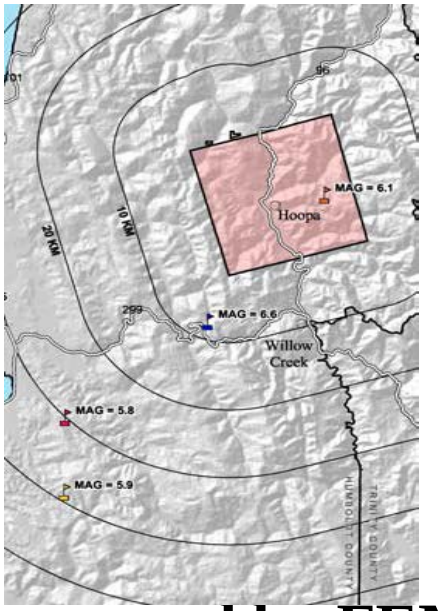
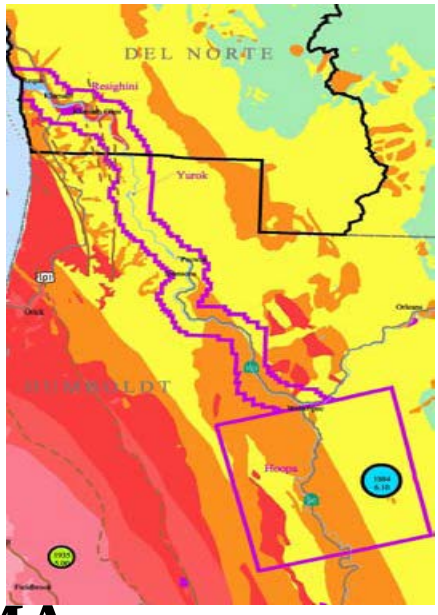
HOOPA VALLEY TRIBE

MULTI-HAZARD MITIGATION PLAN





Approved by FEMA
May 28, 2014

Approved by FEMA on May 28, 2014
HOOPA VALLEY TRIBE
MULTI-HAZARD MITIGATION PLAN

Prepared By
The Hoopa Tribal Local Emergency Planning Committee (LEPC) serving as the Mitigation Planning Team (MPT)
Comprised of Divisions of the Hoopa Tribe and the Community of Hoopa
On Behalf of the Citizens of the Hoopa Valley Indian Reservation

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Hoopa MHMP Approval Resolution

RESOLUTION OF THE HOOPA VALLEY TRIBE

HOOPA VALLEY INDIAN RESERVATION
HOOPA, CALIFORNIA

RESOLUTION NO: 09-233

DATE APPROVED: DECEMBER 3, 2009

SUBJECT: ADOPTION OF THE REVISED 2009, HOOPA VALLEY TRIBAL MULTI-HAZARD MITIGATION PLAN

WHEREAS: The Hoopa Valley Tribe did on June 20, 1972, adopt a Constitution and Bylaws which was approved by the Commissioner of Indian Affairs on August 18, 1972, ratified by Act of Congress on October 31, 1988, and, by tribal law, the sovereign authority of the Tribe over the matter described herein is delegated to the Hoopa Valley Tribal Council, acting by resolution; and,

WHEREAS: the Hoopa Valley Indian Reservation has suffered from several natural disasters in the past including flooding, severe storms, earthquakes, wildfire, and drought, and,

WHEREAS: the Hoopa Valley Tribe has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Pre-Disaster Mitigation Plan under the requirements of the Federal Disaster Mitigation Act of 2000, and

WHEREAS: the purpose of the plan is to identify mitigation projects and strategies that will eliminate or reduce the effects of future disasters on the people and assets of the Hoopa Valley Tribe and its members, and

WHEREAS: adoption of this plan will make the Hoopa Valley Indian Reservation eligible for funding to alleviate the impacts of future hazards on the Reservation,

NOW THEREFORE BE IT RESOLVED THAT: in accordance with requirement §201.4(c)(6), the Hoopa Valley Tribal Council adopts the Pre-Disaster Mitigation which is entitled Hoopa Valley Tribal Multi-Hazard Mitigation Plan, and will forward the plan to FEMA for final acceptance.

NOW THEREFORE BE IF FURTHER RESOLVED THAT: the Hoopa Valley Tribal Council will establish the Hoopa Tribal Local Emergency Planning Committee (LEPC) comprised of representatives of pertinent agencies within the Hoopa Tribe, and that the Hoopa Tribe, Office of Emergency Services (OES) is formed under the direction of the Director, Office of Emergency Services

CERTIFICATION

I, the undersigned, as Vice-Chairman of the Hoopa Valley Tribal Council do hereby certify that the Hoopa Valley Tribal Council, composed of eight members; of which eight (8) were present constituting a quorum at a Regular meeting thereof; duly and regularly called, noticed, and convened, and held this 3rd day of December, 2009; and that this resolution was duly adopted by a vote of seven (7) for, zero (0) against, and zero (0) abstaining, and that said resolution has not been rescinded or amended in any way.

DATED THIS THIRD DAY OF DECEMBER, 2009

BYRON NELSON JR., VICE-CHAIRMAN
HOOPA VALLEY TRIBAL COUNCIL

ATTEST:
DARCY A. MILLER, EXECUTIVE SECRETARY
HOOPA VALLEY TRIBAL COUNCIL

RESOLUTION OF THE HOOPA VALLEY TRIBE
Hoopa Valley Indian Reservation
Hoopa, California

RESOLUTION NO: 11-47

DATE APPROVED: NOVEMBER 21, 2011

SUBJECT: AUTHORIZING THE ADOPTION OF HOOPA VALLEY TRIBE'S 2011 MULTI-HAZARD MITIGATION PLAN UPDATE.

WHEREAS: The Hoopa Valley Tribe did on June 20, 1972, adopt a Constitution and Bylaws which were approved by the Commissioner of Indian Affairs on August 18, 1972, and re-approved by Congress on October 31, 1988 and Article IX, section 1 (g) of this Constitution and Bylaws authorizes the Hoopa Tribal Council to negotiate with the Federal, State and local governments on behalf of the Tribe; and,

WHEREAS, the Hoopa Valley Indian Reservation has suffered from natural disasters in the past including, Landslides, Flooding, Severe Storms, Earthquakes, Wildfire, and Drought, and,

WHEREAS, The Hoopa Valley Tribe has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Pre-Disaster Mitigation Plan under requirements of the Federal Disaster Mitigation Act of 2000, and

WHEREAS: The purpose of the plan is to identify and update new and current mitigation projects and strategies that will eliminate or reduce the effects of future disasters on the people and assets of the Hoopa Valley Tribe and its members, and

WHEREAS: Adoption of the plan will make the Hoopa Valley Indian Reservation eligible for funding to alleviate the impacts of present and future hazards on the Reservation,

NOW THEREFORE BE IT RESOLVED THAT: In accordance with requirement 204.4(c)(6) the Hoopa Valley Tribal Council adopts the Pre-Disaster Mitigation Plan which is entitled the 2011 Hoopa Valley Tribal Multi-Hazard Mitigation Plan Update, and will forward the plan to FEMA Region IX for final ***review*** and acceptance.

NOW THEREFORE BE IT FURTHER RESOLVED THAT: The Hoopa Valley Tribal Council will establish the Hoopa Tribal Local Emergency Planning Committee (LEPC) comprised of representatives of pertinent agencies and

disciplines within the Hoopa Tribe, and that the Hoopa Tribe, Office of Emergency Services (OES) is formed under direction of the Director, Office of Emergency Services.

C E R T I F I C A T I O N

I, the undersigned, as Chairman of the Hoopa Valley Tribal Council do hereby certify that the Hoopa Tribal Council is composed of eight (8) members of which six (6) were present, constituting a quorum, at a Regular Meeting thereof; duly called, noticed, convened and held this 21st day November 2011; and that this resolution was adopted by a vote of approval this resolution was adopted by a vote of five (5) for, and zero (0) opposed, and zero (0) abstaining; and that since its approval this resolution has not been rescinded, in any way.

DATED THIS TWENTY-FIRST DAY OF NOVEMBER 2011.

LEONARD MASTEN, CHAIRMAN
HOOPA VALLEY TRIBAL COUNCIL

ATTEST: Darcy H Miller

DARCY A.MILLER, EXECUTIVE SECRETARY
HOOPA VALLEY TRIBAL COUNCIL

Hoopa MHMP Letter of Promulgation

Hoopa Valley Tribal Council

Hoopa Valley Tribe

P.O. Box 1348 ~ Hoopa, California 95546 ~ Phone (530) 625-4211 ~ Fax (530) 625-4594

Leonard E. Masten Jr.
Chairman

LETTER OF PROMULGATION

TO: OFFICIALS, TRIBAL GENERAL COUNCIL, TRIBAL MEMBERS AND EMPLOYEES OF THE HOOPA VALLEY TRIBE

The preservation of life and property is an inherent responsibility of tribal, local, state and the federal government. The Hoopa Valley Tribe has prepared this Multi-Hazard Mitigation Plan to evaluate the natural hazards of the reservation area and, if appropriate, take action to mitigate the hazards. The Hoopa Tribe, Office of Emergency Services will endeavor to develop and maintain a systematic program for identifying hazards, monitor changes in hazard vulnerability, and develop and undertake the necessary action to reduce hazard vulnerability. It further requires that repairs be done in accordance with applicable codes, specifications, and standards of the Hoopa Valley Tribe.

While no plan can prevent death and destruction, good plans carried out by knowledgeable and trained personnel can and will minimize losses by improving the quality of protection for the public health and safety, property, and the environment. The objective of this plan is to outline the processes for identifying the natural hazards, risks, and vulnerabilities of the area and reduce their impact to the reservation by mitigation efforts. This Mitigation Plan is also prepared in order to reduce or eliminate the risk to human life and the loss or destruction of property, which may occur as a result of natural or man made hazards.

The Hoopa Valley Tribal Council gives its full support of this plan and urges all officials, employees, and Tribal Members, individually and collectively, to do their share in the mitigation effort of the Hoopa Valley Indian Reservation to lessen the impact during a disaster.

Concurrence of this promulgation letter constitutes the adoption of the Hoopa Tribe's Multi-Hazard Mitigation Plan in accordance to the requirements of the Disaster Mitigation Act of 2000 and will becomes effective on approval through Resolution of the Tribal Council.

Byron Nelson, Vice-Chairman
Hoopa Valley Tribe

Regular Council Meetings on the First and Third Thursday of Each Month

Executive Summary

The purpose of the Hoopa Valley Tribe's Multi-Hazard Mitigation Plan (MHMP) is to guide current and future efforts effectively and efficiently, to mitigate natural, technological and human caused hazards on the Hoopa Valley Indian Reservation (HVIR). HVIR, in coordination with other agencies and governments as appropriate, mitigate and respond to hazards that may generate off the Reservation and cross over Reservation boundaries. The overall goal is to reduce or eliminate long-term risk to life and property from various hazards.

Natural hazards such as floods, wild land fires, earthquakes, and severe winter storms pose a significant threat to the natural resources, political integrity, economic stability, health and well-being of the community members on all levels of the HVIR. The lack of planning and preparation for those hazards could potentially increase the frequency and severity of those hazards if left unregulated. The Office of Emergency Services led the development and the Hoopa Tribal Local Planning Committee (LEPC) effectively served as the Mitigation Planning Team. Sophi Beym, independent contractor, served as final editor and assisted with the submission of the final plan.

The Office of Emergency Services will lead the implementation of the MHMP, will secure funding for future community planning and develop grants to sustain the mitigation actions within the plan. The Local Emergency Planning Committee (LEPC) was developed as a government and community based organizations to be the Tribal Emergency Response Committee (TERC) and fulfill the requirements of an LEPC as well.

The original version of the MHMP was meant to be a living document. Once the original document was approved and implemented by the Hoopa Valley Tribe, pre October 2008 before 201.7. The original document is in accordance with §201.4[1](c)(6) through Tribal Resolution #09-233. As such the Hoopa Valley Tribe would ensure accordance with 44 CFR §13.11(c) and 44 CFR §13.11(d) with respects to periods for which it receives grant

[1] In October 2008, Section 201.4 was replaced with 201.7 Tribal Mitigation Plans.

funding through FEMA. Below is the prerequisite 44 CFR §201.4[2](c)(7), providing the requirements for a Standard State-Level Mitigation Plan:

The Hoopa Valley Tribe will comply with all applicable Federal statutes and regulations: and in addition, the tribe will amend this Plan to reflect new or revised Federal regulations or statutes, or changes in Tribal Law, organization, policy, or tribal government operations. Such amendments will be added to the Plan as they are developed and deemed applicable.

The Hoopa Valley Tribe has endured many events that have tasked the abilities of tribal resources to respond to, mitigate, and recover from incidents such as flooding, severe damage from storms, wildfires, and public health threats. A severe winter storm at the end of 2005 through the New Year of 2006 caused an estimated $1.5 million dollars in damage. Flood stage warnings were in effect for several days despite peaking approximately 3 feet under the flood stage level. In 1999 the tribe found itself immersed in smoke from wildfires that started off the reservation and burned onto Hoopa, creating a public health incident from the effects of the long-term exposure to the smoke. Similarly, the Hoopa Tribe once again found itself inundated and immersed in smoke in 2008 from wildfires outside the boundary of the reservation. In 2007 and 2008, the Hoopa Tribe evoked the Hoopa Tribes, Emergency Operation Plan (EOP), and was successful in setting in place an Incident Management Organization, which dealt with the response, mitigation, and recovery efforts of the 2007 Severe Storm Event and 2008 Air Quality/Public Health Threat affecting the health and welfare of the community of Hoopa. The Hoopa Valley Indian Tribe defines public as the community of Hoopa, visitors of Hoopa, human beings on Hoopa. With the continued development of the 2011 MHMP Update and long-term infrastructure training and development, the Hoopa Tribe will systematically identify policies, actions, and tools for maintenance for any type of emergency or disaster.

[2] In October 2008, 201.4 was replaced with 201.7 Tribal Mitigation Plan.

Chapter 2 describes the existing hazard conditions of the Hoopa Valley Indian Reservation, as well as the current infrastructure, resources, and use patterns, as well as attitudes and expectations. The Reservation has faced, and continues to face the threat from several natural hazards. Among these discussed in the Risk Assessment found in Chapter 3 are; dam failure, earthquakes, droughts, floods, severe storms, and wildfires. The Tribe also faces threats from hazards such as chemical spills, arson, and other human caused disasters. Since we live in a valley surrounded by conifer forests, we are subject to unique dynamics that control the options we have in dealing with certain hazards. As such, we have had to extensively research not only historical events, but potential threats associated with living downstream from an earthen dam. Knowledge about these hazards is a necessary element to the development of effective hazard mitigation strategies to limit and/or prevent the loss of life and damage to structures and infrastructure.

Our Mitigation Strategy is the most critical portion of this document, as the Hoopa Tribe attempts to evaluate every possible scenario that could result from a natural disaster or potential risks outlined in Chapter 3.

Chapter 4 discusses the pre and post-disaster hazard management policies, programs, and mitigation capabilities of the Hoopa Valley Tribe, as well as other regional jurisdictions that provide support services to the Hoopa Valley Tribe during disasters impacting Hoopa Valley Reservation. This discussion includes an evaluation of Hoopa Valley Tribe laws, regulations, policies, and programs that are related to hazard mitigation, pre-disaster and post-disaster laws and policies are addressed along with addressing new development activities in hazard-prone areas. Funding capabilities for hazard mitigation projects are also discussed.

Chapter 5 discusses the local and Tribal capability assessments including general descriptions and analyses of mitigation policies, programs, and capabilities of local organizations on the Reservation. Finally, the MPT prioritized the mitigation actions based on precedence and funding to determine an action plan.

The Plan Maintenance Process is outlined in Chapter 6, and describes how the MHMP will be monitored, evaluated, and maintained as a living document. The newer federal hazard mitigation planning regulations (44 CFR 201.7) require revision every five years. The MPT will review the mitigation plan annually. Federal regulations require a plan maintenance process that includes 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 identifying projects, creating structural and non-structural projects, achieving mitigation goals as well as specific activities and projects identified in this mitigation plan. Chapter 6 describes this process in detail.

Chapter 1 – Purpose and Need

Introduction

This 2011 update to the 2006 Hoopa Valley Tribal Multi-Hazard Mitigation Plan (MHMP) has been prepared in accordance with 44 CFR 201.7 Tribal Mitigation Plans. This plan is based on the *Multi-Hazard Mitigation Planning Guidance of the Disaster Mitigation Act of 2000* (***P.L. 106-390***), published by FEMA in 2004, revised in June 2007, November 2006 and June 2007 and the Tribal Multi-Hazard Mitigation Planning Guidance in March 2010. This MHMP documents the coordination of planning efforts, who was involved, public outreach, what tasks and resources were made available and descriptions of the Hoopa Tribe's existing resources and infrastructure, risks and hazard assessments, and a mitigation strategy to prioritize risks and associated action plans.

