, economic, and social damage. The continuing terrorist threat itself has a profound impact on many aspects of everyday life in this country and on the U.S. economy.

Vulnerabilities

Vulnerabilities are not provided due to security controls.

Loss Estimates

Projected loss estimates are not provided due to security controls.

Hazard Evaluation

Repetitive Loss - none

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
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3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

TOTAL SCORE = 12

SECTION 4: RISK ASSESSMENT

RISK ANALYSIS

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) SPATIAL EXTENT –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) MAGNITUDE (SEVERITY OF IMPACT) – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	4	4	3	18	H
Wildfire	3	4	3	3	4	17	H
Extreme Cold	3	4	4	4	2	17	H
River Flooding	3	4	3	2	3	15	H
Drought	2	4	4	4	1	15	H
Extreme Heat	2	4	4	2	2	14	H
Biological	1	1	4	4	4	14	H
Flash Flooding	3	4	2	2	2	13	H
Landslide	3	4	1	1	3	12	M
Earthquake	1	2	3	3	3	12	M
Thunderstorm	3	4	2	1	1	11	M
Straight Line Wind	3	4	2	1	1	11	M
Snow Avalanche	1	1	4	1	1	8	L
Volcano	1	1	2	1	1	6	L

Table 4.1: Natural Hazards Risk Assessment

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Structure Fire	3	4	1	1	3	12	M
Hazardous Materials	3	4	2	1	2	12	M
Terrorism	1	1	4	3	3	12	M
Dam Failure	1	1	3	2	3	10	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Table 4.2: Technology Hazards Risk Assessment

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions, as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

The severity Rankings were reviewed and approved by the Pend Oreille County Board of County Commissioners and representatives from the participating jurisdictions. The table below illustrates the severity ranking chart.

REPETITIVE LOSS SUMMARY

A specific category of repetitive loss properties are those that are insured under the National Flood Insurance Program (NFIP), and which have been the subject of repeated claims for flood loss damages. In the 2004 Mitigation Plan eight properties were designated as repetitive loss within Pend Oreille County. According to FEMA Region X, there are now only 2 repetitive loss properties that participate in the NFIP. Federal authorities consider the owner's names and street addresses of these properties to be confidential information. Specific information regarding the location and nature of the flood-related repetitive losses is available to the Committee members to facilitate identification of mitigation needs for these properties. To date, one of these properties has been the subject of mitigation actions taken to prevent future flood damages. There are many other repetitive loss properties that experience repetitive flooding which are not insured through the NFIP.

There are repetitive losses suffered from landslides in Pend Oreille County. The railroad tracks north of Ione experience yearly losses due to landslide debris that collects on the tracks. There are also areas of the tracks in the same location that experience repetitive damage by losing their base due to landslides.

Highway 31 just south of Metaline experiences repetitive landslide damage near milepost 11. Debris must be removed from this major transportation route on an annual basis. Losses at this location are heavily tied to loss of service and debris removal.

There are many other reoccurring hazards that affect Pend Oreille County and the participating jurisdictions. For these hazards there have been no repetitive loss properties identified. Severe Winter Storms, Thunderstorms, Flash Flooding, and Wildfire occur annually in the County at one degree or another. Because of the widespread nature of these hazards, and the various locales in which they occur there have not been any specific repetitive losses identified.

Risk Ranking Comparison

There have been changes made to the risk ranking in this Plan from the previous version. Some hazard categories were excluded in this revision because they are losses associated with hazards, rather than hazards themselves, or there is insufficient evidence to suggest that the hazard should be of any concern. The following were excluded from this Plan: Loss of Electrical Service, Telecommunications, Loss of Sewer Service, Key Employer Crisis, Economic Crisis, Loss of Gas Service, Storm Surge/Tsunami, and Subsidence/Expansive Soils. The following table compares the risk ranking of hazards in the 2004 Plan with those in this update.

Natural Hazards	2005 Rank	Total	2010 Rank
Winter Storm	1	18	1
Extreme Cold	Unranked	17	2
Wildfire	3	17	3
River Flooding	4	15	4
Drought	9	15	5
Extreme Heat	Unranked	14	6
Biological	11	14	7
Flash Flooding	Unranked	13	8
Landslide	5	12	9
Earthquake	6	12	10
Thunderstorm	8	11	11
Straight Line Wind	2	11	12
Snow Avalanche	Unranked	8	13
Volcano	10	6	14

Table 4.3: Natural Hazard Risk Ranking Comparison

There were some changes in the risk ranking in this update. The largest changes are in the hazards of terrorism, epidemic/pandemic, hail, volcanic activity, and straight line wind. Most of these changes came because of a more in depth analysis of the damage caused by hazards and their frequencies. Though most of the hazards changed rank, they stayed relatively close to their original position. Most of those differences can be attributed to the use of a different ranking methodology.

Technological Hazards	2005 Rank	Total	2010 Rank
Structure Fire	2	12	1
Hazardous Materials	1	12	2
Terrorism	3	12	3
Dam Failure	Unranked	10	4
Riot/Demonstration/ Civil Disorder	4	5	5

Table 4.4: Technology Hazard Risk Ranking Comparison

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SECTION 5: MITIGATION STRATEGY

SECTION 5.1: GOALS & OBJECTIVES

2010 Update Summary

The goals and objectives were updated to reflect changes in the priorities of the committee members and jurisdictions. Most of the changes were made to focus the goals and objectives to make them measurable. Also, specific goals to address flood and wildfire were added.

The Pend Oreille Hazard Mitigation Committee established a number of goals and objectives when the Plan was developed in 2004. These have been revisited in this Plan revision and updated to reflect changes in mitigation priorities by the participating jurisdictions. The goals and objectives in this Plan are designed to ensure that focused mitigation measures are implemented.

The goals selected by the Hazard Mitigation Planning Committee are related to the broad mitigation needs and capabilities of the communities involved, rather than addressing a specific hazard type or category of hazard. Therefore, the Pend Oreille County mitigation goals and objectives, by definition, are "multi-hazard" in scope and can be described as statements of the desired "mitigation-related capabilities" that will be present in each participating jurisdiction in the future as the goals are achieved.

The objectives are intended to create a specific framework to guide the development of proposed mitigation initiatives for incorporation into the Plan. The planning participants have associated each proposed mitigation initiative with the objective the initiative is intended to achieve. By associating a mitigation initiative with a specific objective, the proposed initiative helps to achieve the broader goal to which the objective corresponds. Proposing mitigation initiatives that are consistent with the selected objectives is a principal mechanism for the Mitigation Committee participants to achieve the stated goals of the mitigation planning program.

Goal 1: Pend Oreille County will reduce the impact of disasters on residential, public, and commercial structures.

Objective 1.1: Protect structures in flood prone areas through acquisition and/or relocation.

Objective 1.2: Retrofit existing structures to the International Building Code Seismic Standards

Objective 1.3: Protect public facilities from disruption of service during disasters.

Goal 2: Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.

Objective 2.1: Protect critical energy facilities and distribution lines.

Objective 2.2: Develop backup power sources for critical facilities.

Objective 2.3: Protect transportation and evacuation routes.

Objective 2.4: Protect critical water and sewer services.

Objective 2.5: Ensure continuity of government operations.

Goal 3: Pend Oreille County will improve its capability to initiate and sustain emergency response operations during and after a disaster.

Objective 3.1: Increase the capability of emergency services to identify and respond to disasters.

Objective 3.2: Protect communications systems and utilities serving emergency services.

Goal 4: Pend Oreille County will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.

Objective 4.1: Maintain the NFIP Requirements.

Objective 4.2: Examine the floodplain for accuracy with NFIP requirements.

Objective 4.3: Improve drainage systems.

Goal 5: Pend Oreille County will protect the health, safety, and welfare of citizens and visitors.

Objective 5.1: Ensure that evacuation and sheltering procedures are in place in the event of a disaster requiring evacuation.

Goal 6: Pend Oreille County will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.

Objective 6.1: Improve protection through the proper use of ordinances and codes.

Objective 6.2: Improve access to areas prone to wildfire.

Objective 6.3: Improve hazard communications tools.

Objective 6.4: Conduct roadside vegetation treatments to reduce flammable fuels immediately adjacent to roads in high risk areas.

Objective 6.5: Conduct fuel reduction projects.

SECTION 5.2: COMPLETED MITIGATION ACTIONS SUMMARY

The following table shows the projects that were previously identified. They are categorized by jurisdiction and aligned with the goals and objectives of the 2004 Plan. These projects were reviewed during the Plan update process to identify those that had been completed, those under way, and those that still need to be completed. Those projects that still need to be completed are incorporated with the Mitigation Projects in Section 5.3 of this Plan. The completed Mitigation Actions Summary for individual jurisdictions can also be found in Appendix 1.

Project	Responsible Entity	Cost	Hazard(s)	Complete d	Goal	Objective
Flood ordinance limits crawl space height to 5'-0" vertical. Eliminate this provision so structures can be raised above floodplain.	Pend Oreille County	$1,000	Flood	Yes	Residents of the community will have homes, institutions and places of employmen t that are less vulnerable to disasters.	Programs for removal, relocation, or retrofitting of vulnerable structures and utilities in hazard areas will be established and implemented, if resources and/or authorities to do so become available.
Elevate Usk Bridge above floodplain along with Kings Lake Road and McKenzie Road.	Pend Oreille County	$35,000,00 0	Flood	No	The availability and functioning of the community' s infrastructur e will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Transportation facilities and systems serving the community will be constructed and/or retrofitted to minimize the potential for disruption during a disaster.
Cusick Flats Flood Area Feasibility Study: Determine best cost effective and community acceptable approach to solve the flood problems in the Cusick Flats area including towns of Cusick and Usk.	Pend Oreille County, Town of Cusick	$125,000	Flood	No	The health, safety and welfare of the community' s residents and visitors will be less threatened by disasters.	Effective structural measures will be developed to protect residential areas from the physical impacts of disasters, whenever feasible.

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
Elevate, remove or relocate residential structures along Pend Oreille River from Newport to Metaline outside of Towns of Cusick and Usk.	Pend Oreille County	$20,000,000	Flood	No	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Residential structures will be removed or relocated from defined hazard areas whenever practicable, workable, affordable, and achievable.
Remove and/or relocate residences, businesses, and dikes in and around communities of Cusick and Usk, and Kalispel Lake.	Pend Oreille County	$40,000,000	Flood	No	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Residential structures will be removed or relocated from defined hazard areas whenever practicable, workable, affordable, and achievable.
Educate residents on defensible perimeters and reduction of fuel for fires.	Pend Oreille County	$50,000	Wildfire	Yes, Ongoing	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Effective structural measures will be developed to protect residential areas from the physical impacts of disasters, whenever feasible.
Purchase portable generators and control to power communities' water and sewer plants during outages. Install tie-in connections for generator at each facility.	Pend Oreille County	$1,500,000	Earthquake	No	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Facilities in the community posing an extra health or safety risk when damaged or disrupted will be made less vulnerable to the impacts of a disaster.

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
Replace District 3 Road Shop with new structure due to increase in snow load from 40 psf to 60 psf.	Pend Oreille County	$2,500,000	Severe Weather	No	The continuity of local government operations will gain increased protection from disruption by disasters.	Buildings and facilities used for the routine operations of government will be retrofitted or relocated to reduce the impacts of disasters.
LeClerc Road and Indian Creek Road line replacement.	Public Utility District	$96,200	Wildfire, Winter Storm	Yes	The availability and functioning of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Rocky Gorge Road Line Replacement	Public Utility District	$144,300	Wildfire, Winter Storm	Yes	The availability and functioning of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Calispel Creek Power Project: Increase the reliability of the headgate	Public Utility District	$110,000	Severe Weather, Earthquake, Flood, Wildfire	No	Residents of the community will have homes,	Programs for removal, relocation, or retrofitting of vulnerable

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
operation at Power Lake					institutions and places of employment that are less vulnerable to disasters.	structures and utilities in hazard areas will be established and implemented, if resources and/or authorities to do so become available.
Riverbend Water System: To aid in the current water capacity: build a 200,000 gallon reservoir, Increase pump intake, treatment system upgrade, and main line size upgrade. Additionally 1.0 miles of 8" main line (C-900), and 8 fire hydrants placed locally throughout the subdivision.	Public Utility District	$500,000	Flood, Wildfire, Severe Weather	No	The availability and functioning of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Discontinuance of water and sewer services because of a disaster will be reduced
Metaline Falls Water: To aid in current water capacity: build additional 1.0 million gallon reservoir placed upon rye field flats to balance fire flow.	Public Utility District	$2,000,000	Flood, Wildfire, Severe Weather	No	The availability and functionality of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Discontinuance of water and sewer services because of a disaster will be reduced

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
Flood Project at Cusick Substation.	Public Utility District	$336,000	Flood	No	The availability and functionality of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Retire 3 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Camden/Phay Roads to Allen Road.	Public Utility District	$314,000	Severe Weather, Wildfire	No	The availability and functionality of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along	Public Utility District	$157,000	Severe Weather, Wildfire	No	The availability and functioning of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
Horseshoe Lake Road.					disruption caused by a disaster.	
Retire 4 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line from Tweedy Road to Garrett Road.	Public Utility District	$258,000	Severe Weather, Wildfire	No	The availability and functionality of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Baker Lake Road.	Public Utility District	$97,000	Severe Weather, Wildfire	No	The availability and functionality of the community's infrastructure will gain increased protection, to the extent feasible, from destruction and disruption caused by a disaster.	Sources of energy normally used by the community will not be unwarrantedly vulnerable to the impacts of a disaster.
Newport Administrative Building Retrofit: Retrofit the old section of the Newport Headquarters Building to enable it to withstand a	Public Utility District	$1,032,000	Earthquake	No	The continuity of local government operations will gain increased protection from disruption by disasters.	Buildings and facilities used for the routine operations of government will be retrofitted or relocated to reduce the impacts of disasters.

Project	Responsible Entity	Cost	Hazard(s)	Complete d	Goal	Objective
major earthquake.						
Emergency Mobile Substation Distribution Transformer: Purchase an Emergency Mobile Substation Distribution Transformer in the event of the loss of a substation transformer due to equipment failure, lightning, terrorism, earthquake, and vandalism to restore service to electric customers as expeditiously as possible.	Public Utility District	$1,347,000	Severe Weather, Wildfire, Earthquake, Flood	No	The continuity of local government operations will gain increased protection from disruption by disasters.	Redundant equipment, facilities, and/or supplies will be obtained to facilitate reestablishing local government operations after a disaster, as the resources and/or authorities to do so become available.
Relocate and/or elevate structures & dikes in the Cusick Flats Floodplain	Town of Cusick	$40,000,000	Flood	No	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Residential structures will be removed or relocated from defined hazard areas whenever practicable, workable, affordable, and achievable.
Cusick Flats Flood Area Feasibility Study	Town of Cusick	$125,000	Flood	No	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Effective structural measures will be developed to protect residential areas from the physical impacts of disasters,

Project	Responsible Entity	Cost	Hazard(s)	Complete d	Goal	Objective
						whenever feasible.
Replace or strengthen roofs on Ione Maintenance Shop, Fire Station, and City Clerk's Office for increased snow loading.	Town of Ione	$600,000	Severe Weather	Yes	The continuity of local government operations will gain increased protection from disruption by disasters.	Buildings and facilities used for the routine operations of government will be retrofitted or relocated to reduce the impacts of disasters.
Cedar Creek Dam Removal: Remove old earth fill dam and silt materials behind the dam.	Town of Ione	$300,000	Dam Failure	Yes	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Effective structural measures will be developed to protect residential areas from the physical impacts of disasters, whenever feasible.
Stabilize approximately 300 feet along bank of Sullivan Creek below Lehigh Avenue, where stream has cut into bank below residential area.	Town of Metaline Falls	$250,000	Flood	In Progress	The health, safety and welfare of the community's residents and visitors will be less threatened by disasters.	Effective structural measures will be developed to protect residential areas from the physical impacts of disasters, whenever feasible.
Newport Water System Backup: The well fields directly to water mains with controls and construct additional million gallon storage tank.	City of Newport	$1,500,000	Earthquake, Wildfire, Severe Weather	No	The community will improve its capability to initiate and sustain emergency response operations during and after a disaster.	Utility and communications systems supporting emergency services operations will be retrofitted or relocated to reduce the impacts of disasters.

Project	Responsible Entity	Cost	Hazard(s)	Completed	Goal	Objective
Stabilize slide areas and protect railroad tracks from falling rocks.	Port of Pend Oreille	$1,400,000	Landslide, Avalanche	On-Going	The economic vitality of the community will be less impacted by a disaster.	Components of the infrastructure needed by the community's businesses and industries will be impacted less from disasters.
Install new roofs on school buildings due to increase in snow loads from 40 psf (pounds per sq foot) to 60 psf.	Cusick School District	$4,100,000	Severe Weather	No	Residents of the community will have homes, institutions and places of employment that are less vulnerable to disasters.	The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized.
Install new roofs on school/buildings due to increase in snow loads from 40 psf (pounds per sq foot) to 60 psf.	Selkirk School District	$3,800,000	Severe Weather	No	Residents of the community will have homes, institutions and places of employment that are less vulnerable to disasters.	The vulnerability to disasters of schools, libraries, museums, and other institutions important to the daily lives of the community will be minimized.

Table 5.2.1: Completed Mitigation Actions Summary

SECTION 5.3: MITIGATION PROJECTS

Hazard Mitigation is defined as any cost-effective action(s) that has the effect of reducing, limiting, or preventing vulnerability of people, culture, property, and the environment to potentially damaging, harmful, or costly hazards. Hazard mitigation measures which can be used to eliminate or minimize the risk to life, culture and property, fall into three categories:

1) Keep the hazard away from people, property, and structures.
2) Keep people, property, or structures away from the hazard.
3) Reduce the impact of the hazard on victims, i.e., insurance.

The Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan (AHMP) has identified key strategies that fall into all three categories.

- Hazard mitigation measures must be practical, cost effective, and culturally, environmentally, and politically acceptable. Actions taken to limit the vulnerability of society to hazards must not in themselves be more costly than the anticipated damages.
- The primary focus of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan (AHMP) has been to identify the point at which capital investment and land use decisions are made, based on vulnerability, or in other words where capital investments can be made to reduce the risk posed to the County from hazardous events. Capital investments for mitigation projects, whether for homes, roads, public utilities, pipelines, power plants, or public works, determine to a large extent the nature and degree of hazard vulnerability reduction in a community.
- Previously, mitigation measures have been the most neglected programs within emergency management. Since the priority to implement mitigation activities is usually very low in comparison to the perceived threat, some important mitigation measures take time to implement. Mitigation success can be achieved, however, if accurate information is portrayed through complete hazard identification and impact studies, such as those presented in the previous sections that are followed by effective mitigation management. Hazard mitigation is the key to eliminating long term risk to people, cultures, and property.

Prioritization Process

Initial prioritization of the Mitigation Projects occurred at the Local Mitigation Workshop where representatives from the Counties and the participating cities came together to approve the risks severity ranking, the goals, and associated projects. (See Attachment 1 for meeting minutes). The projects were selected based on the goals and related objectives of the AHMP. The basic tenets of the process, as discussed in the scope and mission statement of this Plan, was life safety first, protection of critical infrastructure second, and reduction of repetitive loss third. Those projects that were selected, listed, and then road-mapped as the four highest priority projects were selected based on the following criteria:

- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Benefit / Cost
- Vulnerability to the Community
- Population Benefit

- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Potential project effectiveness and sustainability
- Potential to mitigate hazards to future development

The responsible jurisdictions have the final voice in the approval process, as do the County Commissioners, in that they are responsible for the personnel, financial resources, or seeking out the financial resources to perform the mitigation work.

Ongoing Prioritization Process

Differing prioritization processes will occur within the County and the participating cities after the AHMP is adopted and then becomes a living document with annual evaluation and updating.

The prioritization process will continue to be based on the three basic tenets of Mitigation Planning: 1) Save lives, 2) Protect critical infrastructure, and 3) Eliminate repetitive loss.

The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent, or more, in benefits over the life of the project when compared with the costs. Projects that are approved by local jurisdictions will be administered by the local jurisdictions, unless the County is specifically asked to administer the project(s). Overall administration coordination, when applicable, will be provided by the County Emergency Management Director.

County Commissioners, and the elected officials of all jurisdictions, may evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where existing federal and/or local funds and resources are available, and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that the County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. The County will consider all pre-disaster mitigation proposals brought before the County Commissioners by department heads, city officials, fire districts, local civic groups and other jurisdictions or governmental agencies.

When federal or state funding is available for hazard mitigation projects that are specifically asked to be administered by the County, instead of being administered by the local jurisdiction, the requirements for establishing a rigorous benefit-cost analysis as a guiding criterion in determining project priorities will be followed. Note that federal and state funds almost always require partial funding, or a match, by a local jurisdiction. With this being the case the County will obtain appropriate prior local jurisdiction approval as part of their understanding of the basic federal grant program criteria, which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects.

Prioritization Scheme

The following numerical scoring system developed by Northwest Laboratories may be helpful and used to prioritize projects. The system was modified slightly to represent the basic mitigation tenants chosen by Pend Oreille County. This prioritization serves as a guide for the County when developing mitigation activities. This project prioritization scheme has been used in other

Counties within the State of Idaho and is designed to rank projects on a case by case basis. The County mitigation program does not want to restrict funding to only those projects that meet the highest priorities because what may be a high priority for a specific community may not be a high priority at the County level. Conversely, what may be a high priority for the County may not be a high priority for a specific community. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the County and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been detailed below. When applicable and allowed by local jurisdictions, any type of project, whether county, city, or jurisdiction specific, will be prioritized in this more formal manner.

To prioritize projects, a general scoring system has been developed. These factors range from cost-benefit ratios, to details on the hazard being mitigated, to environmental impacts.

The factors for the non-planning projects include:

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

Since some factors are considered more critical than others, two ranking scales have been developed. A Hazard Mitigation Scale of 1-10, 10 being the best, has been used for hazard magnitude/frequency, potential for repetitive loss reduction, cost, and vulnerability to the community, population benefit, and property benefit. An Economic Benefit Scale of 1-5, with 5 being the highest, has been used for project feasibility, potential to mitigate hazards to future development, and potential project effectiveness and sustainability. The highest possible score is 80.

The guidelines for each category are as follows:

Hazard Magnitude/Frequency

The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 10, the project mitigates a high frequency, high magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

Potential for repetitive loss reduction

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses which occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses and have occurred more than three times will receive a rating of 10. Those that do not address repetitive losses receive a rating of 1.

Benefit / Cost

The analysis process will include summaries as appropriate for each project, but will include benefit /cost analysis results. Projects with a negative benefit /cost analysis result will be ranked as a 0. Projects with a positive benefit /cost analysis will receive a score equal to the projects benefit /cost analysis results divided by 10. Therefore a project with a benefit/cost ratio of 50:1 would receive 5 points; a project with a benefit/cost ratio of 100:1 (or higher) would receive the maximum points of 10.

Vulnerability of the Community

A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote participation by the smaller or less vulnerable communities in the County, the score will be based on the relationship to other communities being considered. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

Population Benefit

Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (County, city, town, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

Property Benefit

Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save $1,000,000 or more in losses. Property benefit of less than $1,000,000 will receive a score of the benefit divided by $1,000,000 (a ratio below $1 million). Therefore, a property benefit of $300,000 would receive a score of 3. In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

Economic Benefit

Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 5 would prevent a total economic collapse, a ranking of 3 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that

do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

Project Feasibility (Environmentally, Politically & Socially)

Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

Potential to mitigate hazards to future development

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the County will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

Potential project effectiveness and sustainability

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

Final ranking

Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranked high, medium, or low based on the non-planning project thresholds of:

Project Ranking Priority Score

- High 45-80
- Medium 30-44
- Low 10-29[44]

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP and the priority projects that were developed to address the risks posed. Included in the list are a cost estimate where established, or a rough order of magnitude cost, and an anticipated period for further investigation, project development and implementation. The non planning/administrative projects were ranked using the aforementioned scale. A detailed description of the project rankings can be found in Appendix 4.

Denotes 2004 AHMP Project | **Denotes CWPP Project**

Flood

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.	Maintain the NFIP Requirements	Seek Community Rating System (CRS) Status for the Community	Administrative Project	Floodplain Administrator	No Cost - Ongoing
	Examine the floodplain for accuracy with the NFIP requirements.	Request FIRM updates for known inaccuracies	Administrative Project	Floodplain Administrat or	No Cost – Ongoing
	Improve drainage systems.	Flood Project at Cusick Substation	6	Pend Oreille PUD	
		Reduce Flooding from runoff at Border Crossing	21	Road Department	ROM - $150,000 2012 – Engineering of Options 2013 – Apply for Funding 2014 – Install solution
		Raise the Spring Valley Road at section 29 township 30N range 45E	7	Road Department	ROM - $2,000,000 2010 – Complete Conceptual Engineering 2011- Apply for HMA Grant 2012 – Complete Project

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Replace Sullivan Lake Inlet Bridge over Harvey Creek	17	Road Department	ROM - $250,000 2014 – Engineering of Options 2015 – Apply for Funding 2016 – Install Bridge
	111	Replace the road crossing culvert on Perkins Slough	30	Road Department	ROM - $250,000 2013 – Engineering of Options 2014 – Apply for Funding 2015 – Replace road
Pend Oreille County will reduce the impact of disasters on residential, public, and commercial structures	Protect structures in flood prone areas through acquisition and/or relocation.	Cusick Flats Flood Area Feasibility Study: Determine best cost effective and community acceptable approach to solve the flood problems in the Cusick Flats area including towns of Cusick and Usk.	Administrative Project	Town of Cusick, Pend Oreille County	ROM - $150,000 2012 – Apply for Funding 2013 – Conduct Study

Wildfire

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	Administrative Project	P & Z Administrator/ Fire Districts/ County Commissioners	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Designate the WUI areas as a special land use category in the County Comprehensive Plan	Administrative Project	P & Z Administrator	ROM – No Cost 2011 – During next update of Comprehensive Plan
		Require new construction to install underground power lines.	Administrative Project	P & Z Administrator and County Commissioners	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance
	Conduct roadside vegetation treatments to reduce flammable fuels immediately adjacent to roads in high risk areas.	Fuels mitigation of the "Emergency Evacuation Routes" in the county to ensure these routes can be maintained in the case of an emergency.	5	Public Works	No Cost - Ongoing
		Road-side fuels management (e.g., State Highway 20, State Highway 31, State Highway 211, LeClerc Creek Road, Scotia Valley Road, Spring Valley Road, Fertile Valley Road, Deer Valley Road, Bead Lake Road, Flowery Trail Road, Diamond Lake Road, and Sullivan Lake Road).	4	Public Works	No Cost - Ongoing

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	2	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update
Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect critical water and sewer services.	Riverbend Water System: To aid in the current water capacity: build a 200,000 gallon reservoir, Increase pump intake, treatment system upgrade, and main line size upgrade. Additionally 1.0 miles of 8" main line (C-900), and 8 fire hydrants placed locally throughout the subdivision.	11		ROM - $470,000 2011 – Engineer Solution 2012 – Seek Funding 2013 – Implement Project
		Metaline Falls Water: To aid in current water capacity: build additional 1.0 million gallon reservoir placed upon rye field flats to balance fire flow.	13		ROM - $2,000,000 2012 – Engineer solution 2013 - Apply for Funding 2014 – Build Reservoir

Severe Weather

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect critical energy facilities and distribution lines.	Remove tall or double top trees along the PUD power line easements	1	Public Utility District	ROM - $50,000 2011 – Identify Trees 2012 – Remove Trees

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Flood project at Cusick Substation.	6	Pend Oreille PUD	
		Retire 3 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Camden/Phay Roads to Allen Road.	22	Pend Oreille PUD	ROM - $314,000
		Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Horseshoe Lake Road.	23	Pend Oreille PUD	ROM - $157,000
		Retire 4 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line from Tweedy Road to Garrett Road.	24	Pend Oreille PUD	ROM - $258,000
		Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Baker Lake Road.	16	Pend Oreille PUD	ROM - $97,000

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Replace 2.5 Miles of existing cross-country overhead electrical distribution line that crosses inaccessible terrain and build new line along fertile valley road	29	Pend Oreille PUD	ROM - $500,000
	Protect critical water and sewer services.	Newport Water System Backup: Tie well fields directly to water mains with controls and construct additional million gallon storage tank.	20	City of Newport	ROM - $250,000
	Develop backup power sources for critical facilities and relocation centers	Emergency Mobile Substation Distribution Transformer: Purchase and emergency mobile substation distribution transformer in the event of the loss of a substation transformer due to equipment failure, lightning, terrorism, earthquake, vandalism to restore service to electric customers as expeditiously as possible.	12	Pend Oreille PUD	ROM - $1,347,000
Pend Oreille County will reduce the impact of disasters on residential, public, and commercial structures	Protect public facilities from disruption of service during disasters	Calispell Creek Power Project: Increase the reliability of the headgate operation at Power Lake	28	Pend Oreille PUD	ROM - $148,000

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Increase the standard for snow loads on Manufactured Home roofs.	Administrative Project	Building Official/ County Commissioners	No Cost 2010 – Adopt Higher Load Limit
		Install system at weather station at the Ione Airport to provide weather data for the northern end of the County.	Administrative Project	Emergency Management/ Fire District #2	ROM - $100,000 2011 – Design System 2012 – Apply for Funding 2013 – Install System
		Install new roofs on school buildings due to increase in snow loads to exceed engineering requirements.	25	Cusick School District	ROM - $4,500,000
		Install new roofs on school/buildings due to increase in snow loads to exceed engineering requirements.	26	Selkirk School District	ROM - $4,500,000

Geologic

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will reduce the impact of disasters on residential, public, and commercial structures.	Retrofit existing structures to the International Building Code Seismic Standards	Seismically reinforce (tie down) equipment in the Pend Oreille County Dispatch Center	29	Dispatch Supervisor	ROM - $25,000 2011 – Secure Equipment

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Newport Administrative Building Retrofit: Retrofit the old section of the Newport Headquarters Building to enable it to withstand a major earthquake.	33	Pend Oreille PUD	ROM - $1,032,000
Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect transportation and evacuation routes.	Stabilize the slide area along Sullivan Road	8	Road Department	ROM - $250,000 2013 – Engineer Solution 2014 – Apply for Funding 2015 – Conduct Stabilization
		Stabilize the rock slide area along the Spring Valley Road south of Land of the Woods	9	Road Department	ROM - $750,000 2012 – Engineer Solution 2013 – Apply for Funding 2014 – Conduct Stabilization
		Stabilize landslide areas on the Ashen Felter Bay Road	27	Road Department	ROM - $250,000 2014– Engineer Solution 2015 – Apply for Funding 2016 – Conduct Stabilization
		Stabilize the rock slide area along the railroad 2.1 miles south of Newport	14	Port Authority	ROM - $300,000 2011– Engineer Solution 2012 – Apply for Funding 2013 – Conduct Stabilization

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Conduct an engineering study to determine why the Blue Slide Railroad Tunnel is being displaced towards the River.	3	Port Authority	ROM - $200,000 2010 – Apply for Funding 2011 – Conduct Study
		Mitigate the sink holes along Sullivan Lake Road	15	Road Department	ROM - $250,000 2014– Engineer Solution 2015 – Apply for Funding 2016 – Mitigate
		Stabilize the mud and rock slide area along Highway 31 at mile post 11	10	WDOT	ROM - $750,000 2011 – Engineering Solution 2012 – Apply for Funding 2013 – Conduct Stabilization
		Repair the sink hole on the north end of LeClerc Road near Yochum Lake	31	Road Department	ROM - $100,000 2010 – Determine Solution 2011 – Repair Roadway
		Replace the Indian Creek bridge/culvert on south LeClerc Road South	18	Road Department	ROM $250,000 2011– Engineer Solution 2012 – Apply for Funding 2013 – Replace Culvert/Bridge

Other

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will improve its capability to initiate and sustain emergency response operations during and after a disaster.	Increase the capability of emergency services to identify and respond to disasters.	Replace the Fire Station at Metaline Falls	Non-Mitigation Project	Fire District #2 Commission	ROM $1,500,000 2012 – Design Facility 2013 – Seek Funding 2014 – Construct
		Install standby power at the Ione Fire Station	Non-Mitigation Project	Fire District Commission	ROM - $50,000 2011 – Seek Funding 2012 – Install Generator
		Install water wells for Fire District #2 at the Ione and Metaline Falls Fire Stations	Non-Mitigation Project		ROM - $50,000 2012 – Seek Funding 2013 – Install Water Wells
		Develop relocation and sheltering capability at the Fire District #2 Station in Ione	Non-Mitigation Project	Fire District Commission	ROM - $50,000 2011 – Identify Needs 2012 – Purchase Materials
		Replace the County Road Shop at Metaline Falls	32		ROM - $1,500,000 2012 – Design Facility 2013 – Seek Funding 2014 – Construct
		Improve the Ione Airport runway to allow access to evacuation fixed wing aircraft	Non-Mitigation Project	City of Ione/ Fire District Commission	ROM $500,000 2011 – Design Improvements 2012 – Seek Funding 2103 – Install Improvements
	Protect communications systems and utilities serving emergency services.	Develop an alternate communications center for the north end of the County	Non-Mitigation Project	Fire District Commission/ Emergency Management	ROM - $150,000 2010 – Design System 2011- Identify and Seek Funding 2012 – Purchase and Install Equipment

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
		Develop a reverse 911 system for the County.	Administrative Project	Dispatch Supervisor	ROM $12, 000 2010 – Identify System Requirements 2011 – Seek Funding 2012 – Install System
	Improve emergency data transfer	Install broadband in the north end of the County	Non-Mitigation Project	Fire District Commission	ROM - $10,000,000 2011 – Identify Project Partners 2012 – Indentify Requirements 2013 – Engineer Solution 2014 – Seek Easements 2015 – Seek Funding 2016 -17 Install Capability

Technological/Manmade

Goal	Objective	Project	Rank	Responsible Entity	Order of Magnitude Cost & Planning Horizon
Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Ensure continuity of government operations.	Develop a Continuity of Operations Plan	Planning Project	Emergency Management	ROM $35,000 2011 – Seek SHSP Funding 2012 – Develop Plan 2013 – Adopt Plan
Pend Oreille County will protect the health, safety, and welfare of citizens and visitors.	Ensure that evacuation and sheltering procedures are in place in the event of a disaster requiring evacuation.	Review and Revise Evacuation Plan	Planning Project	Emergency Management	ROM $25,000 2010 – Review Evacuation Plans 2011 – Revise Plans 2012 – Test Plans

Section 5.3: Priority Mitigation Project Roadmaps

The following four projects have been chosen by the Pend Oreille County Commissioners as the priority mitigation projects for Pend Oreille County. A mitigation implementation roadmap has been developed for each project. Some of the projects may be better defined and broken into subprojects due to cost and complexity. Each project will require engineering and associated benefit costs analysis once a conceptual engineering design and cost estimate is developed. This step is necessary before project grants applications are submitted.

