2020 Tribal Multi-Hazard Mitigation Plan

Prepared for

The Confederated Tribes of Siletz Indians

"Siletz Tribe"

Funded by

The Confederated Tribes of Siletz Indians

Prepared by

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Cover photo:

Siletz Tribal Members ca. 1912

FEMA-

Each element within this planning document serve to guide through the MHMP process as it follows FEMA guidelines. The sections in this plan are organized as follows:

- Element A: Planning Process
- Element B: Hazard Identification and Risk Assessment
- Element C: Mitigation Strategy
- Element D: Plan Updates
- Element E: Assurances and Plan Adoption

Acknowledgements and Executive Summary

This mitigation plan was developed solely by the Confederated Tribes of the Siletz Indians. The Federal Emergency Management Agency (FEMA) provided no funding for this document. State of Oregon employees from DOGAMI, State Hazard Mapping, and Matt Williams, alongside FEMA Region X office provided technical support throughout the process. Amanda Siok and others at FEMA were instrumental in initial planning and formation of a Steering Committee and to instruct Tribal Employees in the planning process. This valuable information helped the Tribe develop a plan that would meet Federal mandates established by the Stafford Act.

Many people contributed to this plan and to the creation of the following document. Many community and Tribal Employee hours were given to reach Tribal Membership and gain an understanding of what the Tribal Communities needs were and are. The following list is not meant to be entirely inclusive to the many people who helped with this plan.

The final plan was created primarily by the Confederated Tribes of Siletz Indians Planning department. The following people had an important role in creation of this document:

Ian Keene- GIS Analyst/Research Planner – Ian Keene is the primary author and project manager of this document. Ian Keene performed the research, data, and document collection and review, map creation, field research, and compilation of the information for this plan. He also served as the GIS Analyst/DOGAMI and FEMA Point of Contact/Photographer/and Final Editor for the plan.

Michael Gallagher- Environmental Planner – Michael provided valuable property information along with contributions to portions of the final document, particularly in the editing and writing process with important Environmental perspectives on capacity of the Tribal Planning process and departmental knowledge with NEPA and federal environmental guidance.

Bonnie Peterson- as Assistant General Manager, Bonnie assembled the Steering Committee, met initially with personnel to guide the process of the team working with the FEMA personnel and process, attended meetings, appointed additional members, and administered some of the Steering Committee meetings.

Pam Barlow-Lind- Tribal Planner- Pam leads the Planning Department, and provides endless knowledge and editing expertise in documentation and historical and timely processes for plan creation and is an endless source of inspiration. Pam helped guide the authors and the planning process throughout.

Max Hoover- Public Works Supervisor- Max provided expertise on many historical events, as well as being an active Steering Committee member. Max provided insight in to past events and instrumental understanding of municipal systems and utilities that are inherently important to the Tribe.

Eli Grove- Emergency Preparedness Coordinator- Eli provided hours of community outreach and planning for natural hazards since his hiring in 2018. He was an active member of the Steering Committee, headed the Emergency Planning Committee, and contributed greatly to getting Tribal Membership input throughout the planning process. Eli regularly presented findings to Tribal Council and Department Managers through his ongoing training in Emergency Preparedness and Response work, and outreach.

Cherity Bloom-Miller- As a Steering Committee member, Cherity participated in many meetings providing knowledge of human health issues, public outreach, concerns regarding families in the hazard areas, and a myriad of additional insights in to the importance of a community being prepared.

RC Mock- As then Siletz Valley Fire Chief, RC provided emergency preparedness expertise and first responder insight in to the many issues that surround being prepared for fire.

April Middaugh- April provided continual administrative support to planning processes and was an active Steering Committee member. April participated in FEMA trainings and kept meeting minutes.

Glen Sakamura- IS Department- Glen provided many hours of effort of mitigation planning for the Tribe. He provided great effort in order to train and implement emergency protocols for various departments and Tribal personnel. Glen was an active member of the Steering Committee and was part of the FEMA regional training process and participated with Region X personnel at FEMA trainings. He provided the steering committee with many details of the trainings he attended as well.

Brenda Bremner, General Manager – Brenda contributed in the guiding, administrative, and final editing process.

ELEMENT A: PLANNING

Overall Intent: A successful planning process involves bringing tribal members, such as tribal leaders, tribal elders, and other partners together to discuss their knowledge, their perception of risk, and how to meet their needs as part of the process. This inclusive process works within the traditions, culture, and methods most suitable to a tribal government, so that participants better understand the unique vulnerabilities to the tribal planning area[6] and can develop relevant mitigation actions.

FEMA recognizes that public participation may be different for each tribal government. Leadership (including elders and cultural leaders), staffing, and in-house expertise in the tribal government may fluctuate over time. The planning process description serves as a permanent record that explains how decisions were reached. This planning process description documents that the plan was developed with input from tribal members and other partners. Leaders can rely on this documentation to continue to make decisions in a pre-and post-disaster environment to decrease vulnerability to hazards. Documentation of the current planning process is required for both new and updated plans. - FEMA

Executive Summary:

The purpose of the Confederated Tribes of the Siletz Indians (CTSI) Multi-Hazard Mitigation Plan (MHMP) is to guide current and future efforts to effectively and efficiently mitigate natural hazards on all CTSI Reservation lands, in coordination with other jurisdictions as appropriate, to mitigate and respond to natural hazards that are generated off the reservation lands, and tribally owned fee lands, or that cross these boundaries.

The Confederated Tribes of Siletz Indians finds that natural hazards on the Tribal lands have a direct, serious, and substantial effect on the political integrity, economic security, health, and welfare of the Tribal lands, its members, and all persons present on Tribal lands. Further, CTSI finds that those activities that potentially increase the frequency or severity of damages from natural hazards, if left unaddressed, could cause such damages. Accordingly, the Confederated Tribes of Siletz Indians Administration and

Tribal Council, Planning Department, Human Resources Department (HR), and Natural Resources Department (NR) helped develop this update to the MHMP for the Siletz Tribe.

The goals of the CTSI MHMP are to:

1. Increase Tribal and community members' knowledge of natural hazards;

2. Reduce the threats to public health and safety posed by natural hazards;

3. Reduce structural damages caused by natural hazards;

4. Reduce the environmental impacts of natural hazards, mitigation actions, and future development activities;

5. Increase the effectiveness of mitigation actions; and

6. Reduce the long term costs resulting from natural hazards and their mitigation.

The objectives of the MHMP are the following:

1. Ensure that development occurs in such a way that the risk is minimized in areas that are vulnerable to natural hazards;

2. Protect or alter existing development in hazardous areas to make it less susceptible to damage;

3. Ensure that the solution chosen to protect existing development is the most cost-effective available; protects or enhances cultural resources, natural resources, and sensitive terrestrial, riparian, or coastal habitats; and is consistent with applicable land use plans and regulations, codes, and in general, promotes an economically and ecologically sound Tribe.

4. Ensure that the benefits of maintaining existing facilities outweigh their costs; if not, redesign facilities to make them less susceptible to damage or implement some other type of solution at the site;

5. Redesign existing projects and/or change maintenance practices to protect or enhance riparian or coastal habitats;

6. Manage floodplains, rivers, streams, and other water resources for multiple uses, including flood and erosion hazard reduction, fish and wildlife habitat, finfish and shellfish harvesting, open space, recreation, water supply, and cultural/traditional practices;

7. Improve coordination and consistency between CTSI and other jurisdictions, as appropriate, in management activities for floodplain and coastal areas;

8. Increase public awareness of natural hazards and improve appropriate preparation for and response to such hazards; and

9. Improve hazard warning and emergency response systems.

Tribal Multi-Hazard Mitigation Plan

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Tribal Multi-Hazard Mitigation Plan Natural Hazard Section

The Confederated Tribes of Siletz Indians Tribal Multi-Hazard Mitigation Plan (MHMP) has been prepared to guide current and future efforts to effectively and efficiently mitigate natural hazards on the Confederated Tribes of Siletz Indians lands and properties. The MHMP is for the Siletz Indian Reservation, trust and fee lands and other areas of Tribal interest including, but not limited to, its 1855 Coast Reservation Boundary, traditional hunting and fishing areas and all other ceded and non-ceded lands since the inception of the Tribe.

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident. However, hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. The mitigation planning process encourages coordination among tribal authorities and other governmental agencies, tribal members, local residents, businesses, academia, and non-profit groups and promotes their participation in the plan development and implementation process. This broad-based approach enables the development of mitigation actions that are supported by tribal members and other stakeholders and that reflect the needs of the Tribal government as a whole.

This Tribal Multi-Hazard Mitigation Plan establishes goals, lists objectives necessary to achieve the goals, and identifies policies, tools, and actions that will help meet the objectives. These short- and long-term actions will reduce the potential for losses to the Tribe due to natural hazards. This plan is intended to help create a disaster-resistant community by reducing the threat of natural hazards to life, property, emergency response capacities and capabilities, economic stability, and infrastructure, while encouraging the protection and restoration of natural and cultural resources.

The natural hazards that have affected the Confederated Tribes of Siletz Indians in the past and will affect the Tribe in the future include riverine flooding from the Siletz, Yaquina, Salmon, and other Rivers and their tributaries on the Mid Oregon Coast, earthquakes, and severe winter storms including high winds. Landslides and wildfires are also potential hazards. Winter Storms are the most frequent hazard on the Mid-Oregon Coast, and may include flooding, high winds, snow flurries, landslides due to heavy rains, loss of infrastructure and roads due to landslides, and a myriad of effects on the livelihoods of tribal membership through these deleterious effects.

The Confederated Tribes of Siletz Indians Tribal Government published these following Constitutional Objectives:

Upon restoration, the Siletz Indians established a membership and adopted the Constitution of the Confederated Tribes of Siletz Indians. The Constitution symbolizes the incessant desire of the tribal government to alleviate past hardship endured by the Siletz Indians, through spiritual, cultural, social, personal, and economic enhancement, as indicated below:

1. Continue forever, with the help of God, our unique identity as Indians and as the Confederated Tribes of Siletz Indians of Oregon, and to protect that identity from forces that threaten to diminish it;

2. Protect our inherent rights as Indians and as a sovereign Indian tribe;

3. Promote our cultural and religious beliefs and to pass them on in our own way to our children, grandchildren and grandchildren's children forever;

4. Help our members achieve their highest potentials in education, physical and mental health and economic development;

5. Maintain good relationships with other Indian tribes, the United States, the State of Oregon and local governments;

6. Support the Government of the United States and encourage our members to be loyal citizens;

7. Acquire, develop and conserve resources to achieve economic and social self-sufficiency for our tribe;

8. Insure that our people shall live in peace and harmony among themselves and with all other peoples

Goals & Objectives

The goals and objectives for the Multi-Hazard Mitigation Plan for the Confederated Tribes of Siletz Indians were identified in short above, and are elaborated upon below in the form of a planning process and analysis. These goals and objectives were developed to coordinate with the Tribe's aforementioned Constitutional Objectives, as well as coincide from direction of the Administration through the Mission Statement of Administration which reads as follows:

Confederated Tribes of Siletz Indians

It is the mission of the Administration Department to provide administrative support to Tribal Programs and Tribal Government for efficient delivery of programs and services to Tribal Membership and clients.

Responsibilities:

The Administrative Manager oversees Accounting, Fringe Benefits, Information Systems, Public Works Department, Property and Procurement, Facilities and Fleet, and Administrative staff. Duties also include serving as plan administrator and trust officer for the Tribe. The Tribal Government exists to protect its people, property, natural environment, natural resources and economic vitality. The Tribe intends this while upholding its sovereignty, identity, and self-governance. Identifying future projects and programs for the Tribe that, upon implementation, would eliminate, reduce or otherwise mitigate the vulnerability of the Tribe's people, property, natural resources

and economic vitality which may result from impacts of future disasters is the Tribal Governments duty wherever possible. Future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development and helps to promote a disaster resilient community.

Grant Eligibility

Indian Tribal governments with an approved Tribal Mitigation Plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Indian Tribal government coordinates with the State for review of their Tribal Mitigation Plan, then the Indian Tribal government also has the option to apply as a sub-grantee through a State or another tribe. A grantee is an entity such as a State, territory, or Indian Tribal government to which a grant is awarded and that is accountable for the funds provided. A sub-grantee is an entity, such as a community, local, or Indian Tribal government; State-recognized tribe; or a private nonprofit organization to which a sub-grant is awarded and that is accountable to the grantee for use of the funds provided.

If the Indian Tribal government is eligible as a grantee or sub-grantee because it has an approved Tribal Mitigation Plan and has coordinated with the State for review, it can decide which option it wants to take on a case-by-case basis with respect to each Presidential Disaster Declaration, and for each grant program under a Declaration, but not on a project-by-project basis within a grant program. For example, an Indian Tribal government can participate as a sub-grantee for Public Assistance (PA), and also as a grantee for the Hazard Mitigation Grant Program (HMGP) under the same Declaration. However, the Indian Tribal government would not be able to request grantee status under HMGP for one HMGP project, then request sub-grantee status for another HMGP project under the same Declaration. - FEMA Tribal Multi-Hazard Mitigation Planning Guidance

Under the Stafford Act and the National Flood Insurance Act, Indian Tribal governments must have an approved, adopted Tribal Mitigation Plan to meet the eligibility requirements types of assistance, which may differ depending on whether the Indian Tribal government intends to apply as a grantee or sub-grantee, as outlined in the following table.

Purpose

Mitigation Planning is the process used by tribal, state, and local government leaders to understand risks from natural hazards and to develop long-term strategies to reduce the impacts of future events on people, property, and the environment. The purpose of this Tribal Mitigation Plan Review Guide (or Guide) is to help the Federal Emergency Management Agency (FEMA) assess tribal governments' mitigation plans in a fair and consistent manner and to ensure that approved tribal mitigation plans meet the requirements of the Stafford Act and Title 44 of the Code of Federal Regulations (CFR).1 Specifically, the Stafford Act requires states, tribes, territories, and local governments to develop and adopt FEMA-approved hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance. (See Section 1.5, Eligibility for FEMA Assistance).

Interpreting requirements for enhanced tribal mitigation plans. Enhanced tribal mitigation plans document a sustained and proven commitment to hazard mitigation and result in eligibility for increased funding under the Hazard Mitigation Grant Program. The regulations in 44 CFR Section 201.3 allow for tribal governments to pursue enhanced mitigation plan status by meeting the state requirements for enhanced plans established in 44 CFR Section 201.5. The intent of this MHMP is for the Confederated Tribes of Siletz Indians to obtain FEMA funding for various mitigation activities.

-FEMA

Small, impoverished communities are eligible for up to a 90 percent Federal cost share for their mitigation planning and project sub-applications in accordance with the Stafford Act. A small, impoverished community must:

Be a community of 3,000 (Siletz is currently shown at 1,278 (American Fact Finder data 2018) with 741 Tribal Members residing in Siletz and 1,242 residing in Lincoln County) or fewer individuals identified by the State as a rural community that is not a remote area within the corporate boundaries of a larger city

Be economically disadvantaged, with residents having an average per capita annual income not exceeding 80 percent of the national per capita income, based on best available data. For the most current information, go to the Bureau of Economic Analysis website at https://www.bea.gov

Have a local unemployment rate that exceeds by 1 percentage point or more the most recently reported, average yearly national unemployment rate. For the most current information, go to the Bureau of Labor Statistics website at https://www.bls.gov/eag/eag.us.htm

Meet other criteria required by the Applicant in which the community is located.

Native American Tribal governments meeting the definition of a small, impoverished community that apply to FEMA directly as Applicants are eligible for a 90 percent Federal cost share for their planning, project, and management costs subapplications, which make up their overall PDM grant application. Applicants and subapplicants who

apply as an impoverished community must request the Federal cost share amount up to 90 percent in the Cost Share section of their planning, project, and management costs subapplication(s). Applicants must certify small, impoverished community status and provide documentation with the subapplication(s) to justify up to a 90 percent Federal cost share. If documentation is not submitted with the subapplication, then FEMA will provide no more than 75 percent Federal cost share of the total eligible costs. For insular areas, including American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands, FEMA automatically waives the non-Federal cost share when the non-Federal cost share for the entire grant is under $200,000. If the non-Federal cost share for the entire grant is $200,000 or greater, FEMA may waive all or part of the cost share. If FEMA does not waive the cost share, the insular area must pay the entire non-Federal cost-share amount, not only the amount over $200,000. More detailed information is provided in Part III, C, Cost Sharing, of the HMA Guidance, available on the FEMA website at https://www.fema.gov/media-library/assets/documents/103279.

1. Introduction to Tribal Mitigation Planning

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Adoption

The Confederated Tribes of Siletz Tribal Council previously formally adopted the Confederated Tribes of Siletz Tribal Multi-Hazard Mitigation Plan in 2009 as Resolution 2009- 357.

The Resolution adopting the current plan will be attached to said document and filed in Tribal Council records and with Legal, Planning, and Central Administration Departments respectively.

Assurances

The Confederated Tribes of Siletz Indian Tribe assures that it will continue to comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The Tribe will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes as required in 44 CFR 13.11(d).

Organization of the Plan

The Confederated Tribes of Siletz Tribal MHMP is divided into eight sections plus appendices:

- Section 1 is this introduction and Executive Summary;
- Section 2 describes how the Tribal MHMP was prepared including the planning process and public involvement;
- Section 3 describes the land use, socioeconomic conditions, and physical characteristics of the Confederated Tribes of Siletz Tribe's 1855 Reservation Boundary, CTSI properties in Lincoln County and the surrounding area;
- Section 4 presents an assessment of hazard risks to Confederated Tribes of Siletz Tribal Lands;
- Section 5 presents the Confederated Tribes of Siletz Tribe's mitigation strategy;
- Section 6 describes the Tribal MHMP maintenance process;

• Section 7 describes the Tribe's Repetitive Loss Plan (in development).

The references cited in this plan are footnoted and any additional references are listed in Section 8.

Additional materials, such as Resolutions adopting the plan, meeting notes and survey results are located in the Appendices.

2. Planning Process

This section will discuss the planning process used to develop the Confederated Tribes of Siletz Multi-Hazard Mitigation Plan.

The planning process is an extremely important aspect in the development of a hazard mitigation plan. It is crucial for the success of the plan to have the public ask questions and comment on the plan. Involving the public in the planning process is necessary and it increases the public's awareness of the hazards affecting the Confederated Tribes of Siletz Tribal Members, buildings and properties, Tribal and Culturally significant areas, and also informs them about the importance of natural hazard mitigation planning. Having public involvement in the planning process also allows the plan to reflect the public's views and opinions. The Confederated Tribes of Siletz Tribe defines "public" as its Tribal Membership, Tribal Government and employees. The majority of the surrounding local communities such as Siletz, Newport, Depoe Bay, Lincoln city, and Waldport are all a part of CTSI's community, and vice versa. Lincoln County, and the State of Oregon both also have hazard mitigation plans. Federal agencies, and relevant non-government organizations have adopted the both national, regional, and State of Oregon mitigation plans. The Tribe maintains final authority on decision making related to this Plan.

The following sections will detail who was responsible for developing and producing the plan, and other associated activities such as coordinating the planning process; a

listing of participating departments and agencies; and a timeline of the plan development process, dating back to 2004, the Siletz Tribe has had Multi-Hazard Mitigation Plans approved by FEMA on a continual basis and ending with the adoption of the Tribal MHMP by the Confederated Tribes of Siletz Tribal Council and Final FEMA approval. This section will also discuss opportunities the Public was given to comment and give suggestions on the Plan during development.

Plan Preparation

Plan preparation was led by the Confederated Tribes of Siletz Tribe's Planning Department and specifically, Ian Keene, GIS Analyst/Research Planner, Pam Barlow-Lind, Tribal Planner, General Manager Brenda Bremner and Central Administration, and the Tribe's Legal Department with assistance from both a Steering Committee (CTSI Personnel and Local First Responders including Fire Chief RC Mock and emergency personnel, and with FEMA experts from National, Regional, and State offices with experience in developing tribal hazard mitigation plans. The Planning Department led in the drafting of the Plan and worked with the Tribe in preparing the different components and meeting FEMA requirements necessary for a successful and approved Plan.

The Tribe decided to hire an emergency planning coordinator to assist with the development of the Plan and to do public outreach for the last year in late 2018. The Tribe selected a trainee in winter of 2018. Planning began in May of 2018 with an initial completion date of October of 2018. This date was later moved up to October 2019 due to outreach requirements and other necessary timelines to follow to allow for public input and for research and planning time. Later this date was extended out to include more a detailed building inventory and hazard assessment, as well as additional public comment and to provide the emergency planning coordinator position to attend

training, conferences, and outreach events, both for the Tribal Administration, and for Tribal outreach to members and the community.

Internally the Tribe put together a Multi-Hazard Mitigation Plan Steering Committee (listed below). In addition the Steering Committee, the Tribe selected an Emergency Planning Committee that met and communicated to discuss various components of the Plan as well as gather data and planning documents and to review the Plan.

A first draft of the Plan was submitted by Ian Keene for review internally to the Tribal Planner. A final draft was submitted to both the General Manager Brenda Bremner and Tribal Council in October 2019.

The Steering Committee met throughout 2018-2019

A Final draft that included most current data on tribal buildings and inventory was prepared and submitted to the Confederated Tribes of Siletz Multi-Hazard Steering Committee by the Planning Department and GIS Analyst Ian Keene on October 11th, 2019.

The Plan was distributed internally within the Tribal government for comment with the comment period ending December 1st 2019. The Steering Committee will meet on November 5th 2019 to discuss comments and corrections to the draft plan.

The Committee will vote whether to recommend the Plan and chose to move forward on submitting the Plan to FEMA for review. A public review period was provided during October-November of 2019, and a 30 day comment period during November was advertised in the newspaper. After the conclusion of the comment period, the Tribe moved to have the Tribal Council formally adopt the Plan. Comments and corrections will be sent to the Planning Department to prepare a final draft for FEMA and Public review as well as Council adoption.

GIS and Hazard Mapping Data

The Tribe's GIS Research Analyst and Planner, Ian Keene, alongside the Tribal Planner, Pam Barlow-Lind, with effective direction from Tribal Council and the General Manager, Brenda Bremner, gathered hazards data to better identify exposure and vulnerability to tribal lands and structures. The data was analyzed for discussion and maps were created for the Risk Assessment. Flood inundation data from the Tribe's administration and reservation areas in and around Siletz and FEMA Floodplain data was provided by the Tribe. Other hazards data including Wildfire Risk, Past Wildfires, and Locations of Past Landslides, were gathered online from the Oregon Geospatial Enterprise Office and the Oregon Department of Forestry. Winter storm data, both geospatial and tabular, were gathered from Oregon State University, the National Oceanic and Atmospheric Administration, and more. The Planning Department updated GIS databases of tribal lands and properties, current to November 2019, and tribal buildings and infrastructure, are also current to November 2019.

Plan Participation

The planning process was led by the Confederated Tribes of Siletz Tribal Multi-Hazard Mitigation Planning Steering Committee, Planning Department, Emergency Planning Committee, FEMA Representative Amanda Siok, and led in the formulation of goals and objectives through conducting meetings with Tribal Membership and Tribal Council; identification of hazards and past events; and the identification of Mitigation Actions from the Tribe's previous plans, with ultimate approval resting upon the Confederated Tribes of Siletz Tribal Council and General Manager Brenda Bremner. Efforts to include broad public participation included the development of community surveys, formation of an external stakeholder outreach effort, site tours with tribal staff, meetings with tribal, county and state officials, and informal discussions amongst tribal

staff and membership. Emergency Management Personnel and Planning Department personnel attended Tribal Council Meetings, performed public outreach, and attended conferences. Planning Department personnel attended the Oregon Tsunami annual conference, Infrastructure and transportation conferences, and participated in FEMA webinars and trainings. The Emergency Planning Coordinator sent out surveys through the mail to the entirety of Tribal Membership to inform and ask for feedback on the MHMP, as well as selecting critical assets for the Tribe. Tribal personnel attended annual Tribal Enrollment meetings to inform Tribal Membership of the MHMP.

Geospatial and Environmental Planning

Future Land Use and Capacity Building

The Confederated Tribes of Siletz Tribe is committed to expanding its land holdings, developing affordable housing that is consistent with goals of sustainability, and government services for its Tribal members. The Siletz Tribe is always pursuing developing its business enterprises, all done with a consideration of the impact natural hazards will have on this continued development, and what role the Tribe has environmentally, always pursuing sustainability, ecological, and social justice.

The Tribe is committed to developing outside of hazard areas. When not possible to develop outside of hazard areas, the Tribe will implement mitigation measures, such as building to or exceeding the highest building code standards, or reducing wildfire fuel loads near structures that will minimize the vulnerability of that development. Where possible and applicable, each hazard section will discuss future land use in relation to that hazard. The Siletz Tribe adopted the 2012 International Building Codes and support Codes for all construction on Sept. 16, 2011. The resolution including the support codes is listed as Tribal Council Resolution 2011-302. That is a minimum code requirement. In some cases the State of Oregon Residential Code and State of Oregon

Structural Code is more specific to higher structural standards then the International Code. For instance when we have buildings designed, we have to comply with the seismic zone D2 and wind load of 110 mph in Lincoln County, both are higher than the valley ratings like Polk, Marion, Yamhill and Linn counties for example.

Environmental Planning

CTSI's current Environmental Planning and Realty, Environmental Protection, Land Use –Transportation-Engineering, Natural Resources, Housing, Cultural, and Legal department specialists are holistically integrated in many practical ways to provide life-cycle support for Tribal actions involving a wide range of environmental concerns and programs. The Tribe's staff is well versed and skilled in the following topics, guidance, and activities that are important to Emergency Preparedness:

- Long-term to short-term/project specific planning for Tribal housing, transportation, roads, natural and cultural resources preservation/protection, and economic development.
- Extensive public and agency engagement, often considering a wide range of sensitive issues
- Plan development and implementation
- Indian Housing Plan
- Siletz Tribal Transit Services
- Siletz Tribe Comprehensive Plan/Planning
- Several plans related to transportation services (such as the Siletz Tribal Transit Services, Siletz Reservation Transportation Improvement Program, Indian Reservation Road Transportation Program, etc.)

- Forest Resource Management Plan
- Construction and engineering project development, contracting and oversight contract
- Property (land, structures, infrastructure) acquisition and management
- Environment Management
- National Environmental Policy Act (NEPA)
- Extensive staff experience managing or disciplinary specialist/preparing successful Categorical Exclusions, Environmental Assessments, Environmental Impact Statements, and support documents involving, e.g. but not limited to:
- Interagency coordination
- U.S. Entities -Federal Highway Administration U.S. Department of Transportation (Federal Highways Administration, Federal Transit Administration, Federal Aviation Administration, Federal Rail Administration), U.S. Army Corps of Engineers, U.S. Department of Agriculture (U.S. Forest Service, Natural Resources Conservation Service, Rural Housing Service, Rural Utilities Service), U.S. Department of Interior (Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation; U.S. Department of Commerce (National Oceanic and Atmospheric Administration); U.S. Department of Defense (Air Force, Army .
- Oregon Entities - Oregon Department of Transportation, Oregon State Historic Preservation Office, Department of Land Conservation and Development, Military Department, Department of State Lands, Department of Fish and Wildlife

- Local jurisdictions: To some level with all jurisdictions within the Tribes Ancestral Homelands, and extensively within its historic 1855 Siletz Coast Reservation area.

- Subject Features: Housing, transportation facilities (roads/bridges, railroads), resource use/harvesting, manufacturing, clean up (small site to large Superfund areas), power-generation, water reservoirs, stormwater facilities, wastewater treatment facilities, mineral extraction, timber harvest, conservation areas, etc.

- Environmental Protection Oversight Programs for Specific Topics (Participant in):

- Pacific Northwest Tribal Climate Change Network

- Portland Harbor Superfund Site Cleanup Stakeholders

- Upper Willamette River Conservation and Recovery Plan For Chinook Salmon and Steelhead.

- Key Permitting/Compliance Support particularly for projects in Oregon's designated Coastal Zone, e.g, (but not limited to):

- Federal Coastal Zone Management Act

- Oregon Land Use Planning Goals (not applicable if Federal (Indian) Trust Land), especially Goals 1-Citizens Involvement, Goal 7- Areas Subject to Natural Hazards, Goal 99 – Economic Development, Goal 10 – Housing, Goal 11 Public Facilities and Services, Goal 12 Transportation, and coastal goals 16 – 19, Estuarine Resources, Coastal Shorelands, Beaches and Dune, and Ocean Resources.

- Contamination and Toxic Substances

- Endangered Species Act
- National Historic Preservation Act, Section 106
- Floodplain Management, Executive Order 11988
- Estuarine Areas Executive Order 11190

https://www.archives.gov/federal-register/codification/executive-order/11190.html

- Wetlands – Oregon Removal-Fill Law (ORS 196.795-990); Federal Clean Water Act Section 404 Permit

Property/Realty Acquisition and Management

Various Tribal departments and associated Tribal entities such as the Siletz Tribe's Chinook Winds Casino and Resort, Siletz Tribal Business Council seek property to meet their land-based, economic and community goals.

Generally, the Tribe's Environmental Planner (EP) is responsible for conducting the basic footwork related to the Tribe's property acquisition process. Nonetheless, the EP coordinates extensively with other Tribal employees and consultants as needed when considering the range of each property's potential uses and the Tribal staff who would be engaged in realizing those uses should the property be acquired. As the acquisition study process advances, more close coordination between the Tribe's Housing, Public Works, Legal, financial/accounting, planning and administrative staff and Tribal Council likely occurs.

The Environmental Planner typically leads the process of:

- Monitoring property availability
- Conducting suitability research and reporting

- Initial property inspection to assess its opportunities and constraints
- Documentary background research and initial field inspections for cultural resources presence/absence and need for further research by federally and state-qualified archaeologists and/or historic built-environment professionals
- Developing and overseeing necessary cultural resource contracting; conducting contract product sufficiency assessments
- Initial online investigations regarding a wide range of environmental concerns
- Seeking, securing, and either overseeing staff support and/or managing needed contracts regarding, but not limited to:
- Cultural resources
- Land survey
- Title search
- Phase I Environmental Site Assessment
- Natural resource surveys
- Transportation planning support

Basic design schematics of potential uses

The Environmental Planner then Prepares a Property Evaluations to facilitate the Tribal Council's review and support their acquisition decisions.

- Facilitating finance packaging as needed
- Property Transfer recordation(s) with the County and if appropriate with the BIA should the property be proposed for or in federal Trust status.

Steering Committee/Emergency Planning Committee

The Emergency Planning Committee was composed of representatives from the Legal Department, Tribal Administration, the Health Clinic, Risk Management, GIS and tribal membership. See Table 2-1 for a list of members on the Committee.

Table 2-1: Confederated Tribes of Siletz Tribal MHMP Steering Committee

*Name/Title/Department

Ian Keene

GIS Research Analyst and Planner

Planning Department

Pam Barlow-Lind

Tribal Planner

Planning Department

Art Fisher, J.D.

General Legal Counsel

Legal

Max Hoover

Public Works Department Supervisor

April Middaugh

Administrative Assistant

Administration

Eli Grove

Emergency Preparedness Coordinator Trainee

Administration

Bonnie Peterson

Assistant General Manager

Outside Agency

RC Mock

Past Siletz Valley Fire Chief

Outside Agency

Alison McGrath

Siletz Valley Fire

Emergency Planning Committee

Eli Grove

Max Hoover

Jenifier Leakes

Bonnie Petersen

April Middaugh

Ian Keene

Cherity Bloom-Miller

The Confederated Tribes of Siletz Indians Tribal Council

Reggie Butler Sr.

Lillie Butler

Alfred "Bud" Lane III

Angela Ramirez

Loraine Butler

Delores Pigsley

Gloria Ingle

Robert Kentta

Tribal Membership Participation

A great effort was made to gain participation and input from the Confederated Tribes of Siletz Tribal membership. Many tribal staff are also Tribal members, and many were able to participate in either the Emergency Planning Committee, the Steering Committee, or in meetings for enrollment, planning, and Tribal Council. Other efforts include notification about the plan and other emergency preparedness efforts in the CTSI tribal newsletter, as well as information, the draft plan, mail outs to Tribal Membership, and the comment period at the Siletz Library, Administration Buildings, and on the tribal website. http://www.ctsi.nsn.us/

Local and Regional Participation

The Tribe also invited local and regional partners to participate in the comment period as well as Tribal Personnel participating in local and regional basecamp and mitigation planning. This included tribal representatives from the Emergency Planning Committee as well.

External Stakeholder Participants

Agency

Title

Name

Siletz Valley Fire District

Fire Chief

RC Mock

Region X FEMA Tribal Liason

Erin Ward

Region X FEMA Rep

Amanda Siok

Lincoln County Planning Department

Director

Onno Husing

Oregon Office of Emergency Management

GIS Program Coordinator

Daniel Stoelb

State of Oregon, DOGAMI

Althea Rizzo

Oregon Office of Emergency Management

GIS Manager

Matt Williams GIS and Remote Sensing Section Supervisor

Oregon Department of Geology and Mineral Industries

Oregon Department of Forestry

Lincoln County Unit Forester

Lincoln County Sheriff's Office

Emergency Manager

Virginia Demaris

City of Siletz

Mayor

Willy Worman

Newport Samaritan Hospital Personnel

Siletz Health Clinic Representative

Lincoln Co. Health Services

Administrator

2. Project Timeline

2000-2009: Confederated Tribes of Siletz Tribe finalized our last FEMA MHMP plan in 2009. The first MHMP plan was completed in 2004. The second was completed in 2009 by the Planning Department.

April 2018: Begin project to update previous Siletz Tribal MHMP. Steering Committee members were appointed based upon experience, training, and education. Steering Committee members come from varied backgrounds, and some of the members participated in initial emergency trainings, initial site visits to some locales that had previous mitigation work completed and/or will need mitigation planning to be considered. Along with the Tribe's Assisstant General Manager, Bonnie Peterson, FEMA personnel and the Steering Committee held initial meetings discussing the experience each person had with Natural Hazard Mitigation Planning and with FEMA, and additional relevant information. The group gained insight and met to discuss the Tribe's Mitigation Goals, potential hazard areas, critical issues and work at selecting critical facilities.

Mitigation Activities completed from 2009 Plan include updates to water conservation planning documents, engaging in water and sewer system upgrades on Tribal residential and commercial buildings to be up to a more strenuous level of hazard resilience, land use planning and hazard planning, committing funds to promote hires for emergency planning, outreach, Tribal Member outreach and education concerning natural hazards, and much more. The Siletz Tribe continues to strive for planning excellence and to excel and exceed expectations for hazard resilience and to promote a safer environment, economy, and infrastructure for all Tribal Members and community profiles within the communities that CTSI operates within. The Tribe will continue it's commitment to excellence in all areas of emergency planning and outreach.

March 22, 2018: Confederated Tribes of Siletz Administration and department personnel meet and later form the Steering Committee and Emergency Planning Committee meets to discuss comments and revisions to Plan.

April-August 2018: Initial data gathering, formation of planning committees, development of survey, review of local and regional plans for integration and risk assessment, identification of potential mitigation actions. Identification of critical assets ongoing and decisions made on what stakeholders were chosen to be a part of the plan.

June/July/August 2018: Workgroup Meeting, discussion of hazard issues, critical facilities, review and discussion of mitigation actions, mitigation training for multiple staff members.

April 2018: Draft Plan made available to Public, including External Stakeholders, for review and comment. Plan also submitted to FEMA for pre-review compliance.

May-November, 2018: Tribal staff engages in FEMA training sessions with Region X personnel, and begins updating all GIS/geospatial/data related information for MHMP. DOGAMI, FEMA, and CTSI personnel complete HAZUS analysis of CTSI structures and properties.

July – August, 2018: Internal review and prioritization of Mitigation Goals, Objectives and Actions. Selection of Critical Facilities. August 2018: Mitigation Goals, Objectives and Actions adopted by Tribal Council.

August, 2018: Begin drafting of Plan document.

October, 2019: First draft submitted to Tribe for review. After review, it was determined that a more detailed inventory (including geo-locations) of Tribal structures was needed for the risk assessment to better identify and demonstrate vulnerability to hazards, particularly flooding. Forwarded to Tribal Council for review and adoption.

October 2019: Insurance statement of values was given to Planning Department Staff from Accounting, listing all Tribal structures and values according to insurance policies. The planning department created a GIS database of structures with policy amounts and through HAZUS for analysis and to be included in the risk assessment.

September/October 2019: Final draft submitted to Tribe for internal review and comment. The Plan was distributed internally to members of the Emergency Planning Committee and other Tribal staff for comment.

November 2019- Committee is satisfied with the ongoing Plan and agrees to move forward on submitting the Plan for FEMA review as well as releasing it for public comment. The committee will seek formal adoption of the Plan by the Tribal Council.

Comments were due December 1st 2019.

Emergency Preparedness Coordinator

Trainings Attended From 12/3/18-10/8/19

IS 100, IS 200, IS 700, IS 800	Upcoming
ICS 300	Tsunami Resiliency Work Group (3x)
ICS 400	Storm Ready Community Meeting-Siletz
Oregon Prepared Emergency Conference	Emergency Preparedness Team Meeting
Tribal Emergency Managers Coalition	
Disaster Behavioral Health	
Lincoln County Wildfire Exercise/Simulation	
NW Tribal Public Health Emergency Preparedness Training & Conference	
Electricity & Wildfire Conference	
Statewide Medical Countermeasures Exercise	
Crisis Communication for the Non-PIO	
CTSI Community Clinic Annual Training-Wildfire preparedness, defensible space, evacuations. Go bag training/education.	
CTSI Summer Safety Kickoff-Fire	

Season/Regulated Use.	
Statewide Fuel Planning Workshop.	
Community Recovery Planning AWR-356	
AWR-232 Mass Fatalities Planning & Response for Rural Communities.	
MGT 403 Access & Functional Needs Preparedness Planning for Rural Communities.	
MGT-403 Access & Functional Needs Preparedness Planning for Rural Communities.	
Siletz Community Meeting	
Eugene Community Meeting.	
Salem Community Meeting.	

-Tracy Bailey and Ian Keene attended the Oregon Tsunami Conference

-Pam Barlow –Lind attended many regional Transportation and Infrastructure conferences including the 2018 and 2019 ATNI conferences, National BIA and DOI Conferences, and more

-Max Hoover and Eli Grove attended the Oregon Prepared Conference

-Cherity Bloom-Miller and Eli Grove attended the Oregon Prepared Conference

Program Integration

Every effort was made to integrate this planning process into other Tribal planning processes. The Tribe has a planning portfolio that includes comprehensive planning, transportation water, water planning, and housing plans. The Tribe will integrate this plan into current and future planning efforts such as the yearly budgeting process and in annual reviews by the Committees responsible for this plan. This plan will also be incorporated into the Emergency Operations Plan as it is developed and updated. During the planning process of previous multi-hazard mitigation plans, and in

conjunction with the Steering Committee, and through tribal departments, it was agreed that current and future planning efforts will integrate the Tribal Natural Hazard Mitigation Plan in to the plans that would simultaneously have an effect on one another. Effort will be made so that this Plan will also be integrated into other FEMA programs and initiatives that the Tribe is involved in, such as potential participation in the National Flood Insurance Program or any other mitigation actions that the Tribe would become a part of.

The plans and documents reviewed for integration include:

Tribal Comprehensive Plan

Emergency Operations Plan

Natural Resources Department Plans (Forestry, WWMP, et al.)

This Plan currently has:

No direct Emergency Action Plan for Residential Developments (Siletz, Lincoln City, Salem, Eugene, Portland, et al.

- Emergency Response Plan for Tribal Health Clinic; Gwee Shut Rd.
- Evacuation Procedures for CTSI employees from all Administration Buildings; and
- Emergency Response Plan for Departments within the Chinook Winds Casino.

The Mitigation Plan will be incorporated into the Emergency Operations Plan as the Mitigation component.

The tribal mitigation planning regulations are established in Title 44 Code of Federal Regulations (CFR) §201.7 Tribal Mitigation Plans. In addition, Title 44 CFR §201.3(e)(3) indicates that, "In order to be considered for the increased HMGP funding, the Tribal

Mitigation Plan must meet the Enhanced State Mitigation Plan criteria identified in §201.5." Those Enhanced State Regulations can be found in Title 44 CFR §201.5 Enhanced State Mitigation Plans.

Local

Lincoln County Natural Hazards Mitigation Plan, Revised 2017

https://www.co.lincoln.or.us/planning/page/natural-hazards-mitigation-plan

Lincoln County Community Wildfire Protection Plan, latest update, 2018

https://www.co.lincoln.or.us/planning/page/community-wildfire-protection-plan

State or Oregon Multi-Hazard Mitigation Plan

https://www.oregon.gov/lcd/NH/Pages/Mitigation-Planning.aspx

https://oregonhazardmitigationplan.weebly.com/index.html

https://www.oregon.gov/oem/hazardsprep/Pages/Hazard-Mitigation.aspx

3. Community Profile

Introduction

History and Culture

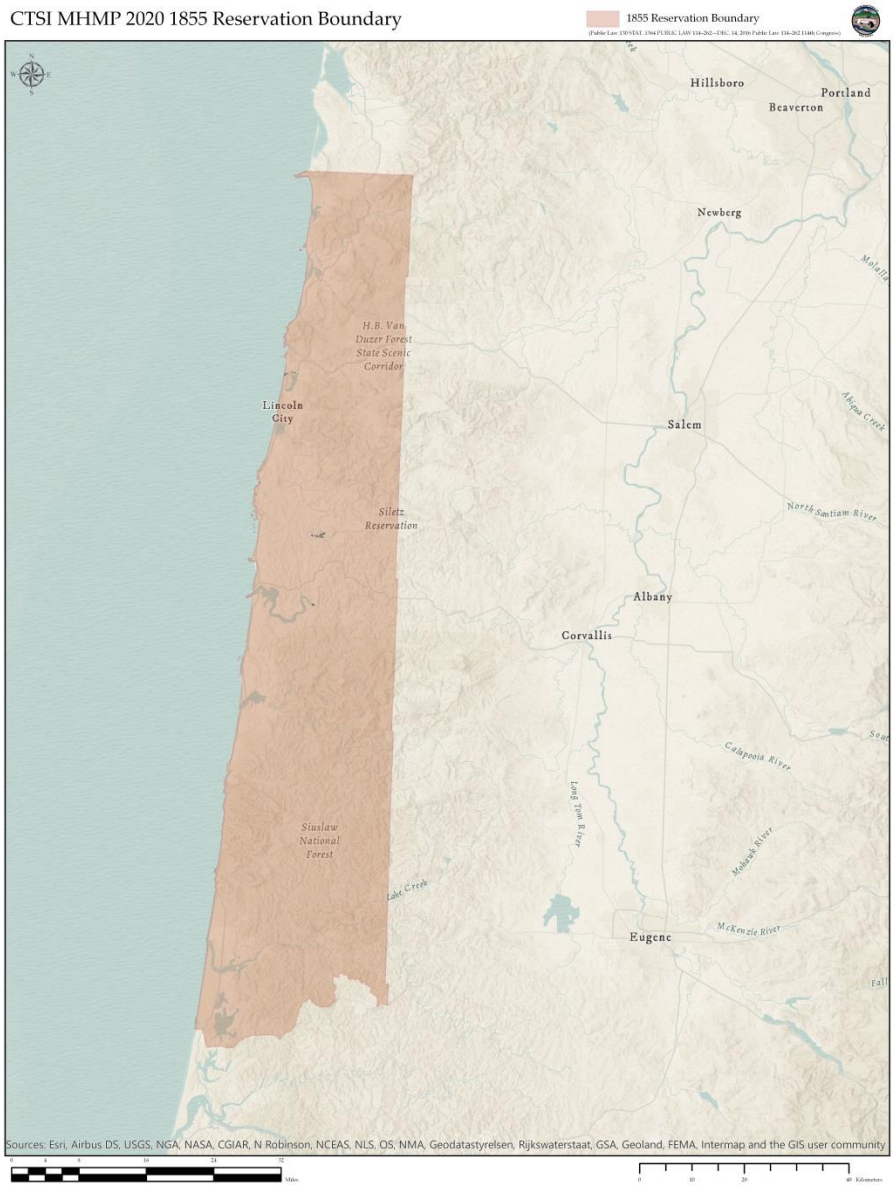
The Confederated Tribes of Siletz is a federally recognized confederation of 27 bands, originating from Northern California to Southern Washington. Termination was imposed upon the Siletz by the United States government in 1955. In November of 1977, we were the first tribe in the state of Oregon and second in the United States to be fully restored to federal recognition. In 1992, our tribe achieved self-governance, which allows us to compact directly with the US Government. This gives us control and accountability over our tribal programs and funding. We occupy and manage a 3,666 acre reservation located in Lincoln County, Oregon. We manage several resources, including water, timber and fish.