The Federal Emergency Management Agency (FEMA) is the principal federal agency with jurisdiction over the proposed updated mitigation plan. The Applicant for the proposed updated plan is the Hoopa Valley Tribal Council (HVTC). The purpose of this updated MHMP is to satisfy the requirements of FEMA as well as to document the needs of the Hoopa Valley Tribe in regards to hazard planning preparedness. Beginning in Federal Fiscal Year 07, all federal preparedness funding became conditioned upon full compliance with the National Incident Management System (NIMS). Homeland Security Presidential Directive (HSPD-5) was issued in 2003 and required all federal agencies to use it in their individual domestic incident management and emergency prevention, preparedness, response, recovery and mitigation programs and activities. The NIMS was issued by the Department of Homeland Security (DHS) on March 1, 2004, to provide a comprehensive and consistent national approach to all-hazard incident management at all jurisdictional levels and across functional disciplines. In a September 8, 2004, letter to the nation's governors, DHS outlined a phased approach to NIMS implementation, with full compliance required by September 30, 2006.

The goals of the Hoopa MHMP are to:

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

2. Reduce infrastructure damages caused by natural hazards;
3. Reduce the environmental impacts of natural hazards, mitigation actions, and future development activities;
4. Reduce the long-term costs resulting from natural hazards and their mitigation.
5. Mitigate threats of terrorist activities and illegal marijuana grows on Tribal lands that result in health and safety impacts to humans and the watershed, including sensitive wildlife and salmon species.

The objectives of the Hoopa MHMP are to:

1. Prevent future development areas of high risk or create ways to minimize risk;
2. Protect or alter existing hazardous areas;
3. Choose most cost effective way to deal with hazards and protect our Tribal resources, which is in line with existing Tribal ordinances;
4. Develop a Cost Benefit analysis for all hazards and mitigation measures;
5. Redesign existing projects to be in compliance with MHMP;
6. Manage floodplains, rivers, streams, erosion, and slides to minimize impacts to structures and the community;
7. Improve coordination between the Hoopa Valley Tribe and other local, state, and Federal jurisdictions;
8. Increase public awareness through education, community meetings, and the media in preparation for future hazards;
9. Improve warning systems for potential hazards.
10. Obtain support and secure Homeland Security and other federal funding for a coordinated response from law enforcement to reduce and eradicate illegal marijuana grows and the associated health, safety and environmental impacts.

In order to effectively respond to all natural hazards the MPT identifies all potential hazards and areas of concern within the Hoopa Valley by conducting a thorough hazard identification and risk assessment. To meet the goals and objectives outlined above, the Hoopa Tribe must be prepared for the worst-case scenario. This includes upgrades to existing medical facilities, adoption of a comprehensive Incident Command System with properly trained personnel, comprehensive studies on seismic activity an fault line

locations, adoption of stricter uniform building codes and environmental monitoring, valley wide warning systems, east and west side response/stockpile centers, implementation of best management practices under the Forest Management Plan (FMP) and associated Fuels Management Plan (revised and approved in 2008) for fuels reduction, evacuation plans, and most importantly public outreach. Without public outreach, any disaster has the potential to reach pandemonium. Also the Hoopa Tribe needs to pursue funding either through the State, guaranteed Government-to-Government agreements, grants, or even introduction of legislation for a Tribal portion of Homeland Security funds. These funds can be used to bring infrastructure up to code, increase protection for new development, staff training, public outreach, and critical equipment necessary to carry out the goals and objectives of the Hoopa Tribal MHMP.

The Office of Emergency Services will serve as the lead tribal agency and conduct bi-monthly meetings on the MHMP to discuss current issues and to implement projects and activities conveying these matters to the HVTC. For the public, the OES will educate the community on emergency preparedness through various measures, such as, implementing a Mass Notification Warning Sirens System with educational outreach and disaster preparedness drills to educate and encourage the community to prepare for disasters by stocking extra supplies and keeping emergency survival kits, knowing family emergency contact information and evacuation plans, and generally becoming more aware of all hazard types. Public input will always be welcome as most people are aware of issues in the community but, more importantly,

The LEPC, serving as the Mitigation Planning Team (MPT), recommends the following action plans based on the development of this MHMP:

1. Establish a permanent all hazards emergency planning team evolved from the LEPC from pertinent agencies and tribal departments; elect a chairperson, and immediately identify infrastructure needs. This would be an advisory board to the Chairman and Council, as well as a liaison between emergency services departments;

2. Pursue permanent funding for building codes, infrastructure upgrades and planning team efforts;
3. Approve this MHMP as a guiding document and ensure it is in line with existing Tribal Codes and Ordinances;
4. Coordinate with other Tribal, Local, State and Federal agencies with interoperable communications, and MOA's where applicable, planning and emergency funding;
5. Review the existing Emergency Operation Plan and Hazardous Materials Plan and amend where necessary to align and support the 2011 MHMP Update;
6. Review and amend existing models, maps and GIS coverage to be up to date with current census and resource information of the Hoopa Tribe;
7. Implement a strong Public Education campaign in order to make the community aware of potential hazards and how to respond to different situations. Also
8. Provide and maintain a current list of emergency contacts with numbers, cell phones and e-mail addresses of pertinent employees of the Tribe.

To improve preparation for future hazard events, the HVTC has developed an Emergency Operations Plan (EOP) for the Hoopa Valley Tribe (http://www.hoopansn.gov/documents/TribalEOP.pdf). In addition, the Hoopa Tribe has developed a Hazardous Materials Response Plan to guide the response to spills of hazardous materials on and adjacent to the Reservation. Other documents pertinent to the guidance of this document are the Hoopa Tribe's Forest Management Plan (FMP), the Hoopa Tribal Water Quality Control Plan (WQCP), the Hoopa Tribe's Land Use Plan and Development Standards (LUPDS), 1998 Draft Only - Integrated Resource Management Plan (IRMP), and the revised and approved 2008 Hoopa Tribe's Fuels Management Plan (FMP.

This MHMP provides detailed recommendations and an action plan designed to meet each objective and, ultimately, the goals of the plan. The Hoopa Valley Tribal Council, the governing body of the Hoopa Valley Tribe, originally passed Resolution No. 09-233 on December 3rd, 2009 and Resolution No.11-47 on November 21, 2011 to formally adopt this updated plan.

This Hoopa Tribal MHMP is divided into seven Chapters:

- Chapter 1 is this introduction, planning process and the purpose and need of the Hoopa Tribal MHMP;
- Chapter 2 describes the land use, socioeconomic conditions, and physical characteristics of the Hoopa Indian Reservation;
- Chapter 3 presents an assessment of hazard risks on the Hoopa Valley Indian Reservation as well as a potential loss analysis;
- Chapter 4 presents the Hoopa Tribe's Mitigation Strategy;
- Chapter 5 describes local mitigation planning coordination;
- Chapter 6 describes the Hoopa Tribe's MHMP maintenance process;
- Chapter 7 summarizes this report.

The references cited in this plan and the acronyms and abbreviations used in this plan follow Chapter 7 as well as supporting Appendixes.

Documentation of the Planning Process - §201.7(c)(1)

A Historic Perspective on the original development of the 2006 Multi-Hazard Mitigation Plan

The core team members were invited to participate in 1- 2 or more planning meetings per month from May through November 2011. Each meeting was facilitated by OES staff who led the group planning process in determining Risk Assessment, Mitigation Strategies, Funding Streams and Plan Maintenance. The beginnings of the MHMP formed following the December 2005/January 2006 storm event experienced throughout Northern California. Declaration of a state of emergency was issued by Humboldt County, the State of California, and finally by the President of the United States for the regions affected by that severe winter storm.

When the HVTC began assessing damage on the reservation, tribal officials contacted federal and state agencies to determine what options were available to assist the Tribe with disaster repairs. FEMA helped the Tribe start the process for site damage evaluations and began educating tribal staff on the requirements for receiving FEMA assistance. Most of the FEMA eligibility requirements for permanent assistance could be met with existing tribal records and resources. However, the hazard mitigation plan proved to be the one time-limiting factor because it would have to be constructed from a variety of sources and made into a single cohesive plan. The Tribe's staff, having experience in developing broad policies to deal with a wide range of contingencies, began drafting the MHMP with FEMA's guidance and technical assistance beginning in February 2006.

Preparation of the Original MHMP

The Tribe, with more than forty department managers, began assessing storm damage as soon as January 3, 2006. In addition to documenting storm related damages, the discussion encompassed the nature of the damages, the types of preventative measures that could have been taken to prevent those same types of damage in the future, and the process for recovery. On February 2, 2006, the hazard mitigation process began with a conference call between the Tribe, department managers, FEMA, and the California's Office of Emergency Services (OES) because this was the first emergency the Tribe has

expedited since passing of the Disaster Mitigation Act of 2000. In addition to emergency response and initial repairs, the Tribe is also required to begin a formalized mitigation planning processes in order to be eligible for post disaster funding and repairs. While site visits were being scheduled and damage assessments were being compiled, the Tribe sent representatives to a FEMA applicants briefing in Eureka, CA on February 14, 2006 for affected Humboldt and Del Norte entities. California OES and FEMA representatives explained the recovery process and encouraged participation in all available recovery programs. Indian tribes, as direct grantees, must submit an individual request for assistance, which includes a FEMA-Tribal agreement and a mitigation plan.

On February 24, 2006, a hazard mitigation group was designated from the Tribe's emergency responders and essential services. The hazard mitigation group officially formed under the Local Emergency Planning Committee (LEPC) and set about gathering examples of successful mitigation plans from other tribes and cities for use in developing the Hoopa Tribe's plan. The Tribe held its annual General Meeting of the tribal membership on March 4, 2006, and the Individual Assistance, Public Assistance, and MHMP were topics for presentation and discussion. The LEPC incorporated comments from the General Meeting into their planning process. In addition, previous occurrences of certain types of hazards and disasters began to be verified and documented. The group also began to chart the assets available to the Tribe in the event of a disaster through the Office of Tribal Insurance. As the necessary information coalesced into usable documents, each member of the group was delegated sections of the MHMP based on technical expertise and logistical placement by department. The Tribe participated in multi-agency collaboration at the Humboldt County OES on April 13, 2006, which included US Bureau of Reclamation (USBOR), Central Valley Project (CVP), and National Weather Service (NWS). The LEPC met with representatives from the Klamath-Trinity Joint Unified School District (KTJUSD) and Hoopa's downtown business community. The group also met with cultural leaders on May 2, 2006.

Formation of the original Mitigation Planning Team (MPT) from the Local Emergency Planning Committee (LEPC)

The MPT/LEPC members remain current with the exception of adding a few new members to replace others who are no longer work for the Hoopa Valley Tribe or who not directly involved with mitigation planning for their tribal department. Originally, the core team of the MPT/LEPC solidified once responsibilities were assigned. The core team met multiple times per month since March 2006 to gather the data necessary to construct a hazard mitigation plan. The current LEPC member roster is shown in Table 1.

Table 1 - Current Members of the MPT/LEPC and Associated Plan Tasks

LEPC Member	Plan Development
Rod Mendes, Hoopa Office of Emergency Services	Lead Coordinator, Planning and Emergency Services Collaboration
Dr. Bryan Preppernau, Pacific Rim Sciences	Technical Services, Review, Edits
Barbara Ferris, Hoopa Public Utilities District	Water Resources and Plan Maintenance, Meeting Facilitation
Curtis Miller, Hoopa Tribal EPA	Air Quality and Biological Opinion, Plan Review & Edits
Gary Risling, Hoopa Fire Management Officer, Hoopa Fire Department	Wildland Fire and ICS protocols, Plan Review, Comments & Edits
Warren Tamerius, Hoopa Tribal Roads	Transportation Planner, Mapping
Mary Lou Marshall, R.N.	Elder Liaison, Interviews
Jimmy Campbell, Hoopa Forestry	Map Designer, GIS Technician, Geospatial Analysis
Norma McAdams, Hoopa Grants Specialist	Research, Editor, Meeting Coordinator
Bob Kane, Chief, Hoopa Tribal Police	Law Enforcement, Plan Reviews, Comments and Edits
Dr. Mihail Soare, Kimaw Medical Center	Emergency Medical Services, Plan Reviews, Comments and Edits
Shelly Lev-er, P.H. N.	Pandemic Liaison, Plan Reviews, Comments and Edits
Beverly Stevens, KTJUSD	Klamath Trinity School District Liaison, Plan Reviews, Comments and Edits

2007 and 2008 Updated MPT/LEPC - Emergency Operations Plan Incidents

The MPT/LEPC participated in (2) two Emergency Operations Center activations for Storms in 2007 and 2008.

Hoopa Tribal Departments and community infrastructure continue to participate in HVT MHMP goals, objectives and activities in actual all hazard incident disaster response and threats in our local community and regional events. Hoopa department managers, other than those listed as part of the core team, participated in the ongoing meetings, as their respective expertise was needed. Those departments not called upon for their specific expertise participated in the manager meetings called by the Tribal Chairman to discuss mitigation planning progress. In addition, outside agencies (such as the KTJUSD) were directly contacted to participate, including the Klamath Trinity Rural Community district (KTRCD) to explore food sustainability. Efforts to reach the downtown business community involved walking door to door. The core team made use of telephone, fax, and email to reach interested parties. In addition, use of local media, KIDE 93.1FM radio station and the Two Rivers Tribune Newspaper, helped spread information about the ongoing mitigation planning efforts to the Hoopa community.

Coordination among Agencies - §201.4[3](b)

How Federal, State, and Tribal Agencies Participated

In early 2006, each tribal department was directed to make contact with all governmental entities relevant to emergency preparedness, disaster planning, and recovery services. Most tribal departments already have a gather data/generate report relationship with outside funding agencies so outside participation frequently came through tribal department channels. The Hoopa Valley Public Utilities District (HVPUD) and K'ima:w Medical Center (KMC) are both operated by the Tribe, and the Hoopa Volunteer Fire Department act under the auspices of the Tribe.

[3] In October 2008, 201.4 was replaced with 201.7 Tribal Mitigation Plan.

Table 2 – Coordinating Agencies, Contacts, and Interests

Agency	Tribal Contact	Area of Interest
Federal Emergency Management Agency (FEMA)	OES	Disaster Assistance
Bureau of Indian Affairs (BIA)	OES, Forestry, Fire, Police	Roads, IRR system
Federal Highways Admin.	Tribal roads	IRR System
County of Humboldt	OES, Tribal Police, Roads	Emergency Services, Roads
Indian Health Services	K'ima:w Medical, OES	Health Care
Environmental Protection Agency (EPA)	Tribal EPA, PUD, OES	Water Quality
California Department of Transportation	Roads, OES, Tribal Police	Highway 96
California Geological Survey	Tribal Forestry, OES	Geology
National Oceanic and Atmospheric Agency / National Weather Service (NOAA/ NWS)	OES, Tribal Fisheries, Forestry	Fisheries/ Water
State Dept. of Water Resources	OES, TEPA, Fisheries, Forestry	Water, Flooding,
United States Postal Service	OES	Mail Delivery
American Red Cross	OES, Kimaw Medical	Disaster Assistance
Humboldt County Public Health	OES, Kimaw Medical	Public Health
California Emergency Management Agency	OES	Disaster Assistance
CalFire	OES, Fire Dept, Police	Fire Operations, Mutual Aid
Humboldt County Sheriff	OES, Tribal Police	Law Enforcement
California Highway Patrol	OES, Tribal Police	Law Enforcement, Traffic Assistance
Other Interested Groups		
Klamath Trinity Joint School District	OES	Evacuation and Shelter Assistance
Volunteer Organization Active in a Disaster (VOAD)	OES	Shelter Assistance
California Conservation Corps	OES, TCCC	Disaster Assistance, Personnel
Klamath Trinity Rural Community District	OES	Food Sustainability

How Other Interested Parties Participated

The Tribal Council directed all tribal departments to make disaster information available in each of the respective offices. Many departments distributed and received damage reports from a wide range of community members. Besides the overarching mandate to all departments to assist with disaster and relief efforts, the LEPC held meetings open to the public multiple times per month. In addition, meetings were scheduled to target other interested parties in order to solicit their input for the hazard mitigation plan. See Table 3.

