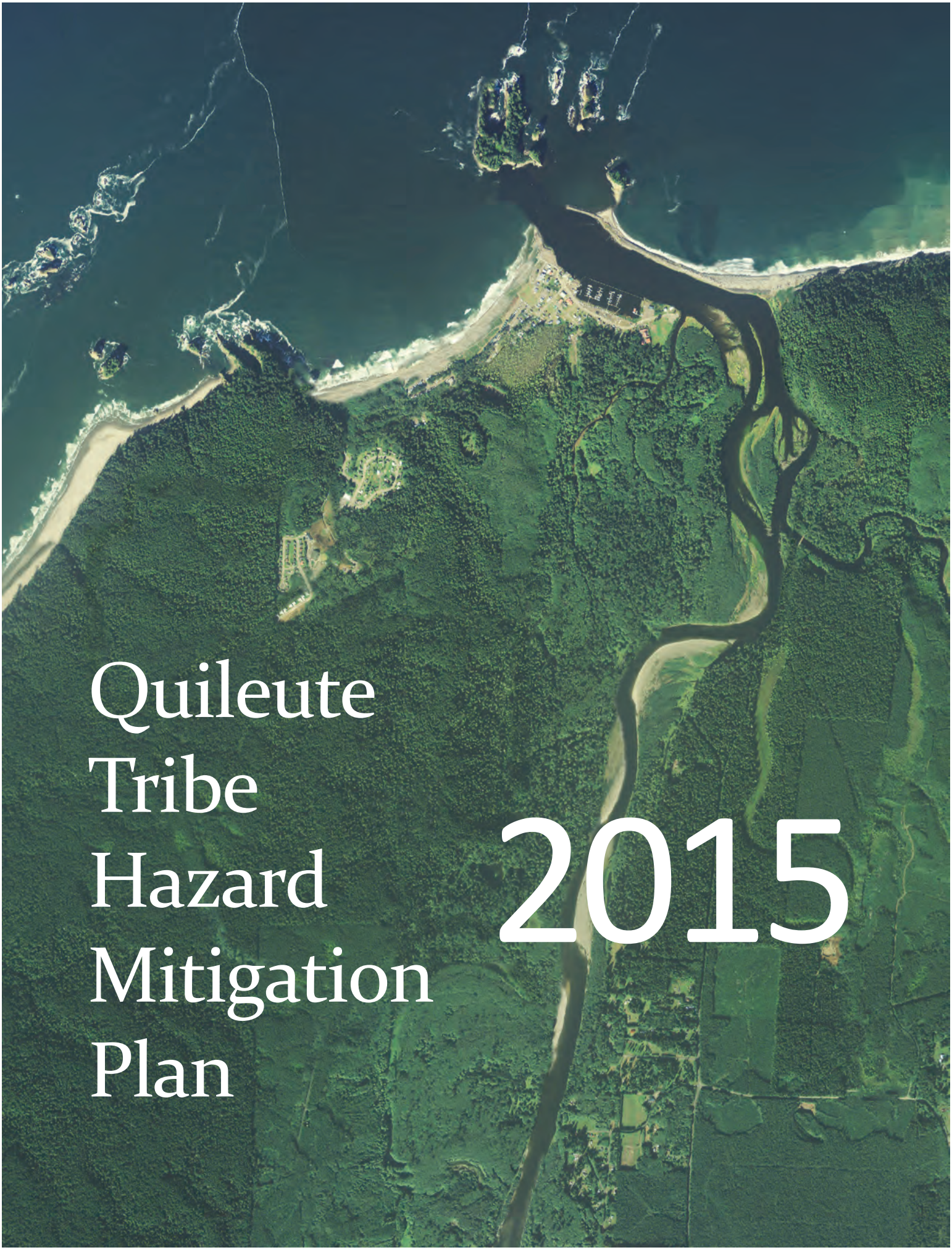

Quileute Tribe Hazard Mitigation Plan

2015

AS THE QUILEUTE PEOPLE, WE VALUE:

Our Tribal Sovereignty, as it affirms our rightful place among the nations and cultures of the World

Our Quileute Elders, for the knowledge they can share and for providing the foundation to ensure that the Quileute people, and our culture, have survived for thousands of years

Our Quileute Children, as they are the future of the Quileute people and they need a safe, nurturing environment to grow and learn from our Elders, our families, and from our community

Our Quileute Culture and Songs, holding a deep respect for our past, present and future, for the strength and identity our culture and our songs provide to our people

Community and Family Harmony, harboring respect for each other, and every family, emphasizing fairness in all our public and private interactions

Our Quileute Hospitality, affirming to the world that the Quileute people are generous with our guests and hospitable to everyone

Life-long Health Care, so that throughout our lives as Quileute people, we will be actively engaged in helping our Tribe, our families and new generations of our people thrive and prosper

Life-long Education, as it is essential for all our people, to help us to live meaningful lives, and build a work ethic based on self-reliance that is necessary to provide for their families

Our Village of La Push; the Creator gave us this safe home that has nurtured our people since the beginning of our time

Our Environment, the Ocean and our Marina, as they provide the Quileute people with the nourishment that has allowed us to prosper, thrive and develop our cultural identity and economy in this place

Tribal Economic Development, so that we can create a sustainable economic future for our people, and find fulfilling employment and family wage jobs here in La Push and elsewhere

Compiled in 2008 by the Quileute Tribal Community

Quileute Tribe Hazard Mitigation Plan 2015

Northwest Tribal Communications

Colleen Jollie, Project Manager

Bridget Ray, Planner

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Acronyms

ACOE	Army Corp of Engineers
CFR	Code of Federal Regulations
DMA 2000	Disaster Mitigation Act of 2000
DR	Disaster
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FY	Fiscal Year
g's	Gravitational Rate of Acceleration
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
M	Magnitude
MM	Modified Mercalli
MTHG	Move to Higher Ground project
Mw	Moment Magnitude
mph	Mile(s) Per Hour

NEIC	National Earthquake Information Center
NFIP	National Flood Insurance Program
NRC	National Response Center
NTC	Northwest Tribal Communications
PDM	Pre-Disaster Mitigation
Planning Team	Quileute Hazard Mitigation Planning Team
POC	Point of Contact
Reservation	Quileute Indian Reservation
RFC	Repetitive Flood Claim
RL	Repetitive Loss
SRL	Severe Repetitive Loss
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic and Environmental
Tribe	Quileute Tribe
URS	URS Group, Inc.
USGS	U.S. Geological Service

The Quileute Tribe has been impacted by natural disasters for thousands of years. In La Push, on the Quileute Indian Reservation, weather is so fierce that in ancient times there was a group called the Weatherman Society. The winter season is called the Bask'alidx – Bad Weather. There are other hazards identified in this Hazard Mitigation Plan, but Bad Weather is by far the most frequent and predictable. The impact of disasters on families and individuals can be immense. Disaster damages to businesses are costly. The time, money, and effort needed to respond to and recover from disasters divert resources and attention from other important programs and problems. In the case of severe storms, earthquake, tsunami, for instance, these catastrophes cannot be avoided, but they can be mitigated through planning and preparation. In this way, the Quileute Tribe can build a resilient community and reduce the impacts of disasters.

In 2000, the United States Congress passed the Disaster Mitigation Act (Public Law 106-390) to reinforce the importance of mitigation planning and to emphasize planning for disasters before they occur. Because of this act, states, tribes, and local communities must have an approved natural hazard mitigation plan in place before they may receive funds for either pre-disaster mitigation or post-disaster recovery. These plans must demonstrate that proposed mitigation measures are based on a sound planning process that accounts for the risks to, and the capabilities of, the various agencies.

Using a community-based planning process, the Quileute Tribe prepared this 2015 Hazard Mitigation Plan (HMP) for guidance toward greater disaster resistance in accord with federal requirements and to reflect the character and needs of the Quileute Tribe. The potential hazards identified and assessed in this HMP consist of: seismic hazards, such as ground shaking, ground movement (liquefaction and earthquake-induced landslide), and tsunami; severe storm hazards, such as flood (coastal and riverine), landslide/mudslide, coastal erosion, wind storm, and snow/ice storm; wildland fire or urban conflagration; and hazardous material spills, such as a vessel incident, fixed incident and mobile incident. Mitigation actions include a range of specific actions and projects that reduce the effects of each hazard, with particular emphasis on prevention and protecting new and existing buildings and infrastructure.

This Plan aims to coordinate with neighboring governmental agencies. The planning process opened communication with county, state and federal agencies to build informed relationships as major hazards travel beyond Reservation boundaries; plus, many Tribal Members live or attend school in nearby towns. There are excellent reasons to work together, i.e. the U.S. Coast Guard Station #13 is located in La Push and they are an important partner. Also, the State Department of Transportation (WSDOT) is responsible for safe passage on SR 110, the only road that serves the Quileute Reservation. It is frequently flooded at Mile Post 8, trapping residents either within or outside of the community. The mitigation measure which is listed on both the County and the Tribal project lists will require multiple funding partners.

The Quileute Tribal HMP has been prepared to meet the Federal Emergency Management Agency's (FEMA's) requirements for the Disaster Mitigation Act of 2000 and the Interim Final Rule, thus making it eligible for funding and technical assistance from state and federal hazard mitigation programs. If a major disaster is declared in the future, the Tribe will be required to review and update its mitigation strategy. With a major mitigation effort already in process, appropriately called the *Move to Higher Ground* (MTHG), there will be radical changes to infrastructure as the Tribe relocates essential services out of the tsunami zone. This 2015 Quileute Tribe Hazard Mitigation Plan must be updated every 5 years.

This section provides a brief introduction to hazard mitigation planning and the requirements of a Tribal Hazard Mitigation Plan and Federal Emergency Management Agency (FEMA) mitigation grants. This section also outlines the Tribal Hazard Mitigation Plan.

1.1 HAZARD MITIGATION PLANNING

Title 44 of the *Code of Federal Regulations* (CFR), Subpart M, Section 206.401, defines hazard mitigation as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." Therefore, hazard mitigation includes any work undertaken to minimize the impacts of a hazard event before it occurs and to reduce losses from future disasters. It is a process in which hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed. Implementing mitigation actions, which include long-term strategies that may involve planning, policy changes, programs, projects, and other activities, is the end result of this process.

1.2 TRIBAL PLANNING REQUIREMENTS

The Disaster Mitigation Act of 2000 (DMA 2000) drives hazard mitigation planning. On October 30, 2000, Congress passed the DMA 2000 (Public Law 106-390), which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act) (Title 42 of the United States Code, Section 5121 et seq.) by repealing the act's previous mitigation planning section (Section 409) and replacing it with a new mitigation planning section (Section 322). This new section emphasized the need for States, Tribes, and local entities to closely coordinate mitigation planning and implementation efforts. The section also provided the legal basis for FEMA's mitigation plan requirements in order to obtain mitigation grant assistance.

To implement these planning requirements, FEMA published an Interim Final Rule in the *Federal Register* on February 26, 2002 (FEMA 2002) (44 CFR Part 201). In July 2008, FEMA released the draft *Tribal Multi-Hazard Mitigation Planning Guidance* (FEMA 2008), which contains the new Tribal Hazard Mitigation Plan requirements. They are identified at the beginning of each section throughout this plan.

1.3 GRANT PROGRAMS WITH MITIGATION PLAN REQUIREMENTS

Currently, five FEMA grant programs provide funding to tribes that have a FEMA-approved Tribal Mitigation Plan. Two of the grant programs are authorized under the Stafford Act and DMA 2000. The remaining three are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act.

1.3.1 Stafford Act Grant Programs

Hazard Mitigation Grant Program: The Hazard Mitigation Grant Program (HMGP) provides grants to Tribes, States and local agencies to implement long-term hazard mitigation measures after the declaration of a major disaster. The purpose of the HMGP is to reduce the loss of life and property as a result of natural disasters and to enable implementation of mitigation measures during the immediate disaster recovery period. Projects must provide a long-term solution to a problem (for example, elevating a home to reduce the risk of flood damage rather than buying sandbags and pumps to fight the flood). A project's potential savings must be greater than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. HMGP

has limited funding available under a particular disaster declaration. Under the program, the Federal government may provide a state or tribe with up to 20 percent of the total disaster grants awarded by FEMA and may provide up to 75 percent of the cost of projects approved under the program.

Pre-Disaster Mitigation Program: The Pre-Disaster Mitigation (PDM) Program provides funds to Tribes, States and local agencies for hazard mitigation planning and the implementation of mitigation projects before a disaster. PDM grants are awarded on a nationally competitive basis. In the same manner as HMGP funding, the potential savings of a PDM project must be more than the cost of implementing the project, and funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. Congress appropriates the total amount of PDM funding on an annual basis. The federal government provides up to 90 percent of the cost of projects approved under the program.

1.3.2 National Flood Insurance Act Grant Programs

Flood Mitigation Assistance Grant Program: The goal of the Flood Mitigation Assistance Grant Program is to reduce or eliminate flood insurance claims under the National Flood Insurance Program (NFIP). This program places particular emphasis on mitigating repetitive loss (RL) properties. The primary source of funding for this program is the National Flood Insurance Fund. Grant funding is available for three types of grants: Planning, Project, and Technical Assistance. Project grants, which use most of the program's total funding, are awarded to local entities to apply mitigation measures to reduce flood losses to properties insured under the NFIP. The cost-share for this grant is 75 percent Federal/25 percent non-Federal, although a cost-share of 90 percent Federal/10 percent non-Federal is available in certain situations to mitigate severe repetitive loss (SRL) properties.

Repetitive Flood Claims Program: The Repetitive Flood Claims Program provides funding to reduce or eliminate the long-term risk of flood damage to residential and non-residential structures insured under the NFIP. Structures considered for mitigation must have received one or more payments on claims for flood damages. All Repetitive Flood Claims Program grants are eligible for up to 100 percent Federal assistance.

Severe Repetitive Loss Program: The SRL Program provides funding to reduce or eliminate the long-term risk of flood damage to residential structures insured under the NFIP. To be considered for mitigation, the structures must have received at least four NFIP payments on claims, each one totaling more than $5,000, with at least two occurring within any 10-year period, and with the cumulative amount of such claim payments exceeding $20,000; or for which at least two separate claims payments have been made, where the cumulative amount of the building portion of such claims exceeded the value of the property and two such claims have occurred within any 10-year period. The cost-share ratio for this grant is 75 percent Federal/25 percent non-Federal, although a cost-share ratio of 90 percent Federal/10 percent non-Federal is available to mitigate SRL properties when the Hazard Mitigation Plan addresses ways to mitigate Severe Repetitive Loss properties.

1.4 DESCRIPTION OF THE HAZARD MITIGATION PLAN - HMP

The remainder of this Tribal Hazard Mitigation Plan consists of the sections and appendices described below.

1.4.1 Section 2: Official Record of Adoption

Section 2 addresses the adoption of this Quileute Tribal Hazard Mitigation Plan by Resolution of the Tribal Business Council. The resolution is provided in Appendix B, Adoption Resolution.

1.4.2 Section 3: Community Description

Section 3 provides a general history of the Tribe, including historical trends for population and the demographic and economic conditions that have shaped the area, and cultural resources. *Figures E-1* and *E-2* (Appendix E, Figures) show the Reservation in relation to the surrounding area, and *Figures E-3A, E-3B* and *E-3C* (Appendix E, Figures) show the land use patterns on the Reservation.

1.4.3 Section 4: Planning Process

Section 4 describes the planning process, identifies the Planning Team, and describes the meetings held as part of the planning process (meeting agendas are attached as Appendix C, Planning Team Meetings). This section also documents public outreach activities (attached as Appendix D, Public Outreach) and discusses the review and incorporation of relevant plans, reports, and other information.

1.4.4 Section 5: Hazard Analysis

Section 5 describes the process through which the Planning Team identified, screened, and selected the hazards profiled in the Tribal Hazard Mitigation Plan. The hazard analysis includes the nature, history, location, extent, and probability of future events for each hazard. Location and historical hazard figures are provided in Appendix E, Figures.

1.4.5 Section 6: Vulnerability Analysis

Section 6 identifies potentially vulnerable assets—population, housing, assets, areas of cultural significance, utilities, and areas of future development. This information was compiled by assessing the potential impacts from each hazard using Geographic Information System (GIS) data. The resulting information identifies the full range of hazards that the Tribe could face and the potential social impacts, damages, and economic losses.

1.4.6 Section 7: Capability Assessment

Section 7 identifies and evaluates the human and technical; financial; legal; and, regulatory resources available for hazard mitigation for the Tribe. This section also lists the Tribe's current, ongoing, and completed mitigation projects and programs.

1.4.7 Section 8: Mitigation Strategy

Section 8 provides a blueprint for reducing the potential losses identified in the vulnerability analysis. The Planning Team created a list of mitigation projects. Through the evaluation and prioritization process described in this section, the Planning Team selected high-priority projects to include in the implementation strategy.

1.4.8 Section 9: Plan Maintenance

Section 9 describes the formal plan maintenance process to ensure that the Tribal Hazard Mitigation Plan remains an active and relevant document. The process includes monitoring, evaluating, and updating the Tribal Hazard Mitigation Plan; monitoring mitigation projects and closeout procedures; implementing the plan through existing planning mechanisms; and achieving continued public involvement.

1.4.9 Section 10: References

Section 10 lists the reference materials used to prepare the Tribal Mitigation Plan.

1.4.10 Appendix A, Tribal Hazard Mitigation Plan Review Crosswalk

Appendix A provides the FEMA crosswalk, which documents compliance with 44 CFR for the Tribal Hazard Mitigation Plan requirements.

1.4.11 Appendix B, Adoption Resolution

Appendix B provides a copy of the official Tribal Business Council Adoption Resolution.

1.4.12 Appendix C, Planning Team Meetings

Appendix C provides information on the Planning Team's meetings.

1.4.13 Appendix D, Public Outreach

Appendix D provides public outreach information, including planning information posted in the Tribal Center, an introductory brochure, and notes from a public forum.

1.4.14 Appendix E, Figures: GIS Data and Maps

Appendix E provides figures that identify known hazard areas, previous hazard occurrences, population density, land use, Tribal assets, and areas of cultural significance, utilities, and areas identified for future acquisition, among other things.

1.4.15 Appendix F, Financial Resources

Appendix F provides a chart of QHMP funding prospects.

1.4.16 Appendix G, Electronic Copy of the Tribal Mitigation Plan

Appendix G provides an electronic version of this Tribal Hazard Mitigation Plan on a compact disc.

This section describes the official record of adoption of this Tribal Mitigation Plan.

The requirements for the adoption of this Tribal Hazard Mitigation Plan by the participating Tribal governing body, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PREREQUISITES

Adoption by the Tribal Governing Body

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

Element

- Has the governing body of the Indian Tribal government adopted the new or updated plan?
- Is supporting documentation, such as a resolution, included?

Source: FEMA 2008.

To meet the requirements of Section 322 of DMA 2000, the Tribal Hazard Mitigation Plan must be formally adopted by the governing body of the Indian Tribal government prior to submittal to FEMA for final review and approval.

The Tribal Council adopted this Tribal Hazard Mitigation Plan by resolution. A scanned copy of the resolution is provided in Appendix B, Adoption Resolution.

This section describes the Quileute Tribe's history, location, geography, government, demographic information and current land use and development trends.

3.1 HISTORY, LOCATION, AND GEOGRAPHY

A discussion of cultural history is included in Section 3.5 – Cultural Resources. Compared to the deep history of Quileute which spans millennia, contact with non-Natives is very recent. The Quileute Tribe first met Europeans in 1775 when a Spanish ship crashed on the rocks at the mouth of the Quillayute River, a fate that would occur repeatedly with travelers over the next 200 years. Similar incidents occurred, one with a British crew in 1787 and another with a Russian crew in 1808. There have been ten shipwrecks documented in that turbulent location.

The first official contact between some members of the Tribe and the American government took place in 1855, when Governor Isaac Stevens negotiated the Treaty of Quinault River. Besides claiming the region for America as opposed to Spain, England or Russia, the Treaty established title to the land for America and vast wealth in natural resources. It was negotiated in the Chinook Trade Jargon and stipulated that the Tribe must cede over 800,000 acres of traditional territory. The People, however, refused to leave their ancient homeland. President Grover Cleveland issued an Executive Order in 1889, the year Washington became a State, establishing the 640-acre reservation at the mouth of the Quillayute River at their village of La Push.

Using a common hazard term, a 'conflagration', occurred – caused by human action. It was started by the factor of the trading post at La Push who wanted to claim the site as his homestead. The fire destroyed 26 longhouses, canoes, nearly all their fishing gear, and personal items. His homestead claim was eventually denied. There were other encroachments as La Push was a highly desirable site, being right on the ocean and at the mouth of the river. The Olympic National Park managed a visitor's lodge at First Beach for many years. Fishing was big business. Hundreds of fishermen used the bay and river for moorage and a fish processing plant. It is only in very recent history that the Tribe has been successful in regaining their land and control of the businesses. The greatest reclamation has been the return of 800 acres of forested highlands from the Olympic National Park. The Tribe is relocating the village in a massive project called the *Move to Higher Ground*, to move essential facilities up and out of the frequent flood zone – and to minimize tragedy from a major tsunami whenever that may occur. This is their most urgent hazard mitigation measure and is currently in the planning phase now that the land is secured into trust status. It is discussed in more detail in the Land Use portion of this section.

The Quileute Indian Reservation is located on the western coast of the Olympic Peninsula, the farthest northwest corner of the contiguous United States. The Olympic Peninsula is bound on the west by the Pacific Ocean, on the north by the Strait of Juan de Fuca, and on the west by Puget Sound. *Figures E-1* and *E-2* (Appendix E, Figures) show the Reservation and tribally owned properties in relation to the surrounding area. The peninsula is bisected north to south by the Olympic Mountains, the highest point being Mount Olympus at 7,962 feet. A significant portion of the range is covered by glaciers and year-round snow fields at elevations as low as 5,000 feet. The Hoh Rainforest covers much of the peninsula and is one of the few temperate rainforests on Earth. With an average of 142 inches of rainfall each year, this area is the wettest place in the lower 48 states. Vegetation of the Reservation is typical for the rainforest, giant evergreens - cedar, spruce, hemlock, and fir. Wooded wetlands cover the surroundings of the Quillayute River and nearby tributaries. Flooding is a perennial challenge.

The Quileute Reservation is located on the western edge of Clallam County, Washington. The county covers 2,670 square miles. The Quileute Reservation is approximately 2.5 square miles. Quileute ceded lands, also known as Usual and Accustomed Area (U&A), are 1,498,000 acres or 2,341 square miles, including 40 miles west into the Pacific Ocean. Immediately bordering the Quileute Reservation, the Olympic National Park covers 523 square miles of the county. An additional 124 square miles is covered by the Olympic National Forest.

The Reservation is remote, isolated. Traveling from the north or south end of the Peninsula by US101 to Forks, it is served by a single 2-lane road, SR110, for 15 miles west to La Push. Both US101 and SR110 are frequently impassable during winter storms and flooding events. The nearest town for groceries, fuel, and minor services is Forks, 15 miles east of La Push, (where SR110 intersects with US101). Tribal jurisdiction for law enforcement through the La Push Police Department and Natural Resources Enforcement Officers extends throughout the U&A. The Tribe has a Memorandum of Agreement with Forks to use the town's jail facilities when necessary. Port Angeles, the county seat and largest city, is 65 miles northeast of La Push, and has the closest hospital in the area.

3.2 ECONOMICS

The Quileute people have lived by fishing, hunting and gathering the enormous wealth of resources from the forests, rivers and ocean for thousands of years. Tradition says, "When the tide is out, the table is set." The fishery, sealing and whaling was their mainstay, and fishing continues to be the foundation of their subsistence and economy albeit a seasonal resource. In addition to the bounty of the sea, deer and elk, root vegetables, wild greens and a variety of berries provide a healthy diet and medicinal pharmacopeia. Today there is no whaling or seal hunting, and massive over fishing has reduced that resource substantially. The 1974 Boldt Decision reaffirmed the Tribes' right to fish and to co-manage the fishery. Currently, fishing contributes $2MM annually for the Quileute Tribe. In cooperation with Washington Department of Fish and Wildlife, the Tribe operates a hatchery for wild summer Chinook stock and a winter steelhead stock. Even as most essential services move to higher ground, the marina and the fish hatchery will remain inextricably tied to the river and the ocean, and as such, they are subject to damages in the case of flooding and tsunami events.

The primary sources of employment on the reservation are provided by government services, commercial ocean fisheries, subsistence river fisheries, the Quileute Oceanside Resort and the small Riverside Restaurant. Today ten percent (10 %) of the Tribe's workforce is employed in farming, fishing, or forestry occupations. The Tribe made a commitment to tourism as their number one economic strategy when they regained ownership of the Oceanside Resort, (personal communication, Russ Woodruff, previous Tribal Chairman and elder of the community). To that end, La Push will continue to develop as a destination resort community. Flooding and severe winter storms cause constant wear-and-tear on the facilities and require annual repairs and maintenance. A major earthquake and/or tsunami would devastate the economy of the Quileute Tribe as all tourist facilities are right on the beach and river.

Because its economy relies heavily on ecotourism, the Tribe recently expanded its Oceanside Resort, which includes 71 rooms in a mix of cabins and motel units, a convenience store, and an RV Park. The Tribe owns the only marina between Neah Bay and West Port. The Quileute Harbor Marina is capable of handling as many as 60 vessels up to 50 feet in length. The Marina is subjected to high wave action from several directions in spite of a major breakwater that was

built by the Army Corps of Engineers. It is frequently damaged by storms. Major repairs on the marina were completed in 2014. To sustain and operate essential government services, the Tribe generally receives approximately $8 million in Federal grants; that number fluctuates annually. The Tribe has rejected options to build a casino and is focused on the natural environment in developing its economy. They receive approximately $2.5 million from the lease of their slot-machine permits to other tribes.

3.3 GOVERNMENT AND DEMOGRAPHICS

In 1934, the Quileute Tribe organized under the Indian Reorganization Act and adopted a constitution and bylaws approved by the U. S. Secretary of the Interior. The Tribe is governed by a five-member Tribal Council. The elected officials serve staggered 3-year terms and vote internally to determine individual positions. The Quileute Tribal Council has seven primary executive departments which consist of Housing, Education, Health, Law and Justice, Council Operations, Natural Resources, and Human Services. There is also a Planning Committee that works with the Council to oversee community and economic development; and, a Business Manager to supervise multiple economic enterprises.

For Hazard Mitigation Planning purposes, the population base in La Push consists of three groups: 1) Residents, both Tribal Membership and the Coast Guard servicemen who live there; 2) Tribal employees who are there essentially for the workday; and, 3) Tourists who stay at the Oceanside resort and casual visitors there for a day at the beach. Planners accessed several sources of demographic data: Tribal Records, the 2010 U. S. Census, and FactFinder – a reporting service of the Census Bureau, and tourism data generated by the Olympic National Park.

The village of La Push has its own zip code, 98350, and the following 2010 census data is drawn from that tract. The total population is 460. Most of the people living in La Push are Tribal Members, 30 people are stationed at the Coast Guard facility. This community is predominantly of Quileute lineage, three hundred and seventy (370) or 80.4 percent identify as one race, American Indian. The median age is 30.4 years. 71 percent are 16 years of age and over, which drops abruptly to only eight percent at age 62. Fifty three percent (53%) are male, forty six percent (46%) are female. There are 159 housing units, 142 occupied, 3 for rent, and zero (0) for sale. Homeowner vacancy rate is zero, and rental vacancy rate is 4.2 percent. This will be revisited in the housing section of this report.

Tribal enrollment data differs from the general data generated in census tables. Tribal records indicate that Tribal enrollment is 763, with 202 of those members age 17 and under. Approximately half of the tribal members live on the reservation, in 159 households.

In addition to enrolled Quileute members, individuals enrolled in other tribes live on the reservation or receive services through the Quileute tribal programs. A 2010 survey of elders on the reservation identified 205 elders (over age 50) living on the reservation or receiving health services, of which 69 are enrolled members of other tribes. According to the Quileute Planning Department, the larger tribal community service area is approximately 3,000; this includes members and their descendants living on or off the Reservation.

According to FactFinder, the civilian work force consists of 58.6 percent, or 146 individuals, 16 years and older. Of those, 106 were employed, and 40 (27.4 percent of the civilian labor force) were unemployed.

FactFinder reports from 2008 to 2012 the median **household** income in this tract was $39,107. **Individuals** show a median income of $24,276, and those without high school diplomas average $11,136. The population 25 years and over - which is 292 people, 28.1 % do not have a diploma, 29.8 % are high school graduates or have a GED, 31.5 % have some college but no degree, 7.5% have an associate's degree, 0.7% have a bachelor's degree, and 0.7% have a graduate degree. 70.2% are high school graduates or higher, 1.4% have a bachelor's degree or higher.

According to the Olympic National Park data, in the tourist season, approximately 359,000 people a month visit the campground and beach at Mora, just across the Quillayute River from La Push. A tourist count could not be found for Second and Third Beaches, two popular day-hiking trails at the edge of La Push owned by the national park. The parking lots at the trailheads are full everyday all summer. In the event of a major disaster, approximately 300 tourists could be staying in the Tribe's Oceanside Resort and would need to be either evacuated or cared for in place.

3.4 LAND USE AND DEVELOPMENT TRENDS

The Tribal Planning Region consists of three areas of land development - the traditional village located in lower elevation at the mouth of the Quillayute River, upland development including new land acquired through recent legislation, and purchased land closer in proximity to Forks and Highway 101. The oldest development is along the beach, known as the lower village, with newer development in more elevated areas adjacent to La Push Road. The rest of the Tribal Planning Region is predominantly open wetlands and forest, as the Reservation is conscribed by the Quillayute River on the north, Olympic National Park on the eastern and southern boundaries, and the Pacific Ocean on the western shore. The Tribe has committed to tourism as their number one economic development strategy, a decision reflected throughout the Olympic Peninsula. The village of La Push is designated as a tourist destination in the Peninsula Regional Transportation Plan as "a natural, historical or privately developed area that serves as a destination for tourists and recreational users."

Figures E-3A through *E-3C* (Appendix E, Figures) show the current land use patterns on the Reservation, the Quileute Reservation Expansion, and the ACOE Preliminary Land Use Plan, respectively.

Recently the Tribe obtained adjacent areas of elevated land formerly owned by the Olympic National Park. Federal action by the 112th Congress added 1,041 acres to the reservation through the *Quileute Tsunami and Flood Protection* legislation (H.R. 1162),sponsored by Mr. Norm Dicks) and signed by President Barack Obama on February 27, 2012. The expansion property is shown as "Southern Lands on *Figure E-3B*. Only 285 acres of the expansion will be developed. In October 2014, the Army Corp of Engineers (ACOE) surveyed wetlands and produced a report and preliminary master plan of roadways, residential and governmental areas, based on surveyed topography and wetland designations. The preliminary design map shows possible placement for future housing, public facilities, and commercial development. (*Figure E-3C*)

The Tribe's strategic plan calls for moving their members and tribal assets out of the low-lying areas that are susceptible to flooding and tsunamis. The long awaited project is called the *Move to Higher Ground* (MTHG). This action is taken directly from the Tribe's First Goal of the *2013 Community Economic Development Strategy*, "Complete acquisition of land for the purposes of enhancing community development, public safety and tribal administration." The First Objective under that Goal is to "Ensure the safety of the tribal community and provide the necessary

space for appropriate development by completing the trust transfer of lands to the Quileute Reservation as passed by HB1162 by the 2012 Congress by the end of 2014." Accordingly, all recent housing construction and other development have occurred in the higher elevation areas in the southeast corner of the Reservation along La Push Road. Tribal Housing consists of 159 units, of which about one-fourth are located in the lower village. The remaining units are located upland mostly in three developments - Quileute Heights (51 units), Ravens Crest (36 units), and Ravens Crest II (8 units). Ravens Crest II has space allotted for a community garden and is the newest development having just been completed in 2014. The Quileute Housing Authority office and Health Clinic are located at the entrance of Quileute Heights. There is a large demand for new housing on the reservation for returning tribal members, service providers, and employees. Two 50-acre parcels are set aside for housing development on the newly obtained land.

Currently, the remaining government services are concentrated in the lower village and include the tribal administrative offices, senior center, human services and law enforcement. The Tribe's Natural Resource Office and the Quillayute River Coast Guard Station flank the east side of the lower village. The educational facilities are on a bluff overlooking the Pacific Ocean. The *Move to Higher Ground Project* includes plans to relocate the school upland as the highest priority, with a 50-acre site set aside close to the existing gym, Akalat Center. Also overlooking the Pacific Ocean is the Tribe's flagship enterprise, the Oceanside Resort, a destination for tourists and Olympic National Park recreational users. The resort operates 71 rooms and 66 RV campsites. The lower village land use designation will be for expanded enterprise and day use facilities.

3.5 CULTURAL RESOURCES

The Quileute Tribe has endured cataclysmic hazards since the beginning of time as the creation stories recall supernatural battles that "shook the mountains" and created the land and rivers. First Beach at La Push is where 'The Changer – K'wati' transformed wolves into The Quileute People in the 'time of the beginning'. Since time immemorial, The Quileute Tribe has lived in the watersheds of the Sol Duc, Calawah, Bogachiel and Dickey Rivers, which all drain into the Quillayute River. Deep shell middens across La Push and atop Akalat Island document their continuous presence for millennia. Their villages dotted the shores of the rivers and along the coast. Most Quileutes stayed close to their homeland as their unique language demonstrates.

Neighboring tribes traveled extensively along vast trade routes by land and sea, they spoke primarily Salish language dialects, and the Chinook trade jargon. Today the Quileute language is only spoken in this one place, but in the past the Chimicum people shared this unique dialect. They were located well across the mountains from the Quileute. The Quileute and Chimicum division by the Olympic Mountains is explained in their great Flood Story which split the original Tribe into two groups. A great flood engulfed the region and forced everyone to ride the waves as the waters rose up the mountains. As floodwaters receded from the mountain tops each went their separate ways. A Quileute canoe was found high atop a tree in the Chimicum territory, proof of the extensive power of the flood. The Chimicum branch essentially disappeared through relocation and intermarriage with other tribes in the 1800's.

According to a report titled, *A Cultural Resources Survey of the Quileute Indian Reservation Waterfront*, Randall Schalk and Jay Powell, 1997, "Swan, Frachtenberg, Farrand and others concluded that most of pre-contact Quileutes resided in riverine settlements (listed above), away from the modestly sized saltwater settlement at the mouth of the Quillayute River and the small community at Goodman (Jackson) Creek." Their territory ranged into the heights of the Olympic

Mountains. Many ancient village sites and burial grounds have been recorded at the Washington State Office of Archaeology and Historic Preservation, OAHP.

Numerous archaeological surveys and ethnographies have been generated since the late 1800's. The Quileute Tribe has fully participated in the exploration and recovery of cultural knowledge as evidenced in those documents. Given the deep history and connection to the waterways, there is always a chance that new sites and cultural resources will emerge, especially during floods, seismic land movement and construction of roadways, bridges, utility trenching, and other public works projects. A catastrophic tsunami would take the entire historic site out to sea. The Tribe and other agencies must be prepared to interact and protect cultural resources wherever and however they are exposed. This is usually done through an Unanticipated Discovery Plan based on the location of particular public works projects and with the support of OAHP. The Tribe has had a Tribal Historic Preservation Officer in the past but that office is currently vacant.

Of the entire area from First Beach, to the sea stack islands (Akalat), the sand spit at the mouth of the river, and swaths of land in the lower historic village of La Push, two sites are already documented historical sites with OAHP. The area could be classified as a Traditional Cultural Property if the Tribe chooses to go through the process and make those declarations. Villages along the Dickey River have also been documented in archaeological surveys, and other rivers are producing evidence of rich cultural material. There are enough artifacts in storage at the Tribal Office and other facilities in Port Angeles and at the University of Washington to fill a museum. Plans have been discussed to pursue that idea both to preserve cultural resources and to promote tourism.

The living culture is also vitally important. The community has been deeply involved in reclaiming their language as the elders who could still speak it worked with linguist, Jay Powell, to create tapes, a dictionary, and recall ancient stories. These are kept primarily at the school, but are in need of curation facilities with modern conservation technologies. If the school is damaged in a hazard event, these critically important materials will be ruined.

Here is an example of a current mitigation strategy: There is a facility at the heart of La Push in which the living culture has been practiced for the past 50 years. This is the Community Center where the dinners, drum circles, and special events occur. Tourists also attend to enjoy the food and ceremonies. It has been a place of traditional hospitality which is a deeply held value. The facility has been pummeled relentlessly by winter storms. Several years ago the roof blew off, so the building has had a temporary covering. The consequent damage now renders it too dangerous to use. As this Plan was being written, the community celebrated their last event there to sing a farewell song to the Community Center. Some historical elements will be salvaged for use in a new building in the future. It will be challenge to site a new facility, to move upland. As the bottomless shell middens attest to the deep history, the very songs and stories and ceremonies performed here have been sung in this spot for thousands of years.

This section describes the original planning efforts, including the details of how the plan was drafted and who was involved in this process, documents public outreach efforts, and discusses the existing plans, studies, and reports that were used to develop this Tribal Mitigation Plan. Additional information regarding the meetings of the Planning Team and public outreach efforts is provided in Appendix C, Planning Team Meetings, and Appendix D, Public Outreach.