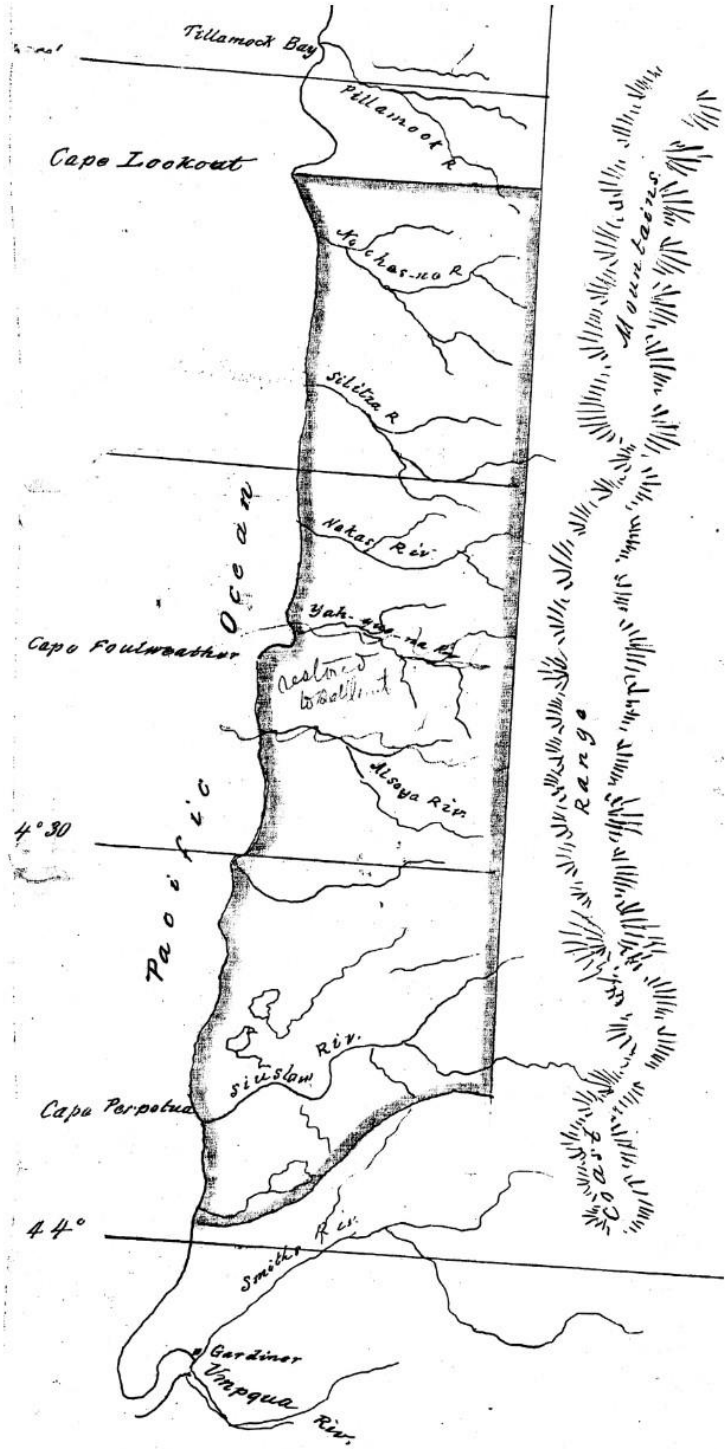
Artifacts and historical documents are stored and displayed at the Siletz Tribal Community (Cultural) Center. Our Cultural Specialist is Robert Kentta and the rest of the Siletz Tribe Culture Department also is housed in the Community Center.

The Confederated Tribes of Siletz Indians is one of nine federally recognized Indian Tribal Governments in the State of Oregon. The Confederated Tribes of Siletz Indians, located in western Oregon, has 5,468 members who are governed by an elected nine member council known as the Tribal Council. The Confederated Tribes of Siletz have a rich history in Western Oregon that reflects hard work, perseverance and the desire to be self-reliant. The Tribal Council consists of nine members elected by the General Council to terms of three years. The Tribal Council shall elect from its membership a Tribal Chairman, Vice Chairman, Secretary and Treasurer. The Tribal Council is empowered to exercise all legislative authority, except that vested in the General

Council, and executive authority of the government, including the right to delegate authorities as it deem appropriate. Said authority shall include, but is not limited to the power to employ legal counsel, the choice of counsel and fixing of fees to be subject to the approval of the Secretary of the Interior; to prevent the sale, disposition, lease or encumbrance of tribal lands, interests in land, or other tribal assets without the consent of the tribe; and to negotiate with the Federal, State and local governments.

See Figure 3-1 for a map of the Tribe's location.





Map drawing from BIA Superintendent Joel Palmer ca. 1854

This section will discuss the geographic and climatic setting of the Tribe's homeland and define and discuss its lands, properties, facilities and infrastructure. This section will also discuss the Tribe's history, demographics and economy. This background information is vital to understanding the Tribe's exposure to natural hazards and its resiliency in mitigating, preparing, responding and recovering from disasters.

Geographic Areas of Interest Tribal Ordinance- Siletz Tribal Code § 7.2

From the Siletz Tribal Code General Purpose of Interest

Statement of Purpose: The Confederated Tribes of Siletz Indians is a federally recognized Indian Tribe (referred to as the "Siletz Tribe" for some purposes) which is comprised of Indian tribes and bands and members of Indian tribes and bands who were settled by the federal government on the "Siletz" or "Coast" Reservation (hereinafter "Siletz Reservation"), from 1855 forward. Those tribes, bands, and persons which were settled on the Siletz Reservation were and are possessed of legal and customary rights of possession and use to those geographic areas in which they historically resided and occupied, in addition to legal rights associated with such tribes', bands' and persons' settlement on the Siletz Reservation. These legal and customary rights arise from many sources including, but not limited to, Anglo-American legal principles. The Siletz Tribe is asserting and will assert these legal and customary rights on behalf of the Tribe and tribal members.

(b) Standard of Interest. The Siletz Tribe has conducted an intensive investigation of the historical and legal circumstances of the Tribe and of the tribes, bands, and persons who make up the Siletz Tribe and its membership. The Siletz Tribe declares its interest in those geographic areas where its investigation has shown a justifiable scientific and/or legal connection to such areas.

Definitions

(a) "Ancestral lands" shall mean the traditional historical area of occupation of an Indian tribe or band, and shall include the terms "ancestral lands," "aboriginal area" or "aboriginal territory," and "ancient tribal lands" or "ancient tribal boundaries."

(b) "Pre-treaty times" shall mean that period of time pre-dating the negotiation of treaties by the federal government with tribes, bands, and other groups of Indians which occupied the lands of western Oregon, northwest California and southwest Washington. For purposes of this Ordinance, pre-treaty times shall be defined as any period of time prior to 1851.

(c) "Occupied" or "occupation" shall mean those lands upon which an Indian tribe, band or group resided upon or used on a permanent, seasonal, or periodic basis. Use of such lands includes regular or sustained use for any societal purpose, including but not limited to residence; hunting, fishing, gathering, or other resource utilization; travel or passage; ecosystem protection or health; culture; religious; and political purposes. It shall not be a negation of occupation of lands under this section if a geographic area was used only on an episodic basis or was not used for years at a time. "Occupation" need not have been exclusive to any specific tribe, band or group of Indians, but must have been of substantial importance to such tribe, band or group.

Governance

Once the Confederated Tribes of Siletz Tribe regained Tribal sovereignty, the Tribe established the Constitution of the Confederated Tribes of Siletz Tribe and a structure of ordinances, charters, and committees to guide their newly regained jurisdiction over Tribal lands, businesses and community members. A nine member elected Tribal Council (“Tribal Council” or “Council”) is the governing authority for the Tribe's

legislative and executive functions. The Board-appointed Chief Judge of the Tribal Court oversees the Tribe's judicial matters. The Staff Attorney oversees all other legal matters for the Tribe. The Tribe also has outside legal counsel.

One of the primary responsibilities of the Tribal Council is to ensure that all of the Tribe's governmental functions are in accordance with Tribal law. Elected by Tribal members at least 18 years of age, Council members serve staggered three year terms. Tribal officers include a Tribal Chairperson, a Vice-Chair, a Secretary and a Treasurer, any of whom can act as a spokesperson for the Tribe and Council. The Tribal Council has authority to establish directives, committees, and advisory appointments when appropriate to conduct Tribal functions. The Tribe has a Council appointed Tribal Administrator (General Manager Brenda Bremner) and appoints this position to run the Tribe's daily affairs. The positions appointed by Council, however, remain under the Council's general authority.

Elected Officials and Special Districts

The Confederated Tribes of Siletz is generally served by local and county services for schools, police, and fire protection and emergency services. The Tribe utilizes local utility providers such as Central Oregon Coast PUD for electrical and some water, City of Siletz for water and sewer services in the City of Siletz, and a myriad of other providers for additional services.

Elected Representation outside of the Tribal Council and Administration:

State of Oregon Governor

The Honorable Kate Brown - Democrat

Congressional District 5,

National:

Senior Senator

Ron Wyden

Democrat

Since Jan 1, 1996

Next Election in 2022

Junior Senator

Jeff Merkley

Democrat

Since Jan 6, 2009

Next Election in 2020

United States Representative in Congress, 5th District

Kurt Schrader - Democrat, Independent

Note these are the representatives for the Tribe's lands within the Siletz, Newport, and Lincoln County area. The Tribe's Usual and Accustomed areas may be served by additional districts and representatives.

3. Geography

The Confederated Tribes of Siletz Tribe current Reservation is located in present day Lincoln County, with current tribal lands centered along the main stem of the Siletz River, with Administration Buildings and Tribal Government also located along the Siletz River in the City of Siletz as well, and communities existing between Siletz, Newport, Toledo, Lincoln City, and timberlands within Lincoln County to the north down to Waldport and beyond in the south and up the Alsea River. Lincoln County is located in Western Oregon and covers an area of 1,194 square miles. Principal industries of the county are travel (primarily tourism), trade, health services and construction. Paper manufacturing and fishing are still important although they contribute proportionally less to the county's employment than they used to. Newport is one of the two major fishing ports of Oregon that ranks in the top twenty nationally of fishing ports by fish landed and processed. Newport has averaged 105 million pounds (48,000 tons) of fish landed in recent years. Newport is home of Oregon State University's Hatfield Marine Science Center, as well as the Oregon Coast Aquarium, and their fleet of ocean-going vessels. It is the federal West Coast hub for NOAA, EPA, and USFWS Pacific Fleet and marine studies. Of the many protected areas within Lincoln County, some include Oregon Islands National Wildlife Refuge, Siletz Bay National Wildlife Refuge, and part of the Siuslaw National Forest. Over 50% of the land area in Lincoln County is owned by the federal government. The US Forest Service and the Bureau of Land Management manage most of these lands, alongside the United States Fish and Wildlife Service managing a significant amount of the Coastal wetland and estuarine environments, including Siletz Bay.

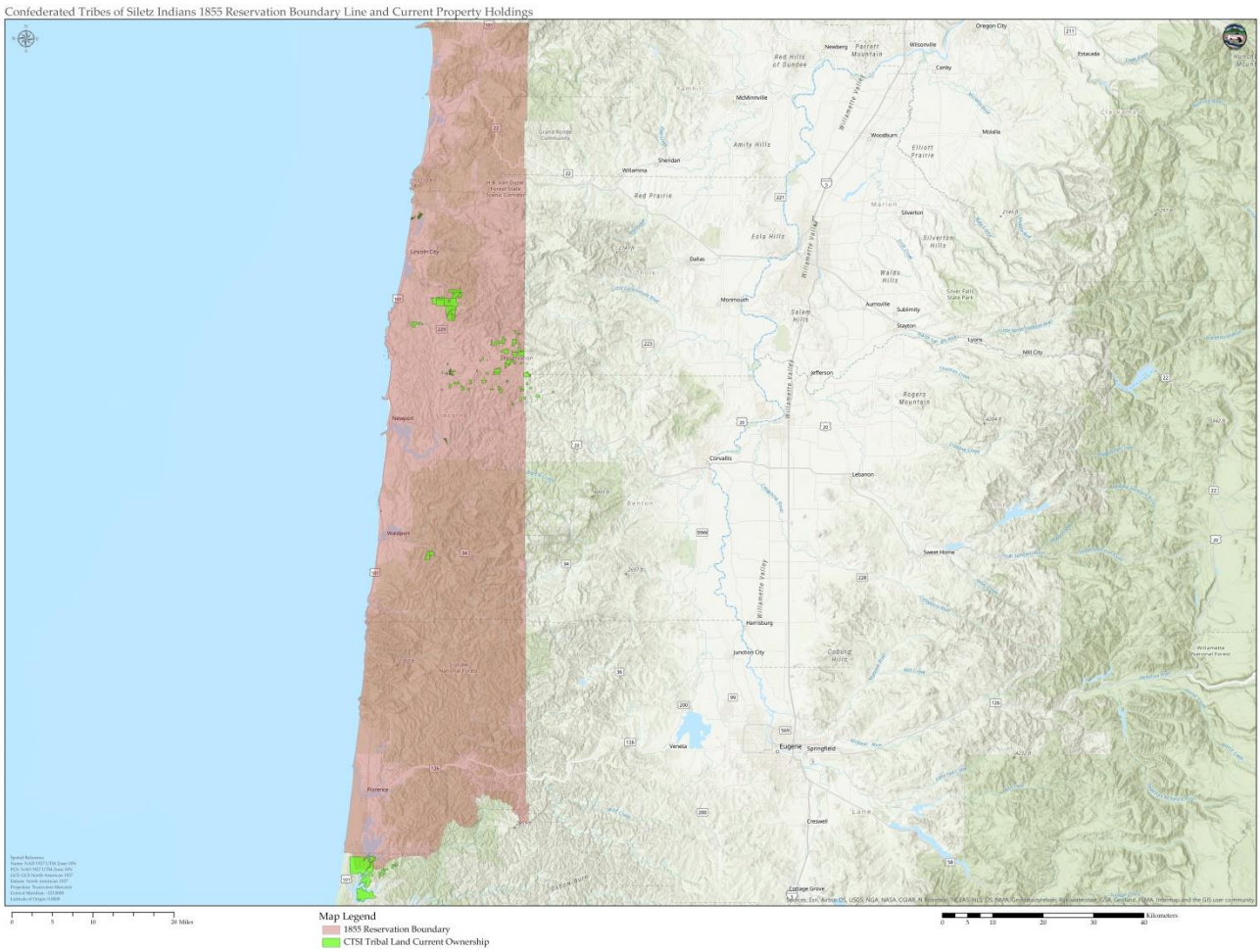


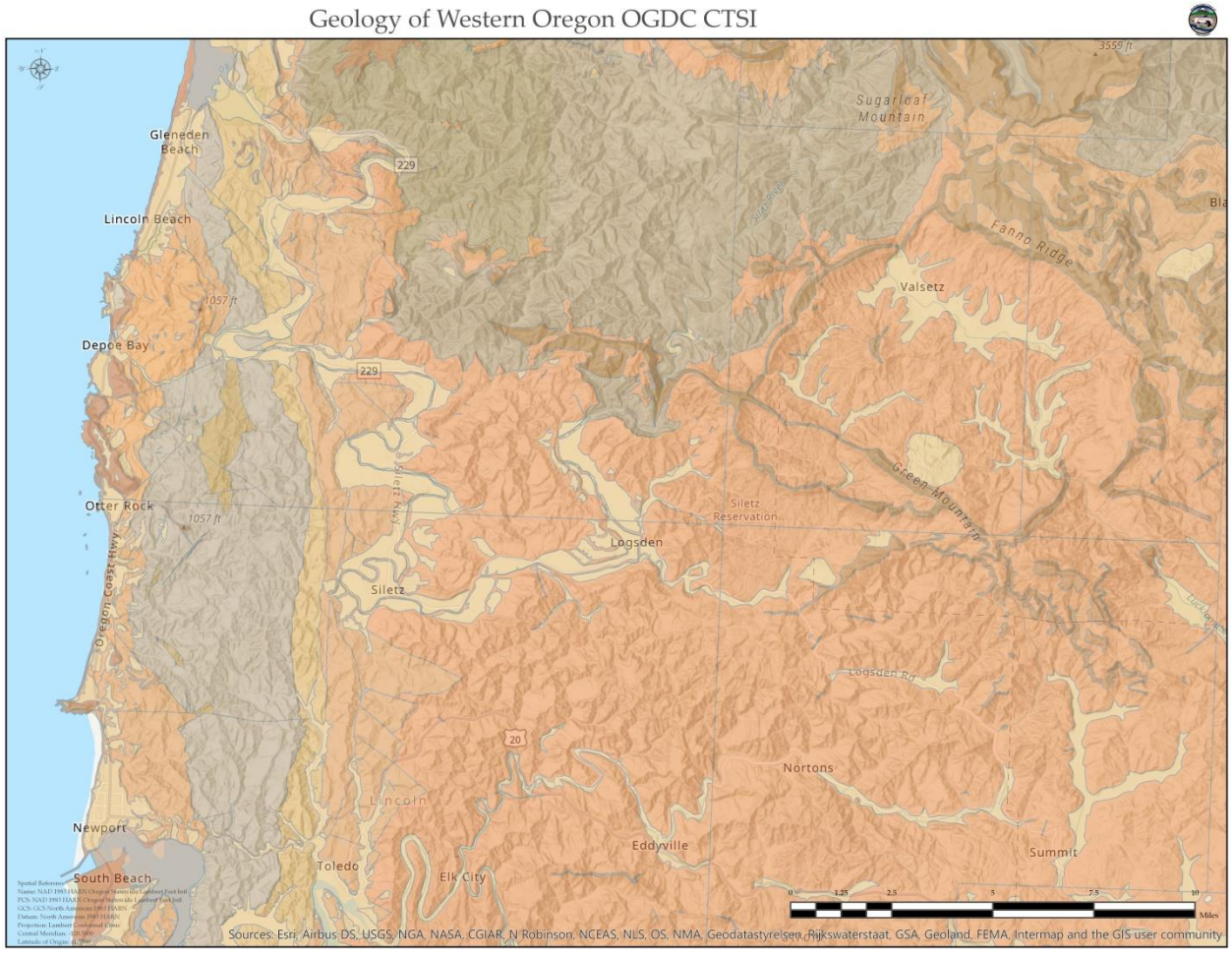
Fig. above Confederated Tribes of Siletz Land Ownership within 1855 Boundary

The Confederated Tribes of Siletz Tribal lands are generally defined as its 1855 Reservation Boundary, which includes part of the Tribe's traditional pre-contact lands, in addition to its Treaty Ceded lands (including Table Rock and southern Oregon Tribal Areas at the mouth of the Illinois and Rogue Rivers, which were defined and ceded in the 1850 era Treaties (including the 1851-1853 treaties, 1855 treaty, et al.) with the United States, and its current Reservation and lands, which are Trust lands and other properties, comprised of parcels mainly in Lincoln County.

Geology

Lincoln County is comprised of five to six major geologic types according to OGDC and DOGAMI geospatial data. Four of the geological types converge near some of the main land holdings in and around Siletz, Newport, and the rest of the Reservation lands in the immediate area. The County wide area shows a larger diversification of geological and land form, parent material, and soil types. See Figures _____

Parent material and Soil maps located on CTSI website and maps attached in appendices. The Natural Resources Conservation Service (NRCS) also provides the Web Soil Survey (WSS), which was completed for this MHMP, and is also available through the CTSI website, or at this locale https://websoilsurvey.nrcs.usda.gov/app/



Minerals and Soils

The soils present in Lincoln County are the acidic and leached products of weathering in a moist temperate maritime climate under mixed species compositions and coniferous forest cover. Sedimentary processes with tectonic events over epochs have formed Siletzia, and other formations along the coastal areas in Lincoln County. "Siletzia is the massive formation of early to middle Eocene epoch marine basalts and interbedded sediments in the forearc of the Cascadia subduction zone; this forms the basement rock under western Oregon and Washington and the southern tip of Vancouver Island.[1] It is now fragmented into the Siletz and Crescent terranes. Siletzia corresponds geographically to the Coast Range Volcanic Province (or Coast Range basalts),but is distinguished from slightly younger basalts that erupted after Siletzia accreted to the continent and they differ in chemical composition. The Siletzia basalts are tholeiitic, a characteristic of mantle-derived magma erupted from a spreading ridge between plates of oceanic crust. The younger basalts are alkalic or calc-alkaline, characteristic of magmas derived from a subduction zone.This change of composition reflects a change from marine to continental volcanism that becomes evident around 48 to 42 Ma (millions of years ago), and is attributed to the accretion of Siletzia against the North American continent.

Various theories have been proposed to account for the volume and diversity of Siletzian magmatism, as well as the approximately 75° of rotation, but the evidence is insufficient to determine Siletzia's origin; the question remains open. The accretion of Siletzia against the North American continent approximately 50 million years ago (contemporaneous with the initiation of the bend in the Hawaiian-Emperor seamount chain) was a major tectonic event associated with a reorganization of the earth's tectonic plates.[8] This is believed to have a caused a shift in the subduction zone, termination of

the Laramide orogeny that was uplifting the Rocky Mountains, and major changes in tectonic and volcanic activity across much of western North America. (Wells)

Much of the montaine soil in Lincoln County is characterized by variable thickness of parent material, moderate to rapid runoff, and moderate to extreme erosion hazard in some locales. Siletz Volcanics and Tyee soil formation along terraces above the riparian zone soils have some area of high to moderate runoff and slight to high erosion potential depending on the steepness of slope and vegetative characteristics. Lowland soils in the Siletz Valley are the products of ongoing accretion and depositional events, adfluvial depositional events, and oceanic deposition events on high wind high water winter storm events. The deep alluvial soils are rich in minerals and Siletz volcanics from from 50 mya provide some consistency to soil formation and loss along the riverscape. (NRCS) The soils that are closer to the coastline have hazard qualities that are far different than inland soils, due to the erosional properties of sand and the physical characteristics of the parent material (e.g. tensile strength, porosity of coastal parent material, liquefaction, weathering, etc.)

Potential soil related hazards include; landslides, shallow soils to water table, shallow soils subject to deterioration and when they are inundated, towards mass erosion and liquefaction, an earthquake related hazard where sandy silt soils turn from a solid state to a liquid state as a result of stress and pressure.

Extraction based industrial forest management has created some additional landslide and liquefaction areas wherein tree plantations have removed parent material composition that allows for higher sheer and sheet stresses at shallower root development locations. SLIDO data from the State of Oregon maps are shown in exhibits _____

Rivers

Within the boundary of Lincoln County lies the majority of the Siletz River drainage basin. The basin covers an area of approximately 373 square miles. This is unique for a county boundary to entirely encompass a major river watershed. See Figure 3-3.

The Siletz Basin has a myriad of minor and major streams. The Siletz River, which meanders westward and joins the Pacific Ocean near (south of) Lincoln City, Oregon. The Siletz River flows roughly 67 miles from the headwaters at and above Valsetz . The River drains an area of approximately 373 square miles. There are many major streams, and some of the major tributaries include Eagle Creek, Buck Creek, Cedar Creek, Elk Creek, Sunshine Creek, Palmer Creek, Baker Creek, Mill Creek, Euchre Creek, Big Rock and Little Rock Creeks, Reed Creek, and many other smaller order streams. Stream size, depths, discharge, and gradients in the basin vary greatly.

The Siletz River broken down in to sections for gradient, discharge, and classes:

Section: Moonshine Park to Sam Creek Bridge

Class: I II

Station #:14305500

USGS ID #:14305500

NWS ID: SILO3

Latitude: 44.71511720 Longitude:-123.88733480

Length : 7 miles

Gradient: 12 feet/mile

Elevation Lost: 84feet

Low Flow: 300 CFS

High Flow: 4000 CFS

Section: Elk Creek to Buck Creek

Class: III IV

Length: 4.5 miles

Gradient: 20 feet/mile

Elevation Lost: 100feet

Low Flow: 750 CFS

High Flow: 5000 CFS

Section: Buck Creek to Moonshine Park

Class: III IV V

Length: 6.5 miles

Gradient: 40 feet/mile

Elevation Lost: 260feet

Low Flow: 1000 CFS

High Flow: 6000 CFS

Section: Sam Creek

Class: I

Length: 10 miles

Gradient: 10 feet/mile

Elevation Lost: 100feet

Low Flow: 400 CFS

High Flow: 2000 CFS

On the Siletz, there is a gentle average gradient from Hee Hee Illahee at Siletz, to the confluence of the Siletz River and Millport Slough, Drift Creek, and Schooner Creek at Siletz Bay.

Tribal Lands and Property

The Tribe's historical, culturally significant, and aboriginal Lands span all of Western Oregon, parts of Northern California, and beyond. The original Coast Reservation is an area approximately 1.1 million acres in size, spanning from Cape Lookout in the North due east to the 8th Township line, and south to the mouth of the Siltcoos River. The Tribe's treaty ceded land is generally defined as the 1855 Coast Reservation (or the Confederated Tribes of Siletz original Reservation, Coast Reservation, et al.) The Siletz River basin between Siletz and the Salmon and Yaquina Watersheds is about 942 miles in size (as estimated using georeferenced ESRI data and simple measuring of the watersheds by CTSI GIS Staff).

Current Tribal Lands & Reservation

As of 2018-, Confederated Tribes of Siletz Tribal lands total about 15,800 acres comprising 313 parcels. Properties are located in the towns and unincorporated areas between Siletz, Lincoln City, Newport, Toledo, rural Lincoln County, Salem, Portland, Eugene, and Douglas County. Most properties and development are located in the Lincoln County area. Tribal housing developments are located in Siletz and Lincoln City. Currently the Tribe has 15,147 acres of forest lands, and an additional 86 acres of vacant/undeveloped land.

Trust Status

Historic Sites

The Confederated Tribes of Siletz Tribe's aboriginal areas span all of Western Oregon to Northern California. The lands have been inhabited since time immemorial, and until the last several hundred years, the Tribes and Bands were interconnected by a vast and established system of social and ecological balances with other tribes and trade and potlatch society was regular with a network of routes joining the Pacific Northwest's Indigenous Peoples. For this plan, particular historical cultural locations are not specifically identified for hazard analysis, although some of them lay within the boundaries of the 1855 reservation, and also fall in to known critical analysis areas. The Siletz Tribe and the many bands that makeup the Tribe have been here since time immemorial, and the waters and land that make up Western Oregon area all sacred to the Tribe.

Climate

In the Siletz Valley, the maritime influence from the Pacific Ocean creates the localized climate for seasonal temperatures and rainfall. The precipitation and weather events blow over the Coast Range, through the inland valleys, and up to the Cascade

Mountains. The maritime climate provides ample precipitation over the wet season, and has high variability when considering the El Nino Southern Oscillation (ENSO) and Pacific Decadal Oscillation (PDO). The coastal areas have the most moderate fluctuality in between seasons, while the inland areas in Lincoln County have higher temperatures in summer, and much lower, and often freezing and snowy winters in to the Coast Range. The inland valleys experience the hottest summer sun, while the Cascades to the East witness the most extreme winter temperatures and storms.

The ocean winds lose some of their velocity, and much of their moisture as they climb the Coast Range and enter the inland valleys. Coastal Lincoln County receives the most rainfall, reporting 100+/- inches per year at Cascade Head Scenic Research Area, and over 100 inches per year in many locales within the Coast Range. Newport receives on average 67 +/- inches of rain, and Siletz (as recorded) is near 70 inches per annum.

In summer, the average countywide temperature ranges between 52 and 70 degrees Fahrenheit. In winter, the average temperature does not drop to far below 40 degrees Fahrenheit very often, although some winter storms typically bring several inches of snow every year. This temperature climate is due, in part, to the oceanic and maritime climate brought by winds from the Eastern Pacific Ocean oscillations including the (PDO). The protected coastal valleys are home to Elk, Deer, Black Bear, Cougar, Pine Marten, and many other species. Dominant tree cover type remains Sitka Spruce, Western Hemlock, Red Alder, Coastal Douglas Fir (including industrial tree plantation), Western Red Cedar, and Big Leaf Maple. Here rainfall averages 67+ inches annually. There is a steep gradient of rainfall differences from north to south in Lincoln County, ranging from 100+ inches at Cascade Head Scenic Research Area in the North, to the low 60's south of Newport. This gradient is caused by topography and localized oscillations off the Pacific Ocean. This maritime rainforest climate is marked with comfortable winters with regular winter storms and winds reaching 100 mph, followed

by mild and wet Spring, and temperatures rarely reaching 100 in the Summer. Days without frost generally occur between April and October. The first hard frost usually does not arrive until December.

3. Tribal History

Today's members of the Confederated Tribes of Siletz Tribe are descendants of a people who for thousands of years lived in the watersheds of the entirety of the Oregon Coast, and areas far north and south of the Siletz River. Siletz Tribal ancestors signed a number of treaties between 1851 & 1855 with the United States Government. The earliest of these treaties to become ratified was the Rogue River Treaty of September 10, 1853. Nine days after this Rogue River Treaty was signed, a treaty was concluded with our ancestors living in the Cow Creek drainage. The two treaties went side by side through the complete process of being ratified by the U.S. Senate and being proclaimed law by the President. They were both ratified on April 12, 1854 and proclaimed on the 5th of February 1855.The ancestral territory included more than 1,100,000 acres, which, as part of their Treaty with the United States, was ratified on November 9th, 1855. Finally, all of the correspondence and comments on BIA Superintendent Joel Palmer's original request fell into place, and the Coast Reservation was established by an Executive Order signed by President Franklin Pierce. This Treaty left the Tribe with the entirety of the lands that span from Cape Lookout in the North, to the 8th Township line, and south, to the mouth of the Siltcoos River. Shortly after signing the treaties, the Confederated Tribes of Siletz people were forced onto already established reservation lands; the Siletz Indian Reservation and the Grande Ronde Indian Reservation, north of the Confederated Tribes of Siletz Tribe's traditional territory.

In 1954, the federal government terminated the Confederated Tribes of Siletz Tribe before it gained official recognition and without prior notice to the Tribe. The

Confederated Tribes of Siletz Tribe, however, was recognized by the United States for purposes of involuntary termination by the government. This resulted in the Confederated Tribes of Siletz Tribe being restored in November 1977 by public law 95-195. The Confederated Tribes of Siletz Tribe has subsequently made several land purchases, and today the Tribe owns 15,780 acres of land in Oregon.

The Confederated Tribes of Siletz Indians offers many programs and services to eligible tribal members. These services include housing, education, health, social and employment services. Some programs and services have an income and/or residency requirement to access. Others are provided, regardless of income or residency. Some of the most common programs are listed in the tabs below. The Confederated Tribes of Siletz has numerous services to offer our tribal members.

From Confederated Tribes of Siletz Written History: (Robert Kentta) It is difficult to say who the earliest European was to spot our coastline from the deck of his sailing ship. Whoever that first European was, it is possible that there had already been significant changes our people had undergone, because of hemisphere-wide epidemics resulting from Columbus' contact with native people on the east coast in 1492. Many foreign governments competed for several centuries to explore & map the surface of the earth, building vast empires by claiming "discovery rights" to all lands & resources they encountered which didn't already have a strong, recognized European presence.

There is currently a debate going on about whether Sir Francis Drake's vessels made it this far north in 1579. There is some pretty compelling evidence (Elizabethan coins found in this area, etc.) and there are also lots of firsthand accounts & "pioneer folk tales" of fifteenth century English swords and other paraphernalia being found here locally. Whatever the earliest provable direct contact with our people was, it is clear that if the people weren't already impacted by the influences (diseases) that contact on the

East Coast had transmitted, our ancestors were very soon to experience the ravages of catastrophic deadly pandemics.

In an epidemic, there is a significant number of the population affected. In a pandemic, all or nearly all of the population is affected. Beginning by at least the 1770's there were a good number of direct contacts made between our people on the coast and the trade & exploration ships. Smallpox was one of several diseases transmitted during these visits. Our people had no resistance to these diseases, we have all heard this, but I don't know if any of us can really understand the physical, social, cultural & political devastation that was the effect. It is estimated that during each of the major pandemic episodes, from 75% to 90% of the population was killed. In some localized areas, whole large villages disappeared.

Although most of the trading contacts were in themselves peaceful, the Europeans, did not consider the fact that they were in a foreign land and subject to local laws and customs. Being very ethnocentric in their dealings with our people, and communicating entirely through signs and gestures, misunderstandings quickly arose and the result was sometimes bloodshed. The often rude manners of the visitors coupled with the fact that it probably did not take our ancestors long to recognize the source of the pandemics, probably quickly developed into a building and intense resentment among many of our people. There are also signs of many of our ancestors being fairly forgiving and endlessly friendly to the visitors, soon to be invaders. Trade along the coast continued and intensified at intervals.

The first overland journey into our country was the Lewis & Clark Expedition in 1805. They made many notes on the locations of major villages along the lower Columbia River, their populations and other information. They noted that there were villages that had been totally de-populated by disease. The houses were left standing, with the

people's bodies scattered about. No one was even left to bury the dead. It is hard to relate to a disease carrying people off that quickly, but a tribal ancestor Hoxie Simmons made comments that were recorded that told the story. He said that the people would begin to feel ill, and would go into the sweathouse to try to break the fever. Then, as was the custom, they would go jump in the river to cool off. The disease moved so quickly, that he said many did not even make it back from the river.

The Fur Trade Era is often described as a friendly period of "free trade." That may have been true in some cases, especially in the earliest phases. But, as soon the trappers got to know the lay of the land & how to get from one place to another, they began engaging us in economic warfare by running their own trap lines in our country, instead of depending upon our people selling them furs. These were some of the early signs of things to expect of the foreigners - taking without permission or apology.

In the early trade on the coast, the Spanish & Russians (as well as the British, Americans & others) had been involved to some degree, but by the mid 1820's, the only two remaining fur trade competitors were the Hudson Bay Co (British) and the Pacific Fur Co. (USA). Fort Astoria (P.F. Co.) & Fort Vancouver (H.B. Co.) had been built as signs of the political posturing that was the reality of the day. There were also many smaller outposts & trap lines that were manned by employees of the fur companies.

While the US Constitution recognized our native people's right to our homelands (Aboriginal Title), the United States also participated in constitutionally contradictory political practices & subscribed to the same European concepts that permitted colonization of foreign lands & peoples and empire building by European nations.

In 1832 there was an attack ordered on the Yaquinas by John McLaughlin, Chief Factor at the Hudson Bay Co. post at Ft. Vancouver. This attack was brought on because two HBC trappers were running a trap line in the Yaquina/Alsea territory without

permission of our local people. The trappers paid for their disrespect with their lives. When news of their deaths reached Ft. Vancouver, John McLaughlin ordered some HBC employees to teach the natives of the north central coast a lesson. He wasn't sure who was even responsible, but thought that a reprisal anywhere in the neighborhood, issued with sufficient force, would deliver the desired message.

This attack on a village at Yaquina Bay in 1832 (well documented in both HBC records and our tribal oral histories) was brutal enough that it (combined with the epidemics) was given as a reason that so few Yaquina people survived into the reservation period. Some of the fur trappers & traders took Indian wives, such as Jean Baptiste Garnier on the Umpqua River, and many of the fur company employees who stayed on in the Willamette Valley. This eased some of the relationships in local areas, but strangers stomping through our lands with little respect or humility were not welcomed.

As the fur trade era faded, many of the trappers turned farmer, & by the late 1830's there were various missionary settlements revolving around the main Methodist Mission at what is now Willamette University (Salem). A mission school for our children of the valley was one of the first non-Indian structures in that part of the valley. The relationships between our tribal people & the settlers changed slightly or radically depending on the rate of population influx, and the main activity of the new population, as the focus switched in different areas from fur trade to permanent settlement activities.

It doesn't appear that our ancestors resisted settlement to the point that they thought that all foreigners needed to be kept out, but instead tried to accommodate settlers who were respectful. However, each year our people grew weaker in number as the strangers grew stronger in number and presence. The signing of a treaty between Great Britain and the United States in 1846, and the subsequent establishment Oregon

Territory, & a provisional government as a part of the United States would change the form and direction that all future encroachment on our homelands would take.

– CTSI Historical Text

Tribal Member Population and Area Numbers

There are not accurate historical population counts available for many bands in the early recorded history of the Tribe, it is however known those interactions with fur trappers and traders and other Europeans in the 1700 and early 1800's decimated entire villages by introducing various diseases. According to a study of the Tribe's population, as of 2019, the Tribe included 5,468 members.

Of the 5,468 Tribal Members, the median age was 30. Of the 5,468 Tribal Members, many resided in Lincoln County, 23% or 1,242 of the total population. A total of 3,187 Tribal Members live within the eleven county service area (Map of 11 county in appendices) and more Tribal Members live in several other Oregon Counties (which together with Lincoln County comprise the Tribe's Service Area include all of Oregon) as follows:

Clackamas County (188 members)

Multnomah County (299 members)

Washington County (121 members)

Marion County (654 members)

Polk County (74 members)

Yamhill County (61 members)

Benton County (76 members)

Lane (322 members)

Linn (135 members)

Tillamook (15 members)

Economic

In May of 1995, the Tribe completed the building of Chinook Winds Casino and Resort. After intense planning and three years of negotiation at the local, state and federal level, the Siletz Tribe opened a 10,000 square foot temporary facility known affectionately as "The Tent." With only 250 slots, 12 card tables and a small deli, "the tent" opened under the name "Chinook Winds Gaming Center." Meanwhile, just north of the temporary facility, construction began on Chinook Winds' current home. Just over one year later, the grand opening of Chinook Winds Casino Resort's permanent facility took place on June 28, 1996. Later, STGC and STBC were established and created to take the lead in making the Tribe economically self-sufficient. Working closely with the Tribal Council, STBC manages and administers the Tribe's business ventures. And CWCR and STGC are the most financially productive venue and single entity the Tribe owns.

The Confederated Tribes of Siletz Tribe is the largest employer in Lincoln County, employing over 1,000 people. As of October 2019, about 73% of the Tribe's employees work at Chinook Winds Casino and Resort (including the Golf Club and CWCR Hotel). Tribal businesses account for one in every 20 jobs in Lincoln County, according to census numbers of total jobs within Lincoln County.

Tribal Holdings, Facilities, and Administration Breakdown

Chinook Winds Casino and Resort

Tribal Administration (Buildings I and II in Siletz)

Area Office Buildings (Salem Area, Eugene Area, Portland Area)

Confederated Tribes of Siletz Health Clinic

Tenas Illahee Child Care Center

Siletz Tribal Headstart-

Chinook Winds Casino Resort

Chinook Winds Hotel

Chinook Winds Golf Resort

CTSI

Lincoln Shores Office Building

Salem Commercial Building (Harbor Freight Bldg)

The following are owned and/or operated by STBC:

Hee Hee Illahee RV Park

Logan Road RV Park

Toledo Mill Property

Depoe Bay Building

Salem Flex Office Building

Eugene Office Building

Gift shop in Lincoln City

Employees by Tribal Agency

CWCR/Golf Club/Hotel- 769

CTSI – 255 (Which includes temps, IAD, and non-employee Tribal Council members)

TICC - 17

STBC - 4

STGC – 11

A brief on Tribal Oral History and sharing on Hazards in the Tribe's Aboriginal Lands

There are lots of stories on natural disasters/phenomena handed down through the generations of Siletz Tribal Members.

Landslides: Apparently even more recently in history than the devastating Ozette landslide that suddenly covered and killed part of the Ozette Village in NW Washington, there is at least one similar incident that covered/killed an entire village at Whales Head on the SW Oregon Coast. An old woman was the first one up in the village to the South one morning, and noticed there wasn't any smoke visible, as should have/always had been coming from that next village up the coast. She rousted others and pointed that out. All the men went in canoes up the coast, and found that a landslide had come down and covered/smooshed out into the creek-bed the entire village - apparently during the night, as people were asleep - and so suddenly, that nobody escaped. It was a place avoided afterwards. It was so shocking to the people who found it - because they did not see an immediate cause - it just happened. The story teller who passed this down in the 1940's said: those people thought "perhaps the Illahee shake, but they did not know it" (maybe there was an earthquake that they didn't feel) - in trying to justify the loss of a whole village that way..... when it was not an overly rainy period, etc. The people in the village to the south became known as Nalh-Tene-Tun-ne (movement+trail+place+people (of))..... the trail that used to go from that village to Whales Head Village was discontinued....and the new trail skirted around that place, avoiding the whole area, instead going to the next village north.

There is another location up the Rogue where an apparently much older village site deposit is eroding out from under a thick layer of "clay bank" - another apparent devastating, village-killing landslide episode.

Floods/Tsunamis- Of course the Siletz People have flood stories - some so bizarrely epic, that they may refer back to witnessing the Missoula Floods (a series of extreme Flood events that inundated the Willamette Valley, over a thousand years or so - when gigantic ice dams broke in what is now Montana, sending millions of acre-feet of water rushing down the Columbia. Those floods, created the broad, flat, Willamette Valley floor, dropping an unimaginable combined sediment load - accumulating in-totals of hundreds of feet in some places. Ice-Age megafauna remains (Mammoth, etc.) are frequently found deep in these sediments, sometimes appearing to have been deposited there as dis-articulated (ripped apart) megafauna, who were caught in the flood and killed, their corpses being shredded by the violence, and body parts washing up, or sinking to the bottom when waters stilled..... and being trapped in the new sediments - and hence good preservation - yet of not-complete individual animals.

Stories like "The Inland Whale" - also may harken to extreme flood events.

Many of what are told as "Flood" stories may also be Tsunami remembrances - because that is how they are usually experienced - as a (seemingly) never-ending incoming tide.... some Tribal origin stories lay down the foundation of creation - the time of people being created, and then at some (Later) time period, an epic flood or tide comes and floods nearly the entire known "world" mountaintops and canoes are the refuge of a few individuals who come together after this event and form the foundations of all future generations for those people.

South Wind Woman: Out most violent winds are generally associated with weather events/storm systems coming out of the South. Tillamook people oral traditions call this "South Wind Woman" in stories. A character who wreaks havoc.

Wildfires: many wildfires are recorded in our oral histories. Extreme 1846-48 Wildfires in the Siuslaw/Alsea district, and some of our Alsea people being trapped on the coast -

nearly roasted alive on the bare rocks at mouth of Cape Creek near (now) Heceta Lighthouse..... (Lhtowaisk - "the protected place") are recorded in an (eye witness) oral history collected at Siletz in the early 1900's and published in Alsea Texts by Leo J. Frachtenburg.