Table 3 – List of MPT/LEPC and MHMP Meetings with Dates and Purposes

11/07	MPT/LEPC Meeting	Local Emergency Planning Meeting
1/2008	MPT/LEPC Meeting	Local Emergency Planning Meeting
3/2008	MPT/ LEPC Meeting	Local Emergency Planning Meeting
5/2008	MPT/LEPC Meeting	Local Emergency Planning Meeting
7/2008	MPT/LEPC Meeting	Local Emergency Planning Meeting
9/2008	MPT/LEPC Meeting	Local Emergency Planning Meeting
11/2008	MPT/LEPC Meeting	Local Emergency Planning Meeting
1/2009	MPT/LEPC Meeting	Local Emergency Planning Meeting
1/2009	MPT/LEPC Training	American Red Cross
2/2009	MPT/LEPC Meeting	Local Emergency Planning Meeting
2/2009	OES/ MPT/LEPC	Council Working Session
2/2009	MPT/LEPC	Community Preparedness Training
2/2009	MPT/LEPC	IHS Training in Arcata CA.
3/2009	OES/ MPT / LEPC	Regional Collaboration Training
4/2009	OES/ MPT/ LEPC	PIO/ JIC Training
6/2009	MPT/LEPC Meeting	Local Emergency Planning Meeting
7/2009	MPT/LEPC Meeting	Local Emergency Planning Meeting
11/2009	MPT/LEPC	Public Hearing and comments on MHMP
5/2011	MPT/LEPC	Local Emergency Planning Committee Meeting
6/2011	MPT/LEPC Meetings	Local Emergency Planning Committee Meeting
7/2011	MPT/LEPC Meetings	Local Emergency Planning Committee Meeting
8/2011	MPT/LEPC Meetings	Local Emergency Planning Committee Meeting
8/2011	MPT/LEPC Meetings	Community Outreach and Preparedness Surveys
9/2011	MPT/LEPC Meetings	Local Emergency Planning Committee Meeting
10/2011	MPT/LEPC	Public Hearing Comments - Community Outreach
10/2011	MPT/LEPC Meetings	Local Emergency Planning Committee Meeting
11/2011	MPT/LEPC	Local Emergency Planning Committee Meeting

	Meetings	
11/2011	MPT/LEPC	HVT Council Meeting Approval 2011 MHMP Update Resolution

2011 MHMP Update

Participation by OEM-MPT/LEPC Members was represented over a (7) seven month period from May through November 2011, by HVT Managers and Directors. The Hoopa Tribal Forestry Department performed Geographic Information Systems (GIS) mapping edits and update edits, including specific sections from other contributors in the Living Resources Section. The Hoopa Fire Management Department contributed various update edits, including the 2010 – 2011 Wildland Fire Analysis in Table 5. The Cultural Section participated in the update with comments from members of the Hoopa Cultural Committee. The Museum Curator updated this section by referencing locations of dance sites that are intrinsic to our beliefs and are of extreme importance in connecting to our ancestors/descendants and connecting the spiritual to ourselves. One or more of these cultural sites are particularly vulnerable to erosion and must be protected and maintained. Some Hoopa Tribal Departments had no changes, such as Hoopa Tribal Fisheries Department, Hoopa Tribal Police Department, Hoopa Volunteer Fire Department, Hoopa Tribal Environmental Protection Agency Geologist stated since the research and writing of the Hazard Identification and Risk Assessment (HIRA) section of the Hoopa Valley Tribe's Multi-Hazard Mitigation Plan five (5) years ago in 2006, no new significant information regarding the natural hazards covered in that section has been produced which would warrant a rewrite of the Hazard Identification and Risk Assessment section. A Community Disaster Preparedness Survey was distributed in August – October 2011 at various community events and meetings, for the purposes of the community prioritizing the greatest threat to least threat for all hazards preparedness and evaluating individual and family disaster readiness. The Hoopa Community Emergency Preparedness Survey provided a snap shot of our tribal community's disaster preparedness knowledge and readiness. There were 51 participants with, 32 females and 19 males who prioritized the hazards to include:

- #1 Wildfires – Highly Likely
- #2 Dam Failure/Land Slides tied – Highly Likely
- #3 Floods – Highly Likely

Approximately 50% of the survey participants were prepared for a disaster with resources for survival and owned battery powered or solar radios for communication broadcasts. Over 90% responded that they would be trained to help their neighbors and would participate in a Citizen Emergency Response Team (CERT). Over 90% of those responding offered advice for mitigation projects that would make the community safer.

Meeting with Community Businesses

Due to a variety of personal and professional obligations, many of the Hoopa business owners were unable to attend either of the two scheduled FEMA mitigation emergency planning team meetings. So instead, members of the MPT/LEPC conducted door-to-door visits with the businesses, distributing a brief survey at each site. They also took the opportunity to discuss disaster preparedness with some of the local business owners and their key staff. From the surveys and visit responses, the following summarized documented information added to the MHMP.

- Businesses in the Hoopa area both rent and own in roughly equal numbers. The highest reported value of a business-owned building is $200,000, with some not reporting a number. No one addressed the value of the property, but presumably the building value includes the contents as well. The highest reported approximate content value was $100,000 and the lowest reported was $8,000.
- Each of the businesses believed that it is important to plan for emergencies. One business indicated that it was present for the 1955 or 1964 floods. When asked whether they were prepared for a flood or other disaster, two businesses answered in the affirmative, but one identified transportation as being limited. One responded “somewhat,” indicating a level of uncertainty. Two of the businesses indicated that they had emergency plans and that their employees are aware of the plan. One business did not have an emergency plan and did not have any employees.
- All of the businesses expressed an interest in meeting to discuss disaster planning, but also indicated the schedule of the meeting would affect the ability to attend.

- One business commented that a main concern should be alternative evacuation and transportation routes out of the Hoopa Valley, especially in light of the current conditions of our highways and roads.

The following businesses were contacted initially by telephone call and later received the survey: Tent-man Sales, Burger Barn, Coast Central Credit Union, Laura's Kitchen, Thunderbird Intertribal, and Office FX.

Meeting with Community Elders

In August 2011 OES staff performed community outreach and education at the Hoopa Valley Tribe's 23rd Annual Sovereign's Day Event using a Hoopa Community Emergency Preparedness Survey targeting tribal elders and families. Distribution of Household Disaster Preparedness Surveys, and the following handouts; Six Ways to Plan Ahead for an Earthquake Event During Earthquake – Remember To STOP – COVER & HOLD ON, What to Do During an Earthquake, and Disaster Preparedness For Seniors by Seniors (American Red Cross/HSMI), Preparing Makes Sense for Older Americans – Brochure targeting tribal elders made the event a success. Outreach and emergency preparedness education was shared with tribal elders at the Senior Nutrition Center and at various other community meetings from August – October 2011.

A meeting with Tribal Elders took place on May 26th, 2006 at the Senior Nutrition Center in order to ascertain as much historical information as possible from these valuable resources. Other informal interviews occurred between April and June usually in passing, as sometimes the best place to visit an elder would be in a public place such as the post office or grocery store. Interviews took place as well as questionnaires in order to maintain anonymity for some of our elders do not wish to be recorded. Questions were geared toward all disasters of memory however, there were only a few that most chose to talk about.

The 1955 and 1964 floods were the most memorable for the interviewees who ranged in age from 65 to 90 years old. The 1999 Megram fire was another disaster that many could remember due to its recent occurrence as well as its devastating impact to the elderly in particular. Other disasters of memory included other smaller floods, numerous power outages, and food and drinking water shortages.

Many elders spoke of how they were taught to prepare for such emergencies by always having extra blankets, candles, kerosene, water, and canned foods. Several individuals spoke of how they would spend all summer canning fish and fresh fruits and vegetables, so they would never be without during a harsh winter. Most said that if they ever ran out of food that they could always borrow or trade for another who had surplus, but community members learned to rely on each other in times of need.

We asked about evacuations and the only time they could really remember was in the 1999 Megram Fire where many were forced to leave their homes due to elevated smoke levels that were very harmful to elders in particular.
In the 1955 and 1964 floods, nobody really left as they just had to wait it out until supplies were dropped by helicopter. By the time the flood came through all the roads were blocked off anyway, so there was no option of evacuation. Many who were washed out of their homes were forced to stay at the school or with other family members or relatives. The military dropped supplies such as sleeping bags, K Rations, flour, sugar, powdered milk and other necessities. From speaking to many elders about these disasters, there was a unifying theme which was that our community really knows how to come together and help each other in times of need.

There were numerous stories of slides and power outages from severe storm events, however they had a difficult time remembering exact years and dates for such disasters. Not many remembered any great earthquakes in their lifetimes, but many have felt small tremors here and there. There was a wealth of oral tradition in speaking with the elders. Some told stories of great tsunami's thousands of years ago that actually altered the flow of the Trinity River, and of giant earthquakes that formed certain peaks and rock formations in the Hoopa Valley.

Program Integration - §201.4[4](b)

Integration with Ongoing Tribal Planning Efforts

The Hoopa Tribal Council approves all projects and plans that the Tribe undertakes. The volume of projects and plans create a wide range of timetables. In order to consolidate information, dates, and public comments, tribal ordinance (the Legislative Procedures Act) requires particular methods for distributing information to tribal departments and the public. In addition, it specifies rules for public hearings and receiving public comments prior to final enactment of legislation or major policy of the Tribe. In this regard, planning efforts affecting the Hoopa Valley receive the widest possible distribution and public input. Any final update draft of the MHMP will go through this process, as all other major tribal policies do, to ensure that any interested party that has not already commented has the opportunity to do so. Also, the MHMP will be the guiding document for any new development, existing development or disaster response/recovery projects.

The mitigation planning is intended to complement existing tribal policies affecting the public, including the Emergency Operations Plan (EOP) under the federal NIMS requirements, Forest Management Plan (FMP), Tribal Transportation Plan (2002-2007), EPA Spill Prevention Plan, and a preliminary Land Use Plan. Besides these comprehensive, multi-department policies listed, the Tribe has long established and enforced ordinances aimed to protect people and property. The formation of a tribal court, development of civil action laws and rules of court was part of Hoopa's pioneering efforts in California. From 1986 to the present, the Tribe has adopted more than 50 fully sectioned out ordinances aimed at regulation of resources and conduct on the reservation. Some, like the Land Assignment Ordinance to regulate responsible land use and safe development out of harm's way, the Conservation and Trespass Ordinance to protect tribal forest resources, the Netting and Fishing Ordinance to protect fishing resources, and the Riparian Protection Ordinance to protect gravel and surface mining resources, have been in effect for more than 10 years and survived complex challenges in federal and state courts. Others, like the Solid Waste Ordinance regulating solid waste disposal

[4] In October 2008, 201.4 was replaced with 201.8 Tribal Mitigation Plan.

and the Traffic Code regulating driver conduct and fines on the reservation, have gone through a more recent adoption and enforcement.

Integration with FEMA Mitigation Programs and Initiatives

The MHMP was developed utilizing FEMA 386 documentation to develop the 2006 plan and for the 2011 update. A review of FEMA Mitigation Best Practices was the guideline for acceptable mitigation practices. Using this review of FEMA approved mitigation projects created a template for searching for solutions to hazards likely to occur on the reservation.

The underlying goal is to become NIMS compliant by FY07. The Tribe met this goal in 2007, and most recently in again April 2009 as part of the annual NIMS compliance review.

The Emergency Manager will take full responsibility to update the Tribal Council on developments regarding mitigation. Currently, in the State of California, there are no "open" disasters to fund Hazard Mitigation Grant Program (HMGP). However, with the return of Pre-Disaster Mitigation (PDM), Hoopa Emergency Manager will maintain the connection with FEMA Region IX to potentially obtain funding for projects or a plan upgrade. Under Flood Management Assistance, the Hoopa Emergency Manager will develop outreach to the current Council and Administration in order to keep them aware of funding streams for flood mitigation. The Emergency Manager is aware of the differences between mitigation and NIMS compliance. Since the review of the mitigation plan, the planner has been reassigned and replaced with a trained mitigation planner.

In being NIMS compliant, the Hoopa Tribe can;

- Ensure common and proven incident management doctrine, practices, and principles are used to plan for, protect against, respond to, and recover from emergency incidents and pre-planned events;
- Maintain a response operation capable of expanding to meet an escalating situation and the ability to integrate resources and equipment from intrastate and interstate mutual aid agreements, state-provided assistance, and federal government response;

- Order and track response assets using common resource typing and definitions, and draw on mutual aid agreements for additional assistance;
- Establish staging and allocation plans for the re-distribution of equipment, supplies, and aid coming into the area from other localities, states, or the federal government through mutual aid agreements;
- Conduct situational assessments and establish the appropriate ICS organizational structure to effectively manage the incident; and
- Continue to maintain communication processes, procedures and protocols that will ensure effective interoperable communications among emergency responders, 9-1-1 centers, and multiagency coordination systems (Emergency Operations Centers).

Purpose and Need for the MHMP

Tribal and local authorities, not federal, have the primary responsibility for preventing, responding to, and recovering from emergencies and disasters. The overwhelming majority of emergency incidents are handled on a daily basis by a single jurisdiction at the local level. Implementation of the NIMS in every tribal and local jurisdiction establishes a baseline capability that once established nationwide, can be used as a foundation upon which more advanced homeland security capabilities can be built. The Office of Emergency Services values the information within the MHMP and regard it as the foundation document for Emergency Management. Homeland Security Presidential Directive 5 (HSPD- 5), Management of Domestic Incidents, requires all federal departments and agencies to adopt and implement the NIMS, and requires state 1 and local 2 jurisdictions to implement the NIMS to receive federal preparedness funding.

The Hoopa Tribe's Office of Emergency Services (OES) is the focal point of all emergency or disaster preparedness and management as well as public information center. This department is responsible for maintaining and updating the MHMP, EOP, Hazardous Materials Plan and any other personal health and safety document under the Tribes archives. Our priority goal is to save lives, reduce risk & lessen property damage.

Furthermore, Hoopa OES maintains compliance with federal regulations including NIMS compliance and maintaining a FEMA approved MHMP.

Through a systematic process, this MHMP analyzes the possible impacts of hazards on vulnerable areas of the community infrastructure and focuses on the continued well-being of the Hoopa Valley Tribe. Preliminary conceptual hazard plans and models are utilized for the basis of hazards analysis. Conceptual plans have been analyzed to represent the maximum level of damage based in hazard type. The Disaster Mitigation Act of 2000 requires that Tribes along with local governments have a disaster mitigation plan that explains how you identify hazards, risks and vulnerabilities as well as how to prioritize mitigation actions to deal with these hazards. The goal is to learn how to solicit technical support when needed as well as develop a federally approved mitigation plan to be eligible for future pre and post disaster funds through FEMA.

According to the 2010 Census there are 3,041 people living on the Hoopa Valley Indian Reservation in 960 occupied homes. The Hoopa Tribe is a Self-Governance Tribe and maintains a government-to-government compact; however the Tribe remains reliant on Timber as its economic base. The Tribe has millions of dollars in assets and structures, as we will address later in this plan. Natural disasters can occur frequently with the amount of Tribal Assets and natural resources at risk. Protecting our community and member wellbeing is very important, however protecting our way of life and cultural traditions is of utmost importance.

Chapter 2 – Description of the Hoopa Valley Tribe Community and Reservation

Introduction

The purpose of this section of the Hoopa Valley Tribe's MHMP is to describe the existing environment, land use patterns, and resources of the Hoopa Tribe and Community. This chapter of the MHMP contains nine sections each of which may include pertinent sub-subsections. The land uses, topography, climate, hydrology, soils, watersheds, and surface water resources on the reservation affect the vulnerability of the Reservation to natural hazards. This section briefly describes each of these elements.