1. Remove tall and double top trees along the Pend Oreille Public Utility District power line easements.
2. Conduct fuel reduction projects at Congen, Flowery Trail, Limestone, Highway 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger.
3. Conduct an Engineering Assessment to determine why the Blue Slide Railroad Tunnel is being displaced towards the Pend Oreille River.
4. Conduct road-side fuels management on the following roadways:
    - State Highways 20, 31, 211
    - LeClerc Creek Road
    - Scotia Valley Road
    - Spring Valley Road
    - Fertile Valley Road
    - Deer Valley Road
    - Bead Lake Road
    - Flowery Trail Road
    - Diamond Lake Road
    - Sullivan Lake Road

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APPENDICES

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APPENDIX 1: INDIVIDUAL JURISDICTION PLANS

APPENDIX 1.1: PEND OREILLE PUBLIC UTILITY DISTRICT MITIGATION PLAN

Pend Oreille Public Utility District (PUD) was established in 1936 and began operations in 1948. The Pend Oreille Public Utility District was the first PUD in the state to build its own dam. The District is a consumer-owned electric and water utility service. The District is comprised of three operating systems, with the possibility of a fourth. The first is the electrical system which distributes electricity to 8,500 customers in the County and is also a provider of wholesale broadband to anchor institutions (school, libraries, government, health, etc.) throughout the County. The second system is the water system which serves 650 residents and consists of nine individual water distribution systems. The third system is the Box Canyon Hydroelectric System which includes Box Canyon Dam that is being upgraded to an ultimate capacity of 100 MVA. The possible fourth system is the Community Network System, which is currently a part of, and contained within the Electric System. The Electric System reserves the right to separate the Community Network System into its own distinct operating division of the District.

Risk Assessment

Impacts

Various natural and man-made hazards affect the Pend Oreille County Public Utility District No. 1 (PUD). Many of these hazards affect the essential services that the PUD offers to its customers. The PUD operates six substations, four in the southern part of Pend Oreille County and two located in the northern portion of the County. Three natural hazards have a large impact on the PUD: Wildfire, Winter Storm and Extreme Cold.

Figure A-3.1.1
Severe Winter Storm Damage

The direct impacts of wildfire on the PUD are the loss of transmission and distribution lines and in accessibility to line repair. Because of the land cover and terrain of the County, many transmission lines traverse rugged and densely forested terrain The PUD does perform vegetation removal along its power lines, but large forest fires can easily jump across the reduced fuel area and damage poles and lines. Wildfires occur yearly in Pend Oreille County.

Severe winter storms are also a high risk for the PUD. As seen in Figure A-3.1.1, severe winter storms can overload large trees with snow causing them to tip over and destroy transmission and distribution lines. This situation is especially dangerous when large amounts of snowfall are coupled with moderate to high wind events. Severe winter storms occur annually in the County.

When cold events occur with temperatures below -20 degrees Fahrenheit, lasting for more than one or two days, the PUD system experiences a very high demand. These extreme cold events occur every 5 to 10 years.

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact, based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) SPATIAL EXTENT –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) MAGNITUDE (SEVERITY OF IMPACT) – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	4	4	3	18	H
Wildfire	3	4	3	4	3	17	H
Thunderstorm	3	4	4	3	3	17	H
Extreme Cold	3	4	3	3	3	16	H
Straight Line Wind	3	4	3	3	2	15	H
Drought	2	2	4	4	2	14	H
Landslide	2	4	2	3	3	14	H
Biological	1	2	3	4	3	13	H
River Flooding	2	3	2	2	3	12	M
Volcano	1	1	4	4	2	12	M
Flash Flooding	2	3	2	2	2	11	M

Extreme Heat	1	2	2	4	1	10	M
Earthquake	2	2	2	2	1	9	M
Snow Avalanche	1	2	2	1	1	7	L

The following table shows the Technological Hazard Risk Assessment.

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Hazardous Materials	3	4	2	1	2	12	M
Terrorism	1	1	4	3	3	12	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions, as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Pend Oreille County Public Utility District No.1 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

Over the past five years the Pend Oreille County Public Utility District No. 1 (PUD) has completed mitigation projects to reduce the risk due to hazard events. Many of these projects have been funded by the District's general budget and have been effective in mitigating losses. Some of these projects have been upgrades and maintenance to existing electrical lines.

Project	Responsible Entity	Cost	Hazard Mitigated	Completion Summary
LeClerc Road and Indian Creek Road Line Replacement.	Engineering & Construction	$96,200	Wildfire, Winter Storm	Completed
Rocky Gorge Road Line Replacement	Engineering & Construction	$144,300	Wildfire, Winter Storm	Completed

Mitigation Projects

Listed below are the goals and objectives developed by the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Committee, otherwise known as the AHMP Committee, and the priority projects that were developed to address the risks posed. Included in the list are a cost estimate, where established, or a rough order of magnitude cost, and an anticipated period for further investigation, project development and implementation.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Pend Oreille PUD will reduce the impact of disasters on residential, public, and commercial structures.	Protect public facilities from disruption of service during disasters	Calispel Creek Power Project: Increase the reliability of the headgate operation at Power Lake	Water Department	$110,000	Severe Weather, Earthquake, Flood, Wildfire
Pend Oreille PUD will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect critical water and sewer services.	Riverbend Water System: To aid in the current water capacity: build a 200,000 gallon reservoir, increase pump intake, treatment system upgrade, and main line size upgrade. Additionally 1.0 miles of 8" main line (C-900), and 8 fire hydrants placed locally throughout the subdivision.	Water Department	$500,000	Flood, Wildfire, Severe Weather

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
		Metaline Falls Water: To aid in current water capacity: build additional 1.0 million gallon reservoir placed upon rye field flats to balance fire flow.	Water Department	$2,000,000	Flood, Wildfire, Severe Weather
	Protect critical energy facilities and distribution lines.	Flood project at Cusick Substation.	Construction / Engineering	$336,000	Flood
		Retire 3 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Camden/Phay Roads to Allen Road.	Construction / Engineering	$314,000	Severe Weather, Wildfire
		Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Horseshoe Lake Road.	Construction / Engineering	$157,000	Severe Weather, Wildfire

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
		Retire 4 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line from Tweedy Road to Garrett Road.	Construction / Engineering	$258,000	Severe Weather, Wildfire
		Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Baker Lake Road.	Construction / Engineering	$97,000	Severe Weather, Wildfire
		Fertile Valley Road Line Replacement. Retire 2.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new line along Fertile Valley Rd.	Construction / Engineering	$500,000	Severe Weather, Wildfire
		New 115 KV transmission line from Diamond Lake Substation to Bare Mountain Substation to increase electrical capacity to south Pend Oreille County.	Construction / Engineering	$5,765,000	Severe Winter Storm, Extreme Cold

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Pend Oreille PUD will reduce the impact of disasters on residential, public, and commercial structures.	Retrofit existing structures to the International Building Code Seismic Standards	Newport Administrative Building Retrofit: Retrofit the old section of the Newport Headquarters Building to enable it to withstand a major earthquake.	Construction / Engineering	$1,032,000	Earthquake
Pend Oreille PUD will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Develop backup power sources for critical facilities.	Emergency Mobile Substation Distribution Transformer: Purchase an emergency mobile substation distribution transformer in the event of the loss of a substation transformer due to equipment failure, lightning, terrorism, earthquake, vandalism to restore service to electric customers as expeditiously as possible.	Construction / Engineering	$1,347,000	Severe Weather, Wildfire, Earthquake, Flood

Notice of Acceptance and Participation In the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Pend Oreille County Public Utility District agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille Public Utility District.

DATED this 27th day of May, 2011

Pend Oreille Public Utility District

By: _____

Manager

Received by the District Secretary this _____day of _____ 2011

Signature:

District Secretary

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APPENDIX 1.2: TOWN OF CUSICK MITIGATION PLAN

The Town of Cusick was officially incorporated in Pend Oreille County, in March 1927. The community has grown to a population of 219 in 2008. The town consists of 0.3 square miles of land along the Pend Oreille River, at an elevation of 2050 feet. The estimated median income per household for 2008 was $19,438, considerably lower than the rest of the state. Residents with income below the poverty level in 2008 averaged 41.2%. The unemployment rate reported in 2009 was 13.60%, which is higher than both Washington State and the U.S.

Major employers in the Town of Cusick include Ponderay Newsprint, Ponderay Valley Fibre (now Vaagen Brothers Lumber), the Cusick School District, and Pend Oreille Railroad.

Risk Assessment

A number of natural and technological hazards pose a risk to the The Town of Cusick. The risks posed by hazards to the town are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by the Town of Cusick with their associated physical location and insured value.

Address	Description	Value
121 First St.	Community Building	$ 293, 585
Black Rd-1 mile S of Kings Lake	Filter Plant Equipment	$ 166, 670
1st & Monumental	Fire Station (NEW)	$ 180, 388
2101 Black Rd.	Lift Station (Ben Nelson)	$ 9, 710
214 River Rd.	Lift Station (M. Keogh)	$ 9, 710
3rd St.-100 ft. W of River Rd.	Lift Station (Rhiney Stehr)	$ 24, 272
Monumental, 100 ft E of RR tracks	Lift Station (RR Tracks)	$ 48, 544
Kalispel & SR 9-E of RR tracks	Pump House (Sewage)	$ 37,217
1st St & Monumental	Restrooms @ Boat Launch	$ 146, 751
121 First St.	Town Hall/Community Bldg. Addition	$ 270, 876
66 2nd Avenue	Town Shop	$ 267, 909
Black Rd.-1.6 miles S of Kings Lake	Water Tank 500,000 Gal	$ 304, 681
Riverside Ave & Tacoma	Water Treatment Plant & Fencing	$ 32, 363
Total Value		**$ 1,792,676**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to

hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
River Flooding	3	4	4	4	2	17	**H**
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	4	4	3	15	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	4	1	14	H
Straight Line Wind	2	3	2	4	2	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	1	4	2	2	2	11	M
Earthquake	1	2	3	4	1	11	M
Extreme Heat	1	2	1	4	1	9	M
Landslide	1	2	1	1	1	6	M
Volcano	1	1	2	1	1	6	M
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Hazardous Materials	3	4	2	1	2	12	M
Terrorism	1	1	4	3	3	12	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Town of Cusick does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

The Town of Cusick identified two mitigation projects in the 2004 Plan. Both projects were not completed in the past 5 years. They are detailed in the following table.

Project	Responsible Entity	Cost	Hazard Mitigated	Completion Summary
Relocate and/or elevate structures & dikes in the Cusick Flats Floodplain	Town of Cusick & Pend Oreille County	$40,000,000	No	Because of the overwhelming scope and cost of this project it was not implemented.
Cusick flats flood area feasibility study	Town of Cusick, Cusick School District & Pend Oreille County	$125,000	No	This planning project was not completed, but will be included in the mitigation projects section of this Plan. It will qualify for FMA funding.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Cusick will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.	Maintain the NFIP Requirements	Seek CRS Status for the Community	Floodplain Administrator	No Cost – Ongoing	Flood
Cusick will reduce the impact of disasters on residential, public, and commercial structures.	Protect structures in flood prone areas through acquisition and/or relocation.	Cusick Flats Flood Area Feasibility Study: Determine best cost effective and community acceptable approach to solve the flood problems in the Cusick Flats area including towns of Cusick and Usk.	Floodplain Administrator & Mayor & City Council	ROM - $150,000 2012 – Apply for Funding 2013 – Conduct Study	Flood

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction

All Hazard Mitigation Plan

The Town of Cusick agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Town of Cusick.

DATED this 22 day of May, 2011

Town of Cusick

By: Robert Spencer

Mayor

Received by the Town Clerk this 22 day of May 2011

Signature: Charlotte Yergens

Town Clerk

APPENDIX 1.3: TOWN OF IONE MITIGATION PLAN

Ione is a community with a population of 496, as of the 2008 Census estimate. Officially incorporated in January of 1910, the town covers a total land area of 0.54 square miles, at an elevation of 2090 feet. The estimated median income in 2008 was $32,101. The 2008 Census Summary also reports that 16.4% of the residents in the community average an income below the poverty line.

The community consists of the Selkirk School District, which is also one of the major employers of the community. Other major employers in the area include Ponderay Newsprint and Ponderay Valley Fibre (now Vaagen Brothers Lumber).

Risk Assessment

A number of natural and technological hazards pose a risk to the the Town of Ione. The risks posed by hazards to the town are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by the Town of Ione with their associated physical location and insured value.

Address	Description	Value
111 Central Street	Pend Oreille Sub Station	$ 159,913
206 Central Street	Equipment Shop/Storage	$ 190,600
204 Central Street	Firehall	$ 568,550
Cedar Creek Rd.	500,000 Gallon Reservoir	$ 475,500
104 E. Main Street	City Park/Changing Room	$ 59,970
104 E. Main Street	Covered Picnic Area	$ 180,663
207 Houghton Street	Town Hall	$ 233,589
104 E. Main Street	Pump House Station	$ 250,230
Alley Across from Grade School	Concession STD/Restroom	$ 33,339
N. Hwy 31	Sewage Lagoon Bldg.	$ 107,541
Hwy 31 & Riverside Avenue	Master Meter Station	$ 36,671
210 Blackwell	Community Center/Library	$ 764,792
Water Treatment Plant	511 W. Houghton Street	$ 1,500,000
Total Value		**$ 4,561,358**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might

be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	4	4	3	15	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	4	1	14	H
Straight Line Wind	2	3	2	4	2	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	4	2	2	2	12	M
Earthquake	1	2	3	4	1	11	M
River Flooding	1	2	2	1	3	9	M
Extreme Heat	1	2	1	4	1	9	M
Landslide	2	3	1	1	1	8	M
Volcano	1	1	2	1	1	6	M
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	1	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Town of Ione does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

Over the past five years the Town of Ione has been working to fulfill the established goals and objectives of the 2004 Plan. The following table summarizes the work that has been completed.

Project	Responsible Entity	Cost	Hazard Mitigated	Completion Summary
Replace or strengthen roofs on Ione Maintenance Shop, Fire Station and City Clerk's Office for increased snow loading.	Town Administration	$600,000	Severe Weather	Funded and Complete
Cedar Creek Dam Removal: Remove old earthfill dam and silt materials behind the dam.	Town Administration	$300,000	Dam Failure	Funded and Complete

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
The Town of Ione will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.	Maintain the NFIP Requirements	Seek CRS Status for the Community	Floodplain Administrator	No Cost - Ongoing	Flood
	Examine the floodplain for accuracy with the NFIP requirements.	Request FIRM map updates for known inaccuracies	Floodplain Administrator	No Cost - Ongoing	Flood

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction

All Hazard Mitigation Plan

The Town of Ione agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Town of Ione.

DATED this 1 day of June, 2011

Town of Ione

By: _____

Mayor

Received by the Town Clerk this 1 day of June 2011

Signature: _____

Town Clerk

APPENDIX 1.4: TOWN OF METALINE MITIGATION PLAN

The Town of Metaline was incorporated in 1948 and covers a land area of 0.30 square miles. The town of Metaline reported a population of 168 in 2008. The estimated median income in 2008 was $30,632 with 32.6% of the population with incomes below the poverty level

Metaline was initially established as a mining and major cement manufacturing town. Major employers in the area include: Selkirk School District, Seattle City Light, and the US Forest Service.

Critical Facilities

A number of natural and technological hazards pose a risk to the Town of Metaline. The risks posed by hazards to the town are similar to those posed to the County in general and detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by the Town of Metaline with their associated physical location and insured value.

Address	Description	Value
101 Housing Drive, Hwy 6	City Hall	$ 291,048
Main Street	Gazebo-Town Park	$ 10,641
Main Street	Picnic Shelter	$ 16,660
Park	Restrooms	$ 140,078
101 Housing Drive, Hwy 6	Shop/Fire Hall	$ 103,605
Highway 6	WTP-570,000 gallon Including C1535	$ 598,856
Cemetery Road	Water Tower-200,000 gallon	$ 189,113
Cemetery Road	Cemetery Gazebo	$ 5,000
Total Value		**$ 1,355,001**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	4	4	3	15	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	4	1	14	H
Straight Line Wind	2	3	2	4	2	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	4	2	2	2	12	M
Landslide	3	4	2	1	2	12	M
River Flooding	2	3	2	1	3	11	M
Earthquake	1	2	3	4	1	11	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	M
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	1	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Town of Metaline does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

The Town of Metaline did not identify any mitigation projects in the 2004 Plan.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
The Town of Metaline will continue to participate in the National Flood Insurance Program and develop actions that will reduce the damage to County infrastructure due to flash and stream flooding.	Maintain the NFIP Requirements	Seek CRS Status for the Community	Floodplain Administrator	No Cost - Ongoing	Flood

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction

All Hazard Mitigation Plan

The Town of Metaline agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Town of Metaline.

DATED this 15 day of June, 2011

Town of Metaline

By: _____

Mayor

Received by the Town Clerk this 15 day of June 2011

Signature: E. Diane Brown

Town Clerk

APPENDIX 1.5: TOWN OF METALINE FALLS MITIGATION PLAN

The Town of Metaline Falls was established in 1911 and covers 0.21 square miles. The Town of Metaline Falls reported a population of 283 people in 2008. The median income for the community was $22,771, less than half of the state median.

Major employers in the Metaline Falls area are the Selkirk School District, Seattle City Light, Pend Oreille Mine, and the US Forest Service. US Customs and Immigration and the Sullivan Lake District are also employment contributors in both of the Metaline areas.

Risk Assessment

A number of natural and technological hazards pose a risk to the Town of Metaline Falls. The risks posed by hazards to the town are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by the Town of Metaline Falls with their associated physical location and insured value.

Address	Description	Value
203 E. 5th, Metaline Falls	City Hall	$ 262,462
99 Lehigh Ave., Metaline Falls	Sewer Lift Station & Pumps	$ 215,000
267 E. 3rd, Metaline Falls	Fire Hall/Maintenance Shop	$ 169,342
98 N. Washington, Metaline Falls	Train Deport	$ 26,342
100 N. Washington, Metaline Falls	Busta Park Public Restroom	$ 14,917
½ miles N. of Metaline Falls	Sewage Treatment Facility	$ 213,626
Total Value		**$901,689**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	4	4	3	15	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	4	1	14	H
Straight Line Wind	2	3	2	4	2	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	4	2	2	2	12	M
Landslide	3	4	2	1	2	12	M
River Flooding	2	3	2	1	3	11	M
Earthquake	1	2	3	4	1	11	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	1	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Town of Metaline Falls does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

Over the past five years, the Town of Metaline Falls has been working to fulfill the established goals and objectives of the 2004 Plan. The following table summarizes the work that has been completed.