4.1 PROCESS FOLLOWED TO PREPARE THE PLAN

The requirements for the documentation of the planning process, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLANNING PROCESS

Documentation of the Planning Process

Requirement §201.7(c)(1): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(ii) As appropriate, an opportunity for neighboring communities, Tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(iii) Review and incorporation, if appropriate, of existing or ongoing planning efforts, studies, reports, and technical information.

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

Element

- Does the new or updated plan provide a narrative description of the process followed to prepare the plan?
- Does the new or updated plan indicate who was involved in the current planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan indicate that an opportunity was given for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?

Source: FEMA 2008.

4.2 PLANNING HISTORY AND CONTEXT

In 2008, FEMA tasked URS Corporation to provide technical assistance to the Quileute Tribe to develop a Hazard Mitigation Plan. Headquartered in San Francisco, URS is a top-tier Fortune 500 engineering company with 50,000 employees world-wide. URS met with Walter Jackson, Planning Director, Bert Black, Public Works Director, and Bill Lyons, Tribal Police Chief, who were the Planning Team at that time. URS presented the requirements of DMA 2000, provided an overview of the planning process, work schedule, and draft outline. The Planning Team selected the hazards to be profiled and provided a list of the Tribal assets for the vulnerability analysis. After developing a draft mitigation strategy, capability assessment, and initial hazard

figures, the Planning Team developed a final implementation strategy. Two notices were published in the Quileute Tribal Newsletter and on the Tribe's website announcing the availability of the draft Tribal Hazard Mitigation Plan for review and comment. The record shows that the Hazard Mitigation Plan was never officially adopted. The planning process brought attention and action to looming hazards and the need to mitigate affects. The Tribe focused their actions to securing land from the Olympic National Park for the express reason of moving the endangered community out of the identified tsunami zone. That effort dominated the following six years and resulted in congressional action to return the land to the Quileute Tribe. Having accomplished this goal, the Tribe turned its attention to revisiting the unfinished *Hazard Mitigation Plan*. In addition to finishing and updating the work that URS did, the Tribe is updating the *Comprehensive Emergency Management Plan*, and developing a *Move to Higher Ground Master Plan*. The three plans are being coordinated by the Tribal Planning Department Director, Larry Burtness.

Northwest Tribal Communications (NTC) was hired to compile the Hazard Mitigation Plan, and along with the Quileute Planning Director, make up the core Planning Team for this plan. NTC is a Native-owned firm that specializes in tribal services using a methodology called 'Action Planning'. In addition to providing a factor of cultural competence, NTC is located in Olympia, Washington – 150 miles from La Push and available to attend numerous site visits. The Action Planning approach called for multiple face-to-face meetings with tribal departments, committees, the Tribal Council, and presentations at community events to gain valuable information from local knowledge. The Planning Team conducted a more robust consultation process with stakeholders than had been provided with the original 2008 Plan.

The first step was project review and preparation to conduct interviews, develop community presentations, and investigate the original plan, especially as it related to other jurisdictions and current conditions. After careful review, it was determined that the 2008 Plan was professionally compiled as a technical document and could be used as the framework of the *2015 Quileute Tribal Hazard Mitigation Plan*. The (2008) mitigation strategy, capability assessment, and hazard figures were assessed to identify potential projects as follows: 1) projects that had been accomplished, 2) Projects that are no longer pertinent, 3) Projects that had not been accomplished, and, 4) new strategies to be added for current conditions. This was the core of the investigation and became the basis for interview questionnaires and public engagement. Potential Projects grew from 40 to over 80 with this approach. The actual proposed projects were gleaned from the list of potential projects by grouping like projects and those that had multiple departments involved or were repeated by several participants. Projects were determined by immediacy and feasibility. Some have potential for other jurisdictions to share in project delivery that will benefit a wider population. Some projects were considered for a later version or update of the next Hazard Mitigation Plan.

NTC tribal planning consultants met first with the Planning Director, Larry Burtness, as the Tribe's Point of Contact and project leader, followed by a meeting with the Quileute Tribal Council to introduce the project and gain their input. Tribal Council expressed primary concern with developing good working relationships with FEMA before a major disaster strikes. The Planning Team continued to meet monthly face-to-face and weekly via teleconference.

Next, the Planning Team met with the Planning Committee which is made up of key Community Leaders who work with the Tribal Council in an advisory capacity. They provided direction and reviewed the proposed Interview Questions that would be shared with Department Directors. The

Planning Team then met with Brett Holtz of FEMA to introduce the project and gain information and resources to assist the planning process.

Interviews of department directors were conducted to gain specific information from their particular areas of responsibility. The Mitigation Strategies section from the 2008 Plan was shared to ascertain accuracy, validity and whether their particular area had been considered adequately. Individuals that were interviewed are included in the following chart, Table 4-1.

The Quileute Natural Resources Department provided GIS support in mapping tribal assets and boundaries of the reservation. The boundaries changed just as this project was beginning because the new land parcels, discussed in Land Use Section, were put into trust and a boundary revision was required.

4.3 PLANNING TEAM AND CONSULTING DEPARTMENTS

As noted above, the Tribal POC assembled department directors to assist in the preparation of the 2015 Hazard Mitigation Plan. The Directors met as a group and were introduced to the project, and then individual interviews were conducted. The names of the Planning Team members, representative departments, and key input from each member during this process, are listed in the table below. Sign in sheets for the committee meetings are attached in the appendices.

Table 4-1. Hazard Mitigation Planning Team & Participants

Name	Quileute Tribe Department	Key Input
Larry Burtness Official Planning Team Member	Director, Planning Department	Point of Contact Coordination of all planning efforts ongoing with the Tribe
Colleen Jollie, MPA Official Planning Team Member	Principal, Northwest Tribal Communications	Consultant and author of the 2015 Hazard Mitigation Plan
Bridget Ray, BABS Official Planning Team Member	Principal, Northwest Tribal Communications	Consultant and author of the 2015 Hazard Mitigation Plan
Tribal Council:	**Project introduction and authorization to move forward**	
Chas Woodruff	Chairman	Wants meetings with FEMA before an emergency situation happens, and it will happen. Wants to build strong working relationship. Affirmed need for interagency coordination and consultation.
Naomi Jacobson	Vice Chairwoman	
Cathy Salazar	Secretary	
Chrystal Lyons	Treasurer	
Rio Jaime	Member at Large	
Tribal Planning Committee:	**Introduction, Mitigation Strategies and Proposed Questionnaires**	
Bob Bouk	Committee Chair	Ham radio, emergency team
Leroy Black	Vice Chair	Emergency Management
Ruth Jackson	Secretary	Housing Authority
Roger Jackson	Retired Planner	Wildland fires, need emergency power

		backup or local power
Bert Black	Planning Committee	"homeowner's concerns, settling of land causes cracks in houses.'
James Jaime	Tribal Rep – Wa. State Community Economic Revitalization Board	Funding opportunities for projects
Cathy Smith	Enterprise Manager	Economic development
Rosanne Fonzi	Human Resources	Help with staffing outreach
Danny Hinchen	Public Works	Key participant in project
Department Directors:	**Department**	**Asset Identification, Values, Capability & Mitigation Actions**
Anna Parris	Tribal Housing Authority Executive Director	Raise houses in flood plain, need update building codes, need 100 more houses
Kevin Harris	Tribal Police Department	Plan Review and CEMP Coordination
Melvin Moon	Quileute Natural Resources Director	Director
Frank Geyer	Quileute Natural Resources	Issues: flooding/water quality/fishery
Kris Northcut	Quileute Natural Resources	Issues: flooding/water quality/fishery
Garrett Rasmussen	Quileute Natural Resources	GIS Mapping
Danny Hinchen	Public Works Manager	Utilities, maintenance, slide at Lonesome Creek broke water line
Mark Jacobson	Tribal School Superintendent	Children's safety is biggest concern, power lines biggest risk factor
Andrew Shogren	Health Clinic Director	Professional staff live off-res, no emergency responders live on-res
Nicole Earls	Human Services Director	Need to protect important records
Cathy Smith	Oceanside Resort Manager	Asset Identification & Tourism Demographics
Mark Ufkes	Tribal Executive Director	Organizational Capabilities
Walter Jackson	Past (2008) Planning Director, Community Member	Primary contact for 2008 Plan Sent written statement
External Communications	Telephone conv. Regarding meetings, shared projects, communications	
Brett Holtz	FEMA	Preplanning Consultation, Resources
Kevin Dayton	Olympic Regional Administrator Washington State Department of Transportation	Manages the WSDOT roads that serve the Reservation, SR110, US 101 Reviewed transportation element of Haz Mit Plan.
Penelope Linterman	Clallam County	Clallam Co. Haz Mit Plan

4.4 PUBLIC OUTREACH AND PLANNING RESOURCES

The public as defined for this HMP is primarily Tribal Members living on the Quileute Indian Reservation. Their comments were incorporated in the first draft. Tribal Members living off-reservation were included via a review draft of the Hazard Mitigation Plan. It was made available for review at the Tribal Website, plus a hard copy was made available at the Tribal Office. A community forum to discuss the demolition of the Community Center which had suffered repeated damages from winter storms was scheduled on October 6th. This forum was identified by the Planning Committee, and several interviewees, as an opportunity to effectively reach the greatest number of Tribal Members living on the Reservation. The Planning Team made presentations using mitigation measure charts, and distributed flyers at the morning and afternoon sessions. The outreach materials were left at the Tribal Center to share with people who couldn't attend the forum. Approximately forty people participated in the two sessions (combined), and several shared their opinions and made notations on the charts which were incorporated into the 2014 Mitigation Measures. The forum provided a draw to talk about hazard mitigation planning in general, and this building in particular. Key participants learned that this activity is itself a 'hazard mitigation measure'.

Described in Section 3.5 Cultural Resources, demolition of the Community Center is a top priority mitigation measure to reduce threats to personal safety. The building was blessed in ceremony as it was an important cultural facility. Replacement of this essential facility in an area out of the tsunami zone is now the challenge facing the Tribe. This building could be classified as a Severe Repetitive Loss (SRL). Structural integrity of the building was compromised due to repetitive damages.

Public outreach is a critical element of Action Planning. A brochure was developed for the community forum described above, and it was printed in the Tribal Newsletter, *ba'yak, the Talking Raven*, Vol 8, Iss 12, pg 11. This is document is printed and widely distributed in La Push, is mailed to subscribers off-reservation, and it is posted on the Tribal website, www.quileutenation.org The Project enjoyed a full-color, full-page write up with photographs of hazard events. This issue also contains a full report on a project contained in this Plan regarding the demolition of the community center; and, an example of the ongoing work of the cultural resources preservation efforts upon which this report relied heavily.

Public Outreach presentation and brochure are included in Appendix D: Public Outreach.

Incorporation of Existing Plans and Other Relevant Information

Northwest Tribal Communications consulted various Tribal, County, and State plans, including the following:

- *Quileute Tribe Emergency Management Plan* (September 2006). This plan is currently being updated as of October 2014 with a goal of completion in early 2015. The Plan discusses Tribal history, economics, and demographics, identifies development goals, but it is so outdated that other plans and current census data were more pertinent.
- *Quileute Tribe Long Range Transportation Plan - LRTP,* (2001), this plan is two cycles overdue, updates are required every five years. The annual Tribal Transportation Improvement Program - TTIP, and Indian Reservation Road Inventory have also fallen behind but are somewhat current. A project prioritization process will address safety needs. This Hazard Mitigation Plan can inform that process and outcome. There are three projects that would improve evacuation of the flood zone if they were implemented.

- *Quileute Tribe Comprehensive Economic Development Strategy* (2013-2018) This document is current and provided useful information, demographics, a business perspective of Tribal assets, regional economic expectations, and, importantly, Quileute Tribal Values particularly the statements about the Village of La Push, "The Creator gave us this safe home that has nurtured our people since the beginning of our time."
- *Native Peoples of the Olympic Peninsula,2002,* edited by Jacilee Wray, sponsored by the Olympic National Park. This is a collaborative publication of the Olympic Peninsula Intertribal Cultural Advisory Committee which is made up of representatives of each Tribe on the Olympic Peninsula. The chapter on the Quileute People was authored by tribal member, Chris Morganroth, III, and is an excellent source on the culture and history of the Tribe. Mr. Morganroth presents the deep history since the 'beginning of time' and brings the reader right up through the changing times of the 1800's to contemporary life at La Push.
- *A Cultural Resources Survey of the Quileute Indian Reservation Waterfront,* 1997, Randall Schalk and Jay Powell. Prepared for the Quileute Tribal Council as an in-depth professional investigation of the archaeological sites on the reservation. It "involved 1) archival research, review of previous archaeological, ethnographic, and historical data; 2) interviews of Tribal members; 3) archaeological survey; and preparation of a technical report summarizing results of the three elements. Maps were prepared but are not included in this report. They are available at the Tribal Office and can be accessed only by special permission. The analysis demonstrate that there a multitude of overlapping cultural associations exist for most of the Quileute Reservation waterfront."
- *Clallam County Hazard Mitigation Plan* (2010). The hazards identified in this plan provided hazard profile information for the following natural hazards: earthquakes, landslides, tsunamis, flooding, wildland fires, windstorms, and winter storms. One project is listed in the County Plan that has direct bearing on the Quileute Tribe: frequent and severe flooding of the Bogachiel River at Mile Post 8 on State Route 110. During winter storms, water from a side channel of the river rushes across the road as deep as 3 to 4 feet stranding people wherever they happen to be, either in La Push or Forks. This is the only road serving the Reservation. Getting the project listed on the Olympic Peninsula Regional Transportation Planning Organization's (RTPO) TIP, the Tribe's TIP, and the State TIP could be the unifying effort it will take to get all of the stakeholders to agree to resolve the problem. Interagency coordination is essential. The Tribe could attend the County quarterly Hazard Mitigation meetings (at least one per year) and the RTPO meetings to promote the project. Also, sharing the 2014 Plan with the County will promote good intergovernmental relationships.
- *Washington State Transportation Improvement Program, STIP (2014)* The flooding condition on SR110 is listed in the County Hazard Mitigation Plan, but it does not show up in the State Department of Transportation 'transportation improvement program' or STIP. However, flooding events have taken a toll on the abutments of the Bogachiel River Bridge on SR110 and repairs both to the abutments and to the bridge deck are listed in the STIP.
- *Washington State Enhanced State Natural Hazard Plan* (2013). The hazards identified in this plan provided hazard profile information for the following hazards: earthquakes, landslides, tsunamis, flooding, wildland fires, windstorms, and winter storms. (Washington State 2013)

A complete list of the sources consulted in preparing this Tribal Hazard Mitigation Plan is provided in Section 10.

This section describes the Tribal Mitigation Plan's hazard analysis. A hazard analysis consists of identifying and profiling each hazard. Hazard identification is the process of recognizing the natural and human-caused events that threaten an area. Hazard profiling describes the hazards in terms of their nature, history, location, extent, and probability.

HAZARD IDENTIFICATION

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT – IDENTIFYING HAZARDS

Identifying Hazards

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

Element

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

Source: FEMA 2008.

As the first step of the hazard analysis, the Planning Team developed a list of natural and human-caused hazards. Next, as shown in Table 5-1, the Planning Team evaluated and screened this comprehensive list based on a range of factors, including prior occurrence, perception of the relative risk presented by each hazard, and the ability to mitigate each hazard.

Table 5-1. Hazard Identification and Screening

Hazard Type	Subhazard	Presidential Declarations in Clallam County since 1972	Identified in Clallam County HMP	Hazard to be Profiled in Tribal Mitigation Plan
Avalanche	—	—	—	No
Dam Failure	—	—	—	No
Drought	—	—	—	No
Erosion	—	—	X	Yes
Flood	Coastal and Riverine	DR – 1734 (2007) DR – 1641 (2006) DR – 1499 (2003) DR – 1159 (1996/97) DR – 1079 (1995) DR – 883 (1990) DR – 757 (1986)	X	Yes
Hailstorm	—	—	—	No
Heat	—	—	—	No
Hurricane	—	—	—	No
Land Subsidence	—	—	—	No
Landslide/Mudslide	—	DR – 1734 (2007) DR – 1682 (2007) DR – 1641 (2006)	X	Yes
Hazardous Material Event	Vessel, Fixed, and Mobile	—	—	Yes
Seismic	Ground Shaking, Liquefaction, Lateral Spread, Landslide	—	—	Yes
Severe Storm	Flood, Landslide, Erosion, Wind, Snow, Tidal Surge, Coastal Rain	DR – 4083 (2012) DR – 4056 (2012)	X	Yes

Table 5-1. Hazard Identification and Screening

Hazard Type	Subhazard	Presidential Declarations in Clallam County since 1972	Identified in Clallam County HMP	Hazard to be Profiled in Tribal Mitigation Plan
		DR – 1817 (2009) DR – 1734 (2007) DR – 1682 (2007) DR – 1641 (2006) DR – 1499 (2003) DR – 1159 (1996/97) DR – 883 (1990) DR – 757 (1986)		
Snow/Ice	—	DR – 1159 (1996/97)	—	Yes
Tornado	—	—	—	No
Tsunami	—	—	—	Yes
Urban Fire	—	—	X	Yes
Volcanic Eruption	—	—	—	No
Wildland Fire	—	—	X	Yes
Wind	—	DR – 1682 (2007) DR – 1159 (1996/97) DR – 1079 (1995)	—	Yes

DR = Disaster

The Planning Team determined that the following hazard groups pose the greatest threat to the Quileute Tribe. The threats are not identified in any priority order.

A. Seismic hazards
   - Ground shaking
   - Ground movement (liquefaction and earthquake-induced landslide)
   - Tsunami

B. Severe storm hazards
   - Flood (coastal and riverine)
   - Coastal rainfall
   - Landslide/mudslide
   - Coastal erosion
   - Wind storm
   - Snow/ice storm

C. Fire hazards
   - Wildland fire
   - Urban conflagration

D. Hazardous material hazards
   - Vessel incident
   - Fixed incident
   - Mobile incident

The screening process excluded the remaining hazards because they were considered to pose a lower threat to the life and property of the Tribe given their low likelihood of occurrence or the low probability that life and property would be significantly affected. Should the risk from these hazards increase in the future, the Tribal Hazard Mitigation Plan can be updated to incorporate analyses for these hazards.

Section 5.1 provides a detailed description of each hazard that affects the Quileute Tribe.

5.1 HAZARD PROFILES

The requirements for hazard profiles, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Profiling Hazards

Requirement §201.7(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the Reservation. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Element

- Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the plan?
- Does the risk assessment identify the extent (i.e., severity or magnitude) of each natural hazard addressed in the plan?
- Does the plan provide information on previous occurrences of each hazard addressed in the plan?
- Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the plan?

Source: FEMA 2008.

Accordingly, the Planning Team examined in a methodical manner the specific hazards selected for profiling based on the following factors:

- Nature
- History
- Location
- Extent and probability of future events

This Tribal Hazard Mitigation Plan drew from various sources to gather data on the nature, history, and extent of each identified hazard. These sources are listed in Section 10. To determine the location of the hazards in relation to the Reservation, the URS GIS team created maps for each hazard, drawing from publicly available data as well as data provided by the Tribe. These maps are included in Appendix E, Figures.

The hazards selected for profiling are presented in Sections 5.2.1 through 5.2.4. The order of presentation signifies neither the level of importance nor the level of risk.

There are no identified significant events specific to La Push for the time period 2009-2014. Key events for out of area were included per the Washington State Enhanced Hazard Mitigation Plan October 1, 2013 (WSEHMP 2013).

There were no references to Clallam County or the La Push area in the Element B Natural Hazard Identification and Risk Assessment of the WSEHMP 2013 for Avalanche.

5.1.1 Seismic Hazards

5.1.1.1 Ground Shaking

Nature

An earthquake is generally a result of displacement along a geologic fault resulting in the release of accumulated strain. The effects of large earthquakes can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause significant damage and extensive casualties. The most common effect of earthquakes is ground motion, or shaking, which is caused by seismic waves traveling in the earth's interior or along the earth's surface.

The severity of an earthquake can be expressed in terms of intensity. Intensity is based on people and damage to the natural and built environment. The effects vary depending on the location with respect to the earthquake fault rupture. The intensity generally increases with the amount of energy released, which is proportional to the size of the earthquake, and decreases with distance from the causative fault.

The scale most often used to measure intensity is the modified Mercalli (MM) intensity scale. As shown in Table 5-2, the MM intensity scale consists of 12 increasing levels that range from imperceptible to catastrophic destruction. With the advent of modern instrumentation, ground shaking intensity can be quantitatively measured. It is measured in terms of acceleration, velocity, or displacement. Peak ground acceleration (PGA) is a common ground motion parameter used by engineers. It measures the earthquake's intensity by quantifying how hard the earth shakes in a given location. PGA is measured in units of the gravitational rate of acceleration (1 g = 980 centimeters/second^2). Magnitude (M) is the measure of the earthquake's size and is often based on the amplitude of the earthquake waves recorded on instruments. The first magnitude scale was the Richter local magnitude scale. The magnitude scale used by seismologists is the moment magnitude (Mw) scale. Table 5-2 shows an approximate correlation between M, MM intensity, PGA in g's, and the perceived shaking.

Table 5-2. Magnitude/Intensity/Ground-Shaking Comparisons

Magnitude (M)	MM Intensity	PGA (% g)	Perceived Shaking
0–4.3	I	< 0.17	Not Felt
	II-III	0.17–1.4	Weak
4.3–4.8	IV	1.4-–3.9	Light
	V	3.9–9.2	Moderate
4.8–6.2	VI	9.2–18	Strong
	VII	18–34	Very Strong
6.2–7.3	VIII	34–65	Severe
	IX	65–124	Violent
	X	124+	Very Violent

Table 5-2. Magnitude/Intensity/Ground-Shaking Comparisons

Magnitude (M)	MM Intensity	PGA (% g)	Perceived Shaking
7.3–8.9	XI		
	XII		

Source: USGS 2004.

% = percent

g= gravitational rate of acceleration [?]

MM = modified Mercalli

PGA = peak ground acceleration

History

Approximately 7,000 surface earthquakes have been documented over the past 200 years in the Pacific Northwest. This documentation has occurred sporadically, with only the most significant events being recorded until recent history. Currently, the University of Washington participates in the Pacific Northwest Seismic Network to record earthquakes in Washington and Oregon. These records indicate that approximately 1,000 minor earthquakes occur annually in the region, with anywhere from 12 to 24 earthquakes causing enough ground shaking to be recognized as actual earthquakes (PNSN 2008).

The Washington coast and the greater Puget Sound Basin are most at risk although damaging tremblors have occurred east of the Cascades. Statewide annualized loss estimates from Hazus-MH 2.1 indicate total losses over $300,000 million. Property damage could be in excess of $20 billion dollars in the event of a catastrophic earthquake (Washington State 2013).

No earthquakes with epicenters on the Reservation have been recorded. Therefore, earthquakes that have occurred in Western Washington within the last 100 years are shown in *Figure E-4* (Appendix E, Figures). Historical earthquakes with a magnitude of M 5.0 or greater are described below (Washington State 2013):

January 1909: An M 6.0 earthquake occurred 19 miles below the Earth's surface, approximately 15 miles northeast of Friday Harbor.

July 1932: An M 5.7 earthquake occurred at the earth's surface, approximately 9.5 miles southeast of Granite Falls.

November 1939: An M 6.2 earthquake occurred 19 miles below the earth's surface, approximately 11.5 miles south of Bremerton.

April 1945: An M 5.7 earthquake occurred at the earth's surface, approximately 8 miles southeast of North Bend.

February 1946: An M 5.8 earthquake occurred 15.5 miles below the earth's surface, approximately 17.5 miles north of Olympia.

April 1949: An M 7.1 earthquake occurred 33.5 miles below the earth's surface, approximately 7.5 miles northeast of Olympia. It caused about $25 million (in 1949 dollars) in property damage in Olympia, Seattle, and Tacoma and killed eight people.

April 1965: An M 6.5 earthquake occurred 35 miles below the earth's surface, approximately 11.5 miles north of Tacoma. It cause about $12.5 million (in 1965 dollars) in property damage and killed seven people.

January 1995: An M 5.0 earthquake occurred 10 miles below the earth's surface, approximately 11 miles northeast of Tacoma.

July 1996: An M 5.4 earthquake occurred 2.5 miles below the earth's surface, approximately 5.5 miles east of Duvall.

July 1999: An M 5.8 earthquake occurred 25 miles below the earth's surface, approximately 5 miles north of Satsop.

February 2001: An M 6.8 earthquake occurred 32 miles below the earth's surface, approximately 10.5 miles northeast of Olympia. The Nisqually earthquake was declared a Federal disaster for 24 counties in Washington (FEMA-DR-WA-1361). A total of $155.9 million in Stafford Act disaster assistance was provided. The Small Business Administration approved loans in the amount of $84.3 million and the Federal Highway Administration provided $93.8 million in emergency relief. Total damages to facilities throughout Washington have been estimated to be between $1 billion and $4 billion.

June 2001: An M 5.0 earthquake occurred 25 miles below the earth's surface, approximately 11.5 miles north of Satsop.

Note: no earthquakes of magnitude 5.0 or greater have occurred since 2001.

No significant seismic data was identified for the La Push area from 2009-2014 per a review of the available University of Washington provided seismic data and a further review of the Washington State Enhanced Mitigation Plan October 1, 2013 (WSEHMP 2013).

Because of its location near the collision boundary of two major tectonic plates, Washington State is particularly vulnerable to a variety of earthquakes. FEMA has determined that Washington State ranks second (behind only California) among states most susceptible to damaging earthquakes in terms of economic loss. FEMA notes that a majority of the state is at risk to strong shaking (on a scale of minimal to strong) with shaking magnitude generally decreasing from west to east (Washington State 2013).

Location

Washington is located along the Cascadia subduction zone, the fault boundary between the North America plate and the northward-moving Juan de Fuca plate, which lies offshore from northern California to southern British Columbia and subducts under the North America plate. The plates are converging at a rate of approximately 2 inches per year. The largest earthquakes in the Pacific Northwest occur along the Cascadia subduction zone, deep below the earth's surface in either the subducting plate or between the two colliding plates. These earthquakes occur infrequently but are very powerful, with magnitudes ranging from M 8.0 to M 9.0. According to the Washington State HMP, the Cascadia subduction zone has generated at least six M 8.0 or larger earthquakes in the past 3,500 years (Washington State 2013). The last earthquake along the Cascadia subduction zone occurred in 1700.

Washington also experiences smaller earthquakes closer to the earth's surface in the overriding plate above the North America and Juan de Fuca plates (Washington State 2013). All the historical earthquakes that have occurred in western Washington within the last 100 years have occurred in this surface plate. The surface-level faults in the vicinity of the Reservation are depict-

ed in *Figure E-4* (Appendix E, Figures). The closest fault to the Reservation is the Calawah fault, which is located approximately 25 miles to the northeast. Several other minor faults are in the vicinity of the Reservation, including the Little River fault and the Hood Canal fault, on the northern and western edges of the Olympic Peninsula, respectively. In addition, the Puget Sound has at least seven active faults, including the Seattle fault, Tacoma fault, Darrington-Devils Mountain fault, Utsalady Point fault, and the Southern Whidbey Island fault (Washington State 2013). Surface earthquakes occur frequently in the vicinity of the Reservation, and as explained above, their magnitude in recent history has ranged up to M 7.1.

Extent and Probability of Future Events

U.S. Geological Survey's (USGS) National Earthquake Information Center (NEIC) collects information on potential earthquakes and associated ground-shaking around the world. Using seismic hazard curves calculated on a grid of sites across the United States that describe the frequency of exceeding a set of ground motions, as well as feedback obtained from numerous workshops, surveys, and expert panel reviews, the NEIC has created a set of seismic hazard maps for the contiguous United States (NEIC 2008). The maps display the maximum severity of an earthquake that has a 2 percent chance of occurring in a given area within 50 years. *Figure E-5* (Appendix E, Figures) shows the probabilistic shaking-intensity areas for the Olympic peninsula as determined by the NEIC's national seismic hazard maps. According to the NEIC's seismic hazard maps, there is a 2 percent chance that within the next 50 years, the Reservation will experience a violent earthquake measuring between M 6.2 and M 7.3. Such an event would likely be the result of a rupture in one of the surface-level faults in the Strait of Juan de Fuca or in the Puget Sound, but could also be caused by a deep earthquake along the Cascadia subduction zone.

The Washington State HMP has evaluated historic patterns to estimate the recurrence interval for both a surface-level earthquake in northwestern Washington and for a Cascadia subduction zone earthquake. The recurrence interval for a surface-level earthquake such as the 1965 M 6.5 Seattle-Tacoma earthquake or the 2001 M 6.8 Nisqually earthquake is estimated to be approximately 35 years, and the recurrence interval for an M 9.0 earthquake along the Cascadia subduction zone is estimated to be between 350 and 500 years (Washington State 2013).

5.1.1.2. Ground Movement

5.1.1.2 A Liquefaction

Nature

Liquefaction occurs when earthquake waves pass through a saturated granular soil layer, distort its granular structure, and cause some of its pore spaces to collapse. The collapse of the granular structure increases pore-space water pressure, and decreases the soil's shear strength, causing ground rupture, sand boils, ground subsidence, and lateral displacement of the ground. Liquefaction typically occurs in artificial fills or in areas of loose sandy soils that are saturated with water, including low-lying areas near bodies of water such as rivers, lakes, bays, and oceans.

The most important geologic factors that influence the liquefaction susceptibility of a soil layer are age, grain texture, and depositional environment. Geologic age can affect the compaction and cementation of a soil layer, which contribute to its ability to withstand shaking. Grain texture influences a soil layer's susceptibility to liquefaction, as liquefaction tends to occur within soils that have sand-sized grains. The depositional environment often influences the grain size and texture of a soil layer.

History

Historical earthquakes along the Strait of Juan de Fuca faults have not resulted in known liquefaction on the Reservation. As such, the most notable example of liquefaction in western Washington, occurred after the 2001 Nisqually earthquake, which caused liquefaction in several areas, including the runway at the Seattle-Tacoma International Airport.

Location

The Washington Department of Natural Resources has analyzed shear-wave velocity surveys and geotechnical boring and water well data in order to create liquefaction susceptibility maps, which outline areas within the State of Washington where water-saturated sandy soil loses strength during earthquake shaking (Washington DNR 2004). As shown on *Figure E-6* (Appendix E, Figures), a large portion of the Reservation, including the marina and all beach-front properties, are located within the liquefaction hazard area.

Extent and Probability of Future Events

Because the Reservation includes areas where ground conditions are prone to liquefaction, the Tribe may likely experience liquefaction during the next major earthquake. As described in Section 5.2.1.1, the earthquakes that occur along the surface faults in the Strait of Juan de Fuca and the Puget Sound, although frequent, are relatively minor. These events are not likely to induce liquefaction within the Reservation. An earthquake along the Cascadia subduction zone, however, is likely to be severe and to cause liquefaction in the Reservation. As noted in Section 5.2.1.1, the recurrence interval for an M 9.0 earthquake along the Cascadia subduction zone is between 350 and 500 years.

5.1.1.2. B Earthquake-Induced Landslide

Nature

Landslide is a general term for the dislodgment and fall of a mass of soil or rocks along a sloped surface or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, lateral spreads, and slump-earth flows. Earthquake-induced landslides occur as a result of ground shaking. The most common earthquake-induced landslides include shallow rock falls, disrupted rock slides, and disrupted slides of earth and debris.

History

There are no recorded earthquake-induced landslides on the Reservation.

Location

Steep slopes on hills and cliffs and intermediate slopes with previous landslide deposits are highly susceptible to earthquake-induced landslides. Also, weak saturated soils that are bordered by steep or unsupported embankments or slopes are susceptible to lateral spreading, which is a type of landslide. As such, URS analyzed the slope, aspect, vegetation cover, and vegetation type to determine which areas within the Reservation are susceptible to earthquake-induced landslides. The results of this analysis are shown in *Figure E-9* (Appendix E, Figures).

Although the Washington State HMP identifies the State's entire Pacific Coast shoreline as a jurisdiction at risk for landslides, including earthquake-induced landslides, the beach within the Reservation, with the exception of the two islands off the coast of the Reservation and the area below Lonesome Creek, tends to be flat. Therefore, the only sections of the Reservation's coast-

line that are susceptible to earthquake-induced landslides are the narrow strip of bluffs adjacent to Lonesome Creek and the east-facing bluffs of Akalat (James Island) and Little James Island.

Many inland areas within the Reservation are also at risk for earthquake-induced landslides. In particular, the hills adjacent to Highway 110 as it exits the Reservation have experienced frequent landslides and rock falls in the past. These hills are likely to experience landslides in the event of a significant earthquake in vicinity of the Reservation.

Extent and Probability of Future Events

The extent of an earthquake-induced landslide in the Reservation is unknown because it depends on the landslide characteristics and materials, the settings in which the landslide occurs, and the magnitude and type of earthquake. USGS studies show that earthquakes as small as M 4.0 may also dislodge landslides from susceptible slopes, and larger earthquakes can generate tens of thousands of landslides near the epicenter. As described in Section 5.2.1.1, the recurrence interval for a surface-level earthquake in northwest Washington is estimated to be approximately 35 years. Accordingly, the Reservation is likely to experience an earthquake-induced landslide within the next 35 years.

5.1.1.3 Tsunami

Nature

A tsunami is a series of waves generated in a body of water by an impulsive disturbance along the seafloor that vertically displaces the water. Subduction zone earthquakes at plate boundaries often cause tsunamis. However, submarine landslides, submarine volcanic eruptions, and the collapses of volcanic edifices can also generate tsunamis. A single tsunami may involve a series of waves, known as a train, of varying heights. In open water, tsunamis exhibit long wave periods (up to several hours) and wavelengths that can extend up to several hundred miles, unlike typical wind-generated swells on the ocean, which might have a period of about 10 seconds and a wavelength of 300 feet.

The actual height of a tsunami wave in open water is generally only 1 to 3 feet and is often practically unnoticeable to people on ships. The energy of a tsunami passes through the entire water column to the seabed. Tsunami waves may travel across the ocean at speeds up to 700 miles per hour (mph). As the wave approaches land, the sea shallows and the wave no longer travel as quickly, so the wave begins to "pile up" as the wave-front becomes steeper and taller, and less distance occurs between crests. Therefore, the wave can increase to a height of 90 feet or more as it approaches the coastline and compresses.

Tsunamis not only affect beaches that are open to the ocean, but also bay mouths, tidal flats, and the shores of large coastal rivers. Tsunami waves can also diffract around land masses. Since tsunamis are not symmetrical, the waves may be much stronger in one direction than another, depending on the nature of the source and the surrounding geography. However, tsunamis do propagate outward from their source, so coasts in the shadow of affected land masses are usually fairly safe.

Tsunami Hazard Map for Quileute Nation

The Tsunami Inundation Map of the Quileute, Washington, Area of January 2003, as provided per the Washington State Department of Natural Resources is referenced and provided as *Figure E-7* in Appendix E, and is the source of the following data highlights.

The data includes recent research (Atwater and others, 1995) on the occurrence of treat earthquakes (and resulting tsunamis) off Washington, Oregon, and northern California has led to the creation of tsunami hazard maps for potentially affected coastlines. Since tsunami waves may reach nearby coastal communities within minutes of a local earthquake, there will be little or no time to issue formal warnings. This data provided by research from the development of the Tsunami Hazard Map for Quileute, *Figure E-7*.

Evacuation areas and routes will need to be planned well in advance. The tsunami hazard map was prepared as part of the National Tsunami Hazard Mitigation Program (NTHMP) to aid local government in designing evacuation plans for areas at risk from potentially damaging tsunamis.

The tsunamis produced by the two scenarios for this specific tsunami hazard map were shown as "landward limit of expected inundation". The model runs do not include the influences of changes in tides but use a tide height of 4 feet. Tide stage and tidal currents can amplify or reduce the impact of a tsunami on the Quileute Nation community.

Arrival time and duration of flooding are key factors to be considered for evacuation strategies. The elevation time history shows the change in water surface elevation, on the open coast near La Push, with time for eight hours of modeling. Note that the first wave crest is predicted to arrive at about 30 minutes after the earthquake, but significant flooding occurs before the crest, rendering available evacuation time event shorter. Actual flooding depth and extent will depend on tide height at the time of tsunami arrival. Due to the limited estimated time available, evacuation needs are key for the coastal area of La Push.

Note: Per the Washington State Department of Natural Resources an updated Tsunami Inundation Map to include the Quileute, Washington area is estimated to be complete August 2015.

History

Four tsunamis have affected the Washington coast, which includes the Reservation, in the last 60 years (Washington State 2013):

May 1960: An M 9.5 earthquake in Chile generated a tsunami that struck the Washington coast and the Strait of Juan de Fuca.

March 1964: The largest tsunami to affect Washington in recent history was triggered by an M 9.2 earthquake in Prince William Sound, Alaska. The earthquake generated waves in Washington up to 14.8 feet high and caused a total of $640,000 in property damages. Overall, the tsunami killed 110 people in Alaska, Oregon, and California, and is estimated to have caused between $47 million and $97 million in damages.

November 2006: An M 8.3 earthquake occurred northeast of Japan and generated tsunami waves that reached the Washington, Oregon, and California coasts. Wave height in La Push was measured at 0.52 feet (Clallam County 2010).

Note: No identified significant Tsunamis were identified 2009-2013.