Land Resources

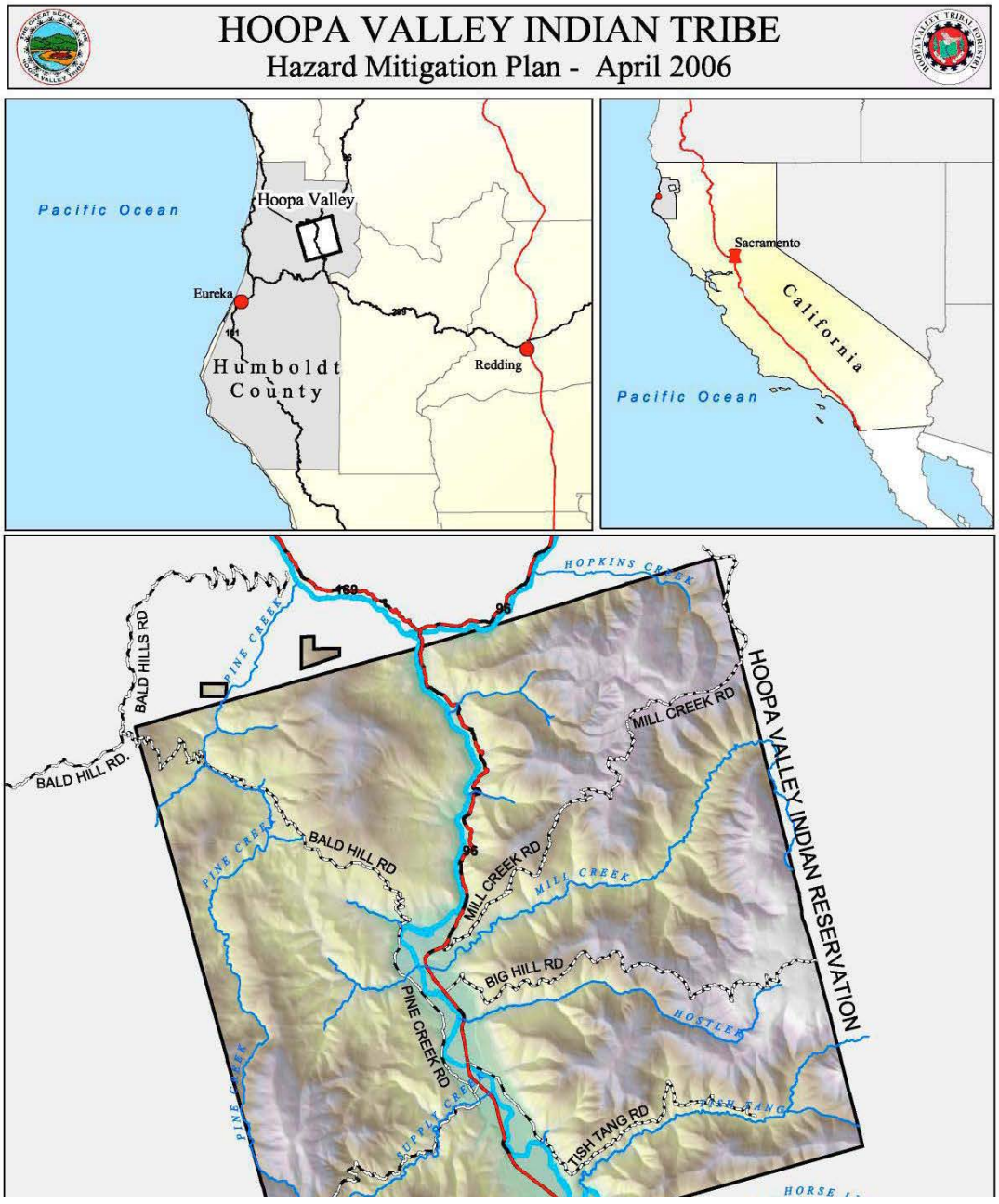
Topography

The Hoopa Valley Indian Reservation, California's largest Indian Reservation, is located in the northeastern portion of Humboldt County (**See Location Map Below**). The Reservation is shaped geometrically similar to a square with sides approximately 12 miles in length. The valley itself lies near the center of the Reservation. Hoopa Valley is located about 65 miles east of Eureka and 120 miles west of Redding. It is 12 miles north of Willow Creek and 10 miles south of Weitchpec, where the Trinity River flows into the Klamath River. The valley floor, an alluvial plain approximately 6 miles long by 1 mile wide and considered the Urban Zone in Chapter 3, is bisected in a north-south direction by the meandering Trinity River. The Hoopa Reservation is separated into 8 districts, or fields, which represent traditional villages of the Hoopa People. The field names are Norton, Soctish/Chenone, Mescat, Hostler, Agency, Bald Hills, Matilton and Campbell. Except for the relatively flat Hoopa Valley, most of the Reservation is steep and heavily forested.

The Bald Hills area is on the northwest side of Reservation and considered Upland Residential according to the hazard assessment areas in Chapter 3. The east side of the

region slopes steeply into the Trinity River which defines the area's eastern border. The western side of the area is defined by the change in slope to Hoopa Mountain and French Camp Ridge. The rest of this mostly forested area of the Reservation is considered Upland Regions as listed later in Chapter 3.

Map Location of the Hoopa Valley Tribe



Soil Types & Characteristics

Past geologic conditions, the steep terrain and high amount of precipitation have all contributed significantly to soils formation in the Hoopa Valley. These factors have combined to produce erosion, which resulted in thicker soil mantle along the Trinity River and thinner soil layers on the mountain valley slopes. The valley contains a series of terraces; each composed generally of differing relationship of soils. The Agency and Chenone soils lie at the lower terraces along the Trinity River. These are the most recently formed and are coarse textured. They also lack profile development and have a high base saturation. On the next terrace level are the Soctish soils, which are older than the Agency and Chenone soils. They are finer textured, have a very weak profile development, and a medium base saturation. Above the Soctish soils are the Norton soils, which are the oldest. These soils are finer in texture, have a weak profile development and have low base saturation. Matilton soils are also found at the higher terraces and, like the Norton soils, support heavy forest vegetation. Above the higher terraces are the steep upland areas of the valley, which support forest vegetation.

Soil types have been extensively mapped for the Hoopa Valley Indian Reservation. A soil survey conducted in 1975 by Agricultural Extension Service and the University of California at Davis classifies agricultural soils on the valley floor as follows:

Table 4 – Soil Grades and Acreage (based on 1975 UC Davis Soil Survey)

Soil Grade	*Rating*	*Acreage*
Grade 1 Soils	*Excellent*	*707 Acres*
Grade 2 Soils	*Good*	*323 Acres*
Grade 3 Soils	*Fair*	*357 Acres*
Grade 4 Soils	*Marginal*	*1,613 Acres*
Total Acreage Surveyed		*3,000 Acres*

Grade 1 soils are suitable for a wide range of crops with excellent yields. Grade 2 soils are suitable for a myriad of crops with average yields. Grade 3 soils have a limited range of crop suitability but specialized crops may give good results. Grade 4 soils are either

marginal in production, or have been developed for human use. Soil surveys conducted on the Hoopa Valley Indian Reservation are classified as Order III, or reconnaissance level surveys. Soil characteristics, qualities, and ratings of interest to land managers on the Hoopa Valley Indian Reservation were presented in a report entitled Soils of the Hoopa Valley Indian Reservation, Humboldt County, California, Annette Parsons, 1985.

There are four main hydrologic soil groups, which indicate the soil's potential for runoff. Factors considered in determining the hydrologic soil group include structure and texture of surface horizon, permeability of surface horizon, and the depth at which a reduction in permeability begins. The groups are classified as follows:

Group A - very low runoff potential
Group B - low runoff potential
Group C - moderate runoff potential
Group D - high runoff potential

Geologic & Mineral Resources

The Hoopa Indian Reservation is in the Klamath Mountains geologic province. A northerly trending, generally steep, thrust fault, the South Fork Mountain fault, separates the Klamath Mountain from the Coast Range (Irwin, 1966). On the upper, or eastern, plate are mildly metamorphosed shale, phyllite, thin-bedded chert, and altered volcanic rocks assigned to the Galice Formation of the western Jurassic belt. Together with other metamorphosed clastic sediments, chert, and volcanic rocks of the western plate are metagraywacke, chert, and volcanic rocks of the Franciscan Formation that are more fully described in the section on geology of the Coast Ranges. Just below the thrust these underlying rocks are somewhat more metamorphosed than elsewhere and are referred to as the South Fork Mountain schist (Irwin, 1966). Along the sole of the thrust is a sheet of serpentinized peridotite of variable thickness that comprises a nearly continuous belt extending northward into Oregon. Other thinner bands of serpentine, with northerly trend found farther east, are believed to have been injected along steep faults. The east edge of the Hoopa Valley Reservation cuts across a bulge on the western side of the extensive

granitic Ironside Mountain batholith. The rock here is chiefly quartz diorite or diorite and has been radiometrically dated to the Jurassic period at 165-167 million years old.

Along Beaver Creek, about 4 miles north of Hoopa, are small patches of sandstone, shale, conglomerate, and lignite that are poorly understood. They may be Oligocene equivalents of the Weaverville Formation that contains coal near Hyampom and Hayfork, or they may be a landward extension of the Miocene Wimer Formation of Maxson.

The sand and gravel deposits of the Hoopa Reservation have been mined for use nearby in road or building construction by Hoopa Aggregates, a Tribal enterprise. The available quantity is enormous, and no doubt this material will continue to be used wherever there is sufficient local demand.

Seismic Conditions

The Hoopa Valley is not located within an Alquist-Priolo special study zone as classified by the California Division of Mines and Geology (CDMG) thus indicating that no active faults (movement occurring in the last 10,000 years) or potentially active faults (movement occurring in the last 2.0 million years) are identified or significantly close to the Reservation. Furthermore, review of the Preliminary Fault Activity Map of California, CDMG Report 92-03, 1992 indicates that no known active faults are mapped either in the reservation boundaries or on nearby land. There is however, an inactive fault known as the Beaver Creek Fault located near Beaver Creek at the base of Pine Creek Road.

Water Resources

Hydrology

The Reservation is bisected in a north-south direction by the Trinity River. The Klamath River flows in an east-west direction through a small portion of the far-northeastern part of the Reservation referred to as Saints Rest Bar. A number of smaller streams flow into the Trinity and Klamath Rivers within the Reservation. The largest of these streams include: Mill Creek, Hostler Creek, Tish-Tang Creek, Campbell Creek, Supply Creek, and Soctish Creek. The valley floor consists of a sequence of prominent stream terrace benches that step upward in elevation and age from the active channel of the Trinity River. The terraces or benches represent ancient to modern flood plain levels. Across the valley floor, the Trinity River has formed a series of broad meanders. The broad meanders of the Trinity River naturally divide the alluvial valley into paired sets of terraces, which the Tribe defines as "fields" of the Reservation.

Lewiston Dam and Trinity River Division

Prior to the completion of the Trinity and Lewiston Dams in 1963, flows in the Trinity River were substantial year-round. Flows of the minor tributaries to the Trinity River within the Hoopa Reservation are directly related to seasonal distribution of precipitation in the area, and over 80 percent of the flows of these streams occur during the months of November through March. Low summer flows in these tributaries have often been inadequate to meet demands of water users for whom the tributary constitutes a sole water source. The Hoopa Valley East and West water systems were interconnected by the Trinity River Bridge connection and the pipeline through Blue Slide to form the Hoopa Valley-Wide system. With these connections, the ability to move water between the east and west of the Trinity River alleviated some of the water shortages. The Telescope springs water system was incorporated into the Valley-Wide system when the Campbell Creek water treatment plant was constructed.

When Congress authorized construction of the Trinity River Division (TRD) of the Central Valley Project (CVP) in 1955, the expectation was that surplus water could be

exported to the Central Valley without harm to the fish and wildlife resources of the Trinity River. The TRD began operations in 1963, diverting up to 90 percent of the Trinity River's average annual yield at Lewiston, California. Access to 109 river miles of fish habitat and replenishment of coarse sediment from upstream river segments was permanently eliminated by Lewiston and Trinity Dams. Within a decade of completing the TRD, the adverse biological and geomorphic responses to TRD operations were obvious. Riverine habitats below Lewiston Dam degraded and salmon and steelhead populations noticeably declined.

In 1981, the Secretary of the Interior directed that a Trinity River Flow Evaluation (TRFE) study be conducted to determine how to restore the fishery resources of the Trinity River. The TRFE study provides recommendations to the Secretary to fulfill fish and wildlife protection mandates of the 1955 Act of Congress that authorized the construction of the Trinity River Division of the Central Valley Project. In June of 2000, the TRFE was issued and the Secretary of Interior signed the Record of Decision (ROD) in the fall of 2000 authorizing the release of additional water into the Trinity River, equivalent to 48 percent of the river's original natural flows.

Groundwater

The groundwater basin of the Hoopa Indian Reservation is confined to the terraces adjacent to the river in the valley itself. The storage capacity of the Hoopa Valley has been estimated by the Department of Water Resources, State of California, at approximately 19,000 acre feet, has a maximum well yield of 300 gallons per minute, and does provide a usable source of "small plot" agricultural water.

Hoopa Valley, in Humboldt County, is a 5 square-mile basin drained by the Trinity River. Trinity River flow data has been collected by the USGS since the 1960's. The Hoopa Tribal Environmental Protection Agency has been collecting data on the Trinity River and priority streams on the Reservation since 1989. Data from the lowest recorded flows indicate that creek flows recorded in October can be less than half than the flows

recorded in June. Creek flow data from 1995 to present are recorded utilizing real-time continuous data recorders.

The Hoopa Valley groundwater area is approximately 7 miles in length and 0.7 miles wide with narrow, gorge-like canyons at both ends of the valley. Surface waters from the Trinity River and springs along the edge of the valley provide the principal source of water supply to the valley.

The terraces bordering the river on each side slope gently upward from the river to merge with alluvial sands near the edge of the valley. The alluvial deposits are generally less than 65 feet in depth along the center of the valley and consist mostly of terrace deposits bordering each side of the river. (Winzler & Kelly, 1974)

The groundwater within the valley area occurs principally in unconsolidated alluvial deposits. The water table appears highest at the edge of the valley near the tributary streams and slopes away from them toward the Trinity River. Examples of this are the wells supplying the Agency system adjacent to Supply Creek and to a lesser extent wells that were constructed along Mill Creek which are of high yield but of low water quality. The rate of groundwater movement, because alluvial deposits are highly permeable, is quite rapid. The groundwater moves in relatively thin sheets above the underlying bedrock, creating a very thin zone of saturation, resulting in notoriously low yields with high draw-downs during late summer months.

One “valley-wide” community water system currently serves the Hoopa Valley east and west of the Trinity River. According to the Hoopa Valley Public Utilities District, there were a total of 539 metered service connections, with about 280 connections on the east, and 259 on the west in 2004. Approximately 2,100 people are served by the water system. The water system has various surface and groundwater sources, with varying manners of treatment.

The recharge of groundwater in the Hoopa Valley is dependent upon two factors: direct infiltration of precipitation, which falls on the terrace deposits, and the infiltration of runoff derived from the various perennial streams. Groundwater can be recharged very rapidly because of the high permeability of the material that composes the alluvial terraces. The high permeability of the alluvial terrace deposits also allows for the rapid movement of groundwater to points of discharge; therefore groundwater is retained on the alluvial terraces for only short periods of time.

Upland areas are characterized by thin layers of surface soils exiting over bedrock. Soil depths in upland areas vary with topography but are generally less than sixty inches. The relatively shallow depth to lithic contact in upland areas means that groundwater is sporadically present in limited quantities. The low amount of available groundwater in upland areas makes the use of wells as a source of domestic water problematic or impossible. Like most of California, Hoopa Valley enjoys a Mediterranean type climate with hot dry summers and cool moist winters. The mean annual temperature is 57°F. Recorded extremes include a low of 7°F and high of 118°F. The mean annual precipitation is 57 inches with 90 percent occurring between October and April. Snowfall on the valley floor is rare, but elevations above 4,000 feet, in the adjoining mountainous areas, receive substantial amounts.

Droughts and Floods

During the winter of 1992-93, the area experienced an end of California's seven-year drought. Precipitation for the period ending December 30, 1992 exceeded 47 inches. The Hoopa Valley Indian Reservation and surrounding areas sometimes receive warm rains during the winter months, which quickly melt existing snow-packs. When this happens, rivers and streams overflow their banks and flooding occurs. Major floods occurred in 1955 and 1964. The flood of 1955 was declared the 100-year flood (has a one percent chance of occurrence in any given year) and the 1964 flood was declared a 1000-year flood. These flood zone areas have been mapped by the U.S. Bureau of Reclamation and entered into the Tribe's GIS database.

Local regulations controlling activities within flood plains are contained in the reservation's draft comprehensive plan, land-use volume. The flood plain zone is intended to be applied in areas subject to inundation by the 100-year flood and areas subject to high liquefaction potentials as delineated in the Tribe's 100-year flood plain map and/or the U.S. Bureau of Reclamation's 100-year flood plain for the Trinity River. Land use is regulated within these areas to protect lives and property from destruction and damage due to liquefaction, floodwaters and the transportation by water of wreckage and debris, to protect the community from the cost that may be incurred when unsuitable or premature development occurs in such areas, and to allow uses which are appropriate in such areas. Mapping of these types of floods and maximum inundations can be found in the Appendices.

Wetlands

In 1999 the Tribal EPA and Humboldt State University cooperated on a wetland identification project using a geographic information system (GIS) and infrared aerial photo interpretation. Data layers from the GIS were queried for attributes indicative of wetland occurrences (soil, vegetation, slope and hydrography). Air photo interpretation was then used to further validate the GIS results. The study area included Mill, Supply and Tish Tang watersheds (uplands) and the Valley floor. Fifty potential wetlands were identified: 13 on the Valley floor & 37 in the uplands. Six Valley floor wetlands and 3 upland wetlands were field verified. Aerial extent of these wetlands was not determined due to the site-specific nature of wetland boundaries. Delineation of wetlands will normally be conducted when a proposed project is adjacent to it.

Due to the restriction of agricultural, residential and commercial development largely to the valley floor, long-term loss of wetlands in upland areas has probably been minimal. Some upland riparian wetlands undoubtedly have been lost to road construction or stream course alterations. Past logging practices have contributed to down-cutting of drainages and sediment deposition in some areas, altering or destroying riparian vegetation. Changes in species composition have undoubtedly occurred due to logging near to or

within the riparian corridors. No attempt was made to quantify change in wetland quality or loss of wetlands as a result of these factors.