Our old people of early settlement period knew wild-fires. Much more of the country had been maintained with "prescribed burns" used to keep berry picking places cleaned up and in peak production, hunting areas/forage good, traditional food patches such a Camas, Tarweed Seed, Acorns (and many others) in peak production. The epidemics reduced populations so drastically that much of the country was suddenly not Maintained - became quickly brushy - full of accumulating ladder fuels - that had been frequently handled with low intensity burns at appropriate seasons before.

Early settlers in the inland valleys caused many of the devastating fires that came in this period - clearing land, clearing land - was their cause. They set fires at inappropriate times to create new/better forage for livestock, clear brush and timber for homes and farms, didn't care what havoc or loss of life it meant for Tribal peoples in the Coast Range, or Cascades.

Our people burned for many reasons, at different and appropriate seasons, often setting low, crawling/scorching fires that were set so frequently (most years annually) and as the people were leaving mountain berry picking grounds for the year in the Fall (for instance) - that there were low fuel loads, and wet weather and eventually snow controlled and put out these fires over the Fall/Winter, even if they crawled into denser fuels before going out.

Today's conifer forest oriented - tree farming practices have thrown this whole region into an unsafe condition. Meadows are non-existent or not maintained as fuel breaks, mountain ridge berry grounds are not maintained as open fuel breaks, headlands on the

coast want to have million dollar homes with multi-million dollar views, rather than leave those as open (maintained by fire) coastal hillside prairies....

Confederated Tribes of Siletz Indians Asset Inventory

ASSET INVENTORY

Developing an asset inventory is the first step of a vulnerability analysis. CTSI assets that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure. Only specific facilities need insurance due to CTSI's limited infrastructure and widely dispersed locations; these facilities were identified within each hazard's profile.

The asset inventory delineates the Tribe's existing building and infrastructure assets and insured values and are identified in detail. Asset Inventory listed below portrays the population and residential and non-residential structures numbers and values, and their potential vulnerability by hazard type (where available).

3. Buildings and Critical Facilities

Buildings

Using the Tribe's Insurance Statement of Values for 2019, an analysis of tribal buildings and facilities was conducted by GIS Analyst Ian Keene and DOGAMI/FEMA personnel. In total, it was determined that the Tribe had 234 buildings valued at approximately $ 72,987,378. These 234 buildings, including Chinook Winds Casino and Resort, Toledo Mill Site, Administration Buildings in Lincoln City and Siletz, HUD-built homes for tribal members, and other residences and Tribal Buildings are all located in Lincoln County, and do not include the Siletz Tribe's Portland, Salem, and Eugene real estate holdings. Other structures include the Tribal Administration & Health Clinic buildings

in Siletz, USDA and Fleet Vehicle, Public Works Shops and Buildings, and the Fish Hatchery Buildings and infrastructure.

The remaining structures are used for tribal businesses, investments and facilities. These buildings include office buildings in Lincoln City and Depoe Bay, residential tracts in Siletz, barns and other farm related structures on several properties towards Logsden, storage facilities at the Dundas Property on Logsden Road, other homes with garages and sheds, back-up generators and other miscellaneous structures. The most valuable structure is the $44,990,000 Chinook Winds Casino and Resort, with the remaining structures worth about $28,600,000 (according to HAZUS analysis of value, Insurance Values are considerably higher)a.

The Fish Hatchery and associated Timber Lands in Lincoln County were not a part of the Critical Facilities list, nor are the Timberlands associated with economic losses within the HAZUS software platform and subsequent analysis performed for consideration while pursuing FEMA funding for hazard mitigation planning.

Planning and Technical Meetings

The Steering Committee along with FEMA personnel held technical review meetings in May, June, July, August, September, and October of 2018

As an example of what was reviewed during these workshops below is from July meeting

From July 17, 2018

FEMA Technical Assistance Workshop #2

Technical Assistance Workshop #1 recap:

- Described the hazard mitigation planning process and FEMA requirements

- Defined mitigation
- Began to identify critical facilities, essential infrastructure, and locations of cultural value
- Distributed the Capability Assessment Worksheet to be completed by members of the planning team

Standalone Plan:

- It was agreed upon by the planning team and tribal council that the tribe will update its own, standalone Tribal Hazard Mitigation Plan
- It was agreed upon that tribal lands and properties in the Portland, Salem, and Eugene areas are adequately covered by existing hazard mitigation plans for those areas and will not be a part of the planning area for this plan

Risk Assessment:

- Ian Keene passed out demographic data, a report by CTSI Planning, and an Oregon State University report on climate change impacts describing potential hazards to water resources
- Ian displayed GIS-based hazard information with the planning team to identify areas at risk to various hazards. He provided additional materials (maps, data, reports, etc.) to the planning team via e-mail at the end of the workshop

Analysis for next steps:

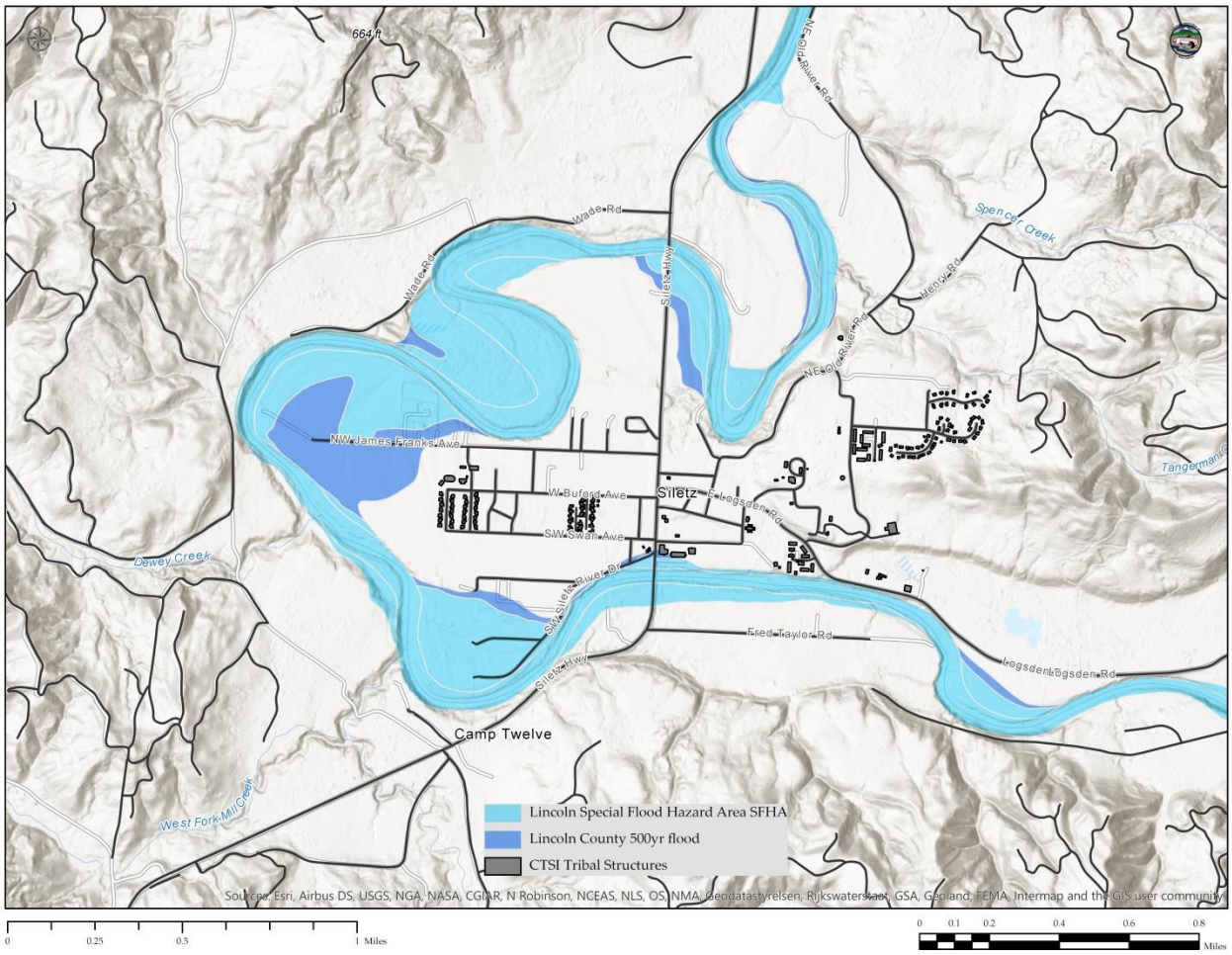
- The planning team needs to complete the hazard inventory and risk assessment work:

- See the Risk Assessment notes taken by Amanda Siok (FEMA, Mitigation Planner), to support the plan's update to the risk assessment

- Homework:
  - Complete and compile the capability assessment discussed during workshop 1
  - Develop "Problem Statements" in advance.
  - Determine how/when the public will be engaged in the planning process (required for FEMA hazard mitigation plan approval). The group discussed potential public input opportunities as:
    - Ask the public (via booth at existing event) what hazard/disaster the tribe should be more resilient to
    - Ask the public for suggestions on how to reduce the risk to ____ Hazards (planning team chooses 1-3 hazards for public input). (Bullet 1 and 2 could be combined for one outreach activity)
    - Ask the public to vote on the top 5-10 mitigation strategies

Critical Facilities

"Critical facilities" are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Shelters, emergency operation centers, public health, public drinking water, sewer and wastewater facilities are examples of critical facilities. Though not explicitly included in the definition, supporting life-line infrastructure essential to the mission of critical facilities must also be included in the inventory when appropriate. Some essential economic-generating facilities may also be considered.



For this inventory, the Tribe's critical facilities are shown in the Table below

Critical Assets List for Tribal Council Meeting (5/17/19)

In the table below is a comprehensive list of critical assets that the Multi Hazard Mitigation Plans' Steering Committee compiled. These assets were compiled by tribal member survey responses, steering committee survey responses and previous listed assets on our previous MHMP.

*Note - Future plan updates can list additional assets if CTSI administration, Tribal Council, and/or Tribal Staff consider that a critical asset has either been omitted, built, and/or added to the Tribal list of assets

ASSETS	**Number of Committee Votes**
Chinook Winds Hotel	7
Casino	6
Lincoln Shores (STBC/STGC)	5
Administration Bldg. 1	8
Administration Bldg. 2	5
USDA Bldg.	5
Gas Station	6
Community Center	6
SR 229	6
Siletz Community Health Clinic	12
Tribal Housing Units	6
Water Distribution System	9
Cultural Repository	6
Public Works Bldg.	7
Siletz Charter School & Head Start	9
Child Care Center	5
Siletz Valley Fire Department	7

*Please note that these facilities may include multiple structures.

4. Risk Assessment

Introduction

This chapter will identify the potential natural hazards that could affect the Confederated Tribes of Siletz Tribal Members and Administration Area within the Coastal Counties, namely and mainly Lincoln County, but not to be limited to Coos, Tillamook, Linn, Benton, Lane, Marion, Polk, and more. The plan is to assess the vulnerabilities of its people, property and natural environment, simultaneously for CTSI, Siletz Tribal Business Corporation (STBC), and the Siletz Tribal Gaming Commission (STGC).

The geographic focus of the Risk Assessment was the Tribe's Lincoln County holdings, but also including in this plan is analysis that included areas within the Tribe's 1855 Coast Reservation boundary. The HAZUS and data analysis is also namely Lincoln County area land holdings. The Siletz River watershed and the remainder of watersheds in Lincoln County with attention and analysis focused on the Siletz, Newport, Toledo, and Lincoln City areas along the Highway 101 corridor, and in the Township of Siletz, where the majority of Tribe's facilities and properties are located.

Hazards Profiled

Risk assessments that provide the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the Tribe to compare potential losses throughout the Tribe's known area, and to determine our priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments. The risk assessment shall

include the following (Per FEMA CFR [67 FR 8848, Feb. 26, 2002, as amended at 67 FR 61515, Oct. 1, 2002; 69 FR 55096, Sept. 13, 2004; 72 FR 61565, 61738, Oct. 31, 2007; 79 FR 22883, Apr. 25, 2014; 79 FR 76085, Dec. 19, 2014; 80 FR 59551, Oct. 2, 2015]

(i) An overview of the type and location of all natural hazards that can affect the Tribe, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate;

(ii) An overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the Lincoln County risk assessment performed by Matt Williams and DOGAMI and Oregon State risk assessment. The State shall describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned or operated critical facilities located in the identified hazard areas shall also be addressed;

(iii) An overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment (HAZUS performed by CTSI and State employees). The State shall estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.

ASSET INVENTORY

Developing an asset inventory is the first step of a vulnerability analysis. CTSI assets that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure. Only specific facilities need insurance due to CTSI's limited infrastructure and widely dispersed locations; these facilities were identified within each hazard's profile.

The asset inventory delineates the Tribe’s existing building and infrastructure assets and insured values and are identified in detail in Tables _____ portray the population and residential and non-residential structures numbers and values, and their potential vulnerability by hazard type (where available).

Siletz Tribal Business Cooperation (STBC)

Buildings and Critical Facilities

Buildings

Using the Tribe's Insurance Statement of Values for 2019, an analysis of tribal buildings and facilities was conducted by GIS Analyst Ian Keene and DOGAMI/FEMA personnel. In total, it was determined that the Tribe had 234 buildings valued at approximately $72,987,378. These 234 buildings, including Chinook Winds Casino and Resort, Toledo Mill Site, Administration Buildings in Lincoln City and Siletz, HUD-built homes for tribal members, and other residences and Tribal Buildings are all located in Lincoln County, and do not include the Siletz Tribe's Portland, Salem, and Eugene real estate holdings. Other structures include the Tribal Administration & Health Clinic buildings in Siletz, USDA and Fleet Vehicle, Public Works Shops and Buildings, and the Fish Hatchery Buildings and infrastructure.

The remaining structures are used for tribal businesses, investments and facilities. These buildings include office buildings in Lincoln City and Depoe Bay, residential tracts in Siletz, barns and other farm related structures on several properties towards Logsden, storage facilities at the Dundas Property on Logsden Road, other homes with garages and sheds, back-up generators and other miscellaneous structures. The most valuable structure are the $44,990,000 Chinook Winds Casino and Resort, with the remaining structures worth about $28,600,000 (according to HAZUS analysis of value, Insurance Values are considerably higher). The total values listed for the HAZUS data analysis were mentioned above, and do not reflect the values listed with CTSI insurance policies, and are not considered to be a valuation of CTSI holdings.

The Fish Hatchery and associated Timber Lands in Lincoln County were not a part of the Critical Facilities list, nor are the Timberlands associated with economic losses within the HAZUS software platform and subsequent analysis performed for consideration while pursuing FEMA funding for hazard mitigation planning.

Below is a list of Property names owned by CTSI: (for further information on individual properties relating to Mitigation Planning contact the CTSI Planning Department)

Siletz Area

Aldridge

Bagley

Bishop (part of "BBS")

Briley (part of "BBS"

Burnham

Burnham 2

Collson

Crawford (Buford)

Dickenson (Oak Flats)

Oak Flats Development

Dundas

Eight-Plex

Faulkner

Faulkner House

Gomes

Government Hill

Grimstad

Grooms

Hueth

Hursh

Jebert

Judd

Silatchee Development

Chetco Playground

Cell Tower

Judd Siding Replacement

Judd Home Wat. Meters Replmnt.

STHD 17 Units

Judd Sidewalks

Silatchee Park & Tootootney Improvements

Mitchell

Metcalf

Miller

Muschamp

Nashif

Paul Washington Cemetery

Seitz (part of "BBS")

Sexton

Trask (Meat Lockers)

Vearl Ray

Wood (Mini Mart)

Lincoln City Area

Chinook Winds Resort

Hemstreet Parking Lots

Lakeside Golf Course

Lakeside Village

Lincoln Shores (Casino)

Lincoln Shores Offices

Logan Road

Lot 57

Mast

Morris Cemetery (Lincoln City Cemetery)

Otis Cemetery

Teeny

Toledo Area

Toledo Mill

Depoe Bay Area

Neptune's Reserve

Seal Rock Area

Lyford

Portland

Portland Area Office

Salem

Chemawa

Robertson

Wyant

Wyant 2

Eugene

Eugene Area Office

Timberlands

229 West (Fisher)

Arnold Creek

Arnold II

Camp 12 (Cutsforth)

Coop (Bulls Bag)

Hatchery I & II

Lower 5 Mile

Reed Creek

Tahkenitch A

Tahkenitch B

Tahkenitch C

Tahkenitch D

Tahkenitch E

Timberlands

South Diamond

North Diamond

Blue Jay, Gunn Creek, Lower Gorge, Red Ant

North Fork Falls

South fork,

Sugas Hill

Burbank Creek

Mill Creek

Cerine Creek

Headwaters

Dry Creek

Brush Creek

Little Rock Creek

Bryant Creek

Sam Creek

Twin Bridges

Section Eight

Northon Hill #1 & #2

Long Sam

Long Prairie #` & #2

Thayer Creek

Thornton Creek

Bale Creek

Yaquina

Long Tom

Twenty Three Creek

Pioneer Mountain

Ollala

Cook Creek

Truman - Calhoun

Other Areas

Harney/Evans Cemetery

Medicine Rock

Collamer 1/2 Interest

Bishop

Gas Station

The first step in preparing a risk assessment for the Confederated Tribes of Siletz is to identify which natural hazards affect the Tribe. Numerous documents, including the Lincoln County Natural Hazards Mitigation Plan, The Fire Planning documents from Lincoln county and Oregon Department of Forestry, the State of Oregon Natural Hazard Planning documents, and more were reviewed. The County encompasses most of the Salmon, Siletz, and Yaquina Rivers and watersheds and thus the County Plan analyzes Tribal areas within the scope of this plan as well. The jurisdiction of the Siletz Tribe is not limited to the scope of this mitigation planning document, nor is this mitigation planning document limiting the area in which the Tribe will choose to operate in the future. Instead, like all planning documents, this mitigation plan update is designed to offer a planning framework in which to operate from in the coming few years.

Natural Hazard Risk Assessment

Fundamental to effective hazard mitigation is general and specific information related to the nature, distribution, probabilities of occurrence, frequency, and severity of historic hazard events. When linked to demographic, economic, infrastructure, structural, and other societal data, risk evaluations and vulnerability assessments can be performed. The amount, availability, and quality of information about different hazards vary widely. Limited information for some hazards results in greater uncertainty in the risk assessment for those hazards. This Multi-Hazard Mitigation Plan is focused on natural hazard mitigation, and a separate effort to develop spill prevention and response plan to address human-caused hazards on tribal property is also needed.

The following assessment of natural hazard risks describes the nature and location of past and potential natural hazard events, assesses the vulnerability of properties to each

hazard, estimates the value of structures and/or property in areas that are vulnerable to hazards, and provides an analysis of the risk to life, property, economic activity, and the environment that may result from natural hazard events on Tribal property. In the first subsection, the natural hazards on Tribal property are identified. Each hazard is then defined; past hazard events are described; the vulnerability of structures and facilities is assessed; and the potential losses to these structures are estimated. In the final subsection, the relative vulnerability of tribal property is summarized.

The Pre Disaster Mitigation program rules require tribes that are submitting a plan to assess hazard risks by jurisdiction. Since the Siletz Tribe only has jurisdiction over land held in trust by the US Government for the Tribe, this MHMP defines properties that are currently owned by the Tribe including Reservation and non-reservation lands and assesses and compares the relative hazard risks with each property. Furthermore, the lack of other local jurisdictions including Lincoln County, City of Siletz, Lincoln City to produce a hazard mitigation plan has prompted the Siletz Tribe to include tribally owned lands under the jurisdiction of local governments in the hazard assessment. Background information regarding risks to specific natural hazards was obtained from the Oregon Emergency Management and Local Emergency management officials. These documents were used to help determine the Tribe's risk to each hazard.

After a brief description of the methods used to identify hazards in each assessment area and the methods used to conduct a vulnerability assessment for each hazard, the remainder of this section addresses each of the natural hazards of concern on all Tribal properties. Profiles of past events, an assessment of vulnerability, and potential losses are presented for each of the natural hazards.

Hazard Identification and Vulnerability Assessment Methodologies and Analysis

The Planning Department took the following steps to identify hazards that have affected the CTSI Properties in the past and/or can be expected to affect CTSI properties in the future:

- Review of past state and federal disaster designations;

- Review of regional hazard information and analyses prepared by state, federal, and reports prepared by university researchers at multiple Universities in the Pacific

Northwest; including the use of HAZUS and FEMA software coninciding with DOGAMI/USGS/NOAA/OSU/USFWS/BLM/USFS/et al. Geospatial databases

- Review of Internet web sites containing regional hazard information;

- Review of the Oregon State Natural Hazards Mitigation Plan 2015, the FEMA Region X analysis documents and interactive webmaps, and the Lincoln County Vulnerability Analysis (DOGAMI 2019) and many regional planning documents (as aforementioned wildfire plans from ODF and Lincoln County Fire, et al.)

- Review of the Revised Preliminary 1990 Flood Insurance Rate Maps and Digital Q3 Data (FEMA 1990); Siletz River Flood History (State of Oregon 2017); Siletz Bay Conservation Plan 2013, et al.

Information acquired from the materials listed above was also used to estimate the vulnerability of CTSI properties to each hazard. This information included the probability of occurrence of hazard events, the types of damage associated with a hazard, and the relative vulnerability of each property. After compiling this hazard information, areas vulnerable to the hazards were identified. The estimated relative levels of vulnerability for each hazard assessment area were based on the following factors:

- Probability of damage resulting from a large hazard event;
- Types of damage associated with the hazard;
- Historic and/or potential severity of damage;
- Potential damage relative to other hazards; and
- Vulnerability of each property.

The relative probability of hazard occurrence (between hazards) is not reflected in the vulnerability assessments. For example, although the floodplain assessment area was rated as having a high vulnerability to both floods and earthquake, it is much more likely to be affected by floods. The ratings for each hazard therefore reflect the estimated vulnerability if a large hazard event occurs. In addition, the amount of development in each assessment area was not factored into the estimated vulnerability

for an area. Different levels of development are reflected in the estimated potential losses for each area, highly developed areas have greater potential losses.

The Lincoln County MHMP analyzed hazards to see if they affected the county region. The Tribe chose to analyze much of the same hazards, as they coincide territorially and contiguously. CTSI hazards chosen were as follows:

- Flood
- Severe Winter Storms
- Earthquake
- Tsunami
- Windstorm
- Wildfire
- Landslide
- Coastal Erosion (where applicable, and not a full HAZUS analysis was conducted for this hazard)

State of Oregon NHMP:

https://www.oregon.gov/lcd/nh/pages/mitigation-planning.aspx?utm_source=LCD&utm_medium=egov_redirect&utm_campaign=https%3A%2F%2Foregon.gov%2Flcd%2Fhaz%2Fpages%2Fnhmp.aspx

Further analysis was conducted to identify which of these hazards specifically affect the Confederated Tribes of Siletz Tribe. The study was conducted by analyzing data and maps from a wide range of sources, including State of Oregon GIS hazard data layers and FEMA floodplain maps, and by interviewing Tribal, county, and local officials.

The Tribe's main Administration buildings and Tribal residential areas are located in a river valley, with some part of the buildings located in the 500 year floodplain. The administration sits 4 miles inland from the coast and, at Siletz, the majority of the township is at or above 100 feet elevation above sea level. Severe Winter Weather and Windstorms, Wildfire, Tsunami, Landslide/Liquefaction, and Flooding all with having

some sort of potential overlap in both data manipulation depending on the model, and or in the essence of a winter storm, usually flooding, landslide, and other hazards may be compounding factors.

Each hazard profile is broken down into the following sections:

Definitions: a primer of some of the key terms used in the study of the hazard, as listed and analyzed by CTSI, or other federal agencies and defining bodies.

General Background: a general overview of the causes and effects of the hazard, focusing on the geological and climatological conditions needed to create the hazard.

Hazard Profile: A detailed profile of the hazard as it affects the Tribe. It is broken down into the following headings:

Location: Where in the study area the hazard could impact people, property and the natural environment;

Extent: How severe or destructive the event could be to CTSI properties and or infrastructure, buildings, or other critical facilities to Tribal Members and the surrounding area.

Past Events: A review of past hazard events in the study area; and

Probability: How often a severe event can occur and the likelihood it will occur in the future.

Vulnerability Assessment: This section will describe the Tribe's vulnerability to each hazard, including its impact on the Tribe's infrastructure, buildings, houses and critical facilities. The amount, type and values of structures will be discussed if information is available. Land use, current and future, within the hazard area will also be discussed.

Cultural and Historic Sites

For MHMP planning, both this Plan and CTSI's previous plans, specific cultural and historic sites are not identified specifically or analyzed for hazard exposure and vulnerability. This is both for reasons of keeping classified and confidential sites still classified, and also to protect those sites from intrusion. Certain locations, such as Medicine Rock, cultural fishing sites that are published, family burial grounds and other known areas, were mentioned by some survey respondents in listing as critical

assets, during Steering Committee meetings and in additional surveys as areas of concern or areas that some members would like listed. Those cultural sites and areas of concern are regardless, held by the Tribe and members to be critical as assets even when not listed explicitly.

The tribe's Natural Resource and Culture Department will continue to identify areas and locations of Tribal cultural and historic value and will identify, internally, any potential hazards exposure and vulnerability. In general, all historic and cultural sites are considered exposed and vulnerable to all of the hazards discussed in this Risk Assessment.

Tribal Critical Facilities, Exposure and Vulnerability

Table _____ discusses the exposure and vulnerability of tribal structures to natural hazards. Vulnerability was ranked by

High: high probability, high risk to damages from natural events

Moderate: has some risk from natural events, either located in hazard area or has structural issues

Low: infrequent risk, newer structures and/or located outside of zones

Comments about vulnerability for each structure (if applicable) are also shown in the Table.

Tribal Facilities Exposure & Vulnerability Assessment

*The following tabular format will show properties listed under the Tribes HAZUS and Geospatial analysis conducted by CTSI GIS Anaylst Ian Keene and DOGAMI Personnel at the State of Oregon *Data analyzed using HAZUS

Earthquake

Earthquake Damage from CSZ M9.0

Community	Total Number of Buildings	Total Estimated Building Value	Sum of Economic Loss	Loss Ratio	Total Population	Number of Displaced Population	Percent of Displaced Population
Depoe Bay	1	193,440	52,352	27%	0	0	0%
Lincoln City	25	44,990,275	8,432,106	19%	60	9	15%
Siletz	167	21,450,304	5,631,692	26%	432	177	41%
Timberlands	3	22,669	2,548	11%	0	0	0%
Toledo	17	868,404	527,822	61%	0	0	0%
Regional Offices	5	5,462,286	N/A	N/A	0	0	0%
Total	218	72,987,378	14,646,520	22%	492	186	38%

Definitions

Cascadia Subduction Zone from USGS

Two Contrasting Models of Lithospheric Structure

The subduction of the Juan de Fuca plate beneath North America changes markedly along the length of the subduction zone, notably in the angle of subduction, distribution of earthquakes, volcanism, geologic and seismic structure of the upper plate, and regional horizontal stress. To investigate these characteristics, we conducted detailed density modeling experiments of the crust and mantle along two transects across the Cascadia subduction zone. One crosses Vancouver Island and the Canadian margin, and the other crosses the margin of central Oregon. Both density models were constructed independently to a depth of approximately 50 km. We gathered all possible geologic, geophysical, and borehole data to constrain the density calculations. The final

densities for the Oregon and Vancouver lithosphere models were obtained from gravity inversions.

Our results confirm that the downgoing slab of the Cascadia subduction zone dips significantly steeper beneath Oregon than beneath Vancouver Island, lending support to the idea that the Juan de Fuca plate is segmented from north to south. In addition, our gravity models indicate that the mantle wedge beneath western Oregon (i.e., below the western Cascades) is lighter than the mantle beneath the Canadian continental crust. This low density agrees with the low mantle velocities observed in the mantle and the present day extensional regime of the Pacific Northwest.

A gravity low at the deformation front of the Oregon margin, absent along the Vancouver margin, can be explained by the different bathymetry of the two regions and by the depth to the top of the subducting Juan de Fuca plate. If the accretionary prisms along these profiles were modeled with equal densities, a density inhomogeneity in the lower part of the models would be necessary. Thus that the density of the accretionary prism for the Vancouver profile must be approximately 0.1-0.2 g/cm3 greater than that for Oregon. A density difference within the accretionary prisms also agrees with other data. We note that the volume of accreted sediments is approximately twice as large along the Vancouver profile than along the Oregon profile, and the prism reaches a greater depth (approximately 20 km as compared with 12 km for the Oregon profile). This implies that the sediments within the accretionary prism at Vancouver Island are at a higher metamorphic grade, and therefore have higher densities.

We find that a substantial part of the coastal gravity maxima for both lines is caused by increasing density with depth in the subducting plate. In the proposed model, the maximum possible density of the slab was used to satisfy constraints for the average density of the near coastal crust for both profiles. If a density increase with depth is not introduced into the model, very high densities would be required for the near surface coastal and continental crustal blocks.

Benioff Zone Earthquake: Sometimes called “deep quakes,” or Intraplate, these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth’s surface.

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth’s surface and are associated with fault movement within a surface plate.

Earthquake: An earthquake is the shaking of the ground caused by an abrupt shift of rock along a fracture in the earth such as a fault or a contact zone between tectonic plates. Earthquakes are measured in both magnitude and intensity.

Intensity: Intensity is a measure of the effects of an earthquake. It is measured by the Modified Mercalli scale and is expressed in Roman numerals.

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Magnitude: Magnitude (M) is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Subduction Zone Earthquake:

This type of quake, also called Interplate, occurs along two converging plates, attached to one another along their interface. When the interfaces between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

General Background

An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs near populated areas, it may cause many deaths and injuries, and extensive property damage.

Location

Oregon is affected by the Cascadia Subduction Zone where the Juan de Fuca plate slides underneath the North American plate. While earthquakes along this zone occur infrequently, plate movement can produce major earthquakes. In addition, Western Oregon is underlain by a large and complex system of faults that can produce damaging earthquakes; these smaller faults produce lower magnitude events, but their ground shaking can be strong and damage can be great to structures nearby. Taken from USGS/Dogami/OSU

@ Old River Road marking the Landslide that occurred after flooding in 2012 Siletz, OR
Imagery captured by CTSI Planning Department August 2019

The erosion of bluffs is dependent on multiple factors including: ocean wave impact, variations in ground water levels, vegetation cover, bluff slope and bluff material

properties. When coupled with the varied geologic composition of the Oregon coastline, this wide range of eroding mechanisms makes the task of estimating how fast the bluffs are eroding very complicated with large amount of uncertainty. Thus, there is no "one-size-fits-all" approach that can be applied coast wide and assessments are typically made on a case by case basis.

Catastrophic Hazards

Catastrophic hazards are associated with earthquakes and related tsunamis. The eastward-moving Juan de Fuca tectonic plate dives under the westward-moving North American plate just off the Oregon coast at the Cascadia Subduction Zone. Powerful earthquakes up to magnitude 7 can take place in either the North American or the Juan de Fuca plates. The Cascadia Subduction Zone, however, is capable of generating even larger earthquakes — up to magnitude 9.

From State of Oregon Hazard Publication on Cascadia

The Cascadia Subduction Zone is a 600-mile fault that runs from northern California up to British Columbia and is about 70-100 miles off the Pacific coast shoreline. There have been 41 earthquakes in the last 10,000 years within this fault that have occurred as few as 190 years or as much as 1200 years apart. The last earthquake that occurred in this fault was on January 26, 1700, with an estimated 9.0 magnitude. This earthquake caused the coastline to drop several feet and a tsunami to form and crash into the land. What is most surprising is that evidence for this great earthquake also came from Japan. Japanese historic records indicate that a destructive distantly-produced tsunami struck their coast on January 26, 1700. By studying the geological records and the flow of the Pacific Ocean, scientists have been able to link the tsunami in Japan with the great earthquake from the Pacific Northwest. Native American legends also support to the timing of this last event.

Oregon has the potential for a 9.0+ magnitude earthquake caused by the Cascadia Subduction Zone and a resulting tsunami of up to 100 feet in height that will impact the coastal area. There is an estimated 2-4 minutes of shaking or rolling that will be felt along the coast line with the strength and intensity decreasing the further inland you are.

The Cascadia Subduction Zone has not produced an earthquake since 1700 and is building up pressure where the Juan de Fuca Plate is subsiding underneath the North American plate. Currently, scientists are predicting that there is about a 37 percent chance that a megathrust earthquake of 7.1+ magnitude in this fault zone will occur in the next 50 years. This event will be felt throughout the Pacific Northwest.

With the current preparedness levels of Oregon, we can anticipate being without services and assistance for at least 2 weeks, if not longer, when the Cascadia Subduction Zone earthquake occurs. While this will be difficult to overcome, our citizens, businesses, schools, government, and communities as a whole can take steps to get prepared. Take action now by actively planning and preparing yourself and your community to be ready for two weeks for disasters. In the event of a Cascadia Subduction Zone earthquake and tsunami, coastal populations will become isolated into "islands" due to landslides, liquefaction, and damaged infrastructure like bridges. The Office of Emergency Management's "Island Mapping Pilot Project" mapped coastal populations in relation to likely infrastructure damage after an earthquake and tsunami. These maps show where transportation infrastructure will be damaged (bridge failure, landslide, liquefaction) causing populations to be isolated into "islands". Workshops were held in coastal communities during the summer of 2016. Our audience for these workshops were city/county officials, public works, and others able to advise on road damage and who lives/works/plays in the "islands". The results of this project are available for download and through RAPTOR.

For general inquiries about the project, contact Althea Rizzo at althea.rizzo@state.or.us.

For the GIS data, contact Daniel Stoelb at daniel.stoelb@state.or.us.
https://earthquake.usgs.gov/hazards/

https://earthquake.usgs.gov/hazards/hazmaps/

Tsunamis

A tsunami is a series of ocean waves most often generated by disturbances of the sea floor during shallow, undersea earthquakes. Less commonly, landslides and volcanic eruptions can also trigger these wave events. Although infrequent in occurrence,

tsunamis are the most dangerous natural hazard affecting the Oregon Coast. In the deep water of the open ocean, tsunami waves can travel at speeds up to 800 km (500 miles) per hour and are imperceptible to ships because the wave height is typically less than a few feet.

However, as a tsunami approaches the coast it slows dramatically and its height may multiply by a factor of 10 or more, having catastrophic consequences to people living at the coast. As a result, people on the beach, in low-lying areas of the coast, and near estuary mouths or tidal flats face the greatest danger from tsunamis.

Earthquakes can trigger other geologic and soils failures that contribute to damage. While surface fault rupture can produce damage to facilities and infrastructure astride the fault, losses from this are minor compared to those resulting from strong ground shaking and associated ground failures. These include landslides and slope failures, lateral spreading and slumping, and liquefaction.

Probability

Although the Confederated Tribes of Siletz Tribe has not had a recorded earthquake within its traditional lands, it is 100% likely that the Tribe will feel the effects of an earthquake from regional sources in the future. Evidence shows that Magnitude 9.0 Cascadia Subduction Zone quakes have occurred on average once every 350+/- years (with major events every 500 to 600 years, with some gaps between events as little as 200 years and as large as 1,000 years Goldfinger OSU)

Vulnerability

Although the Confederated Tribes of Siletz Tribe's people, property and facilities are exposed to earthquakes, the vulnerability is low to moderate. The tribe has a limited amount of facilities and many were built after Seismic Building Codes for Oregon were strengthened in 1993. The Confederated Tribes of Siletz Tribe's area is encompassed in Seismic Zone 3 of the State Building Code map.

The Tribe's newer structures, such as the Health Clinic Building, are built to highest seismic standards and would experience minimal structural damage (estimated through HAZUS). The Tribe's utility systems that depend upon other outside agencies are not so unsusceptible. The water and wastewater systems in Siletz are far out of date for upgrades and are not built to the highest standards and have redundancies for a worst-

case scenario. After a significant event, all Tribal facilities and infrastructure will be inspected for damage.

Structures most vulnerable would be its older commercial facilities in Siletz, Newport, and Lincoln County.

The Tribe's biggest concern will be the lack of access along the state highways 229, 20, 34, and connecting to either Highway 101 or to the I5 corridor. Many publications provide that Siletz and many coastal areas will effectively become "island" communities due to being cut off from damage to local, county and state infrastructure, such as bridges, roads, etc. due to the earthquake or secondary hazards such as landslides.

Known models show that regular disruption of critical services will also be an issue for tribal operations, especially in the immediate aftermath of an Cascadia event and/or following tsunami/earthquake.

Flooding

Floods

In general, three types of flooding occur in this region: (1) riverine, (2) ocean flooding from high tides and wind-driven waves, and (3) flooding associated with a tsunami event. Flooding in riverine systems is a natural occurrence that results when runoff from rain or snowmelt exceeds the carrying capacity of river channels, ditches, drains, reservoirs, and other water bodies. There are two distinct periods of riverine flooding in this region, winter and early spring. The most serious flooding occurs during November, December, January, and February. The situation is especially severe when riverine flooding, caused by prolonged rain and melting snow, coincides with high tides and coastal storm surges. In short, the rivers back up and flood the lowlands. There are other circumstances, as well. Several coastal rivers carry heavy silt loads that originated in areas burned during the "Tillamook Burn" fires (1933 to 1951). Consequently, some rivers may actually be elevated above local floodplains, which increases flood hazards. The costs and long-term benefits of dredging these rivers have

not been determined. In this section, past riverine and coastal flood events, flood vulnerability, and potential flood losses to CTSI properties are described.

Potential Flood Event Areas

Flood events on tribal lands can be divided into 3 broad categories: flooding of the Siletz River, flooding of the Toledo Mill property along the Yaquina River, and coastal flooding of the properties on the coast line and near Devils Lake in Lincoln City. The majority of the damage witnessed in past flood events were primarily along the Siletz River.

Lincoln County has experienced ten major floods since 1964. Four of these resulted in presidential declarations. Past flooding occurred on the Alsea, Siletz, Yaquina rivers between November and March. Flooding also occurs in low-lying areas along the ocean and Devils Lake during high tides and heavy rain. The county estimates that 10 percent of the population and 10 percent of the property would be affected by such a flood event.

Effects of Recent Floods

Siletz River Floods

In February 1996, December 1998, and November 1999 Lincoln County experienced damaging flood events. The 1996 flood event affected communities throughout western Oregon, with floodwater exceeding the "100-year" level in a number of locations. In Lincoln County, however, the 1996 event was of a lower magnitude, with floodwater reaching a level of 24.5 feet on the Siletz River gage (located upstream from the area addressed by this plan). The Siletz 100-year event level is 30.5 feet. The Army Corps of Engineers estimated the recurrence interval of the 1996 Siletz event at 12-15 years, meaning approximately a six percent to eight percent probability of occurrence in any year. The December 1998 event, similar to the 1996 flood, was gauged at a level of 24.7 feet. Accounts from property owners indicate that flood levels in 1998 were as much as one foot higher on the lower Siletz River than in 1996, probably due to the influence of coinciding high tides in Siletz Bay.

HAZUS Flood Analysis Results

1% Annual Chance Flood

Community	Total Number of Buildings	Total Estimated Building Value	Sum of Economic Loss	Loss Ratio	Total Population	Number of Displaced Population	Percent of Displaced Population
Depoe Bay	1	193,440	0	0.0%	0	0	0%
Lincoln City	25	44,990,275	0	0.0%	60	0	0%
Siletz	167	21,450,304	0	0.0%	432	0	0%
Timberlands	3	22,669	140	0.6%	0	0	0%
Toledo	17	868,404	224,010	26%	0	0	0%
Regional Offices	5	5,462,286	N/A	N/A	0	0	0%
Total	218	72,987,378	224,150	0.3%	492	0	0%

**Preliminary analysis indicates that the office in the City of Eugene could be vulnerable to 1% and 0.2% flood risk*

1% Annual Chance Flood Exposure

Community	Total Number of Buildings	Total Estimated Building Value	Sum of Economic Exposure	Exposure Ratio	Total Population	Number of Displaced Population	Percent of Displaced Population
Depoe Bay	1	193,440	0	0.0%	0	0	0%
Lincoln City	25	44,990,275	0	0.0%	60	0	0%
Siletz	167	21,450,304	0	0.0%	432	0	0%
Timberlands	3	22,669	2,416	10.7%	0	0	0%
Toledo	17	868,404	739,408	85%	0	0	0%
Regional Offices	5	5,462,286	423,907	7.8%	0	0	0%
Total	218	72,987,378	1,165,731	1.6%	492	0	0%

Storm Events Database (Database can be accessed through NOAA)

https://www.ncdc.noaa.gov/stormevents/

Event Details:

Event	**Flood**
State	**OREGON**

County/Area	**CENTRAL COAST RANGE OF W OREGON**
WFO	**PQR**
NCEI Data Source	**PDC**
Begin Date	**1996-02-06 00:00 PST**
End Date	**1996-02-15 00:00 PST**
Deaths Direct/Indirect	**7/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**.4B**
Crop Damage	
Episode Narrative	**Runoff from heavy rains and melting mountain snow caused major floods upon many northern Oregon rivers. The first rivers reached flood stage on the morning of February 6th while the heaviest rain was still falling. flooding was measured on twenty one rivers in northwestern Oregon. Six rivers set all time high river stage records, and 7 people lost their lives as a direct result of flooding. In eastern Oregon 4 rivers experienced significant flooding. Many smaller un-gaged streams also left their banks during this period. Statewide damage was estimated at over 285 million dollars with an estimated five thousand homes destroyed. Most rivers had receded to below flood stage by February 14th, however the Lower Willamette river fluctuated around flood stage and the lower reaches of the Columbia remained above flood stage until the end of February.**

Definitions

Base Flood Elevation (BFE): The base flood elevation is the elevation of a 100 year flood event, or a flood which has a 1% chance of occurring in any given year.

Basin: A basin is the area within which all surface water, whether from rainfall, snowmelt, springs or other sources, flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Basins are also referred to as Watersheds or Drainage Basins.

Flood

A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from:

--Overflow of inland or tidal waters; or

--Unusual and rapid accumulation or runoff of surface waters from any source; or

--Mudflow; or

Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Flood Hazard Boundary Map (FHBM). Official map of a community issued by FEMA, where the boundaries of the flood, mudflow and related erosion areas having special hazards have been designated.

Flood In Progress. A flood that is in progress on the earlier of either:

The date the community in which the insured property is located first experiences a flood as defined in this policy; or

The date and time of an event initiating a flood that directly or indirectly affects areas downstream or in a floodway and ultimately results in the damage to the insured

property. Events that may initiate such a flooding event include, but are not limited to, the following:

a. A spillway is opened;

b. A levee is breached;

c. Water is released from a dam; and

d. Water escapes from the banks of a waterway (stream, river, creek, etc.).

The applicability of this exclusion will be evaluated upon the assertion by a policyholder of the right to be paid for a loss under this policy.

Channel Migration Zone (CMZ) (FEMA Def. 2012)
https://www.fema.gov/pdf/about/regions/regionx/nfip_esa_faq/faq_channel_migration_zone_1_11_12.pdf

Channel migration can occur gradually, as a river erodes one bank and deposits sediment along the other. The natural meander patterns of stream channels are the result of the dissipation of energy of flowing water and the transportation of sediment. Channel migration also can occur abruptly, as the river channel shifts (or "avulses") to a new location. Avulsions are usually unpredictable events that occur during high flood flows when the existing channel cannot transport all of the water and sediment supplied to it. The highest rates of channel migration generally occur where steep rivers flow out of foothills onto flatter floodplains. : Dynamic physical processes of rivers can cause channels in some areas to move laterally, or "migrate," over time. The area within which a river channel is likely to move over a period of time is referred to as the channel migration zone.