Project	Responsible Entity	Cost	Hazard Mitigated	Completion Summary
Stabilize approximately 300 feet along bank of Sullivan Creek below Lehigh Avenue, where meander of stream has cut into bank below residential area.	Town Administration	$250,000	Flood	The Sullivan Creek Bank Stabilization Project is in progress. The engineering is done and a contractor chosen. Construction of a log cribwall structure will take place in late July 2010 during low water level.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
The Town of Metaline Falls will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect critical water and sewer services.	Metaline Falls Water: To aid in current water capacity: build additional 1.0 million gallon reservoir placed upon rye field flats to balance fire flow.	PUD, Town of Metaline Falls	Reasonable Order of Magnitude (ROM) - $2,000,000 2012 – Engineer solution 2013 - Apply for Funding 2014 – Build Reservoir	Wildfire

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction

All Hazard Mitigation Plan

The Town of Metaline Falls agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Town of Metaline Falls.

DATED this 8th day of June, 2011

Metaline Falls

By: _____

Mayor

Received by the Town Clerk this 8th day of June 2011

Signature: _____

Town Clerk

APPENDIX 1.6: CITY OF NEWPORT MITIGATION PLAN

Newport is the County seat of Pend Oreille County, Washington. Known as the gate-way to the northwest it is located on the borders of Washington and Idaho. Newport was established in April 1903. The city consists of 1.1 square miles. The 2008 Census reports a population of 2,126 for the City of Newport. The City of Newport also shows a $34,269 median income whih is betterthan other towns in the County; however, this is still below the state median of $58,078. The unemployment rate in Newport is consistent with other communities in the area at 13.6%.

Newport Hospital is the only hospital in the County and is located in the City of Newport.

The Pend Oreille County Library District's main library is located in Newport with branches in Cusick, Ione, and Metaline Falls.

The Newport School District is located in the City of Newport and consists of Stratton Elementary School, Sadie Halstead Middle School, and Newport High School.

Risk Assessment

A number of natural and technological hazards pose a risk to the City of Newport. The risks posed by hazards to the city are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by the City of Newport with their associated physical location and insured value.

Address	Description	Value
9302 Deer Valley Road, Newport	Street Department Garage	$ 100,000
Not Provided	Vehicle Shed	$ 25,000
Not Provided	Quonset Hut Shop	$ 70,000
First St. & Calispel	City of Newport-Big Park	$2,000,000
436 S. Union Avenue	Little People's Park	$ 300,000
116 S. Washington, Newport	Gazebo/Museum	$ 100,000
Kelly Island, Newport	Kelly Island Wilderness Park	$6,000,000
Newport	TJ Kelly Park	$ 200,000
200 S. Washington Ave.	City Hall	$ 358,500
2nd & Union	Fire Hall	$ 275,000
Total Value		**$9,428,500**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be

affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	4	4	3	15	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	4	1	14	H
Straight Line Wind	2	3	2	4	2	13	H
Drought	2	3	3	4	1	13	H
River Flooding	3	3	2	2	3	12	M
Earthquake	1	2	3	4	1	11	M
Flash Flooding	2	3	2	1	2	10	M
Landslide	2	2	2	1	2	9	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	3	1	3	9	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The City of Newport does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but there are no repetitive losses to specific structures by a single hazard.

Mitigation Actions Summary

The City of Newport did not complete the mitigation project that was identified in the 2004 AHMP. Their project has been relisted in this Plan as a future mitigation project.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addressed, and a rough order of magnitude cost and planning horizon.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
The City of Newport will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect critical water and sewer services.	Newport Water System Backup: Tie well fields directly to water mains with controls and construct additional million gallon storage tank.	City Administration	$1,500,000	Earthquake, Wildfire, Severe Weather

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction
All Hazard Mitigation Plan

The City of Newport agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the City of Newport.

DATED this 6th day of June, 2011

City of Newport

By: Shirley Sands

Mayor

Received by the City Clerk this 6th day of June 2011

Signature:

City Clerk

APPENDIX 1.7: PORT OF PEND OREILLE MITIGATION PLAN

The Port of Pend Oreille is operated by the citizens of Pend Oreille County who formed together in 1979 to create the Port. The sole purpose of the Port was to save the railroad and two mills, which was dependant on the railroad for service. Due to poor economic times the two mills have since been closed. The only service currently on this rail line is the Ponderay Newsprint Company.

The Port of Pend Oreille owns and operates the Pend Oreille Valley Railroad which interchanges with the Burlington Northern Railroad at Newport. Products that are shipped into and out of Pend Oreille County from the Newport interchange are newsprint, wood chips and lumber. Rail service is provided into Cusick and Usk that serves Vaagen Brothers Lumber, formerly Ponderay Valley Fibre, and Ponderay Newsprint Company. There is no passenger rail service in the County. On occasion the Pend Oreille Lions Club operates the Lions Club Excursion Train, a re-enactment of the old passenger line from Ione to Metaline Falls. This ride follows the Pend Oreille River and affords views that are only available to train passengers.

Risk Assessment

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Biological	1	3	1	4	1	10	H
Wildfire	2	3	3	3	3	14	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	3	4	2	2	2	13	H
Landslide	3	4	2	2	2	13	H
Straight Line Wind	2	3	2	3	2	12	M
River Flooding	3	3	2	2	3	12	M
Earthquake	1	2	3	4	1	11	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: The Port of Pend Oreille does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but most of those losses are not repetitive. There are repetitive losses to railroad tracks in the north end of the County due to landslides and flash flooding.

Mitigation Actions Summary

Over the past five years the Port of Pend Oreille has been working to fulfill the established goals and objectives of the 2004 Plan. The following table summarizes the work that has been completed.

Project	Responsible Entity	Cost	Hazard Mitigated	Completion Summary
Stabilize slide areas and protect railroad tracks from falling rocks.	Port of Pend Oreille Manager	$1,400,000	Landslide, Avalanche	The Port continues to complete maintenance work on this tunnel as time and funds allow. We recently replaced shoring and added longer ties and steel to try to hold back wall movement. However this is an area that if the hillside slips it will involve more than the tunnel. Depending on the movement, the tunnel, SR 20, and the Pend Oreille River could be involved. State and federal funding will be necessary at that time. This is an on-going project; an ending date cannot be placed on it.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. The 2004 project has been broken down to the planning stage to facilitate continuation of the project.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Pend Oreille County will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect transportation and evacuation routes.	Stabilize the rock slide area along the railroad 2.1 miles south of Newport	Port of Pend Oreille Manager	ROM - $300,000 2011– Engineer Solution 2012 – Apply for Funding 2013 – Conduct Stabilization	Landslide
		Conduct an engineering study to determine why the Blue Slide Railroad Tunnel is being displaced towards the River.	Port of Pend Oreille Manager	ROM - $200,000 2010 – Apply for Funding 2011 – Conduct Study	Landslide

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Port of Pend Oreille agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Port of Pend Oreille.

DATED this 27th day of May, 2011

Port of Pend Oreille

By: _____

Manager

Received by Port Secretary this 27th day of May 2011

Signature:

Port Secretary

APPENDIX 1.8: FIRE DISTRICT #2 MITIGATION PLAN

Pend Oreille County Fire District #2 (referred to as District) was formed in 1967. It encompasses approximately 750 square miles. "The District stretches east from the Idaho border, west to the Stevens County line, and north from mile marker 400 on State Highway 20 to the Canadian border." (Fire District #2 website) The District consists of single and multi-family residential dwellings to forest land, as well as two hydroelectric dams, a railway, schools, commercial property, and two state highways. The District also performs mutual aid to the towns of Ione, Metaline, and Metaline Falls. The District performs emergency medical service and emergency transport for the northern half of Pend Oreille County.

The District has one career firefighter and 20 volunteer firefighters.

Risk Assessment

A number of natural and technological hazards pose a risk to Fire District #2.The risks posed by hazards to the district are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Fire District #2, with their associated physical location and insured value.

Address	Description	Value
13501 Sullivan Lake Road, Metaline Falls	Fire Station 21	$ 92,083
103 Grandview Avenue, Metaline Falls	Fire Station 22	$ 15,292
390442 State Highway 20, Cusick	Fire Station 23	$ 249,778
20281 N. LeClerc Road, Cusick	Fire Station 24	$ 84,400
Total		**$ 441,553**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	3	4	2	2	2	13	H
Landslide	3	4	2	2	2	13	H
Straight Line Wind	2	3	2	3	2	12	M
River Flooding	3	3	2	2	3	12	M
Earthquake	1	2	3	4	1	11	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Fire District #2 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

Fire District #2 has been active in wildfire mitigation projects over the past five years. The District's greatest accomplishment is the Tiger Fuel Reduction Project which was completed in the spring of 2010.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addressed, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Fire District #2 are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Fire District #2 will improve its capability to initiate and sustain emergency response operations during and after a disaster.	Increase the capability of emergency services to identify and respond to disasters.	Replace the Fire Station at Metaline Falls	Fire District #2 Commission	ROM $1,500,000 2012 – Design Facility 2013 – Seek Funding 2014 – Construct	Wildfire, Structural Fire, Other
		Install standby power at the Ione Fire Station	Fire District Commission	ROM - $50,000 2011 – Seek Funding 2012 – Install Generator	Other

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
		Install water wells for Fire District #2 at the Ione and Metaline Falls Fire Stations		ROM - $50,000 2012 – Seek Funding 2013 – Install Water Wells	Wildfire, Structural Fire, Other
		Develop relocation and sheltering capability at the Fire District #2 Station in Ione	Fire District Commission	ROM - $50,000 2011 – Identify Needs 2012 – Purchase Materials	Other

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Pend Oreille Fire District #2 agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille Fire District #2.

DATED this 16 day of June, 2011

Pend Oreille Fire District #2

By: Scott D. Doughty

Fire Chief

Received by the District Secretary this 16 day of June 2011

Signature:

District Secretary

APPENDIX 1.9: FIRE DISTRICT #4 MITIGATION PLAN

Pend Oreille County Fire District #4 was approved by voters on October 5, 1978 and became an official fire district on January 1, 1979.

Fire District #4 is the largest fire district in Pend Oreille County, operating four stations. The District covers roughly 96 square miles in the northeastern corner of the State of Washington and the Central part of Pend Oreille County. The District has mutual aid agreements with the City of Newport, the Town of Cusick, and the Kalispel Tribe, bringing the total area covered to 287 square miles. The Fire District also contains the Ponderay Newsprint Company, which is the largest newsprint producer in the western United States.

The Fire District has a staff of five employees, including a career Chief, and one full time firefighter/emergency medical technician. The District also has volunteer firefighters.

Risk Assessment

A number of natural and technological hazards pose a risk to Fire District #4. The risks posed by hazards to the district are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Fire District #4, with their associated physical location and insured value.

Address	Description	Value
11 Dalkena Street	Dalkena Station 41	$220,529
11 Dalkena Street	Dalkena Training Building	$132,769
11 Dalkena Street	Admin Building	$373,416
433171 Hwy 20	Cooks Mountain Station 42	$220,529
433171 Hwy 2	Maintenance Shop	$ 88,292
1602 Cusick Meadows Rd.	Cusick Meadows Station 44	$117,500
Total Value		**$1,153,035**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	3	3	2	3	14	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Fire District #4 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive

Mitigation Actions Summary

Fire District #4 is continually assisting in mitigation actions through community education programs, fuel reduction projects, and aiding in the development of public policy.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addressed, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Fire District #4 are also included in the 2010 Community Wildfire Protection Plan (CWPP) update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Fire District #4 will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update	Wildfire
	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	P & Z Administrator/ Fire Districts/ County Commissioners	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance	Wildfire
		Require new construction to install underground power lines.	P & Z Administrator and County Commissioners	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance	Wildfire

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction
All Hazard Mitigation Plan

Pend Oreille Fire District #4 agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille Fire District #4.

DATED this 31st day of May, 2011

Pend Oreille Fire District #4

By: _____

Fire Chief

Received by the District Secretary this 31 day of MAY 2011

Signature: Darlynn M. Petrie

District Secretary

APPENDIX 1.10: FIRE DISTRICT #5 MITIGATION PLAN

Pend Oreille County Fire District #5 is located in Cusick, Washington, and serves the areas of Locke-Ruby. The District covers thirty-five square miles. The District consists of one career firefighter and fifteen volunteer firefighters.

Risk Assessment

A number of natural and technological hazards pose a risk to Fire District #5. The risks posed by hazards to the district are similar to those posed to the County in general and detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Fire District #5 with their associated physical location and insured value.

Address	Description	Value
406722 Hwy. 20, Cusick	Station 51	$200,000
Total Value		**$200,000**

Fire District #5 rents a building from a private owner at 412076 Hwy. 20 in Cusick as a second station.

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	3	2	2	3	13	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12

- ✓ High - Generating a score >13

Repetitive Loss: Fire District #5 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

Fire District #5 is continually assisting in mitigation actions through community education programs, fuel reduction projects, and aiding in the development of public policy.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addressed, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Fire District #5 are also included in the 2010 Community Wildfire Protection Plan (CWPP) update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Fire District #5 will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update	Wildfire
	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	P & Z Administrator/ Fire Districts/ County Commissioners	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance	Wildfire

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
		Require new construction to install underground power lines.	P & Z Administrator and County Commissioners	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance	Wildfire

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

Pend Oreille County Fire District #5 agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille County Fire District #5.

DATED this 7th day of June, 2011

Pend Oreille Fire District #5

By: _____

Fire Chief

Received by the District Secretary this 8 day of June 2011

Winnie Sundseth

Signature:

District Secretary

APPENDIX 1.11: FIRE DISTRICT #6 MITIGATION PLAN

Pend Oreille Fire District #6 provides life and property protection to residents of the area. The District also provides an integrated medical care, fire prevention, public education, and emergency management system. The District also provides mutual aid to support and assist other fire service organizations. Fire District #6 is staffed by volunteer firefighters.

Risk Assessment

A number of natural and technological hazards pose a risk to Fire District #6. The risks posed by hazards to the district are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Fire District #6 with their associated physical location and insured value.

Address	Description	Value
7572 LeClerc Rd S, Newport	Pend Oreille District #6 Station	$100,000
Total Value		**$100,000**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	3	2	2	3	13	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Fire District #6 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive

Mitigation Actions Summary

Fire District #6 is continually assisting in mitigation actions through community education programs, fuel reduction projects, and aiding in the development of public policy.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Fire District #6 are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Fire District #6 will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update	Wildfire
	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	P & Z Administrator/ Fire Districts/ County Commissioner s	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance	Wildfire
		Require new construction to install underground power lines.	P & Z Administrator and County Commissione rs	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance	Wildfire

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

Pend Oreille County Fire District #6 agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille County Fire District #6.

DATED this 2 day of June, 2011

Pend Oreille Fire District #6

By: James E Robinson

Fire Chief

Received by the District Secretary this _____day of _____ 2011

Signature:

District Secretary

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APPENDIX 1.12: FIRE DISTRICT #8 MITIGATION PLAN

Pend Oreille County Fire District #8 (District) was formed in 1992.The Fire District covers the southeast corner of Pend Oreille County and extends from the Idaho Washington border west for about seven miles and from the Spokane County line north for another seven miles. The area covers thirty square miles with approximately 700 residents. The area mainly includes self-employed farmers, although the majority of the residents work outside of the district. Fire District #8 includes one chief, an assistant chief, 15 firefighters, a medical officer and two firefighter/EMT's which are volunteers. The District houses one-unmanned fire station. Fire District #8 also participates in the mutual aid agreement with Countywide fire and emergency services. The District also provides aid to the United State Forest Service and the Washington State Department of Natural Resources as needed.

Risk Assessment

A number of natural and technological hazards pose a risk to Fire District #8. The risks posed by hazards to the district are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Fire District #8 with their associated physical location and insured value.

Address	Description	Value
4941 Spring Valley Rd, Newport	Fire District Station #8	$95, 167
Total Value		$95, 167

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	3	2	2	3	13	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12

- ✓ High - Generating a score >13

Repetitive Loss: Fire District #8 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive

Mitigation Actions Summary

Fire District #8 is continually assisting in mitigation actions through community education programs, fuel reduction projects, and aiding in the development of public policy.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Fire District #8 are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Fire District #8 will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update	Wildfire
	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	P & Z Administrator/ Fire Districts/ County Commissioners	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance	Wildfire
		Require new construction to install underground power lines.	P & Z Administrator and County Commissioners	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance	Wildfire

Notice of Acceptance and Participation

In the

Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

Pend Oreille County Fire District #8 agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Pend Oreille County Fire District #8.

DATED this 1 day of June, 2011

Pend Oreille Fire District #8

By: _____

Fire Chief

Received by the District Secretary this 1 day of June 2011

Signature: _____

District Secretary

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APPENDIX 1.13: SOUTH PEND OREILLE FIRE & RESCUE MITIGATION PLAN

South Pend Oreille County Fire District consisting of Fire Districts #1, #3 and #7 is located in Newport, Washington. The District consists of mergers with Fire District #1 and Fire District #3 in November, 2008, followed by a merger with Fire District #7 in February of 2009. The merged Districts preferred the unofficial name South Pend Oreille Fire and Rescue. The District contains five fire stations; Station #11 in Camden, Station #31 in Diamond Lake, Station #32 in Sacheen Lake, Station #33 Deer Valley Road, and Station #71 in Fertile Valley. The District is organized from community volunteers; with one full-time fire chief, thirty-six certified EMS personnel, and seventy volunteer firefighters. The District covers one hundred and forty-nine square miles.