In contrast, decline in amount or quality of wetlands on the valley floor has probably been significant over the past 50-60 years. Black cottonwood/alder swamp and other stagnant wetlands were probably historically widespread in the valley, associated with the mouths of some drainages. BIA agents apparently encouraged modern techniques of farming about the turn of the century. Flat, moist, and fertile land would have been desirable, since most crops required irrigation. Additional wetlands were probably lost to mill construction and related water diversions later in the first half of the century.

Finally, significant loss or decline in quality of wetlands in the valley may have occurred as a result of the 1964 flood and subsequent stream re-channelization by the Army Corps of Engineers. Those impacts may have contributed to the high occurrence of exotic species in the valley. Subsequent construction of irrigation channels serving Campbell Field and other areas of the valley probably caused additional losses. Inspection of 1962 aerial photographs indicated no significant change in non-riparian wetlands in the valley from 1990 photos. Therefore, aside from flood-related impacts on riparian vegetation after 1964, the major historical impacts to wetlands on the valley floor appear to have occurred prior to 1962.

Air Quality

General Air Quality Concerns

The overall air quality of the Hoopa Valley Indian Reservation and general vicinity is excellent since topography and wind conditions usually limit the infiltration of outside pollutants. When the right climatic conditions occur (a low inversion layer and a gentle north or northeasterly wind); air pollution may be noticeable and possibly objectionable. However wildland fires can cause serious impacts to air quality in Hoopa as documented during the 1999 Megram fire where the first ever state of emergency was declared due to poor air quality.

The major influence upon air quality in the area is from slash burning, cars and logging trucks, with most of the vehicle generated pollutants occurring on the unpaved roads on the Reservation. Major logging haul roads generate dust pollutants during the summer months. Residential generators also have a minor influence, with most of the pollutants created by fireplaces, woodstoves, and residential burning. With the proper atmospheric conditions and sufficient densities, smoke may be noticeable and even objectionable at certain times. However, even under these conditions, the Hoopa Valley Indian Reservation remains “in attainment” of standards under the Clean Air Act.

Air Quality Monitoring

2008 Public Health Threat/Air Quality Alert Results in Historical Presidential Declaration

The 2008 Fire Siege of Northern California caused from lightening strike fires turning into a Public Health Threat/Air Quality Alert for the residents living on the Hoopa Valley Indian Reservation and in Northern California. The Hoopa Tribe evoked their Emergency Operation Plan (EOP) and Incident Command Center and dealt with the response, mitigation, and recovery efforts of the 2008 Public Health Threat. Collaborative efforts were coordinated with Humboldt County OES and CA State OES, USFS, FEMA, Humboldt County Public Health, NCIDC, Red Cross, NWTEMA, IHS, UIHS, CDC, County Law Enforcement, Calif. Hwy Patrol, CAL FIRE, and Air Quality Management

District. The Public Information and Communications Plan were put in place with PSA's and community meetings. As a result of the proactive efforts during the 2008 Public Health Threat/Air Quality Alerts the Hoopa and Yurok Tribes were added to a Presidential Declaration for this historical 2008 Public Health Threat/Air Quality Alert.

Air Quality Response

Effective March 16, 1998 the Clean Air Act (CAA) was amended to include section 301(d) Tribal Authority Rule TAR. In the TAR, the EPA set forth its interpretation that the CAA is a delegation of Federal authority, to Tribes, approved by EPA to administer CAA programs in the same manner as States over all air resources within the exterior boundaries of the Reservation for such programs. However, unlike States, Tribes have the flexibility to choose which parts of the CAA they wish to implement based on the specific needs of the Tribe.

The Tribal Environmental Protection Agency (TEPA) monitors air quality continuously throughout the year. TEPA utilizes mini-volume portable PM10 on-site samplers and a Tapered Element Oscillating Microbalance (TEOM) to monitor air quality on the Reservation. When smoke from wildfires invades the valley and degrades air quality, TEPA responds by tracking increases in particulate matter (PM10) in real time. Increases in PM10 values are compared to numeric criteria representing the level of threat to public health. These criteria are organized into an Air Quality Action Plan (AQAP). The AQAP serves as an inference of public health threats relative to air quality conditions. It identifies objective criteria on stage levels relative to public health threats and provides recommendations for community actions to protect respiratory health and mitigate the impacts from increasing smoke.

The Tribal Environmental Protection Agency (TEPA) monitors air quality when inversion layer conditions exist, or when forest fires may create objectionable air quality conditions. TEPA utilizes mini-volume portable PM10 on-site samplers and a Tapered Element Oscillating Microbalance (TEOM) to monitor air quality on the Hoopa Valley Indian Reservation.

The 1990 amendments to federal Clean Air Act Section 176 required the EPA to promulgate rules to ensure that federal actions conform to the appropriate State Implementation Plan (SIP). These rules, known together as the *General Conformity Rule* (40 CFR §§ 51.850-.860 and 40 CFR §§ 93.150-160), require any federal agency responsible for an action in a non-attainment or maintenance area to determine that the action is either exempt from the General Conformity Rule's requirements or positively determine that the action conforms to the applicable SIP. In addition to the roughly 30 presumptive exemptions established and available in the General Conformity Rule, an agency may establish that forecast emission rates would be less than the specified emission rate thresholds, known as *de minimis* limits. An action is exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the project would be less than the applicable *de minimis* thresholds and would not be regionally significant, which are defined as representing 10 percent or more of an area's emissions inventory or budget.

Health Effects From Smoke

Wood smoke is a major air pollutant composed of a combination of fine carbon particles and gases. Carbon monoxide (CO) is an odorless gas produced from burning wood without enough air. CO reduces the ability of a person's blood to supply oxygen to body tissues. Even small amounts in the air can stress your heart and reduce your ability to exercise. Nitrogen Dioxide (NO2) is also emitted as a gas. It impairs proper function of the respiratory system and reduces its' ability to fight infection. Volatile Organic Compounds (VOC's), are evaporated carbon compounds which react with (NO2) in sunlight to produce ozone smog. When exposed to water vapor this combination produces acid rain. In a combustion process, VOCs change into irritating and cancer causing substances such as benzene, formaldehyde and polycyclic aromatic hydrocarbons, which are very harmful to human health. Wood smoke also contains Particulate Matter, (PM10), microscopic solid and liquid particles 10 microns or less. Most wood smoke particles average less than one micron and can travel deep into the lungs causing irritation and leading to chronic lung disease and cancer.

Wildland Fires

In 1991, the Hoopa Tribe through the self-governance process compacted the Wildland Fire program from the BIA forming the Hoopa Fire Department. Since 1991 there are nearly 300 fires on an average started each season to which that Wildland Fire responds. Under Mutual Aid agreements the Fire Department is able to work with other agencies to meet their objectives. The Hoopa Valley Volunteer Fire Department is one of these mutual aid agencies that provide structural fire protection and suppression during a Wildland fire event on the Hoopa Valley Indian Reservation.

Since coniferous forests surround the Hoopa Valley, the potential for outbreaks of wildland fires is very high, especially during dry times of the year, where large fires have been known to become unmanageable. The Hoopa Fire Department provides initial and extended attack of fire suppression for Wildland fires on the Hoopa Reservation, however there have been instances of large fires being very destructive and costly not only to the

Tribe but surrounding State and Federal agencies as well. Table 5 shows the number of fires documented by Hoopa Fire Department over the past 11 years with the total acreage burned on Reservation and the estimated costs to the Tribe.

Table 5 – Wildland Fire Instances on Hoopa Reservation from 1999 to 2009

Year	Total Incidents	Total Acres Burned	Wildland Incident Costs
1999	149 (includes Megram Fire)	5039.0	$266,746 (Megram Fire Cost $37,747)
2000	190	275.9	$195,977
2001	201	285.7	$196,000
2002	230	933.8	$4,087,866
2003	186	255.6	$177,146
2004	170	194.9	$135,077
2005	187	276.1	$193,317
2006	294	230.4	$862,460
2007	314	186.1	$938,091
2008	257	666.2	$3,743,278
2009	233	2,068.9	$4,100,000 (initial estimate)
2010	143	55.2	$301,806
2011	174	93.6	$512,386

The 1999 Megram Fire

The Hoopa Valley air program is operated with the underlying premise that local catastrophic wildfires could erupt in any given year. Local wildfires produce extreme plumes of smoke that settle in the valley, often causing hazardous air quality conditions and threatening the immediate health of people. Particulate matter PM10 has been measured as high as 325-800 μg/M3 for several days to a week during major fires. Therefore, preparedness is of primary concern in the Hoopa air quality program.

The winter of 1998/1999 affects of the La Nina ocean currents altered weather patterns in Northern California, causing a particularly dry winter and spring. This led to an extremely dry summer and an increased susceptibility to wildfires. A total of 93,702 wildfires covering 5,661,976 acres burned Nationwide in 1999 resulting mostly from lightning strikes. In August 1999 heavy fuels, extreme high winds and dozens of

lightening strikes set off the Big Bar/Megram fire complex East of Hoopa. This fire engulfed 140,947 acres and burned from August 23rd to November 3rd 1999. Intensified by autumn season inversions, smoke from this fire filled local valleys like Hoopa and increased air-born particulate matter (PM10) from a normal average of 22 μg/M3 to over 800 μg/M3 for up to 24 hours or more. This situation cannot be tolerated by the community. Therefore, in response to this event, an air quality action plan was developed to act as an objective guide for alerting the local Hoopa community of air quality conditions and the associated response for action.

TABLE 6

Air Quality Emergency Operations Plan

August 7, 2010

The following table presents numeric criteria, which will is used as an indicator of potential impacts to public health from air pollution.

Air quality is measured continuously be Air Quality Professionals. PM10 and/or PM2.5 values are recorded hourly in metrics of micrograms/per cubic meter (µg/M^3). Hourly values are used to determine health protection action and stage of alert.

Air Quality Condition	PM 10	PM 2.5	Potential heath effects	Health Protection Action	Visibility	Stage Alert
Good	0-49	0-36	None	None	≥ 10 miles	None
Moderate	50-149	37- 111	Initial signs of respiratory symptoms in sensitive people: irritation of eyes, nose throat and lungs	Sensitive groups - people with heart or lung disease, Elders, pregnant women and children should reduce prolonged or intense outdoor activity.	10 - 5 mi	Stage 1 4-24 hours
Poor--unhealthy for sensitive people	150-249	112 - 186	Obvious aggravation of respiratory symptoms in sensitive people Initial signs of respiratory symptoms in the general public irritation of eyes, nose throat and lungs	Sensitive people should limit vigorous outdoor activity to 4-6 hours a day. General public should reduce intense outdoor activity if feeling sensitive	5 - 2.5 mi	Stage 2 8 hours
Unhealthy	250-349	187 - 262	Increased aggravation of respiratory symptoms in sensitive people; increased respiratory symptoms in *general public	Sensitive people should seek clean-air shelter or remain indoors as much as possible; general public should reduce prolonged outdoor activities to 4-6 hours	2.5 - 1.0 mi	Stage 3 8 hours
Very Unhealthy	350-449	263 - 337	Breathing difficult for sensitive people; Cumulative aggravation of respiratory symptoms in the general public.	All sensitive groups should seek clean-air shelter and remain indoors; General public should remain indoors as much as possible and limit prolonged outdoor activity	1.0 - 0.25 mi	Stage 4 4 hours
Hazardous	450 or >	338 or >	Sensitive people at risk of serious respiratory impairment; Respiratory symptoms highly aggravated in General public, making breathing difficult.	Everyone should avoid all physical activity outdoors; clean-air shelter recommended for general public; Clean-air shelter OR temporary relocation recommended for pregnant women, infants, small children, elders and those suffering respiratory impairment	< 0.25 mile	Stage 5 4 hour

Sensitive people/groups: People with chronic lung or heart disease, asthma, emphysema, bronchitis, angina, congestive impairment; elderly, pregnant woman, infant and young children under 10 years old. *General public: Generally, healthy people between the ages of 11-59 years that do not fit the above description. People can vary significantly in response and sensitivity to air pollutants

Living Resources

It is a policy of the Hoopa Valley Tribal Council through the Hoopa Forest Management Plan (FMP) to actively protect and conserve non-market resources associated with the commercial forestlands on the Reservation. The management plan goes beyond state and federal listings of rare and endangered species by identifying and providing for culturally significant plant and animal life.

Since the Tribe actively manages the forest resources of the Reservation, the Hoopa Tribal Forestry Department has initiated a comprehensive wildlife management program. This program includes over twelve years of biological surveys, a Spotted Owl Habitat survey and wildlife assessments, which are performed prior to all projects. As a result, wildlife data on the Reservation is comprehensive as well as creditable.

Threatened Wildlife Species

The Hoopa Tribe took over management of its forest resources in 1989 when it became one of the first Self Governance Tribes in the nation. Following the federal listing of the northern spotted owl as a threatened species in 1990, Tribal Forestry hired a wildlife biologist in the spring of 1991. From that point forward the tribe has been developing a wildlife program focused primarily on surveying and monitoring of federally threatened or endangered (T&E) species but also attempting to develop comprehensive management of the wildlife resource.

Currently there are 2 species of wildlife that are federally listed as threatened (marbled murrelet and northern spotted owl) and 2 candidate species (fisher and yellow-billed cuckoo). Yellow-billed cuckoos have not been confirmed on the reservation and it is doubtful that they are present. Extensive surveys of the potential marbled murrelet nesting habitat have been conducted from 1992-2006 but have not confirmed occupancy of any reservation habitat. The U.S. Fish and Wildlife Service (FWS or Service) has removed survey requirements within the eastern portion of the reservation falling within marbled murrelet zone 2. Tribal Forestry is currently working on a Programmatic

Biological Assessment for the recently completed 15 year Forest Management Plan (FMP) (2011-2026) which will be submitted for Consultation with the FWS in the next several months. Survey requirements for marbled murrelets are expected to be dropped as a result of the tribe's intensive survey efforts and the establishment of a small reserve of forest stands in the only area where potential marbled murrelet detections were recorded using radar surveys in 2005 and 2006. Loss of potential marbled murrelet habitat will occur through implementation of the tribe's FMP and those losses will be reported to the Service annually.

The tribe has also conducted intensive surveys and demographic monitoring of the northern spotted owl population within the reservation since 1991. With 20 years of demographic data the tribe has been able to document the decline of the population. However, the cause of that decline is uncertain. The objectives of the monitoring were to determine the effects of the tribe's FMP on the species. For the first 15 years of monitoring the reservation population was essentially stable. However, the population began to decline rapidly during the last 5 years. Although the cause of the decline can not be positively identified, tribal biologist suspect that it is the result of a rapidly increasing barred owl population rather than the implementation of the tribe's FMP. Tribal forestry has also monitored and reported changes in spotted owl habitat along with the demographic data to the Service and will continue to do so following completion of the programmatic consultation of the revised FMP. In addition, Tribal Forestry implements seasonal restrictions on disturbance activities near active spotted owl nesting pairs and provides environmental review of other tribal department projects.

The fisher is a medium sized forest carnivore that has been of concern to biologists for several decades within their Pacific coast range. The species also holds cultural significance to the tribe as its hides are used for dance regalia. Fishers are closely associated with dense forest cover throughout their range in California. Fisher

Official FWS list of threatened and endangered species expected to occur on the Hoopa Valley Indian Reservation, October 18, 2011.

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Listed/Proposed Threatened and Endangered Species for the Hoopa Valley Tribe Reservation (HOOPA) Administrative Unit (Candidates Included)

October 18, 2011

Table 7 - Threatened and Endangered Species
Document number: 765851286-112445

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KEY:
(PE) Proposed Endangered Proposed in the Federal Register as being in danger of extinction
(PT) Proposed Threatened Proposed as likely to become endangered within the foreseeable future
(E) Endangered Listed in the Federal Register as being in danger of extinction
(T) Threatened Listed as likely to become endangered within the foreseeable future
(C) Candidate which may become a proposed species Habitat Y = Designated, P = Proposed, N = None Designated
* Denotes a species Listed by the National Marine Fisheries Service

Type		Scientific Name	Common Name	Category	Critical Habitat
Fish					
	*	*Acipenser medirostris*	green sturgeon	T	Y
		Eucyclogobius newberryi	tidewater goby	E	Y
	*	*Oncorhynchus kisutch*	S. OR/N. CA Coho salmon	T	Y
	*	*Oncorhynchus mykiss*	Northern California steelhead	T	Y
	*	*Oncorhynchus tshawytscha*	CA coastal chinook salmon	T	Y
Birds					
		Brachyramphus marmoratus	marbled murrelet	T	Y
		Coccyzus americanus	Western yellow-billed cuckoo	C	N
		Strix occidentalis caurina	northern spotted owl	T	Y
Mammals					
		Martes pennanti	fisher, West Coast DPS	C	N

populations in Washington, Oregon and California were substantially reduced following the arrival of European settlers. They were believed to be completely extirpated from Washington, and over 90% of their historic range in Oregon. In addition, they are missing from at least 50% of their historic range in California. Fortunately the population in northern California has persisted and been considered relatively healthy for many decades and the highest densities of fishers in the west is centered on the Hoopa, Willow Creek, Orleans and surrounding area. Tribal Forestry has been conducting

research on fishers since 1992 including two intensive radio telemetry studies (1996-1998 and 2005-present). Between 1998 and 2005 there was a fisher population crash on the Reservation but due to funding restrictions no monitoring was occurring during that time and the cause of the crash was unknown. Since 2005 the population has been relatively stable or possibly growing slightly.