Location

The coastal communities of the Pacific Northwest are among the most at-risk areas for tsunamis in the world. The Reservation is at risk for tsunamis generated by earthquakes as far away as Alaska or Chile, as well as for tsunamis generated by earthquakes occurring directly offshore on the Cascadia subduction zone. Tsunami inundation maps have been created by the Washington Department of Natural Resources, Division of Geology and Earth Resources. A tsunami run-up

map for an M 9.0 Cascadia subduction zone earthquake off the Washington coast is shown in *Figure E-7* (Appendix E, Figures). This map illustrates the portions of the Reservation that could become submerged in a tsunami. The area of land subject to inundation is a factor of the distance of shoreline from the tsunami-generating event; magnitude; duration and period of waves; run-up elevations; tidal level at time of occurrence; location along the shore and the direction of shore in respect to propagated waves; and topography of the seabed. According to the Washington State HMP, the projected tsunami inundation area for La Push in the event of an M 9.0 Cascadia event is 13 feet.

Extent and Probability of Future Events

The Washington coast, which includes the Reservation, is susceptible to tsunamis generated by large Pacific Rim earthquakes at a rate of six every 100 years. In addition, computer models indicate that an M 9.0 Cascadia subduction zone earthquake (reoccurrence interval of 350–500 years) generated-tsunami could reach 30 feet in height and could affect the entire Washington coast within 30 minutes of the earthquake (Washington State 2013).

5.1.2. Severe Storm Hazards

The coastal areas along Washington's Olympic Peninsula experience severe storms during the winter months due to a seasonal air pressure system over the North Pacific Ocean. During the spring and summer, a high-pressure cell spreads over most of the North Pacific Ocean, and the clockwise circulation of air around the cell creates dry, cool, and stable air to flow into the Pacific Northwest from the northwest (Western Regional Climate Center 2003). As the air moves inland, it becomes warmer and drier, which results in a dry season beginning in the late spring and reaching a peak in mid-summer. In the fall and winter, the high-pressure area moves south and a low-pressure cell moves in from the north. The counter-clockwise circulation of air around the low-pressure cell causes cool, moist air to move into the Pacific Northwest from the southwest. As the air moves inland over the cooler land and rises along the Olympic Mountains, the air temperature drops and subsequently forces the precipitation of any moisture held in the air. This phenomenon causes a "rain shadow" on the western slopes of the Olympic Mountains, meaning that the western slopes are significantly wetter than the eastern slopes.

Accordingly, the Pacific coast of the Olympic Peninsula experiences a distinct wet season beginning in October, reaching a peak in December and January, and gradually decreasing in the spring. The wet winter season can cause severe storm events, including floods, landslides, coastal erosion, wind storms and snow/ice storms, which are each discussed below.

5.1.2.1. Flood

5.1.2.1- A Coastal Flood

Nature

Flooding is the accumulation of water where none usually occurs or the overflow of excess water from a stream, river, lake, reservoir, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods.

Floods are natural events that are considered hazards only when people and property are affected. Nationwide, floods result in more deaths than does any other natural hazard. Physical damage from floods includes the following:

- Inundation of structures, causing water damage to structural elements and contents.
- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects.
- Release of sewage and hazardous or toxic materials as wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed.

Floods also cause economic losses through closure of businesses and government facilities, disrupt communications, disrupt the provision of utilities, such as water and sewer service, result in excessive expenditures for emergency response, and generally disrupt the normal function of a community.

Coastal flooding is generally caused by wave run-up, which can be caused by a combination of any or all of the following factors: astronomical tides, storm surge (the rise in water from wind stress and low atmospheric pressure), waves, and peak still-water elevation. Winter storms along the Olympic Peninsula, in conjunction with high tides and strong winds, can cause significant wave run-up in the Reservation.

History

Flooding occurs in Washington on an annual basis. Coastal flooding along the Reservation is often associated with severe storms, especially strong El Niño events. El Niño, which is an ocean-atmosphere phenomenon, generally appears every 2-10 years around Christmas-time and last for several months, bringing heavy rains, high winds, extreme waves, and high sea-levels to the western United States. In the past 100 years, there have been 23 El Niños. In recent years, the most powerful El Niños occurred during 1982/1983 and 1997/1998. During these two events, large waves caused severe coastal flooding and erosion along much of Washington's coast line, including the coastal areas of the Reservation.

Location

FEMA has prepared Flood Insurance Rate Maps (FIRM) to document areas subject to wave attack, but the Reservation is not mapped under the FIRM system. Therefore, no official estimate of the coastal areas within the Reservation at risk for wave run-up exists. However, the relatively flat topography along the Reservation's beachfront reinforces an assumption that the entire coastline of the Reservation is at risk for coastal flooding. *Figure E-8* (Appendix E, Figures) outlines the coastal areas within the Reservation that would experience shallow coastal flooding.

Extent and Probability of Future Events

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies often use historical records to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in a given year.

The magnitude of flood used as the standard for floodplain management in the United States is a flood having a probability of occurrence of 1 percent in any given year, also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year flood is the system of FIRMs prepared by FEMA, which are used to support the NFIP. The Quileute Tribe is a member of the NFIP, but as stated earlier, the Reservation is not mapped under

the FIRM system, so no official estimate exists of the extent or probability of wave run-up within the Reservation. Therefore, wave run-up onto the Reservation is unknown. However, based on previous occurrences, the Reservation can expect to experience coastal flooding as a result of severe storm events, generally occurring in the winter months. In particular, as noted above, the Tribe can expect coastal flooding during strong El Niño every 2 to 10 years.

5.1.2.1- B Riverine Flood

Nature

Riverine flooding refers to overbank flooding of rivers and streams. Factors contributing to the severity and frequency of riverine flooding include:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features (swamps and lakes) and human-built features (dams)
- The existence of flood-control features, such as levees and flood-control channels
- Velocity of flow
- Availability of sediment for transport and the erodibility of the bed and banks of the water course

Riverine flooding is a common occurrence in the Pacific Northwest due to the high levels of precipitation in the region. Many floods in the region are caused by the Pineapple Express, a warm and wet flow of subtropical air originating near Hawaii that can produce storms with heavy warm rainfall. When the intense warm rain melts mountain snowpack, the streams and rivers that drain the mountains can quickly become overtopped. El Niño causes other flooding events in the Pacific Northwest.

As noted above, floods are natural events that are considered hazards only when people and property are affected. Riverine flooding can cause severe damage to structures and/or facilities from inundation or impact damage. It can also release toxic materials by damaging wastewater treatment plants, storage tanks, or pipelines. Riverine flooding often causes significant economic losses through closure of businesses, facilities, communications, and/or utilities.

5.1.2.2. Coastal Rainfall

Nature

The following data is provided by the Western Regional Climate Center at the Desert Research Institute (WWRC 2013). West of the Cascade Mountains, summers are cool and comparatively dry and winters are mild, wet and cloudy. The average number of clear or only partly cloudy days each month varies from four to eight in winter, eight to 15 in spring and fall, and 15 to 20 in summer. The percent of possible sunshine received each month ranges from approximately 25 percent in winter to 60 percent in summer. In the interior valleys, measurable rainfall is recorded on 150 days each year and recorded on 190 days in the mountains and along the coast. Thunderstorms over the lower elevations occur on four to eight days each year and over the mountains on seven to 15 days.

During July and August, the driest months, it is not unusual for two to four weeks to pass with only a few showers; however, in December and January, the wettest months, precipitation is frequently recorded on 20 to 25 days or more each month. The range in annual precipitation is from approximately 20 inches in an area northeast of the Olympic Mountains to 150 inches along the southwestern slopes of these mountains. Snowfall is light in the lower elevations and heavy in the mountains.

During the wet season, rainfall is usually a light to moderate intensity and continuous over a period of time rather than heavy downpours for brief periods. Maximum rainfall intensities to expect in one out of ten years are: .6 to 1.0 inch in one hour; 1.0 to 2.5 inches in three hours; 1.5 to 5.0 inches in six hours; and 2.0 to 7.0 inches in 12 hours. The heavier intensities occur along the windward slopes of the mountains.

During the latter half of the summer and early fall, the lower valleys are sometimes filled with fog or low clouds until noon, while at the same time, the higher elevations are sunny. The strongest winds are generally from the south or southwest and occur during the late fall and winter. In the interior valleys, wind velocities can be expected to reach 40 to 50 m.p.h. each winter and 75 to 90 m.p.h. once in 50 years. The daily variation in relative humidity in January is from approximately 87 percent at 4 a.m. to 78 percent at 4 p.m., and in July from 85 percent at 4 a.m. to 47 percent at 4 p.m. During periods of easterly winds, the relative humidity occasionally drops to 255 percent or lower. The highest summer and lowest winter temperatures are usually recorded during periods of easterly winds. The total evaporation for the warm season, May through September, as measured by a National Weather Service evaporation pan at Seattle, is 25 Inches with an average of seven inches in July.

History

A total of eight winter storm/severe storm/flood Federal declarations have been issued for Clallam County since 1968, which are described below. Many of these floods occurred along the Quillayute River, and therefore, affected the Reservation.

January 1968: High levels on the Quillayute River caused by a prolonged period of high rainfall.

January1986: Severe storms caused flooding in western Washington and a total of $5 million in damages. The storm was declared Federal Disaster #757.

November 1990: Severe storms and flooding were declared Federal Disaster #883.

November-December 1995: Flooding and high winds caused one death and damaged or destroyed more than 850 homes. The storm was declared Federal Disaster #1079.

December 1996-January 1997: Saturated ground combined with high levels of snow and rain in a 5-day period caused massive flooding and landslides in Washington. The Quileute Natural Resource records report 162 inches of rainfall for December 1996-January 1997. The event killed 24 people and caused an estimated $140 million in losses. The storm was declared Federal Disaster #1159.

October 2003: A severe storm caused flooding in northwestern Washington. The storm was declared Federal Disaster #1499. La Push was evacuated and homes were flooded.

January 2006: One month of steady rainfall caused flooding, landslides, and mudflows throughout Washington. The event was declared Federal Disaster #1641.

December 2007: Pineapple Express storms caused a flooding event that was declared Federal Disaster #1734.

January 2009: A strong, warm and very wet Pacific weather system brought copious amounts of rainfall to Washington during the period 6-8 January, 2009, with subsequent major flooding extending through January 11, 2009, as well as minor flooding that continued through most of January. The storm involved a strong westerly flow aloft with embedded sub-tropical moisture, known as an *atmospheric river* of moisture. Snow levels rose from low levels to between 6,000 and 8,000 feet, with strong westerly winds enhancing precipitation amounts in the mountains. Quillayute saw 2.88 inches breaking 2.39 set on January 7, 1983 (from NWS). Stafford Act disaster assistance provided approximately $10 million. The event was declared Federal Disaster #1817.

January 2012: A severe winter storm pummeled the Pacific Northwest in late January 2012, icing roads, downing power lines, and prompting avalanche warnings. The period of January 14-19 featured some heavy snowfall and significant freezing rain in the lowlands of western Washington. Precipitation continued on January 19, and much of it fell as freezing rain or snow. The series of Pacific weather systems brought severe winter storms, flooding, landslides, and mudslides to Western Washington State. This snow and ice storm was one of the highest impact weather events for western Washington in a few years. On January 20, more than 250,000 customers were without electricity. The Preliminary Data Assessment estimated $32 million in total public assistance needed. The event was declared Federal Disaster #4056.

July 2012: A severe thunderstorm hit the region, resulting in flash flooding and significant damage to residential and commercial property. Strong winds of up to 90 miles-per-hour knocked out power and phone service and a damaged storm sewer system prevented local access to clean water for several days. The storm significantly impacted timber, resulting in a $1 million loss for the Washington State Department of Natural Resources and a $2 million loss for the Colville Tribe. The event was declared Federal Disaster #4083.

Location

Flooding on the Quillayute River is a particular hazard for the Tribe, as the river runs directly through the Reservation. Flooding on the smaller Lonesome Creek also poses a threat to the Reservation. Although the Quillayute River and Lonesome Creek are not mapped as part of a FIRM on the Reservation, URS analyzed historical and topographical data, including the visible extent of the unmapped floodplain, to approximate the areas at risk for riverine flooding from these two sources. *Figure E-8* (Appendix E, Figures) outlines the areas within the Reservation that would experience inundation during a major riverine flood event.

Extent and Probability of Future Events

As noted in Section 5.2.2.1 Extent and Probability of Future Events, floods are described in terms of extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. As noted above, *Figure E-8* (Appendix E, Figures) shows the approximate extent of flooding on the Reservation. Based on historical flooding events in the state, the Washington State HMP estimates that the recurrence interval for major riverine floods in Clallam County, including the Reservation, is seven years (Washington State 2013).

5.1.2.3. Landslide/Mudslide

Nature

As described in Section 5.2.1.2, landslide is a general term for the dislodgment and fall of a mass of soil or rocks along a sloped surface or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. Landslides may involve a wide range of combinations of natural rock, soil, or artificial fill. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also occur because of indiscriminate development of sloping ground or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions.

Non-earthquake-induced landslides, the focus of this section, often occur as a result of intense or prolonged precipitation that can saturate slopes and cause failures. They can also be caused by erosion from river or ocean waves that create over-steep slopes or remove support from the base of slopes.

History

Historic non-earthquake-induced landslides on the Reservation are unknown. Therefore, the following non-earthquake-induced landslides have occurred in the vicinity of the Reservation in the last 10 years (Washington State 2013):

March 1998: A large landslide occurred after soils were saturated by three years of above-average rainfall. The event damaged or destroyed 126 homes in Cowlitz County and is known as the second-worst landslide disaster in U.S. history. The event was declared Federal Disaster #1255.

December 1996-January 1997: Saturated ground combined with high levels of snow and rain in a 5-day period caused massive flooding and landslides in Washington. Landslides caused the deaths of at least four people. Most landslides occurred in Seattle, immediately north of Seattle in the Puget Sound, or along the I-5 corridor. The storm was declared Federal Disaster #1159.

October 2003: A severe storm caused flooding and landslides in northwestern Washington. Landslides due to the storms caused temporary closures of nine State highways and a sinkhole on State Route 112 adjacent to the Makah Indian Reservation on the Olympic Peninsula. The storm was declared Federal Disaster #1499.

December 2005: A rockslide near Crescent Lake on the Olympic Peninsula temporarily closed Highway 101.

January 2009: A severe storm which was a typical Pineapple Express storm, bringing warm rains that originated from around Kauai (Hawaiian Islands) and rapidly melting snow in a

rain-on-snow event. Washington State Geological Survey reported through field and aerial surveys that the storm caused over 1,500 landslides greater than 5,000 square feet in size. The flooding resulted in the largest evacuation in state history, forcing more than 30,000 people living in the Puyallup River area to flee.

Note: Landslides occur on an annual basis in Washington State. The remaining landslides identified per Washington State up to 2013 are in groupings of data and not identified specifically to La Push area (Washington State 2013).

Location

As described in Section 5.2.1.2, the coastal bluffs near Lonesome Creek, the east-facing bluffs of Akalat (James Island and Little James Island), and several inland areas, including the hills along Highway 110, are subject to earthquake-induced landslides. Because areas that are subject to earthquake-induced landslides are generally also at risk for landslides triggered by other conditions, such as high precipitation levels, it can be assumed that these areas are also at risk for non-earthquake-induced landslides. *Figure E-9* (Appendix E, Figures) shows the location of all steep-sloped areas at risk for landslides in the Reservation.

Extent and Probability of Future Events

The extent of landslides on the Reservation is unknown. Shallow flows, slides, falls, and topples, and deep-seated slides of earth and debris are all common types of landslides in western Washington. Landslides are likely to occur during winter storm events that produce heavy and/or prolonged rainfall. As explained in Section 5.2.2.1, the Reservation is affected by a severe storm every seven years and strong El Niño events every two to ten years.

5.1.2.4. Coastal Erosion

Nature

Coastal erosion is a natural process caused by continual wave action along beaches or coastal bluffs, which may cause long-term loss of sediments or rocks or merely the redistribution of coastal sediments. The rate of erosion is influenced by the hardness and geological structure of the bluffs, the presence/absence of a beach at the base of the bluff, the stability of the foreshore, and the supply of additional beach material from updrift patterns. Because erosion is particularly prevalent along coastal bluffs with drainage problems or minimal vegetation at the top of the slopes, shoreline development often exacerbates coastal erosion by removing pre-existing vegetation and destabilizing bluffs.

History

The coastline of the Quileute Indian Reservation has changed significantly over time as a result of coastal erosion. Beach erosion has redistributed sand along First Beach and continual wave action has eroded the sandstone bluffs at Quateata, the outcrop at the southern end of First Beach near Lonesome Creek, creating distinct arches, spires, and other rock formations. The horseshoe shape of Akalat (James Island) is due to wave action on a small section of thin, relatively soft siltstone strata in the center of the island, which erodes more quickly than the sandstone that comprises the rest of the island (Rau 1980).

Most significantly, the mouth of the Quillayute River has changed locations several times because of natural erosion forces. Historical records indicate that in 1876, the mouth of the river was approximately in the same location as it is today, but a log jam closed the river and forced it through a sand spit further north (the current location of the Rialto Beach picnic area) (Rau

1980). Sometime around 1911, the mouth of the river migrated south again. In 1931, the U.S. Army Corps of Engineers stabilized the location of the river by constructing a dike extending from the existing sand spit to Akalat (James Island) and a jetty on the opposite side of the river. These structures have been continually damaged by wave action since 1931 and have required near-constant repairs.

Location

The Pacific Northwest has high wave action as a result of regularly occurring swells in the Pacific Ocean. Severe storms, generally occurring in the winter, can cause exceptionally strong wave action with deep-water significant wave heights (trough to crest) averaging 9.8 feet every 12 seconds (Washington Department of Ecology 2008b). As shown in *Figure E-10A* (Appendix E, Figures) the USGS's coastal vulnerability index is "high" for the coastal area of the Reservation and therefore is susceptible to erosion rates of 3.3–6.6 feet per year. *Figure E-10B* shows the coastal area of the Reservation at risk to erosion over a 10-year period. As such, the coastline of the Reservation is subject to beach erosion along First Beach, bluff erosion on Quateata and Akalat (James Island), and destabilization of the dike and jetty protecting the mouth of the Quillayute River.

Extent and Probability of Future Events

Coastal erosion rates along the coast of the Olympic Peninsula are considered high by the USGS. High coastal erosion rates equate to 3.3–6.6 feet per year.

5.1.2.5. Windstorm

Nature

Wind is air flow that travels horizontally with respect to the earth's surface and topography. Wind speeds vary with individual storms and often do not last for protracted amounts of time. Strong winds can topple trees or power lines. Near-surface winds and associated pressure effects exert loads on walls, doors, windows, and roofs, often causing structural components to fail. Flooding can be an additional problem, as wind contributes to the formation of storm surge in large bodies of water.

History

Numerous damaging windstorms have affected the Reservation in recent history, including the following:

January 1950: A blizzard with high winds ranging from 25 to 40 mph killed 13 people in the Seattle area. This storm is considered one of the top-10 weather events in Washington during the 20th century, according to the National Weather Service.

October 1962: Rated the top weather event in Washington during the 20th century, according to the National Weather Service, this wind storm had gusts up to 160 mph. The storm, known as the "Columbus Day Storm," killed 46 people in the Pacific Northwest region. Total estimated damage was $235 million (1962 dollars).

April 1972: Three tornadoes hit Washington in one day. Wind speeds ranged up to 206 mph. This storm is considered one of the top-10 weather events in Washington during the 20th century, according to the National Weather Service.

January 1993: Hurricane force winds with gusts up to 98 mph swept through central Washington, killing 5 people and causing $130 million in damages. The storm was declared Federal Disaster #981.

December 2006: Severe winds known as the "Hanukkah Wind Storm" hit all areas of Washington. Wind speeds in the Cascade Mountains were over 100 mph. The storm killed 15 people in Washington and left up to 1.5 million residents without power for 11 days.

December 2007: Over a period of three days, two windstorms swept the Pacific Northwest. This event was unique for the extended length of the high wind period. Peak wind gusts in La Push were recorded at 54 mph.

January 2009: There was a storm induced flood event was declared Federal Disaster #1817. Please see flood hazard section.

January 2012: Severe winter storm 'Snowmageddon' disrupted airport traffic, closed roads and schools, downed trees resulting in tons of debris blocking roads and knocked out power to more than 275,000 customers across the state. According to the National Climatic Data Center, "arctic air moved into the region followed by a series of moderate to strong upper level storm systems riding on a moist subtropical jet stream. The result was widespread heavy snow and local high winds." Damage estimates of over $32 million were reported in the Preliminary Damage Assessment document. Public Assistance was granted to 11 counties: Clallam, Grays Harbor, King, Klickitat, Lewis, Mason, Pierce, Skamania, Snohomish, Thurston, and Wahkiakum. The per capita damage estimates in each of these counties is as follows: Countywide per capita impact according to the Preliminary Damage Estimate is as follows: Clallam County ($3.57), Grays Harbor County ($7.21), King County ($3.97), Klickitat County ($113.46), Lewis County ($13.86), Mason County ($9.72), Pierce County ($12.87), Skamania County ($83.72), Snohomish County ($7.72), Thurston County ($13.00), and Wahkiakum County ($3.49) (based on 2000 demographic data). These damages resulted in a statewide per capita impact of $1.35. Over 800 recovery projects were applied for as a result of the storm. Federal Disaster #4056.

Location

Washington's coastal areas receive the full force of all storms moving inward from the ocean, and extremely high winds are common during such events. Because of the air pressure weather patterns in the region, the strongest wind storms in the Olympic Peninsula occur during the winter months and generally come from the south or southwest. According to the Western Regional Climate Center, wind velocities in the Olympic Mountains during extreme winter storms are expected to reach 90 to 100 mph once in 100 years (Western Regional Climate Center 2003).

Figures E-11A and *E-11B* reflect the wind patterns from the two most recent major wind events in the Reservation: the 2006 Hanukkah Storm and the December 2007 storms (Appendix E, Figures).

Extent and Probability of Future Events

The National Weather Service defines a severe wind storm as an event having sustained winds of 40 mph or gusts of 58 mph, or greater, not caused by thunderstorms, expected to last for an hour or more (Washington State 2013). The historical patterns described above indicate that severe wind storms occur approximately every 10–15 years.

5.1.2.6. Snow/Ice Storms

Nature

Snowstorms happen when a mass of very cold air moves away from the polar region. As the mass collides with a warm air mass, the warm air rises quickly and the cold air cuts underneath it. This action causes a huge cloud bank to form and as the ice crystals within the cloud collide, snow is formed. Snow will only fall from the cloud if the temperature of the air between the bottom of the cloud and the ground is below 40°F. A higher temperature will cause the snowflakes to melt as they fall through the air, turning them into rain or sleet. Similar to ice storms, the effects of a snowstorm can disturb a community for weeks or even months. The combination of heavy snowfall, high winds, and cold temperatures pose potential danger by causing prolonged power outages, automobile accidents, and transportation delays; creating dangerous walkways; and causing direct damage to buildings, pipes, livestock, crops, and other vegetation. Buildings and trees can also collapse under the weight of heavy snow.

Ice storms, which include freezing rain, sleet, and hail, can be the most devastating winter weather phenomena and are often the cause of automobile accidents, power outages, and personal injury. Ice storms result in the accumulation of ice from freezing rain, which coats every surface it falls on with a glaze of ice. Freezing rain is most commonly found in a narrow band on the cold side of a warm front, where surface temperatures are at or just below freezing temperatures. Typically, ice crystals high in the atmosphere grow by collecting water vapor molecules, which are sometimes supplied by evaporating cloud droplets. As the crystals fall, they encounter a layer of warm air where the particles melt and collapse into raindrops. As the raindrops approach the ground, they encounter a layer of cold air and cool to temperatures below freezing. However, since the cold layer is so shallow, the drops themselves do not freeze, but rather, are supercooled, that is, are in a liquid state at below-freezing temperature. These supercooled raindrops freeze on contact when they strike the ground or other cold surfaces.

History

Some of the most significant snow/ice storms that affected Washington, and therefore the Reservation, are listed below.

January/February 1916: "Seattle's Greatest Snowstorm" occurred after two months of heavy snowfall, during which a total of 58 inches of snow fell on Seattle. Seattle's maximum 24-hour snowfall, 21.5 inches, occurred on February 1. This storm is considered one of the top-10 weather events in Washington during the 20th century, according to the National Weather Service.

January 1950: A blizzard caused 21.4 inches of snow to fall in Seattle, the second-greatest 24-hour snowfall for Seattle ever recorded (the greatest occurred in 1916). The storm had winds of 25–40 mph and killed 13 people. This storm is considered one of the top-10 weather events in Washington during the 20th century, according to the National Weather Service.

December 1982: A severe storm caused coastal flooding, four injuries, and $1.7 million in damages. The storm was declared Federal Disaster #672.

November 1990: A severe storm caused flooding in northwestern Washington. The storm was declared Federal Disaster #896.

December 1996-January, 1997: Saturated ground combined with high levels of snow and rain in a five-day period caused massive flooding and landslides in Washington. The storm killed 24

people and caused $140 million in estimated losses. The storm was declared Federal Disaster #1159.

December 2008: Considered the biggest snowstorm for western Washington in 12 years, heavy snowfall and below average temperatures gripped the State for approximately 2 weeks.

Location

As explained in Section 5.2.2.4, Washington's coastal areas receive the full force of all storms moving inward from the ocean, and the strongest storms occur during the winter months. Because the Quileute Indian Reservation is located directly on the coast, it does not experience the severe ice and snowstorms that occur in the higher elevations in the Olympic Mountains, but it has experienced relatively severe winter storms (either freezing rain or snow) in the past.

Extent and Probability of Future Events

The National Weather Service defines a severe winter storm as a storm event having significant snowfall, ice and/or freezing rain of 4 inches, or more, in a 12-hour period or 6 inches, or more, in a 24-hour period (Washington State 2013). The average annual snowfall in La Push is 13 inches. Given the historical patterns of winter snow/ice storms explained above, severe snow/ice storms have a recurrence interval of about every 10–20 years in the Reservation.

5.1.3. Fire Hazards

5.1.3.1. Wildland Fire

Nature

A wildland fire spreads through consuming vegetation. It often begins unnoticed, can spread quickly, and is usually indicated by dense smoke that may be visible for miles around. Wildland fires can be caused by human activities, such as arson or campfires, or by natural events, such as lightning.

The classic wildland fire is a forest fire that occurs in undeveloped areas with large amounts of vegetative fuels. These fuels include timber and other associated fuels, such as brush, grass, logging residue, and thick stands of regrowth. Because of variations in fuel and topography, this type of fire may be extremely difficult and costly to suppress. A wildland-urban interface fire is another type of wildland fire that occurs in areas where urbanization and the presence of natural vegetation fuels allow a fire to spread rapidly from natural fuels to structures, and vice versa. Especially in the early stages of such fires, structural fire-suppression resources can be quickly overwhelmed, and as a result, the number of destroyed structures increases. Such fires are known for the large number of structures that are simultaneously exposed to fire.

The following three factors contribute appreciably to wildland fire behavior and can be used to identify hazards:

Topography. As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridgetops may mark the end of the spread of a wildland fire, as fire spreads more slowly, or may even be unable to spread, downhill.

Fuel. The type and condition of vegetation play a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible mate-

rial available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. The moisture content of both living and dead plant matter decreases during periods of prolonged drought, and therefore drought periods greatly increase the risk of fire. The continuity of fuel, both horizontally and vertically, is also an important factor.

Weather. The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and the spread of fire. Extreme weather, such as high temperatures coupled with low humidity, can lead to devastating wildland fires. Conversely, cool temperatures and higher humidity often signal reduced wildland fire occurrence and easier containment of existing fires.

A wildland fire may grow into an emergency or disaster if not promptly controlled. Even a small fire can threaten lives and resources and destroy property. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency watering and feeding, evacuation, and alternative shelter for livestock and pets.

Both the immediate and the long-term effects of wildland fires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm waterways, and the soil itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thus increasing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris-flow hazards.

Wildland fire has always been a force in shaping landscape and ecology in the Pacific Northwest. Both human-induced and natural fires burned periodically and renewed the cycle of succession in both meadow and forest areas. Regular burns prevented fuel from accumulating, so that few fires were hot enough to destroy mature, established trees, scorch deep into the soil, or cause severe damage to wetlands. In many areas of the country land managers are now questioning the wisdom of wholesale fire suppression, as fire-suppressed forests tend to build up fuel loads of dead and dry vegetation.

History

Historical wildland fires on the Reservation are unknown. Therefore, historical wildland fires in the vicinity of the Reservation, as described by the Olympic National Park, are shown in *Figure E-12* (Olympic National Park 2008). The most recent fires located in this area are described below:

1951: The Great Forks Fire burned over 33,000 acres. The town of Forks was evacuated, and a sawmill and several homes and barns were destroyed.

1984: The Lebar Fire burned 495 acres in Olympic National Park.

1999: The Oh Brothers Fire burned 294 acres in Olympic National Park.

2006: The Bear Gulch 2 Fire burned 1,055 acres in Olympic National Park.

2007 – 2013: No significant wildland fires were identified for Clallam County.

Location

Despite the fact that La Push is located on the coast, it is adjacent to areas with steep slopes and high levels of vegetation, and is therefore at risk for wildland fires that encroach into the urban-interface area, as shown in *Figure E-13* (Appendix E, Figures).

Extent and Probability of Future Events

Figure E-13 displays the extent of wildland fires in and around the Reservation. Historical records of wildland fires indicate that the region surrounding the Reservation will experience a major wildland fire (more than 300 acres) every 10–15 years, generally between the months of July and September.

5.1.3.2. Urban Conflagration

Nature

Conflagration is a type of fire that occurs in the built environment, starting at one structure and quickly spreading to many more. A conflagration often expands uncontrollably beyond its original source area to engulf adjoining regions. A conflagration can have many causes, including:

- Criminal acts (arson, illegal explosive devices, acts of terrorism, or civil unrest)
- Residential accidents (improper use of electrical and heating appliances, improper storage or handling of flammables, faulty connections, grease fires, misuse of matches and lighters, and improper disposal of charcoal and wood ashes)
- Industrial accidents (hazardous material incidents, explosions, and transportation accidents)
- Acts of nature (lightning strikes or ignitions after a large earthquake)

Also, wind, extremely dry weather conditions, explosions, and a dense built environment can contribute to a conflagration.

History

The Reservation has experienced several incidents of urban conflagration in the last 20 years. Most incidents have been initiated by wood-burning or gas stoves within Tribal residences.

Location

All facilities and residences belonging to Tribal members, are located in the semi-urbanized area of La Push. Therefore, all Tribal assets are located in an area at risk for urban conflagration.

Extent and Probability of Future Events

An urban fire in a Tribal facility or residence could easily spread to other structures or to the surrounding forested areas. *Figure E-14* (Appendix E, Figures) shows the areas at risk for urban conflagration within the Reservation. Based on previous experiences, the Tribe is likely to experience an urban fire every 1–2 years. However, these fires may be extremely small and will likely stay contained within a single residence.

5.1.4. Hazardous Material Hazards

Hazardous materials are substances that may have negative effects on health or the environment. Exposure to hazardous materials may cause injury, illness, or death. Effects may be felt over seconds, minutes, or hours (short-term effects) or not emerge until days, weeks, or even years after exposure (long-term effects). Also, some substances are harmful after a single exposure of short duration, but others require long episodes of exposure or repeated exposure over time to create harm.

The toxicity of a specific substance is one important factor in determining the risk it poses, but other factors can be just as important, if not more so. Factors affecting the severity of an accidental release include:

- Toxicity
- Quantity
- Dispersal characteristics
- Location of release in relation to population and sensitive environmental areas
- Efficacy of response and recovery actions

5.1.4.1. Vessel Incident

Nature

A particularly problematic type of a vessel incident-related release in coastal areas is an oil spill. Oil spills can involve a variety of materials, including crude oil, refined petroleum products (such as gasoline or diesel fuel) or by-products, ship bunkers, oily refuse, or oil mixed in waste. When oil is released in water, it forms a slick on the surface that can be transported very quickly by strong ocean or river currents. Oil spills generally occur when a ship crashes or sinks and releases fuel in the process. Public attention often focuses on spills cause by major oil tankers, but oil spills can also be caused by smaller vessels such as fishing or recreational boats.

Oil spills can cause severe damage to ecological resources within marine or riverine habitats. Oil spills can also cause economic damage by inhibiting fishing industries or water-based recreation.

History

On behalf of several Federal agencies, including the U.S. Environmental Protection Agency (EPA) and United States Coast Guard, the National Response Center (NRC) serves as the POC for reporting oil, chemical, radiological, biological, and etiological discharges within the United States. The NRC's Internet-based query system of non-Privacy Act data show that since 1990, 15 oil spills have occurred along the coastal areas of the Reservation (Table 5-3).

Table 5-3. Vessel Incident Spills in the Reservation

Date	Location	Event Description	Suspected Responsible
September 15, 1990	La Push Boat Basin	Sheen was reported in the water. It may have come from Barrelson Beach.	N/A
May 6, 1994	La Push Boat Basin	Sheen was reported in the water.	N/A
February 17, 1998	Quillayute Harbor	A fishing vessel sank and fuel was released from its vents as it sank.	N/A
May 23, 1998	Mouth of the Quillayute River	A fishing vessel sank.	N/A
August 23, 1998	Quillayute Harbor/River	A vessel was intentionally run aground and the vessel created sheen with the incoming tide.	N/A
February 19,	La Push Harbor/Marina	Material was released out of a vessel when it	N/A

Table 5-3. Vessel Incident Spills in the Reservation

Date	Location	Event Description	Suspected Responsible
2001		sank at its mooring.	
August 10, 2003	Quillayute Marina	Diesel fuel spilled into the river from a fishing vessel for unknown reasons.	Maranantha
May 4, 2005	La Push Harbor, Dock A5	Material was released from a vessel because of equipment failure.	N/A
August 12, 2005	La Push Marina	A sheen was reported in the water.	N/A
March 1, 2007	Coast Guard Moorings at the end of La Push Road	Materials spilled from the dock because of operator error.	U.S. Coast Guard Station
May 11, 2007	La Push Marina	The fishing vessel *Merna Jane* discharge diesel fuel into the marina.	Fishing Vessel *Merna Jane*
June 11, 2007	End of La Push Road	Diesel fuel leaked out of the pumping station at the docks into the water.	U.S. Coast Guard Station
November 20, 2007	Pacific Ocean	A vessel hit submerged logs and released materials as it sank.	N/A
November 20, 2007	Pacific Ocean, in the Washington Marine Sanctuary	A fishing vessel sank and released fuel.	N/A
July 31, 2008	End of La Push Road outside the boat dock	Diesel fuel was discharged from the air vent of a vessel as a result of over-filling.	U.S. Coast Guard Station

Note: No significant vessel spill information has been provided for 2009- 2013.

Location

Because the Reservation is located on the coast and at the mouth of a major river, it is at risk for oil spills. Many small fishing vessels and recreational boats use the marina as a means to access both the ocean and the Quillayute River and are the biggest cause of oil spills in the Reservation. However, the Reservation could also be affected by an offshore spill from an oil tanker or commercial ship; the oil slick from such an event could potentially be carried by ocean currents to the coast of the Reservation. *Figure E-15* (Appendix E, Figures) shows areas along the coast of the Reservation that are at risk for a vessel incident spill.

Extent and Probability of Future Events

Based on the historical patterns of oil spills in the area, the Reservation can expect to experience an oil spill every 1–2 years. Recently recorded oil spills have been relatively minor in extent. Although a more significant event is possible from an offshore spill, erratic shipping and ocean current patterns make it difficult to quantify the extent and probability of such an event.

5.1.4.2. Fixed Incident

Nature

Hazardous materials can be found almost everywhere in our society. Paints, solvents, adhesives, gasoline, household cleaners, batteries, pesticides and herbicides, and even medicines are all po-

tential sources of hazardous materials. Although many people are beginning to question the wisdom of surrounding themselves with so many potential toxins, this plan does not focus on the hazards contained in everyday products, but rather on the hazards associated with potential releases of hazardous substances from fixed facilities within, or within contamination range of, the Reservation.

Hazardous materials are generally classified by their primary health effects on humans. Some common types include the following:

- Anesthetics and narcotics are substances that depress the central nervous system.
- Asphyxiants are substances that interfere with normal breathing and can cause suffocation.
- Explosives are substances that pose a risk of exploding; fires and chemical effects may also be a danger.
- Flammable materials are substances that catch fire easily, though they may also pose other dangers, such as explosion or chemical effects.
- Irritants cause burns or irritation to body tissues such as eyes, nose, throat, lungs, or skin.

Unless exempted, fixed facilities that use, manufacture, or store hazardous materials in the United States fall under the regulatory requirements of the Emergency Planning and Community Right to Know Act, and must report to the EPA. Hazardous materials that pose the greatest risk for causing catastrophic emergencies, as identified by the EPA, are classified as extremely hazardous substances.

Exposure to hazardous substances generally takes place by one or a combination of the following mechanisms:

- Direct contact with skin or eyes
- Ingestion through contaminated food or water
- Inhalation of particles or gas in contaminated air

The release of hazardous substances from facilities can be caused by human error, acts of terrorism, or natural phenomena. Earthquakes pose a particular risk, because they can damage or destroy facilities containing hazardous substances. The threat posed by a hazardous-material event may be amplified by restricted access, reduced fire suppression and spill containment capability, and even complete cutoff of response personnel and equipment.