Cubic Feet per Second (cfs): Discharge or river flow is commonly measured in cfs. One cubic foot is about 7.5 gallons of liquid.

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

Floodplain: Floodplains are the land area along the sides of rivers that becomes inundated with water during a flood. Floodplain can be defined in different ways, but is

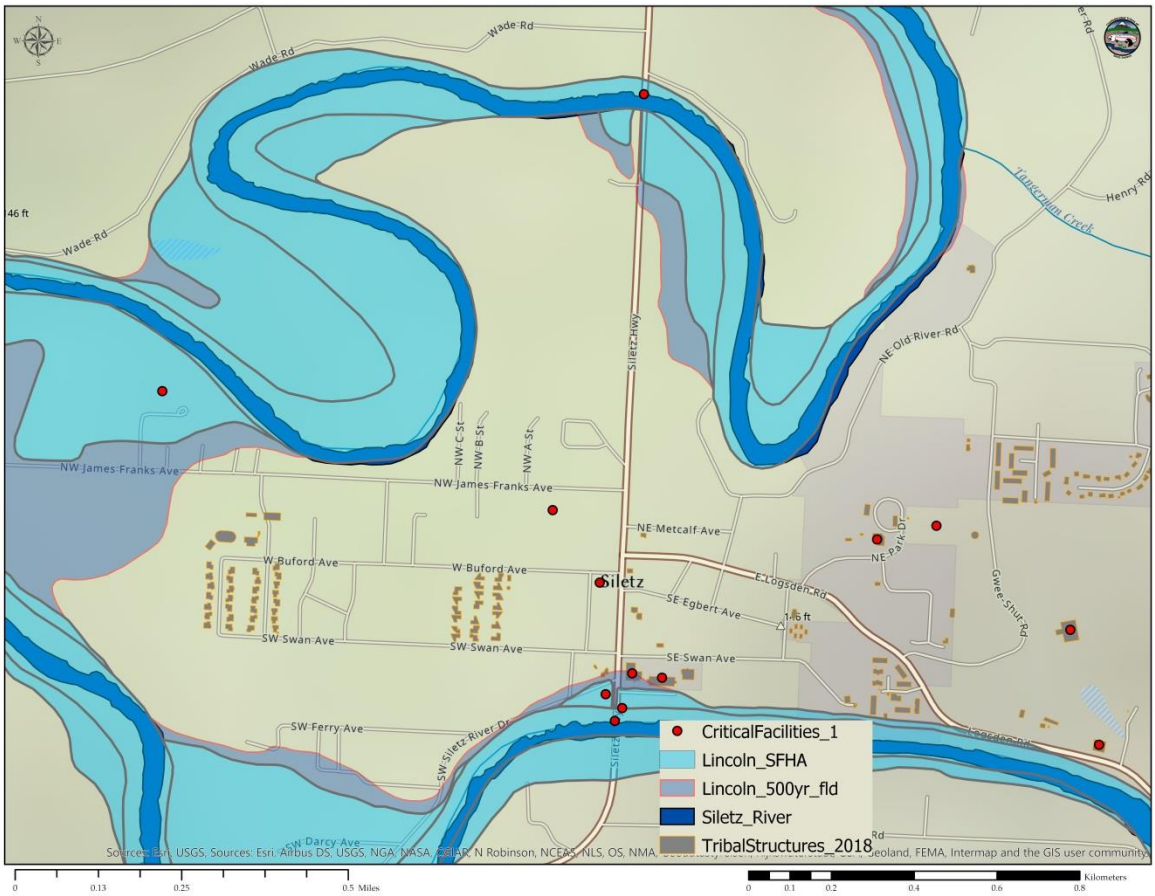
commonly defined as the area that is also called the 100 year floodplain. The term 100 year flood is misleading. It is not the flood that will occur once every 100 years. Rather, it is the flood that has a 1% chance of being equaled or exceeded each year. Thus, the 100 year flood could occur more than once in a relatively short period of time. Because this term is misleading, FEMA has properly defined it as the 1% annual chance flood. This 1% annual chance flood is now the standard used by most Federal and State agencies and by the National Flood Insurance Program.

Floodway:

Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than one-foot.

Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters

Floodway Schematic



Floodway Fringe: Floodway fringe areas are those lands that are in the floodplain but outside of the floodway. Some development is generally allowed in these areas with a variety of different restrictions.

Flood Zone Designations: These are the different flood hazard zones FEMA uses for FIRMs. These designations may be found on the flood hazard maps for Whitman County's communities.

Zone A: An area inundated by 100-year flooding, for which no Base Flood Elevations (BFEs) have been determined.

Zone AE: An area inundated by 100-year flooding, and which BFEs have been determined.

Zone ANI: An area that is located within a community or county that is not mapped on any published FIRM.

Zone X500 (0.2% annual chance): An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from the 100-year flooding.

National Flood Insurance Program: In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods.

The Mitigation Division is a section of the Federal Emergency Management Agency (FEMA) manages the NFIP, and oversees the floodplain management and mapping components of the Program. Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities.

FEMA contracted the Army Corps of Engineers to map the floodplains, floodways, and floodway fringes. Figure 4-5 depicts the relationship among the three designations.

Pre and Post FIRM rates: Category of rates published in the National Flood Insurance Program Manual, applying to buildings located in a community qualifying for the regular flood program. Post-FIRM rates are used on building construction that started

after December 31, 1974, or after the community's initial Flood Insurance Rate Map was published, whichever is later. These rates are lower than pre-FIRM rates.

Repetitive Loss Properties:

(a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or A residential property that is covered under an NFIP flood insurance policy and:

(b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and Zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems.

FEMA:

https://www.fema.gov/national-flood-insurance-program/definitions

Stream Bank Erosion:

Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife. Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair.

Streamgage: A stream gage is a structure located beside a river that contains a device to measure and record the water level in a river. Generally these measurements occur

every 15 minutes. The USGS operates a network of about 7,000 streamgages nationwide, and at about 5,000 of these, the data is sent back via satellite to an USGS office every 4 hours and more frequently in time of flooding. The flow and gage-height data are then made available to users over the internet. For the Siletz River the data can be found at the below links:

http://water.usgs.gov/nwis

https://waterdata.usgs.gov/nwis/uv?site_no=14305500

Subbasin: A subbasin is a tributary basin of a larger basin or watershed.

Zero-Rise Floodway: A 'zero-rise' floodway is an area reserved to carry the discharge of a flood without raising the base flood elevation. Some communities have chosen to implement zero-rise floodways because they provide greater flood protection than the floodway described above, which allows a one foot rise in the base flood elevation.

General Background

A flood is the inundation of normally dry land resulting from the rising and overflowing of a body of water. A natural geologic process that shapes the landscape, floods provide habitat and create rich agricultural lands. Human activities and settlements tend to use floodplains, frequently competing with the natural processes and suffering inconvenience or catastrophe as a result. Human activities encroach upon floodplains, affecting the distribution and timing of drainage, and thereby increasing flood problems. The built environment creates often localized flooding problems outside natural floodplains by altering or confining drainage channels. This increases flood potential in two ways: 1) it reduces the stream's capacity to contain flows; and 2) increases flow rates downstream. Floods also cause erosion and landslides, and can transport debris and toxic substances that can cause secondary hazards.

Besides Winter Storms (which flooding is often a part of) flooding represents the most common and best known of the natural hazard threats in Lincoln County and to the Confederated Tribes of Siletz Tribe's Coast Reservation Area.

Location

The Confederated Tribes of Siletz Tribe is generally affected by riverine flooding from the Siletz River between Siletz and Logsden, and Lincoln County has flood events nearly every year on one or more rivers depending on climactic conditions. To a lesser extent, flooding of the Siletz, Yaquina, and Salmon Rivers are by their respective tributaries. The Tribe can also be affected by urban flooding in areas of the aforementioned cities and Lincoln County.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural process of riverine flooding adds sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers.

Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100- year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

The Tribe's exposure to riverine flooding is from the Siletz River. The Siletz River may affect the Tribal Administration building and nearby facilities, especially if combined with urban flooding. Maps of Tribal exposed lands and structures in the FEMA floodplain can be seen in Figure _____ .

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force. Although most of the Tribe's lands are located in rural areas, its government facilities and economic developments, such as the Seven Feathers Casino and Truck Stop, are located in urban areas with impermeable surfaces that either collects water, or concentrate the flow of water. During periods of urban flooding, streets carry water to culverts. Culverts and storm drains sometimes back up with vegetative debris causing localized flooding.

The Tribe's urban flooding risks are in Siletz, Newport, Toledo, Depoe Bay, and other Lincoln County areas. The area offices located in Eugene, Salem, and Portland all have adopted local mitigation plans that show flood risk for urban areas.

Severity

Severity of flooding can be determined by the height of the Siletz River and its tributaries in comparison to flood stages determined for the USGS streamgages located throughout the area. See https://oregoncoasthistory.org/ and https://www.co.lincoln.or.us/emergencymanagement/page/hazards-flooding-and-river-levels for a list of highest flood crests in Lincoln County for major events from 1950-2019 (up unto October 2019)

Severity can also be measured by past damages from flooding, but because of lack of specific tribal history and damages from flooding, county-wide figures can only be used to generalize the severity of flooding that may affect tribal lands and facilities.

The 1964 and 1996 floods are considered the most severe floods in Lincoln County history. Using information from the Lincoln County Hazard Mitigation Plan, the 1964 flood caused $26 million in damages, while the 1996 flood caused $2 million in reported damages to county and private property. Correcting for inflation to 1996 dollars, the 1964 flood would have cost $131 million.

Compilation of Hazard Data using both independent databases and Sheldus was used by CTSI Planning Dept. with National Climatic Data Center (NCDC) storm damage reports, it was found that the most severe flood event in Lincoln County, adjusted to 2019 dollars, was in 1974, with the November 1996 floods the second most severe. See for a summary of damages as reported in the SHELDUS database for Lincoln County.

Links to sites used in Data compilation:

https://www.climate.gov/maps-data

https://www7.ncdc.noaa.gov/CDO/cdo

https://www.ncdc.noaa.gov/

State of Oregon Hazards

https://www.oregon.gov/OEM/hazardsprep/Pages/Hazard-Mitigation.aspx

Spatial Hazard Events and Losses Database for the United States (2019). The Spatial Hazard Events and Losses Database for the United States. Arizona State University Available https://cemhs.asu.edu/SHELDUS/

Table _____ Flood Levels in Lincoln County, 1950-2019

https://www.co.lincoln.or.us/planning/page/links

https://www.co.lincoln.or.us/planning/page/floodplain-management

Lincoln Co. River Flood Crest History

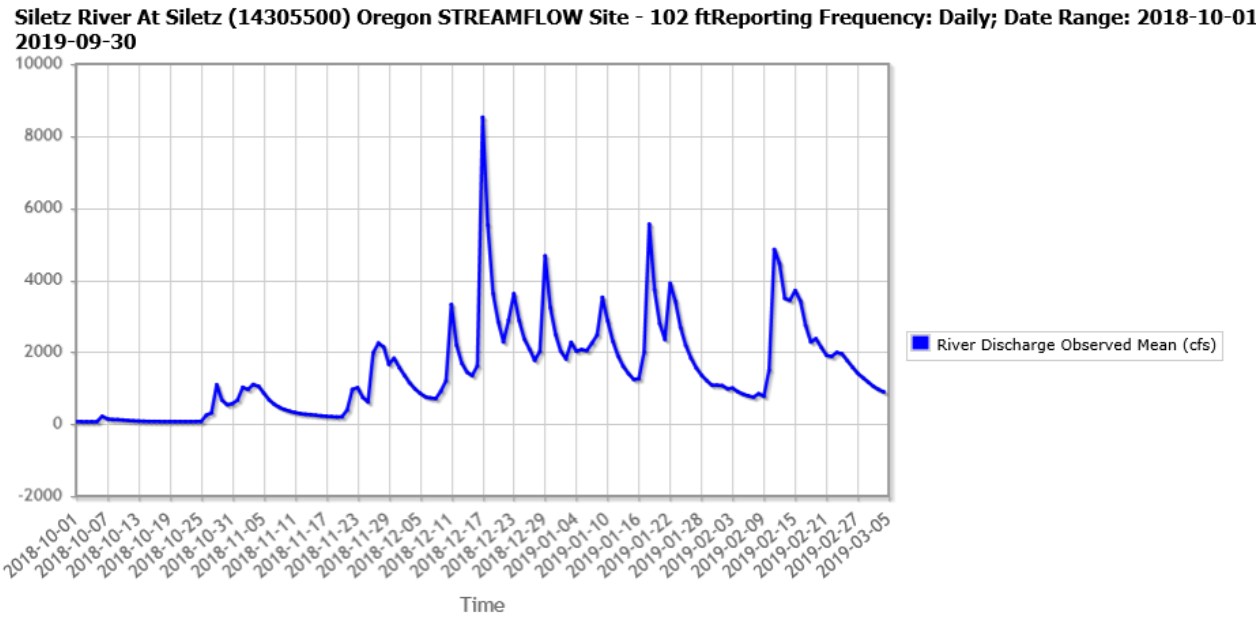
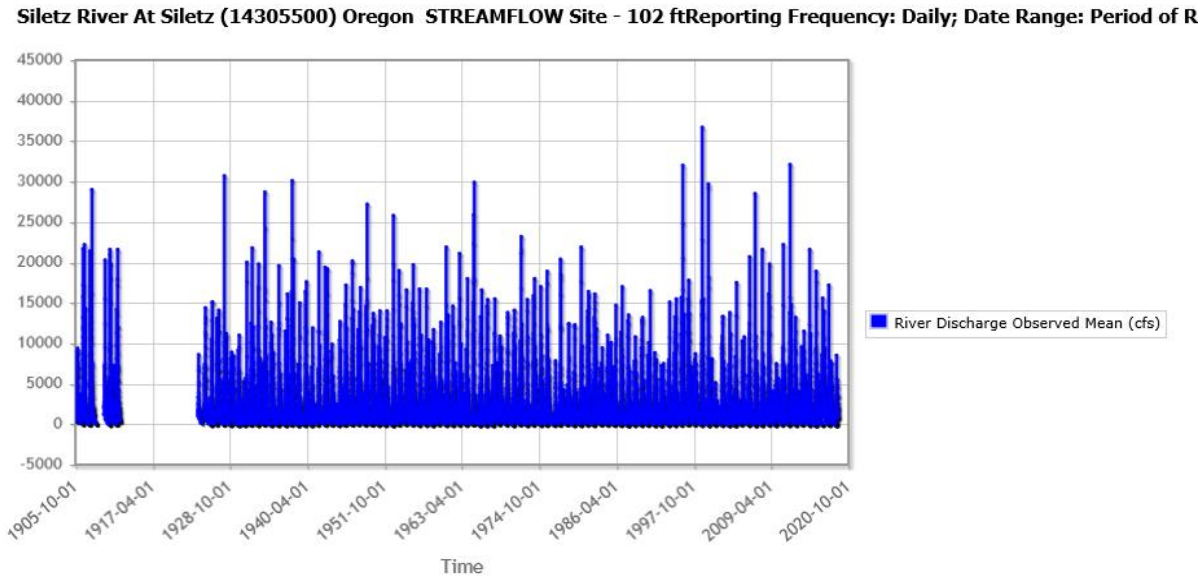


Table ____ : Severity of Flooding in Lincoln County, by Monetary Damages, SHELDUS



River Levels at the Siletz River since ca. 1905 (notice data break at approx. 1916-1927)

Past Events: Floods

Several buildings owned by CTSI in the town of Siletz are close to but not in the floodplain (administration buildings one and two are both partially in the 500 Year Floodplain, as is the part of the lot of the gas station, but not Tollala Court subdivision, USDA, and the clinic). If a 100-year flood event were to occur, these buildings would not likely be damaged. Due to safety issues, the most of the offices would likely be closed. The clinic would likely only accept emergency patients during a large flood event. However, any water level greater than a 100-year event could potentially damage the administration building II and I. During times of severe flooding of the Siletz River, the Town of Siletz could potentially become inaccessible by automobile traffic. The possibility of high water and woody debris could potentially damage both north and south access to the town of Siletz.

Floods have been a fact of life in the Confederated Tribes of Siletz Area (1855 Reservation Boundary and beyond to ancestral homelands) for thousands of years of

tribal inhabitation. Years with Established Flood Records are 1861, 1890, 1893, 1907, 1909, 1927, 1931, 1932, 1956, 1958, et al. Although the 1996 floods were devastating to the entire region, the floods of 1890, and 1964 were larger.

Lincoln County has experienced ten major floods since 1964. Four of these resulted in presidential declarations. Past flooding occurred on the Alsea, Siletz, and Yaquina rivers between November and March. Flooding also occurs in low-lying areas along the ocean and Devils Lake during high tides and heavy rain. The county estimates that ten percent of the population and ten percent of the property would be affected by such a flood event.

Effects of Recent Floods

Siletz River Floods In February 1996, December 1998, and November 1999 Lincoln County experienced damaging flood events. The 1996 flood event affected communities throughout western Oregon, with floodwater exceeding the "100-year" level in a number of locations. In Lincoln County, however, the 1996 event was of a lower magnitude, with floodwater reaching a level of 24.5 feet on the Siletz River gage (located upstream from the area addressed by this plan). The

Siletz 100-year event level is 30.5 feet. The Army Corps of Engineers estimated the recurrence interval of the 1996 Siletz event at 12-15 years, meaning approximately a six

percent to eight percent probability of occurrence in any year. The December 1998 event, similar to the 1996 flood, was gauged at a level of 24.7 feet. Accounts from property owners indicate that flood levels in 1998 were as much as one foot higher on the lower Siletz River than in 1996, probably due to the influence of coinciding high tides in Siletz Bay.

Probability/Frequency

The region experiences some flooding at least twice a year, with larger floods occurring at least once a decade. Based on past events, major flooding seems to occur at least every 30 -50 years.

Vulnerability

GIS analysis was used to determine tribal property and structures vulnerable to flooding. Property and buildings located within the FEMA 100- or 500- year floodplain are shown in the Siletz Area MHMP Flood Map

Property

The Tribe has many GIS layers related to parcels and property as they relate to utilities, water supply, tax identification, elevation data, drone imagery, etc. The Planning Department and GIS Analyst Ian Keene analyzed a myriad of datasets to determine property as it relates to hazard management and mitigation strategies.

Buildings/Facilities

In Siletz, Newport, and Lincoln County, Tribal property consists of cultural, residential, industrial, and commercial buildings. Tribal buildings are located within the floodplain of the Siletz River at the 100 and 500 year flood marks at several locations. HAZUS was performed that analyzes this flood area significantly.

The Administration buildings at Swan Avenue are both partially located in the 500-year floodplain. The Siletz Dancehouse at the end of Swan Ave is also partially located within the floodplain.

The Administration Buildings at Swan Ave. being partially located in the floodplain, are considered vulnerable due to their proximity to the Siletz River, and potential isolation and damage or wash-out of the Bridges on SR 229, both towards Kernville and towards Toledo, could be considered vulnerable to large flood events, both simply by water level, but also through debris flows during high water events.

The Tribe owns additional lands that adjacent to the Siletz River, including the Men's Transitional Living Center (high bluff above the river), The Dundas Property (also high bluff), the Fish Hatchery (low elevation for all buildings along Little Rock Creek) and multiple other developments are vulnerable to flooding within Siletz Proper.

GIS analysis of building vulnerability

GIS analysis was conducted with DOGAMI employees and Ian Keene. The GIS analysis found multiple structures located in the FEMA 100-year floodplain in the Siletz Area. Both bridges along SR 229 are within the flood zone, as are residential, and Tribal owned properties. No structures are currently planned on being moved.

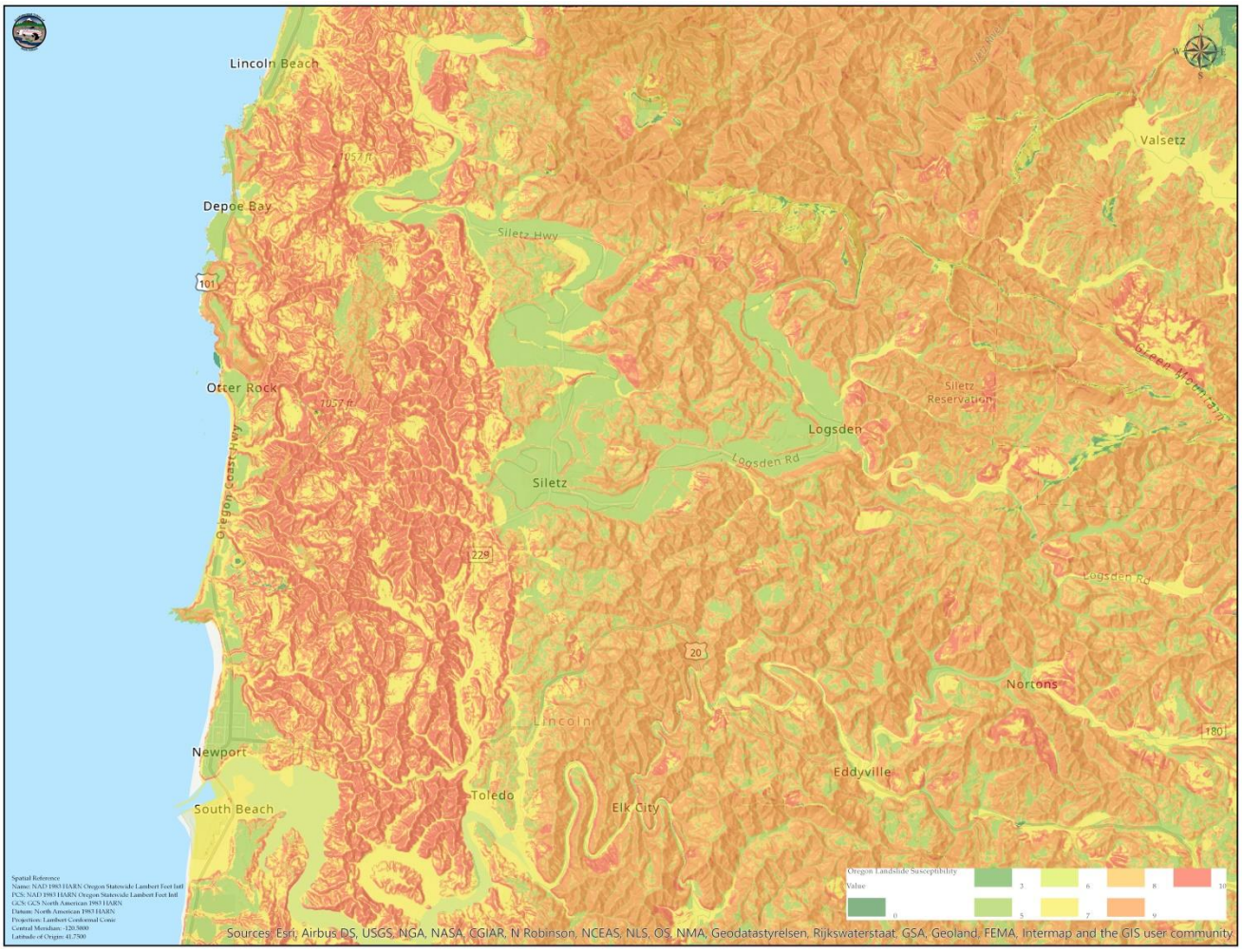
The November 1999 flooding of the Siletz River, significantly larger in magnitude than either the 1996 or 1998 events, was gauged at a level of 28.5 feet. This was the highest gage reading in 80 years, yet this event did not reach the 100-year flood level. Again, the 100-year flood elevation projected by the region's Flood Insurance Rate Map (FIRM) flood study is approximately 30.5 feet on the Siletz Gage, or roughly two feet higher than the November 1999 event. The highest recorded event on the Siletz River was in 1921 was estimated at 31.6 on the gage, with an estimated recurrence interval of slightly more than 100-years or one percent probability of occurrence in any year. This event was caused by a dam failure at Valsetz Lake and was not directly related to a high rainfall event. Figure 1-1 illustrates the relative levels attained on the Siletz gage by recorded flood events. It is notable that floodwaters below the "100-year" level have caused considerable damage. The level at which flooding begins is 16 feet on the town of Siletz gage.

Yaquina River Floods

Large floods of the neighboring Yaquina River could also affect tribal property. Due to its location and watershed similarities, peak events on the Yaquina River tend to coincide with peak events measured on the Siletz River. The amount of vulnerability and damage to structures is relatively low when compared to the total number of vulnerable structures located along the Siletz River.

On December 30, 2005 heavy rainfall for several days occurred at the same time as abnormally high tides caused the water to overflow the banks causing damage to the Tribes Mill property. While the rainfall was not substantial, the flood elevation was estimated to be at around 12.2 feet on the mill property. This was approximately one foot below a 100 year flood event and possibly the largest flood since the 1974 event. Figure 22 shows the river levels over ten feet between the years 1973 and 1991. Other recent flood events were not recorded due to the closure of this monitoring station.

Landslide



Definitions

Debris Slides: Debris slides consist of unconsolidated rock or soil that have moved rapidly down slope. They occur on slopes greater than 65%.

Earthflows: Earthflows are slow to rapid down slope movements of saturated clay-rich soils. This type of landslide typically occurs on gentle to moderate slopes but can occur on steeper slopes especially after vegetation removal.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Mass Movements: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Rock Falls: A type of landslide that typically occurs on rock slopes greater than 40% near ridge crests, artificially cut slopes and slopes undercut by active erosion.

Rotational-Translational Slides: A type of landslide characterized by the deep failure of slopes, resulting in the flow of large amounts of soil and rock. In general, they occur in cohesive slide masses and are usually saturated clayey soils.

Sinkholes: A collapse depression in the ground with no visible outlet. Its drainage is subterranean, its size typically measured in meters or tens of meters, and it is commonly vertical-sided or funnel-shaped.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%.

General Background

Landslides (or more properly, mass movement), are caused by a combination of geological and climatological conditions. This includes steep topography, as well as the encroaching influence of urbanization. Figure 4-18 shows landscape features associated with landslides.

A landslide is a mass of rock, earth or debris moving down a slope. Landslides may be minor or very large, and can move at slow to very high speeds. They can be initiated by storms, earthquakes, fires, volcanic eruptions, and by human modification of the land.

HAZUS Analysis of Landslides for CTSI MHMP Area

High and Very High Landslide Susceptibility Exposure

Community	Total Number of Buildings	Total Estimated Building Value	Sum of Economic Exposure	Exposure Ratio	Total Population	Number of Displaced Population	Percent of Displaced Population
Depoe Bay	1	193,440	193,440	100%	0	0	0%
Lincoln City	25	44,990,275	3,816,773	8.5%	60	60	100%
Siletz	167	21,450,304	14,649	0.1%	432	0	0%
Timberlands	3	22,669	0	0.0%	0	0	0%

Toledo	17	868,404	868,404	100%	0	0	0%
Regional Offices	5	5,462,286	0	0.0%	0	0	0%
Total	218	72,987,378	4,893,266	6.7%	492	60	12%

Landscape Features Associated with Landslides

Mudslides or mudflows (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

A debris flow or mudflow can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. Locally, they can be some of the most destructive events in nature.

A sinkhole is a collapse depression in the ground with no visible outlet. Its drainage is subterranean; its size is typically measured in meters or tens of meters, and it is commonly vertical-sided or funnel-shaped.

Landslides are caused by one or a combination of the following factors: change in slope gradient, which increases the load the land must bear, shocks and vibrations, change in water content, ground water movement, frost action, weathering of rocks, and removal or changing the type of vegetation covering slopes.

In general, landslide hazard areas occur where the land has certain characteristics, which contribute to the risk of the downhill movement of material. These characteristics include:

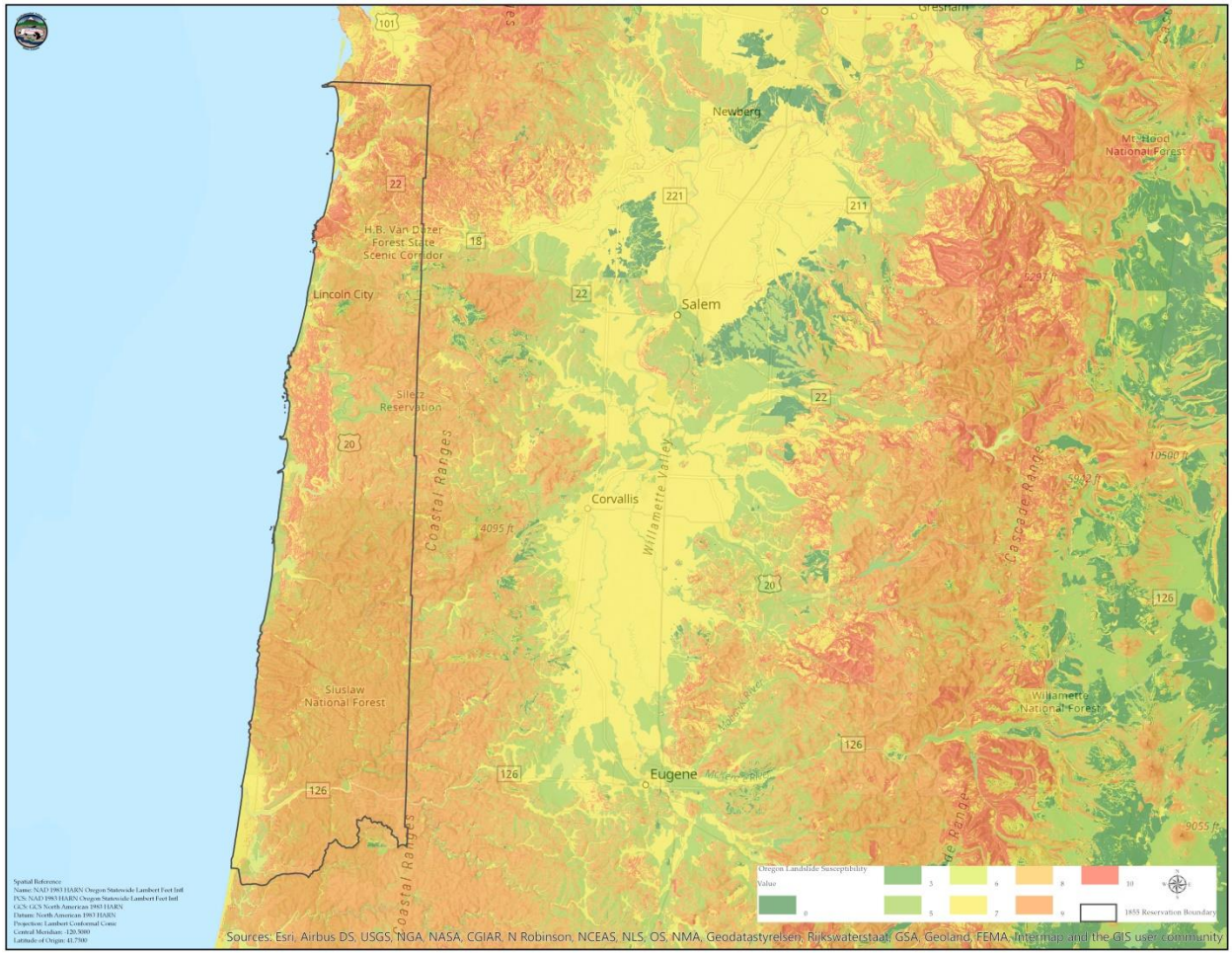
- A slope greater than 15 percent.
- Landslide activity or movement occurred during the last 10,000 years.

• Stream or wave activity, which has caused erosion, undercut a bank or cut into a bank to cause the surrounding land to be unstable.

• The presence or potential for silt/sediment/parent material/snow avalanches.

• The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments.

• The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.



LANDSLIDE CAUSES (From USGS Publications)

1. Geological causes

a. Weak or sensitive materials

b. Weathered materials

c. Sheared, jointed, or fissured materials

d. Adversely oriented discontinuity (bedding, schistosity, fault, unconformity, contact, and so forth)

e. Contrast in permeability and/or stiffness of materials

2. Morphological causes

a. Tectonic or volcanic uplift

b. Glacial rebound

c. Fluvial, wave, or glacial erosion of slope toe or lateral margins

d. Subterranean erosion (solution, piping)

e. Deposition loading slope or its crest

f. Vegetation removal (by fire, drought)

g. Thawing

h. Freeze-and-thaw weathering

i. Shrink-and-swell weathering

3. Human causes

a. Excavation of slope or its toe

b. Loading of slope or its crest

c. Drawdown (of reservoirs)

d. Deforestation

e. Irrigation

f. Mining

g. Artificial vibration

h. Water leakage from utilities

Although there are multiple types of causes of landslides, the three that cause most of the damaging landslides around the world are these:

Landslides and Water

Slope saturation by water is a primary cause of landslides. This effect can occur in the form of intense rainfall, snowmelt, changes in ground-water levels, and water-level changes along coastlines, earth dams, and the banks of lakes, reservoirs, canals, and rivers.

Landsliding and flooding are closely allied because both are related to precipitation, runoff, and the saturation of ground by water. In addition, debris flows and mudflows usually occur in small, steep stream channels and often are mistaken for floods; in fact, these two events often occur simultaneously in the same area.

Landslides can cause flooding by forming landslide dams that block valleys and stream channels, allowing large amounts of water to back up. This causes backwater flooding and, if the dam fails, subsequent downstream flooding. Also, solid landslide debris can "bulk" or add volume and density to otherwise normal streamflow or cause channel blockages and diversions creating flood conditions or localized erosion. Landslides can also cause overtopping of reservoirs and/or reduced capacity of reservoirs to store water.

Landslides and Seismic Activity

Many mountainous areas that are vulnerable to landslides have also experienced at least moderate rates of earthquake occurrence in recorded times. The occurrence of earthquakes in steep landslide-prone areas greatly increases the likelihood that landslides will occur, due to ground shaking alone or shaking-caused dilation of soil materials, which allows rapid infiltration of water. The 1964 Great Alaska Earthquake caused widespread landsliding and other ground failure, which caused most of the monetary loss due to the earthquake. Other areas of the United States, such as California and the Puget Sound region in Washington, have experienced slides, lateral spreading, and other types of ground failure due to moderate to large earthquakes. Widespread rockfalls also are caused by loosening of rocks as a result of ground shaking. Worldwide, landslides caused by earthquakes kill people and damage structures at higher rates than in the United States.

Landslides and Volcanic Activity

Landslides due to volcanic activity are some of the most devastating types. Volcanic lava may melt snow at a rapid rate, causing a deluge of rock, soil, ash, and water that accelerates rapidly on the steep slopes of volcanoes, devastating anything in its path. These volcanic debris flows (also known as lahars) reach great distances, once they leave the flanks of the volcano, and can damage structures in flat areas surrounding the volcanoes. The 1980 eruption of Mount St. Helens, in Washington triggered a massive landslide on the north flank of the volcano, the largest landslide in recorded times.

Landslides and debris flows always have and always will shape Oregon's landscape. Landslides become problematic, however, when people place buildings and infrastructure in harm's way. Additionally, development practices can cause or contribute to the severity of landslides. There are several categories of landslides, based on configuration (slide mechanism), slide materials, and rate of movement. Some slides are ancient, deep-seated, and slow moving. Others move rapidly as a mass of rock, mud, and large woody debris. All can be problematic when in the vicinity of buildings and infrastructure. Fast-moving landslides, or debris flows, occur throughout Oregon, but are especially noteworthy in the Cascade and Coast Ranges.

Debris flows (mudslides, mudflows, debris avalanches) are a common type of rapidly moving landslide that generally occur during intense rainfall on previously saturated ground. They usually begin on steep hillsides as slumps or slides that liquefy, accelerate to speeds as great as 35 mph or more, and flow down slopes and channels onto gently sloping ground. Their consistency ranges from watery mud to thick, rocky, mud-like wet cement, dense enough to carry boulders, trees, and automobiles. Debris flows from different sources can combine in canyons and channels, where their destructive power is greatly increased. In general, slopes that are over 25 percent or have a history of landslides might signal a landslide problem.

Landslides / debris flows probably accompany every major storm system that impacts western Oregon. In recent events, particularly noteworthy landslides accompanied storms in 1964, 1982, 1966, and 1996. Two major landslide producing winter storms occurred in Oregon during November 1996. Intense rainfall on recently and past logged land as well as previously unlogged areas triggered over 9,500 landslides and debris flows that resulted directly or indirectly in eight fatalities. Highways were closed and a

number of homes were lost. The fatalities and losses resulting from the 1996 landslide events brought about the passage of Oregon Senate Bill 12, which set site development standards, authorized the mapping of areas subject to rapidly moving landslides and the development of model landslide (steep slope) ordinances.

Oregon's landslide / debris flow warning system primarily involves three state and one federal agency: the Oregon Department of Forestry (ODF), the Oregon Department of Geology and Mineral Industries (DOGAMI), the Oregon Department of Transportation (ODOT), and the National Oceanic and Atmospheric Administration (NOAA). The warning system is triggered by rainfall and monitored in areas that have been determined to be hazardous. A landslide is the movement of rock, soil, and/or debris down a slope that occurs when the materials comprising the slope can no longer resist gravity. Factors that influence landslides (e.g., soil composition and moisture, slope steepness, precipitation, land development and zoning practices, and seismic shaking) generally decrease the shear strength (resistance) of the slope materials and/or increase the shear stress (loading) to the slope. Saturation of slope materials with water, which can be caused by heavy or prolonged rainfall and/or where human activity has altered drainage patterns such that slopes are more likely to become saturated, can decrease slope stability (shear strength). Undercutting of slopes by streams, waves, or construction activity can increase the shear stress and the likelihood of slope failure (landslide). Landslides occur without human influence, but can also be caused or exacerbated by human activities. Landslides encompass a wide range of slope movements, from small rock falls to debris flows to the failure of entire mountainsides, and multiple landslides types can occur within a single event. The spatial extent of landslides also varies from square feet to square miles. In general, most steep slopes are at some risk of slope failure, and some soil/geologic formations are particularly susceptible to landslide activity, even on relatively gentle slopes. For example, when layers of sand and gravel lie above less permeable silt and clay layers, ground water can accumulate and zones of weakness can develop. (ONHMP, CCMHMP)

The following characteristics may be indicative of a landslide hazard area (WEMD 2001):

- Bluff retreat caused by erosion and sloughing of bluff sediments, resulting in a vertical bluff face with little vegetation.

- Pre-existing landslide area.

- Tension or ground cracks along or near the edge of the top of a bluff.

- Structural damage caused by settling and cracking of building foundations and separation of steps from the main structure.

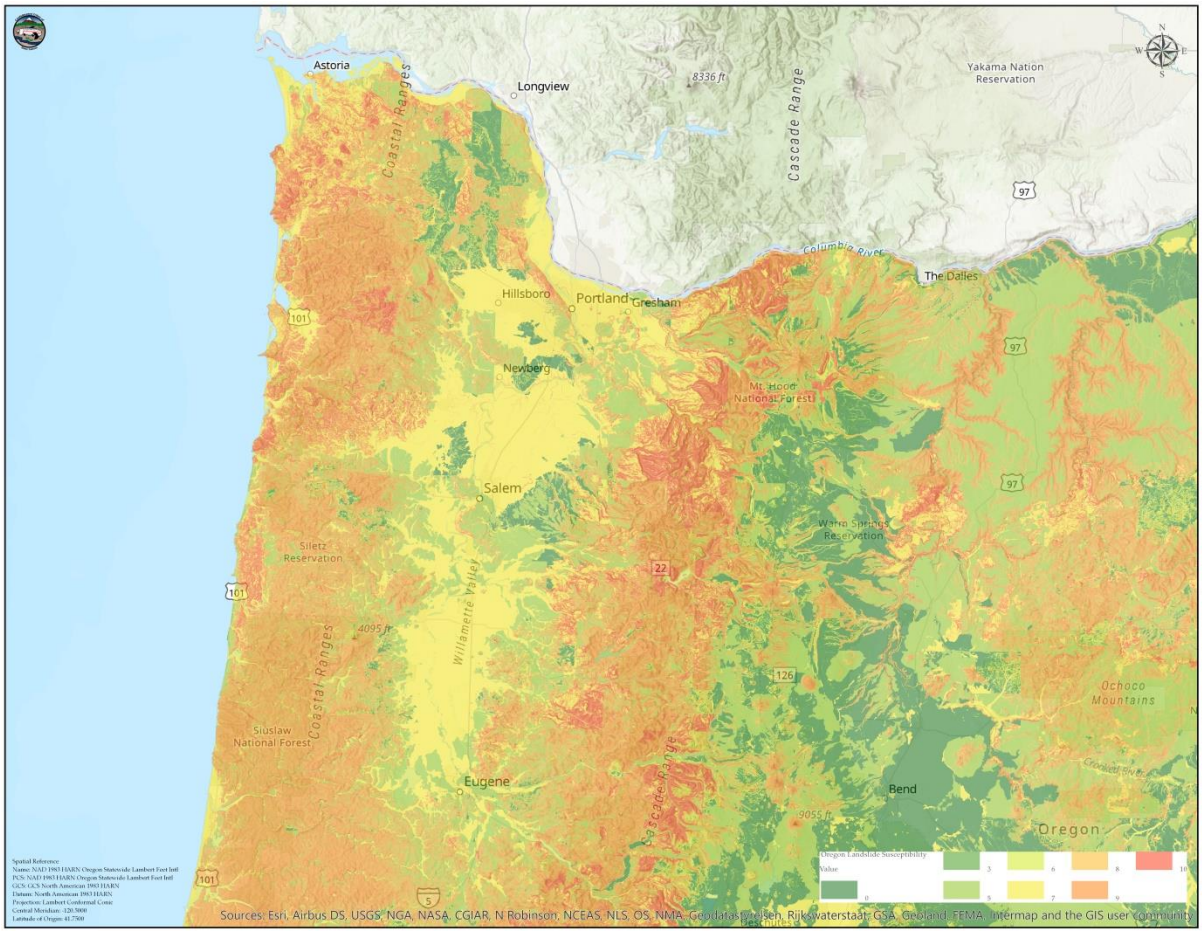
- Toppling, bowed or jack-sawed trees.

- Gullying and surface erosion.

- Mid-slope ground water seepage from a bluff face.

- Topographic convergence (especially as slope increases).

SLIDO Mapping and Landslide Types and Processes within Lincoln County Oregon



Hazard Profile

Location

In many parts of Lincoln County, weathering and the decomposition of geological materials produces conditions conducive to landslides. Human activity is believed to further exacerbate the landslide problem. Landslides can occur all through the Tribe's area and on tribal lands. In particular, locations at risk from landslides or debris flows include areas with one or more of the following conditions:

• On or close to steep hills;

• Steep road-cuts or excavations;

• Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground);

• Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels; and

• Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.