Risk Assessment

A number of natural and technological hazards pose a risk to South Pend Oreille Fire & Rescue. The risks posed by hazards to the District are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by South Pend Oreille Fire & Rescue with their associated physical location and insured value.

Address	Description	Value
4210 Allen Rd. Elk, WA	Camden Fire Station 11	$500,000
11 Jermain Rd., Newport, WA	Fertile Valley Station 71	$792,000
325272 Hwy 2 Newport, WA	Diamond Lake Station 31	$350,000
6131 Hwy 211 Newport, WA	Sacheen Fire Station 32	$790,000
8165 Deer Valley Rd. Newport, WA	Deer Valley Fire Station	$280,000
325272 Hwy 2 Newport, WA	Maintenance Facility	$240,000
Total		**$2,952,000**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	4	4	3	18	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	3	2	2	3	13	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Biological	1	3	1	4	1	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: South Pend Oreille Fire and Rescue does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive

Mitigation Actions Summary

South Pend Oreille Fire and Rescue is continually assisting in mitigation actions through community education programs, fuel reduction projects, and aiding in the development of public policy.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for South Pend Oreille Fire and Rescue are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
South Pend Oreille Fire and Rescue will reduce the losses caused by wildfire by continuing the Wildland Urban Interface Mitigation Program.	Conduct fuel reduction projects	Congen, Flowery Trail, Limestone, Hwy 31, Dry Ridge, Dry Canyon, Bear Paw, and East Tiger	Fire Districts	Because of the large number of project areas ROM was not Calculated Planning Horizon is detailed in the CWPP 2010 Update	Wildfire
	Improve protection through the proper use of ordinances & codes.	Develop a Wildland Fire Ordinance which establishes road widths, access, water supply, and building regulations suitable to ensure new structures can be protected	P & Z Administrator/ Fire Districts/ County Commissioners	ROM - $10,000 2011 – Develop Ordinance 2012 – Adopt Ordinance	Wildfire
		Require new construction to install underground power lines.	P & Z Administrator and County Commissioners	ROM - $10,000 2011 - Seek Funding in County Budget 2012 – Develop and Adopt Ordinance	Wildfire

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction
All Hazard Mitigation Plan

The South Pend Oreille Fire & Rescue agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the South Pend Oreille Fire District.

DATED this 31 day of May, 2011

South Pend Oreille Fire District

By: Mike Novles

Fire Chief

Received by the District Secretary this 31 day of May 2011

Signature: Darlyn Petrie

District Secretary

APPENDIX 1.14: CUSICK SCHOOL DISTRICT MITIGATION PLAN

Cusick School District has an enrollment of two hundred and seventy eight students in two schools. Bess Herian Elementary provides education to one hundred and thirty three students in grades Pre-K to six. The Cusick Junior/Senior High School provides education to one hundred and forty-five students in grades seven to twelve. Class sizes in the District are small; with seventeen students to one teacher in the elementary and nineteen students to one teacher in the Junior/Senior High School.

Risk Assessment

A number of natural and technological hazards pose a risk to Cusick School District. The risks posed by hazards to the District are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Cusick School District with their associated physical location and insured value.

Address	Description	Value
305 Monumental Way	Announcers Booth	$ 7,040
305 Monumental Way	Baseball Dugout	$ 5,013
305 Monumental Way	Gymnasium	$ 1,181,172
305 Monumental Way	Grade School Bldg.	$ 1,845,723
305 Monumental Way	Bus Garage	$ 306, 744
305 Monumental Way	High School Building	$ 6,715,863
305 Monumental Way	Playground Equipment	$ 27,510
305 Monumental Way	Fence	$ 85,583
305 Monumental Way	Bleachers	$ 8, 911
305 Monumental Way	Light Standards	$ 25, 891
305 Monumental Way	Electric Scoreboard	$ 6, 330
305 Monumental Way	Baseball Fencing	$ 22, 279
Total Value		**$11,997,314**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** – Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** – The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	3	3	3	16	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
River Flooding	3	4	2	3	3	15	H
Thunderstorm	3	4	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Biological	1	3	3	4	2	13	M
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Cusick School District does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

Because of a lack of funding the project identified in the 2004 Plan was not implemented. To assist in the completion of this project it was included in this Plan and a list of possible funding sources was developed.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Cusick School District are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Cusick School District will reduce the impact of disasters on residential, public, and commercial structures	Protect public facilities from disruption of service during disasters	Install new roofs on school buildings due to increase in snow loads from 40 psf (pounds per sq foot) to 60 psf.	Cusick School District Superintendent	$4,100,000	Severe Weather

Notice of Acceptance and Participation In the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Cusick School District agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Cusick School District.

DATED this 31 day of May, 2011

Cusick School District

By: _____

Superintendent

Received by the District Secretary this 31st day of May 2011

Signature: _____

District Secretary

APPENDIX 1.15: NEWPORT SCHOOL DISTRICT PLAN

Newport School District consists of four schools; Stratton Elementary, Sadie Halstead Middle School, Newport High School and a progressive secondary alternative school. Stratton Elementary School maintains an enrollment of four hundred thirty nine students in grades Pre-K to four. The Sadie Halstead Middle School houses grades five to eight with an enrollment of three hundred and ninety students. Newport High School consists of grades nine to twelve with four hundred and two students. The student to teacher ratio in the district is fifteen to one.

Risk Assessment

A number of natural and technological hazards pose a risk to Newport School District. The risks posed by hazards to the district are similar to those posed to the County in general and detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Newport School District with their associated physical location and insured value.

Address	Description	Value
1020 W. First	Bus Garage #1	$ 131, 947
1624 W. Seventh	Bus Garage #2	$ 341, 250
1380 W. Fifth	Admin Building	$ 437,933
1380 W. Fifth	Maintenance Shop	$ 783, 076
1201 W. Fifth	Stratton Elementary	$ 8,318,385
331 S. Calispel	Halstead Middle School	$ 9,126,497
1400 W. Fifth	Newport High School	$12,194,862
1300 W. Fifth	Portable Classroom	$ 138,686
1300 W. Fifth	Fire Science Bldg.	$ 350,000
Total Value		**$31,822,636**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	3	3	3	16	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Thunderstorm	2	3	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Biological	1	3	3	4	2	13	H
River Flooding	3	3	2	2	2	12	M
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Newport School District does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

Newport school district was not able to complete any of the identified mitigation projects in their 2004 AHMP. The relevant projects have been in this Plan.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Newport School District are also included in the 2010 CWPP update.

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Newport School District will protect the community's critical infrastructure from disruption and destruction caused by disasters.	Protect public facilities from disruption of service during disasters	High School Roof Retrofit	Newport School District	ROM - $1,500,000 2011 – Seek Funding 2012 – Install New Roof	Severe Weather
	Develop backup power sources for critical facilities and relocation centers	Emergency Backup Generators in all Schools	Newport School District	ROM - $750,000 2012 – Seek Funding 2013 – Install Generators	Severe Weather
	Protect public facilities from disruption of service during disasters	Upgrade fire mains in all buildings.	Newport School District	ROM - $60,000	Structural Fire

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction
All Hazard Mitigation Plan

The Newport School District agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Newport School District.

DATED this 31st day of May, 2011

Newport School District

By: _____

Superintendent

Received by the District Secretary this 31st day of May 2011

Signature: Janet E Hansen

District Secretary

APPENDIX 1.16: SELKIRK SCHOOL DISTRICT PLAN

The Selkirk School District consists of two schools: the Selkirk Elementary School containing grades Pre-K to six, and the Selkirk Junior/Senior High School containing grades seven through twelve. The Selkirk Elementary School is located in Metaline Falls and consists of an enrollment of one hundred fifty seven students. The Junior/Senior High School is located in Ione and enrolls one hundred and fifty seven students. The student to teacher ratio in the elementary school averages seventeen to one, while the Junior/Senior High School averages a student to teacher ratio of sixteen to one.

Risk Assessment

A number of natural and technological hazards pose a risk to Selkirk School District. The risks posed by hazards to the District are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Selkirk School District with their associated physical location and insured value.

Address	Description	Value
219 Park Avenue, Metaline Falls	Selkirk Elementary School	$1,902,093
10372 Hwy 31, Ione	Selkirk Jr/Sr High	$6,925,179
201 Pend Oreille Blvd. Metaline Falls	Elementary Gym/Bus Garage	$ 652,135
Houghton & 7th, Ione	Bus Garage Storage Building	$ 15,225
10372 Hwy 31, Ione	District Office	$ 230,809
Total Value		**$9,725,441**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	3	3	3	16	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Thunderstorm	2	3	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Biological	1	3	3	4	2	13	H
River Flooding	3	3	2	2	2	12	M
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Landslide	2	3	3	2	2	12	M
Earthquake	1	2	3	4	1	11	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Selkirk School District does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

The Selkirk School District did not complete any mitigation projects in the past 5 years. The project identified in the 2004 Plan has been relisted below.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP Committee, as aligned with mitigation projects. Included in the list are the responsible entity, hazards addresses, and a rough order of magnitude cost and planning horizon. It is noted that the mitigation projects for Selkirk School District are also included in the 2010 CWPP update.

Denotes 2004 Project

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Selkirk School District will reduce the impact of disasters on residential, public, and commercial structures	Protect public facilities from disruption of service during disasters	Install new roofs on school/buildings due to increase in snow loads from 40 psf (pounds per sq foot) to 60 psf.	Selkirk School District Superintendent	$3,800,000	Severe Weather

Notice of Acceptance and Participation
In the
Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Selkirk School District agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to Selkirk School District.

DATED this 1 day of June, 2011

Selkirk School District

By: Nancy Hoff

Superintendent

Received by the District Secretary this 1 day of June 2011

Signature: Debra Mathews

District Secretary

APPENDIX 1.17: PUBLIC HOSPITAL DISTRICT #1-NEWPORT HOSPITAL AND HEALTH SERVICES

Newport Hospital and Health Services consists of several facilities. The first facility is the Newport Hospital and a twenty-four bed Acute Care full service facility. The next facility is the Newport Long Term Care facility which is located adjacent to the hospital and is a fifty bed long-term, skilled nursing and restorative care unit. Family Health Center of Newport is located on the Hospital District campus near the Newport Hospital. The Hospital District also consists of River Mountain Village and Family Medicine of Newport.

Public Hospital District #1 employs three hundred and fifty-three employees.

Risk Assessment

A number of natural and technological hazards pose a risk to Public Hospital District #1. The risks posed by hazards to the district are similar to those posed to the County in general. The detailed descriptions of hazards, and their general impact, can be found in Section 3 of this document.

The following list represents the critical facilities owned and operated by Public Hospital District #1 with their associated physical location and insured value.

Address	Description	Value
714 W. Pine	Acute Care Hospital	$ 13,655,168
714 W. Pine	Long Term Care Unit	$ 4,784.295
714 W. Pine	Family Health Center/Dietary Addition	$ 7,018,742
507 W. First	Storage Building	$ 308,318
200 N. Scott	Brown House (Finance Accounting)	$ 135,307
200 N. Scott	Brown House Garage	$ 39,539
100 S. Scott	Family Medicine Newport	$ 1,592,650
701 W. Pine	Johnson House (Administration)	$ 152,266
225 N. Cass	Romero House (Overnight Lodging)	$ 138,446
602 W. Second	River Mountain Village	$ 5,600,000
213 S. Warren	Rental House	$ 65,000
Total Values		**$33,489,731**

Risk Summary

Using the *Mitigation 20/20* methodology to ensure consistency, the 2005 Risk Analysis was updated using the information gathered in the hazard profiles presented above. To determine the risk posed by each hazard, several kinds of information are required: 1) the number of historical occurrences, 2) the probability or likelihood of the hazard occurrence, at times without regard to hazard history, 3) vulnerability, expressed as the percentage of people and property that would be affected by the hazard event, 4) spatial extent, the geographical area of the community that might

be impacted, and 5) the magnitude or severity of impact based on an assessment in terms of fatalities, injuries, property/economic losses. Tables illustrating this process are provided below.

1) **HISTORICAL OCCURRENCE** – Number of historical occurrences within community.

Rating	Adjective Description	Number of Historical Occurrences (within 50 years)
1	Low	• 5 or few occurrences
2	Medium	• 6-9 occurrences
3	High	• More than 10 occurrences

2) **PROBABILITY** – Likelihood of the hazard occurrence, sometimes without regard to hazard history.

Rating	Likelihood	Frequency of Occurrence
1	Rare	• Probability of occurrence one chance in the next 50+ years
2	Low	• Probability of occurrence at least one chance in the next 25-50 years
3	Medium	• Probability of occurrence at least one chance in the next 10-25 years
4	High	• Probability of occurrence at least one chance in the next 1 to 10 years

3) **VULNERABILITY** –Percentage of people and property that would be affected by the hazard event.

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	• Less than 5%
2	Limited	• 5% to 10%
3	Critical	• 10% to 25%
4	Catastrophic	• More than 25%

4) **SPATIAL EXTENT** –The geographical area of the community that might be impacted.

Rating	Magnitude	Percentage of jurisdiction affected
1	Negligible	• Less than 10%
2	Limited	• 10% to 25%
3	Critical	• 25% to 50%
4	Catastrophic	• More than 50%

5) **MAGNITUDE (SEVERITY OF IMPACT)** – Assessment of severity in terms of fatalities, injuries, property/economic losses.

Rating	Likelihood	Characteristics
1	Negligible	• Few if any injuries or illness • Minor quality of life lost with little or no property damage • Brief interruption of facilities/services less than 4 hrs
2	Limited	• Minor injuries and illness • Minor or short term property damage that does not threaten structural stability • Loss of essential facilities and services for 4 to 24 hours
3	Critical	• Serious injury and illness • Major/ long term property damage; threatens structural stability • Shutdown of essential facilities and services for 24 to 72 hours
4	Catastrophic	• Multiple deaths • Property destroyed or damaged beyond repair • Complete shutdown of essential facilities/services for 3+ days.

The hazards with the highest total scores were considered the hazards of greatest concern for the County. The table below demonstrates the ranking of the natural hazards, with the priority hazards scoring highest and appearing in the light red rows.

Natural Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Wildfire	3	4	3	3	3	16	H
Winter Storm	3	4	3	4	2	16	H
Extreme Cold	3	4	2	4	2	15	H
Thunderstorm	2	3	2	3	1	13	H
Drought	2	3	3	4	1	13	H
Biological	1	3	3	4	2	13	H
River Flooding	3	3	2	2	2	12	M
Flash Flooding	2	3	3	2	2	12	M
Straight Line Wind	2	3	2	3	2	12	M
Earthquake	1	2	3	4	1	11	M
Landslide	2	3	2	1	2	10	M
Extreme Heat	1	2	1	4	1	9	M
Volcano	1	1	2	1	1	6	L
Snow Avalanche	1	1	1	1	1	5	L

Technology Hazards Qualitative Risk Assessment

	Historical Occurrence	Probability	Vulnerability	Spatial Extent	Magnitude	Total	Rank
Terrorism	1	1	4	3	3	12	M
Hazardous Materials	2	3	2	2	2	10	M
Structure Fire	1	2	2	1	3	9	M
Dam Failure	1	1	2	1	2	7	M
Riot/Demonstration/ Civil Disorder	1	1	1	1	1	5	L

Once the numerical ranking was completed, in an effort to remain consistent with the local jurisdictions as most utilize a High/Medium/Low ranking system, the total score was then converted to a High/Medium/Low method of priority ranking.

The breakdown of ranking is as follows:

- ✓ Low - Generating a total score of </=7
- ✓ Medium - Generating a score of 8-12
- ✓ High - Generating a score >13

Repetitive Loss: Public Hospital District #1 does not have any facilities participating in the NFIP that have repetitive losses documented. There are routine losses caused by a number of hazards, but they are not repetitive.

Mitigation Actions Summary

The Public Hospital District #1 did not participate in previous mitigation planning efforts.

Mitigation Projects

Listed below are the goals and objectives developed by the AHMP and the priority projects that were developed to address the risks posed. Included in the list are a cost estimate, where established, or a rough order of magnitude cost, and an anticipated period for further investigation, project development and implementation.

Goal	Objective	Project	Responsible Entity	Order of Magnitude Cost & Planning Horizon	Hazard
Public Hospital District #1 will reduce the impact of disasters on residential, public, and commercial structures.	Retrofit existing structures to the International Building Code Seismic Standards	Seismically reinforce (tie down) equipment the Newport Hospital	Hospital Manager	ROM - $25,000 2011 – Secure Equipment	Earthquake

Notice of Acceptance and Participation In the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan

The Public Hospital District #1-Newport Hospital and Health Services agrees to support and participate in the implementation of the Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan as it applies to the Hospital District.