History

The NRC's Internet-based query system of non-Privacy Act data shows that since 1990, three fixed incident material spills have occurred on the Reservation (Table 5-4).

Table 5-4. Fixed Incident Spills on the Reservation

Date	Location	Event Description	Suspected Responsible Company
July 11, 2003	350 Main Street	Gasoline spilled onto the concrete from a fuel filter located at a fuel fixed farm.	U.S. Coast Guard Station

December 7, 2003	71 Main Street	Material was released from a landed vessel as a result of inattentive fueling.	Private Citizen
December 8, 2003	71 Main Street	Material was released from a leaking hose or fitting.	Quillayute Marina

Location

EPA-regulated facilities within the Reservation include one facility permitted to discharge to water and four facilities that are hazardous waste handlers. Generally, the small, fixed facilities have varying uses of hazardous chemicals, but do not pose a significant risk to the Reservation. The location of all the facilities is shown in *Figure E-15* (Appendix E, Figures). Details for all five EPA-regulated facilities are outlined in Table 5-5.

Table 5-5. EPA-Regulated Facilities in the Reservation

Facility Name/Address	Permitted Discharges to Water?	Toxic Releases Reported?	Hazardous Waste Handler?	Active or Archived Superfund Report?	Air Releases Reported?
Clallam County Public Works La Push Site, 7 miles west of Forks on La Push Road	Yes	No	No	No	No
La Push Drums, U.S. Coast Guard Quillayute Station	No	No	Yes	No	No
Quillayute River Drum, U.S. Coast Guard Station	No	No	Yes	No	No
U.S. Coast Guard Station, Quillayute River, end of La Push Road	No	No	Yes	No	No
WSDOT Bogachiel River Bridge 11015, State Route 110, MP 8.64	No	No	Yes	No	No

MP = Milepost

U.S. – United States

WSDOT =Washington Department of Transportation

Extent and Probability of Future Events

Previous occurrences of hazardous material events indicate that the likelihood of a non-mobile spill occurring at a fixed facility within the Reservation is once every five to ten years. Past events have involved oil leaks from stationary sources and have been relatively minor in extent, but that does not mean that a more significant event is not possible. However, wide variations among the characteristics of hazardous material sources and among the materials themselves make it difficult to produce a more exact evaluation of the extent and probability of a future non-mobile spill.

5.1.4.3. Mobile Incident

Nature

Mobile incident-related releases are dangerous because they can occur anywhere, including close to human populations, assets and utilities, or environmentally sensitive areas. Mobile incident-related releases can also be more difficult to mitigate because of the great area over which any given incident might occur and the potential distance of the incident site from response resources.

History

The NRC's Internet-based query system of non-Privacy Act data shows that no recent mobile incident spills have occurred in or in the direct vicinity of the Reservation.

Location

Mobile incident-related releases have the potential to occur along Highway 110, which is the only transportation corridor to the Quileute Indian Reservation. *Figure E-15* (Appendix E, Figures) shows areas at risk for a mobile incident event, including an area within a 0.25-mile radius of Highway 110.

Extent and Probability of Future Events

Based on previous occurrences, it is unlikely that a hazardous-material, mobile incident-related release will happen in the near future. However, as noted above, trucks carrying gasoline and other hazardous materials are known to travel on Highway 110.

6.1 ASSET INVENTORY

Assets within the Reservation that may be affected by hazard events include Tribal population and housing, Tribal assets, Tribal areas of cultural significance, Tribal utilities and transportation, and future acquisitions. In this analysis, Tribal assets have been broken into the following sub-categories: departments and agencies, emergency services, educational facilities, recreational and tourism facilities, commercial facilities, other assets, and areas of cultural significance. A complete list of assets that may be affected by hazard events, including type, name, and location, is described below.

6.1.1 Tribal Population and Housing

Population and housing data for the Tribe was obtained from the 2000 and 2010 Census, and the 2012 American Community Survey. The Tribe's total population in La Push for 2010 was 460. The estimated population on the Reservation is shown in *Figure E-16A* and the estimated population density is shown in *Figure E-16B*. Table 6-1A outlines population growth from 2000 to 2012 and growth rate of 1.8% for both population and housing units. Table 6-1B Shows Reservation census block data for 2010.

Table 6-1A. Quileute Tribal Population and Housing

Year	*Population*	*Total Housing Units*	*Occupied Housing Units*
2000	371	128	116
2001	379	131	118
2002	387	134	120
2003	395	136	123
2004	405	140	125
2005	415	143	128
2006	427	147	132
2007	437	151	135
2008	446	155	138
2009	453	157	140
2010	460	159	142
2011	460	159	142
2012	459	159	142
Change 2000-2012	88	31	26
CAGR 2000-2012	1.8%	1.8%	1.7%

Table 6-1B. On-Reservation Tribal Population

Census Block	Tribal Population (2010 Census)
2059	135
2061	58
2060	52
2072	50
2075	40
2052	33
2050	32
2073	19
2074	14
2062	11
2056	10
2055	6
2047	2

Source: U.S. Census 2010.

The Tribal Housing Authority provided information on housing as it relates to neighborhoods in the upper village. Tribal Housing is broken into three distinct groups, which are shown in *Figure E-16C* and outlined in Table 6-2. The specific addresses for Tribal residences are not included in this plan. Also, housing in the lower historic village is based on original allotments and not available through the Housing Authority.

Table 6-2. Tribal Housing

Category	Neighborhood	Number of Units	Lat./Long. Location	Estimated Value Per Unit
Housing: Upland Development	Quileute Heights	51	-124.623, 47.900	$145,644
	Raven's Crest	36	-124.616, 47.896	$145,644
	Raven's Crest Addition	8	-124.614, 47.898	$145,644
Housing: Lower Village	Individual Homes	25	-124.621, 47.899	N/A

Source: Quileute Tribe 2014, Anna Parris, Housing Authority Director.
Lat. = latitude
Long. = longitude

The HMP does not address Repetitive Loss (RL) properties, which FEMA defines as a property with at least two $1,000 claims within any 10-year period since 1978, because according to FEMA's SQAnet, there are no RL properties located on the Reservation. Similarly, no SRL properties are located on the Reservation. This could be addressed in a future Enhanced HMP as there are certainly locations of frequent flooding with impacts on facilities, but repetitive loss incidents have not been managed in a way that is recognized in the NFIP process.

6.1.2 Tribal Assets

The Quileute Tribe's structural assets are listed in Table 6-3. The assets listed have been grouped into six categories which include: departments and agencies, emergency services, educational facilities, recreational and tourism facilities, commercial facilities, and other assets. These assets are shown in *Figures E-17A* through *E-17G*, respectively (Appendix E, Figures).

Table 6-3. Tribal Assets

Category	Facility	Lat./Long. Location	Estimated Value
Departments and Agencies (Figure E-17A)	Health and Human Services (HHS) Building	-124.621, 47.899	$414,432
	HHS TANF Vehicles (7 GSA)	-124.621, 47.899	$225,000
	HHS Transit Bus	-124.621, 47.899	$40,000
	HHS Trailers (2)	-124.623, 47.900	$3,400
	Youth Center (Blue Shed)	-124.623, 47.900	$212,209
	Youth Center Strip Canoe	-124.623, 47.900	$10,000
	Housing Maintenance Vehicle	-124.616, 47.897	$15,000
	Church	-124.637, 47.909	$76,251
	Courthouse	-124.636, 47.909	$415,778
	*101 Building Tribal Office	(Figure E-17G)	$885,088
	Fisheries & Natural Resources Office	-124.636, 47.913	$761,822
	Natural Resource Trailer Bldg.	124.629, 47.905	$36,976
	Fisheries & Natural Resources Vehicles (17)	-124.636, 47.913	$478,364
	Senior Center Building	-124.636, 47.908	$222,752
	Senior Center Bus & Van	124.636, 47.908	$61,000
	Tribal Council & Administration Building	-124.636, 47.909	$1,080,245
	Tribal Council & Admin Vehicles (5)	-124.636, 47.909	$124,680
	Utilities Heavy Equipment (9)	-124.629, 47.905	$481,794
	Utilities Vehicles (4)	-124.629, 47.905	$64,160
	Commodities Food Distribution Center	-124.636, 47.908	$219,359
	Food Distribution Van (GSA)	-124.636, 47.908	$22,177
Emergency Services (Figure E-17B)	Police Station	-124.615, 47.897	$708,000
	Police Vehicles (5)	-124.615, 47.897	$145,150
	Fire Station (at Raven's Crest)	-124.616, 47.897	$205,044
	Fire Station Emergency Vehicles (3)	-124.616, 47.897	$66,000
	Health and Dental Clinic	-124.621, 47.898	$2,551,179
	Health Clinic Vehicles (3 GSA)	-124.621, 47.898	$67,278

Education (Figure E-17C)	Tribal School Administration Building	-124.637, 47.908	$1,400,648
	School Accounting & Print Shop	-124.637, 47.908	$173,481
	Cultural Modular Classroom	-124.637, 47.908	$113,757
	Carving Shed	-124.637, 47.908	$28,170
	High School/Middle School Portable	-124.637, 47.908	$139,763
	Tribal School – Main Building	-124.637, 47.908	$3,581,606
	Special Ed. And Technology Portable	-124.637, 47.908	$210,447
	Tribal School Rolling Stock	-124.637, 47.908	$198,552
	Akalat Center - gymnasium	-124.617, 47.897	$5,561,659
	Pump Building/Water Tank	-124.617, 47.897	$129,987
	Propane Tank & Enclosures	-124.617, 47.897	$10,952
	Baby Face Modular Classroom	-124.617, 47.897	$212,063
	Early Education Building	-124.615, 47.896	$1,943,887
	Headstart Classroom Building 1	-124.615, 47.896	$172,977
	Headstart Classroom Building 2	-124.615, 47.896	$172,977
	Headstart Classroom & Covered Play Area	-124.615, 47.896	$ 34,174
	4 Carved Cedar Canoes	-124.637, 47.908	$101,471
	Hand Carved Totem Pole	-124.637, 47.908	$39,109
	Headstart Bus (GSA)	-124.615, 47.896	$80,000
	Tribal School Miscellaneous Equip-ment	-124.637, 47.908	$199,541
Recreation and Tour-ism (Figure E-17E)	River's Edge Restaurant	124.637, 47.909	$906,988
	Floating Docks	-124.637, 47.910	$1,366,254
	Shoreline Resort	-124.630, 47.903	$332,273
	Lonesome Creek Beach House	-124.629, 47.902	$105,817
	Lonesome Creek RV Hookups	-124.629, 47.902	$135,809
	Ocean Park Restrooms/Showers	-124.629, 47.902	$94,316
	Ocean Park RV Hookups	-124.630, 47.907	$130,946
	Whale Motel	-124.633, 47.906	$1,585,171
	Thunderbird Motel	-124.633, 47.905	$2,190,092
	Ocean Park: Duplex Cabins	-124.631, 47.903	$214,600
	Ocean Park: A Frame Units	-124.631, 47.903	$1,084,373
	Ocean Park: Cabins 29-35	-124.631, 47.903	$743,211
	Ocean Park: Cabins 38-39	-124.631, 47.903	$232,013
	Ocean Park: Cabins 40-45	-124.631, 47.903	$619,657
	Oceanside Resort Units14-28	-124.631, 47.903	$1,463,420
	Oceanside Vehicle	-124.632, 47.906	$7,943
	Ocean Park Office and Gift Shop	-124.632, 47.906	$387,917
	Lonesome Creek Store & PO	-124.630, 47.903	$982,820
	Lonesome Creek Store Warehouse	-124.630, 47.903	$76,620

Commercial (Figure E-17D)	Main Hatchery Building	-124.627, 47.902	$163,515
	Hatchery Storage Building	-124.627, 47.902	$76,197
	Hatchery #2	-124.627, 47.902	$144,494
	Hatchery Office & Lab	-124.627, 47.902	$337,363
	Raceways/Fisheries	-124.627, 47.902	$12,969
	Hi-Tides Seafood Processing Plant	-124.638, 47.909	$1,093,863
	Hi-Tides Seafood Refrigerator Building	-124.638, 47.909	$194,533
	Hi-Tides Seafood Compressor Building	-124.638, 47.909	$64,845
	Harbor Master's Building	-124.637, 47.909	$161,505
	Marina Building	-124.636, 47.911	N/A
	Marina Vehicle	-124.630, 47.903	$24,795
	*Highway 101/110 Business Park	(Figure E-17G)	$5,000,000
Other (Figure E-17F)	Ocean Park Manager's Residence	-124.634, 47.906	$249,592
	Ocean Park Maintenance Shop	-124.632, 47.906	$243,334
	Lonesome Creek Post Office	-124.637, 47.909	
*The 101 Building (Depts. & Agencies) and 110 Business Park (Commercial) are shown separately in *Figure E-17G*, Tribally Owned off Reservation			

6.1.3 Tribal Areas of Cultural Significance

The Quileute Cultural Resource Survey (Powell, 1997) identifies two significant shell middens, one on top of the sea stack known as Akalat (James Island), and the other encompassing the shoreline and most of the town of La Push. These are known to contain cultural material dating back at least 800 years, the full depth of the shore-side site is over 20 feet and a full scale analysis would date back thousands of years. These two sites have been recorded at OAHP, 45CA23 (La Push) and 45CA33 (Akalat). There have been construction disturbances to the sites over time, but enough of each site remains that would render a profound understanding of the history and culture of the Tribe if a preemptive archaeological study was done before a major disaster, such as a tsunami, hits the area. The beach and adjacent area of La Push are considered in several archaeological surveys to be sites of extraordinary value, one of the most significant on the Pacific Coast because of its ancient connection to Quileute, and relatively undisturbed condition. Historic, ethnographic and archaeological studies have provided numerous surveys and reports on the cultural resources of the Quileute Tribe and their environs.

Thunder Road and the old Quillayute Prairie are also of significant historical value. Before La Push Road was built, Thunder Road was the main trail serving the village of la Push for many hundreds, likely thousands, of years. This traverses the edge of the Quillayute and Bogachiel Rivers, which flood frequently, and exposure of cultural resources is highly likely in the case of strong winter and spring storms that cause river avulsion. Several studies also describe in detail the historic/cultural significance of Lonesome Creek and the Cemetery. A map of historical allotments and housing occupation patterns is included in the 1997 Survey, (Powell).

The Cultural Resources Survey provided information on the areas of cultural significance within the Reservation or within close proximity of the Reservation. These areas are shown in *Figure E-*

18 (Appendix E, Figures) and described in Table 6-4. Since these are not built assets, but are of intrinsic cultural and historic significance, financial values cannot be calculated. An estimate of costs to conduct an archaeological study of the sites could be ascertained if the Tribe chooses to do so. That is beyond the scope of this report. There are other sites off of the Reservation that have documented village sites and archaeological features along the rivers associated with the Quileute Tribe. A list of those surveys is included in the References Section of this Plan.

Table 6-4. Tribal Areas of Cultural Significance

Category	Areas of Cultural Significance Name	Lat./Long. Location
Areas of Cultural Significance	45CA33Akalat (James Island) and Little James Island	-124.647, 47.905
	Cemetery	-124.610, 47.914
	Lonesome Creek	-124.625, 47.904
	Thunder Field	-124.629, 47.901
	45CA23 Lower Historic Village of La Push (using admin bldg. as set point for Lat/Long Location)	-124.636, 47.909

Source: Cultural Resources Survey of the Quileute Indian Reservation Waterfront 1997.

6.1.4 Tribal Utilities

The Quileute Tribe has a variety of utilities that provide essential services to Tribal members in three categories: potable water, waste water, and other utilities. These utilities are shown in *Figure E-19* (Appendix E, Figures) and described in Table 6-5.

Table 6-5. Tribal Utilities

Category	Utility	Lat./Long. Location	Estimated Value
Potable Water	Brick Pump House	-124.575, 47.898	$15,176
	Water Storage Tank	-124.575, 47.898	$972,668
	Water Storage Tank #2	-124.575, 47.898	$972,668
	Water Storage Tank #3	-124.533, 47.533	$1,750,804
	Pump House Wells	-124.546, 47.909	$77,812
Waste Water	Wastewater Treatment Center	-124.629, 47.906	$3,566,450
	Lift Station #2	-124.629, 47.903	NA
	Lift Station #3	-124.627, 47.904	NA
	Lift Station #4	-124.635, 47.909	NA
	Lift Station #5 (Lonesome Creek)		NA
Other Utilities	Utilities Storage Office #1	-124.629, 47.905	$127,091
	Utilities Storage Office #2 (modular)	-124.629, 47.904	$31,858
	Wastewater Treatment Storage Office	-124.627, 47.904	$70,547
	Ocean Park Maintenance Shop	-124.631, 47.905	$243,334
	Marina Electrical Shed	-124.636, 47.909	$18,461

Source: Quileute Tribe 2014.

Lat. = latitude
Long. = longitude
NA = not applicable

The Quileute Water System (PWSS ID#105300016) is owned and operated by the Quileute Tribal Council. This system provides approximately 85,000 gallons of water per day to around 200 customers in the La Push, WA area. The Quileute Water System consists of two production wells, standard associated well machinery, three concrete reservoirs (100,000 g, 190,000 g, 110,000g), and 15 miles of buried mater mains. The system is operated and managed by 5 certified operators, two of which are tribal members.

Quileute water source comes from two wells (69 and 71 feet) located in the Three Rivers area. The largest reservoir, 190,000 gallons, is located at Steep Hill. The 100,000 gallon reservoir is located behind a locked gate in the recycling area. The 110,000 gallon reservoir is located on Cemetery Road behind the old Coast Guard Housing. All reservoirs are locked to public access. The tanks located on Cemetery Road and behind the recycling area have sensors that are monitored from the Public Works Office. The water consumption rate leveled out at 85,000 gallons per year, and has capacity to meet future community development needs.

6.1.5 Tribal Transportation

Goal 3 of the 2013 Community Economic Development Strategy – CEDS -addresses transportation and infrastructure. Objective 3.1 calls for completion of planning for roads…by 2015; and, task 3.1.1 specifies "Planning roads transportation infrastructure development to be submitted to the Bureau of Indian Affairs by 2014." Note: the Tribal Transportation Plan is outdated, but projects have been accomplished individually based on immediate need.

Transportation is complex both in the elements that keep people, goods and services moving; and, in the multiple jurisdictions that own those facilities. Tribal facilities, the roadways and bridges primarily, are owned and managed by the Bureau of Indian Affairs Department of Transportation - Indian Reservation Roads Division (BIA-DOT). They are funded through the Federal Highway Administration - Federal Lands Highways Division. The Region 10 Headquarters is located in Portland, Oregon. Area Managers are assigned to certain Tribes; the Manager for the Quileute Tribe is Franco Yazzie. Mr. Yazzie provides administrative and technical support for the 5-Year Transportation Plan and the annual Transportation Improvement Plan (T-TIP). The Indian Reservation Roads, (IRR), Inventory is reviewed annually and it changes only when roads are added or taken off of the system. Mr. Yazzie was consulted in the preparation of this Hazard Mitigation Plan.

The entire IRR Inventory includes roads owned by the Tribe, the BIA, Clallam County, and the Washington State Department of Transportation – WSDOT. Tribal roads are the internal roads that serve the housing projects, the parking lots near the marina, and some side streets, making up a small percentage of the road system serving the reservation. The County owns La Push Road, the main road that leads from the entry of the reservation to the waterfront. The State owns the only road that provides egress and ingress to the reservation, SR 110, from US101 to the entry of La Push. It is a 15-mile 2-lane corridor with narrow shoulders.

There is serious and chronic flooding on SR 110 at MP 8 that poses severe threats during winter storms. Water reaches 3 to 4 feet deep at this site. The Tribe's Executive Director, Mark Ufkes, informed the Planning Team that, "The Tribe loses about $30,000 per day in lost productivity

with our 285 employees when the road is closed and we close our offices." Road closures also pose a significant safety hazard as anyone with a health problem can't get to medical care.

The situation is addressed in the County Hazard Mitigation Plan as a Mitigation Strategy, but it is not listed in the State Transportation Improvement Program (STIP). Fixing this will require strong inter-jurisdictional cooperation. The Tribe and the County cooperate on many levels, and WSDOT has indicated interest in fixing the problem. WSDOT is currently repairing flood scour damages and replacing the deck on the Bogachiel River Bridge on SR110 according to the STIP.

There are two other safety issues that can be addressed in the 2015 Transportation Plan: The first is a potential landslide on La Push Road at Lonesome Creek. This was pointed out in the Planning Team Tour of the village. If the bluff were to slide onto the road due to saturated soil or due to earth shaking, everyone in the lower village would be trapped as this is the only road in or out. There are two solutions to this problem: the first would be to stabilize the bank with an engineered solution; and, the second would be to rebuild Thunder Road which is seriously deteriorated. Thunder Road is listed in the IRR Inventory and could be rebuilt. It is the historic trail to La Push, according to the 1997 Cultural Resources Survey, and connects the lower village to Thunder Field and An exit route in the case of a road closure due to landslides or downed trees along the main road out of town during a disaster event along the waterfront.

The Tribe and Clallam County operate public transportation services between the town of Forks and La Push "for work, school, medical access, and shipping", 2013 CEDS. The Tribe's TANF program operates a shuttle with an average of 3700 passenger trips a year. Clallam Transit operates a bus twice a day, a service that is utilized by several tribal employees. The Tribe has access to several busses and vans. Emergency drills are conducted on a regular schedule. The Tribe's rolling stock is listed in the asset inventory as this is essential to evacuation procedures.

There is no rail service on the reservation. The City of Forks operates two small airports, Forks Municipal Airport and Quillayute Air Port, 15 and 10 miles from La Push respectively. The closest commuter airport is in Port Angeles, 65 miles north of Forks. Seattle-Tacoma International Airport is 200 miles distant.

6.1.6 New Acquisitions

The Tribe recently acquired 3 parcels, expanding the Quileute Reservation to 1041 acres. Additionally, the Tribe purchased a business park at the junction of Highway 101 and La Push Road (Old Highway 110), which does not yet have an official name and is temporarily known as the 110 Business Park. The names and locations of these parcels are described in Table 6-6 and shown in *Figures E-3B* and *E-17G* (Appendix E, Figures).

Table 6-6. New Acquisition Areas

Category	Parcel/Location	Lat./Long. Location
Reservation Expansion	Northern Lands Parcel	-124.617, 47.914
	Southern Lands Parcel	Lat/Long
	(Eastern) Tribally Owned Parcel	Lat/Long
New Acquisition	110 Business Park	Lat/Long

Source: Quileute Tribe 2014.

Lat. = latitude
Long. = longitude

6.2 METHODOLOGY

The following describes the methodology used to prepare the dollar estimates for vulnerability. Potential dollar losses are summarized in Tables 6-7 through 6-11.

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. This analysis is a simplified assessment of the potential effects of the hazard on values at risk, without consideration of probability or level of damage.

Using GIS, the Latitude/Longitude location of Tribal housing, facilities, culturally significant areas, utilities, and future development areas was compared to locations where hazards are likely to occur. Replacement values, or insurance coverage, were developed for Tribal housing, facilities, and utilities. These values were obtained from the Quileute Finance Department and FEMA's Hazards U.S (HAZUS) program. For each asset (tribal housing, facilities, culturally significant areas, utilities, and new development) located within at least 50 percent of a hazard area, exposure was calculated by assuming the worst-case scenario (i.e., the asset would be completely destroyed and would have to be replaced). A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

6.3 DATA LIMITATIONS

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss-estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment as well as approximations and simplifications that are necessary for a comprehensive analysis.

It is also important to note that the quantitative vulnerability analysis results are limited. It was beyond the scope of this HMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function and economic losses). Such impacts may be addressed with future updates of the HMP.

6.4 EXPOSURE ANALYSIS

The requirements for identifying structures and estimating potential losses are described below.

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Identifying Structures

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

Element

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

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Source: FEMA 2008.

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Estimating Potential Losses

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

Element

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan reflect changes in development in loss estimates?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source: FEMA 2008.

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Assessing Cultural and Sacred Sites

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

Element

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

Source: FEMA 2008.

The results of the exposure analysis are summarized in Tables 6-7 through 6-11 and in the discussion that follows.

Table 6-7. Potential Hazard Exposure Analysis Overview – Tribal Population and Housing

			Tribal Pop	Lower Village		Quileute Heights		Raven's Crest		Raven's Crest Addition	
Hazard Group	**Hazard Category**	**Hazard Area**	**No.**	**No.**	**Value**	**No.**	**Value**	**No.**	**Value**	**No.**	**Value**
Seismic Hazards	Ground Shaking	Very high	459	25	NA	51	$7,427,844	36	$5,243,184	13	$1,893,372
	Ground Movement	Liquefaction area	337	25	NA	0	$0	0	$0	0	$0
	Tsunami	Inundation area	337	25	NA	0	$0	0	$0	0	$0
Severe Storm Hazards	Flood	100-year flood zone	337	25	NA	0	$0	0	$0	0	$0
		Likely flood zone	337	25	NA	0	$0	0	$0	0	$0
	Landslide**	Very high	320	0	NA	0	$0	0	$0	0	$0
		High		15	NA	2	$291,288	0	$0	0	$0
	Coastal Erosion	10-year erosion area	0	0	NA	0	$0	0	$0	0	$0
	Windstorm*	---	---		NA	---	---	---	---	---	---
	Snow/Ice Storm*	---	---		NA	---	---	---	---	---	---
Fire Hazards	Wildland Fire	High	---	0	NA	0	$0	0	$0	0	$0
		Moderate		0	NA	25	$3,641,100	16	$2,330,304	13	$1,893,372
	Urban Conflagration	Extreme	462	0	NA	1	$145,644	0	$0	0	$0
		High		0	NA	30	$4,369,320	35	$5,097,540	13	$1,893,372
Hazardous Material Hazards	Vessel	Tidal reach	83	0	NA	0	$0	0	$0	0	$0
	Fixed	0.25-mile radius	112	25	NA	0	$0	0	$0	0	$0
	Mobile	0.25-mile buffer	460	25	NA	51	$7,427,844	36	$5,243,184	13	$1,893,372

* Windstorm and snow/ice storm affect the Reservation equally. NA = Estimated values or replacement costs information is not available.

** The best available landslide data is the same data used to also create the earthquake-induced landslide data.

*** Hazard data for Wildland Fire is not known at this time. Technical assistance from FEMA requested.

Table 6-8A. Potential Hazard Exposure Analysis Overview – Tribal Assets

			Departments and Agencies		Emergency Services		Educational	
Hazard Group	**Hazard Category**	**Hazard Area**	**No.**	**Value ($)**	**No.**	**Value ($)**	**No.**	**Value ($)**
Seismic Hazards	Ground Shaking	Very high	21	$5,850,489	5	$3,742,651	4	$14,505,221
	Ground Movement	Liquefaction hazard area	9	$3,324,069	0	$0	2	$6,186,545
	Tsunami	Inundation area	9	$3,324,069	0	$0	2	$6,186,545
Severe Storm Hazards	Flood	100-year flood zone	0	$0	0	$0	0	$0
		Likely flood zone	10	$3,280,045	0	$0	2	$6,186,545
	Landslide**	Very high	0	$0	0	$0	0	$0
		High	0	$0	0	$0	0	$0
	Coastal Erosion	10-year erosion area	0	$0	0	$0	0	$0
	Windstorm*	---	---	---	---	---	---	---
	Snow/Ice Storm*	---	---	---	---	---	---	---
Fire Hazards	Wildland Fire***	High	---	---	---	---	---	---
		Moderate	---	---	---	---	---	---
	Urban Conflagration	Extreme/High	12	$2,913,951	3	$3,675,373	4	$14,085,100
Hazardous Material Hazards	Vessel Incident	Tidal reach	1	$478,364	0	$0	0	$0
	Fixed Incident	0.25-mile radius	2	$83,177	0	$0	2	$6,186,545
	Mobile Incident	0.25-mile buffer	14	$3,027,178	3	$3,675,373	3	$14,085,100

* Windstorm and snow/ice storm affect the Reservation equally.

** The best available landslide data is the same data used to also create the earthquake-induced landslide data. As such, the data reported for earthquake-induced landslides is the same as severe storm-induced landslides and is therefore not reported.

*** Hazard data for Wildland Fire is not known at this time. Technical assistance from FEMA requested.

No. = number

Table 6-8B. Potential Hazard Exposure Analysis Overview – Tribal Assets

			Recreation and Tourism		Commercial		Other	
Hazard Group	**Hazard Category**	**Hazard Area**	**No.**	**Value ($)**	**No.**	**Value ($)**	**No.**	**Value ($)**
Seismic Hazards	Ground Shaking	Very high	19	$12,660,240	12	$7,274,079	3	$492,926
	Ground Movement	Liquefaction area	19	$12,660,240	4	$1,558,002	3	$492,926
	Tsunami	Inundation area	19	$12,660,240	5	$2,292,540	3	$492,926
Severe Storm Hazards	Flood	100-year flood zone	0	$0	0	$0	0	$0
		Likely flood zone	19	$12,660,240	5	$2,292,540	3	$492,926
	Landslide**	Very high	0	$0	1	$1,353,241	0	$0
		High	0	$0	0	$0	0	$0
	Coastal Erosion	10-year erosion area	0	$0	0	$0	0	$0
	Windstorm*	---	---	---	---	---	---	---
	Snow/Ice Storm*	---	---	---	---	---	---	---
Fire Hazards	Wildland Fire***	High	---	---	---	---	---	---
		Moderate	---	---	---	---	---	---
	Urban Conflagration	Extreme/High	8	$6,469,824	2	$186,300	3	$492,926
Hazardous Material Hazards	Vessel Incident	Tidal reach	3	$6,796,958	0	$0	0	$0
	Fixed Incident	0.25-mile radius	7	$9,701,193	2	$43,256	3	$492,926
	Mobile Incident	0.25-mile buffer	19	$12,660,240	5	$2,292,540	3	$492,926

* Windstorm and snow/ice storm affect the Reservation equally.

**The best available landslide data is the same data used to also create the earthquake-induced landslide data. As such, the data reported for earthquake-induced landslides is the same as severe storm-induced landslides and is therefore not reported.

*** Hazard data for Wildland Fire is not known at this time. Technical assistance from FEMA requested.

NA = Estimated values or replacement costs information not available.
No. = number

Table 6-9. Potential Hazard Exposure Analysis Overview – Areas of Cultural Significance

			Areas of Cultural Significance				
Hazard Group	**Hazard Category**	**Hazard Area**	**45CA33 Akalat**	**45CA23 La Push**	**Cemetery**	**Lonesome Creek**	**Thunder Field**
Seismic Hazards	Ground Shaking	Very high	X	X	X	X	X
	Ground Movement	Liquefaction hazard area		X		X	X
	Tsunami	Inundation area		X		X	X
Severe Storm Hazards	Flood	100-year flood zone		X		X	X
		Likely flood zone		X		X	X
	Landslide**	Very high					
		High	X	X		X	
	Coastal Erosion	10-year erosion area					
	Windstorm*	---	---	---	---	---	
	Snow/Ice Storm*	---	---	---	---	---	
Fire Hazards	Wildland Fire***	High			X		
		Moderate	NA	NA	NA	NA	NA
	Urban Conflagra-tion	Extreme					
		High		X		X	
Hazardous Mate-rial Hazards	Vessel Incident	Tidal reach		X		X	
	Fixed Incident	0.25-mile radius		X			
	Mobile Incident	0.25-mile buffer		X	X		

* Windstorm and snow/ice storm affect the Reservation equally.

**The best available landslide data is the same data used to also create the earthquake-induced landslide data. As such, the data reported for earthquake-induced landslides is the same as severe storm-induced landslides and is therefore not reported.

*** Hazard data for Wildland Fire is not known at this time. Technical assistance from FEMA requested.

X = 50 percent or more of the area of cultural significance is located in this hazard area.

NA = Information not available

Table 6-10. Potential Hazard Exposure Analysis Overview – Tribal Utilities				
Hazard Group	**Hazard Category**	**Hazard Area**	**No.**	**Value ($)**
Seismic Hazards	Ground Shaking	Very high	15	$7,846,869
	Ground Movement	Liquefaction hazard area	8	$5,554,015
	Tsunami	Inundation area	4	$3,693,541
Severe Storm Hazards	Flood	100-year flood zone	0	---
		Likely flood zone	5	$5,395,066
	Landslide**	Very high	2	$197,638
		High	0	---
	Coastal Erosion	10-year erosion area	0	---
	Windstorm*	---	---	---
	Snow/Ice Storm*	---	---	---
Fire Hazards	Wildland Fire***	High	---	NA
		Moderate	---	NA
	Urban Conflagration	Extreme	1	0
		High	0	---
Hazardous Material Hazards	Vessel Incident	Tidal reach	0	---
	Fixed Incident	0.25-mile radius	3	$158,949
	Mobile Incident	0.25-mile buffer	10	$5,756,458

* Windstorm and snow/ice storm affect the Reservation equally.
**The best available landslide data is the same data used to also create the earthquake-induced landslide data. As such, the data reported for earthquake-induced landslides are the same as severe storm-induced landslides and therefore are not reported.
*** Hazard data for Wildland Fire is not known at this time. Technical assistance from FEMA requested.
NA = Estimated values or replacement costs information not available.
No. = number

Table 6-11. Potential Hazard Exposure Analysis Overview –New Acquisition Areas

			New Acquisitions			
Hazard Group	**Hazard Category**	**Hazard Area**	**Northern Lands**	**Southern Lands**	**(Eastern) Tribal Lands**	**110 Business Park**
Seismic Hazards	Ground Shaking	Very high	X	X	X	0
	Ground Movement	Liquefaction hazard area	X	X	X	0
	Tsunami	Inundation area	X	X	0	0
Severe Storm Hazards	Flood	100-year flood zone	X	X	X	0
		Likely flood zone	0	0	0	0
	Landslide**	Very high	0	0	0	0
		High	0	0	0	0
	Coastal Erosion	10-year erosion area	0	0	0	0
	Windstorm*	---	---	---	---	---
	Snow/Ice Storm*	---	---	---	---	---
Fire Hazards	Wildland Fire	High	0	0	0	0
		Moderate	0	X	0	0
	Urban Conflagration	Extreme	0	0	0	0
		High	0	0	0	0
Hazardous Material Hazards	Vessel Incident	Tidal reach	0	0	0	0
	Fixed Incident	0.25-mile radius	0	0	0	0
	Mobile Incident	0.25-mile buffer	0	0	0	0

* Windstorm and snow/ice storm affect the Reservation equally.

**The best available landslide data is the same data used to also create the earthquake-induced landslide data. As such, the data reported for earthquake-induced landslides is the same as severe storm-induced landslides and is therefore not reported.

X = 50 percent or more of the parcel is located in this hazard area.

6.5 SUMMARY OF IMPACTS

The requirements for an overview of the vulnerability analysis, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: RISK ASSESSMENT

Assessing Vulnerability: Overview

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

Element

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

Source: FEMA 2008.

6.5.1 Seismic Hazards

All the Tribal residences (125; $14,564,400), Tribal assets (46; $44,525,604), areas of cultural significance (5), and utilities (15; $7,846,869) are located in a high hazard area for ground shaking. All new acquisition areas are also located in this hazard area. The total known value of all the facilities in the high hazard area for ground shaking is $66,936,873.

A total of 37 Tribal assets ($24,221,782), 3 areas of cultural significance (La Push, Lonesome Creek and Thunder Field), 8 utilities ($5,554,015), and 2 areas of new acquisition in the Reservation Expansion are located within the liquefaction hazard area. The total known value of all the aforementioned facilities is $29,775,797. Approximately 25 Tribal residences are located within the liquefaction hazard area, the exact value of which is currently not known.

A total of 38 Tribal assets ($24,956,320), 3 areas of cultural significance (La Push, Lonesome Creek, and Thunder Field), 4 utilities ($3,693,541), and one new acquisition areas (Northern Lands Parcel) are located within the tsunami inundation area. The total known value of all the facilities in the tsunami inundation area is $28,649,861. An estimated 25 Tribal residences in the Lower Village are located within the tsunami inundation area.

6.5.2 Severe Storm Hazards

No Tribal assets or utilities are located within the 100-year flood zone as mapped under the FIRM (FIRM map status is "on hold" for Clallam County), although one area of cultural significance (Thunder Field) and recent Northern Lands acquisition areas are located within the 100-year flood zone. A total of 39 Tribal assets ($24,912,296), three areas of cultural significance (La Push, Lonesome Creek, and Thunder Field), and 5 utilities ($5,395,066) are located within the *likely flood zone*. The total known value of all these facilities is $30,307,362. Twenty five Tribal residences are located within either flood zone.

Two Tribal residences were identified by the Quileute Housing Authority as possible landslide hazards ($291,288), one asset ($1,353,241, and one utility ($197,638) are located within landslide hazard area. The total known value of all these facilities is $1,842,227. No Tribal

residences, assets, areas of cultural significance, utilities, or future acquisition areas are located within the coastal erosion hazard area.

As noted in Tables 6-7 through 6-11, windstorms and snow/ice storms are expected to affect the Reservation equally, meaning it will have a similar impact on all residences, assets, areas of cultural significance, utilities, and future acquisition areas.