The Oregon Department of Geology and Mineral Industries (DOGAMI) has created a database of landslide deposits and past events, dating back to 1931. This database is called Statewide Landslide Information Database of Oregon (SLIDO) Tribal lands on or containing landslide deposits include the Toledo Mill Site, and some of the Lincoln County and Tahkenitch area Timberlands. Maps of the SLIDO data will be updated and uploaded to the CTSI website as time allows, and was last updated using SLIDO State of Oregon data from DOGAMI online in 2019. Within the Tribe's 1855 Reservation Boundary , past events are recorded back to the 1996 Winter Storm event. These areas were mapped and exposure of tribal lands and facilities was determined.

http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/SLIDOr2.htm

https://www.oregon.gov/geo/Pages/sdlibrary.aspx

Severity

Past events

There have been frequent landslides and mudflows in the Lincoln County/ Confederated Tribes of Siletz area, and are usually associated with severe weather, flooding and potentially, with earthquakes. The Oregon Dept. of Geology and Minerals (DOGAMI) has been compiling a GIS database of past landslides and this was used to analyze past events on Confederated Tribes of Siletz Tribal Lands and the area chosen for this MHMP. State Highway 229 and Logsden Road provide the only road access to the town of Siletz. During a major flood, these transportation routes could be inundated by floodwaters and/or landslides, blocking all land access to the town of Siletz. These roads have closed for several days during past flood events. Landslides along these roads are also common during high rainfall events. To the Tribe's knowledge, all three routes have never been blocked at the same time. There is a high possibility that high water and debris could damage one of the bridges that allows access to the town of Siletz. The only recorded 100-year flood event on the Siletz River occurred in 1921, so the current bridges have not been subject the forces and danger of a high flood event. Accompanied by occasional landslides along US Highway 101 during high rainfall events, the regional transportation routes have been crippled during past events. Personal accounts from Tribal employees of the 1999 Thanksgiving Day reported that water rose to within a few feet of the South Bridge Platform but did not make the bridge inaccessible. FIRM maps indicate that a 500-year event would crest at a level higher than the bottom support of the south bridge causing the water to back up and flow around the bridge over the SR 229.

Probability/Frequency

Landslides can occur at any time, but most increase in frequency during and after times of severe weather, flooding and earthquakes.

Vulnerability

Tribal lands located on hills, in riverine valleys, adjacent to deforestation practices, and historical landslide vulnerability areas are most vulnerable to landslides, although the Tribe is not at risk from any catastrophic flows at any given specific location at this time. As the Tribe increases development in areas along the Central Oregon Coast,

particularly on steep slopes, its vulnerability will increase. The Tribe is also vulnerable to landslides that close and block roads as they can prevent access to the Tribes properties, facilities, and businesses along a myriad of locations on SR 229 and Highway 101. Although some tribal lands have mapped landslide deposits, they are located in undeveloped, remote areas.

Future Land Use

Although the Tribe does not have any specific plans to develop in landslide prone areas, it has purchased lands on steep hills that could be potentially developed, including for tribal housing, forestry lands, and others that have coastal erosion problems that coincide with steep topography. The Tribe will ensure that landslide hazards are mitigated before any development occurs in landslide prone hazard areas.

Data compiled from state, federal, ESRI and Confederated Tribes of Siletz Tribal Sources. *Additional Mapping data and prints will be available online at a later date ** as prepared by Ian Keene 2018-2019- for Confederated Tribes of Siletz Tribal Multi-Hazard Mitigation Plan

Severe Weather

Definitions

Blizzard: A storm with considerable falling and/or blowing snow combined with sustained winds or frequent gusts of 35 mph or greater that frequently reduces visibility to less than one-quarter mile.

Freezing Rain: This is the result of rain occurring when the temperature is below the freezing point. When this occurs, the rain will freeze on impact and will result in a layer of glaze ice over everything it touches. Although the layer of glaze is generally quite thin it can measure up to one inch in depth. In a severe ice storm an evergreen tree measuring 20 meters high and 10 meters wide can be burdened with up to six tons of ice, creating a serious threat to power and telephone lines and transportation routes.

Severe Local Storms: These include what are termed “microscale” atmospheric systems: tornadoes, thunderstorms, windstorms, ice storms and snowstorms. Typically, major impacts from a severe storm are to transportation and loss of utilities. The major characteristic all of these events have in common is that their effects are usually limited

in scope. Although one of these storms may cause a great deal of destruction and even death, its impact is generally confined to a small area.

Snowstorms: These are caused by a war between air of different temperatures and densities. This resultant low pressure system can cover thousands of square miles with snow. Heavy snow in western Oregon is generally confined to the mountains with heavy accumulation in the lowlands uncommon.

Thunderstorms: This is the most common of severe weather systems. These are typically 25 kilometers in diameter and last 30 minutes from birth to growth through maturity to decay. Thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life nationwide. Heavy rains dumped in a small area over a very short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornadoes: Tornadoes are characterized by funnel clouds of varying sizes that generate winds as fast as 500 miles per hour. They can affect an area of ¼ to ¾ of a mile, with the path varying in width and length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorms: These are storms consisting of violent winds. There are several sources of windstorms. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the Cascade Mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

General Background

Severe winter storms can produce rain, freezing rain, ice, snow, cold temperatures and wind. Severe winter storms affecting Lincoln County and the Confederated Tribes of Siletz Indians originate in the Gulf of Alaska and the central Pacific Ocean and are most common from October through March. Wind storms are also an issue, but are diminished in the foothills and towards the Willamette Valley due to its being surrounded by the Coast Range. The township of Siletz receives greater windbreak from the surrounding topography than does the immediate coastline and homelands along highway 101.

Hazard Profile

Location

All of the Tribe's properties and buildings can be affected by severe weather, including snow and ice, in the Siletz River Valley. The tops of hills and mountains, as well as higher elevations exposed to the prevailing winds, are most exposed to the damaging effects of severe weather including wind storms in winter.

Severity

Windstorms having sustained winds of at least 50 miles per hour (mph) cause significant damage and occur frequently. Damage from storms includes loss from automobile accidents, damage to vegetation and structures, business and school closure, and power outages. Emergency response may be affected. During La Nina weather years, severe weather can be more extreme. The worst storm years, such as 1996 flooding, were associated with La Nina climate patterns.

In general though, the Confederated Tribes of Siletz Indians administration buildings and tribal housing (except for Lincoln City and other area Offices) location in the Siletz Valley decreases the severity of even the most extreme storms. Nonetheless damages and power outages can still occur.

Past Events

The Tribe did not report any specific events that caused damages or disruptions from severe weather and windstorms. Although not as common as in other areas, the Siletz Valley has been affected by strong winds, ice and snow in the past and will be discussed below.

Snow

In the past 80 years, there were over 80 days where an inch of snow or greater fell in Siletz, Newport, and Lincoln County and other areas of the Siletz Valley. All of the snow events occurred between November and April.

The December 1919 storm was recorded as the third heaviest snow-producing storm in Oregon. The Columbus Day Windstorm of 196 was the most destructive windstorm ever recorded in the Pacific Northwest. The severe winter weather and windstorm

season is typically between October and April and damaging events occur every year. Large events typically occur about once a decade. Large snow events used to occur every 20-30 years during the late 19th to mid-20th centuries, but have become less frequent. This may be attributable to changing climate patterns, ENSO, and the PDO.

The Flood section provides detailed information for all flood events including those generated by winter storms. We will not duplicate that information here. The majority of winter storms that affect the region are rain and wind based storms. Snow and ice events have occurred in the past, but rainstorms are more frequent. High winds can be expected throughout Lincoln County as experienced during most winter storms on the Oregon Coast. Destructive windstorms are less frequent, and their pattern is fairly well

known. They form over the North Pacific during the cool months (October through March), move along the coast and swing inland in a northeasterly direction. Wind speeds vary with the storms. Gusts exceeding 100 miles per hour have been recorded at several coastal locations

(Table below) but lessen as the storm moves inland. These storms can be very destructive as documented in the now infamous Columbus Day Storm of October, 1962. Less destructive storms usually topple trees, power lines, and cause building damage. Flooding from these winter storm events causes a large percentage of Oregon's annual precipitation.

Historic Windstorm Events Affecting CTSI Property in Lincoln County

Date Location Description Remarks

January 1880 Western Oregon Very high winds 65-50 mph near Portland Flying debris; fallen trees

January 1921 Oregon Coast/ Lower Columbia

Winds 113 mph at mouth of Columbia. Gusts at Astoria, 130 mph

Widespread damage

April 1931 Western Oregon

Unofficial reports of wind speeds up to 78 mph

Widespread damage November 1951 Most of Oregon Winds 40-60 mph with

75-80 mph gusts Widespread damage, especially to transmission lines

December 1951 Most of Oregon Winds, 60-100 mph, strongest along coast

Many damaged buildings. Telephone/power lines down

December 1955 Western Oregon Wind gusts at North Bend 90 mph

Significant damage to buildings and farms

January 1956 Western Oregon Heavy rains, high winds, mud slides

Estimated damage: $95,000 (1955 Dollars)

November 1958 Most of Oregon

Wind gusts to 75 mph at Astoria. Gusts to 131 mph at Hebo Damage to buildings and utility lines

November 1962 Statewide

Wind speeds of 131 mph on the Oregon coast (Columbus Day Windstorms

Oregon's most destructive storm. 23 fatalities. Damage at $170 million

Vulnerability

The Tribe's primary vulnerability from severe weather and windstorms is from power outages and isolation from road closures. Business disruption, especially for facilities without back-up generators, is also a vulnerability. Tribal elders are vulnerable, especially those that can be trapped in their homes from power failures, heavy snow and ice, and debris from falling trees and power lines. Some older homes and buildings (such as barns) may also be affected by heavy wet snow on roofs. The Tribe's timber and forest resources may also be affected by wind, although not as common or severe as forests near the coast.

Wildland Fire

Definitions

Forest Fire: Forest fires are the uncontrolled destruction of forested lands caused by natural or human-initiated events. Wildfires occur primarily in undeveloped areas; these natural lands contain dense vegetation such as forest, grasslands or agricultural croplands. Because of their distance from firefighting resources and manpower, these fires can be difficult to contain and can cause a great deal of destruction.

Conflagration: A conflagration is a fire which grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup and explosions are usually the elements behind a wildfire conflagration.

Firestorm: This term describes a fire that expands to cover a large area, often more than a square mile. A firestorm usually occurs when many individual fires grow together to make one huge conflagration. The involved area becomes so hot that all combustible materials ignite, even if they are not exposed to direct flame. Temperatures may exceed 1000° Celsius as the fire creates its own local weather: superheated air and hot gases of combustion rise upward over the fire zone, drawing surface winds in from all sides, often at velocities approaching fifty miles per hour. Although firestorms seldom spread because of the inward direction of the winds, once started there is no known way of stopping them. Within the area of the fire, lethal concentrations of carbon monoxide are present; combined with the intense heat this hazard poses a serious life threat to responding fire forces. In exceptionally large events, the rising column of heated air and combustion gases carries enough soot and particulate matter into the upper atmosphere to cause cloud nucleation, creating a locally intense thunderstorm and the hazard of lightning strikes.

Wildland/Urban Interface (WUI) Area: The Wildland-Urban Interface (WUI) is an area within or adjacent to an at-risk community identified in an Oregon Community Wildfire Protection Plan (CWPP). Some Community Wildfire Protection Plans delineate WUI boundaries (CWPP WUI). The Wildland-Urban Interface is the area where structures or human improvement meet or intermingle with wildland vegetation, which includes timber, grassland and brush fields. Communities with wildland fire risk (and

their boundaries) are identified by the state through the risk assessment process or during development of Community Wildfire Protection Plans.

General Background

Wildfires are a common and widespread natural hazard in Oregon. Fire is a critical component of the forest and rangeland ecosystems found in all portions of the state. Over 41 million acres of forest and rangeland in Oregon are susceptible to wildfire, which may occur during any month of the year, but usually occur between July and October. In addition to wildland/urban interface fires, Oregon experiences wildland fires that do not threaten structures, and also occasionally has prescribed fires. The principal type affecting Oregon communities is interface fire, which occurs where wildland and developed areas intermingle with both vegetation and structures combining to provide fuel. As more people have moved into wildland interface areas, the number of large wildfires impacting homes has escalated dramatically. The areas of highest risk are in central, southwest, and northeast Oregon. Fuel, slope, weather, and development are key components in wildfire hazard identification. (OSU, CCMHMP, ODF)

The coastal areas of Oregon have separate fire regions in regards to threats and fire ecology. Lincoln County and the Confederated Tribes of Siletz are in one of the lower risk areas for wildfires in Oregon in terms of recurrence, but one of the higher in terms of fire intensity and stand replacing fires (which many of the large stand replacing fires in the last decades of been west of the coast range that are greater than 30,000 acres).

Seventy percent of the wildfires suppressed on lands protected by the Oregon Department of Forestry (ODF) result from human activity. The remaining thirty percent result from lightning. Typically, large wildfires which threaten WUI communities result primarily from lightning. (ODF, CCMHMP)

For a more detailed discussion of wildfire issues within the Confederated Tribes of Siletz Tribe's Usual and Accustomed areas, including Lincoln County, please see the Lincoln County Community Protection Plan. Of particular interest is Appendix B, Tiller Pre-Contact Reference Condition Study, which discusses tribal wildfire and vegetation management and from which research and findings were used for this hazard profile.

WILDFIRES

Wildland fires (wildfires), whether naturally occurring or caused by humans, can result in the uncontrolled destruction of forests, brush, field crops, grasslands, and any structures found within the landscape. Fire is a natural part of the ecosystem in the western United States that has been unnaturally reduced in frequency due to fire suppression efforts over the past century. These fire suppression efforts generally resulted in an increase in the volume of wood available to feed a fire. The fire season in Lincoln County typically runs from June through September. Dry periods can extend the fire season. Factors affecting the vulnerability of an area to wildfire include the type and density of vegetative fuel, weather conditions, and topography. Factors affecting potential losses due to wildfire include the number and density of structures, distance of structures from fuels, and proximity to firefighting resources.
Fire Season Changes over last years (Data from ODF and Lincoln County 2018 Fire Plan)

Fire season Start Date
Fire Season End Date
Length (days)
2011 July 11th - October 3rd 84
2012 July 11th - October 16th 97
2013 July 2nd - September 25th 85
2014 July 1st - October 14th 105
2015 June 16th - October 26th 132
2016 July 5th - October 4th 91

Wildfires usually are extinguished when less than one acre in size, but can spread to thousands of acres and may require thousands of firefighters and several weeks to extinguish. Federal, state, county, city, and private agencies and private timber companies typically combine to provide fire protection and firefighting services in the region (WEMD 2001).

Many urban/wildland interface areas are located in some of the most fire-prone fuel areas. The term interface is often used to describe areas where homes and other structures have been built on or adjacent to forest and range lands. While the term is in

common use, the situation is not truly an interface. It is not an identifiable line, but rather an intermingling of homes and structures with natural cover or forestlands at various degrees of growth and complexity (Clackamas County 2002). This interface is not limited to remote areas.

Profiles of Past Wildfire Events

Oregon has a very lengthy history of fire in the undeveloped wildlands and in the developing wildland/urban interface. In recent years, the cost of fire suppression has risen dramatically; a large number of homes have been threatened or burned, more fire fighters have been placed at risk, and fire protection in wildland areas has been reduced. These factors have prompted the passage of Oregon Senate Bill (SB) 360 (Forestland / Urban Interface Protection Act, 1997). This bill: (1) establishes legislative policy for fire protection, (2) defines urban/wildland interface areas for regulatory purposes, (3) establishes standards for locating homes in the urban/wildland interface, and (4) provides a means for establishing an integrated fire protection system.

Most coastal counties (including Lincoln) are heavily timbered and have a long history of devastating forest fires. Some of the history is derived from Native Americans who recall extensive forest fires before the arrival of Euro-Americans. Fires involving the wildland interface occur in portions of the state where urbanization and natural vegetation fuels allow a fire to spread rapidly from natural fuels to structures and vice versa. Especially in the early stage of such fires, structural fire suppression resources can be quickly overwhelmed increasing the number of structures destroyed. Such fires are known for the large number of structures that are simultaneously exposed to fire, increasing the total losses per structure ignited. Nationally, wildland interface fires commonly produce widespread, extreme losses. Thus far, Oregon has escaped the level of property losses experienced by neighboring states. Table 9 describes the history of some of the significant wildland fires experienced on the coast.

Historic Wildfires on the Oregon Coast

Date Name of Fire Location Area Burned Remarks

1846 Yaquina

Lincoln & Lane counties
Burned over 450,000 acres (estimates show as high as 497K acres)
Event related by Native American hunters.

1853 Nestucca Fire
Burned over 320,000 acres.

1868 Coos Bay Coos
296,000 acres burned

1922 Astoria
Downtown, City of Astoria
Many Buildings (32 city blocks burned)

Early December structural fire most likely not related to wildfire.

1933 Tillamook 240,000 acres burned
The Tillamook Forest burned every
six years between 1933 and 1951. (The complex is attributed with closer to 330,000 acres total including several other complexes)

1936 Bandon 143,000 acres burned

1939
Saddle
Mountain Clatsop County 207,000 acres burned

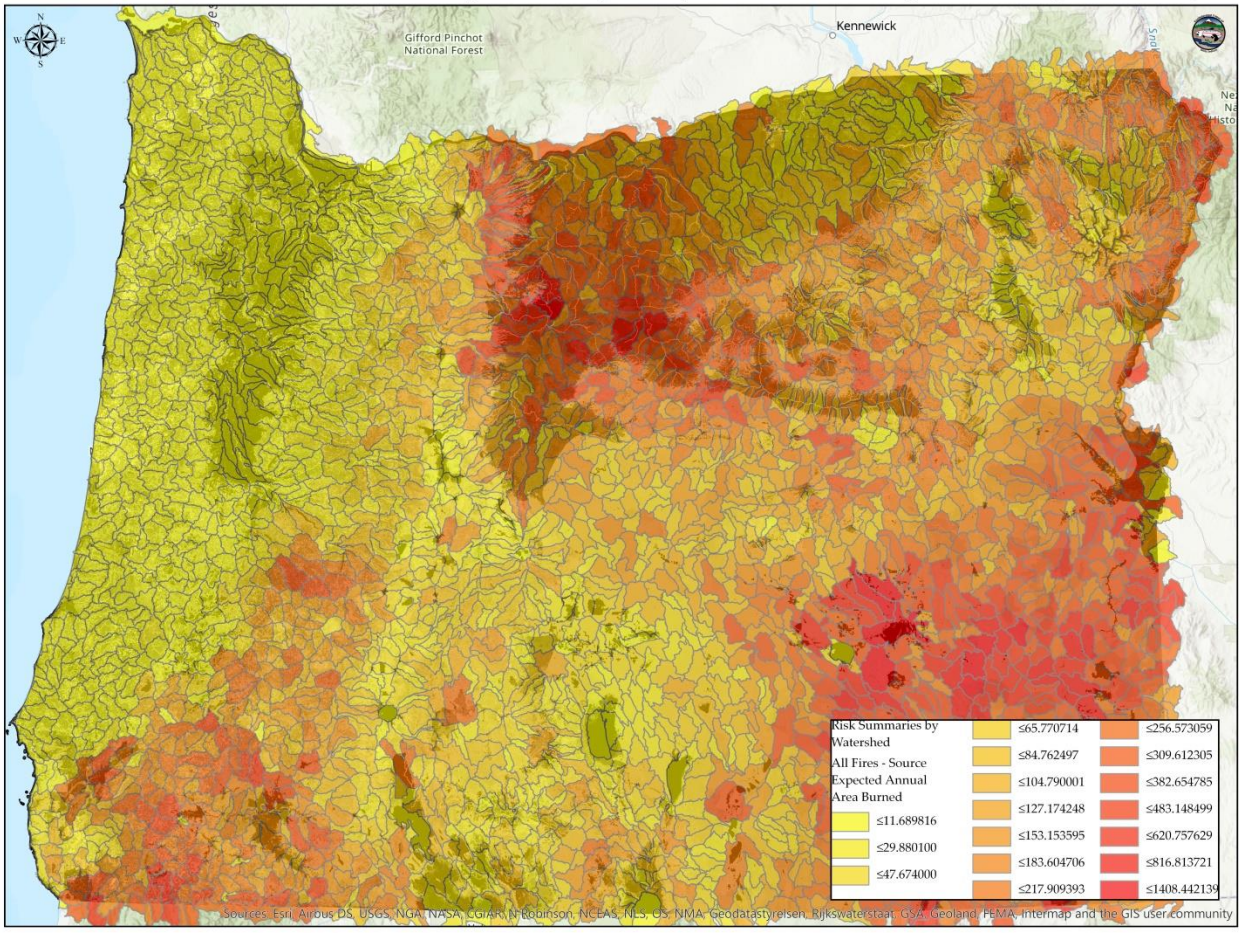
1945
Wilson River/
Salmonberry Tillamook County 173,000 acres

1951
North Fork/
Elkhorn Tillamook County 33,000 acres burned

2002 Florence/Biscuit S.W. Oregon
Almost 500,000 acre (perimeter)burned
Largest forest fire in Oregon since
arrival of Euro-Americans (albeit in very close to proximity of size with the Yaquina Burn estimated size)

Klondike and Taylor Burns
Rogue/Siskiyou

CTSI MHMP Fire Probability Statewide by HUC (Data from State of Oregon ODF/USFS)



Wildfire Vulnerability Assessment

Calculations of fire behavior are based on fuels, topography, and weather, or what is commonly called the fire triangle. According to the fuel model key (excerpted from the National Fire Danger Rating System developed by the U.S. Forest Service) in the Urban

Wildland Interface Code (FEMA 2001a), the fire fuels in the forested areas of the Reservation can be described as light to medium (out of three classifications: light, medium, and heavy fuels). In the areas where deciduous trees dominate, the fuel classes are light. In the areas of coniferous trees, fuel classes are mostly medium. Because of the low critical fire weather frequency and slopes in the forested areas, the wildfire hazard in these areas is moderate in severity.

Much of the uplands above the floodplains on the Reservation are forested and therefore vulnerable to large wildfires. However, the relatively cool, humid, maritime climate, the usually short dry season, the imposition of burning bans, and the close proximity to firefighting resources combine to make the probability of a damaging wildfire relatively low throughout. A damaging fire on the Reservation would probably require a combination of factors: an extended dry period, hot weather to dry fuels, and winds that are high enough to spread the fire faster than it can be controlled. Although these conditions evidently occurred in the 1800s when there was no fire suppression apparatus in the area, this combination of conditions is currently very rare on the Reservation.

Potential Wildfire Losses

If a wildfire were to occur on or near tribal property the losses would most likely be in timber resources since most tribal buildings are located away from urban/forest transition areas.

Table 4.43 shows the total estimated value of woodland owned by the tribe. Such a total loss is unlikely since a fire probably would not burn the whole area and would not completely damage all houses in its path. Thus the estimated potential losses represent a long-term, worst-case scenario. The tribe currently owns 41 parcels totaling approximately 3600 acres of timberland. According to the Lincoln County Tax Assessor's Office the value of these lands is 2.02 million. The timber value of these properties would be much greater than the County's assessed value since the assessor only calculates the value of the land not the resource value of the property.

Timber Revenue from logging on reservation lands supports several tribal programs without staff. These programs include: Hatchery, Honoree Travel, Investment,

Contingency, Holiday Fund, Gifts, Tribal Court, Public Works, Security, Election Board, Tribal Committees, Elders Council, Area Community Meetings, Culture Activities, Honor/Color Guard, and Funeral Pot Lucks. Programs that include staff funding that timber revenue supports include: Tribal Council Secretaries, Tribal Court, Security, and Maintenance.

Drought

Drought Vulnerability Assessment

The entire population on tribal property is directly or indirectly vulnerable to drought because water availability affects lives in many ways. Residents are directly affected by a reduced water supply, either because well production may cease or be limited, because wells can become contaminated by seawater, because water use restrictions may be implemented, or because water costs may increase. Residents may be indirectly affected if drought effects on hydroelectric power result in increased electricity rates to industry, businesses, and private homes, which have ripple effects throughout the economy. Another economic factor is a lack of irrigation for agriculture, which results in unemployment and loss of farm production and associated income.

Approximately 80 percent of tribally owned lands are currently forested, and these lands are a large source of income for the Tribe. During a drought, these forestlands have an increased risk of fire, which could be devastating with the loss of timber potentially causing human life losses and affecting recreation, natural and cultural resources, and wildlife.

The Reservation's overall vulnerability to drought is low. Prolonged events present a significant fire, subsistence, and financial risk to tribal population and infrastructure. However, severe droughts occur infrequently. The historically long duration of droughts events could directly influence CTSI's economic structure. The probability of occurrence is low. While the 2001 drought affected much of the region, severe droughts that have a large direct effect on the Confederated Tribes of the Siletz Indians are relatively rare because of the maritime climate of the region. This climate provides moderate temperatures that minimize the effect of dry periods, and it generally provides rain-producing weather systems often enough to reduce the duration of a drought.

In addition to the effect on the surface water supply used in the Siletz hatchery property, lower flows in the Siletz River can have a large impact on salmon production in the river. Salmon are important to the Siletz people both as a food source and culturally.

Potential Drought Losses

State-wide droughts have historically occurred in Oregon, and as it is a region-wide phenomenon, all residents are equally at risk. The effects of drought can be large and far-reaching, quantifying these effects is difficult because droughts vary in severity and duration and because many of the effects are indirect, complex, and/or diffuse. Structural damage from drought is not expected; rather the risks are present to humans and resources. Agriculture, fishing, and timber have historically been impacted, as well as local and regional economies.

Hazard Profile

To show exposure and vulnerability to wildfires, GIS data created by Oregon Department of Forestry (ODF) was used to show Wildland Urban Interface Areas which are also defined as Community Wildfire Protection Plan Boundaries of which the Tribe falls under numerous Plans in Lincoln County. ODF mapped variables to determine risk which are shown in the hazard maps that follow.

Location

Lincoln County is +/- 90% covered by forest and thus a wildfire can occur anywhere in this area if the conditions are met. Fire ecology tells us that all that is needed is climate and weather conditions, fuels as above ground biomass, and topography to equate to event.

Community at Risk, Hazard Rating_____ The most current ODF fire data was used

https://www.oregon.gov/geo/Pages/geoservices.aspx

https://www.oregon.gov/GEO/Pages/index.aspx

Severity

GIS analysis of past wildfire events within the Confederated Tribes of Siletz Tribe 1855 Reservation Boundary revealed that near 80%% of all past events were less than an acre in size, with 95% of all events less than ten (10) acres. The risk of large and severe fires appears much greater today than in any other time in history due to increased living and dead fuel accumulations, continuity of fuels across the landscape, extended canopy closures, and prevalence of ladder fuels.

*Past Events of Fires listed above

Other significant fires in Western Oregon Lincoln are listed below

https://www.co.lincoln.or.us/emergencymanagement/page/hazards-wildfire

GIS analysis of past events compiled by the Oregon Department of Forestry

Through analysis of the Oregon Department of Forestry and United States Forests Service, CTSI found that there were 8,135 wildfires within the Confederated Tribes of Siletz Tribe 1855 Reservation Boundary area between 1980 and 2010. These events are shown in and give a good visualization of the amount of wildfires in the area.

Historic Fires GIS data layers from Oregon Department of Forestry and United States Forest Service

Data can be found at

https://data.fs.usda.gov/geodata/

https://www.oregon.gov/ODF/AboutODF/Pages/MapsData.aspx

Wildfire Causes on Confederated Tribes of Siletz Tribal Lands

Wildfire Causes

The Confederated Tribes of Siletz Indians CTSI has only begun acquiring land in the last 40 some years with most land located in urban areas or in the Siletz River Valley and thus has not had any reported large losses from wildfires in the past decades.

However, as the Tribe increases its land holdings and development, especially into the coastal regions that encompass the 1855 Reservation boundary, the potential and likelihood of losses is certain.

Probability/ Frequency

Fire is a natural component of forest and rangeland ecosystems found in all portions of the state. Many of these ecosystems are dependent upon the existence of frequent fire, or on a viable substitute, for their continued existence. Even western Oregon forests, in the "wet" coastal and western portion of the state, depend upon fire.

Factors that influence the occurrence and severity of wildfires include poor forest health, climate impacts which have extended some drought like conditions in various years, invasive plant and tree species, high amounts of vegetation arising from long-term fire exclusion, changes in weather and climate patterns locally and regionally, and the ever increasing anthropogenic impacts of expanding human development in Western Oregon. In Oregon, wildfires are inevitable. Although usually thought of as being a summer occurrence, wildland fires can occur during any month of the year. The vast majority of wildfires burn from June to October time period. Dry spells during the winter months, especially when combined with winds and dead fuels, may result in fires that burn with an intensity and a rate of spread that surprises many people in the drier sections of our state. The vast majority of wild fires that occur on the Western side of the Coast Range, are stand replacing and catastrophic in scale when large in size (greater than 5,000 acres), e.g. Yaquina, Tillamook, Biscuit, et al.

It should be noted that with current forest management policies that focus on suppression, wildfires have been trending towards increased size and severity and have become harder to contain. Catastrophic fires, those which burn over 100,000 acres during a single event or catastrophic fire years, calendar years in which more than 100,000 acres of forestland within a given area are burned by wildfire, whether during the course of a single event, or as a result of numerous events, have become more frequent in historic times.

Oregon Department of Forestry – West Oregon District Mobilization Plan The purpose of the West Oregon District Mobilization Plan is to provide critical information necessary to direct activities for wildfire and other emergencies. The Mobilization Plan details the District's critical information including: lists of personnel, vehicle

inventories, standard report forms, the District's fire operations plan, cooperators, and inventories of available equipment and other resources. The plan also covers the District's emergency and support services, details their radio operations, provides an extended attack plan, and discusses the District's procedures for dealing with other incidents that may arise during a fire event. The district mobilization plan is updated annually before the start of the fire season.

The Lincoln County CWPP Planning Committee supports the West Oregon District's efforts to develop formal documentation in advance of fire events to help coordinate its response as well as the response of other fire service organizations that may be providing assistance.

Lincoln County Community Wildfire Protection Plan - 2017 Update Page 14

Confederated Tribes of Siletz Indians Fire Mobilization Plan (2016)3 The Confederated Tribes of Siletz Indians places a maximum emphasis on safety, the promotion of fire prevention and suppression of all fires occurring on or adjacent to its operations and timberlands. The Tribe's 2016 Fire Mobilization Plan details its contact information, general prevention actions, and fire readiness. The Plan also contains maps and other graphical information useful for wildland fire planning.

Vulnerability

The Confederated Tribes of Siletz Tribe is located in the Western United States, and being so, wildfire is both natural on the landscape and we live in one of the most wildfire prone areas of the country and thus is highly vulnerable to wildfires. The Klondike Fire complex, Biscuit Fire, and many others in recent years have shown that Coastal Oregon is both under threat of wildfire regularly in the dry season, but also that some of these fires, as in our further past, can be catastrophic and life altering for communities. It is in our best interest to look back, even to the Yaquina Fire only one hundred and seventy years ago, to see that Lincoln County, and many areas here have burned in the past, and that they will likely at some point, naturally, burn again.

The vulnerability of a landowner in an area with increasing forest fires essentially will increase their inherent vulnerability to that hazard. As the Tribe increases its land holdings, the vulnerability, at least as a probabilistic analysis is concerned, increase. As the Tribe acquires lands to the south and east, and into the upland ecotones in Lincoln

County, fire becomes increasingly important to forecast for. Nearly all of the Tribe's non-forest lands are within the Wildland -urban interface areas of Lincoln County.

As the Tribe develops more of its lands, the vulnerability of its structures will increase, especially if effective mitigation efforts are not utilized.

Mitigation Strategy

This section provides the blueprint for the Confederated Tribes of Siletz Tribe to reduce potential losses from the natural hazards identified in the Risk Assessment found in Chapter 4. The format of this chapter is as follows:

Section 5.1 will describe the Goals and Objectives the Confederated Tribes of Siletz Tribe has formulated to guide the selection of mitigation strategies.

Section 5.2 is an assessment of the Tribe's pre-and post-disaster capabilities.

Section 5.3 identifies, evaluates and prioritizes the mitigation strategies the Tribe is pursuing.

Section 5.4 identifies current and potential sources of Federal, State, Tribal, local and private funding to implement mitigation activities.

Goals and Objectives

This section defines the general outcomes that can be expected as a result of successful implementation of this plan. Plan goals are broad statements describing the principles that guide the actions suggested in this document. Plan objectives are more targeted statements that define strategies and implementation steps to attain the goals. The plan goals and objectives below were developed based on the Tribe's overall Mission

Statement, the outcome of planning meetings and the results of the Risk Assessment.

Tribal Mission Statement:

"The mission of the Confederated Tribes of Siletz Indians is to uphold Tribal Government, protect and preserve Tribal history, culture and the general welfare of the Tribal membership, as well as to provide for the economic needs of the Tribe and its members through land acquisition and business development. To further fulfill its mission, the Tribe fosters a "good work ethic" and independence for the membership

and strongly upholds the "government to government" relationship with local, State and Federal governments. The Tribe constantly develops strong cooperative relationships that benefit not only the Tribe, but the local community as well."

Goals and objectives:

The Tribe intends to stay true to its Mission Statement while accomplishing the following goals in developing its Plan:

• to protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identity and self-governance;

• to identify and recommend future projects and programs for the Tribe that, upon implementation, would eliminate, reduce or otherwise mitigate the vulnerability of the Tribe's people, property, natural resources and economic vitality which may result from impacts of future disasters;

• to guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development; and

• to promote a disaster resilient community.

The Tribe's plan objectives include, but are not limited to:

• Focusing on risk assessment to keep future developments outside of known hazard areas;

• Protecting culturally and historically significant Tribal sites and resources;

• Increasing mitigation and emergency management capabilities for the Tribe; and

• Supporting local and regional mitigation efforts that do not conflict with the Tribe's Mitigation Goals.

5. Identification & Analysis of Tribal Mitigation Actions

The Mitigations actions proposed for this Tribal Multi-Hazard Mitigation Plan were identified through the Community Hazards Survey and meetings with Tribal, Federal and local/state officials. This section identifies the mitigation actions the Confederated

Tribes of Siletz Indians Tribe will implement as resources and funding become available.

Mitigation actions can be grouped into six broad categories:27

1. Prevention. Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

2. Property Protection. Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.

3. Public Education and Awareness. Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

4. Natural Resource Protection. Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

5. Emergency Services: Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

6. Structural Projects: Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

7. Review of Local/Regional Mitigation Actions

The Tribe's process of identifying and prioritizing mitigations actions began by reviewing local and regional mitigation actions that could potentially affect the Tribe and its interests. The Mitigation actions reviewed came from:

Lincoln County Hazard Mitigation Plan and Community Fire Plan – 2018 update

- Actions identified for specific review of tribal support

State of Oregon Natural Hazards Mitigation Plan – 2015 update

The State Interagency Hazard Mitigation Team (State IHMT) consists of staff from state agencies and universities involved in hazard mitigation. It provides broad oversight and policy direction for hazard mitigation in Oregon, including updating and maintaining the Oregon NHMP. The Office of Emergency Management (OEM) supports the State IHMT and manages some of the disaster mitigation funding that the state receives from the federal government. Federal funds are generally given to the state because of a Presidentially-declared natural disaster.

Through meetings and workshops with Tribal officials, the External Stakeholder Workgroup and staff and community members, the Confederated Tribes of Siletz Tribe identified 19 mitigation actions for prioritization and implementation in the previous published mitigation plan.

The criteria used to prioritize included feasibility, costs and need. As the specific mitigation projects are further defined, the FEMA Benefit-Cost Analysis software will be used to rank said projects for feasibility.

The initially identified Mitigation Actions include:

Suggested from Steering Committee meeting in May, June, and July of 2018:

- Continued Coordination with City, County and State.
- Continued maintenance - continuing planning process – highest standards.
- Integrate Best Practices & Lessons Learned in to all planning processes
- Community and Public Emergency/Hazard Education & Outreach.
- Hazard awareness & emergency info for tribal members, employees, guests, and tourists.
- Plan for redundancy of resources & facilities.
- Build structures to highest standards for those in known hazard areas.

• Develop Updated Emergency Operations Plan.

Hazard Type Hazard Name

Natural Hazards Coastal Erosion

Drought

Earthquake

Flooding

Landslide

Severe Weather and Winter Storms

Tsunami

Wildfire

FEMA Requires Identification of:

- Location: geographical area in the tribal planning area that would be affected by the hazard.
- Extent: the magnitude or severity of each potential natural hazard.
- Probability: Likelihood of the hazard occurring.
- Past occurrences: information on the damages that occurred, the duration of the event, and level of severity (e.g. flood depth, wind speeds, earthquake shaking intensity, etc.)
- Impacts and Vulnerabilities: 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.

Things to Consider when assessing impacts:

- Geographic Scope: A description of the locations most likely to be impacted by the hazard.

- Health Impacts: A description of the potential short- and long-term human health complications related to the hazard.
- Displacement: A description of the hazard's likelihood to cause the displacement of tribal members or visitors accompanied by an estimate on the anticipated displacement duration.
- Economic Impacts: A description of the potential economic and financial losses related to the hazard.
- Environmental Impacts: A description of the potential impacts that may adversely affect natural systems.
- Structural Impacts: A description of the scale and scope of potential building and infrastructure damages related to the hazard.
- Critical Services: A summary of the tribal departments and functions most likely to be taxed following the hazard.
- Cascading Effects: A brief overview of potential secondary hazards caused by the onset of the initial hazard in question.

Hazard: Flood

Previous Occurrence/History:

Source:

FEMA Flood Insurance Rate Maps

Potential Impacts from future climate conditions

Flood risk and vulnerability may Increase during King Tide events, especially when the tide is in; additionally, future sea level rise may increase flooding and erosion at the tribal properties in Lincoln City.

Location, Extent, and Magnitude

-See FEMA Flood Insurance Rate Maps of 100 year and 500 year flood hazard areas.

-King Tide Maps may be indicative of future flooding events resulting from future climate conditions.

Future Probability Trend

It is likely that flood hazards will experienced more frequently in the spring and winter months as a result of anticipated increases in the duration and frequency of precipitation events.

Cascading Impacts

-raw sewage into river

-storm drains cause local flooding (undersized)

-undersized bridges may be at risk to high river flows, impacting transportation.

-Terraces?

Vulnerable Infrastructure

-water treatment

-Housing

-Hwy 20

-Hwy 229

-Admin buildings and boat ramps are vulnerable to high flooding events

Hazard: Earthquake

Previous Occurrence/History

-no recent events since the last plan.

Sources

USGS ShakeMap, DOGAMI Cascadia Scenario, Liquefaction Susceptibility and probability Maps, SLIDO

Potential Impacts from future climate conditions

While earthquakes probability itself is not impacted by a changing climate, anticipated intensity, frequency, and duration of precipitation events will likely cause an increase in earthquake-caused landslides, especially if the earthquake occurs during the wet winter months.

Location, Extent, Magnitude

-M9.0 –M9.2 Cascadia Event, Fault Map, soil classification maps

-DOGAMI HazVu shows active faults in area

Future Probability Trend

-According to the Oregon State Hazard Mitigation Plan, (PDF page 70 of the 2015 plan) states that "for Oregon, west of the crest of the Cascades, the Cascadia subduction zone is responsible for most the [earthquake] hazard… The return period for the largest earthquakes is 530 years, and the probability of the next such event occurring in the next 50 years ranges from 7 to 12%."

Cascading Impacts

-Landslides

-Erosion

-Liquefaction

-Tsunami

-Evacuation

-City's water storage is susceptible to liquefaction which would cause flooding of the proposed museum.

-Bridges likely won't withstand earthquakes, isolating the community. ODOT's lifeline plan doesn't include the 229 bridge for seismic retrofit.

-All of Hwy 229 can be blocked from landslides due to susceptible soils which are prone to shaking in an earthquake.

-Clinic and Casino are both very vulnerable to earthquakes and could benefit from retrofits.

-Study needed of critical infrastructure to identify and determine vulnerability and retrofit needs

-loss of economic revenue from casino and tourism industries

Vulnerability

-Channel loop

-Hwy 229

Hazard: Severe Weather and Winter Storms

Previous Occurrence/History

Potential Impacts from future climate conditions

Location, Extent, and Magnitude

Future Probability Trend

Cascading Impacts

Vulnerability

Hazard: Coastal Erosion

Previous Occurrence/History

Lincoln City has experienced coastal erosion

Potential Impacts from future climate conditions

Likely increased erosion at the backside of the resort, potentially impacts to casino

Location, Extent, Magnitude, and Probability

-Larger during king tide events

-If at flood stage, potential impacts exacerbated by erosion, flood, wave action, and magnitude differences according to river, tide height

Future Probability Trend

Anticipated climate impacts will likely increase the amount of coastal erosion to Siletz lands in Lincoln City.

Cascading Impacts

Vulnerability

Hazard: Drought

Previous Occurrence/History

Loss of drinking water source

Contamination of drinking water source

Loss of fishery

Drought-Caused Algae Blooms:

In May of 2018, the Salem water supply was compromised by a toxic algae bloom in the city's drinking water source, Detroit Lake. The reservoir, east of Salem, is annually afflicted by algae blooms in late spring and early summer however, water tests revealed that algal toxin levels were higher than deemed safe by the EPA, prompting the City of Salem to issue a health advisory, suggesting those vulnerable to cyanotoxins (young children and those with compromised immune systems) drink water from other sources.

This health advisory prompted Oregon governor Kate Brown to issue a state of emergency for Marion and Polk Counties. The emergency announcement prompted National Guard troops to deploy and truck in fresh water, made available at alternative water distribution centers.

Upon informing the public of toxins in the water, several supermarkets in the Salem area ran out of bottled water, with major supermarket chains reporting low inventory

levels. Additionally, there were many reports of price gouging on bottled water in the area, prompting State law enforcement to investigate the claims.

Sources

Toxic Algae Bloom Sources:

Zach Urness, Statesman Journal "From bloom to ban: How toxic algae fouled Salem's water for the first time". Published May 30, 2018, Updated June 2, 2018.

https://www.statesmanjournal.com/story/news/2018/05/30/how-toxic-algae-fouled-salems-water-first-time/656483002/

Bradford Betz, Fox News "Toxins in Salem drinking water prompt Oregon governor's emergency declaration". Published May 31, 2018.

http://www.foxnews.com/us/2018/06/01/toxins-in-salem-drinking-water-prompt-oregon-governors-emergency-declaration.html

Oregon Health Authority and City of Salem Water Advisory: https://www.cityofsalem.net/water-advisory

Erin Ross, Oregon Public Broadcast. "As Salem Frets About Toxic Algae, Should The Rest Of Oregon?" Published June 7, 2018.

Potential Impacts from future climate conditions

The Oregon Health Authority associates the higher than normal toxicity levels from the 2018 toxic algae blooms to be associated with climate change, "hotter and drier conditions and a rapid snowmelt could definitely increase conditions that cause algae blooms".

Extent and probability

Future Probability Trend

Probability will increase during drought years (during late spring and early summer months) and will likely become a more frequent occurrence as a result of changing climate conditions. May 2018 was the fourth hottest month in Oregon history, and also one of the driest. These conditions will likely be seen more frequently in the futre.

Cascading Impacts

-Drinking water supply may become contain toxic levels of algae

Vulnerability

-infants, young children, pregnant or nursing women, and others with compromised immune systems (like those with kidney problems) are more vulnerable to the cyanotoxins released into drinking water from algae blooms.

Hazard: Wildfire

Previous Occurrence/History

-Tillamook (1945 and 1951)

-Biscuit Fire (2002)

-2017 Fire season and resulting smoke

Sources

Potential Impacts from future climate conditions

Warmer and drier conditions anticipated from climate change will likely increase the probability of future wildfires.

Extent and probability

-WUI, most critical facilities are surrounded by heavy wooded areas, making them vulnerable to wildfires.

-wildfires can jump from clearcuts and grow quickly. There are several clearcuts in the Siletz tribal area.