DATED this 1st day of June, 2011

Public Hospital District #1-Newport Hospital and Health Services

By: Tom Wilburn

Administrator

Received by the District Secretary this 1ST day of June 2011

Signature: Nancy Shaw

District Secretary

APPENDIX 2: MEETING MINUTES

Pend Oreille County
All-Hazards Multi-Jurisdiction Mitigation Plan
Committee Meeting
January 13, 2010

The second meeting of the Pend Oreille County All Hazards Multi-Jurisdiction Mitigation Plan (AHMP) Committee was held on January 13, 2010 in the Pend Oreille County Emergency Operations Center in Newport, Washington, under the direction of JoAnn Boggs, Pend Oreille County Emergency Management Director. JoAnn called the meeting to order and welcomed everyone in attendance and asked them to sign the attendance roster. She thanked them for their attendance at the meeting and introduced Rick Fawcett of Whisper Mountain Professional Services, Inc., the consulting firm hired by the County to write their Plan. Rick added his welcome to JoAnn's and introduced his company and Derrick Sharp, Whisper Mountain's GIS senior specialist. Rick explained to the group the purpose of the AHMP is to save lives and reduce the risk of property loss. He presented a power-point discussion about the identified risks in Pend Oreille County and how they are ranked using the formula **frequency X magnitude = risk**. He emphasized that this Plan is a pre-disaster plan verses a post-disaster plan, and is required by the State and FEMA in order to qualify for post-disaster reimbursement funds in the event of a disaster. Derrick reviewed maps and discussed areas of concern from a research prospective. (See attached power-point slide notes) Rick had the committee fill out a "risk survey questionnaire " to see what their perspectives of local risks are. (See attached survey results)

The meeting was then opened for discussion of areas known to be of concern from life-threatening or property loss perspective. The following items were discussed:

1. The FEMA flood mitigation plans need to be included in the Plan.
2. Forest/woods burns are restricted.
3. Steep sloped areas have building restrictions in place.
4. There is a need to follow the International Building Code (IBC) as it is not being enforced currently.
5. The City of Newport implements the IBC.
6. The entire County is in the NFIP as all areas are in the flood plain.
7. There are 8 sewer districts in the County and they use lift stations that do not have back-up power.
8. The committee would like to integrate the Community Wildfire Protection pinto the AHMP but not water it down in the integration so it can still be a stand-alone plan.
9. Weather data is not available from the weather service. The Ione airport's weather data is vital and unattainable presently. The committee would like an automated system there.
10. The FIRM information is needed in the Plan.

11. The tunnel at Ione (Blue Slide) is closing in with landslide. It affects the tunnel, the river, and the Highway. This needs to be addressed as it is the major ingress and egress route.
12. The Metaline Road provides the only ingress and egress to the Town of Metaline.
13. The Town of Metaline uses liquid bleach in their water system. Storage of a large amount of liquid chlorine is a potential risk.
14. The Town of Ione put in a new chlorine system for their water system.
15. There are several dykes in the County which pose potential flood risk.
16. The River Road needs stabilization.
17. There are several rural areas that people can cross the border undetected, which could pose a terrorist threat.

Rick invited the committee to continue to think of any areas that are a current risk or could become a potential risk to property or lives. He encouraged them to send these thoughts to him as the Plan is being developed. He again thanked them for their valuable input and invited them to attend the next meeting that will be held on March 2 at 10:00 in the EOC.

January 13, 2010-Pend Oreille County Hazard Mitigation Planning Committee
(Members in Attendance)

Agency	Representative	Position
Kalispel Tribe of Indians	Fred Warren	
Selkirk School District	Nancy Lotze	Superintendant
City of Newport	Bubba Hendricks	Building Inspector
City of Newport	Bill Jackson	Public Works Field Supv.
Port of Pend Oreille	Kelly Driver	Manager
P.U.D.	Chuck Frandrup	Director, Construction & Engineering
South Pend Oreille Fire & Rescue and Fire District #4	Mark Havener	Fire Chief
Newport School District	Bob Mitchell	
Fire District #2	Larry Pollock	Fire Chief
Fire District #8	Chris Smith	Fire Chief
Town of Cusick	Bernice Smith	City Council Member
Cusick School District	Mike Phillips	K-12 Asst. Principal
Town of Ione	Penny Smith	
Ione Fire Town Office	Jerry Spalding	
Sheriff's Office	Darlin Sanchez	
Sheriff's Office	Steve West	

Pend Oreille County
All-Hazards Multi-Jurisdiction Mitigation Plan
Committee Meeting
March 16, 2010

The third meeting of the Pend Oreille County All Hazards Multi-Jurisdiction Mitigation Plan (AHMP) committee was held on March 16, 2010 at the Pend Oreille County Emergency Operation Center in Newport, Washington at 10:00 am under the direction of JoAnn Boggs, Pend Oreille County Emergency Management Director. Jo Ann called the meeting to order and thanked those attending for their time. She reminded everyone to sign the attendance roster. She then turned the time over to Derrick Sharp from Whisper Mountain Professional Services, Inc., the consulting firm hired by the County to write the Plan. Derrick welcomed everyone and told them the purpose of the meeting was to review the Plan updates and especially look at the identified hazards so mitigation projects could be identified. He reminded the committee the purpose of the Plan is to identify current and potential risks that could be mitigated to save lives and protect the loss of property.

The committee raised the question of should structure fire be ranked high/high? It was brought up that structural fires constitute about 15% of run-bys of the fire departments. The loss with structure fires is usually relatively high, but the frequency is low.

The committee said there had been a tornado in Pend Oreille County in 2001 that actually picked up a barn and moved it 1 mile from its origin. The National Weather Service did not report this tornado, and the committee felt there had been others that were not reported also.

Other areas of discussion include:

1. There was an area around Fort Miner that had a possible tornado. There was lots of hail, lightning, and loud noise. It took out the entire park at Priest Falls.
2. Hawk Lane has a lot of repetitive flooding.
3. Slide Mountain is shifting to the East since the railway tunnel was built in 1909. The railway has had to be shifted with the movement of the tunnel. Some reinforcement has been done but it has not stopped the shifting.
4. The County does not have reverse 911 service.
5. There are a significant number of knock-down and blow-down lightning events in the County. There are several lightning caused fires each year.
6. Wildland fire projects have been identified.
7. There are power outages throughout the County each year, but they are the most critical in the sub-zero temperatures.
8. Snow loads on roofs frequently cause cave-ins in the winter months. Trees around homes cave in under heavy snow load also. Tree-topping has not been effective as a preventative measure.
9. Power lines in the timbered areas and along the roads are at risk.
10. Dams are all manned except Power Lake and Calispell. There is a question as to whether homes should still be built on stilts below the Albany Falls Dam.
11. Spring Valley, south of Lake of the Woods, has repetitive flooding.

12. There is a great need for a good weather tower.
13. A correction to the Plan is that Don Egbert is no longer on the City of Metaline Council.
14. A list of the dams in the County will be provided by the committee.

Derrick thanked everyone for their valuable input and encouraged them to send any other information on the risks and hazards to him. (He held a meeting the afternoon of the same day with folks who couldn't attend the morning meeting). The next meeting will be held in Metaline Falls as they have not represented themselves at this or any of the previous meetings.

Attendance Roster

March 16, 2010

Agency	Representative	Position
US Forest Service	Will Markwardt	Fire/Fuels
City of Newport	Bill Jackson	
PUD Water	Bubba Hedricks	WSM
POCFD#2	Larry Pollock	Chief
SPOFR	Randy Miller	Communications
Ione FD	Jerry Spalding	
POCFD#8	Chris Smith	Chief
WSV Extension	Carol Mack	Natural Resource Educator
Cusick School District #59	Mike Phillips	Assistant Principal
Pend Oreille County 911	Steve West	Chief of Comm.
Pend Oreille County 911	Darlin Sanchez	Deputy Chief Comm
Pend Oreille County Sheriff	Alan Botzheim	Inspector
Pend Oreille Valley RR	Cliff Bauer	Road Master
DNR	Forrest Ownbey	Fire Prevention Forester
South Pend Oreille Fire Pend Oreille Fire & Rescue	Mark Havener	Chief
WA DNR	Andrew Stenbeck	District Manager

Agency	Representative	Position
USDA Forest Service	Candy Eighme	Fire Management Officer
Ione Fire Department	Penny Smith	EMS Officer
Pend Oreille-PUD	Dale Weathers	Distribution Engineer
Pend Oreille PUD	Chuck Frandrup	Director Construction & Engineering
Fire District #5	Jay Foster	Chief
WSU Extension	Dixie Chichester	Firewise Outreach
Fire District #2	Sandie Duremd	Fire Commissioner Prevention Specialist
WA DNR	Matt Castle	Forrester, Fuels
R & B Excavating	Billy Lambright	Owner/foreman
R & B Excavating	Wes Miller	
Washington Department of Fish and Wildlife	Jay Shepherd	Wildlife Biologist
Washington DNR	Steve Harris	Landowner Assistance
Washington DNR	Cliff Thresher	Landowner Assistance
	Paul Sieraczi	

Pend Oreille County
All-Hazards Local Community Workshop
April 21, 2010
Newport Public Meeting

The fourth meeting of the Pend Oreille County All Hazards Multi-Jurisdiction Mitigation Plan (AHMP) committee was held on April 21, 2010 at the Pend Oreille County Emergency Operation Center in Newport, Washington at 1pm under the direction of JoAnn Boggs, Pend Oreille County Emergency Management Director. The meeting was advertised as a public meeting. Jo Ann turned the time over to Derrick Sharp from Whisper Mountain Professional Services, Inc., the consulting firm hired by the County to write the Plan. Derrick welcomed everyone and told them the purpose of the meeting was to review the completed risk assessment and to identify mitigation projects that could be included in the Plan. He reminded the committee the purpose of the Plan is to identify current and potential risks that could be mitigated to save lives and protect the loss of property.

The final risk assessment was presented and the committee agreed with the risk severity rankings but questioned if straight line wind should be raised in severity because of the resulting damage that it causes. The decision was that straight line wind often occurs with other hazards and that it increases the risk of damage from those hazards. For example, wind may blow trees onto power lines after long durations of rain. The rain and the wind hazard synergistically cause the damage; individually experienced the effect would not necessarily be expected.

Other items discussed include:

- The need to identify the location of the two parcels which are repetitively damaged by floods.
- The Albany Falls Dam Inundation Zone should be included. The dam is located in Idaho but the inundation zone would impact Pend Oreille County.
- There is a need to examine the effects of Drought and Extreme Heat on Wildfire. This discussion will be placed in the update of the CWPP.
- A question was asked whether individual insurance companies report damage claims to a single location within Washington State.

Projects that were identified include:

1. Flooding occurs along Spring Valley Road at section 29 township 30N Range 45E. The road needs to be raised.
2. Rock Slides occur along the Spring Valley road south of Lake of the Woods. This area needs to be stabilized.
3. The School House Road needs to be improved to allow fire equipment access.
4. Betty May Way roadway needs to be improved to allow fire response access.
5. The County needs to develop and adopt a Wildland/Urban Interface ordinance.
6. A weather reporting station needs to be installed for the northern portion of the County. The Station should be located at the Ione Airport to aid in the landing of medical rescue aircraft.

7. Tall or double top trees should be identified along the PUD power line easements and removed.
8. The road crossing culvert on Perkins Slough needs to be replaced.
9. Bridges or culverts need to be installed on the Skookum Meadows Road near Konklin
10. Landslide hazards need to be mitigated at Ashen Felter Bay Road
11. The slide area along the rail road 2.1 miles south of Newport needs to be stabilized.
12. Blue Slide Tunnel needs to be stabilized, is it a historical structure?
13. The slide area along the entry to the Boundary Dam needs to be stabilized.
14. There are slides and sink holes along the Sullivan Lake Road that need to be addressed.
15. There is a slide area along State Highway 20 that needs to be stabilized south of Metaline.
16. There is a sink hole on the north end of LeClerc Road near Rochum Lake.
17. The Pend Oreille River Bridge at Ione crossing needs to be replaced.
18. The road along the middle fork of LeClerc Creek is sliding into the creek.
19. Replace the south LeClerc Road culvert/bridge on Indian Creek.
20. Secure the equipment in the County Dispatch Center to protect against seismic events.

Derrick thanked everyone for their valuable input and encouraged them to send any other information or additional projects to him.

Pend Oreille County
AHMP Local Community Workshop
Attendance Roster
April 21, 2010

Agency	Representative	Position
POCFD#8	Chris Smith	Chief
WSV Extension	Carol Mack	Natural Resource Educator
Pend Oreille County 911	Steve West	Chief of Comm.
Pend Oreille County 911	Darlin Sanchez	Deputy Chief Comm.
Pend Oreille Valley RR	Cliff Bauer	Road Master
DNR	Forrest Ownbey	Fire Prevention Forester
Pend Oreille-PUD	Dale Weathers	Distribution Engineer
Pend Oreille PUD	Chuck Frandrup	Director Construction & Engineering
WSU Extension	Dixie Chichester	Firewise Outreach
Pend Oreille County Planning	Mike Lithgrow	Director
Port of Pend Oreille	Bob Shanklin	Commissioner
Pend Oreille County OEM	JoAnn Boggs	Director
Pend Oreille County OEM	Laura Haikkila	Assistant

Pend Oreille County
All-Hazards Multi-Jurisdiction Mitigation Plan
Local Community Workshop
April 21, 2010
Ione Public Meeting

The fifth meeting of the Pend Oreille County All Hazards Multi-Jurisdiction Mitigation Plan (AHMP) committee was held on April 21, 2010 at the District 2 Fire Station in Ione, Washington at 6:30 pm under the direction of JoAnn Boggs, Pend Oreille County Emergency Management Director. The meeting was advertised as a public meeting. JoAnn turned the time over to Derrick Sharp from Whisper Mountain Professional Services, Inc., the consulting firm hired by the County to write the Plan. Derrick welcomed everyone and told them the purpose of the meeting was to review the completed risk assessment and to identify mitigation projects that could be included in the Plan. He reminded the committee the purpose of the Plan is to identify current and potential risks that could be mitigated to save lives and protect the loss of property.

The District 2 Fire Chief, Larry Pollock, presented an update on the Tiger WUI Fuel Reduction Project. The project is nearly completed. The grant was for $200,000. There has been 85 parcels treated accounting for over 200 acres. The public has been very supportive of the project and would like to do more. A contractor will stay in the area to do work as requested by private land owners.

Projects that were identified include:

1. There are slide areas along Sullivan Road that need to be stabilized.
2. Bridge on Noisy Creek is a single lane road and needs to be replaced.
3. Flooding from spring runoff causes flooding at the Border Crossing.
4. Examine the snow loading for manufactured homes in the area. Recommend 60 lbs
5. Replace Fire Station at Metaline Falls
6. Install Standby Power at the Ione Fire Station
7. Develop an alternate communications center for the north end of the County.
8. Install broadband in the north end of the County to improve data transfer.
9. Replace the County Road Shop at Metaline Falls
10. Install water wells for Fire District 2 at the Ione Station and Metaline Falls.
11. Develop relocation and sheltering capability at the Ione Fire District #2 Station.
12. Develop a reverse 911 system for the County.

Derrick thanked everyone for their valuable input and encouraged them to send any other information or additional projects to him.

Pend Oreille County
AHMP Local Community Workshop
Attendance Roster
April 21, 2010

Agency	Representative	Position
P.O. Co. FD #2	Larry Pollock	Chief
Pend Oreille County	Diane Wear	Commissioner
Pend Oreille County	John Hankey	Commissioner
Pend Oreille County OEM	JoAnn Boggs	Director
Pend Oreille County OEM	Laura Hiakkila	Assistant
P. O. Fire District #2	Rick Stone	Commissioner

APPENDIX 3: PUBLIC INVOLVEMENT

PUBLIC QUESTIONNAIRE

Pend Oreille County All-Hazards Mitigation Plan

Public Participation Questionnaire

January 2010

Dear Pend Oreille County Resident,

We need your help! Pend Oreille County is embarking on an initiative to assist communities in reducing risk from natural and man-made hazards. This questionnaire is designed to help us understand your perceptions of Disasters. We are developing a strategic plan to prioritize activities to assist Pend Oreille County communities and residents to reduce their risk from natural Disasters. The information you provide will help improve coordination of risk reduction activities within the County.

Your returned survey indicates your willingness to take part in the study. Your participation in this study is voluntary. All individual survey responses are strictly confidential, and are for research purposes only.

Your opinions are important to us. Please return your completed survey no later than 15 days after receipt to our technical consultant on this project Whisper Mountain Professional Services, Inc. at 1110 Call Creek Drive, Suite 6, Pocatello, Idaho, 83201 in the stamped, addressed, return envelope provided.

If you have questions regarding the survey, feel free to contact the Whisper Mountain Professional Service, Inc. at (208) 478-1099.

Thank you for your participation!

Sincerely,

Ms. JoAnn Boggs
Director,
Pend Oreille County
Emergency Management

1. What town do you live in or near? _____

2. Have you ever experienced or been impacted by an Emergency (a sudden event bringing great damage, loss, or destruction)?

- ❑ Yes (please explain**):**_____
- ❑ No

3. How concerned are you about the possibility of our community being impacted by a Disaster?

- ❑ Extremely concerned
- ❑ Somewhat concerned
- ❑ Not concerned

4. Please select the five (5) highest hazards facing your neighborhood:

- ❑ Blizzards/Ices Storms/Winter Storms
- ❑ Hail
- ❑ Storm Water Erosion
- ❑ Hazardous Materials
- ❑ Dam Failure
- ❑ Land Subsidence (e.g. sinkhole)
- ❑ Drought
- ❑ Landslide/Mudslide
- ❑ Earthquake
- ❑ Lightening
- ❑ Expansive Soils
- ❑ Nuclear
- ❑ Extreme Cold
- ❑ Terrorism (bombs/biological/chemical)
- ❑ Extreme Heat
- ❑ Tornadoes
- ❑ Fires
- ❑ Volcanoes
- ❑ Air Quality
- ❑ Flooding – Canal
- ❑ Flooding – Flash (Riverine)
- ❑ Wildland Fires
- ❑ Insect Infestations
- ❑ High Wind / Wind Storms
- ❑ Air Quality
- ❑ Other (please explain):

  _____

5. Is there a hazard not listed in this survey that you think is a wide-scale threat to your neighborhood?

- ❑ Yes (please explain):_____
- ❑ No

Note: ***<u>Please read before answering questions 6 and 7.</u>***

A "flood" as defined by the National Flood Insurance Program is "a general and temporary condition of partial or complete inundation of two of more acres of normally dry land area or two or more properties". Flood zones are geographic areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Hazard Boundary Map or Flood Insurance Rate Map (FIRM). It's important to know that if you have a federally backed mortgage on a home located in a high-risk area, federal law requires you to purchase flood insurance. Also, if you've received a federal grant for previous flood losses, you must have a flood insurance policy to qualify for future aid.