6.5.3 Fire Hazards

Number of Tribal residences and Tribal assets within the moderate hazard area for wildland fire is unknown. One area of cultural significance (the cemetery), and 3 Tribal utilities are located in the moderate wildland fire zone. The total known value of these facilities is yet to be determined. Only one utility is located in a high wildland fire hazard area. One new acquisition area, the Southern Lands parcel, is in a wildland fire hazard area. Technical assistance from FEMA would be helpful in acquiring this data for future plan updates.

A total of 79 Tribal residences ($11,505,876) and 32 Tribal assets ($27,823,474) and one Tribal utility ($0) are located in the hazard area for urban conflagration. The total known value of these facilities is $39,329,350. Two areas of cultural significance (Lonesome Creek and La Push) and no new acquisition areas are located in an area at risk for urban conflagration.

6.5.4 Hazard Materials Hazards

Four Tribal assets and two areas of cultural significance (Lonesome Creek and La Push) are located within the tidal reach zone and are vulnerable to a vessel incident. The total value of these facilities is $7,275,322. No Tribal residences, utilities or new acquisition areas are located within a hazard area for a vessel incident.

Sixteen Tribal assets ($16,257,505), one area of cultural significance (La Push), and three utilities ($158,949) are located within a 0.25-mile buffer for a fixed incident. The total value of these facilities is $16,416,454. No Tribal residences or future acquisition areas are located within a 0.25-mile buffer for a fixed incident.

All the Tribal residences ($14,564,400), 48 Tribal assets ($36,233,357), three areas of cultural significance (Cemetery, Lonesome Creek and La Push), and 10 utilities ($5,756,458) are located within the 0.25-mile buffer for a mobile incident. The total known value of these facilities is $56,534,215. No new acquisition areas are located within this hazard area.

6.6 LAND USE AND DEVELOPMENT TRENDS

The requirements for an overall vulnerability summary and impact summary, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 RECOMMENDATIONS: RISK ASSESSMENT

Assessing Vulnerability: Analyzing Development Trends

Requirement §201.7(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions.

Element

- Does the new or updated plan discuss land uses and development trends?

Source: FEMA 2008.

6.6.1 Land Use and Development Trends

As noted in section 3.4, The Tribe's First Goal of the 2013 Community Economic Development Strategy, "Complete acquisition of land for the purposes of enhancing community development, public safety and tribal administration." The First Objective under that Goal is to "Ensure the safety of the tribal community and provide the necessary space for appropriate development by completing the trust transfer of lands to the Quileute Reservation. The Tribe's strategic plan calls for moving their tribal members and assets out of out of harm's way, as well as future housing construction and community development. Due to a large demand for new housing, two 50-acre parcels of the Southern Land Parcel are currently set aside for housing development. The Move to Higher Ground Project preliminary design and wetland study by the Army Corp of Engineers has identified 285 acres of the Southern Lands are suitable for community development.

Currently, government services that are concentrated in the lower village and include the Tribal Administration, Senior Center, Human Services and Law Enforcement, are being evaluated and prioritized in the Move to Higher Ground Project master planning process. The Tribal School relocation upland and out of the tsunami zone is the Tribe's highest priority, with a 50-acre site set aside upland close to the Akalat Center. The Tribe's Natural Resource Office and the Quillayute River Coast Guard Station will keep their location next to marina in lower village. The lower village land use designation is moving in the direction of expanded enterprise such as Cultural Visitors Center, Conference and Convention facilities, and day use facilities for tourists and recreational users. All land use and development will be conducted with consideration for cultural resources and preservation.

6.6.2 New Acquisition

As noted in Section 6.1.6 and shown in *Figure E-3B* (Appendix E, Figures), the Tribe recently acquired three large parcels as part of the Quileute Reservation Expansion; two parcels on the northern boundary of the Reservation, adjacent to the Quillayute River, and one on the southern boundary of the Reservation. As shown in Table 6-11., the two northern parcels have at least 50 percent, or greater, of their land area located in a very high ground-shaking hazard area, liquefaction hazard area, and the 100-year flood-zone hazard area. In addition, at least 25 percent of the Northern Lands Parcel is located in the tsunami-inundation hazard area.

The Tribe even more recently acquired the 110 Business Park at the intersection of La Push Rd and Highway 101. The Park consists of a complex of buildings that will be developed in accordance with economic development and community needs. The Tribe is progressing with a business plan to leverage existing assets in relation to existing markets and opportunities.

This section provides a capability assessment that identifies and evaluates the human and technical, financial, and legal and regulatory mitigation resources available to the Quileute Tribe. This capability assessment also describes the current, ongoing, and recently completed mitigation projects and programs by the Tribe.

7.1 HUMAN AND TECHNICAL RESOURCES

Table 7-1 describes the Tribe's human and technical resources that are available to engage in mitigation planning, including overseeing mitigation projects and implementing this plan.

Table 7-1. Human and Technical Resources for Hazard Mitigation

Staff/Personnel Resources	Department or Agency	Principal Activities Related to Hazard Mitigation
Planner	Quileute Planning Department	Oversee land development, land management practices, and all programs related to human-caused and natural hazards
Housing Manager	Quileute Housing Department	Manage construction and repair of Tribal homes and infrastructure
Environmental Manager	Quileute Natural Resources Department	Manage all natural resources within the Reservation, specifically water bodies such as the Quillayute River and Lonesome Creek
Police Officer	Quileute Police Department	Implement response and recovery efforts after the occurrence of human-caused and natural hazards
Grants Officer	Quileute Grants and Contracts Office	Manage grant applications and project budgets for all Tribal programs
Public Information Officer	Quileute Tribal Council	Maintain contact with the public on all issues related to human-caused and natural hazards
School Superintendent	Quileute School Board	Coordinate and integrate Tribal safety programs within the school activities, including buildings, grounds and transportation.
Enterprises Manager	Quileute Tribal Council	Coordinate and integrate Tribal safety programs within activities of all enterprises including infrastructure safety and safety for employees and patrons.
Public Works Officer	Quileute Department of Public Works	Repair and maintain Tribal infrastructure and facilities

7.2 FINANCIAL RESOURCES

The requirements for the Tribal capability assessment relating to funding sources, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Funding Sources

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

Element

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

Source: FEMA 2008.

This section identifies current and potential sources of federal, tribal, state, local and private funding to implement mitigation actions and activities. The Quileute Tribe is federally recognized through treaties and executive orders and, as such, has access to funding from federal programs. Funding is also available from the State of Washington and Clallam County. The tribe generates its own funding through various enterprises and programs and can support a limited number of hazard mitigation projects with direct funding or in-kind services. Private sources of funding have not been identified.

Federal

Below are the primary federal programs and agencies that can potentially fund mitigation actions and planning. Additional programs and agencies can also be found in Appendix F, Financial Resources.

• Pre-Disaster Mitigation Program, which provides funds to develop mitigation plans and implement mitigation projects, is administered by FEMA (by submitting a state level plan, the Tulalip Tribes will qualify as a direct grantee);

• Hazard Mitigation Grant Program, which provides post-disaster funds for hazard reduction projects (e.g., elevation, relocation, or buyout of structures), is administered by FEMA and the Washington State Emergency Management Division;

• Flood Control Assistance Account Program, which provides funds for developing flood hazard management plans, for flood damage reduction projects and studies, and for emergency flood projects is administered by the Washington State Department of Ecology (Ecology);

• Flood Mitigation Assistance Program, which provides funds for flood mitigation on buildings that carry flood insurance and have been damaged by floods, is administered by FEMA;

• Department of Homeland Security funding, in addition to FEMA programs;

• U.S. Fire Administration, which provides wildfire program funds;

• Environmental Protection Agency, which could provide funds for projects with dual hazard mitigation and environmental protection goals as well as updates to this HMP and related planning efforts such as spill prevention and response planning;

• Indian Health Service, which could provide funds for hazard mitigation projects that address public health and safety;

• Rural Development Agency, USDA, which provides loan and grant funds for housing assistance, business assistance, community development, and emergency community water and wastewater assistance in areas covered by a federal disaster declaration;

• Community Development Block Grant, which provides funds for a variety of community development projects, is administered by the Department of Housing and Urban Development;

• Small Business Administration Loans, which help businesses recover from disaster damages, is administered by the Small Business Administration; and

• Bureau of Indian Affairs, which provides funds to support tribal activities.

Tribal

The Quileute Tribe is fully committed to the public safety and welfare of its residents and tribal members, and to the goals of the Quileute Hazard Mitigation Plan. The Tribe has limited resources to devote to mitigation planning. Tribal Funding sources generally come from the revenue generated by tribally owned businesses, such as the Oceanside Resort and leased casino interests.

However the Tribe may be willing to match grant funding, either through direct monies or through the allocation of resources, such as labor and expertise, in order to implement the actions discussed in this plan.

State/Local

In some cases, funding may be available from the State of Washington and/or Clallam County, especially on mitigation actions that overlap jurisdictions, such as road and flood mitigation projects. The main resource for funding opportunities from the state of Washington is from the Washington State Emergency Management Division, which helps fund mitigation projects.

The Tribe is currently building relationships with the state of Washington, its departments and Clallam County, as well as local communities, in order to develop partnerships to implement mitigation measures that are regional in scale.

Private

No potential funding from the private sector is currently identified. Nonetheless local businesses and residents located within the Quileute Reservation will be encouraged to volunteer and otherwise contribute to the mitigation effort.

7.3 LEGAL AND REGULATORY RESOURCES

The requirements for legal and regulatory resources, as stipulated in DMA (2000) and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Tribal Capability Assessment

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

Element

- Does the new or updated plan include an evaluation of the Tribe's pre-disaster hazard management policies, programs, and capabilities?
- Does the new or updated plan include an evaluation of the Tribe's post-disaster management policies, programs, and capabilities?
- Does the new or updated plan include an evaluation of the Tribe's policies related to development in hazard prone areas?
- Does the new or updated plan include a discussion of Tribal funding capabilities for hazard mitigation projects?

Source: FEMA 2008.

Table 7-3 describes the legal and regulatory capabilities, including tribal plans, policies, and programs, that affect or promote hazard mitigation, preparedness, response, and recovery within Tribal boundaries.

Table 7-3. Legal and Regulatory Resources for Hazard Mitigation

Regulatory Tool	Name	Description (Effect on Hazard Mitigation)	Hazards Addressed	Mitigation, Preparedness, Response, or Recovery	Affects Development in Hazard Areas?
Plans	Quileute Tribe Strategic Plan	Outlines Tribal capabilities and goals for maintenance and growth over the next ten years. The plan is scheduled to be completed in 2015	All	All	Yes
	Quileute Tribe Emergency Management Plan	Discusses responsibilities of Tribal Emergency Manager, requires updated Emergency Management Plans, and outlines all rules and protocols associated with the emergency management process.	All	All	No
	Clallam County Hazards Mitigation Plan	Profiles human-caused and natural hazards in Clallam County, assesses the risk caused by each hazard, and outlines potential mitigation actions	All	Mitigation	No
	Washington State Enhanced Hazard Mitigation Plan	Profiles human-caused and natural hazards throughout Washington, assesses the risk posed by each hazard, and outlines potential mitigation actions	All	Mitigation	No
Policies	Bureau of Indian Affairs Housing Codes	Requires Tribal housing to comply with certain standards regarding seismic stability and ability to withstand flooding	Flood, Earthquake	All	Yes
Programs	Mutual Aid Agreements	Facilitate coordination between the Quileute Tribe and city/State law enforcement and firefighting agencies to ensure the efficient utilization of all available resources needed to mitigate a human-caused or natural hazard event	All	Response, Recovery	No
	Tsunami Ready	Strengthens Tribal operations to prepare for a tsunami, including installing a warning siren and evacuation route signs	Tsunami	Preparedness	No
	Washington Emergency Management Division Earthquake Drills	Conduct regular drills in the Tribal school to prepare Tribal members for an earthquake	Earthquake	Preparedness	No

7.4 MITIGATION PROJECTS AND PROGRAMS

Table 7-4 describes the current, ongoing, and recently completed large-scale mitigation projects and programs that the Tribe has implemented. For the purposes of this capability assessment, current projects are those that are being implemented now and in the near term, and ongoing projects are those that have been implemented and continue to be implemented over an extended period of time (+10 years).

Table 7-4. Current, Ongoing, and Completed Hazard Mitigation Projects and Programs

Status	Critical Facilities, Major Utilities/Transportation Systems, Private Buildings	Description	Year(s)
Current	Undergrounding of electric cables	The Clallam County Public Utilities Department is in the process of burying various electric cables on the Quileute Indian Reservation.	2008-2015
	Broadband to be installed at La Push for coordination of emergency response	Washington State Community Economic Revitalization Board is hosting a presentation by Quileute to consider funding of Broadband infrastructure.	2015
	Quileute Hazard Mitigation Plan	Adoption of Quileute Hazard Mitigation Plan	2015
	Vulnerability Assessment by USDA Natural Resources Conservation Service	Vulnerability Assessment of the Riverbanks of the Quillayute River at Thunder Field	2015
	Replacement of storm damaged Community Center	Storm-damaged Community Center in La Push too dangerous to use. Doors permanently closed 11/08/2014. Demolition scheduled in early 2015. Site determination and funding search for replacement of facility next steps.	2014-2015
	Comprehensive Waste Management Plan	Update Comprehensive Waste Management Plan. Assure waste water system for new development has Maintenance & Operations Plan and adequate staffing to prevent damages	2015-2016
	Comprehensive Emergency Management Plan	Update of the Comprehensive Emergency Management Plan, under contract as of Oct 2014.	2015
Ongoing	*Move to Higher Ground*	Master Planning Phase underway, 18 month contract, identifying and prioritizing community development needs. Implementation will phase in over 5 to 10 year process.	2014-2021
	Co-location of West End Clallam County Sherriff's Office in Tribally owned	The Tribe has leased a portion of their 101 Facility located in Forks to the Clallam County Sheriff's	On-going

	facility	Department. In a disaster event impacting government services in La Push, Tribal Offices will move to this facility thereby co-locating essential emergency services with Clallam County.	
Completed	Tsunami Mitigation Program	Implementation of warning, evacuation, and interpretive signs, mapping and evacuation	2003-2014

This section outlines the four-step process for preparing a mitigation strategy, including developing mitigation goals, identifying mitigation actions, evaluating and prioritizing mitigation actions, and implementing mitigation actions.

8.1 TRIBAL HAZARD MITIGATION GOALS

The requirements for the local hazard mitigation goals, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Trial Hazard Mitigation Goals

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

Element

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

Source: FEMA 2008.

Mitigation goals are defined as general guidelines that explain what a tribal community wants to achieve in terms of hazard mitigation and loss prevention. Goal statements are typically long-range, policy-oriented statements representing a community-wide vision. As shown in Table 8-1, the Planning Team developed five goals, including one multi-hazard goal, one preparedness, response and recovery goal, and three goals addressing the weather-related hazards, seismic hazards, and human-caused hazards identified in this plan.

Table 8-1. Mitigation Goals

Goal Number	Goal Description
1	Promote disaster-resistant development
2	Build and support local capacity to enable the Quileute Tribe to prepare for, respond to, and recover from disasters
3	Reduce the possibility of damages and losses from seismic hazards, including ground shaking, ground movement, and tsunami
4	Reduce the possibility of damages and losses from storm-related hazards, including flood, landslide/mudslide, coastal erosion, windstorm, and snow/ice storms
5	Reduce the possibility of damages and losses from fire hazards, including wildland fire and urban conflagration
6	Reduce the possibility of damages and losses from hazardous material hazards, including vessel, fixed, and mobile incidents

8.2 IDENTIFICATION OF MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Identification and Analysis of Mitigation Actions

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

Element

- Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?
- Does the mitigation strategy identify actions related to the participation in and continued compliance with the NFIP?

Source: FEMA 2008.

Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural-resource protection, emergency services, and structural projects. The original 2008 Planning Team, including URS, reviewed the vulnerability analysis and hazard maps to determine 20 potential mitigation actions. The 2014 Planning Team interviewed each department director to review those original action items to ascertain current relevancy. A poster-size chart of goals and actions was also presented to community members at an open forum and responses were collected. The list expanded significantly with departmental and community input, and some items were removed as having been accomplished or outdated. As listed in Table 8-2, the Planning Team developed 44 Potential Mitigation Actions (Actions 1.A through 6.D). The following information is listed with each mitigation action: type of mitigation project; hazard(s) addressed; type of development affected by action. From this list, projects are determined based on urgency, available resources, and readily possible with an affordable investment of time and money, i.e. shared responsibilities with multiple stakeholders.

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
Promote disaster-resistant development, incorporate tribal ordinance, policy and plans	1.A	Integrate the vulnerability analysis and implementation strategy within the Tribal Mitigation Plan into the Quileute Tribe Comprehensive Plan	Prevention	All	New & Existing
	1.B	Explore the need for hazard zoning and high-risk hazard land-use ordinances	Prevention	All	New & Existing
	1.C	Update land acquisition criteria within Tribal planning and real estate development documents to include a hazard analysis component	Prevention	All	New & Existing
	1.D	Conduct engineered risk/safety analysis on new construction	Prevention	All	New
	1.E	Relocate Health Clinic to new development and away from top of bluff	Prevention	All	New
	1.F	Provide for secure records management and conservation	Prevention	All	New
	1.G	Move Human Resources, Senior Services and Commodities upland	Prevention	All	New
	1. H	Update Comprehensive Waste Management Plan; and assure waste water system for new development has Maintenance and	Prevention	All	New and Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
		Operations Plan and adequate staffing to prevent damages			
Build and support local capacity to enable the Quileute Tribe to prepare for, respond to, and recover from disasters	2.A	Create a mitigation outreach program that helps tribal members prepare for human-caused and natural hazards (connect with 2.H); post clear information at resort	Public Education & Awareness	All	New & Existing
	2.B	Develop a plan and seek funding for backup electric and telecommunications systems in a Tribally owned asset	Prevention	All	New & Existing
	2.C	Build or install emergency shelters in strategic areas (at cemetery, Akalat) stock with provisions	Emergency Services	All	New
	2.D	Install and maintain back-up generators in high need areas, i.e. lift station #4 on water system, and Akalat for emergency center.	Prevention, Emergency Services, Property Protection	All	New & Existing
	2.E	Support Hazard Mitigation, Safety & Emergency Management Training for Tribal Members to build professional capability on Reservation	Public Education and Awareness	All	New and Existing
	2.F	Improve warning system and communications system. Link and coordinate phone system and fire alarm	Prevention, Public Awareness,	All	New and Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
		system. Can't hear chimes, ineffective.	Emergency Services		
	2.G	Dedicate staff position with responsibility for implementing and maintaining QHMP, check emergency stations, inspect generators, public awareness, promote full participation in evacuation drills.	Prevention, Property Protection, Public Awareness	All	New and Existing
	2.H	Move USDA Commodity Program upland, out of flood & tsunami zone.	Emergency Services	All	New and Existing
	2.I	Work with UW Medical to establish Web-based Telenet Medical Service for remote locations	Emergency Services Public Awareness	All	New and Existing
	2.J.	Increase intergovernmental coordination	All	All	New and Existing
Reduce the possibility of damages and losses as a result of seismic hazards, including ground shaking, ground movement, and	3.A	Inspect and retrofit Tribal assets that do not meet current Washington state building codes or are otherwise vulnerable to seismic shaking	Property Protection	Ground shaking, ground movement	Existing
	3.B	Secure furniture, bookcases, bureaus to walls using safety brackets, durable straps, etc. in Tribal facilities and incorporate model into outreach materials.	Prevention	Ground shaking, ground movement	Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
tsunami	3.C	Re-evaluate tsunami evacuation route for necessary upgrades	Prevention	Ground Shaking, ground movement, tsunami	New and Existing
Reduce the possibility of damages and losses from storm-related hazards, including flood, landslide/mudslide, coastal erosion, windstorm, and snow/ice storm	4.A	Work with WSDOT to resolve SR 110 at MP8 where the road frequently floods, and the Bogachiel Bridge abutment. Communication started, bridge on STIP for scour and deck repair.	Property Protection, Structural Project	Flood	New
	4.B	Reinforce the water main along Highway 110 near Three Rivers and the Bogachiel Bridge. Depending on the method used to secure the road (see above); the water main could be re-routed to follow the road at a higher elevation and out of the floodplain. Include utilities in road redesign.	Property Protection	Flood	Existing
	4.C	Install engineered log structures along the banks of the Quillayute River upstream of Thunder Field to mitigate flood damage and stabilize the riverbank. Work with the ACOE and perhaps WSDOT Environmental Office.	Property Protection	Flood	New
	4.D	Identify and implement mitigation opportunities of Repetitive Loss and Severe Repetitive Loss properties owned by Tribal members; implement acquisition, relocation, elevation, and flood-proofing	Property Protection	Flood	Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
		measures to protect identified properties, i.e. construct berms to divert water flow; install debris fences or traps; construct onsite detention ponds; improve onsite drainage.			
Reduce the possibility of damages and losses from storm-related hazards, including flood, landslide/mudslide, coastal erosion, windstorm, and snow/ice storm	4.E	Continue to participate in the NFIP and obtain flood insurance policies for Tribal properties located in the floodplain	Prevention	Flood	New and Existing
	4.F	Construct a bridge across Lonesome Creek to provide ingress and egress to the southern campground. The campsite is subject to flooding from the creek. It can also be a fire hazard from campfires. Enforce new ordinance banning fires.	Emergency Services, Natural Resource Protection	Flood, Wildland Fire	New
	4.G	Stabilize landslide-prone areas through engineered stabilization measures, i.e. interceptor drains, in situ soil piles, drained earth buttresses, and sub-drains	Property Protection	Landslide/Mudslide	Existing
	4.H	Develop and implement vegetation management plans along the hills adjacent to Highway 110, the tsunami evacuation route, for secure slope stabilization.	Property Protection, Natural Resource Protection	Landslide/Mudslide	Existing
	4.I	Explore options for acquisition of developed areas for relocation of facilities of Tribal structures where repetitive and ongoing flooding & landslide hazards	Prevention, Property Protection	Landslide/Mudslide	Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
		cannot be mitigated, and when opportunities and funding are available.			
	4.J	Work with ACOE to replace or repair sunken breakwater that was damaged in January 2012 storm. Planned over next two years.	Property Protection	Coastal Erosion	New
	4.K	Manage vegetation in areas within and adjacent to rights-of-way, and in close proximity, to Tribal assets and utilities to reduce property damage from trees; and to promote wind screens wherever possible.	Property Protection	Windstorm	Existing
	4.L	Develop a free annual tree chipping and tree/brush pick-up service to encourage Tribal members to manage trees and shrubs that are at risk of falling on overhead power lines.	Property Protection	Windstorm	Existing
	4.M	Bolt down or otherwise reinforce the roofs of Tribal residences and/or facilities in order to prevent wind damage	Property Protection	Windstorm	Existing
	4.N	Bury utilities that are at risk of failure during a windstorm or winter storm event, start at the school - wires that pose an extreme and immediate danger.	Property Protection	Windstorm, Winter Storm	Existing
	4.O	Determine the structural stability of assets, roofs, carports, and garages, to withstand	Property Protection	Winter Storm	Existing

Table 8-2. Potential Mitigation Actions

Goal	Action Number	Action Description	Mitigation Type	Hazard(s) Addressed	Existing or New Development
		ice and snow loads, and other weatherization requirements for extreme storm conditions.			
	4.P	Work with Natural Resource Conservation Service to replace undersized culvert at fish hatchery	Property Protection	Winter Storm/Flooding	Existing
Reduce the possibility of damages and losses from fire hazards, including wildland fire and urban conflagration	5.A	Conduct a vegetation management project to create defensible space around Tribal assets, utilities, and culturally sensitive areas. Thin or remove vegetation within a 50-foot radius, or reasonable distance depending on situation.	Property Protection	Wildland Fire	Existing
	5.B	Offer vegetation management services to elderly, disabled, or low-income Tribal members who need help to remove flammable materials near their homes.	Property Protection	Wildland Fire	Existing
	5.C	Create a voluntary building fire-safety inspection evaluation program for homes or businesses. Professionally inspect for faulty pilot lights, overloaded electrical circuits, open containers containing a combustible substance, and other fire hazards	Prevention	Urban Conflagration	Existing
	5.D	Create an education program to inform Tribal members about the safe use of wood-burning stoves, and other fire prevention activities.	Prevention	Urban Conflagration	Existing

Reduce the possibility of damages and losses from hazardous material hazards, including vessel, fixed, and mobile incidents	6.A	Work with the Washington State Department of Transportation to develop a flow study to understand the number, hours, and location of hazardous material transport on Highway 110, the Quillayute River, and at the marina	Prevention	Vessel	Existing
	6.B	Work with Clallam County, examine municipal-owned ramps, streets, and bridges that are identified as being too narrow or having too many tight turns to ensure the safe transportation of truck loads.	Prevention	Vessel	Existing
	6.C	Work with Haz Mat professional to identify dangerous fuel tanks and other hazards located on the Reservation. Ascertain particular mitigation measures on a per-incidence basis and implement solutions for safety.	Prevention	Fixed Assets	Existing
	6.D	Manage recycling center storm water so that toxic run-off doesn't spill into Lonesome Creek.	Prevention	Fixed Assets	Existing

8.3 ANALYSIS OF MITIGATION ACTIONS

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: MITIGATION STRATEGY

Implementation of Mitigation Actions

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

Element

- Does the new or updated mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the new or updated mitigation strategy address how the actions will be implemented and administered? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)
- Does the new or updated prioritization process include an emphasis on the use of a cost-benefit review to maximize benefits?

Source: FEMA 2008.

Once a list of potential mitigation actions had been developed, the Planning Team evaluated and prioritized each of the mitigation actions to determine which actions would be included in the implementation strategy. To complete this task, the Planning Team reviewed the simplified social, technical, administrative, political, legal, economic and environmental (STAPLEE) evaluation criteria (shown in Table 8-3) to consider the opportunities and constraints of implementing each particular mitigation action.

Table 8-3. Evaluation Criteria for Mitigation Actions

Evaluation Category	Discussion "It is important to consider…"	Considerations
Social	The level of support from the Tribal community support for the overall mitigation strategy and specific mitigation actions	Tribal community acceptance Potential adverse effects on population
Technical	If the mitigation action is technically feasible and if it is a complete or partial solution	Technical feasibility Long-term solutions Secondary impacts
Administrative	If the Tribal community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary	Staffing Funding allocation Maintenance/operations
Political	What the Tribal community and its members feel about issues related to the environment, economic development, safety, and emergency management	Political support Local champion Public support

Legal	Whether the Tribal community has the legal authority to implement the action, or whether the Tribal community must pass new regulations	Local, State, and Federal authority Potential legal challenge
Economic	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis	Benefit/cost of action Contribution to other economic goals Requirement for outside funding FEMA Benefit-Cost Analysis
Environmental	The impact on the environment because of public desire for a sustainable and environmentally healthy Tribal community	Effect on local flora and fauna Adherence to Tribal community environmental goals Adherence to local, State, and Federal laws
FEMA = Federal Emergency Management Agency		

Next, the Planning Team met and determined that any mitigation action to be included in the implementation strategy must meet the following criteria to receive a high-priority ranking:

- Current or potential support from the Tribal Council
- Ability to be implemented during the 5-year lifespan of this version of the Tribal Mitigation Plan
- Ability to reduce expected future damages and losses (cost-benefit analysis)
- Value added to resiliency of the Tribal members

8.4 IMPLEMENTATION OF MITIGATION ACTIONS

The following narratives describe the implementation strategy, which includes all high-priority mitigation actions that the Tribe intends to implement during the 5-year lifespan of this version of the Quileute Hazard Mitigation Plan. Listed with each mitigation action is the administering department or agency, the estimated time frame to complete the project, the potential funding source, and the estimated project cost.

A. EVERY HAZARD (EH) – ***Mitigation Goals: Promote disaster-resistant development, incorporate tribal ordinance, policy and plans. Build and support local capacity to enable the Quileute Tribe to prepare for, respond to, and recover from disasters***

EH– 1. Improve Intergovernmental Coordination at Local, State and Federal Levels.

Cultivate relationships with other agencies to increase coordination and reduce risk

Priority Level: Moderate to High

Timing: 2015-ongoing

Lead Entity: Tribal Council, Planning

Cost: minimal

Potential Funding: Tribe

EH -2. Dedicate Staff Position to Implement and Maintain QHMP

Check emergency stations, inspect generators, promote public awareness, and encourage full participation in training and emergency drills. Create mitigation outreach program to help Tribal Members prepare for disasters, and develop process to incorporate tribal mitigation strategies into other planning mechanisms when appropriate.

Priority Level: Moderate to High

Timing: 2016-ongoing

Lead Entity: Tribe

Cost: $100,000 annual

Potential Funding: FEMA, Tribe, Washington State Emergency Grants

B. SEISMIC HAZARDS (SH) - ***Mitigation Goal: Reduce the possibility of damages and losses as a result of seismic hazards, including ground shaking, ground movement, and tsunami.***

Sub-hazard: Ground Shaking and Ground Movement Mitigation Actions
Objective 1: Protect existing infrastructure against earthquake damage.
Objective 2: Educate the public about earthquake preparedness and precautions

SH-1. Complete a Seismic Assessment of Tribal Facilities and Develop a Strategy for Improvements, if Necessary.

Contract a structural engineering firm to assess Tribal buildings and facilities to determine their structural integrity and a strategy to improve their earthquake resistance, if necessary.

Objective: Objective 1

Priority Level: High

Timing: 2016

Lead Entity: Tribe

Cost: TBD

Potential Funding: Tribe, FEMA, USDA, HUD

SH-2. Nonstructural Retrofits of Critical Facilities

Assess facilities and improve earthquake preparedness through such measures as installing bookshelf tie-downs, improving computer servers' resistance to earthquakes, installing furnace and boiler straps, and moving heavy objects to lower shelves.

Objective: Objective 1

Priority Level: High

Timing: 2015

Lead Entity: Tribe

Cost: TBD

Potential Funding: Tribe, FEMA, USDA, HUD

SH-3. Public Education

Conduct drills and educate for earthquake preparedness. Disseminate information on earthquake preparedness to residents, businesses, government offices, medical/dental clinics, and programs that serve vulnerable populations such as children and Elders.

Objective: Objective 2

Priority Level: High

Timing: 2015

Lead Entity: Tribe

Cost: TBD

Potential Funding: Tribe

Sub-hazard: Tsunami (T) Mitigation Actions

Objective 1: Increase public awareness

Objective 2: Protect critical infrastructure in inundation zone

Objective 3: Improve emergency response capabilities

T-1. Continue to Participate in TsunamiReady with Clallam County.

Training and public education are an important component of this program. TsunamiReady helps community leaders and emergency managers be better prepared to save lives through better planning, education and awareness. Staff and residents should participate in Clallam County TsunamiReady training efforts.

Objective: Objective 1

Priority Level: High

Timing: On-going

Lead Entity: Clallam County, Tribe

Cost: Staff or volunteer time, In-kind services

Potential Funding: Minimal cost

T-2. Advanced Warning Systems

Re-evaluate tsunami warning and alerting systems including sirens, NOAA weather Radio and Marine band. All Hazards Alert Broadcast (AHAB) Sirens are installed. Tribe conducts system maintenance and participation in preparedness drills.

Objective: Objective 1

Priority Level: High

Timing: One year

Lead Entity: Clallam County, Tribe

Cost: Minimal to Tribe.

Potential Funding: State, NOAA

T-3. Continue to Maintain Tsunami Evacuation Route

Re-evaluate Tsunami evacuation route for necessary upgrades.

Objective: Objective 2 and 3

Priority Level: High

Timing: One year

Lead Entity: Tribe - Public Works Department

Cost: To be Determined

Potential Funding: FEMA

C. SEVERE STORM HAZARDS - *Mitigation Goal: Reduce possibility of damages and losses from severe storm related hazards, including flood, landslide/mudslide, coastal and riverine erosion, windstorm, and snow/ice storm.*

Severe Weather (SW) Mitigation Actions
Objective 1: Reduce severe weather damage.
Objective 2: Increase public awareness.
Objective 3: Prevent future severe weather damage.

SW-1. Continue Participation in National Weather Service StormReady Program

StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. Maintain 24-hour warning system and employ multiple ways to receive severe weather forecasts and issue warnings to alert the public. Promote the importance of public readiness through community meetings.

Objective: 1, 2, 3

Priority Level: Moderate

Timing: Ongoing

Lead Entity: Clallam County, State, Tribe (Public Works Department)

Cost: Staff time, in-kind services

Potential Funding: FEMA

SW-2. Conduct Severe Weather Awareness Activities.

Activities may include events such as "Bask'alidx" (Bad Weather) Awareness Week and Flood Awareness Week, and provide information on preparedness. Information could be disseminated at forums, Elders luncheons, annual gatherings or General Council meetings.

Objective: Objectives 1, 2, 3

Priority Level: High

Timing: 2015, on-going

Lead Entity: Tribe, County

Cost: Staff time, in-kind services

Potential Funding: Tribe – minimal costs

SW-3. Build or Install Emergency Shelters in Strategic Areas and Stock with Provisions

Move USDA Commodity Program upland out of flood and tsunami zone

Objective: Objectives 1, 3, 4

Priority Level: High

Timing: 2015-2017

Lead Entity: Tribe

Cost: TBD

Potential Funding: FEMA/USDA/HUD

SW-4. Incorporate Severe Weather Resistant Building Construction Materials and Practices into New Construction and Retrofits/Remodels.

Objective: Objectives 1, 3

Priority Level: Moderate

Timing: Ongoing

Lead Entity: Tribe

Cost: Variable

Potential Funding: Tribe

SW 5. Develop a Plan and Seek Funding for Back Up Electric and Telecommunication Systems.

Install and maintain back-up generators in high need areas. Improve warning system and communication system. Link and coordinate phone and fire alarm system. Work with UW Medical to establish Telenet Medical Services for remote locations.

Objective: Objectives 1, 2, 3, 4

Priority Level High

Timing 2015-2020

Lead Entity Tribe (Public Work, Planning, Health Care)

Cost Variable, TBD

Potential Funding: FEMA, IHS

Sub-hazard: Flood (FLD) Coastal and Riverine Mitigation Projects

Objective 1: Reduce or prevent future flood damage.

Objective 2: Increase public awareness.

FLD-1. Tribal Document Protection

Store and back-up paper and electronic copies of important records to archival location to avoid loss of critical records in case of flood, fire or other natural disaster.

Objective:	Objective 1
Priority Level:	High
Timing:	2015
Lead Entity:	Tribe, all departments
Cost:	$300,000
Potential Funding:	ANA-SEDS, NEH, FEMA

FLD-2. Structure Elevation and/or Relocation

Identify and implement mitigation opportunities of repetitive loss and severe repetitive loss properties owned by Tribal Members; implement acquisition, relocation, elevation, and flood-proofing measures to protect identified properties.

Objective:	Objective 1
Priority Level:	Moderate to High
Timing:	2016 - 2020
Lead Entity:	Tribe
Cost:	TBD
Potential Funding:	FEMA-HMGP

FLD-3. Coordinate with Clallam County to Implement the NFIP Program

Encourage increased participation in NFIP; This includes reviewing and updating regulations for new construction in designated flood zones and disseminating information about the NFIP program to property owners who might benefit from NFIP flood insurance.

Objective:	Objective 1, 2
Priority Level:	High
Timing:	Within one year and ongoing
Lead Entity:	Tribe, FEMA
Cost:	To be Determined
Potential Funding:	FEMA, Tribe

FLD-4. Analyze and Design Appropriate Engineered Stabilization Measures.

Install engineered log structures along the banks of the Quillayute River upstream of Thunder Field to mitigate flood damage and stabilize the riverbank. Stabilize land slide prone areas through engineered solutions, i.e. interceptor drains, in-situ soil piles, drained earth buttresses and sub-drains. Work with ACOE and WSDOT environmental office.

Objective: Objectives 1

Priority Level: Moderate

Timing: Ongoing

Lead Entity: Tribe, ACOE, County

Cost: Relatively high cost

Potential Funding: ACOE, WSDOT, County

FLD-5. Resolve Flooding Issues at SR 110 and Protect Bogachiel Bridge

Work with WSDOT to resolve flooding SR 110 at Milepost 8 and the Bogachiel Bridge abutment. Communication has been started, and the bridge is on the WSDOT State Transportation Improvement Program (STIP) for scour and deck repair. Reinforce the water main along Highway 110 near Three Rivers and the Bogachiel Bridge. Include utilities in road redesign.

Objective: Objectives 1, 2

Priority Level: High

Timing: 2015-2020

Lead Entity: WSDOT, Clallam County, Tribe

Cost: TBD

Potential Funding: WSDOT, Tribe, County, BIA

Sub-hazard: Landslide and Coastal Erosion Mitigation Projects

Objective 1. Reduce or prevent future landslide and erosion damage

L/E-1. Stabilize Landslide Prone Areas Through Vegetation Management.

Limit removal of vegetation in areas prone to ground failure and plant ground cover, particularly hills adjacent to highway 110 and the tsunami evacuation route. Requests to remove vegetation should be handled through a coordinated permit process with Quileute Natural Resources and Public Works Offices. The permit process would involve an assessment of the area for landslide hazard.