Both fishers and spotted owls are closely associated with structural elements of mature and older forests for meeting a portion of their life requisites. Conservation of these species requires close attention to habitat management and preservation. The biggest threat to northern spotted owls at this time appears to be the invasion of the barred owl followed closely by large scale habitat loss such as that which would be expected from catastrophic fire. For fishers the biggest threats are large scale habitat loss or changes which might occur as a result of climate change, including catastrophic fire. Fisher research at Hoopa and more recently in the Southern Sierra's has documented that fishers are very vulnerable to predation by larger carnivores such as bobcats, mountain lions and coyotes. These larger predators are associated with non-forested habitat, forest edges and early seral forest stages. Causes of fisher mortality have been found to include a high percentage of predation throughout California. Therefore, changes in forest habitat conditions through management, natural disasters (fires, insects, disease or blow down), human caused disasters (fire spread of disease such as sudden oak death) or climate change may create habitat conditions that favor the larger predators. In addition, it has also become increasingly apparent that fishers are encountering rodenticide poisons in their environment and are sometimes dying outright from the poisons but may also be reduced in condition to the point where they are more vulnerable to other causes of mortality including predation or natural diseases.

Following disasters impacts to T&E wildlife should be documented in a post disaster Biological Assessment which is submitted to the FWS. Smaller scale impacts can be reported in the tribe's annual monitoring reports.

Tribal Traditional Species of Wildlife

Table I contains a list of species identified as having significance as cultural or subsistence species important to the tribe (Traditional Species). These species have been identified by speaking to tribal cultural leaders and inspecting historic regalia, clothing and other items at the Tribal Museum. The table has indications as to potential effects of the tribe's FMP and a description of the type of affect and potential mitigating affects. Effects of natural or human caused disasters would affect these species differently depending on their habitat requirements. Species associated with the Trinity River, Valley floor or the valley view shed could be heavily impacted by a dam break event but not likely impacted much by wildfire. Many of the species are associated with edge, non-forest, shrub or early serial habitats and might be benefited by large scale stand replacement fire. A few (spotted owl, pileated woodpecker and fishers) could be substantially impacted by catastrophic wildfire but not likely impacted by extreme flooding.

Table 8 - Hoopa Tribal Traditional Species of Wildlife.

Hoopa Valley Indian Reservation Traditional Wildlife Species List

BIRDS

Common Names	Scientific Name	FMP Affect	Type	FMP Mitigations
Great Blue Heron	Ardea herodias	-	potential nesting colony loss	Protect all known Rookeries
Great Egret	Ardea alba	0		
Mallard	Anas platyrhynchos	0		
Bald Eagle	Haliaeetus leucocephalus	-	potential nesting /roosting habitat loss	Protect all known Nest Sites, Survey for Sites within Bald Eagle Zone
Red-shouldered Hawk	Buteo lineatus	-	disrupt nesting/loss of nesting habitat	Protect known nest sites during nesting season
Red-tailed Hawk	Buteo jamaicensis	-	disrupt nesting/loss of nesting habitat	Protect known nest sites during nesting season
American Kestrel	Falco sparverius	0		
Sooty Grouse	Dendragapus fuliginosus	-/+	disrupt nesting/loss of nesting habitat	None-Minimal negative impacts, creation of early seral habitat is beneficial
Ruffed Grouse	Bonasa umbellus	-/+	disrupt nesting/loss of nesting habitat	None-Minimal negative impacts, creation of early seral habitat is beneficial

Band-tailed Pigeon	Patagioenas fasciata	-	disrupt nesting/loss of nesting habitat	
Spotted Owl	Strix occidentalis	--/+	Loss of nesting/roosting habitat, create prey habitat	Survey Annually, protect during nesting/reserve some nest cores
Anna's Hummingbird	Calypte anna	0		
Allen's Hummingbird	Selasphorus sasin	0		
Lewis's Woodpecker	Melanerpes lewis	+		
Acorn Woodpecker	Melanerpes formicivorus	+		
Red-breasted Sapsucker	Sphyrapicus ruber	+		
Northern Flicker	Colaptes auratus	+		
Pileated Woodpecker	Dryocopus pileatus	---/+	Loss of Old growth stands and structure. However, they appear to be attracted to recent cut units	Retain large diameter decadent trees in all units. Old growth reserves RPA's.
Steller's Jay	Cyanocitta stelleri	-/+	Loss of old growth but creation of edges	
Western Scrub-Jay	Aphelocoma californica	++	Favor brushy early seral habitat	
Common Raven	Corvus corax	-/+	Loss of old growth but creation of edges	
Western Bluebird	Sialia mexicana	+	Creation of openings and early seral	
Western Tanager	Piranga ludoviciana	-/+	Loss of old growth but creation of edges	
Western Meadowlark	Sturnella neglecta	0		
Bullock's Oriole	Icterus bullockii	0		
American Goldfinch	Spinus tristis	0		

MAMMALS

Common Names	**Scientific Name**	**FMP Affect**	**Type**	**FMP Mitigations**
western gray squirrel	Sciurus griseus	-/+	Loss of old growth, but attracted to leave hardwoods	
Porcupine	Erethizon dorsatum	+	Create early seral and fast growing young trees	
gray fox	Urocyon cinereoargenteus	+	Create early seral, openings, and edge	
black bear	Ursus americanus	-/+	Loss of old growth and mast producing hardwoods, but creates openings, edges and early seral spring and summer	Retain large diameter trees and snags for denning and cover, Consider planting of herbaceous vegetation on roads and landings

			forage	
Ringtail	Bassariscus astutus	+	Creates early seral and edges	Retain large diameter trees and snags
Pacific fisher	Martes pennanti pacifica	---/+	Loss of old growth, fragmentation, but creates some prey habitat	Retain large diameter trees and snags, Reduce fragmentation by increasing unit sizes when possible
long-tailed weasel	Mustela frenata	unknown		
Mink	Mustela vison	0		
river otter	Lutra canadensis	0		
Elk	Cervus elaphus	++	Increase foraging habitat while retaining forested cover	Implement prairie restoration
black-tailed deer	Odocoileus hemionus columbianus	-/++	Loss of old growth and mast producing hardwoods, but creates openings, edges and early seral spring and summer forage	Retain mast producing hardwoods, variable density thinning with tanoak retention, fuel reduction under burning, Prairie restoration, Consider managing some areas for deer forage and planting herbaceous and shrub vegetation on landings and spur roads
REPTILES				
Common Names	**Scientific Name**	**FMP Affect**	**Type**	**FMP Mitigations**
northwestern ringneck snake	Diadophis punctatus occidentalis	+	Create early seral, openings, and edge	

Three threatened species under the Federal Endangered Species Act (ESA) are known to occur on the Hoopa Valley Indian Reservation: the Northern Spotted Owl, the Bald Eagle, and the Southern Oregon/Northern California Coasts Coho Salmon. The Marbled Murrelet is another threatened species that may occur on the Hoopa Valley Indian Reservation. Extensive surveys of potential Murrelet habitat on the reservation, occurring between 1992 and 2002, have not discovered any Murrelets. The presence of Marbled Murrelets on the Hoopa Valley Indian reservation is considered highly unlikely. Other wildlife species on the Reservation that are afforded special protection under the Migratory Bird Treaty Act include Peregrine Falcon, which was recently de-listed under the ESA.

The Bald Eagle

The Bald Eagle is a rare but regular winter visitor to the lower Trinity River. Occasionally individuals forage along the rivers and streams of the Reservation, especially during salmon spawning seasons. At this time there are no known nests of Bald Eagles on the Reservation. Management considerations for this species on the Reservation include leaving snags and other perching sites along streams and rivers that have salmon and steelhead runs (both present and potential).

The Northern Spotted Owl

The Northern Spotted Owl deserves special consideration because the subspecies that occurs in the Pacific Northwest depends entirely on old-growth Douglas-fir forests. Its population is considered to be declining because of the demise in its habitat due to timber harvesting. Approximately forty-seven (47) Spotted Owl activity centers and 70 acres of nesting habitat have been identified on forested lands in the Reservation. Spotted Owl habitat constraints include large areas of old-growth Douglas-fir, the minimum size of which has not been accurately identified. In a study conducted on Six Rivers National Forest land adjacent to the Reservation by David Solis, (Masters Thesis, Humboldt State University, June, 1983) Spotted Owls were found to concentrate most of their foraging and roosting activities in stands of mature/old-growth timber greater than 250 acres in size with an average stand size of over 500 acres. Nesting stands could apparently be smaller. This should not be confused with minimum total area requirements however, as these may be even larger. The geometric shape of stands managed for Spotted Owls can be variable, but the following considerations may be useful:

1) Larger habitat areas are more useful than smaller areas.
2) Continuous habitats should be circular rather than linear.
3) Continuous habitats should be close and equally spaced from each other.
4) Fragmented habitats should be close and equally spaced from each other.
5) Corridors of suitable habitat should connect fragmented habitat areas.

The Coho Salmon

The Southern Oregon/Northern California Coasts (SONCC) Coho Salmon (Oncorhynchus kisutch) Evolutionary Significant Unit was listed as threatened under the ESA on May 6, 1997 (62 FR 24588). The species was listed as threatened due to numerous factors including habitat degradation, over harvest, water diversions, and artificial propagation that have exacerbated the effects of natural disturbances such as floods, drought, and poor ocean conditions. Designated critical habitat for SONCC Coho salmon encompasses accessible reaches of all rivers, estuarine areas, and tributaries between the Mattole River in California and the Elk River in Oregon.

Coho salmon exhibit a relatively simple three-year life cycle. Adult Coho salmon travel from the ocean into river mouths traveling upstream. In non-winter months, many California streams have sandbars that block the mouths of such rivers, and thus the entry of adult Coho salmon typically occurs between September and February. The precise timing of these entries is determined by the species history and by annual river flows. Once upstream, spawning takes place. Spawning typically occurs from November to January, but occasionally occurs as late as February or March. Coho eggs incubate for 35 to 50 days between November and March. The success of incubation is dependant on several factors, including dissolved oxygen levels, temperature, substrate size, amount of sediment, and water velocity. Fry begin to emerge from the gravel two to three weeks after hatching and move into shallow areas with vegetative or other cover. As fry grow larger, they disperse throughout their resident streams, both up and downstream. In summer, Coho salmon fry prefer pools – or other slower velocity areas such as alcoves – with woody debris or overhanging vegetation. Juvenile Coho salmon over-winter in slow water habitat with cover as well. Juveniles may rear in fresh water for up to 15 months, where after they migrate to the ocean as smolts from March to June. Coho salmon adults typically spend two years in the ocean before returning to their natal streams to spawn as three year- olds. While in the ocean, Coho salmon remain closer to their natal river than do Chinook salmon.

Sensitive Species

The Tribe currently follows all conservation recommendations issued by the U.S. Fish & Wildlife Service on all federally funded projects. Three sensitive species of wildlife exist locally: Goshawk, Osprey and Golden Eagle. No Golden Eagle nests are known on the Reservation, but the remaining two species have nesting populations of unknown size on the Reservation.

Any operations in the vicinity of Osprey nests should be done during non-breeding seasons (September–February). Goshawks depend on old-growth Douglas fir forests to some extent and are therefore important indicator species for assessing the overall health of Douglas fir stands. Goshawk habitat requirements have been studied locally by Pat Hall, see Location and Identification of Essential Habitat for Goshawks (*Accipiter gentilis*) on Six Rivers National Forest. Recommendations for this species include maintaining closed canopy stands around nest sites, alternate nest sites, plucking sites and roost sites. The protection zone should include coniferous stands contiguous with riparian and open habitats.

Special Interest Species

Four special interest species occur on the reservation, Great Blue Heron, Sharp-shinned Hawk, Cooper's Hawk and Pileated Woodpecker. The first three of these species require only protection around their nesting sites. The Pileated Woodpecker has some special requirements in old growth forests, and is considered a culturally important species for the Hoopa people. In a study performed in the Blue Mountains of Oregon, Evelyn Bull (Master Thesis, Oregon State University, 1975) found the following optimum habitat characteristics for Pileated Woodpeckers:

1) Snags greater than 16" diameter at 31' above ground (greater than 20" dbh).
2) Two storied stands with 70% canopy closure.
3) Presence of Carpenter ants; therefore presence of logs with heart rot.
4) Stands large enough to contain 300-acre territories.

5) A density of snags above 7 snags/100 acres greater than 20” dbh in 100% forested stands. A density of 12/100 acres in 60% forested areas.
6) At least 50% forested areas in territories. Pileated Woodpeckers were absent in areas with 35% forested habitat.

Other Species

Species that are not endangered, but require special consideration include: steelhead, sturgeon, eels, deer, elk and neo-tropical migrant birds. There are several fish stocks of concern on the reservation. Surveys conducted by the Fisheries Department have focused on the Trinity mainstem. The Trinity River currently contains Coho (*Oncorhynchus kisutch*) in this Southern Oregon/Northern California Evolutionary Significant Unit, which are listed as threatened species under the Federal Endangered Species Act (ESA) (Federal Register. Vol. 62, No. 87). Klamath Mountains Province ESU Steelhead (*O. mykiss*) and were formerly a candidate species for ESA listing (Federal Register. Vol. 63, No. 53). Both species have been documented in the Trinity River and Reservation tributaries.

Other fish species of cultural significance are green sturgeon and Pacific lamprey eels. Green sturgeons are found mainly in the Trinity River and have reduced populations as a result of the construction of the Trinity dam and regulated river flow. Pacific lamprey eels frequent the mainstem Trinity River, as well as several tributaries on the reservation. They are generally less abundant today than they have been historically due to degraded habitat conditions. Protection of streamside zones from further encroachment of new roads or development would aid in the maintenance recovery of the fisheries.

Vegetation

Natural resource subsistence is a very important aspect of contemporary Hoopa culture. A majority of Hoopa Tribal members and their families rely on hunting, fishing, and gathering to supplement their diets. Pursuant to Tribal law, ordinances have been written which regulate resource uses for the fisheries, mushrooms, hunting and other gathering. Given this extensive cultural reliance on the natural resources of the Hoopa Valley Indian

Reservation, concerns have been expressed by Tribal members to assure future access and use of resources. According to the Cultural Resource Survey and Evaluation of Portions of the Hoopa Valley Indian Reservation, Humboldt County, California (*Sonoma State University, David Fredrickson, 1982*):

> *"interviews conducted to date with knowledgeable persons within the general Northwestern California area have disclosed two major areas of cultural resource concerns: (1) protection of and access to known traditional locations of religious and ceremonial importance, and (2) protection and proper maintenance of and access to natural resources especially those of importance in basket-making and those with subsistence importance."*

Fredrickson further states "Concern was expressed by all individuals over the availability and access to certain plant resources including food and nonfood items". Of primary concern is accessibility and protection of acorns, which are still an important part of the diet of the Hoopa (Fredrickson).

Sensitive Species & Habitats

In 1986 only four (4) separate California sites were documented to contain populations of Bald Hill Locoweed, a sensitive plant species, three of these sites were on the Hoopa Valley Indian Reservation (Theiss, 1986). This species is found in disturbed soils along roadsides in the Bald Hills area of the Hoopa Valley Indian Reservation. Any activity in this upland area must consider impacts to this sensitive species.

2011 Hoopa Valley Tribe Botanical Update – Kimberly Davis, Botanist

Since 1986 there have been Botanical surveys conducted of the intended timber harvesting areas on the Hoopa Reservation. In accordance with the Hoopa Forest Management Plan guidelines these surveys were conducted in order to identify, locate and map any existing Threatened & Endangered plant species, any sensitive plant species and any plant species of cultural interest and concern. In all of the surveys conducted not one population of a listed Threatened & Endangered plant species was found within the

Hoopa Reservation Boundaries. There have been numerous populations of listed California Native Plant Society (CNPS) sensitive plant species and plants of cultural interest and concern located. These have been mapped and the information on their location is available from the Hoopa Tribal Forestry Department.