6. Is your home located in a floodplain?

- ❑ I don't know
- ❑ Yes
- ❑ No

7. Do you have flood insurance?

- ❑ I don't know
- ❑ Yes
- ❑ No

If "No", why not?

- ❑ Not located in a floodplain
- ❑ Too expensive
- ❑ Not necessary because it never floods
- ❑ Not necessary because I'm elevated or otherwise protected
- ❑ Never really considered it
- ❑ Other (please explain):

8. Do you carry hazard insurance for your home/property?

- ❑ Yes
- ❑ No

What Hazards does your insurance cover?

- ❑ Fire
- ❑ Earthquake
- ❑ Wind
- ❑ Landslides
- ❑ Tornado
- ❑ Land Subsidence
- ❑ Volcanic Activity
- ❑ Mudslide/Mud Flow
- ❑ Land Rising or Shifting

9. Have you taken any actions to make your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

If "Yes", please explain:_____

10. Are you interested in making your home or neighborhood more resistant to hazards?

- ❑ Yes
- ❑ No

11.What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

- ❑ Newspaper
- ❑ Television
- ❑ Radio
- ❑ Internet
- ❑ Mail
- ❑ Public Workshops/meeting
- ❑ Other (please explain):

_____
_____
_____
_____

12. In your opinion, what are some steps your County or city governments could take to reduce or eliminate risk of future hazard damages in your neighborhood?

_____
_____
_____
_____
_____

13. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

_____
_____
_____
_____
_____
_____

14. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

1. Prevention

Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

2. Property Protection

Actions involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

3. Natural Resource Protection

Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

4. Structural Projects

Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, canals, detention/retention basins, channel modification, retaining walls and storm sewers.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

5. Emergency Services

Actions that protect people and property during and immediately after a hazard event; examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.

- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

6. Public Education and Awareness

Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.

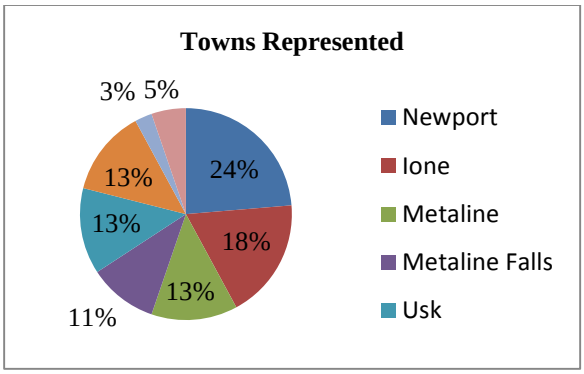
- ❑ **Very Important**
- ❑ **Somewhat Important**
- ❑ **Not Important**

THANK YOU FOR YOUR PARTICIPATION

QUESTIONNAIRE RESULTS

A public questionnaire was provided to 150 residents of Pend Oreille County. Of the one hundred and fifty mailed, 38 were returned for a return rate of 25%, and five or 3.5%, were returned as undeliverable. The following is a discussion of the results.

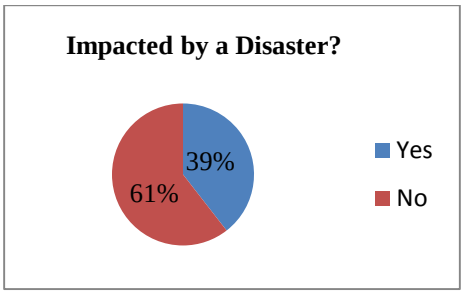
Question 1: What town do you live in or near?



The results of this question represent the population distribution of the County, with each incorporated area being represented.

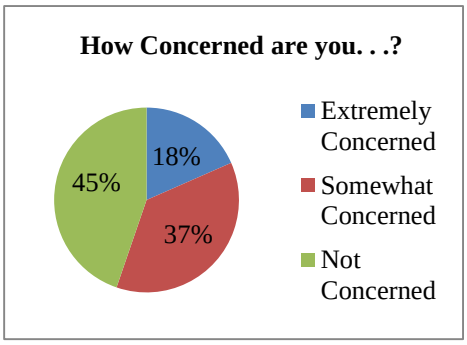
Place of Residence	Number of Responses	Percent
Newport	8	24%
Ione	8	18%
Metaline	6	13%
Metaline Falls	4	11%
Usk	5	13%
Cusick	4	13%
Elk	1	3%
Other	2	5%
Total	**38**	**100%**

Question 2: Have you ever experienced or been impacted by a disaster (a sudden event bringing severe damage, loss, or destruction)?



	Number of Responses	Percent
Yes	16	39%
No	22	61%
Total	**38**	**100%**

Question 3: How concerned are you about the possibility of your community being impacted by a disaster?

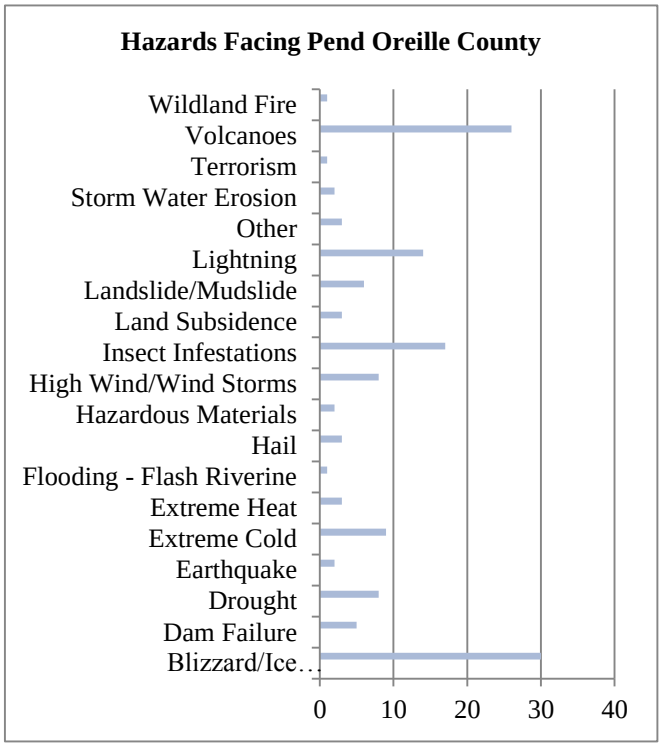


	Number of Responses	Percent
Extremely Concerned	7	18%
Somewhat Concerned	15	37%
Not Concerned	16	45%
Total	**38**	**100%**

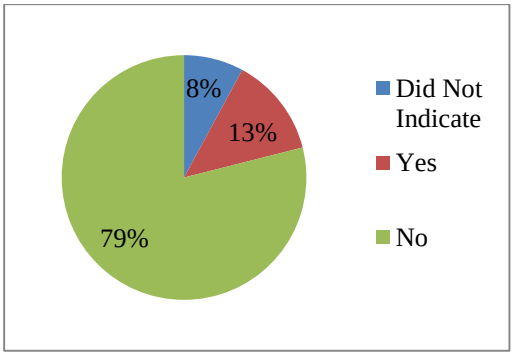
Question 4: Please select the five (5) highest hazards facing your neighborhood.

Five Highest:

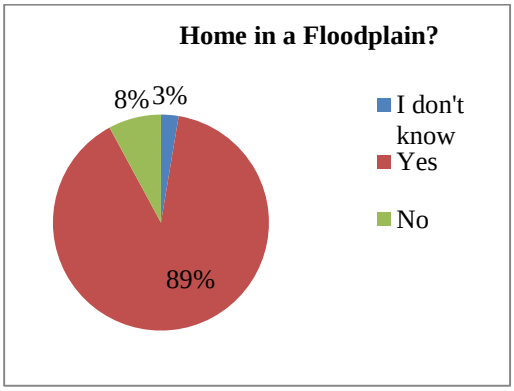
1. Blizzard/Ice Storms/winter Storms
2. Volcanoes
3. Insect Infestation
4. Lightning
5. Extreme Cold



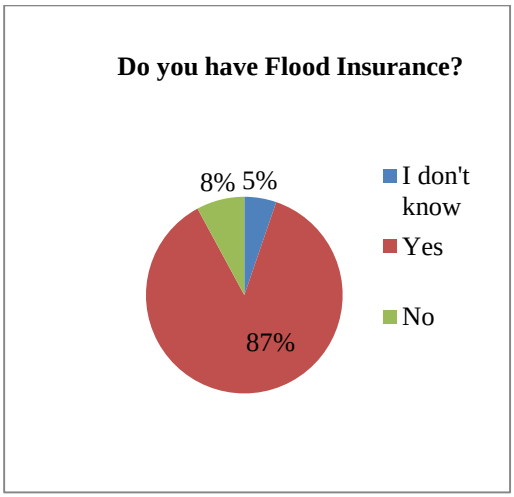
Question 5: Is there a hazard that you think is a wide-scale threat to your community?

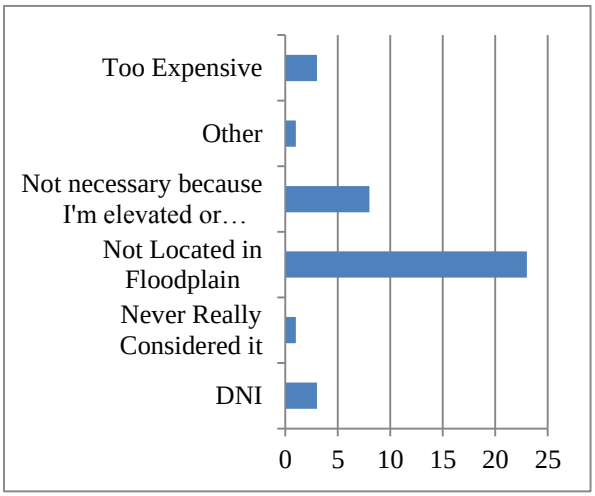


Question 6: Is your home located in a floodplain?

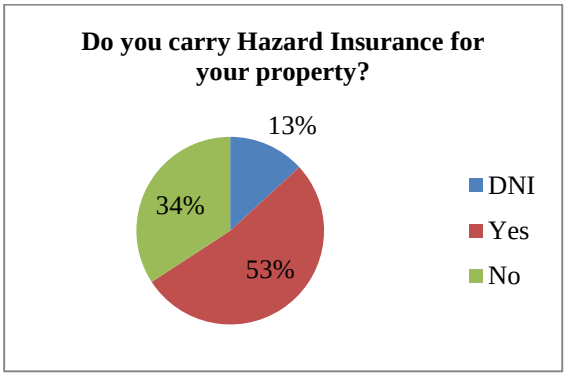


Question 7: Do you have flood insurance? If no, why not?

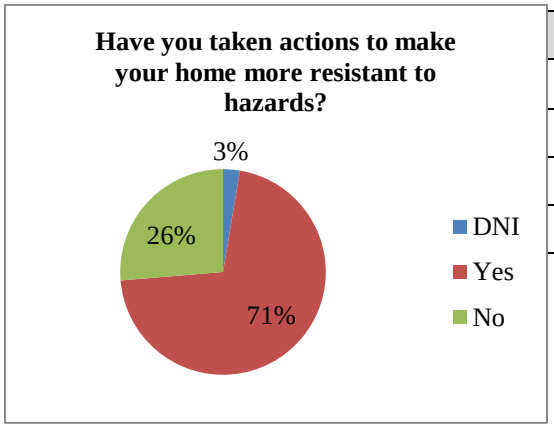




Question 8: Do you carry Hazard Insurance for your home/property?



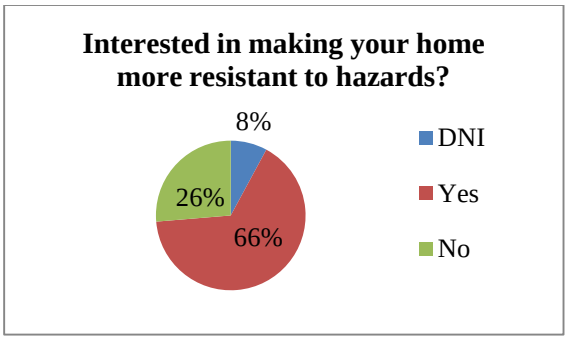
Question 9: Have you taken any actions to make your home or neighborhood more resistant to hazards?



	Number	Percent
Yes	28	71%
No	9	26%
Don't know	1	3%
Total	**38**	**100%**

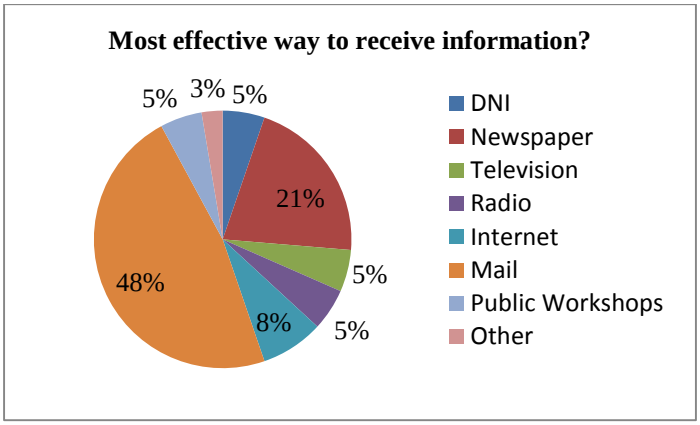
Question 10: Are you interested in making your home or neighborhood more resistant to hazards?

	Number of Responses	Percent
Yes	25	66%
No	9	25%
Don't Know	3	8%
Maybe	1	1%
Total	**38**	**100%**



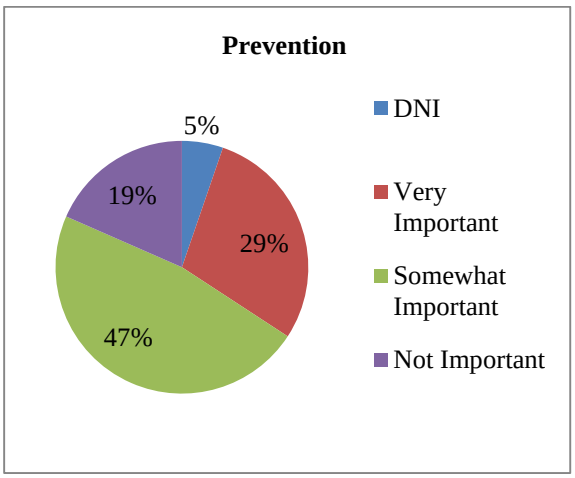
This particular question is very important because many of the mitigation actions that might be taken by the County may require individual property owners to take individual actions and, in some cases, bear the cost of the mitigation.

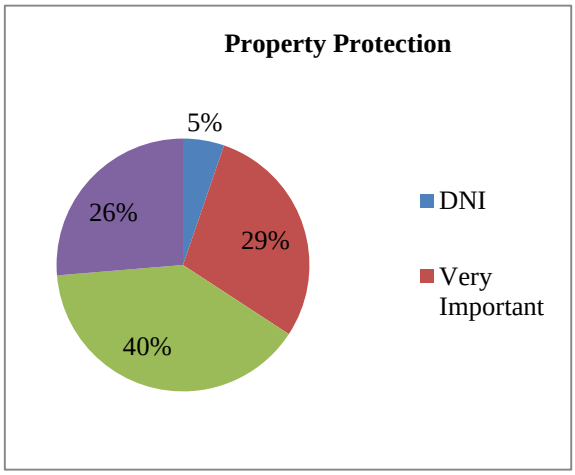
Question 11: What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

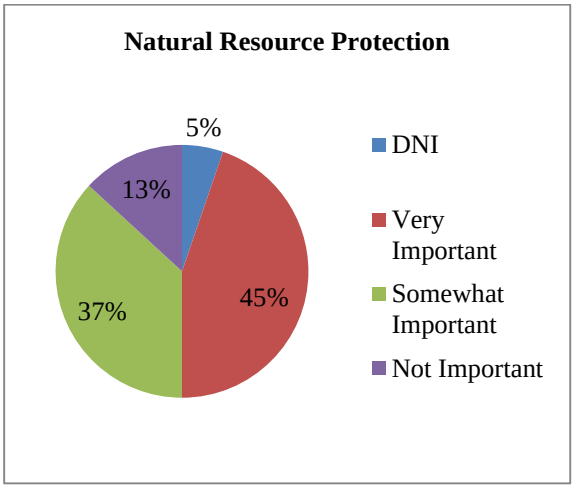


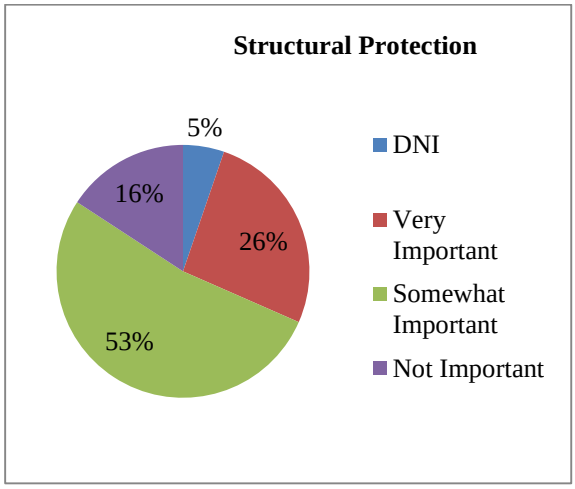
Previous research done by Dr. Hank Jenkins-Smith, the Director of the University of New Mexico's Risk Perception Center as well as Dr. Paul Solvic and others indicated that the public receives 72% of their information regarding risk through television, yet the respondents of the County indicated that they would rather have information provided to them in printed form, either through mail, newspaper, or internet. Television, Radio, and Public Workshops were at the bottom of the list of ways to receive information. This is a very important finding which has become frequent in similar surveys completed for All Hazard Mitigation Plans in the neighboring State of Idaho.