Objective: Objective 1

Priority Level: High

Timing: 2015 - ongoing

Lead Entity: Tribe QNR & Public Works

Cost: Staff time, TBD

Potential Funding: Tribe, WSDOT Environmental Office

L/E- 2 Work with ACOE to Replace or Repair Breakwater Damaged in 2012 Storm

Objective: Objective 1

Priority: High

Timing: 2015-2016

Lead Entity: ACOE, Tribe

Cost: TBD

Potential Funding: ACOE

Sub-hazard: Wind storm and Snow/ice storm Mitigation Projects

Objective 1: Reduce or prevent future damage from wind, snow and ice storms.

Objective 2: Increase public awareness and involvement

WS - 1. Reduce and Protect Tribal Assets from Property Damage Caused by Wind and Ice Storms.

Determine stability of roofs, carports and garages to withstand ice and snow loads, and other weatherization requirements. Reinforce structural stability of tribal assets to withstand wind and snow damage, i.e. bolt down the roofs of tribal residences and facilities. Manage vegetation in close proximity to tribal assets and utilities. Develop a free annual tree chipping and tree pick-up program that educates and encourages tribal members to manage trees and shrubs at risk of falling on structures and overhead power lines.

Objective: Objectives 1, 2

Priority Level: High

Timing: 2015-ongoing annually

Lead Entity: Tribe, FEMA

Cost: $100,000

Potential Funding: FEMA Grants

WS- 2. Protect Utilities, Roads, and Power Lines During Wind and Severe Weather Events.

Bury existing utility cables and power lines on Quileute Reservation that pose an immediate danger. All new development will have buried utilities, as specified in the Move to Higher Ground Project Plan. This project was also identified in the 2010 Clallam County Hazard Mitigation Plan, and was completed up to the reservation boundary line. Special attention will be given to power lines located at the school modules near First Beach.

Objective: Objectives 1

Priority Level: High

Timing: 2015 – 2020

Lead Entity: Tribe, Clallam County, WSDOT

Cost: TBD

Potential Funding: Public Utility District Grants

WS– 3 Replace Undersized Culvert at Fish Hatchery

Work with NCRS Natural Resource Conservation Service to install appropriately sized culvert to accommodate flood levels of Lonesome Creek.

Objective: Objective 1

Priority Level: High

Timing: 2015-2017

Lead Entity: Tribe Natural Resources, WSDOT, NRCS

Cost: TBD

Potential Funding: WSDOT Culvert Replacement Program, BIA-IRR Program, NRCS

D. FIRE HAZARDS - *Mitigation Goal: Reduce the possibility of damage and losses from fire hazards, including wildland fire and urban conflagration.*

Sub-hazard: Wildland Fire and Urban Conflagration Mitigation Actions
Objective 1: Reduce fire danger to the community.
Objective 2: Encourage the creation of firebreaks.
Objective 3: Reduce probability of loss of life from wildland fire.
Objective 4: Public education on fire safety.

WF-1. Fuel Reduction Projects and Defensible Space Around Structures

Create safe corridors by reducing fuel (trees & undergrowth) around homes and driveways. Remove fuel within the community around essential infrastructure such as communications towers, power lines, wastewater treatment facilities, evacuation routes and shelters, and emergency response facilities. Additionally, fuel reduction projects (fire breaks) should be implemented around the Tribal community to reduce the possibility of a wildfire.

Objective: Objectives 1, 2, 3,

Priority Level: High

Timing: 1-5 years

Lead Entity: Tribe Fire Department and Public Works

Cost: TBD

Potential Funding: Fire Management Grant (CFDA 97.046)

WF-2. Create Fire Safety Inspection Program

Create a voluntary building fire safety inspection/evaluation program for homes and businesses. Professionally inspect for faulty pilot lights, over loaded electrical circuits, open containers with combustible substances, and other fire hazards.

Objective:	Objectives 1, 2, 3, 4
Priority Level:	High
Timing:	ongoing
Lead Entity:	Tribe, Fire Department and Housing Authority
Cost:	Staff Time, Monetary Cost to be Determined
Potential Funding:	FEMA, BIA, ANA

WF-3. Enhance Public Awareness of Potential Risk to Life and Personal Property.

Create an education program to inform tribal members about the safe use of wood burning stoves and other fire prevention activities. Promote, and fund where possible, mitigation measures in the immediate vicinity of Tribal Citizens' individual properties.

Objective:	Objectives 1, 2, 3, 4
Priority Level:	Moderate
Timing:	2016 - ongoing
Lead Entity:	Tribe Fire Department, Housing Authority, Public Info. Officer
Cost:	Staff time of applicable departments
Potential Funding:	BIA

E. HAZARDOUS MATERIAL – *Mitigation Goal: Reduce the possibility of damages and losses from hazardous material dangers including vessel, fixed, and mobile incidents.*

Sub-hazards: Vessel, Fixed and Mobile incidents

Objective 1: Reduce danger of hazardous materials incidents

Objective 2: Increase collaboration with local municipalities

H/M -1. Conduct Hazardous Materials Transportation Flow Study.

Work with Washington State Department of Transportation to develop a flow study to understand the number, hours, and location of hazardous materials transport on Highway 110, the Quillayute River, and at the marina.

Objective:	Objectives 1, 2
Priority Level:	Moderate
Timing:	2016
Lead Entity:	Tribe, WSDOT

Cost: TBD

Potential Funding: WSDOT, Tribe

H/M -2. Examine Transportation Infrastructure to Reduce Possibility of Mobile Incidences.

Work with Clallam County to examine municipal-owned ramps, streets, and bridges that are identified as being too narrow, or having too many tight turns to ensure the safe transportation of trucked hazardous materials to the Reservation.

Objective: Objectives 1, 2

Priority Level: Moderate

Timing: 2016

Lead Entity: Tribe, Clallam County

Cost: TBD

Potential Funding: BIA-IRR, Tribe

H/M -3. Identify Dangerous Fuel Tanks and Other Hazardous Materials.

Work with Hazmat professionals to identify hazards, ascertain particular mitigation measures on a per-incidence basis, and implement solutions for safety.

Objective: Objective 1

Priority Level: High

Timing: 2015, ongoing

Lead Entity: Tribe,

Cost: TBD

Potential Funding: FEMA, Tribe

This section describes a formal plan maintenance process to ensure that the Quileute Hazard Mitigation Plan (QHMP) remains an active and applicable document. In addition, this section provides an explanation of how the Planning Team intends to organize its efforts to ensure that improvements and revisions to the QHMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail in the balance of this section:

- Monitoring, evaluating, and updating the QHMP
- Implementing mitigation actions through existing planning mechanisms
- Obtaining continued public involvement

9.1 MONITORING, EVALUATING, AND UPDATING THE TRIBAL MITIGATION PLAN

The requirements for monitoring, evaluating, and updating the Tribal Mitigation Plan, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring, Evaluating and Updating the Plan

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

Element

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

Source: FEMA 2008.

To maintain planning momentum, the Planning Director be will monitor, evaluate, and update the QHMP. The Planning Director will continue to serve in this capacity and will coordinate all Tribal efforts to monitor, evaluate, and update this document.

Every 12 months from the time the plan is adopted, the Planning Director will email each Program Director an Annual Review Questionnaire to complete. Plan Maintenance Documents, the Annual Review Questionnaire will include an evaluation of the following: planning process, hazard analysis, vulnerability analysis, capability assessment, and mitigation strategy. The Planning Director will collect all completed questionnaires and determine if the QHMP needs to be updated to address new or more threatening hazards, new technical reports or findings, and new or better-defined mitigation projects. The Planning Director will summarize these findings and email a description of the findings to the Program Directors. If the Planning Director believes that the Tribal Hazard Mitigation Plan needs to be updated based on the findings, then He or she will request that the Program Directors attend a Tribal Hazard Mitigation Plan Update Planning meeting.

In addition to annual meetings and meetings regarding the Annual Review Questionnaire, the Planning Team will meet to update the Tribal Hazard Mitigation Plan every 5 years. To ensure that this update occurs, in the fourth year after adoption of the plan, the Planning Team will undertake the following activities:

- Thoroughly analyze and update the risk of natural and human-made hazards on the Reservation
- Complete a new Annual Review Questionnaire and review previous questionnaires
- Provide a detailed review and revision of the mitigation strategy
- Prepare a new implementation strategy
- Prepare a new draft Tribal Hazard Mitigation Plan and submit it to the Tribal council for adoption
- Submit an updated Tribal Hazard Mitigation Plan to FEMA for approval

9.2 MONITORING PROJECT IMPLEMENTATION

The requirements for monitoring project implementation, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Monitoring Project Implementation

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

Element

- Does the new or updated plan describe how mitigation measures and project closeouts will be monitored?
- Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?

Mitigation projects and project closeouts will be monitored and updated through the use of the quarterly reporting forms for FEMA-funded projects, provided by the State and/or FEMA, or through the use of a Mitigation Project Progress Report. The Mitigation Project Process Report will be requested annually by the Planning Director to monitor progress made to-date and/or final closeout. The report will address the current status of the mitigation project, including any changes made to the project, identify implementation problems, and describe appropriate strategies to overcome them. After considering the findings of the submitted progress reports, the Planning Director may request that the implementing department or agency meet to discuss project conditions.

9.3 IMPLEMENTING MITIGATION ACTIONS THROUGH EXISTING PLANNING MECHANISMS

The requirements for implementation through existing planning mechanisms, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Incorporation into Existing Planning Mechanisms

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

Element

- Does the plan identify other planning mechanisms available for incorporating the requirements of the mitigation plan?
- Does the plan include a process by which the Indian Tribal government will incorporate the requirements in other plans, when appropriate?

Source: FEMA 2008.

After the adoption of the Quileute Hazard Mitigation Plan, the Planning Director will ensure that elements of the Tribal Hazard Mitigation Plan are incorporated into other existing planning mechanisms. The processes for incorporating the Tribal Hazard Mitigation Plan into various planning documents will occur as (1) other plans are updated and (2) new plans are developed. Accordingly, the Planning Director will ensure that:

- As the Quileute Tribe Emergency Management Comprehensive Plan is updated, the hazards addressed in the plan are consistent with those identified and profiled in the Tribal Hazard Mitigation Plan.
- As the Quileute Tribe Strategic Plan is drafted, it will incorporate the mitigation projects identified in the implementation strategy of the Tribal Mitigation Plan.

9.4 OBTAINING CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in DMA 2000 and its implementing regulations, are described below.

DMA 2000 REQUIREMENTS: PLAN MAINTENANCE PROCESS

Continued Public Involvement

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

Element

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

Source: FEMA 2008.

The Quileute Tribe is dedicated to involving the public directly in the continual reshaping and updating of the Tribal Hazard Mitigation Plan. A copy of the plan will be available at the Tribe's Planning Department office in the Tribal Administration Building and on the website.

The Planning Team will also identify opportunities to raise community awareness about the Tribal Hazard Mitigation Plan and the hazards that affect the Reservation. This effort could include attendance and provision of materials at Tribal emergency preparedness and response special events.

Quileute Tribal Plans and Resources

Quileute Tribe, 2005, *Quileute Tribe Comprehensive Emergency Management Plan*

Quileute Tribe, 2013, *Comprehensive Economic Development Strategy*

Quileute Tribe, 2011, *Quileute Water System, Wellhead/Source Water Protection Plan*, Bert Black, Danny Hinchen, Charles Brown

Quileute Tribe, 2013, *Quileute Water System Report*, Danny Hinchen

Quileute Tribe, 2001, *Indian Reservation Roads Tribal Transportation Plan,* with updated records from the Bureau of Indian Affairs Department of Transportation

Cultural and Natural Resources Reference Materials

Alger, R. A. and Capt. H. Taylor. 1896-97, *Survey of Quillayute Harbor and River, Washington.* US Army Corp of Engineers. Washington D.C.

Andrade, M.J. 1931, *Quileute Texts, Columbia University Contributions to Anthropology. XII.* Columbia University, New York.

Denman, C. and B. Stallard. 1956, *An Archaeological Site Survey on the Coast of Western Washington.* National Park Service. Seattle.

Duncan, M. A. 1977, *Archaeology Investigations at the La Push Village Site: An Interim Report.* University of Washington, Seattle.

Duncan, M.A. 1981, *Archaeological Investigations at La Push, Clallam County, Washington*. University of Washington, Seattle.

Jackson, Walter, Quileute Tribal Elder. 11-19-2014, *Personal Communication*

Papiez, C. 2009, *Climate Change Implications for the Quileute and Hoh Tribes of Washington: A Multidisciplinary Approach to Assessing Climatic Disruptions to Coastal Indigenous Communities.* The Evergreen State College. Olympia.

Pettitt, G.A. 1950, *The Quileute of La Push 1775-1945, Anthropological Records 14:1.* University of California. Los Angeles.

Powell, J., B. Cleveland, K. Kruger, and others. 1995-96, *Dickey Watershed Analysis Cultural Resources Assessment.* The Quileute Tribe. La Push.

Powell, J. and R. Schalk. 1997, *A Cultural Resources Survey of the Quileute Indian Reservation Waterfront.* The Quileute Tribe. La Push.

Woodruff, F., V. Jensen, and J. Powell. n.d. *Raven Tales, Traditional Quileute Stories of Ba'yak, the Trickster.*

Olympic Peninsula Intertribal Cultural Advisory Committee, Wray, J. edit. 2002, *Native Peoples of the Olympic Peninsula: Who We Are*, pp. 135-150. University of Oklahoma. Norman.

Cross-referenced Hazard Mitigation Plans

Clallam County Sheriff's Office, Emergency Management Division, 2010, *Hazard Mitigation Plan for Clallam County*, with City of Forks, City of Port Angeles, City of Sequim, Port

of Port Angeles, Peninsula College, Olympic Medical Center, Public Utility District. Penelope Linterman, plan manager and primary contact.

Jamestown S'Klallam Tribe and W .H. Pacific, 2010, *Tribal Multi-Hazard Mitigation Plan*

Sauk-Suiattle Indian Tribe, 2007, *Tribal Hazard Mitigation Plan*

Washington State Military Department – Emergency Management Division, 2013, *Washington State Enhanced Hazard Mitigation Plan*.

Information Resource Agencies

Environmental Protection Agency, 2014, *List of EPA-regulated facilities*, Envirofacts Data Warehouse, http://www.epa.gov/enviro/facts/qmr.html .

Federal Emergency Management Agency, *2001, Flood Insurance Study Clallam County*

Federal Emergency Management Agency 2010, *Tribal Multi-Hazard Mitigation Planning Guidance*

Federal Emergency Management Agency, 2003, *Federal Register Interim Final Rule* , https://www.fema.gov/media-library/assets/documents/4593

National Response Center, 2014, *NRC Standard Query Report,* http://www.nrc.uscg.mil/Default.aspx

Pacific Northwest Seismic Network (PNSN) *1928-1970 Washington and Oregon Earthquake Information and Isoseismal Maps,* 2014, http://assets.pnsn.org/HIST_CAT/isoseismals.html

National Earthquake Information Center, 2008, *United Seismic Hazard Map* http://earthquake.usgs.gov/hazards/products/conterminous

Olympic National Park Website, 2008, *Frequently Asked Questions,* http://www.nps.gov/olym/faqs.htm

US Census Bureau, 2014, *American FactFinder Reports; Socio-Economic, Income, Employment, Housing, Population, and Race.* http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

US Coast Guard, 2014, *Station Quillayute River Factsheet,* http://www.uscg.mil/d13/docs/factsheets/station_quillayute_river.pdf

Washington Department of Natural Resources, 1980, Rau, Weldon; Geology and Earth Resources Bulletin No. 72, *Washington Coastal Geology between the Hoh and Quillayute Rivers*.

Washington State Department of Ecology, 2008, *Water Resource Inventory Area 20 Watershed Management Plan,* http://www.ecy.wa.gov/programs/eap/wrias/planning/docs/wria20_watershed_plan_final.pdf

Washington State Department of Ecology, 2011, *Water Resource Inventory Area 20 Watershed Detailed Implementation Plan,* http://www.ecy.wa.gov/programs/eap/wrias/Planning/docs/06242011_wria20_dip_publicreview.pdf

Washington State Department of Ecology, 2014, *Southwest Washington Coastal Erosion Study,* http://www.ecy.wa.gov/Programs/sea/swces/index.htm

Washington State Department of Natural Resources, 2004, *Liquefaction Susceptibility and Site Class Maps of Washington State, by County, http://www.dnr.wa.gov/ResearchScience/Topics/GeologyPublicationsLibrary/Pages/pub_ofr04-20.aspx*

Washington State Department of Natural Resources, 2020, *Strategic Plan for Wildland Fire Protection,* http://www.dnr.wa.gov/RecreationEducation/Topics/PreventionInformation/Pages/rp_fire_2020strategicplan.aspx

Washington State Department of Transportation, 2009, *Tribal Transportation Planning Guide for Washington State, pp. 109-120*

Washington State Department of Transportation, 2014, *Statewide Transportation Improvement Program, Peninsula RTPO, http://webpub1.wsdot.wa.gov/LocalPrograms/Projects/Reports/ProjectList.aspx*

Western Regional Climate Center, Desert Research Institute, 1985;2014*, Climate of Washington,* http://www.wrcc.dri.edu/CLIMATEDATA.html ; http://www.wrcc.dri.edu/narratives/washington/

Appendix A

Tribal Hazard Mitigation Plan Review Crosswalk

Appendix B

Adoption Resolution

Appendix C

Planning Team Meetings

Appendix D
Public Outreach

Appendix E

Figures: GIS Data and Maps

Appendix F

Financial Resources for Quileute Hazard Mitigation Plan

Appendix G

Electronic Copy of the Tribal Mitigation Plan

Instructions for Using the Plan Review Crosswalk for Review of Tribal Multi-Hazard Mitigation Plans

Attached is a Plan Review Crosswalk based on the ***Tribal Multi-Hazard Mitigation Planning Guidance***, published by FEMA, dated March 2010. This Plan Review Crosswalk is consistent with the Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended by the Disaster Mitigation Act of 2000 (P.L. 106-390); the National Flood Insurance Act of 1968, as amended by the National Flood Insurance Reform Act of 2004 (P.L. 108-264); and 44 Code of Federal Regulations (CFR) Part 201 – *Mitigation Planning*, inclusive of all amendments through November 30, 2009.

SCORING SYSTEM

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

When reviewing single jurisdiction plans, reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, reviewers may want to put an N/A in the prerequisite box for single jurisdiction plans. Indian Tribal governments or States that have additional requirements can add them in the appropriate sections of the *Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.

Example

Assessing Vulnerability: Overview

Requirement 201.7(c)(2)(ii): *[The risk assessment **shall** include a] description of the Indian Tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the tribe.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan include an **overall summary** description of the Indian tribe's **vulnerability** to each hazard?	Section II, pp. 4-10	The plan describes the types of assets that are located within geographically defined hazard areas as well as those that would be affected by winter storms.		✓
B. Does the plan address the **impact** of each hazard on the Indian tribe?	Section II, pp. 10-20	The plan does not address the impact of two of the five hazards addressed in the plan. **Required Revisions:** • Include a description of the impact of floods and earthquakes on the assets. **Recommended Revisions:** • This information can be presented in terms of dollar value or percentages of damage.	✓	
		SUMMARY SCORE	✓	

Tribal Mitigation Plan Review and Approval Status

Tribe: Quileute Tribe	**Title of Plan:** Quileute Tribe Hazard Mitigation Plan	**Date of Plan:** 2015
Tribal Point of Contact: Larry Burtness	**Address:** PO Box 279 La Push, WA 98350-0279	
Title: Planning Director		
Agency: Quileute Tribe		
Phone Number: 360-374-9651	**E-Mail:** larry.burtness@quileutenation.org	

State Reviewer (if applicable):	**Title:**	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Sara Seremak, STARR	Planner	2/2/15
Nathan Slaughter, STARR	Planner	2/3/15
Brett Holt, FEMA	Mitigation Planner	2/3/15
Date Received in FEMA Region 10	1/15/2015	
Plan Not Approved		
Plan Approved		
Date Approved		

Additional Indian Tribal Governments (if appropriate):	**DFIRM**		**NFIP Status***			
	In Plan	**NOT In Plan**	**Y**	**N**	**N/A**	**CRS Class**
1.						
2.						
3.						
4.						
5. [ATTACH PAGE(S) WITH ADDITIONAL INDIAN TRIBAL GOVERNMENTS]						

*** Notes:** **Y = Participating** **N = Not Participating** **N/A = Not Mapped**

TRIBAL MULTI-HAZARD MITIGATION PLAN REVIEW SUMMARY

The plan cannot be approved if the plan has not been formally adopted. Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.
S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Planning Process	N	S
1. Documentation of the Planning Process: 201.7(b) and 201.7(c)(1)(i) and (ii)	X	
2. Program Integration: 201.7(c)(1)(iii) and (iv)		X

Risk Assessment	N	S
3. Identifying Hazards: 201.7(c)(2)(i)		X
4. Profiling Hazards: 201.7(c)(2)(i)		X
5. Assessing Vulnerability: Overview: 201.7(c)(2)(ii)		X
6. Assessing Vulnerability: Identifying Structures: 201.7(c)(2)(ii)(A)		N/A
7. Assessing Vulnerability: Estimating Potential Losses: 201.7(c)(2)(ii)(B)		X
8. Assessing Vulnerability: Analyzing Development Trends: 201.7(c)(2)(ii)(C)		X
9. Assessing Vulnerability: Assessing Cultural and Sacred sites: 201.7(c)(2)(ii)(D)		X

Mitigation Strategy	N	S
10. Tribal Multi-Hazard Mitigation Goals: 201.7(c)(3)(i)		X
11. Identification and Analysis of Tribal Mitigation Actions: 201.7(c)(3)(ii)		X
12. Implementation of Tribal Mitigation Actions: 201.7(c)(3)(iii)		X
13. Tribal Capability Assessment: 201.7(c)(3)(iv)		X
14. Tribal Funding Sources: 201.7(c)(3)(v)		X

Plan Maintenance Process	N	S
15. Monitoring, Evaluating, and Updating the Plan: 201.7(c)(4)(i)		X
16. Monitoring Progress of Mitigation Activities: 201.7(c)(4)(ii) and 201.7(4)(v)		X
17. Incorporation into Existing Planning Mechanisms: 201.7(c)(4)(iii)		X
18. Continued Member and Stakeholder Involvement: 201.7(c)(4)(iv)		X

Prerequisites	NOT MET	MET
19. Adoption by the Tribal Governing Body : 201.7(c)(5) and (c)(6) ***[single Indian Tribal government only]***	X	
20. Multi-Jurisdictional Plan Adoption: 201.7(a)(4), (c)(5) and(c)(6) ***[multi-jurisdictional only]***		N/A
21. Multi-Jurisdictional Planning Participation: 201.7(a)(4) ***[multi-jurisdictional only]***		N/A

Severe Repetitive Loss Strategy (Optional)	N	S
22. Repetitive Loss Strategy: 201.7(c)(3)(vi)		N/A

TRIBAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	X
See Reviewer's Comments	

PLAN APPROVED ☐

PLANNING PROCESS: *201.7(b): An effective planning process is essential in developing and maintaining a good plan. The mitigation planning process should include coordination with other tribal agencies, appropriate Federal agencies, adjacent jurisdictions, interested groups, and be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA mitigation programs and initiatives.*

1. Documentation of the Planning Process

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

(i) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval, including a description of how the Indian Tribal government defined "public;" and

(ii) As appropriate, an opportunity for neighboring communities, tribal and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process.

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative **description of the process** followed to prepare the new or updated plan?	Section 4.1 to 4.4 pp. 4-1 to 4-6; Appendix C	The plan describes the planning efforts, including the details of how the plan was drafted, and Appendix C.		X
B. Does the new or updated plan indicate **who was involved** in the current planning process?	Section 4.2 and 4.3 pp. 4-1 to 4.4; Appendix C	The plan includes a record of Planning Team membership and attendance and identifies the key input from each member during the plan development process. The Planning Team comprised representatives from the Tribal Council, Tribal Department Directors, and key Community Leaders.		X
C. Does the new or updated plan indicate **how the "public" was defined and involved**? How was the "public" defined? How was the "public" involved? Were they provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?	Section 4.4 pp. 4-4 to 4-5; Appendix D	The Planning Team made presentations on the mitigation measures and hazard mitigation planning at a community forum scheduled to discuss the demolition of the Community Center. Approximately 45 people participated in the 2 sessions and several shared their opinions and made notations on the mitigation measure charges which were incorporated into the 2014 Mitigation Measures. A brochure was also developed for the community forum and it was printed in the Tribal Newsletter which is widely distributed in La Push, mailed to subscribers off-reservation, and posted on the Tribal website. **Required Revision**: • The plan must indicate how the "public" was defined. Simply state if the "public" was only tribal members on the reservation, tribal members both on and off the reservations, all of the population within and around the reservation, or some other way the public was defined.	X	

D. Does the new or updated plan discuss the opportunity for other Indian Tribal governments, tribal and regional agencies, businesses, academia, nonprofits, neighboring communities, and other affected stakeholders and interested parties to be involved in the planning process?	Section 4.3 to 4.4 pp. 4-3 to 4-5; Appendix C	The Planning Team included Tribal and regional agencies, business, and neighboring communities. *Recommended Revision:* • Include a list of other Indian Tribal governments and non-Tribal agencies that were invited to participate in the planning process.		X
E. Does the updated plan document how the planning team reviewed and analyzed each section of the plan? ***[Updates only]***		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
F. Does the updated plan indicate for each section of the plan whether or not it was revised as part of the update process? ***[Updates only]***		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE	X	

2. Program Integration

Requirement 201.7(c)(1)(iii) and (iv): *[The plan **shall**:]*
[include] (iii) Review and incorporation, if appropriate, of existing plans, studies, and reports; and
(iv) Be integrated to the extent possible with other ongoing tribal planning efforts as well as other FEMA programs and initiatives.

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the new or updated plan describe the review and incorporation, if appropriate, of existing plans, studies, and reports in the new or updated plan?	Section 4.4 pp. 4-5 to 4-6; Section 10 pp. 9-1 to 9-3; Citations throughout	The plan identifies and summarizes the various Tribal, county, and state plans that were consulted during plan development in Section 4 and provides a complete list of sources consulted in preparing the plan in Section 10. Additionally, citations are used throughout the plan to document how relevant information from existing plans, studies, and reports was incorporated into the plan.		X
B. Does the new or updated plan describe how the Indian tribal mitigation plan is **integrated with other ongoing Indian tribal planning efforts**?	Section 4.4 pp. 4-4 to 4-5	The community forum to discuss the demolition of the Community Center was identified by the Planning Committee as an opportunity to effectively reach the greatest number of tribal members in person and discuss hazard mitigation planning. *Recommended Revision:* • Review planning documents and/or regulations and determine how the mitigation plan can be integrated with additional ongoing or new Tribal planning efforts.		X

C. Does the new or updated plan describe how the Indian tribal mitigation planning process is **integrated with FEMA mitigation programs and initiatives**?	Section 8.4 pp. 8-12 to 8-21	The mitigation action plan identifies Federal grant opportunities that the Tribe will pursue to implement various mitigation projects.		X
		SUMMARY SCORE		X

RISK ASSESSMENT: *201.7(c)(2): [The plan **shall** include a] risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Tribal risk assessments must provide sufficient information to enable the Indian Tribal government to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

3. Identifying Hazards

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

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the new or updated plan describe the **tribal planning area**?	Section 6.1.6 p. 6-9; Section 6.6.2 pp. 6-19 to 6-20; Appendix E pp. E-2, E-3B	The Tribe recently acquired 3 parcels, expanding the Quileute Reservation to 1,041 acres. Additionally, the Tribe purchased a business park at the junction of Highway 101 and La Push Road. The plan includes maps that depict the Quileute Indian Reservation boundaries and Tribally-owned lands.		X
B. Does the new or updated plan include a description of the **types of all natural hazards** that affect the tribal planning area?	Section 5 pp. 5-1 to 5-4; Section 5.1 pp. 5-5 to 5-31	The plan provides a detailed description of all the hazards that were identified as posing the greatest threat to the Tribes.		X
		SUMMARY SCORE		X

4. Profiling Hazards

Requirement 201.7(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the tribal planning area. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?	Section 5.1.1 pp. 5-8 to 5-9, 5-10, 5-10 to 5-11, 5-13; Section 5.1.2 pp. 5-15, 5-18, 5-19, 5-20, 5-22, 5-23; Section. 5.1.3 pp. 5-25, 5-26; Section 5.1.4 pp. 5-28, 5-30, 5-31; Appendix E pp. E-4 to E-15	The plan uses narratives as well as maps to identify and describe the areas within the Quileute Indian Reservation that are vulnerable or most at risk to each of the identified hazards.		X
B. Does the risk assessment identify the **extent** (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?	Section 5.1.1 pp. 5-6 to 5-7, 5-9, 5-10, 5-11 to 5-12, 5-13; Section 5.1.2 pp. 5-14, 5-15 to 5-16, 5-18, 5-19, 5-20, 5-21, 5-22 to 5-23; Section 5.1.3 pp. 5-24 to 5-26; Section 5.1.4 pp. 5-27 to 5-29, 5-30 to 5-31; Appendix E pp. E-4, E-5, E-7, E-8, E-10A, E-10B, E-11A, E-11B, E-13	The plan describes the magnitude and severity for each identified hazard.		X

C. Does the new or updated plan provide information on **previous occurrences** of each hazard addressed in the plan?	Section 5 pp. 5-2 to 5-3, 5-5; Section 5.1.1 pp. 5-7 to 5-8, 5-10, 5-12 to 5-13; Section 5.1.2 pp. 5-14, 5-17 to 5-18, 5-18 to 5-19, 5-20, 5-21 to 5-22, 5-23; Section 5.1.3 pp. 5-25, 5-26; Section 5.1.4 pp. 5-27 to 5-28, 5-29, 5-31; Appendix E pp. E-4, E-11A, E-11B, E-12	The plan describes the history of past events for each of the identified hazards.		X
D. Does the new or updated plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	Section 5.1.1 pp. 5-9, 5-10, 5-11, 5-13; Section 5.1.2 pp. 5-15, 5-18, 5-19, 5-20, 5-22, 5-23; Section 5.1.3 pp. 5-25, 5-26; Section 1.5.4 pp. 5-28, 5-30, 5-31; Appendix E pp. E-5, E-7, E-8, E-10A, E-10B	The plan estimates the probability of future events for each of the identified hazards and calculates the recurrence interval when appropriate. *Recommended Revision:* • Estimate the probability of future mobile incidents. The plan does not define the term “unlikely” which is used to describe the probability of future mobile incidents so the plan should either define the descriptor (e.g., unlikely could equal less than 1% annual probability) or provide a recurrence interval for future events. This is not required since mobile incidents are not a natural hazard event.		X
E. Does the updated plan address data deficiencies, if any, noted in the previously approved plan?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

5. Assessing Vulnerability: Overview

Requirement 201.7(c)(2)(ii): *[The risk assessment **shall** include a] description of the Indian Tribal government's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the tribe.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan include an **overall summary** description of the Indian tribe's **vulnerability** to each hazard?	Section 6.4 pp. 6-11 to 6-16; Section 6.5 pp. 6-17 to 6-18	The plan summarizes the vulnerability of the Tribal residences, Tribal assets, areas of cultural significance, and utilities to each of the identified hazards by estimating the number and value of assets located in the hazard areas.		X
B. Does the new or updated plan address the **impact** of each hazard on the Indian tribe?	Section 6.2 p. 6-9; Section 6.3 pp. 6-9 to 6-10; Section 6.4 pp. 6-11 to 6-16; Section 6.5 pp. 6-17 to 6-18	The plan used a conservative exposure-level analysis to assess the risks of the identified hazards. For each asset located within at least 50% of a hazard area, exposure was calculated by assuming the worst-case scenario (i.e., the asset would be completely destroyed). A similar analysis was used to evaluate the proportion of the population at risk; however, there was no estimate of the number of potential injuries or deaths. *Recommended Revision:* • Estimate potential dollar losses to vulnerable assets based on different hazard scenarios (i.e., 100- and 500-year floods, 7.0 and 9.0 magnitude earthquakes) rather than assuming that each asset located in a hazard area would be completely destroyed and would have to be replaced following a hazard event.		X
		SUMMARY SCORE		X

6. Assessing Vulnerability: Identifying Structures

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

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 6.4 pp. 6-11 to 6-16; Section 6.5 pp. 6-17 to 6-18	The plan identifies the number of Tribal residences, Tribal assets, areas of cultural significance, and Tribal utilities vulnerable to each of the identified hazards.		X

B. Does the new or updated plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?		The plan does not describe vulnerability in terms of future buildings, infrastructure, and critical facilities. *Recommended Revision:* • Identify the number and type of future buildings, infrastructure, and critical facilities located in hazard areas.		N/A
Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.		**SUMMARY SCORE**		N/A

7. Assessing Vulnerability: Estimating Potential Losses

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

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the new or updated plan estimate **potential dollar losses** to vulnerable structures?	Section 6.4 pp. 6-11 to 6-16; Section 6.5 pp. 6-17 to 6-18	Potential dollar losses were calculated using a conservative exposure-level analysis to assess the risks of the identified hazards. For each asset located within at least 50% of a hazard area, exposure was calculated by assuming the worst-case scenario (i.e., the asset would be completely destroyed). *Recommended Revision:* • Estimate potential dollar losses to vulnerable assets under different hazard scenarios (i.e., 100- and 500-year floods, 7.0 and 9.0 magnitude earthquakes) rather than assuming that each asset located in a hazard area would be completely destroyed and would have to be replaced following a hazard event.		X
B. Does the new or updated plan describe the **methodology** used to prepare the estimate?	Section 6.2 p. 6-9; Section 6.3 pp. 6-9 to 6-10	The plan describes the methodology used to estimate the potential dollar losses and discusses data limitations.		X
C. Does the updated plan reflect the effects of **changes in development** on loss estimates?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.		**SUMMARY SCORE**		X

8. Assessing Vulnerability: Analyzing Development Trends

Requirement 201.7(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of a] general description of land uses and development trends within the tribal planning area so that mitigation options can be considered in future land use decisions.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe land uses and development trends within the tribal planning area?	Section 3.4 pp. 3-4 to 3-5; Section 6.6.1 pp. 6-19; Section 6.6.2 pp. 619 to 6-20	The plan describes land use and development trends on the Reservation and identifies newly acquired parcels that are part of the Quileute Reservation Expansion.		X
B. Does the updated plan reflect changes in development for tribal lands in hazard prone areas within the tribal planning area?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.		**SUMMARY SCORE**		X

9. Assessing Vulnerability: Assessing Cultural and Sacred Sites

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

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe significant cultural and sacred sites that are located in hazard areas?	Section 6.1.3 pp. 6-5 to 6-6; Section 6.4 p. 6-14; Section 6.5 pp. 6-17 to 6-18	The plan describes the Tribal areas of cultural significance and identifies the hazards to which each area is exposed.		X
Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.		**SUMMARY SCORE**		X

MITIGATION STRATEGY: *201.7(c)(3): [The plan **shall** include a] mitigation strategy that provides the Indian Tribal government's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

10. Tribal Multi-Hazard Mitigation Goals

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

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the new or updated plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?	Section 8.1 p.8-1	The plan identifies 5 goals, including 1 multi-hazard goal, 1 preparedness, response, and recovery goal, and 3 goals addressing the weather-related, seismic, and human-caused hazards. *Recommended Revision:* • Link the objectives identified in Section 8.4 with the mitigation goals.		X
B. Does the updated plan demonstrate that the goals were evaluated and either remain valid or have been revised?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

11. Identification and Analysis of Tribal Mitigation Actions

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

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	Section 8.2 pp. 8-2 to 8-10	The potential mitigation actions include prevention, property protection, natural resource protection structural projects, and public education and awareness actions. The plan identifies which goal and hazard(s) each mitigation action addresses as well as the type of development affected.		X
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	Section 8.2 pp. 8-2 to 8-10	Many of the mitigation actions address reducing the effects of hazards on new buildings and infrastructure. All of the actions that affect new development are identified.		X

C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	Section 8.2 pp. 8-2 to 8-10	Many of the mitigation actions address reducing the effects of hazards on existing buildings and infrastructure. All of the actions that affect existing development are identified.		X
		SUMMARY SCORE		X

12. Implementation of Tribal Mitigation Actions

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

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE**	
			N	**S**
A. Does the mitigation strategy in the new or updated plan include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	Section 8.3 pp. 8-11 to 8-12	The Planning Team evaluated and prioritized each of the mitigation actions using simplified STAPLEE evaluation criteria. The discussion and considerations given to each evaluation criteria are identified in the plan.		X
B. Does the mitigation strategy in the new or updated plan address how the actions will be **implemented and administered,** including the responsible agency, existing or potential resources, and the timeframe to complete each action?	Section 8.4 pp. 8-12 to 8-21	The plan identifies the administering department or agency, the estimated timeframe to complete the project, the potential funding sources, and the estimated project cost for each of the high priority mitigation actions that the Tribe intends to implement during the 5-year lifespan of this version of the plan. *Recommended Revision:* • Use the same action numbering system in Table 8-2 and in Section 8.4.		X
C. Does the **updated** plan identify the completed, deleted, or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