Agricultural Resources

Through the ages, the Hoopa's superior hunting and fishing skills insured them a stable food supply. They supplemented their diet with berries, acorns, chinquapin and pine nuts gathered by the women. Little else was grown other than tobacco used for pipe smoking.

In 1890, about the time the government school was started, the Agency began to raise crops in an effort to teach the Indians how to farm. Grains, mainly wheat and oats, were the principal crops grown. Much of the land was cleared, houses were constructed of mill-sawed lumber, and hogs, cattle and horses were raised. The Valley was especially adapted to raising hogs, and by 1935 hogs were a very important source of cash income. Besides raising hogs, cattle and horses, the Indians also raised chickens, turkeys, waterfowl, goats, dairy cows, sheep and mules.

Agriculture uses in the Hoopa Valley include the cattle industry, the raising of feed crops and subsistence gardening/orchards. Of the agricultural uses, raising cattle and the growing of feed crops account for a significant economic sector of the local economy. Several families utilize Big Hill, Bald Hill and occasionally Mill Creek Roads to drive cattle to the summer grazing ranges in the high country of the Reservation or in the Six Rivers National Forest where grazing permits allow for range access.

Timber Harvesting

Timber harvesting is the single most critical aspect of resource management on the HVIR. The Tribe almost exclusively depends on the timber resources of the Reservation for its income and employment opportunities. The timber industry in Hoopa is the single largest sector of the Reservation economy. The Tribe has assumed all of the non-Trust responsibilities of forest management on the HVIR under the Self-Governance

Demonstration Project. The Tribe prepared a Forest Management Plan (FMP) which was subsequently approved on September 20, 1994 by the Bureau of Indian Affairs. This plan covers the period of 1994 through the year 2008, and the plan was amended again on March 22nd 2002. The purpose of the FMP is to manage the approximately 75,000 acres of commercial timberland with an estimated volume of 1.2 billion feet of commercially important timber. The annual timber harvest has impacts on both the Tribal economy and the HVIR environment. The higher the harvest level, the more jobs created and the greater the short-term income to the Tribe. Conversely, higher timber harvests disturb a larger land area. In addition, increasing the Allowable Sale Quantity (ASQ) involves bringing more acreage into intensive production, possibly affecting management of the valley view shed, riparian areas, and Tribal reserves (both current and potential additions). This ASQ increase in turn affects other natural resources of the Reservation, and affects some site development areas that contain timber resources.

The Tribe has in recent years begun to incorporate the principles of new forestry into their timber management operations. New forestry involves modifying timber management activities to more closely resemble natural processes. Harvest techniques include leaving harvest sites with some standing live and dead trees, large woody debris, and corridors of residual trees. These practices can reduce the adverse effects to wildlife from timber harvesting; however, they also create slash disposal problems, decrease wood volume removed per acre, and increase the difficulty of regenerating conifers, all of which may reduce both present and future income from timber. The use of “new forestry” techniques involves the incorporation of integrated resource management planning.

Cultural Resources

Archaeological, Historic & Religious Resources

The locations of the dance sites, particularly the *Chi dil ye’* (White Deerskin and Jump Dance are of extreme importance. They are intrinsic to our beliefs of connecting to *Me’ che kiwil di chwin il* (ancestors/descendants) and the spiritual to ourselves. The ceremonial sites themselves are part of our irreplaceable ceremonial locations identified in the updating of this plan. Significant historical and cultural sites are abundant on the

Hoopa Valley Indian Reservation. Conservation and protection of prehistoric, historic and contemporary sites are important to the people of the Hoopa Valley for historic, religious, ceremonial, and subsistence purposes.

Surface investigations of approximately 23% of the timber producing land on the Reservation have revealed at least 13 prehistoric sites. All have been assigned State of California identification numbers. Findings at these sites range from sparse scatterings of chipping debris to dense concentrations of artifacts. Recommendations for inclusion on the National Register of Historic Places would require subsurface investigations. In addition, the entire valley floor of the Reservation has been surveyed at a surface level. Archaeological/ historical sites within the valley floor have been recorded and trinomials have been issued.

The Hoopa Tribal cultural gill net fishery is managed by the Hoopa Valley Tribal Fisheries Department, and is coordinated by Tribal Members family heads that control fishing areas. The Trinity River fishery has been a cultural and subsistence mainstay of the Hoopa people for thousands of years. The Tribe has and is harvesting from the Tribal allocation of in-river salmonids runs that are headed for the upper reaches of the watershed. The vast majorities of fish migrating through the Reservation do not spawn within the Reservation, but spawn further up in the basin

The People of Hoopa Valley are one of California's first cultures. The first American trappers and gold miners entered Hoopa in 1828. They came up the Trinity River into the rich valley which has always been the center of the Hoopa World, the place where the trails return. Legends say this is where the people came into being. Our treaty was signed providing the whole Hoopa Valley as a reservation. In 1876 an executive order was signed acknowledging this treaty. Since first European contact the culture and traditions remain to this day.

In 1864, a Peace and Friendship Treaty was negotiated with the United States. In 1896, the Department of the Interior began preparing a land allotment list and in 1909 a

Proclamation was handed down by President Theodore Roosevelt. This list was not completed and approved until 1923. The Hoopa People successfully avoided the physical destruction of their valley homeland, and in modern times created one of the first successful Self-Governance Tribal structures in the nation.

The Hoopa people traditionally occupied lands in the far northwestern corner of California. The boundaries of the reservation were established by Executive Order on June 23, 1876 pursuant to the Congressional Act of April 3, 1864. The boundaries were expanded by Executive Order in 1891 to connect the old Klamath River (Yurok) Reservation to the Hoopa Valley Reservation. Further confirmation of the ownership by the Hoopa Tribe of the Hoopa Valley Reservation came on October 31, 1988 with President Ronald Regan's signature on Public Law 100-580, the Hoopa/Yurok Settlement Act.

The Hoopa hold several ceremonial dances during separate parts of the year and usually for different purpose. The White Deerskin Dance and Jump Dance is considered a world healing ceremony where balance can be brought back to the Hoopa people, and is held in the late summer every other year. The Brush Dance is more of a social dance where a medicine man and woman are charged with praying for a sick or new child. There are also coming of age dances for young women called the Flower Dance. All of our ceremonies have been practiced for thousands of years and are meant to ward off evil, such as disasters to our lands or droughts and famines, while at the same time bringing our people together to celebrate our culture and strengths.

Socioeconomic Conditions

The 2000 U.S. Census indicated that there are 2,633 people residing on the Hoopa Valley Indian Reservation. 2000 Census survey data indicates the median household family income for Reservation residents was $23,384. The unemployment rate on the Hoopa Valley Indian Reservation is 14 percent, and 29 percent of families, and 39 percent of individuals residing on the reservation are below the poverty level. 46.4 percent of

families with a female householder and no husband present are below the poverty level (U.S. Census, 2000).

Seasonal tourism, logging, the school district, tribal operations, the Federal government, and the private sector provide most of the employment opportunities on the Reservation. By January 1981, all five lumber mills that once existed on the Hoopa Valley Indian Reservation had either closed down or had relocated to other areas. This situation is largely due to the declining timber industry in Humboldt County.

The Hoopa Valley Indian Reservation is currently experiencing an extreme economic depression. In years past, the Reservation population has been significantly dependent upon the logging and timber production industry for non-professional employment opportunities. However, in recent years, over production, increased automation, and environmental impact priorities have crippled the timber industry. The lumber mills on the Reservation that once employed many Tribal people have been shut down.

The available employment opportunities in the field of logging have been reduced by approximately 85%. The Hoopa Valley Indian Reservation represents an isolated pocket of extremely high unemployment. Recent analysis of the situation indicates that access to employment is a major problem. The nearest job market for residents of the Reservation is a more than 120 mile roundtrip commute to the Eureka/Arcata area. The age distribution of Reservation residents indicated in the 2000 Census presents a dynamic trend to rapid growth due to the median age of 26 years. As the level of growth increases, so will be the demand for Tribal resources.

In projecting population growth and therefore the projected need for housing, infrastructure, and related sociological factors, the conventional planning technique and process will not work effectively in the Tribal spatial environment. For the purposes of this plan, the assumption has been made that the projected population growth will increase by 29.8 percent in the next decade. For this reason, projected Tribal resource demands have been projected to increase at 5 percent per year for the next decade.

Attitudes and Expectations

Tribal government on the Hoopa Valley Indian Reservation is being dramatically changed due to the Tribe's designation as a Self-Governance Demonstration Tribe in 1988. Since designation, the Hoopa Valley Tribe entered into a "Compact" with the United States government in July, 1990 pursuant to Title III of P.L. 100-472. Thus, in a little more than ten years, the Hoopa Tribe has moved from a position of being one of the most regulated tribes controlled by the United States to a position of freedom from such regulation unprecedented among Indian Tribes. This radical change of circumstance has had a considerable effect on all branches of Hoopa Tribal Government including Hazard Mitigation and Planning.

Community Infrastructure

General Overview

The business sector of Hoopa includes a restaurant, delicatessen, fast-food restaurant, gas station, auto repair shop, office supply store, credit union, an independent logging company, Supermarket, and a self-storage facility. Community facilities housed in the Neighborhood Facilities Center include the Tribal Recreation, Day Care Programs, Tribal Administrative, and the Tribal Council. Adjacent buildings house the Public Utilities District, Senior Meals/Volunteer Program, Hoopa Housing Authority, Adult Education/Career Center, and the Tribal Education Center. The Tribal Shopping Center houses the Tribal Museum, Radio Station, grocery store, Hoopa Tsewenaldin Motel and Lucky Bear Casino. Private vehicle transportation is required for virtually all travel. Klamath Trinity Non Emergency Transportation (K/T NET) commenced transit operations in January 2003. K/T NET is a nonprofit community based organization in eastern Humboldt County which provides transit services in underserved areas, including tribal lands in Hoopa, with connections to other existing transit systems, such as Humboldt Transit Authority. The nearest commercial air service is 65 miles away. There is only one paved road (Highway 96 between the Reservation and other population centers. The Tribal Radio Station, KIDE FM, (a 250-watt educational facility, the only Indian owned and operated radio station in California) began broadcasting in December

1980. Other radio and TV reception is poor to fair because of the mountain ranges between the nearest transmitter (in Eureka/Arcata, 65 miles away) and the Reservation.

Fire Protection

The Hoopa Fire Department provides primary wildland suppression responsibilities for the Hoopa Valley Indian Reservation. Department staff is comprised of a Fire Management Officer (Fire Chief) and two Division Chiefs, one Operations and one Prevention Chief. The department is supported administratively with an Office Manager and a Fire Clerk/Receptionist, all full time employees. The Hoopa Fire Department facility and grounds are designated as a location for an Incident Command Post and Primary EOC.

Currently the department staffs 3 (three) Type III Urban interface engines, 5 (five) person effective throughout the summer. These engines crews are lead by permanent Fire Captains that work year around. As funding becomes available the department will be increasing its permanent staffing to eventually staff 6 (six) engines with a minimum of 5 person staffing. Fire planning effort is supposed to eventually provide us with 3 Type III engines, 3 Type IV engines and 2 (two) Type I water tenders. (Resource typing is per ICS resource typing standards.) Currently the department has 4 Type III engines, 1 Type 4 engine, 1 Type 6 engine and 1 Type I Water Tender, though all apparatus is not staffed due to the limiting factor of funding.

All department employees are ICS trained and qualified under NIIMS (National Interagency Incident Management System) standards and is functioning at various levels from introduction to ICS through Advanced Incident Management. Several department members are attached to Local and National Incident Management Teams and/or are trainees, Incident Commander and at the Command and General Staff level as Section Chiefs.

Due to the seasonal nature of wildland fire suppression the majority of the resources are themselves, seasonal in nature; however there is never a month during the calendar year

that the reservation has not experienced a wildland fire based on favorable weather conditions for fire to burn. During periods outside what is normally viewed by the public as “out of fire season” the department still maintains a “skeleton crew” to staff an engine 365 days a year. Our organization is frequently requested to provide suppression resources for incidents off of the reservation and we have provided suppression resources to other geographical locations throughout the country during any month of the calendar year.

The Hoopa Volunteer Fire Department provides structural fire protection and responses to “All Risk” incidents as such their services are rated by an independent insurance ratings service for Hoopa Valley Tribal Insurance purposes. The Insurance Services Office (ISO) designates public protection classification. The ISO bases its classifications on a number of factors, including fire department location, equipment, and staffing; water supply; and communications abilities. Ratings range from 1 to 10, with 1 being the best possible fire protection, and 10 being the worst. The Hoopa Valley Indian Reservation is classified with a rating of 7. In areas where access to water is limited, for example fire suppression, the water must be trucked in.

Law Enforcement

The HTPD reviewed the 2011 Multi Hazard Mitigation Plan Law Enforcement section and at this time there are no chances required by the Department. The Hoopa Tribal Police Department during the several Incidents on the Hoopa Valley Indian Reservation, continue to provide a Law Enforcement presence. Additional Patrol Officers are called out to provide extra coverage depending on the Incident. In the unincorporated areas of the County, the Humboldt County Sheriff’s Department provides limited law enforcement due to State budget cuts. The Hoopa Valley Tribe is exploring Federal Law Enforcement assistance for additional training and officers. The County maintains a Sheriff Department sub-station and jail on the Reservation. In nearby Willow Creek, the California Highway Patrol maintains a field office.

The Hoopa Valley Tribe is one of only a handful of Tribes in California that operate a Tribal Police Department. The Tribal Police Department is subject to the same training,

policies and procedures as any municipal police department and through a landmark agreement with the Humboldt County Sheriff's Department and most Officers have been cross-deputized as Sheriff Deputy's. In addition, the Tribe exerts law enforcement jurisdiction on trespass involving timber and fisheries by providing Resource Protection Officers.

KIDE Radio Station FM 91.3

The local KIDE FM Radio station plays a major role in educating the community and in the notification of emergency evacuation as part of the Office of Emergency Services Whelen Warning Sirens Systems Notification. As part of the Evacuation Alert Protocol all community residents will tune into KIDE FM 91.3 when they hear the Warning Sirens alert to determine what type of emergency notification and what they are instructed to do. This Evacuation Alert Protocol will require extensive community education and monthly sirens testing and annual community drills

Schools

The Klamath-Trinity Unified School District Transportation Coordinator participated in the 2011 MHMP Update planning process and indicated no changes in specific planning and evacuation protocols. The Klamath-Trinity Unified School District encompasses both the Reservation and surrounding areas, with district offices and elementary and high schools located in Hoopa. The Klamath- Trinity Unified School District serves a total of 1,076 students. The school district has primary responsibility for education through high school. The Hoopa Valley Elementary School has 440 students, 91.1% of whom are Indian. The Hoopa Valley High School has 267 students, 69.7% of whom are Indian. This data is from the 2003-2004 school year and comes from the California Department of Education Educational Demographics Unit.

Solid Waste Disposal

Solid waste management is a serious problem on the Reservation. The Tribe once operated a modified landfill near the Supply Creek drainage to serve the Tribal Membership. This landfill has reached capacity and was closed by the Tribe in October 1998. Currently, solid waste is being disposed of at the Tribe's transfer facility located in the center of the valley on Highway 96. The Hoopa Valley Transfer Station is operated

by Hoopa Valley Public Utilities District. The proposed undertaking is not expected to impact solid waste management on the Reservation.

Telephone

Verizon (formerly GTE) provides telephone service to the Reservation. Local ISP providers now provide a local Internet exchanges. The Hoopa Tribe rents a T1 line for tribal entities, however there is still a need for valley wide high speed internet. The Tribe installed a cellular tower in the Bald Hills area in 2004 and cell phone coverage is now available to Reservation residents.

Gas and Electric

Pacific Gas and Electric provides electrical service to the Reservation. Underground natural gas is not available on the Reservation. Amerigas and Campora two local propane gas providers provide propane gas service.

Water and Sewer

The Hoopa Valley Public Utilities District (HVPUD) provides municipal water service to 92 percent of the Reservation residents. The balance of the population obtains water from individual wells and springs, these water sources may have been intermittent and of dubious quality in the past, but since the installation of the Hoopa Valley Wide Water Treatment facility, water has been consistent throughout the year. The Hoopa Valley Public Utilities District aims to increase the access to safe reliable domestic water on the Reservation. Plans are in progress to construct a sewer treatment facility to handle the Hoopa Valley waste issues.

2007 Severe Storm Event

According to the original survey and project plans the Water Treatment Plant is at a benchmark elevation of 333 ft., while the river is ~300 ft. Any significant rise in river levels above +30 ft. (Severe, Major) would begin to inundate the building structure, tanks and distribution pumps. Above that +30 level we can expect significant damage to occur. Should the Water Treatment Plant become a total loss, or should the Plant be non-functional for an extended period of reconstruction/repair, the Telescope Treatment Plant (el. 693') would be utilized to provide treated water. However, this source would be

limited in capacity and conservation measures would need to be in place until such time as the main Plant can be put back into operation. Distribution infrastructure could also be damaged, for example, the water main river crossing under the Hwy 96 bridge. The loss of this crossing would isolate eastern portion of the Valley from available potable water.