Future Probability Trend

Warmer and drier conditions anticipated from climate change will likely increase the probability of future wildfires.

Cascading Impacts

-Closure of highway

-loss of timber

-Loss of tribal harvest lands

-Interruption of tribal cultural practices and berry picking

-loss of economic revenue from casino and tourism industries

Vulnerability

-many tribal lands and buildings are surrounded by heavy wooded areas

-smoke may impact those with asthma and other medical sensitivities.

Hazard: Landslides

Previous Occurrence/History

Between Hwy 229 and Newport several landslides have occurred in the past year alone, blocking the hwy, the tribes lifeline.

Sources:

Potential Impacts from future climate conditions

Projected climate changes describe longer and wetter winters with an increase in frequency, intensity, and duration of high precipitation events. This will cause increased soil saturation of steep slopes that will likely an increased number of landslides.

Extent and probability

Future Probability Trend

Will likely increase due to anticipated climate changes. Increased precipitation events will contribute to an increase of future landslides.

Cascading Impacts

-Isolation

-Hindrance to resource logistics and evacuations (if landslides occur as a result of earthquakes)

-ODOT plans for seismic retrofits to highways don't cover hwy 229 which will hinder evacuations and negatively impact

-loss of economic revenue from casino and tourism industries

Vulnerability

Hwy 229

Hazard: Tsunami

Previous Occurrence/History

Sources:

Potential Impacts from future climate conditions

Extent and probability

Will create a horseshoe effect and come up through "D" river.

See Tsunami Inundation Map from DOGAMI's Cascadia Scenario

Future Probability Trend

Cascading Impacts

-loss of economic revenue from casino and tourism industries

Vulnerability

-Future expansion and growth of the tribe in Lincoln City is vulnerable to a tsunami

Other suggested actions: (from review of Lincoln County Plan, other tribal plans & surveys)

• Become a Firewise Community: http://www.firewise.org/Communities/USA-Recognition-Program.aspx

• Become a NWS StormReady Community: http://www.stormready.noaa.gov/

• Develop and maintain an Emergency Management Program.

• Join FEMA National Flood Insurance Program.

• Maintain flood & earthquake insurance coverage for tribal facilities and housing.

• Support Lincoln County Hazard Mitigation Actions.

• Develop a system to protect and maintain historical and archival Tribal records.

• Identify elders and other vulnerable populations to prioritize for mitigation and disaster assistance.

• Implement a program such as Community Emergency Response Training (CERT) to train Tribal members to respond to an emergency.

• Assure that the Tribal community is informed of the necessity of maintaining a 14-21 day supply of food and water, along with basic first aid and medical supplies.

Implementation of Mitigation Actions

This section will describe how the Confederated Tribes of Siletz Tribe's mitigation actions were prioritized, and will be implemented and administrated by the Tribe.

Prioritization

After the initial identification of mitigation actions, the Emergency Planning Committee reviewed the actions for prioritization. They made internal recommendations that were submitted to Tribal Council for review and adoption. On August 14, 2011, the Confederated Tribes of Siletz Tribal Council adopted, via Resolution 2011-31, ten (10) mitigation actions. This Resolution can be found in Appendix C. Upon additional discussions and review within the Emergency Planning Committee, it was determined to add one additional mitigation action, making the total of eleven.

A formal method of evaluation was not used, but the following considerations were used during the prioritization process:

• Cost effective: Can this project be implemented within the current budget or with current available funding?

• Relevancy: Is this project relevant to the Mitigation Goals of the Tribe?

• Political will: Is this a project that the Tribe can implement and see through?

Due to the nature of the mitigation actions identified, especially in regards to a lack of FEMA PDM eligible projects, a formal benefit-cost analysis (BCA) was not conducted for each identified action. If certain projects are deemed fundable, a BCA will be conducted prior to the development of grant applications.

Implementation

The Confederated Tribes of Siletz Tribal Emergency Planning Committee will oversee the implementation of the mitigation plan and will identify and work with relevant departments and outside agencies. Each mitigation action also has an implementation timeline which is as follows:

On-going: Mitigation action will begin short-term and will continue indefinitely.

Short-term: Mitigation action can be implemented within five (5) years.

Long-term: Mitigation action will be implemented in the future. If not begun within five (5) years, will be re-evaluated in the update

At this time, a detailed implementation strategy for each mitigation action has not been developed but will be when the Tribe determines it is feasible to implement the specific action.

Administration

The Confederated Tribes of Siletz Tribe's Emergency Planning Committee will lead in the administration of the mitigation actions and direct/oversee relevant departments in the implementation.

The Emergency Planning Committee will work to identify funding sources, if applicable, for the implementation of actions. Many of the mitigation actions identified can be implemented without major sources of outside funding, and thus can be carried out within the existing tribal budget.

5.5. Prioritized Mitigation Actions

In keeping with the above listed goals and objectives, the Tribe plans to implement the following eleven mitigation actions to reduce the effects of natural hazards:

• Plan for redundancy of Tribal resources and facilities;

• Continue to plan and build Tribal structures to highest standards and, if possible, to keep such structures out of known hazard areas;

• Develop and maintain an Emergency Management Program and overall Tribal Emergency Operations Plan;

• Become a member community of FEMA's National Flood Insurance Program (NFIP);

• Maintain flood and earthquake insurance coverage for existing Tribal facilities and housing which are located within a known hazard area, with future evaluation whether it remains prudent to maintain said insurance (cost benefit ratio);

• Identify Tribal elders and other vulnerable populations so mitigation and disaster assistance can be prioritized;

• Educate members of the Tribal community and Tribal employees regarding importance of personal and/or family preparedness, for natural disasters and/or terrorism to aid in self-reliance during a disaster or event;

• Develop hazard awareness and emergency information for Tribal employees, guests and tourists;

• Conduct drills and tests of mitigation and emergency system developed;

• Continue to coordinate with City, County and State in mitigation efforts; and

• Support State and County mitigation actions and exercises

The format and explanation of each mitigation measure is shown below:

Mitigation Strategy: The mitigation action or activity is shown here. “T” stands for Tribal. These actions are proposed in the Confederated Tribes of Siletz Tribal Multi-Hazard Mitigation Plan.

Associated Hazards: Each mitigation strategy is related to one or more of the hazards that could affect the Confederated Tribes of Siletz.

Timeline: This estimates the amount of time it will take to begin implementation of each strategy. Under timeline there are three categories, short term, long term and ongoing.

• Ongoing: the mitigation strategy will be implemented in years one to five and will continue into the future indefinitely.

• Short Term: the mitigation strategy will be implemented in years one to two.

• Long Term: the mitigation strategy will be implemented in years three to five.

Lead Agency: This is the agency or agencies that will organize resources, find appropriate funding or oversee project implementation, monitoring and evaluation.

Implementation Cost: This is the approximate amount that the strategy will cost to implement.

Related Goals: Each mitigation strategy is related to a Goal listed in Section

Prioritized Mitigation Strategy 2020-2024

Confederated Tribes of Siletz Tribe Mitigation Strategy 2020-2024

Associated Hazards

Timeline

Lead Agency

Implementation Costs

Plan Goals Addressed

Earthquake

Flood

Landslide

Severe Weather

Wildland Fire

Goal 1: Protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identify and self-governance.

Goal 2: Identify and recommend future projects and programs for the Tribe.

Goal 3: Guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development.

Goal 4: Promote a disaster resilient community.

Plan for redundancy of Tribal resources and facilities

On-going

Emergency Planning Committee

Continue Quarterly Meetings and appointment of new members as old members leave

Continue to plan and build Tribal structures to highest standards and, if possible, to keep such structures out of known hazard areas

On-going

Emergency Planning Committee

Develop and maintain an Emergency Management Program and overall Tribal Emergency Operations Plan

On-going

Emergency Planning Committee

Continue to be a member community of FEMA's National Flood Insurance Program (NFIP);

Short-term

Emergency Planning Committee

Maintain flood and earthquake insurance coverage for existing Tribal facilities and housing which are located within a known hazard area, with future evaluation whether it remains prudent to maintain said insurance (cost benefit ratio)

This MHMP recommends the following specific priorities for flood and windstorm mitigation:

1. Make necessary improvements to local water system.

2. Mitigate flood damage to Toledo Mill Property.

3. Protect vulnerable structures and cultural areas in the coastal and riverine floodplains, outside of the velocity zone and floodway, respectively.

4. Develop ordinances to limit development in the floodplain that comply with the National Flood Insurance Program.

In addition, the following priorities are recommended for all natural hazards:

1. Pursue funding for the CTSI mitigation priorities and recommendations described in this MHMP, including funding for needed staff and infrastructure.

2. Improve and sustain public education programs aimed at mitigating natural hazards.

3. Redirect and/or relocate development away from hazard areas.

4. Encourage seismic strength evaluations of schools, public infrastructure, and critical facilities in the town of Siletz to identify vulnerabilities and help prioritize mitigation to meet current seismic standards.

5. Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.

6. Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during windstorm events.

7. Monitor erosion rates on the properties located along the ocean in Lincoln City.

This MHMP recommends the following action plan:

1. Pursue funding for CTSI mitigation priorities and recommendations described above, including funding for needed staff and infrastructure;

2. Develop strategies to resolve water capacity issues in Siletz, including drought, flood, allocation, and distribution issues surrounding climate projected impacts related to natural hazards and water;

3. Coordinate hazard planning with other jurisdictions, as appropriate, and review any actions proposed for the Siletz River and/or Siletz River watersheds that may affect flooding in the Siletz area (i.e., all proposed actions);

4. Coordinate Tribal emergency response efforts with other appropriate jurisdictions and agencies; and

5. Implement a public education effort that will inform residents and customers of the potential natural hazards on CTSI properties.

This MHMP provides detailed recommendations and an action plan designed to meet each objective and, ultimately, the goals of the plan.

Authority to Plan

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) 42 U.S.C. 5165, as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Indian Tribal governments, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning.

The National Flood Insurance Act of 1968, 42 U.S.C. 4001 et seq., as amended, further reinforces the need and requirement for mitigation plans, linking flood mitigation assistance programs to State, Tribal, and Local Mitigation Plans.

In recognition of tribal sovereignty and the government-to-government relationship that FEMA has with Indian Tribal governments, FEMA amended 44 CFR Part 201 at 72

Fed. Reg. 61720, on October 31, 2007, and again at 74 Fed. Reg. 47471, on September 16, 2009, to consolidate and clarify the requirements for Indian Tribal governments, establish Tribal Mitigation Plans separately from State and Local Mitigation Plans, and finalize the Mitigation Planning rule.

Hazard Risk Report from DOGMAI for Lincoln County

- This is the conclusions section from DOGAMI's report

The purpose of this study is to provide a better understanding of potential impacts from multiple natural hazards at the community scale. We accomplish this by using the latest natural hazard mapping and loss estimation tools to quantify expected damage to buildings and potential displacement of permanent residents. The comprehensive and fine-grained approach to the analysis provides new context for the county's risk-reduction efforts. We note several important findings based on the results of this study:

1. A Cascadia M9 earthquake and tsunami will cause extensive overall damage and losses - Due to its proximity to the Cascadia subduction zone (CSZ), every community in Lincoln County will experience significant impact and disruption from a CSZ magnitude 9.0 earthquake event. Event impacts that were examined are limited to earthquake (including ground deformation) and tsunami. Results show that a CSZ M9.0 event will cause 30% to 50% building losses across all communities. Some communities like Newport and Wakonda Beach can expect a high percentage of losses due to tsunami. Other communities like the City of Toledo have little to no tsunami exposure but will have high losses from earthquake alone. The high vulnerability of the building inventory (primarily because of the age of construction), the proximity to the CSZ event, and the amount of development within tsunami zones all contribute to the estimated levels of losses expected in the study area.

2. Retrofitting buildings to modern seismic building codes can reduce damages and losses from earthquake - Seismic building codes have a major influence on earthquake shaking damage estimated by Hazus-MH, a software tool developed by the Federal Emergency Management Agency (FEMA) for calculating loss from natural hazards. We examined potential loss reduction from seismic retrofits (modifications that improve a building's seismic resilience) in simulations by using Hazus-MH building code "design

level" attributes of pre, low, moderate, and high codes (FEMA, 2012b) in CSZ earthquake scenarios. The simulations were accomplished by upgrading every pre (non-existent) and low seismic code building to moderate seismic code levels in one scenario, and then further by upgrading all buildings to high (current) code in another scenario. We found that retrofitting to at least moderate code was the most cost-effective mitigation strategy because the additional benefit from retrofitting to high code was minimal. In our simulation of upgrading buildings to at least moderate code, the estimated loss for the entire study area went from 23% to 16%. We found further reduction in estimated loss in our simulation to 13% only by upgrading all buildings to high code. Some communities would see greater loss reduction than the study area as a whole due to older building stock constructed at pre or low code seismic building code standards. An example is the City of Newport, which would see a significant loss reduction (from 24% to 14%) by retrofitting all buildings to at least moderate code. This stands in contrast to a community with younger building stock, such as Depoe Bay, which would see loss reduction go from 20% to 14%. While seismic retrofits are an effective strategy for reducing earthquake shaking damage, it should be noted that earthquake-induced landslide and liquefaction hazards will also be present in some areas, and these hazards require different geotechnical mitigation strategies.

3. Flooding is a recurrent problem for many communities in Lincoln County - Many buildings within the floodplain are vulnerable to significant damage from flooding. At first glance, Hazus MH flood loss estimates may give a false impression of risk because they show fairly low damages for a community relative to other hazards we examined. This is due to the difference between loss estimation and exposure results, as well as the limited area impacted by flooding. An average of 12% loss was calculated for buildings within the 100-year flood zone. Residents and buildings located near the estuaries and coastal margins are at a greater risk from flood than other locations within the study area. The areas that are most vulnerable to flood hazard within the study are residential buildings along the Siletz River and developed portions of the City of Toledo along the river.

4. Elevating structures in the flood zone can reduce vulnerability - Flood exposure analysis was used in addition to HAZUS-MH loss estimation to identify buildings that were not damaged but that were within the area expected to experience a 100-year flood. By using both analyses in this way, the number of elevated structures within the

flood zone could be quantified. This showed possible mitigation needs in flood loss prevention and the effectiveness of past activities. For example, in the community of Lincoln City nearly half of the buildings exposed to flooding are elevated above the base flood elevation (BFE). The Cities of Toledo and Siletz would benefit from elevating buildings, because for the large number of buildings exposed to flooding very few of them are elevated.

5. New landslide mapping would increase the accuracy of future risk assessments - Exposure analysis was used to assess the threat from landslide hazard. Landslide is a widespread hazard and is present for some communities within the county. The communities of Otis-Rose Lodge, Lincoln City, Toledo, and Yachats all have high levels of exposure to landslide hazard. The landslide hazard data used in this risk assessment were created before modern mapping technology; future risk assessments using LiDAR-derived landslide hazard data would provide more accurate results.

6. Exposure analysis shows that most communities along the open coast are at risk of coastal erosion hazard - Exposure analysis shows that nearly the entire developed coastline in Lincoln County is vulnerable to coastal erosion hazard. The communities of Newport and Otter Rock, for example, have approximately 8% of their total building value exposed to high coastal erosion hazard.

7. Wildfire hazard is moderate for the overall study area - Exposure analysis shows that buildings in the eastern part of the county are at high risk of wildfire hazard. High wildfire hazard is primarily limited to heavily forested rural areas and along both the Alsea and Yaquina Rivers. However, moderate wildfire hazard is present throughout the county and so is a potential threat for communities.

8. Most of the study area's critical facilities are at high risk to a CSZ earthquake and tsunami - Critical facilities were identified and were specifically examined within this report. We have estimated that 79% of Lincoln County's 72 critical facilities will be non-functioning after a CSZ event. In comparison, 29% (21) of critical facilities are at risk of landslide hazard. A small number of critical facilities are at risk of flooding (3) and wildfire (5).

9. The two biggest causes of displacement to population are a CSZ event (earthquake and tsunami) and landslide - Displacement of permanent residents by natural hazards was quantified within this report. We estimated that 30% of the

population in the county would be displaced due to the combination of earthquake and tsunami. Landslide hazard is a potential threat to 32% of permanent residents, and flood hazard puts 5% at risk of displacement. A small percentage of residents are at risk of displacement from wildfire and coastal erosion.

10. Community needs can be prioritized - Each community within the study area was assessed for natural hazard exposure and loss. This allowed for comparison of risk between communities and impacts from each natural hazard. In using Hazus-MH and exposure analysis, these results can assist in developing plans that address the concerns for those individual communities.

Confederated Tribes of Siletz Tribe Mitigation Strategy 2020-2024

Associated Hazards

Timeline

Lead Agency

Implementation Costs

Plan Goals Addressed

Earthquake

Flood

Landslide

Severe Weather

Wildland Fire

Goal 1: Protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identify and self-governance.

Goal 2: Identify and recommend future projects and programs for the Tribe.

Goal 3: Guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development.

Goal 4: Promote a disaster resilient community.

Identify Tribal elders and other vulnerable populations so mitigation and disaster assistance can be prioritized

Short-term

Emergency Planning Committee

Educate members of the Tribal community and Tribal employees regarding importance of personal and/or family preparedness, for natural disasters and/or terrorism to aid in self-reliance during a disaster or event

Emergency Planning Committee

Develop hazard awareness and emergency information for Tribal employees, guests and tourists

On-going

Emergency Planning Committee

Conduct drills and tests of mitigation and emergency system developed

On-going

Emergency Planning Committee

Continue to coordinate with City, County and State in mitigation efforts

On-going

Emergency Planning Committee

Continuously meet and help update mitigation strategy and goals

Support State and County mitigation actions and exercises

On-going

Emergency Planning Committee

Integration by Plan Element (Elements from FEMA)

Natural hazard mitigation can be integrated into the comprehensive plan through the incorporation of information and or mitigation strategies into each plan element or as a separate stand-alone element. Possible methods of integration are described below for each of the elements found in a typical comprehensive plan.

Community

History, Existing Conditions, and Physical Features

Include a description of past natural disasters and their effects on the community as well as the geographical extent, severity, and probability of potential natural hazards.

Include hazard maps to identify the location of hazardous areas within the community.

Future Land Use

Analyze hazard exposure and vulnerability as part of the development of the future land use map and policies.

Identify hazard areas and include policies to establish standards to control development and reduce vulnerability.

Identify potential problems that may arise from various densities of development in hazard-prone areas, determine what densities are appropriate, and establish standards to direct development away from high-hazard areas.

Use easements and acquisition, when possible, to prevent inappropriate or unsafe uses of land

Conservation/Natural Resources

Protect and restore natural protective features, such as floodplains, wetlands, marshes, and dunes.

Protect wildlife migration corridors along rivers and streams to serve as habitat and environmental protection.

Limit development in flood prone areas

Preserve natural vegetation and woodlands on steep slopes to reduce the likelihood of landslides.

Conserve natural woodlands without development to reduce building exposure to wildfires.

Public Facilities/Services

Include policies that limit public expenditure for infrastructure and public facilities in high-hazard areas.

Use capital improvement policies to steer development away from hazardous areas.

Link water treatment facilities, stormwater management, and sewerage and solid waste policies to natural hazard mitigation.

Interconnect service networks, such as roads, pipelines, and cables, and allow more than one route to any point so that they are less vulnerable to local failures because individual sections can be isolated as necessary.

Locate critical public facilities, such as police and fire stations or emergency operation

centers, in safe locations that are not likely to be affected by hazards.

Locate other major public facilities in safe areas to double as emergency shelters.

Transportation

Determine if transportation facilities are adequate in the event of an evacuation. Plan for contingencies if there is structural failure of bridges or other infrastructure.

Correct any known deficiencies of potential weakness in infrastructure.

Use transportation projects to determine the location and density patterns of future growth (projects most likely to be involved directly with capital improvements planning).

Use transportation policies to guide growth to safe locations and limit access to natural hazard areas.

Housing

Acquire older housing stock in floodplains or other hazardous areas.

Address issues of how housing demand is influenced by the desire for siting near natural amenities, which can produce attractions to hazardous locations.

Retrofit or replace public and publicly-subsidized affordable housing to reduce damage to inhabitants during a natural disaster.

Be aware that manufactured homes pose particular problems of vulnerability

especially to high winds.

Historic Preservation

Protect historic resources from hazards, specifically floods or earthquakes, with appropriate retrofitting techniques.

Economic Development

Develop policies to aid economic recovery post disaster, such as undergrounding utilities within a business district. Provide technical assistance to support natural hazard mitigation for vulnerable small businesses.

Use the community's safety to attract potential new businesses to the area.

Recreation and Open Space

Convert vulnerable floodplain land, steep slopes, and areas vulnerable to wildfire or other hazards into open space or recreational areas to help avert or minimize disaster by sacrificing park land in the short term instead of allowing floods, landslides, wildfires, and other natural hazards to ruin homes or businesses.

Use natural hazard mitigation objectives to protect and provide public access to areas that are also deemed potentially hazardous for development (i.e., riverfronts and beaches) to guide land acquisition choices for open space.

Environment

Couple mitigation goals like floodplain management with clean air and clean water goals.

Designate critical and sensitive areas to focus planning for specific areas that have an especially high priority for protection of natural features.

Establish good floodplain management practices that protect endangered species habitat as well as help reduce and prevent flood damage.

Link the goals and objectives of watershed management (i.e., pollution runoff control, Total Maximum Daily Loads implementation) with hazard mitigation efforts. Prevent the conflict of natural forces and hazardous materials by mitigating the potential destructive combination of natural hazards and industrial development that could otherwise exacerbate losses, such as the contamination of floodwaters. Link wildfire safety with environmental protection strategies (i.e., improving forest ecology, wildlife habitat, etc.).

Protect and restore natural vegetation and other natural resources that provide floodplain protection, minimize erosion, stabilize slopes, or provide other ecosystem services.

Public Safety Hazards

▪. Reduce the risk of public exposure to natural hazards.

▪. Protect the community from the risk of natural hazard events.

▪. Develop emergency response plans for natural hazard events.

▪. Incorporate all or most of the content and findings of the natural hazard

mitigation plan by reference in a stand-alone natural hazards element, and

preferably the two documents will differ little, if at all, in overall content.

Use transportation projects to determine the location and density patterns of future growth (projects most likely to be involved directly with capital improvements planning). Use transportation policies to guide growth to safe locations and limit access to natural hazard areas.

Housing-

Acquire older housing stock in floodplains or other hazardous areas.

Address issues of how housing demand is influenced by the desire for siting near natural amenities, which can produce attractions to hazardous locations.

Retrofit or replace public and publicly-subsidized affordable housing to reduce damage to inhabitants during a natural disaster. Be aware that manufactured homes pose particular problems of vulnerability especially to high winds.

Capability Assessment

This section will discuss the pre- and post-disaster hazard management policies, programs, and mitigation capabilities of the Confederated Tribes of Siletz Tribe. This discussion will include an evaluation of Tribal laws, regulations, policies, and programs that are relevant to hazard mitigation and to development activity in hazard-prone areas.

Tribal Capabilities

Currently the Confederated Tribes of Siletz Tribe's capabilities to deal with disaster events are quite limited. Nonetheless, a framework is in place to develop and expand Tribal pre- and post-disaster hazard management policies, programs, and mitigation capabilities. This mitigation plan and the actions identified in it are the first step that will help to ensure a disaster resilient community in the future. The Tribe has some funding capabilities for hazard mitigation planning and projects. The Tribe is committed to supporting its post-disaster recovery efforts and will supplement its recovery efforts with federal support and programs.

Planning

Apart from this Mitigation Plan, the Tribe does not have any other formal planning capabilities related to hazard mitigation. This Plan will be included in the Tribe's overall Emergency Operation Plan (also under development) as the pre-disaster mitigation component.

Forest Management Planning

Forestry

The Natural Resources Department currently employs Foresters, Engineers, Crew Members and Administrative Staff. They are responsible for ensuring and overseeing day to day operations related to the mission and objectives of the Natural Resource Department. This includes management of the Tribe's 15,000+ acres of timberlands in

accordance with the Tribe's approved Forest Resource Management Plan. Wood permits are issued to enrolled tribal members to access firewood for personal use only at approved tribal firewood sites.

The Natural Resources Department currently conducts forest inventory projects, forest health management, with the support of the Bureau of Indian Affairs. This work will be informative for developing a forest management plan for Tribal lands. Such a plan, along with the environmental assessment required by the National Environmental Policy Act (NEPA) have been conducted on all of the recent developments, building and construction projects, and modifications on Tribal lands.

Fish & Wildlife

Natural Resources is responsible for the maintenance and issuance of hunting, fishing and shellfish tags to enrolled tribal members. Natural Resources also maintains the tribal hatchery grounds and tribal fishing sites. Annually the tribe is provided an allocation of subsistence salmon which is distributed to the membership, typically in late spring or early summer. The tribe also receives illegal game from the Oregon State Police to process and distribute to tribal members in need.

Ordinances & Regulations

The Tribe does not have any adopted ordinances or regulations in regards to hazard mitigation, but the Tribe contracts with the following outside agencies as follows to ensure that the Tribe is protected against the effects of natural hazards:

Lincoln County, a County in Western Oregon adopted building code as reflected below. This is for building inspections to insure the Tribe is meeting all building codes when constructing a new building to the effect of the county. There is no resolution adopting the County's or State's building codes; however, the agreement itself specifies that the County will review for compliance with standards specified in the Uniform Structural Code, Uniform Plumbing Code, Uniform Mechanical Code and related codes nationally recognized and publications including the Lincoln County Code Chapter 15.25 solely as related to building safety and structural specifications. The County Building Code for Lincoln County Oregon .

TRIBAL HOUSING ORDINANCE Siletz Tribal Code § 13.200

http://www.ctsi.nsn.us/warm-springs-umpqua-tillamook-siletz-government/tribal-ordinances

https://www.co.lincoln.or.us/sites/default/files/fileattachments/county_counsel/page/384/2018-lcc-chapter-01_final.pdf

https://www.narf.org/nill/codes/confederated_siletz/

Communications

The Tribe does not currently maintain communications assets or equipment beyond our internal list of Information Technologies (IS Department), Emergency Personnel have satellite phones and two way radio system, and in the past have had several HAM radio trained personnel, The Tribe is working closely with Lincoln County Emergency Management to identify equipment that is interoperable with county/state equipment and is developing agreements to use emergency frequencies for events. The Tribe is identifying funding sources to purchase communications equipment.

Agencies and Programs

The following list is not meant to be comprehensive nor is this an agreement towards any specific action, only to create emergency management/hazard mitigation planning and efforts as it aims to reduce the Tribe's contribution to forest management and to help in guide forest fire hazard review and synthesis.

Wildland fire protection for our trust timber lands is provided by the Oregon Department of Forestry (ODF) via a contract with the Bureau of Indian Affairs

Lincoln County fee timber lands, Oregon Department of Forestry has fire protection responsibility via their mission. That is paid for via our property taxes

For the Tribe's Tahkenitch Timber properties, Coos Forest Protection Association provides fire protection via a tax assessment

Each town within Lincoln County has their own fire protection service

Outside of those boundaries aforementioned, the Wildland fires are Oregon Department Forestry's responsibility. Structure fires are a no man's land outside rural fire protection districts.

• Siletz Valley Fire Protection District for fire suppression services on the Reservation lands.

• City of Siletz for building plan review and inspection services, water and storm drain services, and fire and police services. No particular codes are mentioned, nor have any been officially adopted by the Tribe.

As part of its mitigation strategy, the Tribe intends to continue partnering with Lincoln County Sheriff's Office Personnel, Lincoln County Fire, Siletz Valley Fire District Personnel, City of Siletz, City of Lincoln City, City of Newport, as well as increase its efforts at fuel reduction.

National Flood Insurance Program (NFIP)

The Confederated Tribes of Siletz Indians does not currently belong to the National Flood Insurance Program but as part of its mitigation strategy intends to do so in the short-term. However, the Tribe does purchase flood insurance for its flood vulnerable properties.

Training

The Tribe is active in having key staff trained in emergency management. The Tribe continually has staff attend County and State training sessions and hopes at some point to conduct emergency training internally for Tribal staff, tenants and members.

National Incident Management System (NIMS) compliance training

The Confederated Tribes of Siletz has trained key staff for NIMS compliance as part of its effort to increase emergency management capabilities. Trained staff include:

• Tribal Planner Pam Barlow-Lind

• General Manager of the Casino Mike Fisher

• Geographic Information Systems Analyst and Research Planner Ian Keene

• Staff Attorney Arthur Fisher

• Construction Management Engineer Tracy Bailey

• Executive Administrative Assistant April Middaugh

- Construction Management Engineer Tracy Bailey
- Emergency Preparedness Coordinator Trainee Eli Grove
- Public Works Supervisor Max Hoover
- Housing Department Specialist Isaac Deanda

The Tribe's Administration, Planning, and Legal Department maintain training records. As the Tribe continues to build its safety team and Emergency Planning Committee, additional staff and Tribal members will be trained to NIMS standards.

Northwest Tribal Emergency Management Council

The Confederated Tribes of Siletz Tribe is a member of the Northwest Tribal Emergency Management Council (NWTEMC), which was formed to address homeland security and emergency management issues each tribe faces.

The development of the Northwest Tribal Emergency Management Council not only better prepares Tribal entities for emergency incidents, but will also provide more opportunities for the tribes to work collaboratively to assist one another in meeting the mandates of related emergency management programs and foster partnerships with their neighboring counties and municipalities. The Department of Homeland Security's guidance identifies tribal entities as key stakeholders in partnerships with state, local and private sectors.

Projects

There are currently no identified projects that the Tribe has or is engaging in that strengthens the capabilities of the Tribe to deal with disasters.

Federal/Regional Capabilities

If the Governor of Oregon asks for a Presidential Disaster Declaration, federal aid and assets will become available. All requests for a declaration by the President that a major disaster exists shall be made by the Governor. Such a request shall be based on a finding that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected tribal governments and that federal assistance is necessary.

Oregon Emergency Management (OEM) will include impacted Tribal Governments when processing requests for disaster assistance automatically when processing adjacent county or city requests. OEM will also offer Tribal Governments technical assistance to assure that their damage and impact assessments provides the necessary justification for the declaration request. OEM will also serve as a conduit if necessary to relay tribal disaster concerns with Federal Government agencies.

It is important to note though that the State of Oregon does not pass disaster funding through to the Tribes. The Confederated Tribes of Siletz Tribe needs to apply directly to FEMA for disaster aid and assistance, including mitigation funding, once a declaration is made.

Support following a Presidential Declaration

There is considerable support for risk reduction measures following a Federal disaster declaration. Often these programs and their implications are not taken advantage of before permanent repairs are made. Some of the more significant ones include:

• The Hazard Mitigation Grant Program (HMGP) offers assistance for a wide range of mitigation projects following a presidential declaration. Eligibility is restricted to projects that have gone through a comprehensive hazard mitigation planning process.

• Minimal Repair Program often funds risk reduction such as the anchoring of mobile homes.

• The Small Business Administration will fund eligible mitigation measures to qualified owners of damaged homes.

• Outreach is available through Disaster Reconstruction Assistance Centers (DRACs), Recovery Information Centers or Hazard Mitigation Teams.

• Benefit/Cost Mitigation support is available from FEMA on infrastructure repair. To break the damage-rebuild-damage cycle, FEMA Region X (also known as Region 10) is encouraging communities to:

Institute mitigation betterments taking advantage of multi-hazard, multi-objective approaches whenever possible;

Strengthen existing infrastructure and facilities to more effectively withstand the next disaster; and

Ensure that communities address natural hazards through comprehensive planning.

Following a federal disaster declaration, FEMA can support cost effective mitigation on infrastructure and have published a manual on the subject.

Current and Potential Funding Sources

This section identifies current and potential sources of federal, tribal, state, local and private funding to implement the mitigation actions and activities identified. Due to the Confederated Tribes of Siletz's Tribe's position as a sovereign Indian Nation with a limited revenue base, most funding to implement mitigation measures will come from the federal government through grant programs. With this in mind, the mitigation actions identified in this Plan can be implemented within the normal Tribal operating budget and without considerable resources in terms of time and money.

Current

The Confederated Tribes of Siletz Tribes does not currently receive or allocate any funding to mitigation planning apart from the funds to develop this plan, and the funding to provide the position of Emergency Planning Coordinator Trainee position.

The Tribe allocates staff time to work towards its mitigation goals and objectives in accordance with this plan, and from within the Planning Department, multiple Tribal Employees have spent innumerable hours working towards this update and to further the mitigation goals of the Tribe.

Potential Funding

Federal

Below is a list of the primary federal programs and agencies that can potentially fund mitigation actions and planning.

Pre-Disaster Mitigation Program (PDM), which provides funds to develop mitigation plans and implement mitigation projects, is administered by FEMA (by submitting a tribal level plan, the Confederated Tribes of Siletz Tribe 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 Oregon Emergency Management;

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 (e.g., repair of levees);

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 MHMP 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;

Bureau of Indian Affairs, which provides funds to support tribal activities; and

U.S. Army Corps of Engineers, which provides funding for coastal and waterway projects.

Tribal

The Confederated Tribes of Siletz Indians Tribe is fully committed to the public safety and welfare of its residents and Tribal members and to the goals of the Tribal Natural Hazard Mitigation Plan. The Tribe has only limited resources, though, to devote to mitigation planning. Nonetheless, 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. Funding from the Tribe's economic development capabilities may also be utilized.

State/Local

In some cases, funding may be available from the State of Oregon and/or Lincoln County, especially on mitigation actions that overlap jurisdictions, such as road and flood mitigation projects. The Confederated Tribes of Siletz has continuously been committed to building relationships with the State of Oregon, Lincoln County, local cities and municipalities, as well as rural local communities. The cities of Siletz, Newport, and the rest of Lincoln County are known as a cooperative area. The Tribe is committed to insuring that the most efficient and effective partnerships are formed, fostered, and to help implement mitigation measures that are regional in scope.

Private

No potential funding from the private sector is currently identified. Nonetheless, local businesses and residents will be encouraged to participate and contribute to the mitigation effort.

The Tribe will consistently pursue funds from FEMA and other federal agencies in regards to this plan in order to help fund projects that reduce the effects of natural hazards on all of our communities.

Confederated Tribes of Siletz Indians

Mitigation Strategy 2009 Plan to 2020 – Mitigation Goals Continued

The following section defines mitigation goals and actions' identification and analysis as stipulated in the Tribal Mitigation Plan Guide, and in 44 CFR 201.7 and its implementing regulations. Establishing benchmarks for mitigation and preparedness will help maintain focus on the goal of developing a disaster-resistant community.

These benchmarks will track progress towards institutionalizing preparedness and hazard mitigation, including the characterization of natural hazards; the development of ordinances or standards to mitigate natural hazards; and ongoing education on natural hazard preparedness and mitigation. By measuring or tracking progress toward achieving the benchmarks by CTSI, the rate of success in meeting goals and fulfilling objectives will improve.

44 CFR 201.7 Requirements: Mitigation Strategy

Mitigation Strategy

Requirement ***§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.*

Tribal 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? (**GOALS** are long-term; represent what the tribe wants to achieve, such as "eliminate flood damage"; and are based on the risk assessment findings.)

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

- *Source: FEMA*

The Siletz Tribe reviewed their existing Mitigation Goals from the 2006 and 2009 MHMP's and modified them to better meet their needs and subsequently implemented the Goals in Table 5.1 for the current planning cycle. The 2020 Mitigation Plan continues these goals as well.

Table 5.1 2020 Siletz Tribe MHMP Mitigation Goals

Goal Number	Description
1	Reduce the threats to public health and safety posed by natural hazards
2	Reduce the risk of structural damages on tribal properties caused by natural hazards
3	Reduce the environmental impacts of natural hazards, mitigation actions, and future development activities; and
4	Reduce the long-term costs resulting from natural hazards and their mitigation; and
5	Protection of cultural resources threatened by natural hazards

Table 5.2 list the "Considered" and "Implemented" Mitigation Objectives for the current planning cycle.

Table 5.2 2009 MHMP Siletz Tribal Mitigation Objectives - Considered and Implemented- As reflected in 2020 Mitigation Plan

Objective Number	Description
1	Limit new development or acquisition of lands in areas that are vulnerable to hazards or promote development to occur in a way that risk is minimized
2	Protect or alter existing development in hazardous areas to make it less susceptible to damage
3	Ensure that the solution chosen to protect existing development is the most cost-effective available; protects or enhances cultural resources, natural resources, and sensitive terrestrial, riparian, or coastal habitats; and is consistent with all applicable land use plans and regulations
4	Ensure that the benefits of maintaining existing facilities outweigh their costs; if not, redesign facilities to make them less susceptible to damage or implement some other type of solution at the site
5	Redesign existing projects and/or change maintenance practices to protect or enhance riparian or coastal habitats
6	Manage floodplains, rivers, streams, and other water resources for multiple uses, including flood- and erosion-hazard reduction, fish and wildlife habitat, open space, recreation, water supply, and cultural/traditional practices
7	Improve coordination and consistency between the Siletz Tribe and other jurisdictions, as appropriate, in management activities for floodplain and coastal areas
8	Increase public awareness of natural hazards and improve appropriate preparation for and response to such hazards
9	Improve hazard warning and emergency response systems in tsunami hazard areas

NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

44 CFR 201.6 Requirements: Mitigation Strategy - National Flood Insurance Program (NFIP) Compliance

National Flood Insurance Program (NFIP) Compliance

Requirement §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Element

Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?

Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA

The Confederated Tribe of the Siletz Indians does not actively participate in FEMA's NFIP. However, CTSI has purchased building and location specific flood insurance policies and

implemented floodplain policies, regulations, and ordinances to protect their threatened population and infrastructure.

CTSI's Mitigation Strategy identified and analyzed potential flood mitigation actions that would fulfill NFIP initiatives, specifically addressing repetitive loss (RL) properties to assure an effective flood mitigation program.

Tribal Capability Assessment

This section will discuss the pre- and post-disaster hazard management policies, programs, and mitigation capabilities of CTSI and the other jurisdictions that provide support services to CTSI during disasters on Tribal property.

44 CFR 201.7 Requirements: Tribal Capability Assessment

Tribal Capability Assessment

Requirement ***§201.7(c)(3)(iv):*** *The Tribal mitigation strategy shall include a] discussion of the Tribe'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

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 hazard management policies, programs, and capabilities?

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

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

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

- *Source: FEMA*

This section identifies information and programs that are related to hazard mitigation and to development activity in hazard-prone areas; hazard mitigation project funding capabilities; and a general description and analysis of the mitigation policies, programs, and capabilities of local organizations related to CTSI.

Table 5.3 lists legal and regulatory resources that directly support or impacts all mitigation activities for CTSI. These resources will be used to implement mitigation goals and actions identified within this planning cycle.

Table 5.3 CTSI Legal and Regulatory Resources Available for Hazard Mitigation

Regulatory Tool	Name	Effect on Hazard Mitigation
Plans	Comprehensive Plan	The Comprehensive Plan Map, goals and policies are intended to serve as a guide for land use planning and development for CTSI.
	2006 Hazard Mitigation Plan	Directed mitigation activities for the planning cycle
	Administrative Procedures 09-1605	Defines the role of staff in making decisions
	Constitution 05-16-08	Enforces ordinance authority
	Cultural Resource Lands 09-16-05	Identifies that cultural resources outside of ownership should be protected for future generations
	Forest Management 09-16-05	Ensures the Tribe uses best management practices that include the protection of soil and water resources on forestlands
	Geographic Areas of Tribal Interest 09-16-05	Defines area were tribal interest are located historically. Identifies that the Tribe has areas of interest outside of the current reservation.
	STBC Charter 02-16-07	Supports constitution
	Timber Use Permits 04-14-06	Guides timber management to mitigate future loss and damage from fire, erosion, and landslides
	Tribal Plans of Operations 09-16-05	
	Transportation Systems Plan	Identifies priorities for future funding.
	2005 Toledo Master Plan	Identifies limitations and sets requirements for development of mill property in Toledo.
Programs	Housing Ordinance 06-16-05	Guides development
Policies (Municipal Codes)	Land Use Ordinance 09-16-05	Defines administrative procedures to be used in reviewing development proposals

COORDINATION

In the event of a disaster, the Tribe would respond with its limited resources and enlist the assistance of neighboring jurisdiction's public safety officials to provide services. The Siletz Tribal Police respond to incidents in cooperation with Lincoln County and the City of Toledo. Incidents that occur in the City of Siletz are forwarded to Toledo Police. At this time there is no agreement for how the Tribe will coordinate efforts with local governments in the event there is a natural disaster. The Siletz Planning Department has been building relationships with Lincoln County Division of Emergency Management both on and off Reservation lands. Coordination issues were addressed when the Tribe developed a CTSI Emergency Operations Plan in 2007.

However, intergovernmental coordination could provide an important role by providing the emergency responders with the Siletz Tribe's perspective on possible responses to a disaster and helps ensure an effective response.

Ordinances

At this time, the Tribe currently has no ordinances that pertain to development in hazard prone areas or to mitigating potential hazardous situations during development reviews, other than the adoption of local building codes, which do often pertain to flood management areas and FEMA flood insurance zones. However, the Siletz Tribe has a Forest Management Ordinance (7.100) that ensures the Tribe uses best management practices that include the protection of soil and water resources on forestlands. These best management practices in return likely reduce the risk of specific hazards on tribal forestlands.

Tribal Operations

The field where staff is currently knowledgeable includes planning and design, forestry, Geographic Information Systems (GIS), and environmental issues. The Public Works department and Forestry crew maintain Tribal properties. The Planning department provides information regarding potential issues during development. The Siletz Tribe has no person directly responsible for hazard mitigation on Tribal lands. Currently, the GIS Planner has taken the responsibility of managing publications related to hazard mitigation issues, and the Tribe has employed a trainee for Emergency Preparedness.

Public Services

In the town of Siletz and Lincoln City, the respective city manages water resources and sewer services. The Tribe monitors and manages water systems for Tribal housing and operations. However, the Tribe has limited experience managing or assessing utility problems as they pertain to the Tribe. Currently the Tribe relies on the city for information regarding capacity issues. Other public utilities are managed and maintained by local providers. Electricity is provided through Central Lincoln PUD. For internet and communications services, Wave Broadband and Century Link are the two main providers located in Siletz, Newport, and Lincoln County, Oregon.

Grants Management

The Tribe has established a highly effective fiscal and administrative management program since Restoration in 1977. Program management capability is documented by

tribal staff successfully carrying out annual grant and contract work plans' objectives. This section describes the Siletz Tribe's capability to manage grants.

Compliance with Future Statutes

The Tribe will 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).

Government Oversight

The Tribe is governed by a nine member Tribal Council that is assisted by seven Standing Committees. The Standing committees are: Health, Education, Housing, Cultural Heritage, Natural Resources, Powwow, and Budget. In Addition, members are appointed to project specific ad-hoc committees as needed.

Organization

Tribal Administration departments which provide services are: Administration, Finance, Planning, Natural Resources, Legal, Personnel, Facilities and Maintenance, Health, Human Services, and Education Services.

Fiscal Management

No significant changes have been made since initial plan approval to the fiscal management of funds. The Tribe's financial records are prepared in conformity with general accepted accounting principles (GAAP) as applied to government units. The Tribe's general fund budget is prepared in accordance with the established Tribal Budget Procedures Ordinance. The Tribe's financial records are audited on an annual basis.