13. Tribal Capability Assessment

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

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan include an evaluation of the Indian Tribal government's **pre-disaster hazard management** laws, regulations, policies, programs, and capabilities?	Section 7.1 p. 7-1; Section 7.2 pp. 7-2 to 7-3; Section 7.3 pp. 7-4 to 7-5; Section 7.4 pp. 7-6 to 7-7	The plan identifies and evaluates the human and technical, financial, and legal and regulatory mitigation resources available to the Tribe. It also describes the current, ongoing, and recently completed mitigation projects and programs. *Recommended Revision:* • Specify whether each capability is related to pre-disaster and/or post-disaster hazard management.		X
B. Does the new or updated plan include an evaluation of the Indian Tribal government's **post-disaster hazard management** laws, regulations, policies, programs, and capabilities?	Section 7.1 p. 7-1; Section 7.2 pp. 7-2 to 7-3; Section 7.3 pp. 7-4 to 7-5; Section 7.4 pp. 7-6 to 7-7	The plan identifies and evaluates the human and technical, financial, and legal and regulatory mitigation resources available to the Tribe. It also describes the current, ongoing, and recently completed mitigation projects and programs. *Recommended Revision:* • Specify whether each capability is related to pre-disaster and/or post-disaster hazard management.		X
C. Does the new or updated plan include an evaluation of the Indian Tribal government's laws, regulations, policies, programs, and capabilities **related to development** in hazard prone areas?	Section 7.1 p. 7-1; Section 7.3 pp. 7-4 to 7-5; Section 7.4 pp. 7-6 to 7-7	The plan identifies and evaluates several human and technical and legal and regulatory mitigation resources and mitigation projects related to development, including the Tribe's Planning Department, Strategic Plan, Housing Code, replacement of storm-damaged Community Center, and *Move to Higher Ground*.		X
D. Does the new or updated plan include a discussion of the Indian Tribal government's **funding capabilities** for hazard mitigation projects?	Section 7.2 pp. 7-2 to 7-3	The plan identifies the current and potential sources of federal, tribal, state, local, and private funding to implement mitigation actions and activities.		X
E. Does the **updated plan** address any hazard management laws, policies, programs, capabilities, or funding capabilities of the Indian Tribal government's that have changed since approval of the previous plan?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

14. Tribal Funding Sources

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

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify **current** sources of Federal, tribal, or private funding to implement mitigation activities?	Section 8.4 pp. 8-12 to 8-21	The plan identifies current funding sources for the mitigation actions.		X
B. Does the new or updated plan identify **potential** sources of Federal, tribal, or private funding to implement mitigation activities?	Section 1.3 pp. 1-1 to 1-2; Section 7.2 pp. 7-2 to 7-3; Appendix F	The plan identifies potential sources of potential sources of federal, tribal, state, local, and private funding to implement mitigation actions and activities.		X
C. Does the **updated plan** identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

PLAN MAINTENANCE PROCESS

15. Monitoring, Evaluating, and Updating the Plan

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

Element	Location in the **Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan describe the method and schedule for **monitoring** the plan, including how, when, and by whom (e.g., the responsible agency)?	Section 9.1 pp. 9-1 to 9-2	Every 12 months from the time the plan is adopted, the Planning Team POC will email each member of the Planning Team an Annual Review Questionnaire to complete. The questionnaire will include an evaluation of the following: planning process, hazard analysis, vulnerability, analysis, capability assessment, and mitigation strategy. The Planning Team POC will collect all completed questionnaires and determine if the plan needs to be updated. The findings will summarized and emailed to the Planning Team. *Recommended Revision* • Include the Annual Review Questionnaire template.		X
B. Does the new or updated plan describe the method and schedule for **evaluating** the plan, including how, when, and by whom (e.g., the responsible agency)?	Section 9.1 pp. 9-1 to 9-2	Every 12 months from the time the plan is adopted, the Planning Team POC will email each member of the Planning Team an Annual Review Questionnaire to complete. The questionnaire will include an evaluation of the following: planning process, hazard analysis, vulnerability, analysis, capability assessment, and mitigation strategy. The Planning Team POC will collect all completed questionnaires and determine if the plan needs to be updated. The findings will summarized and emailed to the Planning Team.		X
C. Does the new or updated plan describe the method and schedule for **updating** the plan, including how, when, and by whom (e.g., the responsible agency), within the 5-year cycle?	Section 9.1 pp. 9-1 to 9-2	If the Planning Team POC believes the plan needs to be updated based on the findings of the Annual Review Questionnaire, then the Planning Team POC will request that the Planning Team members attend a Tribal Hazard Mitigation Plan Update Planning Team Meeting. In addition, the Planning Team will meet to update the plane every 5 years. To ensure that this update occurs, the plan identifies a list of activities that will take place in the 4th year after adoption of the plan.		X

D. Does the **updated plan** include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed for the next 5 years?	Section 9.1 pp. 9-1 to 9-2	The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

16. Monitoring Progress of Mitigation Activities

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

Requirement 201.7(c)(4)(v): *[The plan maintenance process **shall** include a] system for reviewing progress on achieving goals as well as activities and projects identified in the mitigation strategy.*

Element	**Location in the Plan** (section or annex and page #)	**Reviewer's Comments**	**SCORE** N	**SCORE** S
A. Does the new or updated plan describe how mitigation measures and project closeouts will be **monitored**?	Section 9.2 p. 9-2	Mitigation projects and project closeouts will be monitored and updated through the use of the quarterly reporting forms for FEMA-funded projects, provided by the state and/or FEMA, or through the use of a Mitigation Project Progress Report which will be request annually by the Planning Team POC to monitor progress made-to-date and/or final closeout. *Recommended Revision* • Include the Mitigation Project Progress Report template.		X
B. Does the new or updated plan identify a **system for reviewing progress** on achieving goals and implementing activities and projects in the Mitigation Strategy?	Section 9.1 pp. 9-1 to 9-2	The Annual Review Questionnaire includes an evaluation of the mitigation strategy and the plan update activities include providing a detailed review and revision of the mitigation strategy as well as preparing a new implementation strategy.		X
C. Does the **updated plan** describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
D. Does the **updated plan** discuss whether mitigation actions were implemented as planned?		The Quileute Tribe Hazard Mitigation Plan is a new plan.		N/A
		SUMMARY SCORE		X

17. Incorporation into Existing Planning Mechanisms

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

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan identify **other tribal planning mechanisms** available for incorporating the requirements of the mitigation plan?	Section 9.3 pp. 9-2 to 9-3	Elements of the plan will be incorporated into other existing planning mechanisms including the Tribe's Emergency Management Comprehensive Plan and Strategic Plan.		X
B. Does the new or updated plan include a **process by which the Indian Tribal government will incorporate the mitigation strategy** and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?	Section 9.3 pp. 9-2 to 9-3	The processes for incorporating the plan into various documents will occur as other plans are updated and new plans are developed. The plan describes how specific elements of the plan will be incorporated into the Emergency Management Comprehensive Plan as it is updated and into the Strategic Plan as it is drafted.		X
		SUMMARY SCORE		X

18. Continued Member and Stakeholder Involvement

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

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Section 9.4 pp. 9-3 to 9-4	A copy of the plan will be made available at the Tribe's Planning Department office in the Tribal Administration Building. The Planning Team will also identify opportunities to raise awareness about the plan and the hazards that affect the Reservation. This effort could include attendance and provision of materials at Tribal emergency preparedness and response special events.		X
		SUMMARY SCORE		X

PREREQUISITES

19. Adoption by the Tribal Governing Body (*Single Indian Tribal government*)

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

Requirement 201.7(c)(6): *[The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE	
			NOT MET	**MET**
A. Has the Indian tribal governing body formally adopted the new or updated plan?	Section 2 p. 2-1 Appendix B	The Tribal Council will adopt the plan.	X	
B. Is supporting documentation, such as a resolution, included with the new or updated plan?	Appendix B	A scanned copy of the adoption resolution will be provided in Appendix B.	X	
C. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?	Appendix B	The sample adoption resolution includes assurances that the Quileute Tribe has compiled the hazard mitigation plan in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statues as required in 44 CFR 13.11(d), and will continue to comply with all applicable Federal statutes and regulations.		X
		SUMMARY SCORE	X	

20. Multi-Jurisdictional Plan Adoption (*Multiple Indian Tribal governments*)

***Requirement 201.7(a)(4)*:** *Multi-jurisdictional plans (*e.g., *county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government…has officially adopted the plan.*

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

***Requirement 201.7(c)(6):** [The plan **must** include] assurances that the Indian Tribal government will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter. The Indian Tribal government will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 13.11(d) of this chapter.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan indicate the specific Indian Tribal government(s) represented in the plan?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
B. For each Indian Tribal government(s), has the governing body adopted the new or updated plan?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
C. Is supporting documentation, such as a resolution, included for each participating Indian Tribal government(s)?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
D. Does the new or updated plan provide assurances that the Indian Tribal government will continue to comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d)?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
		SUMMARY SCORE		N/A

21. Multi-Jurisdictional Planning Participation (*Multiple Indian Tribal governments*)

***Requirement 201.7(a)(4)*:** *Multi-jurisdictional plans (e.g., county-wide or watershed plans) may be accepted, as appropriate, as long as each Indian Tribal government has participated in the process... Indian Tribal governments must address all the elements identified in [44 CFR 201.7] to ensure eligibility as a grantee or as a subgrantee.*

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan describe **how** each Indian Tribal government participated in the plan's development?		The Quileute Tribe is a Single Indian Tribal Government.		N/A

B. Does the **updated plan** identify all participating Indian Tribal governments, including new and continuing Indian Tribal government(s) and any Indian Tribal government(s) that no longer participate in the plan?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
C. Does each participating Indian Tribal government participating in the new or updated mitigation plan meet all of the elements identified in the *Tribal Multi-Hazard Mitigation Plan Review Crosswalk* for their tribal planning area? Has a separate crosswalk for participating Indian Tribal government(s) been completed, and are all elements "Met" or "S"?		The Quileute Tribe is a Single Indian Tribal Government.		N/A
		SUMMARY SCORE		N/A

REPETITIVE LOSS STRATEGY (OPTIONAL)

22. Repetitive Loss Strategy

Requirement 201.7(c)(3)(vi): *An Indian Tribal government applying to FEMA as a grantee may request the reduced cost share authorized under 79.4(c)(2) of this chapter of the FMA and SRL programs if they have an approved Tribal Mitigation Plan meeting the requirements of this section that also identifies actions the Indian Tribal government has taken to reduce the number of repetitive loss properties (which must include severe repetitive loss properties), and specifies how the Indian Tribal government intends to reduce the number of such repetitive loss properties.* ***[Note: While submittal of a Repetitive Loss Strategy is optional, if the Indian Tribal government wants to request the reduced cost share authorized under 44 CFR 79.4(c)(2) for the FMA and SRL programs as a grantee, then all of the following requirements must be met.]***

Element	**Location in the Plan** (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan address repetitive loss properties in its risk assessment (see 201.7(c)(2))?	Section 6.1.1 p. 6-2	The plan does not address repetitive loss properties because according to FEMA's SQAnet there are no repetitive loss properties located on the Reservation.		X
B. Does the new or updated plan describe the Indian Tribal government's mitigation goals that support the selection of mitigation activities for repetitive loss properties (see 201.7(c)(3)(i))?	Section 8.1 p. 8-1	The goal to reduce the possibility of damages and losses from storm-related hazards, including flood, landslide/mudslide, coastal erosion, windstorm, and snow/ice storms supports the selection of mitigation activities for repetitive loss properties.		X
C. Does the new or updated plan identify mitigation actions for repetitive loss properties (see 201.7(c)(3)(iii))?	Section 8.2 p. 8-6; Section 8.4 pp. 8-16 to 8-17	Mitigation action FLD-2 addresses repetitive loss and severe repetitive loss properties.		X
D. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?	Section 4.4 p. 4-5	Demolition of the Community Center is a current top priority mitigation measure intended to reduce threats to personal safety. This building could be classified as a Severe Repetitive Loss property. Structural integrity of the building was compromised due to repetitive damages.		X
E. Does the new or updated plan consider repetitive loss properties in its evaluation of the Indian Tribal government's hazard management laws, regulations, policies, programs, and capabilities and its general description of mitigation capabilities (see 201.7(c)(3)(iv))?		The plan does not consider repetitive loss properties in the capability assessment.		N/A
F. Does the new or updated plan identify current and potential sources of Federal, tribal, or private funding to implement mitigation activities for repetitive loss properties (see 201.7(c)(3)(v))?	Section 1.3.2 p. 1-2; Section 8.4 pp. 8-16 to 8-17	The plan identifies funding sources, such as the FMA grant program and Severe Repetitive Loss Program, available to implement mitigate activities for repetitive loss properties.		X
		SUMMARY SCORE		N/A

MATRIX A: PROFILING HAZARDS

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the tribal planning area. **Completing the matrix is not required**.

Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each applicable hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.

Hazard Type		Hazards Identified Per Requirement 201.7(c)(2)(i)		A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
		Not a Hazard	Yes	N	S	N	S	N	S	N	S
	Avalanche	X									
	Coastal Erosion		X		X		X		X		X
	Coastal Storm	X									
	Dam Failure	X									
	Drought	X									
	Earthquake		X		X		X		X		X
	Expansive Soils	X									
	Extreme Heat	X									
	Flood		X		X		X		X		X
	Hailstorm	X									
	Hurricane	X									
	Land Subsidence	X									
	Landslide		X		X		X		X		X
	Severe Winter Storm		X	X			X		X		X
	Tornado	X									
	Tsunami		X		X		X		X		X
	Volcano	X									
	Wildfire		X		X		X		X		X
	Windstorm		X		X		X		X		X
Other:	Coastal Rainfall		X		X		X		X		X
Other:	Urban Conflagration		X		X		X		X		X
Other:	Hazardous Materials		X		X		X		X		X

Legend: 201.7(c)(2)(i) Profiling Hazards
A. Does the risk assessment identify the location (i.e., geographic area affected) of each hazard addressed in the new or updated plan?
B. Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
C. Does the plan provide information on previous occurrences of each natural hazard addressed in the new or updated plan?
D. Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

MATRIX B: ASSESSING VULNERABILITY

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the tribal planning area. **Completing the matrix is not required**.

*Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each **applicable** hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk. Note: Receiving an N in the shaded columns will not preclude the plan from passing.*

Hazard Type	Hazards Identified Per Requirement 201.7(c)(2)(i)		201.7(c)(2)(ii) Overview	A. Overall Description of Vulnerability		B. Hazard Impact		201.7(c)(2)(ii)(A) and (D) Identifying Structures and Sacred Sites (types and estimated numbers)	A. Existing Structures		B. Future Structures		201.7(c)(2)(ii)(B) Estimating Potential Losses	A. Loss Estimate		B. Methodology	
	Not a Hazard	Yes		N	S	N	S		N	S	N	S		N	S	N	S
Avalanche	X																
Coastal Erosion		X			X		X			X	X				X		X
Coastal Storm	X																
Dam Failure	X																
Drought	X																
Earthquake		X			X		X			X	X				X		X
Expansive Soils	X																
Extreme Heat	X																
Flood		X			X		X			X	X				X		X
Hailstorm	X																
Hurricane	X																
Land Subsidence	X																
Landslide		X			X		X			X	X				X		X
Severe Winter Storm		X			X		X			X	X				X		X
Tornado	X																
Tsunami		X			X		X			X	X				X		X
Volcano	X																
Wildfire		X			X		X			X	X				X		X
Windstorm		X			X		X			X	X				X		X
Other: Coastal Rainfall		X			X		X			X	X				X		X
Other: Urban Conflagration		X			X		X			X	X				X		X
Other: Hazardous Materials		X			X		X			X	X				X		X

Legend:

201.7(c)(2)(ii) Assessing Vulnerability: Overview
- A. Does the new or updated plan include an overall summary description of the vulnerability of the tribal planning area to each hazard?
- B. Does the new or updated plan address the impact of each hazard on the tribal planning area?

201.7(c)(2)(ii)(A) Assessing Vulnerability: Identifying Structures
- A. Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- B. Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

201.7(c)(2)(ii)(B) Assessing Vulnerability: Estimating Potential Losses
- A. Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- B. Does the new or updated plan describe the methodology used to prepare the estimate?

MATRIX C: IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

This matrix can assist FEMA (and the State, if applicable) as well as the Indian Tribal government, in scoring each hazard. Indian Tribal governments may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement 201.7(c)(2)(i). Then, place a checkmark in either the N or the S box for each **applicable** hazard. An "N" for any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type		Hazards Identified Per Requirement 201.7(c)(2)(i)		A. Comprehensive Range of Actions and Projects	
		Not a Hazard	Yes	N	S
	Avalanche	X		X	
	Coastal Erosion		X		X
	Coastal Storm	X		X	
	Dam Failure	X		X	
	Drought	X		X	
	Earthquake		X		X
	Expansive Soils	X		X	
	Extreme Heat	X		X	
	Flood		X		X
	Hailstorm	X		X	
	Hurricane	X		X	
	Land Subsidence	X		X	
	Landslide		X		X
	Severe Winter Storm		X		X
	Tornado	X		X	
	Tsunami		X		X
	Volcano	X		X	
	Wildfire		X		X
	Windstorm		X		X
Other:	Coastal Rainfall		X		X
Other:	Urban Conflagration		X		X
Other:	Hazardous Materials		X		X

Legend:
201.7(c)(3)(ii) Identification and Analysis of Mitigation Actions
A. Does the new or updated plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?

Appendix B. Draft Tribal Resolution

Sample Tribal Resolution – for placeholder only until authorized resolution is adopted

WHEREAS, the Quileute Indian Tribe is an Indian Tribe organized under the Indian Reorganization Act, and the Quileute Tribal Council is the duly constituted governing body of the Quileute Indian Tribe by authority of Article III of the Constitution and Bylaws of the Quileute Indian Tribe approved by the Secretary of the Interior on November 11, 1936; and,

WHEREAS, the ancestors of the present Quileute Tribe were a party to the Olympia Treaty of 1855, and enjoy the rights reserved to it by that Treaty; and,

WHEREAS, the Quileute Tribal Council is responsible to its community for the safety and well-being of all its citizens; and,

WHEREAS, the Quileute Tribe has compiled the *2015 QUILEUTE TRIBE HAZARD MITIGATION PLAN* in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in tribal or Federal laws and statutes as required in 44 CFR 13.11(d), and will continue to comply with all applicable Federal statutes and regulations.

NOW, THEREFORE, BE IT RESOLVED that the Quileute Tribal Council hereby adopts and authorizes the use of the 2015 QUILEUTE TRIBE HAZARD MITIGATION PLAN.

* * * CERTIFICATION * * *

I, hereby attest that the foregoing Resolution and Certification was adopted a regular meeting of the Quileute Tribal Council at La Push, Washington on, the ____day of _____at which time a quorum was present and the Resolution was adopted by a vote of _____FOR, _____, AGAINST and __ ABSTENTIONS

Appendix C. Planning Team Meetings

Planning Team Meetings:

- July 30, 2014 - Initial kick-off meeting
- August 8, 2014 – Planning Team presentation to Tribal Council
    - Materials: Project Overview Presentation
- September 9, 2014 – Planning Team and Planning Committee
    - Materials: Project Overview Presentation
    - Handouts: Project Goals and Objectives, Proposed Mitigation Actions, Proposed Interview Questions for Department Directors
- September 10, 2014 – Planning Team and FEMA
- September 17, 2014 – Planning Team and Department Directors
    - Materials: Project Overview Presentation
    - Handouts: Project Goals and Objectives, Proposed Mitigation Actions, Interview Questions for Department Directors
- October 24, 2014 – Planning Team
- November 4, 2014 – Planning Team
- November 10, 2014 – Planning Team
- December 16, 2014 – Planning Team, Final Review
- December 17, 2014 – Planning Team and Quileute Natural Resources, GIS

Agendas and sign-in sheets for Planning Committee and Directors meetings in following pages.

Quileute Planning Committee

September 9, 2014

Agenda

1. Welcome
2. Organization of committee
3. Issues related to 110 business park
4. Hazard Mitigation Plan – Colleen Jollie, Bridget Ray
5. Other Items

Quileute Planning Committee

Meeting Date: September 9, 2014

Name	Department/Affiliation	Email
Bob Bouck	KETGUO	
Ruth Jackson		
Cathy Smith	QOSR	
Danny Hinchen	QPW	
BRIDGET RAY	NWT —	bee rayroxx@gmail.com
Colleen Jollie	NW Tribal Communications	cjollie@comcast.net

QUILEUTE TRIBAL COUNCIL
POST OFFICE BOX 279
LA PUSH, WASHINGTON 98350-0279
TELEPHONE (360) 374-6163
FAX (360) 374-6311

AGENDA
Quileute Directors Meeting
Wednesday, September 17, 2014
1 pm

1.) Presentation from the ~~Emergency Management~~ Hazard Mitigation Plan Development smart consultants and discussion of ~~evacuation~~ plan, ~~lock down procedures, status of security camera plans, etc.)~~ oops! Coordinate w/ Mark next time
~~2.)~~ Review QuileuteNation.org
~~3.)~~ Joint Tribal Council/Department Working Sessions Planned (Health Clinic - Sept 29, Human Services – Oct. 6, next department?)
4.) Human Resources support discussion
5.) Reminders - Communications leaks from Tribal Council discussion,
6.) Other issues of interest
7.) Agenda items for the next meeting

9/17 Sign-in Sheet

Name Dept. email/phone

MARK UKKES EXEC. MARK.UKKES@QUILEUTENATION.ORG.

LARRY SCROGGINS COURT LARRY.SCROGGINS@QUILEUTENATION.org

RUSSELL BROOKS EVENTS russell.brooks@quileutenation.org

PUBLIC WORKS

3. John McGuire Q.P.W (360)374-4179 (DAN HIMMEL)

2. Sandra Lyons Clinic 360-374-3358 sandra.lyons@quileutenation.org

Pat McCall Lonesome Creek pat.mccall@quileutenation.org. 912-1215 360-

M R QNR

Roseann Fonza Personnel (will scan + share w/ housing + school)

Larry Bratton Planning

1. Frank Geyer QNR frank.geyer@quileutenation.org
360 374-2027

2. Andrew Shogren, Director Health Clinic
360-374-4318 andrew.shogren@quileutenation.org

10/6 Public Safety & Community Ctr.
email Russell Brooks
- Fact sheet + Questionnaire
- PPT? Rolling display @ table
- Blown up maps

Get Rest of Contact info from Larry B.

1. HUMAN SVCS. - Head Start (Nicole Earls)

Quileute Tribal Hazard Mitigation Plan 2014

What is Hazard Mitigation?

Quileute Tribal Members are all too familiar with hazardous events. In the Quileute language, the word Bask'alidix, describes winter as 'Bad Weather Time'. Natural hazards such as severe storms, floods, earthquakes, tsunamis, and wild fire all have the potential to cause loss of life, property damage, economic hardship, and threats to public health and safety. The Tribe has secured land to relocate the village of La Push out of the worst area for flooding, which is also the most vulnerable tsunami zone, to higher ground in order to move people, essential services and facilities out of harm's way. This action is called a 'mitigation measure' in the terms of a Hazard Mitigation Plan.

Mitigation reduces the risk of loss and creates a more disaster-resistant and sustainable community – a safer community. Hazard mitigation measures are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. Hazard Mitigation measures are the thing you do today to be more protected in the future. They are measures taken before a disaster happens to reduce the impact that future disasters will have on people and property.

2006 Heavy wind and flooding along the beach front at the school

Why Does the Tribe Need a Hazard Mitigation Plan?

The Plan demonstrates the Tribe's commitment to reducing risk, and it guides planning and development activities. Mitigation measures include a range of actions and projects that reduce the impacts of each hazard, with emphasis on protecting new and existing buildings and infrastructure. In addition to making the community safer, having an official Hazard Mitigation Plan qualifies the Tribe for funding from FEMA, the Federal Emergency Management Agency.

Who are the stakeholders in the Hazard Mitigation Plan?

The Quileute Tribal Council and the Tribal Planning Committee authorized the 2014 Hazard Mitigation Planning Project. The Planning Team is led by Larry Burtness, Quileute Planning Director. Project consultant is Northwest Tribal Communications. The team is working with Tribal leaders and Tribal membership, department directors, neighboring jurisdictions, and state and federal agencies to develop a fully vetted community-based plan.

2003 Daycare Center ruined by floods

2003 Flooding at the Riverside Restaurant

What does the Quileute Hazard Mitigation Plan include?

The Plan includes a description of this community and the planning process. It identifies and analyzes hazards particular to the Quileute Indian Reservation and measures those against vulnerable assets. The Plan assesses internal capabilities to deal with identified hazards and lays out a mitigation strategy. Maintaining the Plan is an important element to assure the continued safety of the community. A Hazard Mitigation Plan was started in 2008 and provides the basis for the 2014 Plan.

Quileute Tribal Hazard Mitigation Plan 2014

GOALS:

1. Promote Disaster Resistant Planning & Development
2. Build and support local capacity to enable the Quileute Tribe to prepare for, respond to, and recover from disasters
3. Reduce the possibility of damages and losses as a result of the following hazards:

   Seismic ground shaking, movement and tsunami

   Storm related events such as flood, landslide, coastal erosion, wind-snow or ice storms.

   Fire, including wildland fire and conflagration, i.e. housing areas & marina.

Contact Information

Northwest Tribal Communications

A Native/Woman-Owned Business

Colleen Jollie, MPA - Principal
Project Manager – 360-480-7350
cjollie@comcast.net

Bridget Ray, BA/BS - Principal
Tribal Planner – 360-789-0005
beerayrox@gmail.com

Storms of 2010 - Flood impact on transportation infrastructure at the Bogachiel River Bridge abutment on SR 110

Have you ever been stranded in La Push, or outside and couldn't get home, due to flooding on State Route 110?

2003 Flooding at MP8 on SR 110 – the only road into and out of the Quileute Reservation.

Quileute Tribe
Hazard Mitigation Plan

Northwest Tribal
Communications

August 7, 2014

Which of these hazards impact the Quileute Tribe?

- Severe Weather
- Wildfire
- Avalanches
- Landslides
- Earthquake
- Tsunami
- Flooding/Erosion
- Conflagration

What is mitigation?

Any activities which actually eliminate or reduce damages incurred from a disaster.

Overview

- What is a Hazard Mitigation Plan?
- Why does the Tribe need one?
- What are the Planning steps?

What is a Hazard Mitigation Plan?

A Plan adopted by the Quileute Tribal Council which identifies hazards, risks to assets, and vulnerabilities. The Plan includes prioritized mitigation projects. It is not an emergency operations plan.

Why does the Tribe need a Hazard Mitigation Plan?

To be prepared.

To eliminate or reduce impacts on the Tribal Community in the event of a natural disaster.

The Disaster Mitigation Act of 2000 (DMA 2000) requires local governments to have a plan as a condition of receiving federal disaster mitigation funds.

What are the planning steps?

- Planning is a community based process.
- Tribal Leadership is engaged, as are department managers and the general membership through meetings and publications to gain wide participation.
- Other interested parties, such as local agencies, are also consulted.
- The process takes about three months.

What happens after the plan is completed?

The Tribe will be eligible to apply for mitigation funds from FEMA to implement the prioritized projects.

Northwest Tribal Communications

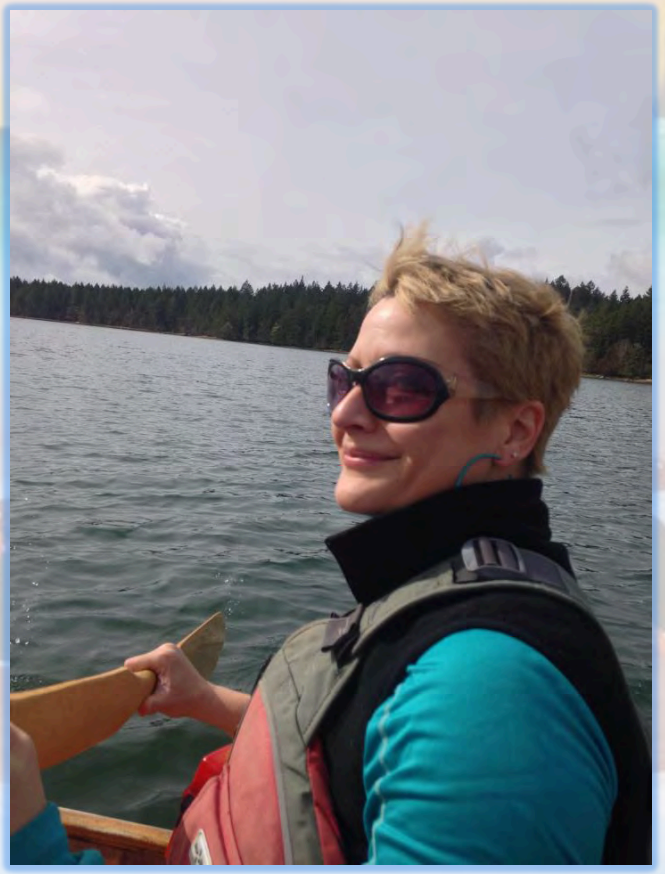
Colleen Jollie, MPA

Project Manager

360.480.7350

cjollie@comcast.net

Northwest Tribal Communications



Bridget Ray

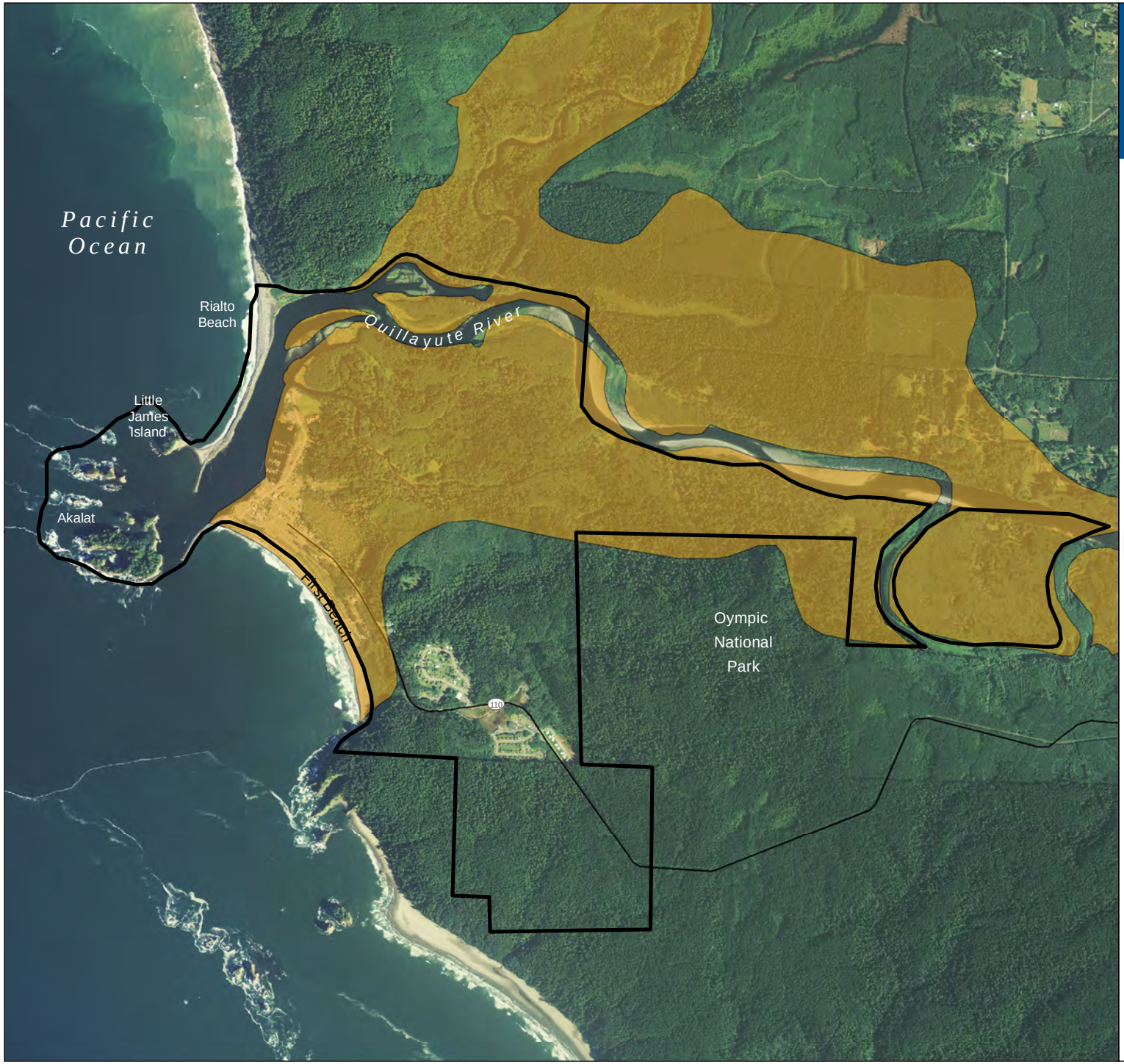
Tribal Planner

360.789.0005

beerayrox@gmail.com

Quileute Tribal Mitigation Plan

Liquefaction Hazard Area



Quileute Reservation

Liquefaction hazard area

This figure shows the liquefaction zone determined by the Washington State Department of Natutal Resources. Liquefaction is the transformation of a confined layer of sandy or silty water-saturated material into a liquid-like state during a seismic event.

N

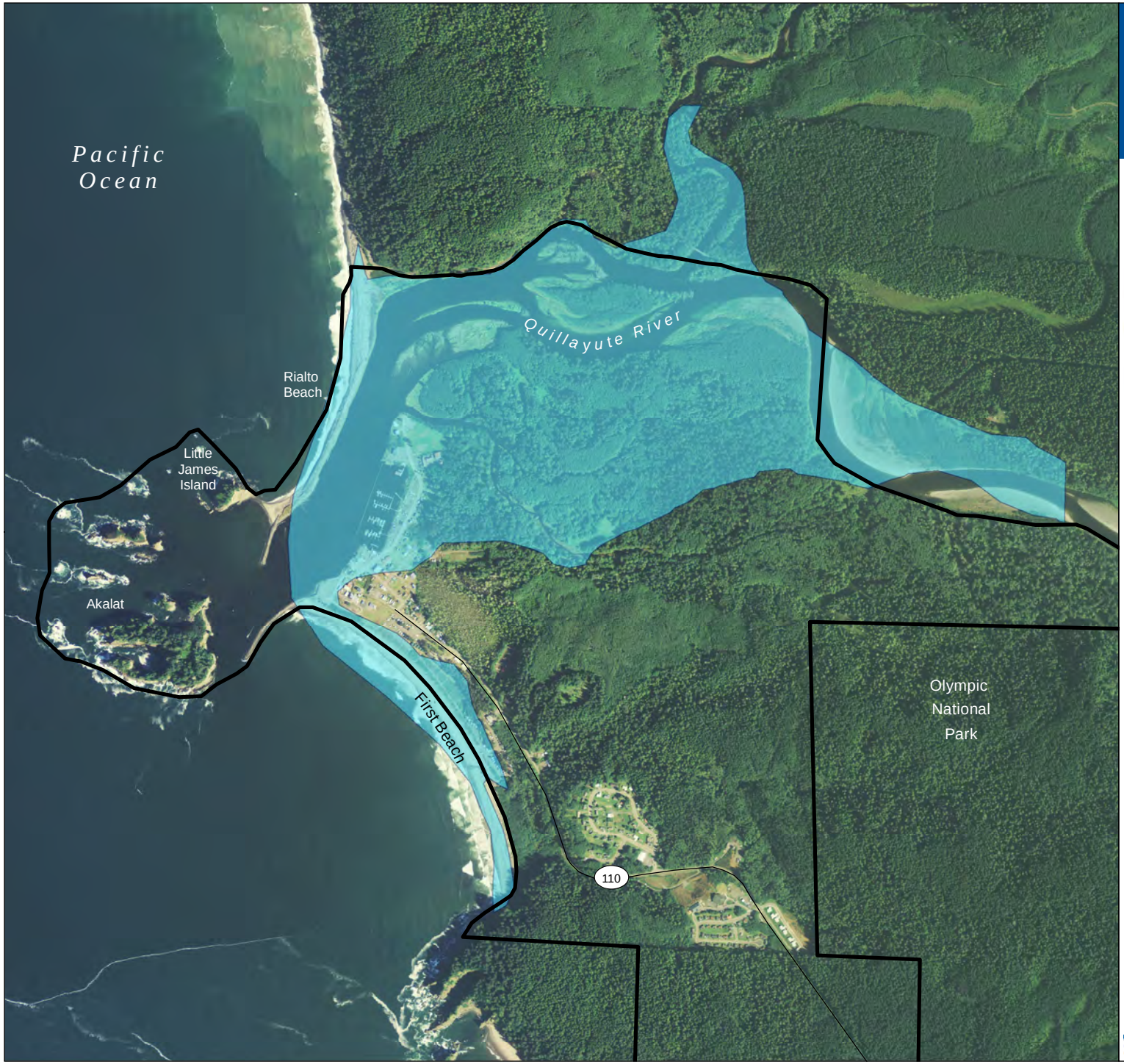
0 220,000 440,000 880,000 1,320,000 1,760,000 Feet

Data source: Washington State Deptment of Natural Resources, 2004

URS

Quileute Tribal Mitigation Plan

Tsunami Inundation Hazard Area



Quileute Reservation

Tsunami inundation hazard area

This figure shows Tsunami run-up of 13 feet based on a Washington State Emergency Management Division model during a 500-year Cascadia Fault seismic event.