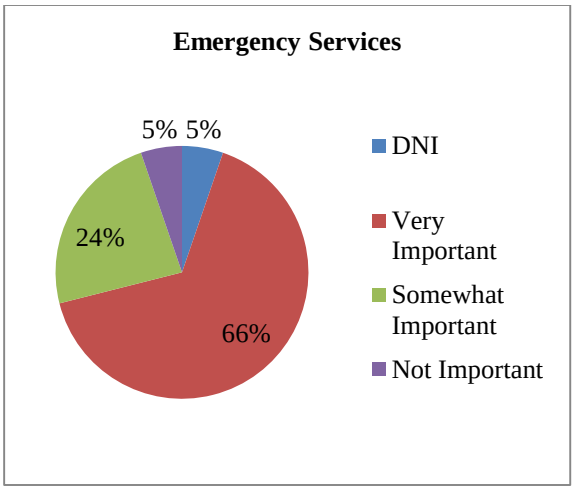
Question 14: A number of other community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

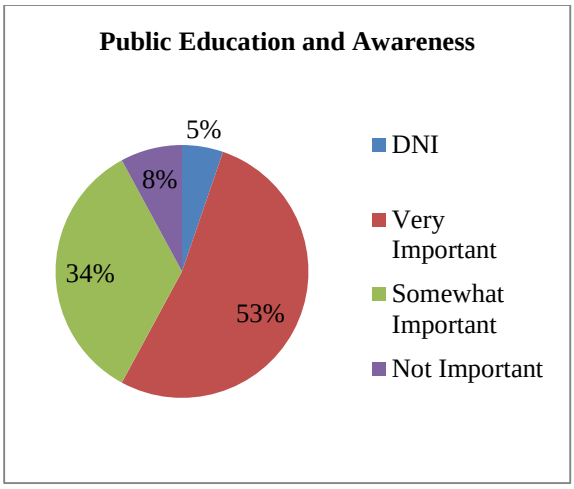












Pend Oreille County All-Hazards Mitigation Plan

Public Participation Questionnaire Results

(*Comments are written and spelled exactly as residents completed form, including capitalization and punctuation or lack thereof.)

2. Have you ever experienced or been impacted by a disaster (a sudden event bringing severe damage, loss or destruction)?

- **Yes (please explain)**

1. Partial roof collapse/snow, SNOW TOO Heavy on Roofs-LAST WINTER,
2. SNOW DAMAGE
3. COLLAP
4. Hurricane/Tropical storm in North Carolina
5. 96-97 WINTER TREE FELL ON ROOF & ROAD DAMAGE
6. SEVERE FIRES
7. 30+ yrs AS A firefighter
8. HANGMAN FALLS FIRE-SPOKANE-1987
9. 1948 flood
10. FIRESTORM/ICE STORM/EXTREME SNOW 1996
11. 1997 FLOOD 08-09 WINTER
12. TORNADO (VANCOUNVER, WA 1972 & (DEATH) loss of Harold L. Komm, SR. 2005
13. lightning hit well-pump
14. HOUSE FIRE-TOTAL DESTRUCTION

4. Please select five (5) highest that you believe are hazards facing your neighborhood.

- **Other (please explain):**

1. GOVERNMENT WASTING MY MONEY ON CRAP LIKE THIS

2. GOV. INVASION OF PRIVATE PROPERTY RIGHTS!
3. THIEVES
4. WEED CONTROL
5. Loss of Power during Winter
6. Crack houses BAR
7. PRIVATE ROAd detERiAtion

5. Is there a hazard not listed in this survey that you think is a side-scale threat to your neighborhood?

- **Yes (Please explain)**

1. THIEVES
2. MilFoil
3. Meth & Drugs & alcohol
4. No ELEctricity $57,000+ IS to much for main line

7. Do you have flood insurance, if required, through a National Flood Insurance Program (NFIP) Carrier? If "No", why not?

1. On top oF A Hill

9. Have you taken any actions to make your home or neighborhood more resistant to hazards?

- **If Yes, please explain:**

1. Timberland Thinning & fire breaks
2. have done some thinning of forest land to reduce wildfire hazard
3. Fire zone/water tank
4. HAVE CLEARED UNDERBRUSH ON SOME AREAS OF MY PROPERTY
5. Brush clearing
6. Expand green space cut back Fuels
7. thinned & cleaned up around the 3 acres surrounding our Home
8. metal roofing-wildfire reduction
9. Brush Removal
10. TRIED TO MAKE IT MORE RESISTANT TO WILDFIRES
11. Cut Dead trees & Debris away
12. Keeping it clean
13. I Have Several Fire Trucks
14. Roof replaced SLANT more-Clear out trees old or dead
15. REMOVED/REMOVING FIRE HAZARD AROUND BUILDINGS THINING TREES
16. GREEN AREA OF 100'
17. Prune, Thin, cleanup of Adjacent forest Area Metal Roof
18. No trees too near the house, Roof design sheds, Snow away from entrances/exits
19. removed Hazard trees-Mow large perimeter around home-clean up fire fuels
20. Currently thinning the Forest Property to help control wildfires
21. Forest safety clearing

22. On the timber land. I try to keep my roads & skid trailes clean. Most all trail & skid trail goes from one to next one so I can use as fire line. Also where there is a lot of dead wood and bad trees remove help keep a fire on the ground
23. Clean space Around home And out buildings
24. CLEAR TREES AND MOST OTHER FLAMMABLES AWAY FROM HOME
25. CUT THE TREES & BRUSH
26. Fireline Has been cut & maintaind Around the 20 Acres

11. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?

- **Other (please explain):**
  1. amail
  2. ON SITE inspections

12. In your opinion, what are some steps your County or city governments could take to reduce or eliminate risk of future hazard damages in your neighborhood?

1. Alow cutting of dead and Down in Public Forist near (my) property
2. Don't Know
3. REDUCE SLASH PILE BURNING, INCREASE FIRE PREVENTION EFFORTS
4. Wildfire reduction BY Property Owners
5. Community Leaders all need Training and Educational materials(?) Distributed to the public
6. Grade Balcon Rd. in the spring Plow Balcon Rd in the winter
7. more Community involvement, incentives
8. I Think Educating people works well
9. unsure
10. cost share with landowners to reduce hazards
11. Govt. is broke. Let landowners protect themselves
12. Weed Control, road maintenance, slope stability in areas of known slide-prone geology
13. (STATE-FEDERAL) Building codes-Setbacks-Roads-Powerline maint. (Rules & Regulations! Planning together! Training together! Consistency of above enforcement!
14. Provide Financial Help to Property Owners for Forest Fire Prevention
15. DEVELOPE A PLAN TO ASSIST LAND OWNERS IN GETTING RId OF NOXIOUS WEEDS AND CLEARING FIRE HAZARDS AFTER INSPECTION
16. We are rural-We are careful
17. More Fire Protection
18. Fire education
19. Camper have a Axe-shovel and 5 gal. of water at capes & fires made sure the fires out befor thay lave And clean up the camp groundes before thay lave
20. ? Maybe better communication to the citizens
21. During times of flood hazard on P.O. River, provide an opportunity for landowners on River to place Rock on the shoreline to protect property in an emergency.
22. Money Fire Protection & Cops
23. ElEctric Company To provide mainline, so we can hAve pumps for wElls to fight fires & havE lights to AidE EmErgEncy vEhEcilEs locate thE Right HomEs.
24. Keep hills plowed & sanded even on weekends

25. MORE & BETTER EQUIPMENT FOR FIRE DEPT

13. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

1. No government mandated requirements
2. DON'T USE THE EXCUSE OF "HAZARD PROTECTION" TO INTRODUCE "ENVIRONMENTAL NONSENSE" THAT IMPEDES ON OUR CONSTITUTIONAL RIGHTS-I.E. CALIFORNIA!!!!
3. Cannot think of any.
4. No-Nope-Not really
5. Any action should be completely voluntary. Mandatory compliance violates our personal property rights
6. No government mandated requirements
7. NOT needed because small rural & very safe-except for TOO MUCH SNOW or fire even then we have a fire department
8. MAKE ALL PUBLIC RECORDS ACCESSABLE YEAR ROUND FOR THE UTILITY COMPANY AND EMERGENCY RESPONSE PERSONNEL. NOT JUST THE ROADS MAINTAINED BY THE COUNTY.
9. probably? vague question
10. respect & curtsy to drivers & campers that enjoy the outdoors
11. OVER HEAD POWER LINES-SOMETIMES ARE OVER-BURDONED WITH ICE OR FALLEN TREES. LOSS OF POWER-HEAT AND ALSO FIRE DANGER-LINES SHOULD BE UNDERGROUND
12. Shoreline projects are very expensive. Since County allowed shoreline to be platted they need to bear some of the responsibility for the erosion. PUD has also benefitted from the dam But they do not help landowner who cannot afford it.
13. NeeD HigHer Levees For Cusick

14. A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. Please tell us how important you think each one is for your community to consider pursuing.

1. **Prevention—Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain.**
   1. Please No more Gov. intervention on Private property
2. **Property Protection—Actions involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.**
   1. Please No more Gov. intervention on Private Property
3. **Natural Protection—Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.**
   1. floodplain protection, slope stabilization, forest management

4. **Structural Projects—Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, canals, detention/retention basins, channel modification, retaining walls, and storm sewers.**

5. **Emergency Services—Actions that protect people and property during and immediately after a hazard event; examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.**

6. **Public Education and Awareness—Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.**

Citizen comments written at end of form—

This could cause government CONTROL. I don't like the thought. Rather prepare ourselves. Rural should be exempt.
PEoplE who want To protEct their propErty will tAkE ThE steps to do so.

Citizen comment written on front of form—

Jesus Loves U

APPENDIX 4: MITIGATION PROJECT RANKING

The following table was used to rank the identified mitigation projects. It follows the ranking scheme detailed in Section 5 of this Plan.

Rank	Non-Planning Projects	Hazard Risk	Repetitive Loss Reduction	BCA	Community Vulnerability	Population Benefit	Property Benefit	Economic Benefit	Project Feasibility	Project Effect-ivines s	Future Devel-opment	Total Score
	Possible Score	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**80**
1	Remove Tall or Double Top Trees Along the PUD Power Line Easements	8	8	7	8	9	7	5	3	3	2	60
2	Wildfire Fuel Reduction Projects	9	8	7	7	8	7	5	2	3	2	58
3	Conduct an Engineering study to Determine Why the Blue Slide Tunnel is Being Displaced	8	7	8	4	7	3	7	4	3	3	54
4	Road-side fuels management (e.g., State Highway 20, State Highway 31, State Highway 211, LeClerc Creek Road, Scotia Valley Road, Spring Valley Road, Fertile Valley Road, Deer Valley Road, Bead Lake Road, Flowery Trail Road, Diamond Lake Road, and Sullivan Lake Road).	6	7	8	5	7	6	4	4	3	3	53
5	Fuels mitigation of the "Emergency Evacuation Routes" in the county to insure these routes can be maintained in the case of an emergency.	6	6	7	5	7	5	4	4	3	3	50
6	Flood project at Cusick Substation.	6	6	6	6	5	3	4	4	4	4	48
7	Raise the Spring Valley Road Adjacent to Lake of the Woods	6	5	7	5	3	3	3	5	5	5	47
8	Stabalize the Slide Area Along Sullivan Lake Road	6	6	7	4	6	2	4	3	3	4	45

Rank	Non-Planning Projects	Hazard Risk	Repetitive Loss Reduction	BCA	Community Vulnerability	Population Benefit	Property Benefit	Economic Benefit	Project Feasibility	Project Effect-ivines s	Future Devel-opment	Total Score
	Possible Score	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**80**
9	Stabilize the Rock Slide Area Along Spring Valley Road South of Land of the Woods	5	7	8	5	4	2	3	4	4	3	45
10	Stabilize the Mud and Rock Slide Area Along Highway 31 at Mile Post 11	7	7	8	3	5	2	4	4	3	2	45
11	Riverbend Water System: To aid in the current water capacity: build a 200,000 gallon reservoir, Increase pump intake, treatment system upgrade, and main line size upgrade. Additionally 1.0 miles of 8" main line (C-900), and 8 fire hydrants placed locally throughout the subdivision.	7	5	6	5	3	5	3	4	4	3	45
12	Emergency Mobile Substation Distribution Transformer: Purchase and emergency mobile substation distribution transformer in the event of the loss of a substation transformer due to equipment failure, lightning, terrorism, earthquake, vandalism to restore service to electric customers as expeditiously as possible.	6	5	6	5	6	2	3	5	5	2	45
13	Metaline Falls Water: To aid in current water capacity: build additional 1.0 million gallon reservoir placed upon rye field flats to balance fire flow.	7	5	6	5	2	4	3	4	4	3	43

Rank	Non-Planning Projects	Hazard Risk	Repetitive Loss Reduction	BCA	Community Vulnerability	Population Benefit	Property Benefit	Economic Benefit	Project Feasibility	Project Effect-ivines s	Future Devel-opment	Total Score
	Possible Score	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**80**
14	Stabilize the Rockslide Areas Along the Railroad at 2 Mile Marker	7	6	6	4	2	2	5	4	4	2	42
15	Mitigate the Sink Holes Along Sullivan Lake Road	5	5	4	4	4	3	5	5	4	2	41
16	Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Baker Lake Road.	5	4	7	5	4	2	3	4	4	3	41
17	Replace the Sullivan Lake Inlet Bridge over Harvey Creek.	5	4	3	5	5	2	3	3	5	5	40
18	Replace the Indian Creek Bridge/Culvert on LeClerc Road South	6	5	7	3	4	2	3	4	4	2	40
19	Replace 2.5 Miles of existing cross-country overhead electrical distribution line that crossess inaccessible terrain and build new line along fertile valley road	5	4	6	5	4	2	3	4	4	3	40
20	Newport Water System Backup: Tie well fields directly to water mains with controls and construct additional million gallon storage tank.	4	4	6	4	3	2	3	4	4	3	37
21	Reduce Flooding From Runoff at Border Crossing	5	5	3	2	2	2	2	5	5	5	36
22	Retire 3 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution	5	4	5	4	3	2	2	4	4	3	36

Rank	Non-Planning Projects	Hazard Risk	Repetitive Loss Reduction	BCA	Community Vulnerability	Population Benefit	Property Benefit	Economic Benefit	Project Feasibility	Project Effect-ivines s	Future Devel-opment	Total Score
	Possible Score	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**80**
23	line along Camden/Phay Roads to Allen Road. Retire 1.5 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line along Horseshoe Lake Road.	5	4	5	4	3	2	2	4	4	3	36
24	Retire 4 miles of existing cross-country overhead electric distribution line that traverses inaccessible terrain and build a new electric distribution line from Tweedy Road to Garrett Road.	5	4	5	4	3	2	2	4	4	3	36
25	Install new roofs on Cusick school buildings due to increase in snow loads to exsceed engineering requirements.	6	4	3	5	3	3	2	4	5	1	36
26	Install new roofs on Selkirk school/buildings due to increase in snow loads to exceed engineering requirements.	6	4	3	5	3	3	2	4	5	1	36
27	Stabilize Landslide Areas on the Ashen Felter Bay Road	5	5	4	3	2	1	2	4	4	4	34
28	Calispel Creek Power Project: Increase the reliability of the headgate operation at Power Lake	5	4	4	4	3	2	3	4	4	1	34
29	Seismically Reinforce Equipment in Pend Oreille County Dispatch Center	2	1	2	3	8	2	4	5	5	1	33

Rank	Non-Planning Projects	Hazard Risk	Repetitive Loss Reduction	BCA	Community Vulnerability	Population Benefit	Property Benefit	Economic Benefit	Project Feasibility	Project Effect-ivines s	Future Devel-opment	Total Score
	Possible Score	**10**	**10**	**10**	**10**	**10**	**10**	**5**	**5**	**5**	**5**	**80**
30	Replace the Road Crossing Culvert on Perkins Slough	5	5	3	3	3	2	2	3	4	2	32
31	Repair the Sink Hole on the NorthEnd of LeClerc Road North Near Yochum Lake.	4	3	6	3	4	2	3	4	2	1	32
32	Replace the County Road Shop at Ione.	6	4	2	3	4	2	1	4	4	1	31
33	Newport Administrative Building Retrofit: Retrofit the old section of the Newport Headquarters Building to enable it to withstand a major earthquake.	3	2	1	2	2	2	2	3	4	1	22

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APPENDIX 5: ACRONYM LIST

AHMP ..... Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan
Base Flood ..... "100-year Flood" or "Regulatory Flood"
Committee..... The Pend Oreille County Multi-Jurisdiction All Hazard or Mitigation Committee
CRS ..... Community Rating System
CWPP..... Community Wildfire Protection Plan
DEM..... Digital Elevation Model
E-cycling ..... electronics recycling
EMD..... Emergency Management Division (State of Washington)
FEMA ..... Federal Emergency Management Agency
FIRM..... Flood Insurance Rate Map
GIS ..... Geographical Information Systems
HAZUS ..... Hazards United States, an abbreviation for Hazards United States
LEPC..... Local Emergency Planning Committee
MMI Scale ..... Modified Mercalli Intensity Scale
NCDC ..... National Climactic Data Center
NFIP ..... National Flood Insurance Plan
NOAA ..... National Oceanic and Atmospheric Administration
NWS..... National Weather Service
PAD..... Protective Action Distances
PDM..... Pre-disaster Mitigation Grant
PGA..... Peak Ground Acceleration
Plan ..... Pend Oreille County Multi-Jurisdiction All Hazard Mitigation Plan
ROM ..... Reasonable Order of Magnitude
USDA..... United States Department of Agriculture
USFS ..... United States Forest Service
USGS ..... United States Geological Survey
WSDFW..... Washington State Department of Fish and Wildlife
WSDNR ..... Washington State Department of Natural Resources
WSDOE ..... Washington State Department of Ecology
WSDOT ..... Washington State Department of Transportation
WUI..... Wildland Urban Interface

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