The Tribe's accounting department utilizes a SQL based, computerized integrated accounting system called MIP. The accounting for each of the grants is maintained so that all grant revenues, expenditures and cost allocations can be reported separately. The 13 staff accounting department has 95 years combined federal, state, and local grant accounting experience and operates with an approved accounting policies and procedures manual that adheres to GASB34 and A87 regulations. The Accounting Department is responsible for grants reporting and preparation of 269s and draws. The Chief Financial Officer is responsible for accounting oversight. An annual A133 audit is performed by an outside audit firm

GRANTS MANAGEMENT PROCESS

1. Program or project design prepared and grant researched
2. Scope of Work and Budget prepared by Grant Writer and submitted to Clearinghouse and ultimately to the Tribal Council for approval to submit
3. Grant Submitted to funding agency
4. Grant Awarded
5. Project Budget submitted to Accounting for input into system
6. Funds drawn from funding agency utilizing agency's required format adhering to requirement that no more than three days cash on hand except where grant or compact can be drawn in its entirety per funding agency.
7. Grant award booked in general ledger as Debit to Grants Receivable

   And Credit to Deferred Revenue.
8. Draws booked as Credit to Grants Receivable and Debit to Cash.
9. Accrual accounting method of recording expenditures against each grant.
10. Administration costs are consolidated and an indirect rate is negotiated.
11. Monthly financial statements prepared and distributed to program managers for monitoring of projects.
12. Policies and procedures are in place for budget modification process.
13. Each program has its own approved set of policies and procedures that adheres to funding agencies requirements.
14. The financial closeout documents are prepared by the Accounting Technician and the quarterly and semi-annual program performance reports and closeout documents are prepared by the program managers.

MITIGATION MEASURES

This section will identify, evaluate, and prioritize, feasible and environmentally sound mitigation actions currently in use or under consideration by CTSI. This discussion will include an explanation of how each activity contributes to the overall mitigation strategy for CTSI. Where pertinent, links to local organizations or responsible agencies will be identified.

DMA 2000 Requirements: Identification and Analysis of Mitigation Actions

Identification and Analysis of Mitigation Actions

CFR Requirement 44 ***§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 new or updated 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?

Source: FEMA DMA 2000 (Public Law 106-390)

For the purposes of this MHMP, short-term actions are those actions that CTSI is capable of implementing within its existing resources and authorities over the next two years. Long term actions are those actions that will require new or additional resources or authorities to implement and that cannot occur or be completed over the next two-year period.

Proposed Mitigation Actions

Many post-disaster reports note the need to strengthen and sustain public information, education, and training efforts by providing additional resources (Oregon 2000a). Although it is commonly recognized that interest in reducing losses increases during and after events, there is an ongoing need to provide residents with hazard mitigation information. Post-disaster assessment reports cite the need to have timely seasonal information available, have better methods to inform residents where they can obtain hazard mitigation information, use improved electronic methods (e.g., web sites), and have materials oriented toward the intended users. This helps keep awareness levels higher, will stimulate actions by some, and reminds users to consider and include hazard mitigation measures in the contexts of regular activities, such as building a new home, relocating an office, or repairing a business.

The Steering Committee met on November 5, 2019 to evaluate and prioritize each of the proposed mitigation actions to determine which considered actions would be included in the MHMP update.

Table 5.2 identifies the status of CTSI's existing Mitigation Actions from the prior planning cycle and provided comments for each action that incurred a status change

(completed, deleted, deferred, or ongoing). New mitigation action items were also identified and considered for implementation during this session. CTSI considered existing and future growth needs as they reviewed action items or activities that would potentially protect existing and any anticipated future facilities or structures.

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
Multi-Hazard (MH)			
MH	**Ongoing**		Require the provision of adequate safeguards before permitting development in identified areas of known or suspected natural hazards
MH	**Ongoing**		Require site investigation reports from a registered professional geologist or certified engineering geologist prior to consideration of development requests in areas of known or suspected geologic hazards
MH ST 1	New	Consider	Establish the formal goal of becoming a Disaster-Resistant Tribe, including objectives or benchmarks for preparedness
MH ST 2	New	Consider	To help disseminate the MHMP, expand knowledge of hazard mitigation on CTSI properties, and encourage further mitigation actions, this plan should be posted on the CTSI web site, and links to further hazard mitigation information (e.g., DisasterHelp.gov) may be posted as time and resources permit
MH ST 3	New	Consider	Further develop, adopt, implement, and maintain the Siletz Tribal Emergency Management Response Plan
MH ST 4	New	Consider	Coordinate CTSI emergency response efforts, as appropriate, with those of Lincoln County and other federal, state, and local agencies
MH ST 5	New	Consider	Establish 24-hour emergency medical response capability (an equipped Medic 1 unit along with paramedics and emergency medical technicians) for the clinic
MH ST 6	New	Consider	Promote the establishment and maintenance of home survival/emergency kits
MH ST 7	New	Consider	Improve emergency communication infrastructure in the Siletz area
MH LT 1	New	Consider	Pursue funding for the mitigation priorities and recommendations described below, including funding for needed staff and infrastructure improvements
MH LT 2	New	Consider	Promote a disaster and hazard mitigation plan to assist the mitigation and response efforts of individuals and organizations on Tribal properties
MH LT 3	New	Consider	Coordinate hazard planning, as appropriate, with other jurisdictions
MH LT 4	New	Consider	Improve and sustain public information and education programs aimed at mitigating natural hazards
Flood			
Flood	Ongoing		Maintain maps of identified geologic hazards and make available to the public

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
Flood	Ongoing		Require developments in areas subject to flooding to comply with the requirements of the U.S. Department of Housing and Urban Development (HUD) Flood Insurance Program
Flood 1	New	Consider	Raise, remove, or flood-proof existing structures
Flood 2	New	Consider	Construct flood control structures to protect existing properties
Flood ST 1	New	Consider	Focus some of the funding identified in the Siletz Tribal Transportation Improvement Plan towards reducing the risk of transportation hazards in specific areas through signage of flood and landslide areas.
Flood ST 2	New	Consider	Upgrade City of Siletz Drinking Water Pretreatment System Approximate Cost - $400,000
Flood LT 1	New	Consider	Make other necessary improvements to City of Siletz and Tribal water systems to ensure system failure does not occur during high water events.
Flood LT 2	New	Consider	Identify funding to help make necessary improvements to SR 229 to decrease vulnerability of the highway to natural hazards as identified in the Siletz Highway Road Assessment (Landcaster Engineering, 2002)
Flood LT 3	New	Consider	Require a certified engineer report stating that the structure of a new building will not significantly alter the flood levels in other areas
Flood Lt 4	New	Consider	Develop a standard to require that all new structures be elevated or flood-protected to an elevation of one feet above the FIRM base flood level within the 100-year floodplain and above the flood elevation within the designated 500-year floodplain
Earthquake (EQ)			
EQ ST 1	New	Consider	Encourage purchase of earthquake hazard insurance.
EQ ST 2	New	Consider	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.
EQ LT 1	New	Consider	Provide information to government building and school facility managers and teachers on securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits
EQ LT 2	New	Consider	Encourage facility managers, business owners, and teachers to refer to FEMA's practical

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
			guidebook: Reducing the Risks of Nonstructural Earthquake Damage
EQ LT 3	New	Consider	Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques
EQ LT 4	New	Consider	Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors
EQ LT 5	New	Consider	Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources
EQ LT 6	New	Consider	Identify seismically vulnerable structures and funding sources to perform structural and nonstructural retrofitting
EQ LT 7	New	Consider	Provide information to property owners, small businesses, and organizations regarding retrofit funding sources (e.g., loans, grants)
EQ LT 8	New	Consider	Explore options for including seismic retrofitting in existing programs such as low-income housing, insurance reimbursements, and pre- and post-disaster repairs
EQ LT 9	New	Consider	Encourage seismic strength evaluations of critical facilities on the Reservation to identify vulnerabilities for mitigation of schools, public infrastructure, and critical facilities to meet current seismic standards.
EQ LT 10	New	Consider	Develop an inventory of critical facilities that do not meet current seismic standards
EQ Lt 11	New	Consider	Encourage water tanks to upgrade them to meet seismic standards
Severe Winter/Wind Storm			
Severe Storm/Wind	Ongoing		Forestry Manager reviews proposed projects as part of the development process may result in the recommended removal of hazardous trees or branches that are close to structures
Severe Storm/Wind ST 1	New	Consider	Build wind-resistant structures and to keep debris, particularly trees, from falling onto the structures
Severe Storm/Wind ST 2	New	Consider	Mitigation actions listed above for flooding should also be considered as mitigation actions for windstorms
Severe Storm/Wind ST 3	New	Consider	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during windstorm events
Severe Storm/Wind ST 4	New	Consider	Collect, design, and disseminate useful education information to property owners to reduce

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
			risk from falling trees to life, property, and utility systems
Severe Storm/Wind ST 5	New	Consider	Develop partnerships with utility providers to document known hazard areas and implement actions to ensure timely response
Severe Storm/Wind ST 6	New	Consider	Identify potentially hazardous trees and either remove or prune to reduce the hazard
Severe Storm/Wind ST 7	New	Consider	Enhance strategies for debris management before and after windstorm events
Severe Storm/Wind ST 8	New	Consider	Develop coordinated management strategies for clearing roads of fallen trees, and clearing debris from public and private property
Severe Storm/Wind St 9	New	Consider	Identify and remove dead or unhealthy trees that could pose a risk during a windstorm
Severe Storm/Wind ST 10	New	Consider	eek funds to replace roofs that could be damaged during a high windstorm event
Severe Storm/Wind ST 11	New	Consider	Housing and Planning department coordination to identify funding to repair/replace roofs
Severe Storm/Wind ST 12	New	Consider	Look for grant opportunities to help repair the ageing roofs on several tribal member's homes
Severe Storm/Wind LT 1	New	Consider	Increase public awareness of windstorm mitigation activities
Severe Storm/Wind LT 2	New	Consider	Provide public education materials for protecting life, property, and the environment from windstorm events
Severe Storm/Wind LT 3	New	Consider	Distribute educational materials to Tribal residents and public and private sector organizations regarding preparedness for loss of power
Severe Storm/Wind LT 4	New	Consider	Support/encourage electrical utilities to use underground construction methods where possible to reduce power hazards and outages from windstorms
Severe Storm/Wind LT 5	New	Consider	Increase the use of underground utilities where possible
Severe Storm/Wind LT 6	New	Consider	Prune trees to reduce the risk of utility failures
Severe Storm/Wind LT 7	New	Consider	Remove hazardous trees near Tribal buildings and homes
Drought			
Drought	Ongoing		Encourage irrigation before a forecasted drought
Drought	Deferred	Why Lack of funding or staff?	Seek method to obtain advance warning of changes in stream flows
Drought	Deleted	Why Not feasible for CTSI?	Develop process to limit irrigation and sprinkling during drought

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
Drought	Deferred	Why	Develop water conservation measures
Drought	Deleted	Why	Develop voluntary energy conservation programs
Drought	Deleted	Why	Apply for federal drought relief programs
Drought	Deleted	Why	Consider emergency supplemental ground water permits
Drought LT 1	New	Consider	Pursue a water use reduction program for the Siletz area and tribally owned Lincoln City Properties
Drought LT 2	New	Consider	Seek method to improve the understanding of water resources in Siletz to enable the community to manage potential future water shortages
Wildfire			
Wildfire	Ongoing		The Rural Fire Protection District implements a ban on open burning and woodcutting when conditions are dry
Wildfire	Ongoing		Fire hydrants, sufficient water storage, and water pressure are maintained in developed areas, although some isolated homes are too far from hydrants for them to be used
Wildfire	Ongoing		Develop, approve, and promote Fire Protection Agreements and partnerships to clarify roles and responsibilities and to provide for fire mitigation activities and suppression preparedness
Wildfire ST	New	Consider	Develop ordinances and educate people regarding wildfire risks and mitigation measures
Wildfire ST	New	Consider	Develop fire detection programs and emergency communications systems
Wildfire ST	New	Consider	Exercise warning systems and evacuation plans
Wildfire ST	New	Consider	Close roads during fires
Wildfire ST	New	Consider	Encourage Woodland property owner to maintain appropriate defensible space around homes
Wildfire ST	New	Consider	Encourage Woodland property owner to provide access routes and turnarounds for emergency equipment
Wildfire ST	New	Consider	Encourage Woodland property owner to minimize fuel hazards adjacent to homes
Wildfire ST	New	Consider	Encourage Woodland property owner to use fire-resistant roofing materials
Wildfire ST	New	Consider	Encourage Woodland property owner to maintain water supplies
Wildfire ST	New	Consider	Encourage Woodland property owner to ensure that home address is visible to first responders
Wildfire Lt	New	Consider	Inventory firefighting water sources and encourage the development of additional sources
Wildfire LT	New	Consider	Advocate for water storage facilities with fire-resistant electrical pump systems in developments outside of fire protection districts that are not connected to a community water

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
			or hydrant system
Wildfire Lt	New	Consider	Develop a protocol for fire jurisdictions and water districts to communicate all hydrant outages and water shortage information
Wildfire Lt	New	Consider	Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management and community stability
Wildfire Lt	New	Consider	Clear trimmings, trees, brush, and other debris completely from sites when performing routine maintenance and landscaping to reduce fire risk
Landslide			
Landslide ST	New	Consider	Use County ordinances where geological hazards have been identified to prevent landslide losses
Landslide ST	New	Consider	Encourage continued careful: slope vegetation maintenance, erosion prevention, engineered slope drainage, and other mitigation using qualified expertise to protect these areas
Landslide ST	New	Consider	Continue to improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in landslide-prone areas
Landslide ST	New	Consider	Develop public information to emphasize economic risk when building on potential or historical landslide areas
Landslide ST	New	Consider	Develop standards to limit the acquisition of properties in areas were a high landslide hazard has been identified
Landslide ST	New	Consider	Encourage construction and subdivision design that can be applied to sloped areas to reduce development effects on landslide vulnerability
Landslide ST	New	Consider	Increase communication and coordination between the Siletz Planning Department divisions and developers
Landslide LT	New	Consider	Limit construction in identified potential and historical landslide areas
Landslide LT	New	Consider	Analyze existing regulations regarding development in landslide-prone areas
Landslide LT	New	Consider	Continue to use land use permitting process to review proposed projects in potential landslide areas
Tsunami			

Table 5.4 Confederated Tribes of the Siletz Indian's Natural Hazard Mitigation Actions Considered
(Blue text items are the Tribe's pre-identified Mitigation Action Items – 2006)

Hazard	Status *Completed Deferred Deleted Ongoing*	Comment	Description
Tsunami	Ongoing		Development of this Multi-Hazard Mitigation Plan
Tsunami	Ongoing		Installed tsunami warning and evacuation route signs in hazard areas by local jurisdictions
Tsunami ST 1	New	Consider	Increase available number of warning systems in high risk areas
Tsunami ST 2	New	Consider	Develop a public education effort to reduce the public health and safety risks for this hazard
Tsunami ST 3	New	Consider	Provide customers in the hazard area with information about what to do if there is a tsunami including the best route to avoid a tsunami
Tsunami LT 1	New	Consider	Develop warning system for the Chinook Winds Casino
Coastal Erosion			
Coastal Erosion ST 1	New	Consider	Identify engineering solutions to remediate erosion problem near cultural site along the Yaquina River.

MITIGATION ACTION PLAN

The committee members reviewed and discussed each item. The Committee then determined the priority order by committee member consensus.

DMA 2000 Requirements: Implementation of Mitigation Actions

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 section (c)(3)(ii) will be prioritized, implemented, and administered by the tribe, the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element

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?)

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

Source: FEMA, July 2008.

Table 5-5 lists CTSI's broad, foundational mitigation actions selected for implementation to meet CTSI goals and objectives for all hazards.

Table 5.5 Foundational Mitigation Actions

1	Coordinate hazard planning, as appropriate, with other jurisdictions and review any actions that may increase winter storm damage on the Tribal lands.
2	Continue to utilize Geographic Information System technology to assess hazard vulnerability issues on Tribal properties.
3	Identify and acknowledge hazard prone properties during the land acquisition process.
4	Review potential participation in the National Flood Insurance Program and the Community Rating System.
5	Continue to review hazard maps for accuracy and any changes in the estimated vulnerability of tribal properties.
6	Coordinate emergency response efforts with other appropriate jurisdictions.
7	Implement a public education effort that will inform residents and customers of the potential hazards.
8	The Committee then met on February 10, 2009 to determine the responsible agency and potential funding sources for the prioritized projects CTSI seeks to pursue. The CTSI Mitigation Action Plan Table 5.6 represents mitigation projects and programs to be implemented through the cooperation of multiple entities during the 2009 MHMP's five-year planning cycle.

The Planning Team assigned a high priority ranking to actions and projects that best fulfill the CTSI goals for the MHMP's five-year lifespan during the planning of the 2009 plan. The Planning Team and Steering Committee determined that only the existing and new mitigation actions that received a high priority ranking would be included in the 2020 Mitigation Action Plan depicted in Table 5.6. Each action designates responsible departments and agencies, identifies potential funding sources, a timeline for implementation, and a rudimentary benefit-costs and technical feasibility determination. Action items are grouped by hazard and in descending priority order within each hazard

Table 5.6 2009 Confederated Tribes of the Siletz Indians Mitigation Action Plan Matrix
(Blue text denotes ongoing projects selected during prior planning cycle – MHMP 2006)
(* Note Benefit Cost Analysis will be performed at the time the project is developed for funding to ensure the most cost effective method is selected)

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs * / Technical Feasibility	Comments
Multi-Hazard (MH)						
MH	Require the provision of adequate safeguards before permitting development in identified areas of known or suspected natural hazards	Lincoln County CTSI Planning	Ongoing	County and CTSI General Funds	BC: TBD TF: Yes	
MH	Require site investigation reports from a registered professional geologist or certified engineering geologist prior to consideration of development requests in areas of known or suspected geologic hazards	Lincoln County CTSI Planning	Ongoing	County and CTSI General Funds	BC: TBD TF: Yes	
MH ST 1	Establish 24-hour emergency medical response capability located at the Siletz Clinic.	Tribal Health Clinic (THC)	2-3 years	General Fund, THC funds	BC: TBD TF: Yes	
MH ST 2	Improve and sustain public education programs aimed at mitigating natural hazards	CTSI	3-5 years	General Fund, HMGP, UHMA	BC: TBD TF: Yes	
MH ST 3	Promote the establishment and maintenance of home survival/emergency kits	CTSI	1-2 years	General Fund, UHMA, DHS	BC: TBD TF: Yes	
MH LT 1	Direct development away from hazard areas	CTSI Planning	1-5 years	General Fund	BC: TBD TF: Yes	
MH LT 2	Limit the purchase of lands for developments that are vulnerable the natural hazards	CTSI Planning	1-4 years	General Fund	BC: TBD TF: Yes	(every 5 years)
MH LT 3	Reduce the number of vulnerable areas on State Route 229 to natural hazards through bridge maintenance and slope stability projects	Lincoln County ODOT	2-5 years	County General Fund	BC: TBD TF: Yes	
Flood and Tsunami						
Flood	Maintain maps of identified geologic hazards and make available to the public	Lincoln County CTSI Planning	Ongoing	County General Fund	BC: TBD TF: Yes	
Flood	Require developments in areas subject to flooding to comply with the requirements of the U.S. Department of Housing and Urban Development (HUD) Flood Insurance Program	Lincoln County CTSI Planning	Ongoing	County & CTSI General Fund	BC: TBD TF: Yes	
Flood & Tsunami LT 1	Consider flood and tsunami damage when developing Lot 57 and Lakeside Village properties	CTSI Planning Chinook Winds Casino	Ongoing	General Fund	BC: TBD TF: Yes	

Table 5.6 2009 Confederated Tribes of the Siletz Indians Mitigation Action Plan Matrix
(Blue text denotes ongoing projects selected during prior planning cycle – MHMP 2006)
(* Note Benefit Cost Analysis will be performed at the time the project is developed for funding to ensure the most cost effective method is selected)

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs * / Technical Feasibility	Comments
Flood & Tsunami LT 2	Consider natural hazards when developing the Toledo Mill Property	CTSI Planning	1-2 years	General Fund	BC: TBD TF: Yes	
Winter Storms/Wind						
Winter Storms/Wind LT 1	Assess the vulnerability of structures to wind damage	CTSI Planning	1-5 years	General Fund, HMGP	BC: TBD TF: Yes	
Winter Storms/Wind LT 2	Remove hazard tree that could damage tribal buildings	CTSI	1-5 years	General Fund, HMGP, HMA	BC: TBD TF: Yes	
Winter Storms/Wind	Forestry Manager reviews proposed projects as part of the development process may result in the recommended removal of hazardous trees or branches that are close to structures	Natural Resources CTSI Planning	Ongoing	General Fund	BC: TBD TF: Yes	
Winter Storms/Wind LT 1	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during windstorm events	CTSI Planning	1-5 years	General Fund, HMGP, PDM, UHMA	BC: TBD TF: Yes	
Earthquake (EQ)						
EQ LT 1	Encourage seismic strength evaluations of schools, bridges, and critical facilities around the town of Siletz to identify vulnerabilities for mitigation to meet current seismic standards	CTSI Planning	1-5 years	General Fund, HMGP, PDM, UHMA	BC: TBD TF: Yes	
EQ LT 2	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices	CTSI	1-3 years	General Fund	BC: TBD TF: Yes	
Landslide						
Landslide LT 1	Limit construction in identified landslide areas and encourage construction and subdivision design that can be applied to sloped areas to reduce development effects on landslide vulnerability	CTSI Planning & Tribal Council	1-2 years	General Fund	BC: TBD TF: Yes	

Table 5.6 2009 Confederated Tribes of the Siletz Indians Mitigation Action Plan Matrix
(Blue text denotes ongoing projects selected during prior planning cycle – MHMP 2006)
(* Note Benefit Cost Analysis will be performed at the time the project is developed for funding to ensure the most cost effective method is selected)

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs * / Technical Feasibility	Comments
Landslide LT 2	Research areas of SR 229 that are vulnerable to hazards such as flooding, landslides, and windstorms	CTSI Planning ODOT	1-5 years	County General Fund	BC: TBD TF: Yes	
Tsunami						
Tsunami LT 1	Install tsunami warning and evacuation route signs in hazard areas and provide residents in the hazard areas with updated information on the tsunami hazard, including the probability of occurrence, potential size of the hazard, signs of an impending tsunami, and best route to avoid a tsunami	CTSI Tribal Council	1-2 years	CTSI General Funds & Oregon NTHMP Funds	BC: TBD TF: Yes	
Wildfire						
Wildfire	The Rural Fire Protection District and Oregon Department of Forestry implement bans on open burning and woodcutting when conditions are dry	Rural Fire District Oregon Department of Forestry	Ongoing	Fire Protection Funds	BC: TBD TF: Yes	
Wildfire	Fire hydrants, sufficient water storage, and water pressure are maintained in developed areas, although some isolated homes are too far from hydrants for them to be used	Rural Fire District	Ongoing	General Funds, Fire Program Funds	BC: TBD TF: Yes	
Wildfire	Develop, approve, and promote Fire Protection Agreements and partnerships to clarify roles and responsibilities and to provide for fire mitigation activities and suppression preparedness	CTSI & Rural Fire District	Ongoing	General Funds, Fire Program Funds	BC: TBD TF: Yes	
Drought						
Drought	Encourage irrigation before a forecasted drought	CTSI Public Works	Ongoing	General Funds	BC: TBD TF: Yes	
Coastal Erosion						
Coastal Erosion	Identify solutions to preserve cultural site on Yaquina River being threatened by erosion.	CTSI Culture & Planning Departments	0-1	Unknown BIA	BC: TBD TF: TBD	Multiple Jurisdiction permits required.

Plan Maintenance Process

The Confederated Tribes of Siletz Tribal Natural Hazard Mitigation Plan is a living document that is intended to provide a guide for hazard mitigation to the Confederated Tribes of Siletz Indians. A formal plan maintenance process is required to ensure that the Tribal Mitigation Plan remains an active and relevant document. The plan maintenance process includes a method and schedule for monitoring, evaluating, and updating the plan at least every five years. This section also includes an explanation of how the Confederated Tribes of Siletz Tribe intends to incorporate the mitigation strategies into existing planning mechanisms. Lastly, a strategy to ensure continued participation throughout the plan maintenance process by the "public," as defined by the Confederated Tribes of Siletz, is essential.

The Confederated Tribes of Siletz Tribal Council has final authority and responsibility over the Tribal Multi-Hazard Mitigation Plan. Responsibility for plan maintenance and coordinating implementation of mitigation measures will be overseen by the Tribe's Central Administration and General Manager Brenda Bremner, along with Steering Committee Members for this MHMP, Planning Department Personnel, the Emergency Planning Committee, which is composed of representatives from the Administration, Legal, Risk Management and Health Clinic Departments, et al. The Confederated Tribes of Siletz Tribe's Emergency Planning Committee will also be responsible for annual progress reports to Tribal Council and for the five-year updates to be submitted to the Board and subsequently to FEMA for approval.

The federal hazard mitigation planning regulations (44 CFR 201.4) require state-level plans such as this MHMP to be reviewed, revised, and submitted for approval to the FEMA Regional Director every three years. Tribal Mitigation Plans differ in that the CFR to be followed is listed as (44 CFR 201.7 (d)(3)

The regulations require a plan maintenance process that includes the following, and both are in accordance with each the State or Tribe having an update process that includes the following: an established method and schedule for monitoring, evaluating, and updating the plan; a system for monitoring implementation of mitigation measures and project closeouts; and a system for reviewing progress on achieving goals as well as specific activities and projects identified in the mitigation plan. This MHMP is a living document that is intended to provide a guide for hazard mitigation to the Confederated

Tribes of Siletz Indians. The MHMP can be revised more frequently than three years if the conditions under which it was developed change significantly (e.g., a major disaster occurs or funding availability changes). This section details CTSI's method and schedule for monitoring, evaluating, and updating the MHMP and for monitoring the progress of mitigation actions.

The CTSI Planning department is responsible for coordinating the maintenance of the MHMP. The Steering Committee is responsible for conducting meetings to account for plan maintenance and to have planning personnel provide updates to ongoing annual maintenance. Other departments also will have responsibilities to update portions of the plan. These departments include Natural Resources, Accounting, Housing, Human Resources, Siletz Tribal Business Corp, and Chinook Winds Casino Resort.

MONITORING, EVALUATING, AND UPDATING THE PLAN

The Planning Department will review this MHMP annually and will update and submit the updates for adoption every three years. Annual reviews will identify progress made on the implementation of mitigation measures and projects and any new regulations. The Siletz tribe understands that Federal laws change over time. For this reason, the Hazard Mitigation Plan will be amended prior to the submission of any Hazard Mitigation Grant applications to reflect changes as required in 44 CFR 13.11(c) http://federal.elaws.us/cfr/title44.part13 . This procedure will ensure that the tribe will be compliant during years in which grant funding is received. The effectiveness of projects and other actions will be evaluated at appropriate, project specific intervals or, at a minimum, when the MHMP is updated every three years as required for state-level plans submitted directly to FEMA. The process of updating the MHMP will include a review of hazard assessments, vulnerability assessments, potential losses, tribal capability, coordination with other planning efforts, funding sources, and recommended and potential new mitigation measures. In support of the three-year update, the MHMT will:

• Examine and revise the Hazard Risk Assessment (Section 4) as necessary to ensure that it

describes the current understanding of hazard risks;

• Examine progress on and determine the effectiveness of the mitigation actions and

projects recommended in this MHMP;

• Identify implementation problems (technical, political, legal, and financial) and develop

recommendations to overcome them;

• Recommend ways to increase participation by CTSI departments and to improve

coordination with other jurisdictions and agencies; and

• Review and, if desirable, revise the MHMP Action Plan.

MONITORING PROGRESS OF MITIGATION ACTIONS

Mitigation action identified within this plan will be monitored and updated by the CTSI Planner on a Yearly basis. The plan will be revised every 3 years or when new information becomes available. Such information could include new vulnerability studies by the State or new property acquisitions by the Siletz Tribe.

Monitoring, Evaluating and Updating the Plan

The Confederated Tribes of Siletz Tribe's Emergency Planning Committee will review this MHMP annually and will update the MHMP every five years. Annual reviews will:

• Identify progress made on the implementation of mitigation measures and projects;

• Assess the impacts of disasters to the Tribe's people, property and natural environment to determine whether the MHMP should be revised based on the new information;

• Examine and ensure that the Mitigation Plan requirements, as well as goals, objectives and mitigation actions are incorporated into current and future Tribal planning processes.

The annual review will occur during the first quarter of each calendar year to coincide with the tribal fiscal year and to prepare for PDM grant deadlines.

The effectiveness of projects and other actions will be evaluated at appropriate, project specific intervals or, at a minimum, when the MHMP is updated every five years as required for Tribal plans submitted to FEMA. The process of updating the MHMP will

include a review of hazard assessments, vulnerability assessments, potential losses, the addition of repetitive and severe repetitive loss properties, tribal capability, and coordination with other planning efforts, funding sources, and recommended and potential new mitigation measures.

In support of the five-year update, the Confederated Tribes of Siletz Tribe's Emergency Planning Committee will:

• Examine and revise the Hazard Risk Assessment as necessary to ensure that it describes the current understanding of hazard risks;

• Examine progress on and determine the effectiveness of the mitigation actions and projects recommended in this MHMP;

• Examine and ensure that the Mitigation Plan requirements, as well as goals, objectives and actions, are incorporated into current and future Tribal planning processes;

• Identify implementation problems (technical, political, legal, and financial) and develop recommendations to overcome them; and

• Recommend ways to increase participation by Tribal government departments and businesses and to improve coordination with other jurisdictions and agencies.

The updated MHMP will be presented to the Confederated Tribes of Siletz Tribal Board of Directors for approval and adoption before it is submitted to FEMA for re-approval.

Monitoring Progress of Mitigation Actions

The Confederated Tribes of Siletz Tribe's Emergency Planning Committee will frequently review progress on the implementation of mitigation actions. The Emergency Planning Committee will also meet with representatives from Tribal Departments to discuss progress of mitigation activities.

The implementation of all short-term mitigation actions will be monitored by the Emergency Planning Committee, on an ongoing basis until implementation is complete. Long-term actions being actively implemented will be monitored on an ongoing basis, or at least annually as needed. Long-term actions planned for the future will be reviewed during plan updates every five years.

The system for reviewing progress on achieving goals, objectives, and specific actions included in the mitigation strategy will be based on a checklist of all goals, objectives and actions. This checklist will be reviewed annually by the Emergency Planning Committee. As described in the previous section, progress on mitigation actions will be described in an annual report to Confederated Tribes of Siletz Tribal Board of Directors and in the five-year update of the Tribal Natural Hazard Mitigation Plan.

Incorporation into Existing Planning Mechanisms

The Confederated Tribes of Siletz Tribe currently has formal planning mechanisms in place to insure that the Comprehensive Plan, and that additional planning documents from all departments are consistent with one another. The Planning Department is insuring and completing a plan at developing and expanding its capacity, capabilities. and processes to encompass Planning Department goals and objectives across the Tribal Administration. This Multi-Hazard Mitigation Plan will serve as the basis of all Confederated Tribes of Siletz Tribal emergency management planning pre-disaster. This plan's vulnerability results and mitigation actions will be incorporated into the Tribe's Emergency Operations Plan, other Tribal emergency plans as well as land use and development plans as they are developed.

A Plan Summary will be added to relevant supporting documents and future plans. Development projects are currently reviewed for natural hazards exposure, such as landslides, floods and seismic risk. In the future, the Plan and its supporting data, such as hazard maps, will also be reviewed during development projects for potential hazard exposure.

As the Tribe develops and enhances its mitigation capabilities as part of its overall emergency management planning efforts, formal processes, i.e. resolutions, ordinances and polices, will be implemented to better incorporate mitigation planning into other tribal planning mechanisms as they are developed concurrently.

Continued Public Involvement

In order to continue public participation in the Plan Maintenance and Update process, the Confederated Tribes of Siletz Tribal Natural Hazard Mitigation Plan will be available online on the Tribe's website. The Plan will also be available in hardcopy at the Tribal Administration Building. Comments may be submitted via e-mail, telephone

or in person at the Administration Building, or during Tribal Board meetings relating to the Plan. Results and information from the Plan will also be incorporated into related emergency preparedness training as applicable as well as be used for disaster preparedness articles in the tribal newsletter and website. Hazard maps and presentations created for the Plan will be used for public outreach opportunities, trainings and other tribal events.

7. Repetitive Loss Strategy

The Confederated Tribes of Siletz does not currently own or lease any properties or structures defined as Repetitive Loss or Severe Repetitive Loss properties. Nonetheless FEMA encourages Tribes to identify repetitive flood loss structures as part of the risk assessment and include a repetitive loss strategy in their plans. Definition from FEMA: Repetitive Loss Structure. An NFIP-insured structure that has had at least 2 paid flood losses of more than $1,000 each in any 10-year period since 1978. A Severe Repetitive Loss Property is defined as : Either a severe repetitive loss building or the contents within a severe repetitive loss building, or both.

The Severe Repetitive Loss (SRL) grant program provides funding to states, territories, and local and federally-recognized Indian tribal governments to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) of structures insured under the National Flood Insurance Program (NFIP). Eligible activities under this program include: acquisition and relocation of at-risk structures and the conversion of property to open space; elevation of existing structures to the Base Flood Elevation (BFE) or an ABFE Advisory Base Flood Elevation (ABFE) or higher (for the SRL program Mitigation Reconstruction is only permitted when traditional elevation cannot be implemented); minor physical localized flood control projects; and dry-flood proofing (historic properties only).

The definition of severe repetitive loss as applied to this program was established in section 1361A of the National Flood Insurance Act, as amended, 42 U.S.C. 4102a

A repetitive loss structure means any residential or commercial structure insured under the National Flood Insurance Program (NFIP) with two or more claim payments of more than $1,000 within ten (10) years. In addition, the NFIP defines Severe Repetitive Loss (SRL) structures as single or multifamily residential properties covered under an NFIP flood insurance policy and:

1. That have incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or

2. For which at least two separate claims payments (building payments only) have been made under such coverage, with cumulative amount of such claims exceeding the market value of the property.

3. In both instances, at least two of the claims must be within ten years of each other, and claims made within ten days of each other will be counted as one claim.

In addition, an approved Tribal Mitigation Plan with a repetitive loss strategy that addresses SRL properties makes the Confederated Tribes of Siletz Tribe eligible under 44 CFR 201.7(c)(3)(vi) for a reduced non-Federal cost share under the Flood Mitigation Assistance (FMA) and SRL hazard mitigation assistance programs when the Tribe applies directly to FEMA as a grantee. The reduced cost share option would only apply to SRL properties. If the Tribe applies as a subgrantee, their eligibility for receiving a reduced Federal cost share is based on the eligibility of the grantee (such as the State of Oregon or Lincoln County), regardless of whether the Tribe has a Repetitive Loss Strategy.

In the Plan update, if the Tribe identifies Repetitive Loss properties, it will expand and develop the Repetitive Loss Strategy.

Weblinks/References/Citation

https://www.co.lincoln.or.us/sites/default/files/fileattachments/planning_amp_development/page/4709/2018_lincoln_co_cwpp_final.pdf

State and Local Mitigation Planning How-to Guide,

http://www.fema.gov/library/viewRecord.do?id=1886

http://www.fema.gov/government/grant/government.shtm

FEMA Tribal Multi-Hazard Mitigation Plan guidance November 30th 2018

http://www.fema.gov/library/viewRecord.do?id=4135

GIS Data Sources:

WildFire Historic Fires, 1900 – 2016, Oregon Dept. of Forestry
http://www.oregon.gov/ODF/GIS/gisdata.shtml

metadata: http://www.oregon.gov/ODF/GIS/pdf/historicFires.pdf

Landslide

SLIDO

Statewide Landslide Information Database of Oregon (SLIDO)

Data: http://navigator.state.or.us/sdl/data/mdb/k24/SLIDO_r2_ORLAM.zip

metadata: http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/SLIDOr2.htm

https://webserver.lcd.state.or.us/Uploads/Inbound/20191017113405_Lincoln%20County%20Future%20Projections%20Report_09262019.pdf

https://biamaps.doi.gov/tribalresilience/resourceguide/funding/index.html

https://tribalclimateguide.uoregon.edu/tribal-profiles?page=1

https://www.epa.gov/tribal/indian-environmental-general-assistance-program-gap

https://www.epa.gov/tribal/region-10-tribal-programs#gap

https://www.epa.gov/tribal/indian-environmental-general-assistance-program-gap

https://www.epa.gov/tribal/region-10-tribal-programs#gap

https://www.epa.gov/grants/specific-epa-grant-programs

https://www.bia.gov/as-ia/ieed/division-energy-and-mineral-development/tedcp

https://www.bia.gov/gis

https://www.epa.gov/exchangenetwork/fiscal-year-2019-national-environmental-information-exchange-network-grant-0

https://www.epa.gov/exchangenetwork/exchange-network-grant-program

Oregon Department of Forestry Fire Records Database

https://apps.odf.oregon.gov/DIVISIONS/protection/fire_protection/fires/FIRESlist.asp

https://www.co.lincoln.or.us/emergencymanagement/page/hazards-wildfire

https://spatialdata.oregonexplorer.info/geoportal/

https://www.fema.gov/faq-details/GIS-Data/

https://library.uoregon.edu/map/map_section/map_librarydata

http://www.nwmapsco.com/ZybachB/DRAFT/PhD_Thesis/Chapter_4.htm#Fig_4_05

http://www.nwmapsco.com/ZybachB/DRAFT/PhD_Thesis/Chapter_4.htm#Fig_4_04

http://www.nwmapsco.com/ZybachB/DRAFT/PhD_Thesis/Contents.htm#Maps_References

http://www.nwmapsco.com/ZybachB/DRAFT/PhD_Thesis/Contents.htm#Maps_References

https://apps.odf.oregon.gov/DIVISIONS/protection/fire_protection/fires/FIRESlist.asp

https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=5558048

https://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=72396

Storm Events Database

https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Flood&beginDate_mm=05&beginDate_dd=01&beginDate_yyyy=1950&endDate_mm=05&endDate_dd=31&endDate_yyyy=2019&county=LINCOLN%3A41&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=41%2COREGON

https://www.oregongeology.org/pubs/ims/ims-028/resources.htm

https://pubs.geoscienceworld.org/gsa/geosphere/article/10/4/692/132166/Geologic-history-of-Siletzia-a-large-igneous

https://ngmdb.usgs.gov/ngm-bin/ngm_search_dbi.pl?bc_ul=45.408269%2C-125.306833&bc_lr=44.114393%2C-121.883219

https://www.oregongeology.org/Coastal/beach-basics.htm

https://pnsn.org/earthquakes/recent

https://www.oregongeology.org/default.htm

https://www.usgs.gov/centers/or-water/data-tools

https://oregonexplorer.info/content/oregon-spatial-data-library-0?topic=4129&ptopic=98&qt-subtopic_quicktab=6

https://oregonexplorer.info/content/coastal-hazards-and-resilience-research?topic=4129&ptopic=98

https://oregonexplorer.info/topics/imagery?ptopic=98

References

Atwater, B.F., and A.L. Moore. 1992. A tsunami about 1000 years ago in Puget Sound, Washington. *Science*. 258 (5088): 1614-1617.

Bates and Jackson. 1980. Glossary of Geology. Second Edition. American Geologic Institution.

Clackamas County. 2002. Clackamas County Natural Hazards Mitigation Plan. Prepared by Resource Assistance for Rural Environments/Oregon Natural Hazards Workgroup for the Clackamas County Emergency Management Department, Clackamas County, Oregon.

Confederated Tribes of the Siletz Indians. Emergency Preparedness and Response Plan. 2006. Confederated Tribes of the Siletz Indians Planning Department and Ecology and Environment, Siletz, Oregon.

Confederated Tribes of the Siletz Indians. January 2002. Siletz Highway Road Assessment, Safety Analysis and Report. Lancaster Engineering.

Confederated Tribes of the Siletz Indians. 2003. Siletz Reservation Transportation Improvement Program. Cascade Design Professionals, LLC Planning and Engineering.

Confederated Tribes of the Siletz Indians, Planning Department. 2005. Land Acquisition Plan.

Confederated Tribes of the Siletz Indians, Planning Department. 2005. Toledo Mill Property Master Plan.

Confederated Tribes of the Siletz Indians, Planning Department. 2005. 10 Year Comprehensive Plan.

Federal Emergency Management Agency (FEMA). 2001a. Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA Publication No. 386-2.

Federal Emergency Management Agency (FEMA). 2002a. State and Local Plan Interim Criteria Under the Disaster Mitigation Act of 2000.

Federal Emergency Management Agency (FEMA). 2002b. Getting Started: Building Support for Mitigation Planning. FEMA Publication No. 386-1.

Federal Emergency Management Agency (FEMA). 2003a. Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies. FEMA Publication No. 386-3.

Federal Emergency Management Agency (FEMA). 2003d. Talking About Disaster: Guide for Standard Messages. Tsunami chapter. National Disaster Education Coalition: American Red Cross, FEMA, IAEM, IBHS, NFPA, NWS, USDA/CSREES, and USGS. http://www.fema.gov/rrr/talkdiz/tsunami.shtm

Garcia, A. W. and Houston, J. R. 1975. Type 16 flood insurance study: Tsunami predictions for Monterey and San Francisco Bays and Puget Sound. Technical Report H-75-17. U.S. Army Corps of Engineers Waterways Experiment Station.

Gardner, C.A., K.M. Scott, C.D. Miller, B. Myers, W. Hildreth, and P.T. Pringle. 1995. Potential Volcanic Hazards from Future Activity of Mount Baker, Washington. Open-File Report 95-498. U.S. Geological Survey.

Gonzalez, F.I. 1999. Tsunami!. Scientific American. May 18, 1999. (http://www.sciam.com).

Lincoln County. 2002. Draft Hazard Identification and Vulnerability Analysis. Lincoln County Department of Emergency Management. Newport, Oregon.

Mitsch, W.J. and J.G. Gosselink. 1993. Wetlands. Van Nostrand Reinhold, New York, NY.

National Assessment Synthesis Team (NAST). 2000. Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change (Overview: Coastal Areas and Marine Resources). US Global Change Research Program. http://www.usgcrp.gov/usgcrp/Library/nationalassessment/overviewcoastal.htm Updated July 20, 2001.

National Drought Mitigation Center. 2003. What is Drought? Historical Maps of the Palmer Drought Index. National Drought Mitigation Center, University of Nebraska – Lincoln. http://www.drought.unl.edu/whatis/palmer/pdsihist.htm

National Oceanic and Atmospheric Administration. 1991. Winter Storms: A Guide To Survival. In cooperation with the American Red Cross and the Federal Emergency Management Agency. Washington, D.C. November.

Oregon State. 2000a. Oregon Natural Hazards Mitigation Plan. Part of Volume I, Preparedness and Mitigation, of the State of Oregon Emergency Management Plan.

Oregon State. 2000b. Planning for Natural Hazards: Oregon Technical Resource Guide.

Pacific Northwest Seismograph Network. 2003. Map and list of selected significant quakes in Washington and Oregon. http://www.geophys.washington.edu/SEIS/PNSN/INFO_GENERAL/hist.html

Portland Metro. 1999. Regional Hazard Mitigation Planning and Policy Guide: Reducing Disaster Losses.

Tillamook County. 1996. Tillamook County: Flood Hazard Mitigation Plan. Tillamook County, Tillamook, Oregon. November.

U.S. Bureau of Indian Affairs. 1999. Indian Service Population and Labor Force Estimates. U.S. Department of the Interior, Bureau of Indian Affairs.