N

0 430 860 1,720 2,580 3,440

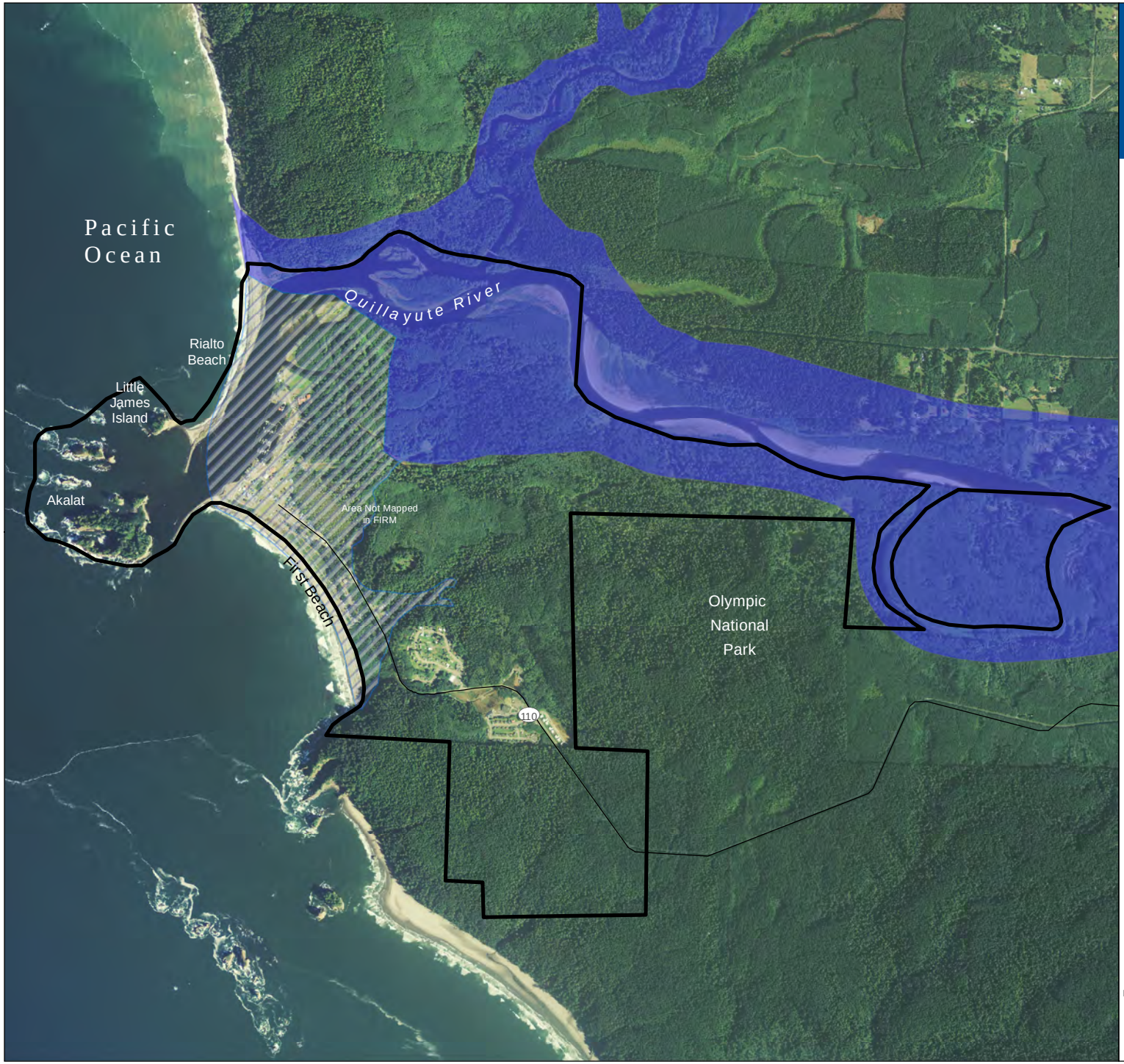
Feet

Data source: Washington EMD, 2007

URS

Quileute Tribal Mitigation Plan

Flood Hazard Area



Quileute Reservation

Flood hazard zone

100-year flood zone

Likely flood hazard area

This figure shows the 100-year flood zone derived from FEMA's Flood Insurance Rate Maps (FIRMs). URS created the "likely flood hazard area" based on a terrain model of the area not mapped by the FEMA FIRM.

N

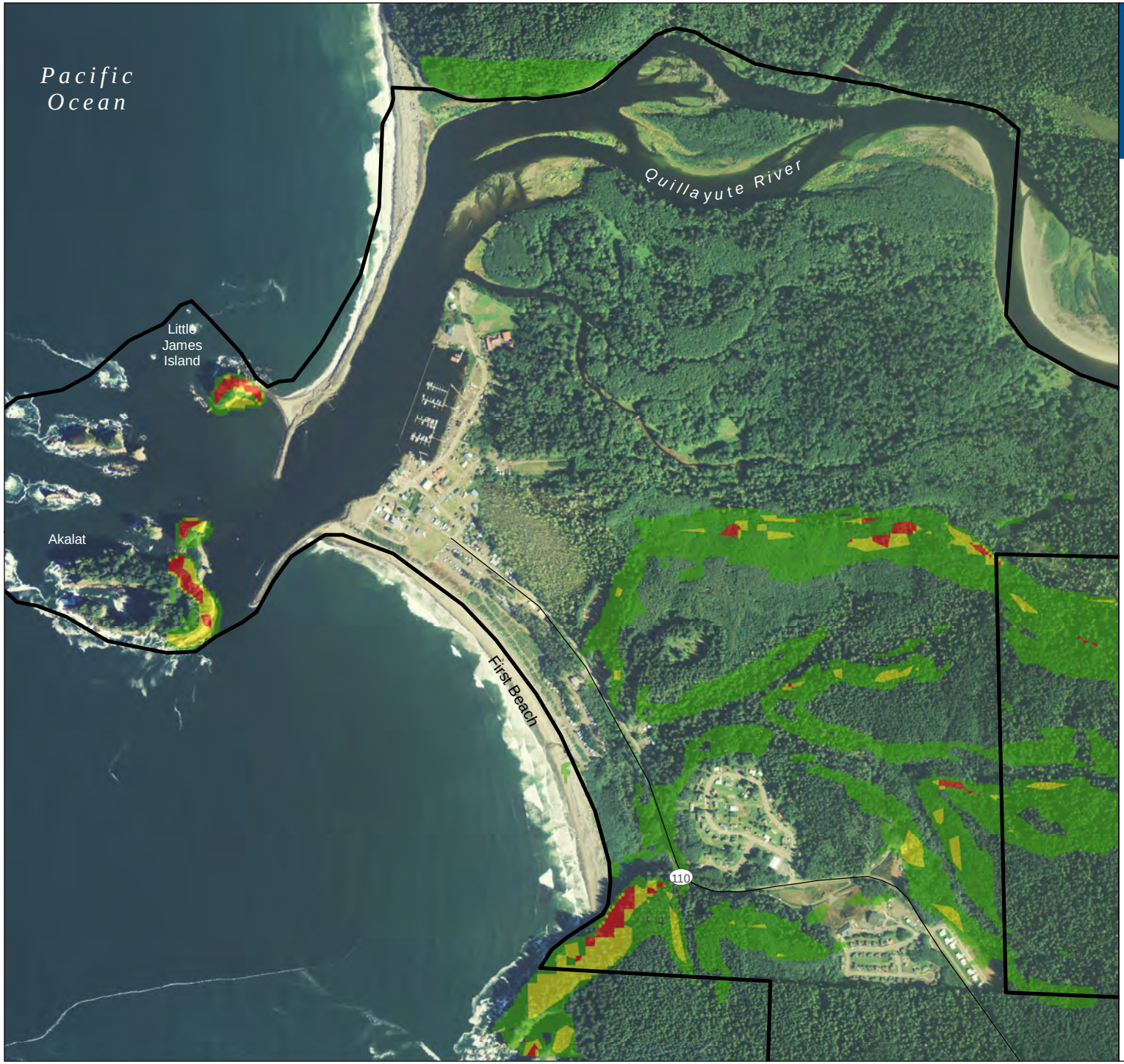
0 0.1 0.2 0.4 0.6 0.8 Miles

Data source: FEMA Flood Insurance Rate Map, 1983

URS

Quileute Tribal Mitigation Plan

Landslide Hazard Area



Quileute Reservation

Landslide hazard

- Very High
- High
- Moderate

This figure shows the landslide hazard areas on the Quileute Indian Reservation. Landslide risk is calcuated by a combination of slope, aspect, and vegetation cover and type.

N

0 0.05 0.1 0.2 0.3 0.4 Miles

Data source: URS, 2008

URS

Quileute Tribal Mitigation Plan

Coastal Vulnerability

Coastal Vulnerability Index

- Low
- Moderate
- High
- Very High
- Quileute Reservation

This figure shows vulnerability along the Washington Coast. It was developed by the USGS and combines the hazard risks from sea-level rise, geomorphology, slope, tide, tsunami, waves, and coastal erosion. High vulnerability equates to coastal erosion of 3.3 - 6.6 ft/yr, sea-level rise of 0.12 in/yr, average wave height of 3.75 ft, and slope of .6 - .3%.

N

0 5 10 20 30 40 Miles

Data course: USGS Coastal Vulnerability Index, (2008)

URS

E-10A
December 2014

Quileute Tribal Mitigation Plan

Coastal Erosion Hazard Area

Coastal erosion hazard area

Quileute Reservation

This figure shows erosion along the Washington Coast. USGS reports that coastal erosion of the area at a rate of 3.3 - 6.6 feet per year. The hazard area is based on an erosion rate of 6.6 feet per year over a 10-year period.

N

0 0.05 0.1 0.2 0.3 0.4 Miles

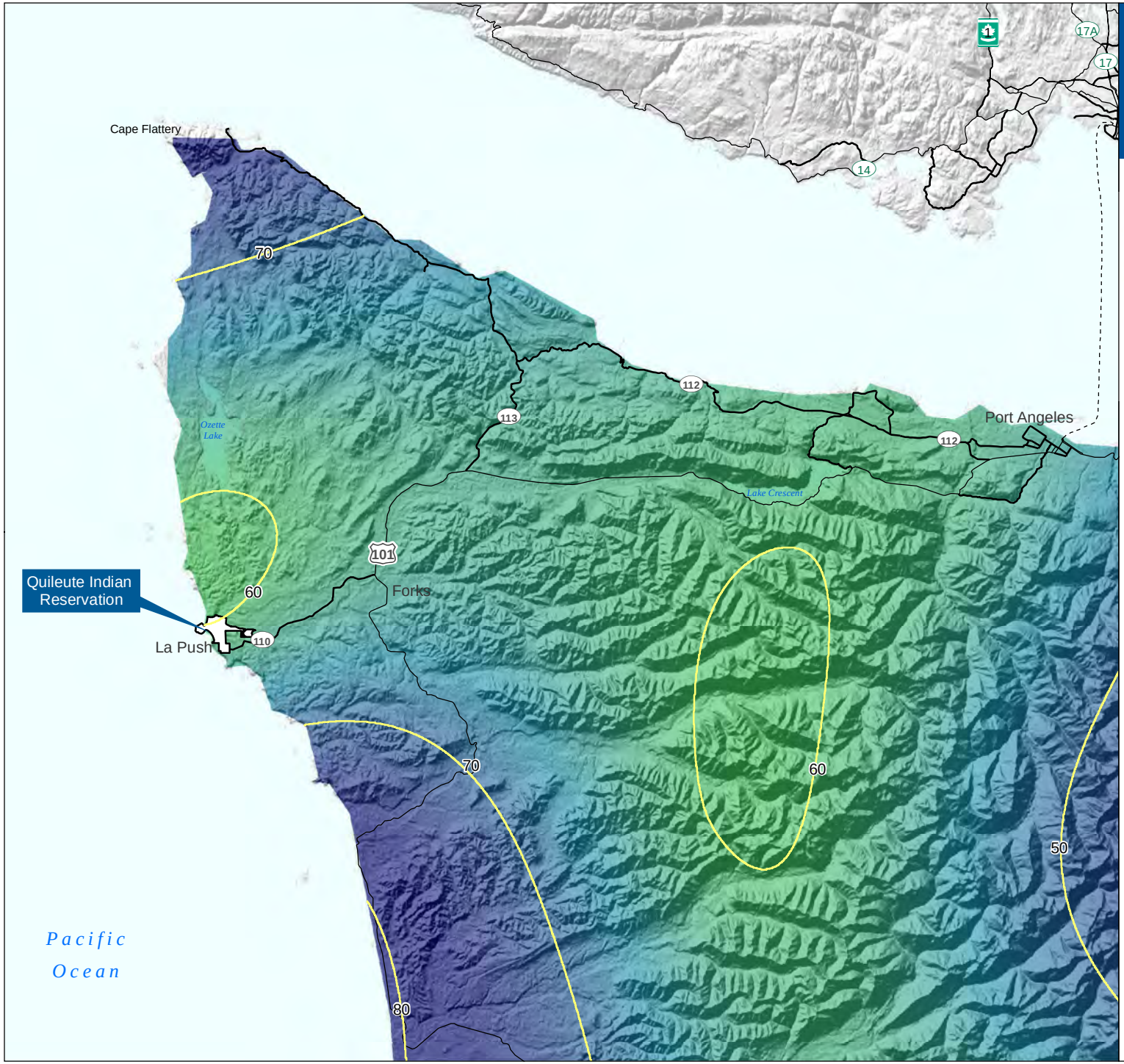
Data course: USGS Coastal Vulnerability Index, 2008

URS

E-10B
December 2014

Quileute Tribal Mitigation Plan

Historical Severe Wind Event (December 14 - 15, 2006)



Wind Speed (peak wind gust)

High : 80.6531

Low : 43.632

10-mph contour

Quileute Reservation

This figure shows an interpolation of wind data gathered during a severe storm event during December of 2006. URS created the model based on observed peak wind gusts measured by the National Weather Services at weather stations throughout Washington State.

N

0 1.75 3.5 7 10.5 14 Miles

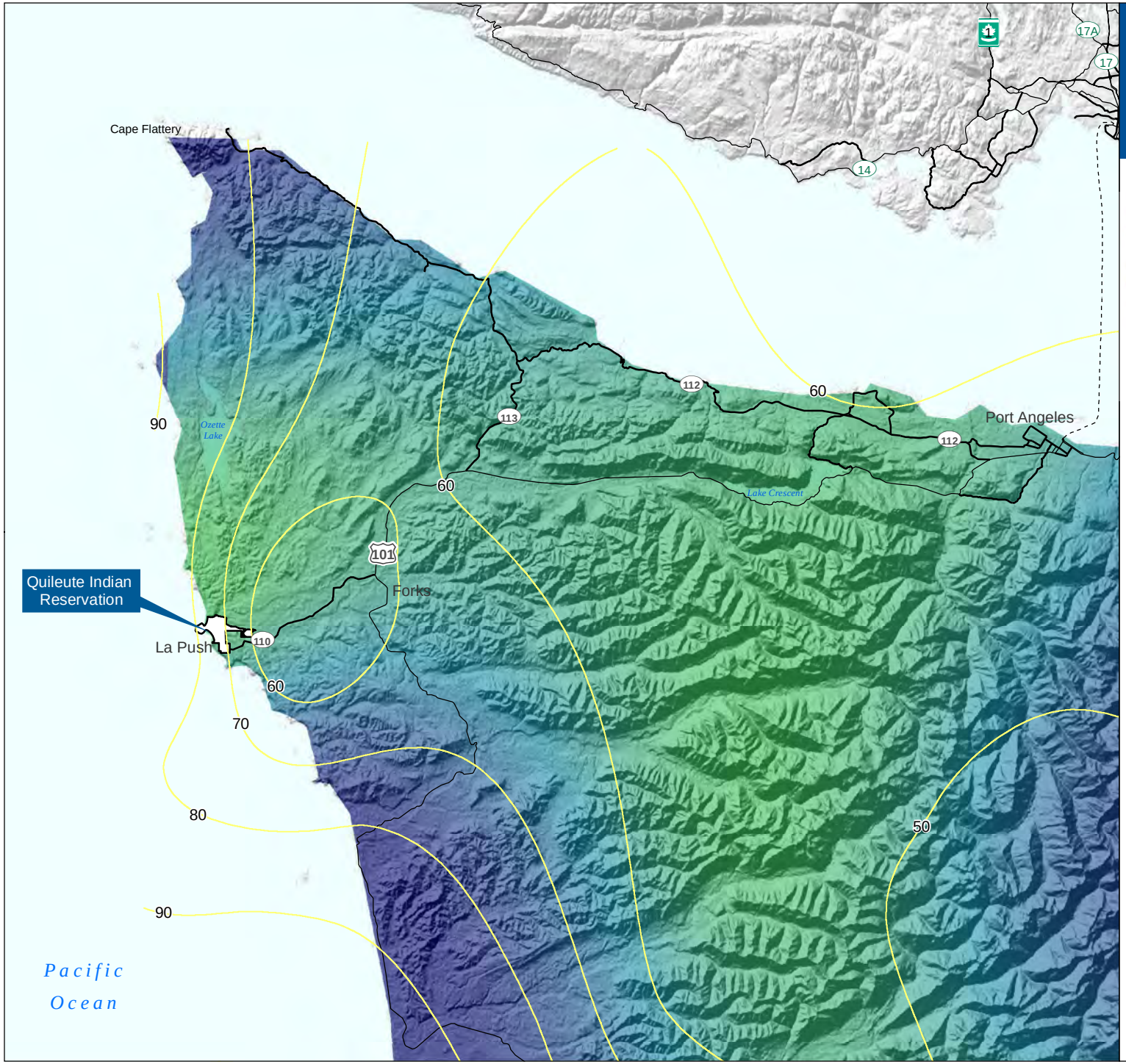
Data course: National Weather Service recorded wind speeds, 2006

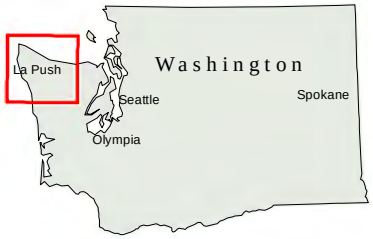
URS

E-11A
December 2014

Quileute Tribal Mitigation Plan

Historical Severe Wind Event (December 1 - 3, 2007)





Wind Speed (peak wind gust)

High : 80.6531

Low : 43.632

10-mph contour

Quileute Reservation

This figure shows an interpolation of wind data gathered during a severe storm event during December of 2007. URS created the model based on observed peak wind gusts measured by the National Weather Services at weather stations throughout Washington State.

N

0 2 4 8 12 16 Miles

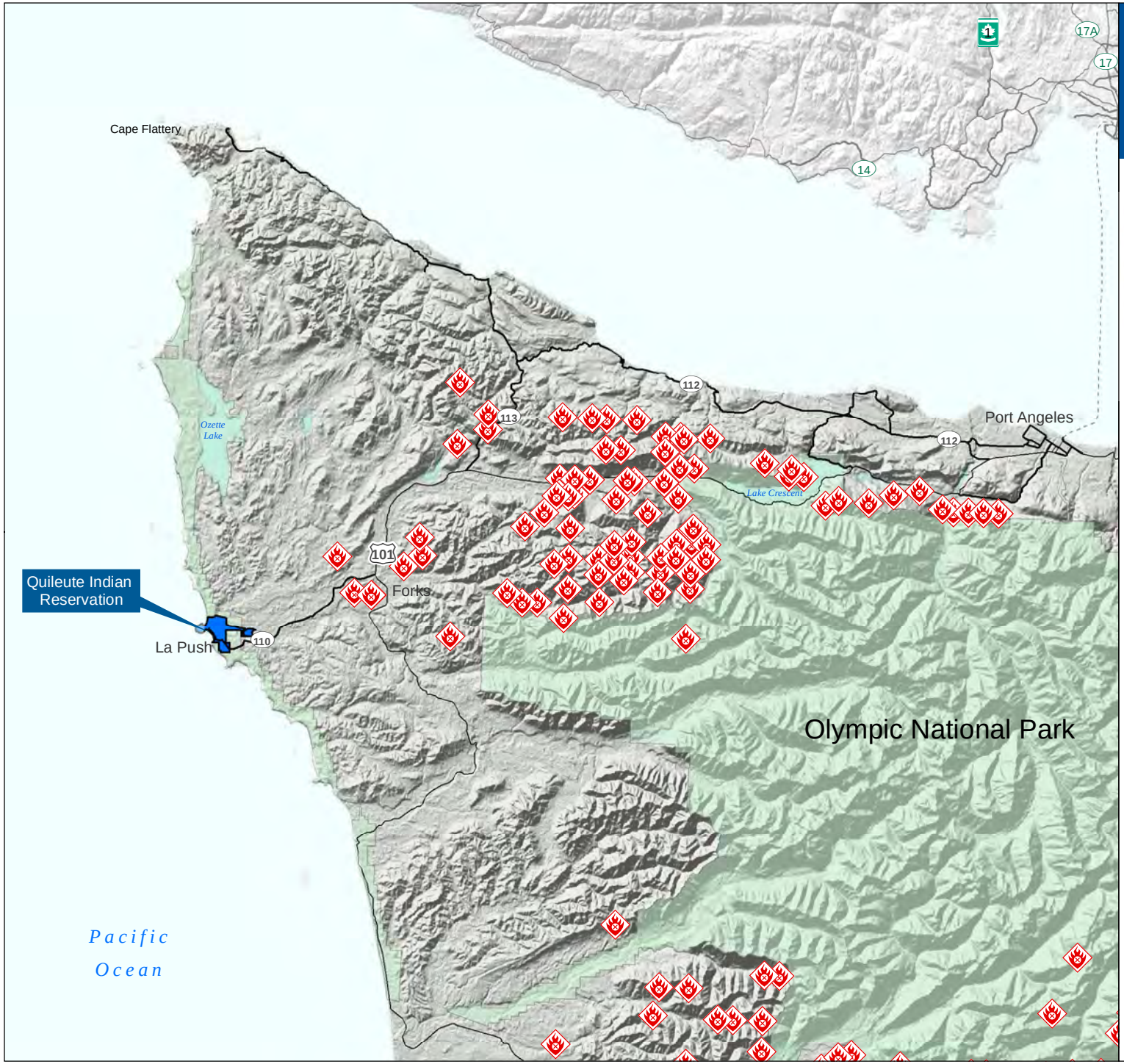
Data course: National Weather Service recorded wind speeds, 2007

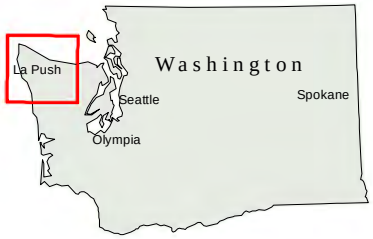
URS

E-11B
December 2014

Quileute Tribal Mitigation Plan

Historical Wildland Fires (1900 - 2005)





Quileute Indian Reservation

Historical fire location (1900 - 2005)

This figure shows Federally recognized fire occurances between 1900 and 2005.

N

0 2.5 5 10

MILES

Data source: USDA Forest Service, 2005

URS

Quileute Tribal Mitigation Plan

Wildland Fire Hazard Area

Quileute Indian Reservation

Fire Hazard Area

- Extreme
- High
- Moderate
- Low
- Very low/Open water

This figure shows wildland fire hazard risk in the vicinity of the Quileute Indian Reservation. URS developed the model using a 33.3 foot digital elevation model to calculate both aspect and slope. These two factors, together with fuel load, were combined in an overlay analysis.

N

0 2.5 5 10

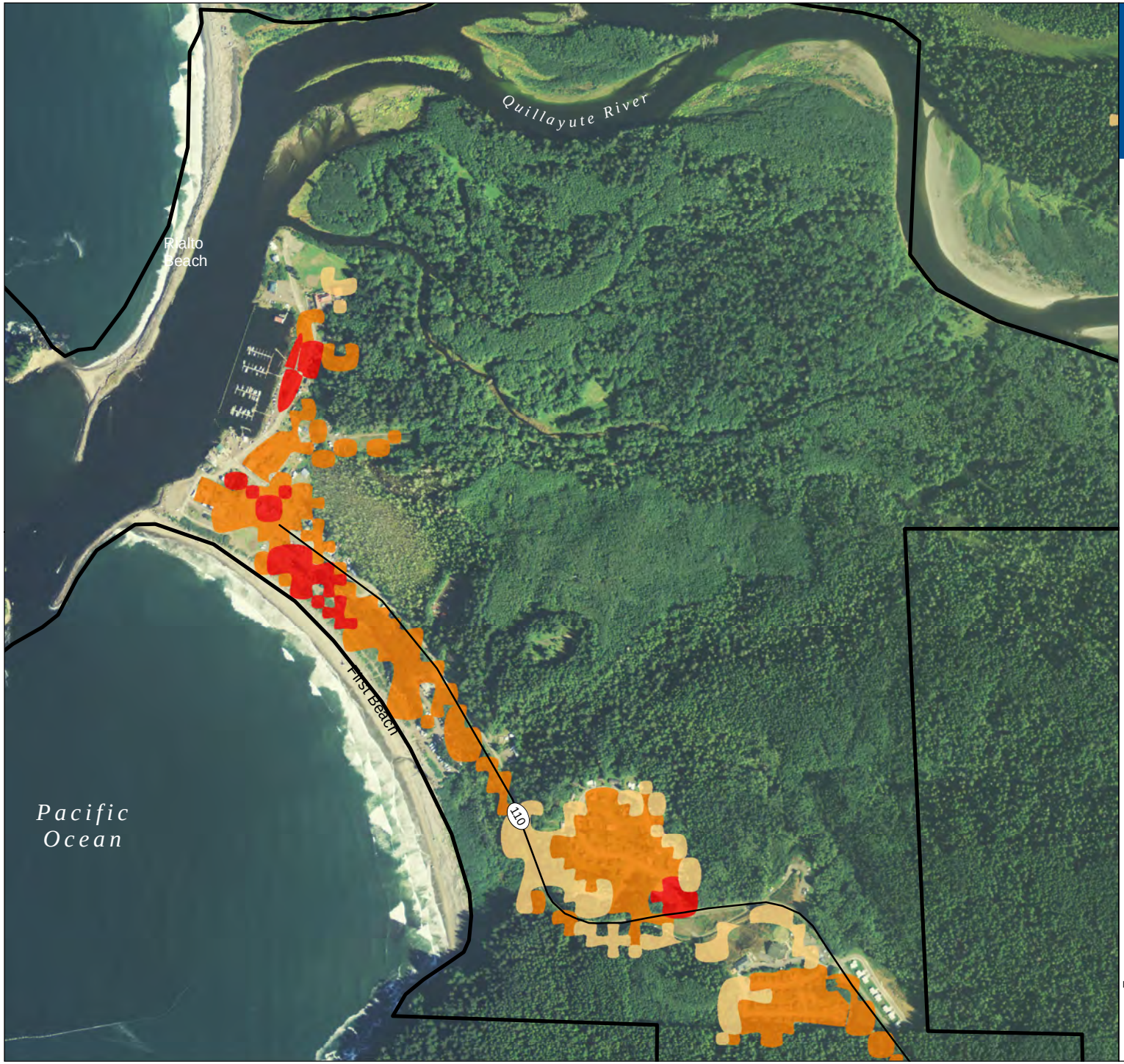
MILES

Data source: URS Fire Hazard Model, 2008

URS

Quileute Tribal Mitigation Plan

Urban Conflagration Hazard Area



Urban Conflagration Hazard

- High
- Moderate
- Low
- Quileute Reservation

This figure shows urban conflagration hazard risk, which is an analysis of fuel load in proximity to population density.

N

0 500 1,000 2,000

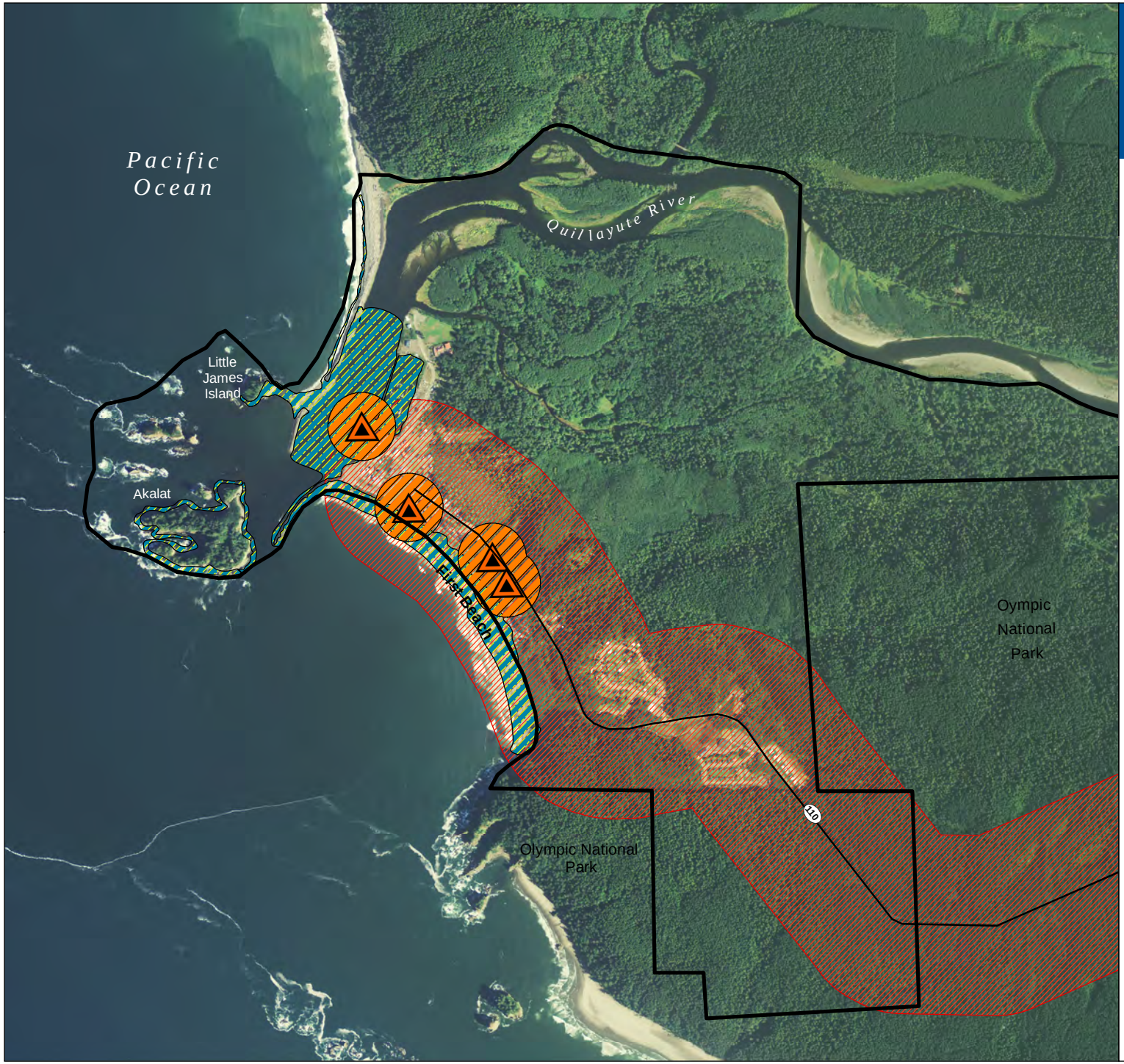
FEET

Data source: USGS National Landcover Database, 2001

URS

Quileute Tribal Mitigation Plan

Hazardous Material Event Hazard Area



Hazardous material zone

- Hazardous material zone
- Fixed incident hazard zone
- Mobile incident hazard zone
- Vessel incident hazard zone
- Quileute Reservation

N

0 500 1,000 2,000

FEET

Source: Quileute Tribe, 2014

URS

Appendix F. Financial Resources for Quileute Tribal Hazard Mitigation

Type	Sub-Type	Administrator	Purpose	Amount/Availability
Federal	Hazard Mitigation Grant Program	Federal Emergency Management Agency (FEMA)	Support pre- and post-disaster mitigation plans and projects.	Available to Washington communities after a Presidentially declared disaster has occurred in Washington. Grant award based on specific projects as they are identified.
	Pre-Disaster Mitigation Grant Program	FEMA	Support pre-disaster mitigation plans and projects.	Available on an annual basis as a nationally competitive grant. Grant award based on specific projects as they are identified (no more than $3 million Federal share for projects).
	Flood Mitigation Assistance Grant Program	FEMA	Mitigate repetitively flooded structures and infrastructure.	Available on an annual basis; distributed to Washington communities by State Office of Emergency Management. Grant award based on specific projects as they are identified.
	National Flood Insurance Program	FEMA	Property owners insurance protection in exchange for State and community floodplain management and regulation	
	Repetitive Flood Claims Program	FEMA	Provides funding to States and communities to reduce risks of flood damage to structures	
	Assistance to Firefighters Grant Program	FEMA/U.S. Fire Administration	Provide equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.	Available to fire departments and non-affiliated emergency medical services. Grant award based on specific projects as they are identified.
	Indian Community Development Block Grant Program	Housing and Urban Development	Provide critical housing and community development resources to aid disaster recovery.	Available to entitled tribes. Grant award based on specific projects as they are identified.
	Imminent Threat, Indian Community Development Block Grant Program	Housing and Urban Development	Alleviate or remove imminent threats to health or safety (e.g., drought).	Available to entitled tribes. Grant award based on specific projects as they are identified.
	Indian Reservation	Federal Highway	Construct and improve roads, bridges, and transit	Available to entitled tribes. Grant award based on specific

Appendix F. Financial Resources for Quileute Tribal Hazard Mitigation

Type	Sub-Type	Administrator	Purpose	Amount/Availability
	Roads Transportation Funding	Administration Federal Lands Highways Bureau of Indian Affairs Department of Transportation, Portland Area Office	facilities leading to, and within, Indian reservations or other Indian lands to provide safe access through hazard-prone areas.	projects as they are identified.
	Administration for Native Americans Grant Programs	Department of Health and Human Services	Fund a variety of environmental management programs, including the identification and assessment of human-caused and natural hazards and their associated risks and the development and implementation of plans, policies, and ordinances.	Available to entitled tribes. Grant award based on specific projects as they are identified.
	Clean Water State Revolving Fund	Environmental Protection Agency	Fund water quality projects, including all types of nonpoint source projects, watershed protection or restoration projects, estuary management projects, and more traditional municipal wastewater treatment projects.	Available to entitled communities. Grant award based on specific projects as they are identified. Provides more than $5 billion annually.
	Aid to Tribal Governments	Bureau of Indian Affairs (BIA)	Support Tribal government operations, maintain up-to-date Tribal enrollment, conduct Tribal elections, and develop appropriate Tribal policies, legislation, and regulations.	Available to entitled tribes. Grant award based on specific projects as they are identified.
	Community Action for a Renewed Environment	Environmental Protection Administration	Fund the removal or reduction of toxic pollution (e.g., storm water).	Competitive grant program. Grant award based on specific projects as they are identified.
	Community Assistance Program – State Support Element	FEMA	Provides funding to States to provide TA to communities in NFIP	
Quileute Tribe	General Fund	Department specific	Program operations and specific projects.	Limited availability.
Washington State	Fish Passage Culvert Replacement Program	Department of Transportation	Transportation Culvert Fund	Limited Funding, must be on list of identified culverts

Federal Transportation Funding Programs

- 100% Federal Share For Safety ("G" Matching Ratio)
- Advance Construction
- Bicycle Transportation and Pedestrian Walkways
- Bond Issue Projects
- Bridge Discretionary Program
- Credit Assistance For Surface Transportation Projects
- Defense Access Roads
- Demonstration, Priority, and Special Interest Projects Designated By Congress
- Disadvantaged Business Enterprise Supportive Services (DBE/SS)
- Disadvantaged Business Enterprises
- Emergency Relief Program
- Equity Bonus (Formerly Minimum Guarantee)
- Excess Funds And Funds For Inactive Projects
- High Priority Projects (HPPs) Program
- High Risk Rural Roads Program (HRRP)
- Highway Bridge Program (HBP)
- Highway Safety Improvement Program (HSIP)
- Highways For LIFE
- Indian Reservation Roads (IRR)
- Indian Reservation Roads Bridge Program (IRRBP)
- Innovative Bridge Research And Deployment (IBRD) Program
- Local Technical Assistance Program (LTAP)
- National Corridor Infrastructure Improvement Program (NCIIP)
- National Highway Institute
- National Scenic Byways Program
- On-The-Job Training Supportive Services
- On-The-Job Training
- Operation Lifesaver
- Park Roads and Parkways Program
- Public Lands Highways - Discretionary and Forest Highways
- Recreational Trails Program (RTP)
- Refuge Roads Program
- STP Set Aside For Transportation Enhancements
- STP Set-Aside For Safety Improvements
- Safe Routes To School
- Safety Incentives To Prevent Operation Of Motor Vehicles By Intoxicated Persons
- Seismic Research Program
- Sliding Scale Rates
- State Highway Safety Data Improvement Grants
- State Infrastructure Banks (SIB) Pilot Program (2005)
- State Planning And Research (SPR)
- Surface Transportation Environment And Planning Cooperative Research Program
- Surface Transportation Program (STP)
- Surface Transportation Research Strategic Planning
- Surface Transportation Research, Development, And Deployment
- Timber Bridge Research And Demonstration
- Transportation Improvements (TIs)
- Transportation, Community, and System Preservation Program