U.S. Department of Agriculture-Soil Conservation Service (USDA). 1970. National Engineering Handbook, Section 4, Hydrology. USGPO, Washington.

U.S. Department of Agriculture- Natural Resource Conservation Service (USDA). 1997. Soil Survey of Lincoln County Area, Oregon.

U.S. Fish and Wildlife Service (USFWS). 1987. National Wetlands Inventory.

U.S. Geological Survey (USGS). 2001b. 1996 Deaggregation Information. http://geohazards.cr.usgs.gov/eq/deagg/bellingham.htm. National Seismic Hazard Mapping Project, Earthquake Hazards Program.

U.S. Geological Survey (USGS). 2002. Magnitude / Intensity Comparison. http://neic.usgs.gov/neis/general/handouts/mag_vs_int.html. National Earthquake Information Center, Earthquake Hazards Program.

U.S. Geological Survey (USGS). 2003a. Frequently Asked Questions: Measuring Earthquakes. http://earthquake.usgs.gov/faq/meas.html#1. Earthquake Hazards Program.

U.S. Geological Survey (USGS). 2003b. National Seismic Hazard Mapping Project. http://geohazards.cr.usgs.gov/eq/ . Earthquake Hazards Program.

U.S. Geological Survey (Usgs). 2009. Preliminary Analysis Of Sedimentary Deposits From The 1998 Papua New Guinea (Png) Tsunami. Http://Walrus.Wr.Usgs.Gov/Tsunami/Itst.Html Accessed 2009)

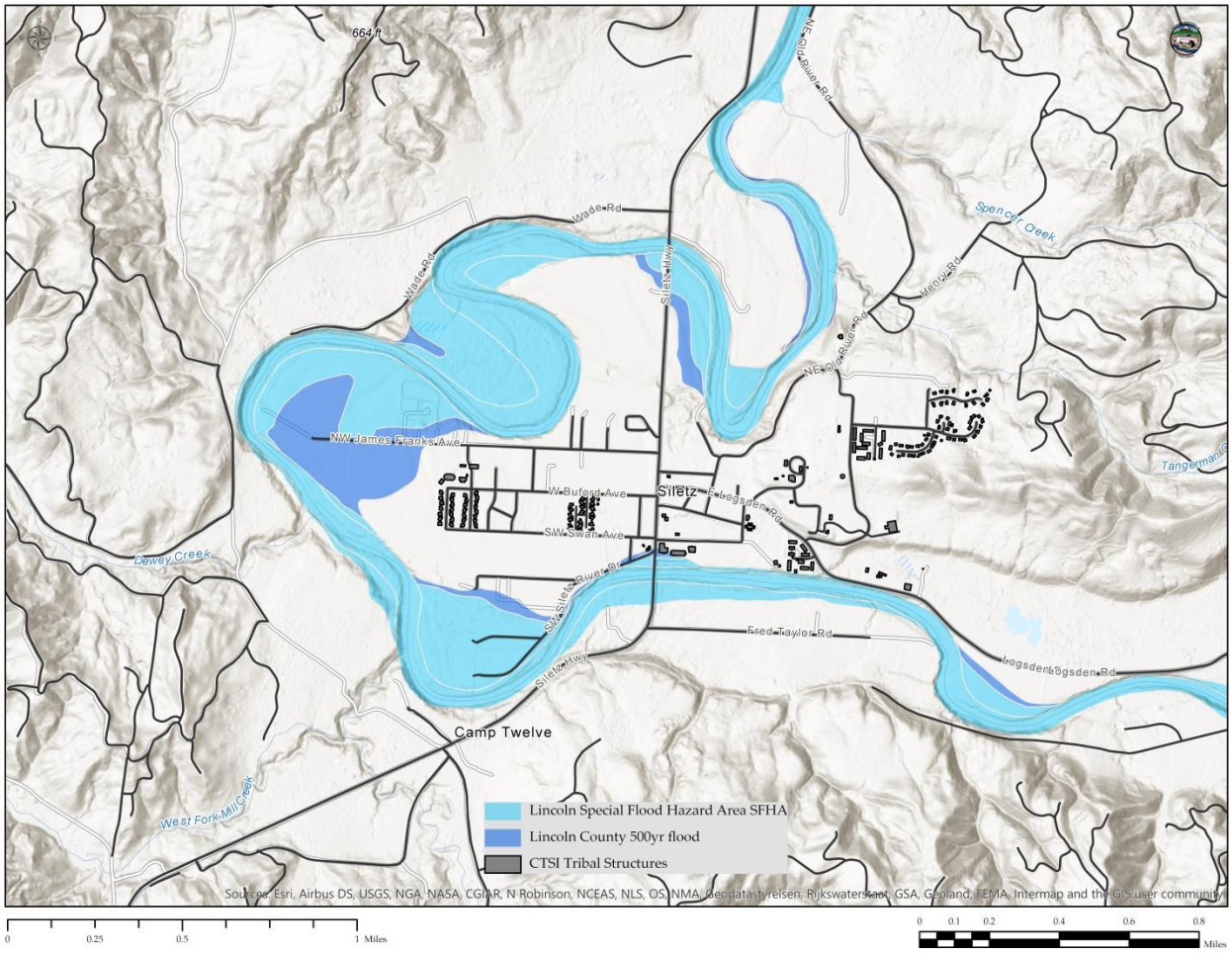
*Public Participation Process

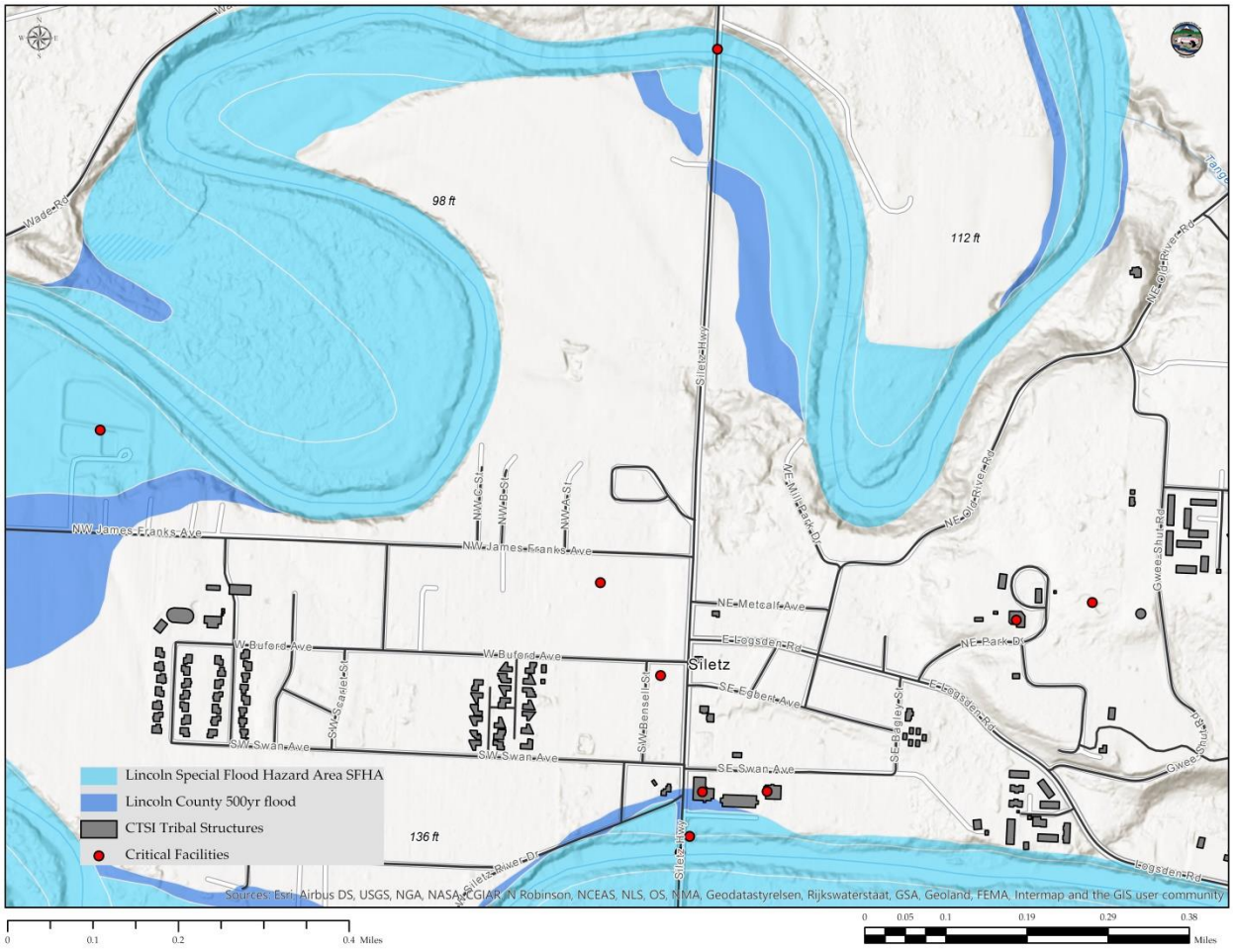
After a draft of the document was completed and the Planning Department personnel and General Manager reviewed the Document, a copy was submitted for review to *Tribal Council, and released for public comment period on November 1st 2019 to see how to proceed with completion of the document. While waiting for further information on how to proceed with the document, the MHMP was reviewed again by staff of the Planning Department, Natural Resources Department, and Human Recourses. After the internal review was finished, the plan was sent to The City of Siletz and the Siletz Rural Fire Department for comments.

FEMA Region X will be sent a final draft copy to check for compliance with federal requirements after the public comment period ended on December 1st 2019. Once the plan meets the requirements, the document will be reviewed by the Core Managers prior to being presented to council again for final approval. The final document will be sent to community groups and governments including: Lincoln County, the City of Lincoln City, City of Siletz, City of Toledo, City of Newport, City of Waldport, and the State of Oregon Emergency Preparedness Office and Emergency Management.

Appendices:

Map Index for 2020MHMP Strategy and Hazard Analysis (Data restrictions and size permitting)

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CTSI Tribal Structures
Critical Facilities
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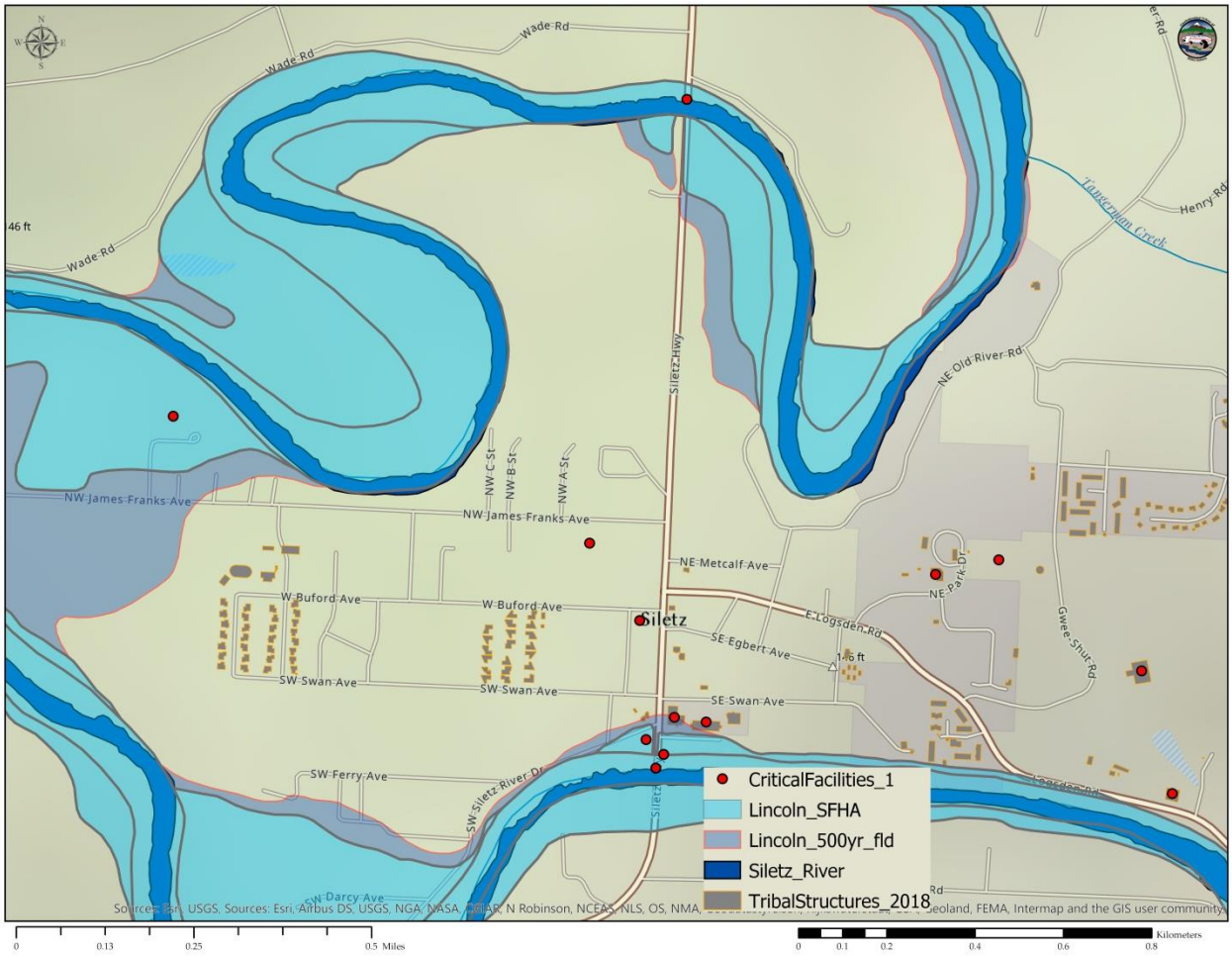
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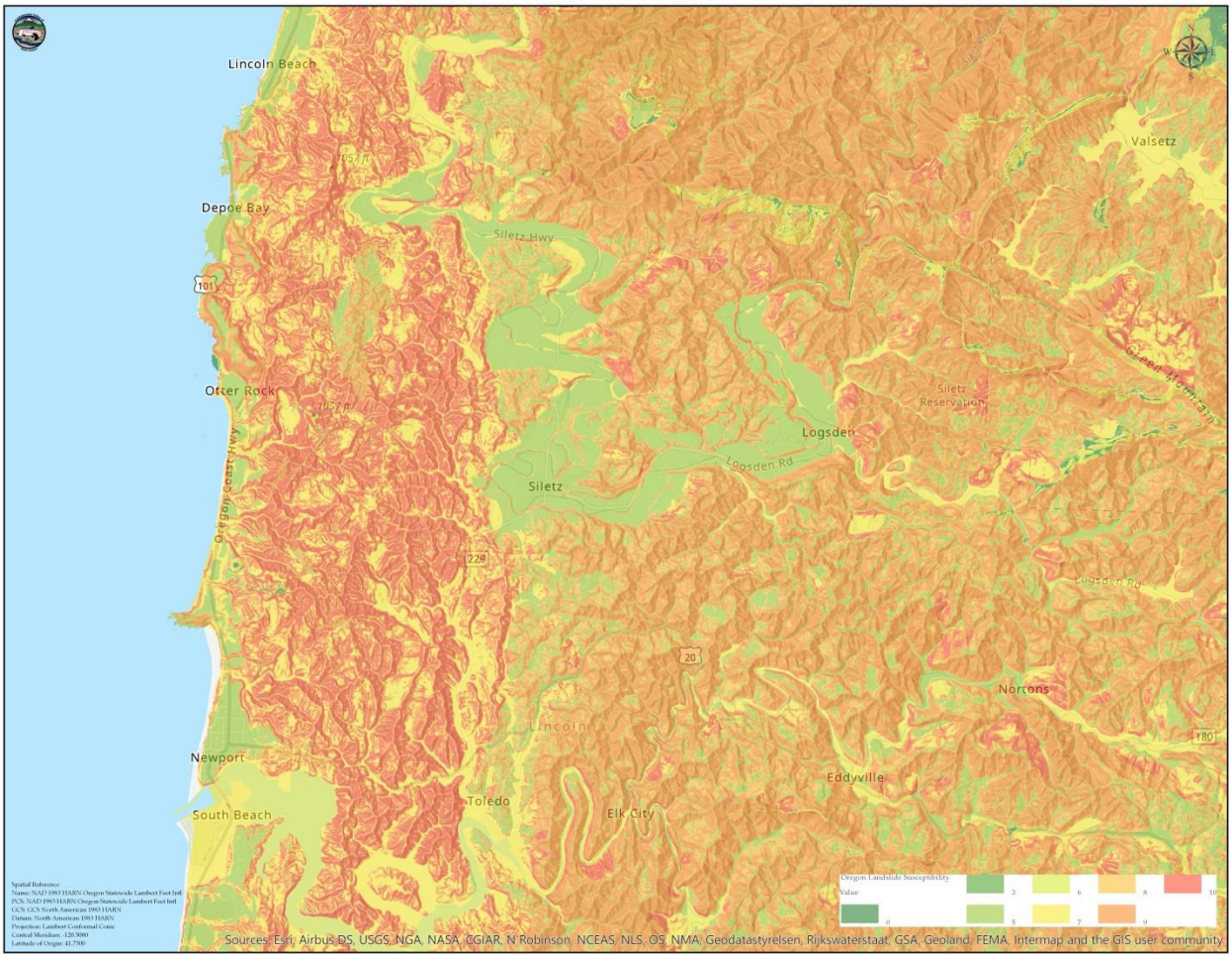
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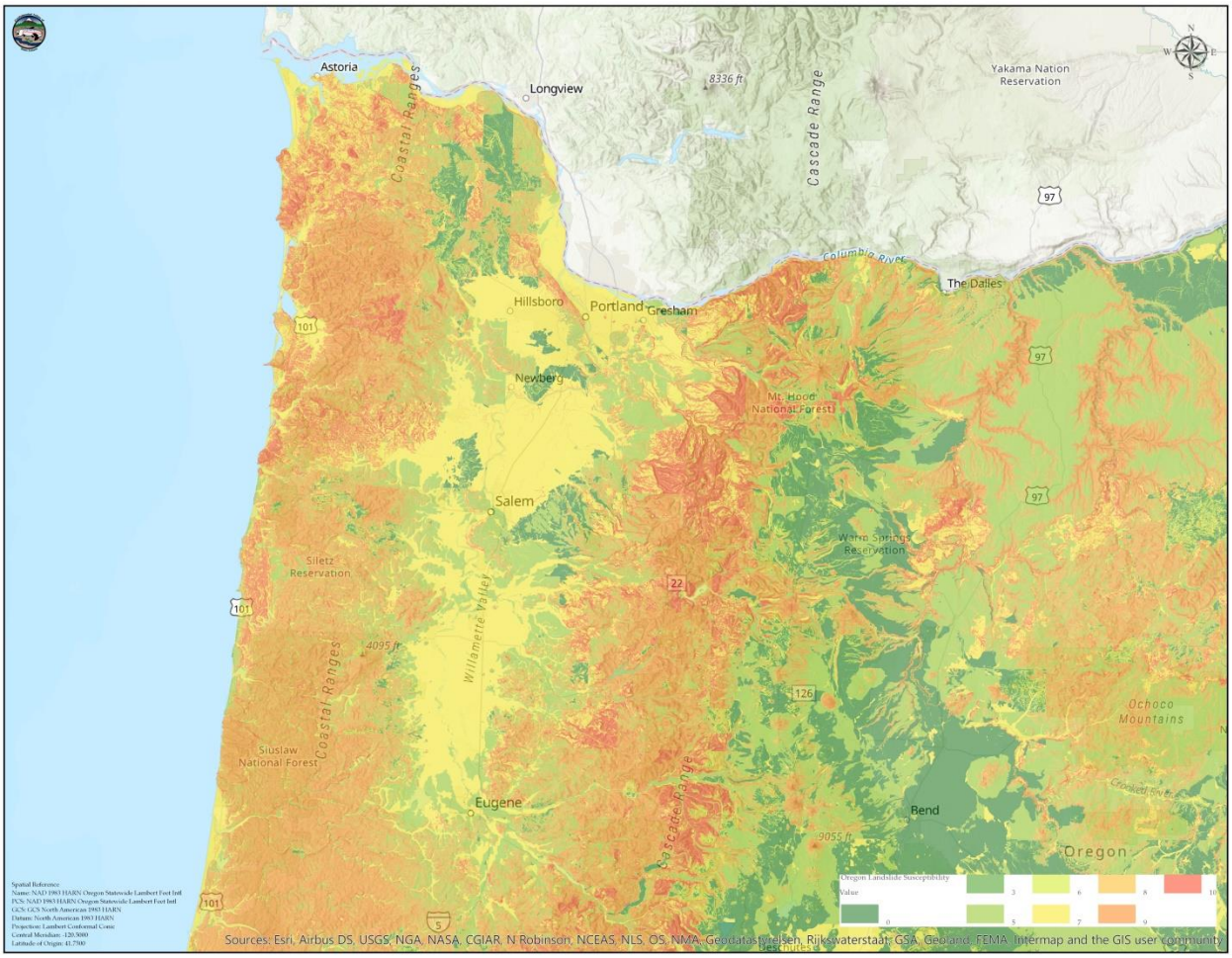
Newport
South Beach
Toledo
Elk City
Oregon Landslide Susceptibility
Value
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community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Salem
Warm Springs Reservation
Siletz Reservation
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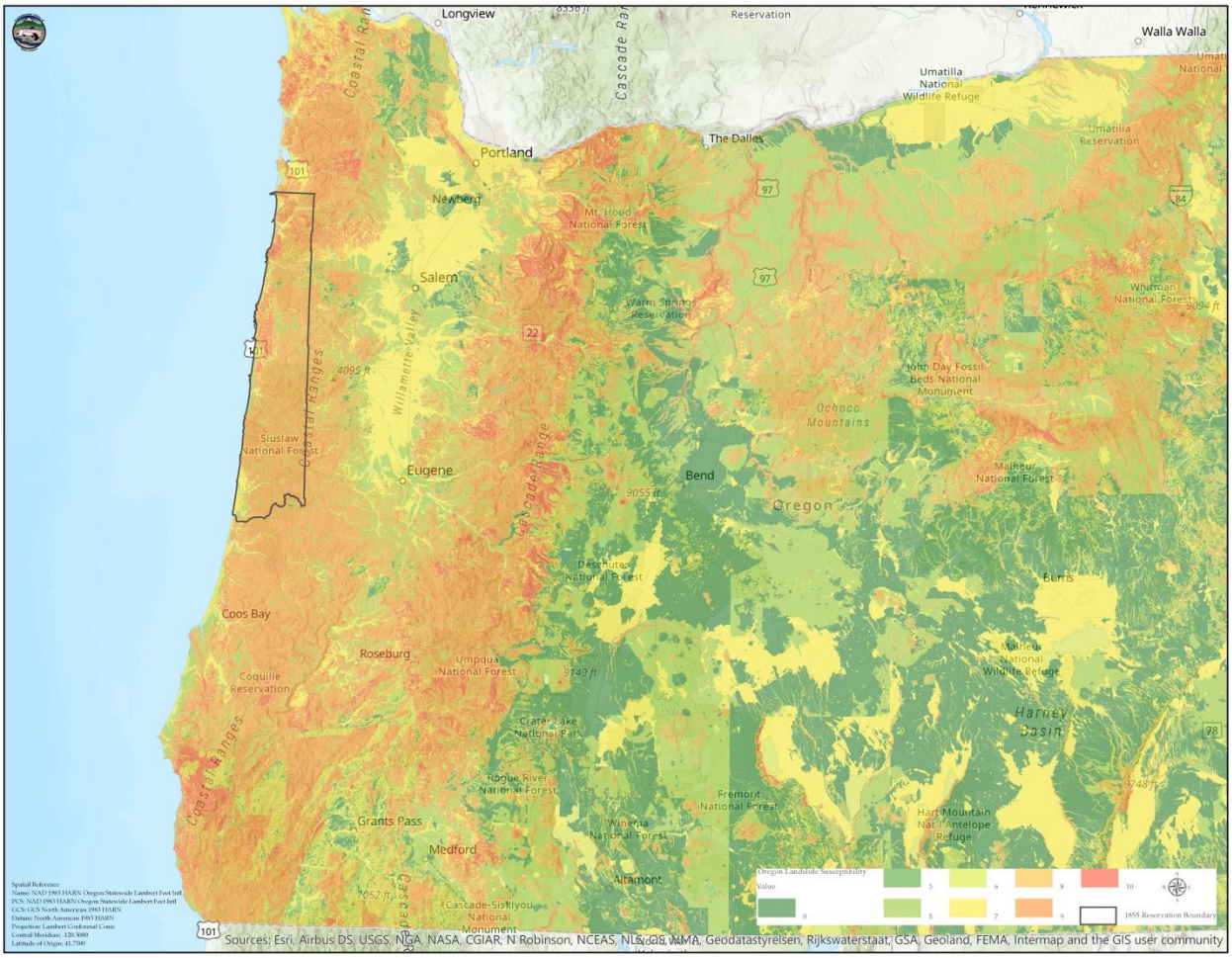
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community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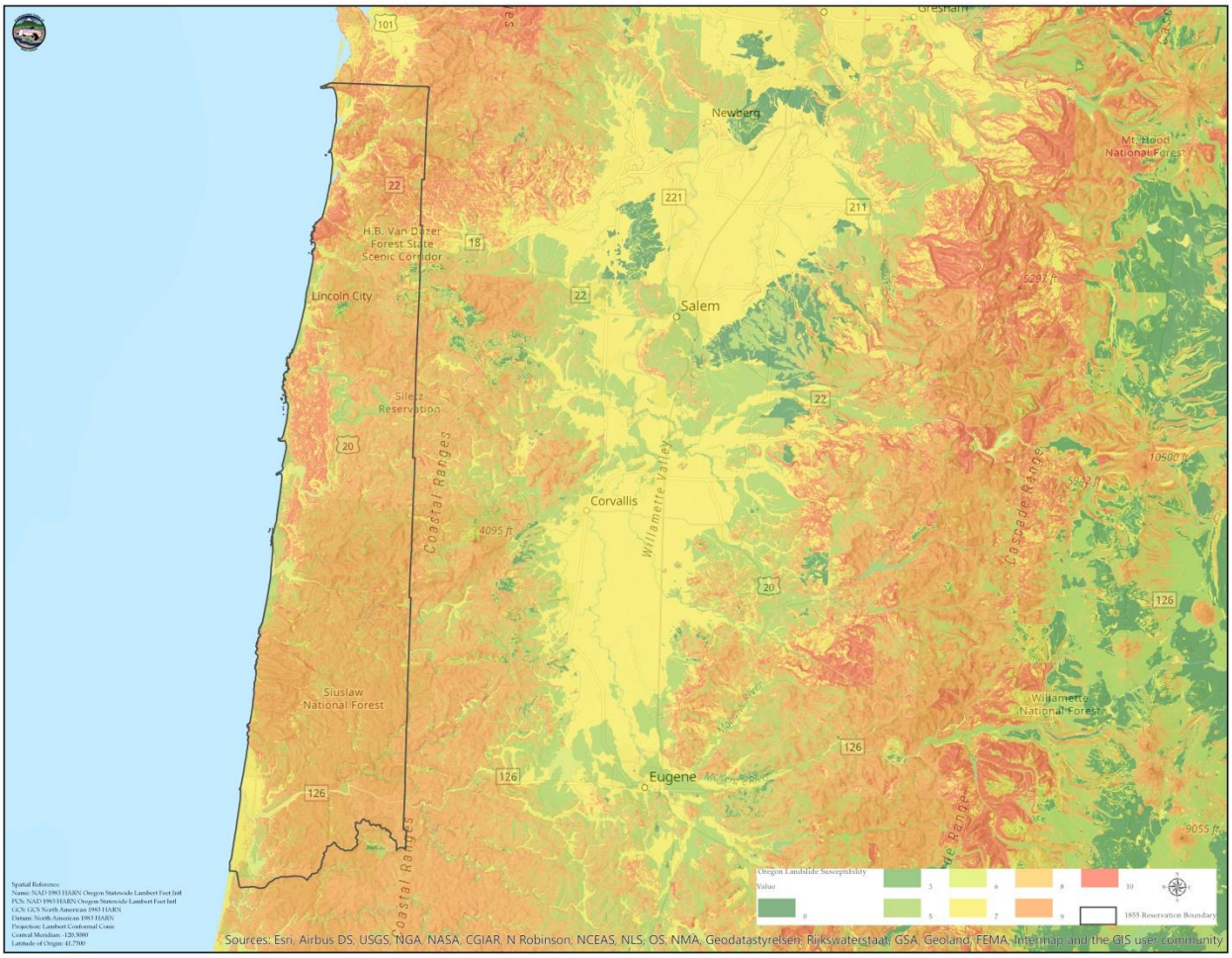
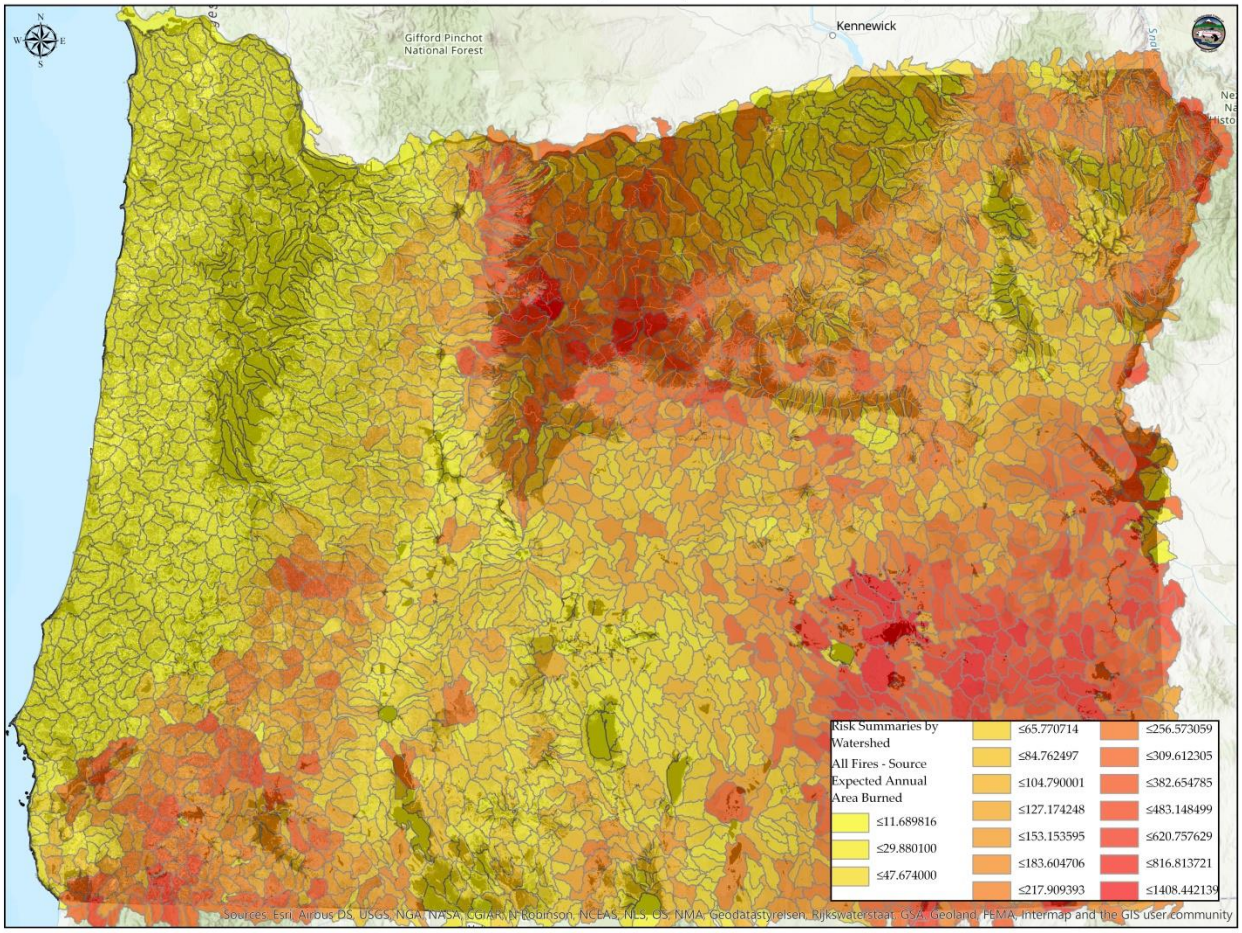
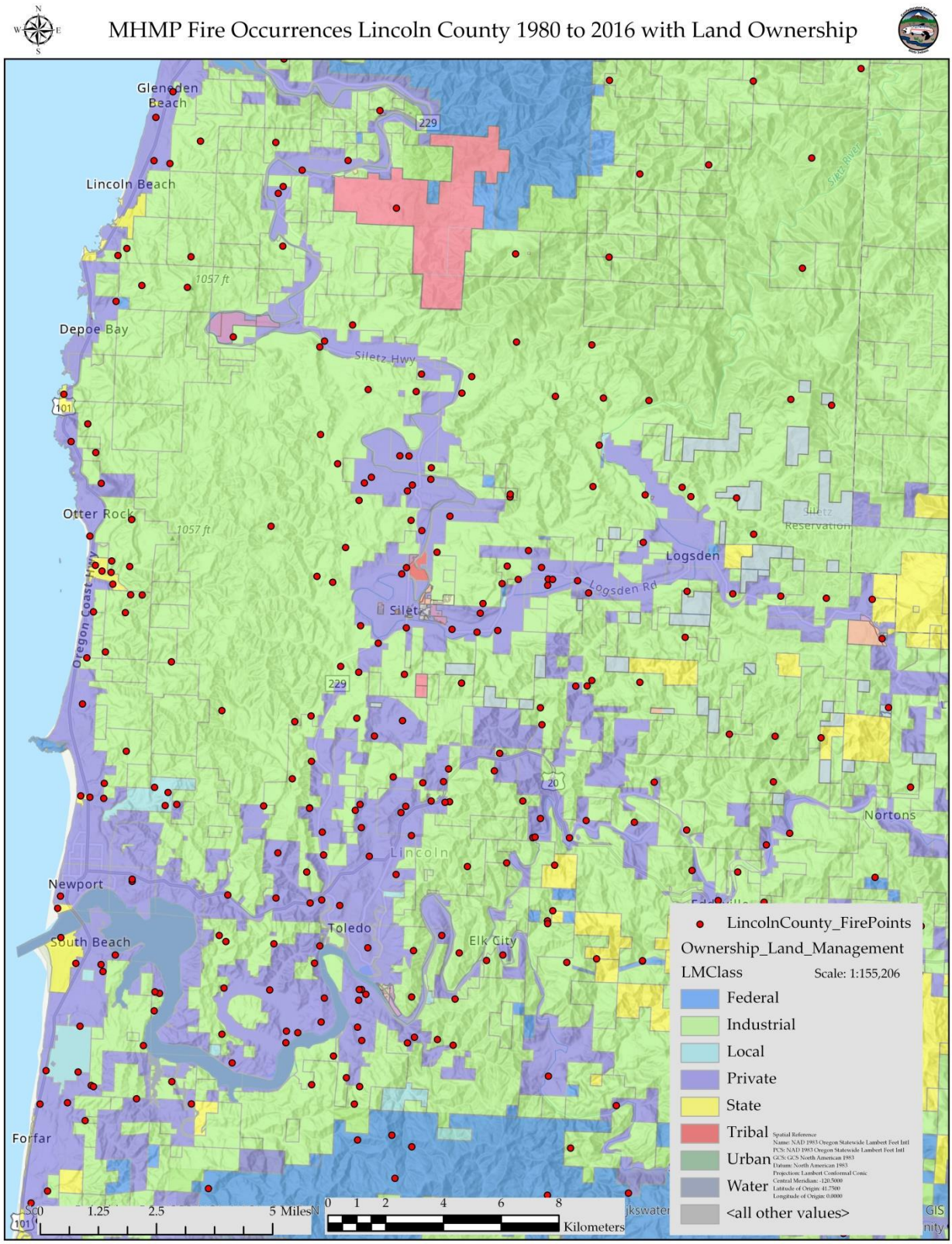
Umatilla Reservation
The Dalles
Portland
Newberg
Mt. Hood National Forest
Salem
Warm Springs Reservation
Whitman National Forest
John Day Fossil Beds National Monument
Ochoco Mountains
Malheur National Forest
Bend
Oregon
Deschutes National Forest
Ellis
Siuslaw National Forest
Coastal Ranges
Willamette Valley
Cascade Range
Eugene
Coos Bay
Roseburg
Umpqua National Forest
Coquille Reservation
Crater Lake National Park
Malheur National Wildlife Refuge
Harney Basin
Rogue River National Forest
Fremont National Forest
Hart Mountain Natl Antelope Refuge
Grants Pass
Winema National Forest
Medford
Altamont
Cascade-Siskiyou National Monument
Oregon Landslide Susceptibility
Value
1855 Reservation Boundary
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

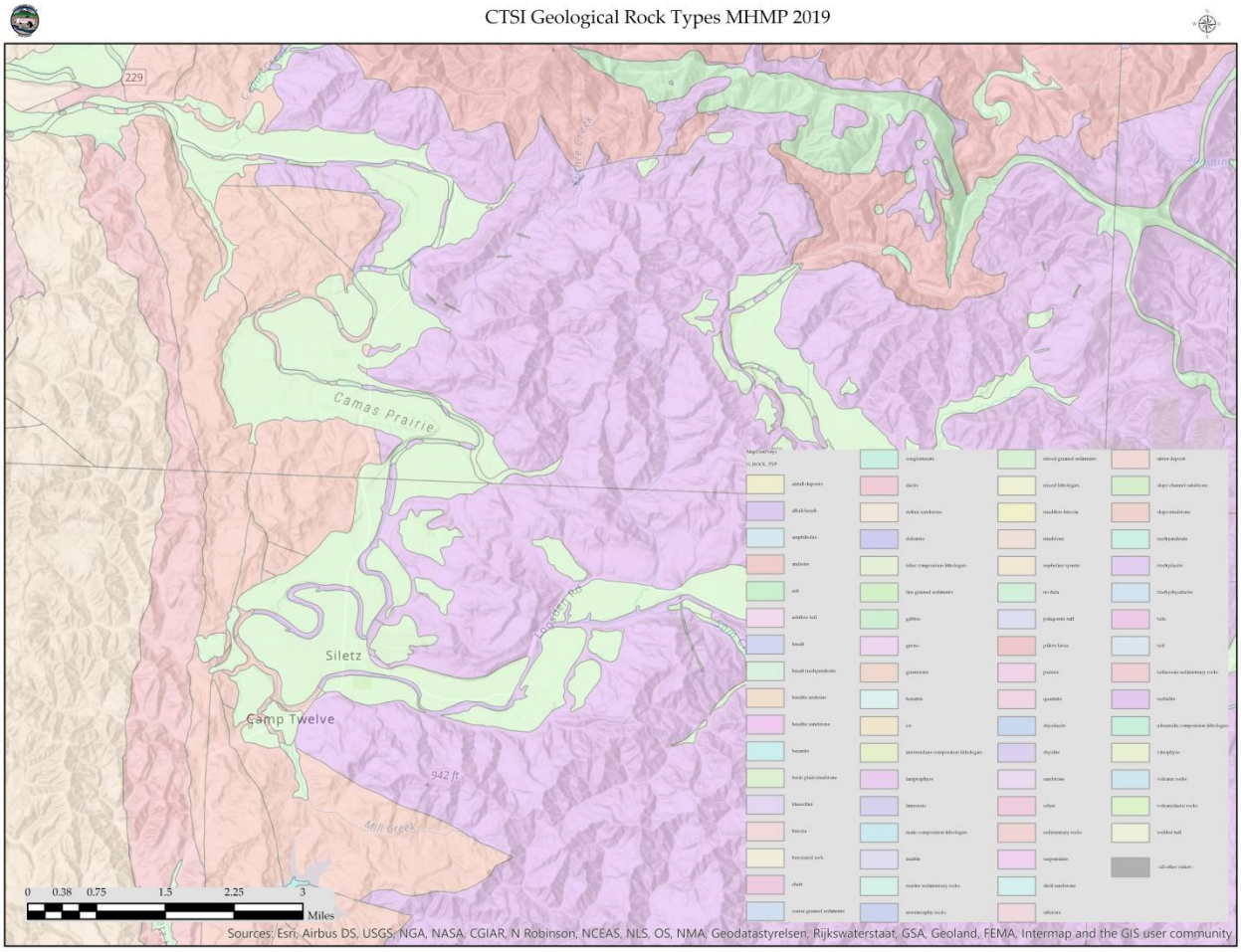

Gresham
Newberg
Mt. Hood National Forest
H.B. Van Duzer Forest State Scenic Corridor
Lincoln City
Salem
Siletz Reservation
Coastal Ranges
Corvallis
Willamette Valley
Cascade Range
10500 ft
5032 ft
4095 ft
Siuslaw National Forest
Willamette National Forest
Eugene
9055 ft
Oregon Landslide Susceptibility
Value
1855 Reservation Boundary
Spatial Reference:
Name: NAD 1983 HARN Oregon Statewide Lambert Feet Intl
PCS: NAD 1983 HARN Oregon Statewide Lambert Feet Intl
GCS: GCS North American 1983 HARN
Datum: North American 1983 HARN
Projection: Lambert Conformal Conic
Central Meridian: -120.5000
Latitude of Origin: 41.7500
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA Intermap and the GIS user community


Union Seamount
Strait of Georgia
Vancouver
Vancouver Island
Nanaimo
Surrey
Abbotsford
Victoria
Strait of Juan de Fuca
WASHIN
Everett
Seattle
Olympic Mountains
Wenatchee Mountains
Wenatchee
Tacoma
Olympia
Mt Rainier
Yakima
Springfield Seamount
Cascadia Basin
Cobb Seamount
Brown Bear Seamount
Thompson Seamount
Astoria Canyon
Juan de Fuca Ridge
Mt St Helens
Columbia
Portland
Mt Hood
Salem
Willamette Valley
BLUE M
Ochoco Mountains
Blanco Fracture Zone
Eugene
Bend
Emilia Seamount
Great Sandy Desert
HAR
BAS
Gorda Ridges
Medford
OREGON
Siskiyou Mountains
Iwabuchi Seamount
Musatov Seamount
Mt Shasta
CALIFORNIA
Yukhov Seamount
Eureka
Redding
Gorda Escarpment
Sierra Nevada
Sacramento Valley
Chico
Reno
Carson City
Boutelle Seamount

CTSI MHMP Fire Probability Statewide by HUC (Data from State of Oregon ODF/USFS)




MHMP Fire Occurrences Lincoln County 1980 to 2016 with Land Ownership
Gleneden Beach
Lincoln Beach
Depoe Bay
Otter Rock
Siletz
Logsden
Logsden Rd
Siletz Reservation
Siletz River
Siletz Hwy
Oregon Coast Hwy
1057 ft
229
101
20
Nortons
Lincoln
Newport
South Beach
Toledo
Elk City
Forfar
LincolnCounty_FirePoints
Ownership_Land_Management
LMClass
Scale: 1:155,206
Federal
Industrial
Local
Private
State
Tribal
Urban
Water
<all other values>
0 1.25 2.5 5 Miles
0 1 2 4 6 8
Kilometers


CTSI Geological Rock Types MHMP 2019
229
Camas Prairie
Siletz
Camp Twelve
942 ft
Mill Creek
0 0.38 0.75 1.5 2.25 3
Miles
Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

CTSI Geological Rock Types MHMP 2019