District structures have been constructed to applicable building codes at the time of construction, however seismic standards are subject to amendment over time. Piping infrastructure and storage tanks would most vulnerable to a significant seismic event. Older pipelines, such as AC piping installed by IHS, would suffer the most damage. It is difficult to determine what damages would occur to the system in the event of a major seismic event. The only solution to this type of damage would be to isolate affected areas and begin repairs.

Resource Use Patterns

Hunting, Fishing, & Gathering

Natural resource subsistence is a very important aspect of contemporary Hoopa culture. A majority of Hoopa Tribal members and their families rely on hunting, fishing and gathering to supplement their diets. Pursuant to Tribal law, ordinances have been written which regulate resource uses for the fisheries, mushrooms, hunting and other gathering.

Timber Harvesting

Timber harvesting is the single most critical aspect of resource management on the Hoopa Valley Indian Reservation. The Tribe almost exclusively depends on the timber resources of the Reservation for its income and employment opportunities. The timber industry in Hoopa is the single largest sector of the Reservation economy.

The Tribe has assumed all of the non-Trust responsibilities of forest management on the Hoopa Valley Indian Reservation under the Self-Governance Demonstration Project. The Tribe prepared a Forest Management Plan (FMP) which was subsequently approved on September 20, 1994 by the Bureau of Indian Affairs. This plan covers the period of 1994 through the year 2010. The purpose of the FMP is to manage the approximately 75,000

acres of commercial timberland with an estimated volume of 1.2 billion feet of commercially important timber.

Agriculture

Agriculture uses in the Hoopa Valley include the cattle industry, the raising of feed crops and subsistence gardening/orchards. Of the agricultural uses, cattle production, and the growing of feed crops account for a significant economic sector of the local economy. Several families utilize Big Hills, Bald Hills and occasionally Mill Creek Roads to drive cattle to the summer grazing ranges in the high country of the Reservation or in the Six Rivers National Forest where grazing permits allow for range access.

2011 Update Local Food Sustainability – Community Emergency Preparedness

Although agricultural uses in the Hoopa Valley is no longer as economically significant as in the past, the Valley is almost perfect for the growing of food crops, with superior soils, available water and a long frost free growing season. The trending towards organic and de-industrialized food systems bodes well for development of economical agricultural enterprises, and expansion of subsistence production to meet local needs. Unfortunately, more than half of the acreage has been developed for other purposes and the remaining areas are much subdivided, overgrown with invasive plants and vulnerable to housing pressure. In 2007, the Hoopa Valley Tribe became the first tribe in California to form a Tribal Resource Conservation District, to serve as advocates for agriculture, conservation and food systems issues. This tribally-chartered non-profit organization, the Klamath Trinity Resource Conservation District, works under as MOU with the Hoopa Valley Tribal Council and has been successful in building partnerships with USDA agencies to assist local farmers and ranchers. One major project is an upgrade to a portion of the BIA-era irrigation system that will result in more efficient, reliable and abundant agricultural water supply to properties on the east of the Hoopa Valley. Funding and technical assistance for the project was provided by a cost-share agreement between Natural Resources Conservation Service and the Hoopa Valley Tribe. Project work has been carried by the Hoopa Valley Public Utilities District. The KTRCD and NRCS have also implemented a Local Food Policy Council, a fruit tree inventory, a community

garden, a farm-to-consumer direct marketing program, a tractor loan program and technical assistance to individual landowners.

Land Use Patterns

The Hoopa Valley Indian Reservation is comprised of 93,702.73 acres with 88,840 acres held in tribal trust, 2,947 acres allotted to tribal members, and 1,968 acres in fee or government use status. It should be noted that the term fee status includes lands owned by Tribal members in fee, non-Indian fee lands, and in some case fee lands owned by the Hoopa Valley Tribal Council.

In addition, the Hoopa Valley Tribal Council owns 224 acres of fee lands outside the reservation. Of the Reservation's total gross acreage 48,332 acres is regarded as the forest component available for intensive forest management, 29,137 acres is designated as special or limited management forest zones. The balance or 16,233.73 acres is unsuitable for forest management because of landslide potential, cultural use or residential, commercial, and agricultural uses.

Approximately 2% of the Hoopa Valley Indian Reservation lands are in fee status. The Reservation fee lands were at one time allotted land upon which a fee patent was issued. Most, but not all, of this land is "alienated" --owned by non-Indians. The Hoopa Valley Tribal Council has either purchased or has been gift deeded 600 acres of land that once was in fee status and in some cases has retained the fee status for various reasons.

Recreation

Recreation opportunities on the Hoopa Reservation include areas designated for specific active recreational uses such as swimming, fishing, boating and camping. Two types of recreational levels exist; one for the local resident Indian population and one for the occasional tourist. The adoption of the Wild and Scenic Rivers Act (16 USC 1273) has classified the Trinity River as recreational river from the southern boundary of the Reservation to a location approximately opposite Carpenter Lane. From Carpenter Lane to the confluence of the Trinity with the Klamath, the designation is scenic with the short

segment of the Klamath River within the Hoopa Valley Indian Reservation classified as recreational.

Transportation Network

State Highway 96, which runs north/south through the center of the Hoopa Valley, is both the principal road within the valley and the chief access route to areas outside the reservation. Highway 96 connects to U.S. 299 at one extreme and Interstate 5 at the other. The only other road providing year round access is Bair Road, which ties into U.S. 299. Other roads leading out of the valley are unimproved forest access roads.

The Hoopa road system conforms to the natural topography of the area. Various loop roads off of Highway 96 provide access to residential and commercial development on the valley floor and within the low-lying hills. Access to Reservation timberlands and spur roads off Highway 96 provide access to adjacent national forest land or other valley roads.

Along with Highway 96 there are 4 major evacuation routes through major arterial roads off the Hoopa Reservation. On the Northeast corner, both Big Hill Road and Mill Creek road lead to Red Cap Road which will lead you to Orleans area. To the Southeast is Tish-Tang Road which leads to Horse Linto Creek Forest Service area and the Willow Creek area. The Northwest evacuation route is the Bald Hills Road and Dowd Road which lead to either the Weitchpec area or across to Orick area on the Pacific Coast. Finally the Bair Road or Supply Creek Road will lead to the Redwood Creek area and eventually to Highway 299 which can go back towards Willow Creek or out to Arcata/Eureka area along the coast. These four main roads will be prioritized to maintenance in order to be kept clear for emergency situations. Also they will be properly signed and publicized as evacuation routes during emergency preparedness public outreach.

Humboldt County currently maintains an airstrip on the Reservation. This airstrip, located on Matilton Field, can accommodate only small non-commercial aircraft. The nearest commercial air service is 65 miles away. State, County, BIA, and Tribal Roads serve the Hoopa Valley Indian Reservation. The Tribe has contracted road maintenance

and betterment from the BIA and is responsible for road maintenance activities of BIA roads.

Mining

Both lode and placer deposits have been mined successfully on the Hoopa Reservation in the past, with sand and gravel provided for local use. The Reservation has some potential making use of copper deposits (including by-product gold and zinc), mercury lode deposits, and for the recovery of gold and platinum from placer deposits. Resources of sand, gravel, and stone are large, but their use depends on local requirements. Small or low-grade deposits of manganese, chromite, coal, and graphite also exist on the Reservation.

Chapter 3 – Natural and Human Caused Hazard Risk Assessment

Introduction

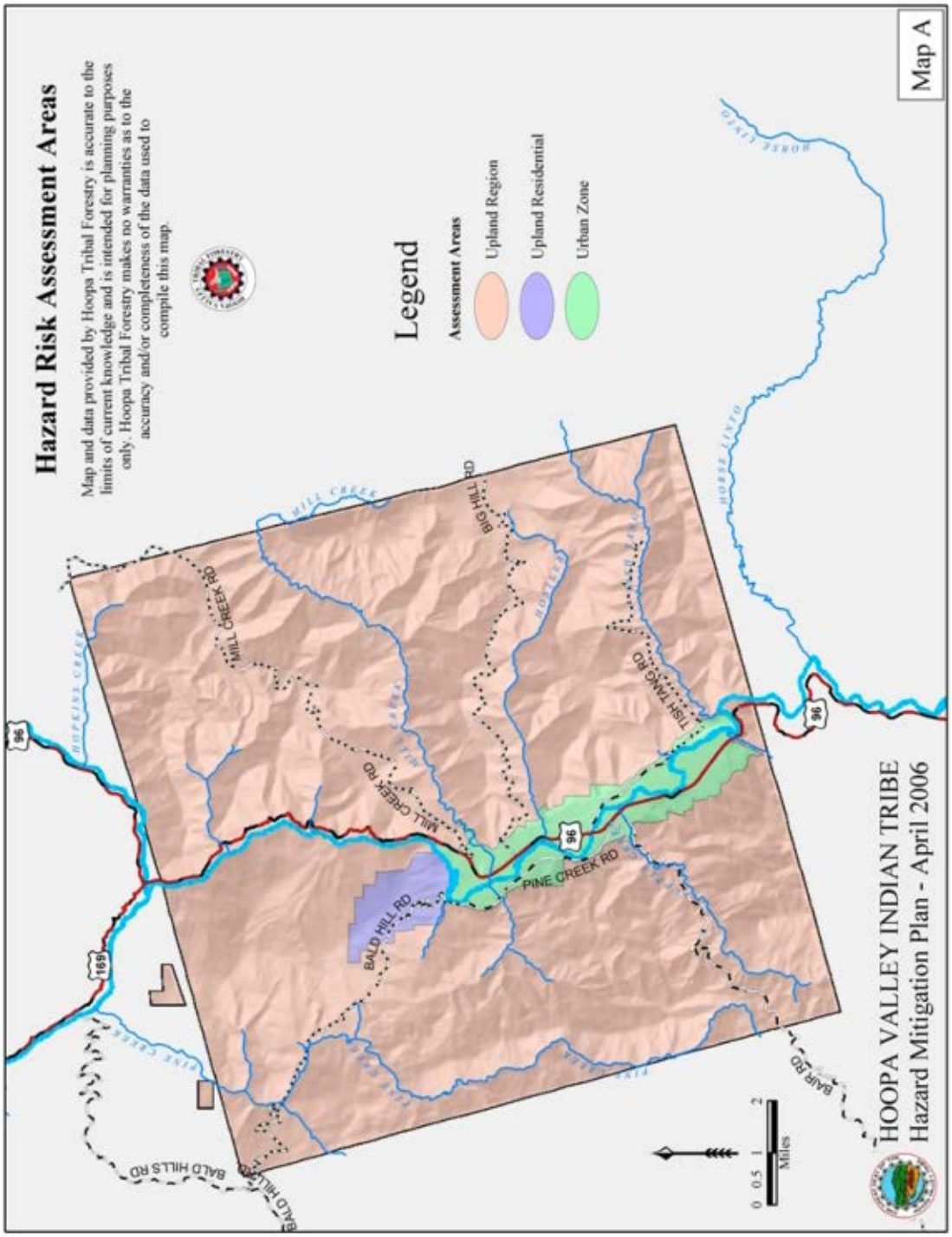
Effective hazard mitigation planning requires, as in depth as possible, knowledge of and about the potential natural and human caused hazards which pose a threat to a Community, its people, structures and infrastructure. Knowledge about these hazards is a necessary element to the development of effective hazard mitigation strategies to limit and/or prevent the loss of life and/or damage to structures and infrastructure. Because of the limits to the knowledge about certain potential natural and human caused hazards, there is a greater uncertainty in assessing the risk posed by these hazards. To the extent then possible the natural and human caused hazards which pose a possible threat to the health, welfare and safety of the Hoopa Valley Indian Reservation are assessed in this section of the Hoopa Valley Indian Tribe's Multi Hazard Mitigation Plan (MHMP).

The Hoopa Valley Indian Reservation faces the threat from several natural hazards among these are Dam Failure, Earthquake, Drought, Flood, Severe Storm, Landslide, and Wildfire. The Tribe also faces threat from certain human caused hazards such as; air quality pollution from illegal burning of household garbage and construction materials, chemical spill, arson, etc. To effectively assess the risk from these hazards the Reservation has been divided into three hazard risk assessment areas, Urban, Upland Residential, and Upland (see Map A). The Urban Area comprising all of Hoopa Valley proper and includes approximately 85% of the populated area of the Reservation with associated structures, infrastructure, and all Tribal government departmental offices. The Upland Residential Area is located in the Bald Hill region of the Reservation and includes approximately 15% of the Reservation's population residing in a dispersed pattern of residential development. The Upland Area is the largely unpopulated mountainous region of the Reservation and the location of the majority of the Tribe's cultural, wildlife, and timber reserve areas.

The Natural and Human Caused Hazard Risk Assessment Chapter is divided into 9 sections. Following the Introduction, the initial section (3.1) is a brief description of the

methods used to identify the natural and human caused hazards in each assessment area plus methods used to assess vulnerability. The following 7 sections address each natural and/or human caused hazard of concern on the Hoopa Valley Indian Reservation. A description of past events, an assessment of vulnerability, and potential losses are discussed for each hazard. The hazards are discussed in alphabetical order not in an order of ascending or descending of severity of risk or vulnerability.

Map A - Hoopa Valley Indian Reservation Hazard Risk Assessment Areas



Hazard Identification and Vulnerability Assessment Methods

In the 2011 MHMP Update planning meetings the Local Emergency Management Committee (LEPC) determined there were not new identified Hazard Risk Assessment Probabilities, Vulnerabilities or Impacts in the 2011 MHMP Update discussions and review of recent local events, state and federal disaster designations. Including, regional hazard information prepared by state, and federal agencies and internet web sites containing local and regional hazard information. Originally in 2006 when developing the hazard identification and vulnerability assessment methods the Local Emergency Planning Committee (LEPC) took the following steps to identify hazards that have affected the Reservation in the past and/or can be expected to affect the Reservation in the future:

- Review of past state and federal disaster designations
- Review of regional hazard information prepared by state, and federal agencies
- Review of Internet web sites containing regional hazard information

The seven main natural and human caused hazards that have affected the Reservation in the past and/or could affect the Reservation in the future are dam breach, drought, earthquake, flood, landslides, severe storm event, and wildland fires. In addition to these hazards, other potential hazards such as tsunamis, tornados, and hurricanes where also evaluated, but found to pose no real threat to the Reservation due to our location and weather patterns. As a result of the literature described above and a draft review of the Hoopa Valley Indian Tribe Emergency Operations Plan (EOP), all of the above natural hazards are assessed in this plan with the exception of hazards not commonly recognized as threats to the Tribe, as noted.

Information acquired from the materials listed above was also used to estimate the vulnerability of the Reservation assessment areas to each hazard (see Tables 6 & 7 and Map B). This information included the probability of occurrence of hazard events, the types of damage associated with a hazard, and the relative vulnerability of each

assessment area. After compiling this hazard information, areas of the Reservation 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 area relative to other areas within the Reservation.

The relative probability of hazard occurrence (between hazards) is not reflected in the vulnerability assessments. For example, although the Urban Area was rated as having a high vulnerability to both floods and earthquakes, 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. For example, although the Upland Residential and Urban areas have very different levels of development, they have the same estimated earthquake vulnerability. Different levels of development are reflected in the estimated potential losses for each area; highly developed areas have greater potential losses.

The following table explains the hazard/threat frequency measurement scale used to determine the probability or how likely a hazard is to impact the community. Frequency distributions measure the community's exposure to a hazard, as shown in the table.

Exposure	**Frequency**
Highly Likely = 3	The potential for impact is very probable (near 100%) in the next year.
Likely = 2	The potential for impact is between 10% and 99% within the next year or there is at least one chance of occurrence within the next 10 years.
Possible = 1	The potential for impact is between 1 and 10% within the next year, or there is at least one chance of occurrence in the next 100 years.
Unlikely = 0	The potential for impact is less than 1% in the next 100 years.

Table 9 – Hazard Risk & Extent Assessment for Hoopa Valley Reservation

Hazard Assessment	Risk									Extent								
Hazard Assessment Area	Urban Zone			Upland Residential			Upland Region			Urban Zone			Upland Residential			Upland Region		
Hazards	Hi	Low	None	Hi	Low	None	Hi	Low	None	Wide	Limited	n/a	Wide	Limited	n/a	Wide	Limited	n/a
Dam Failure	x					x		x		x					x		x	
Drought		x		x			x			x			x			x		
Earthquake	x			x			x			x			x			x		
Flood	x				x			x		x				x			x	
Landslides		x		x			x			x				x		x		
Severe Storm Event	x						x			x			x			x		
Wildland Fires	x						x			x			x			x		

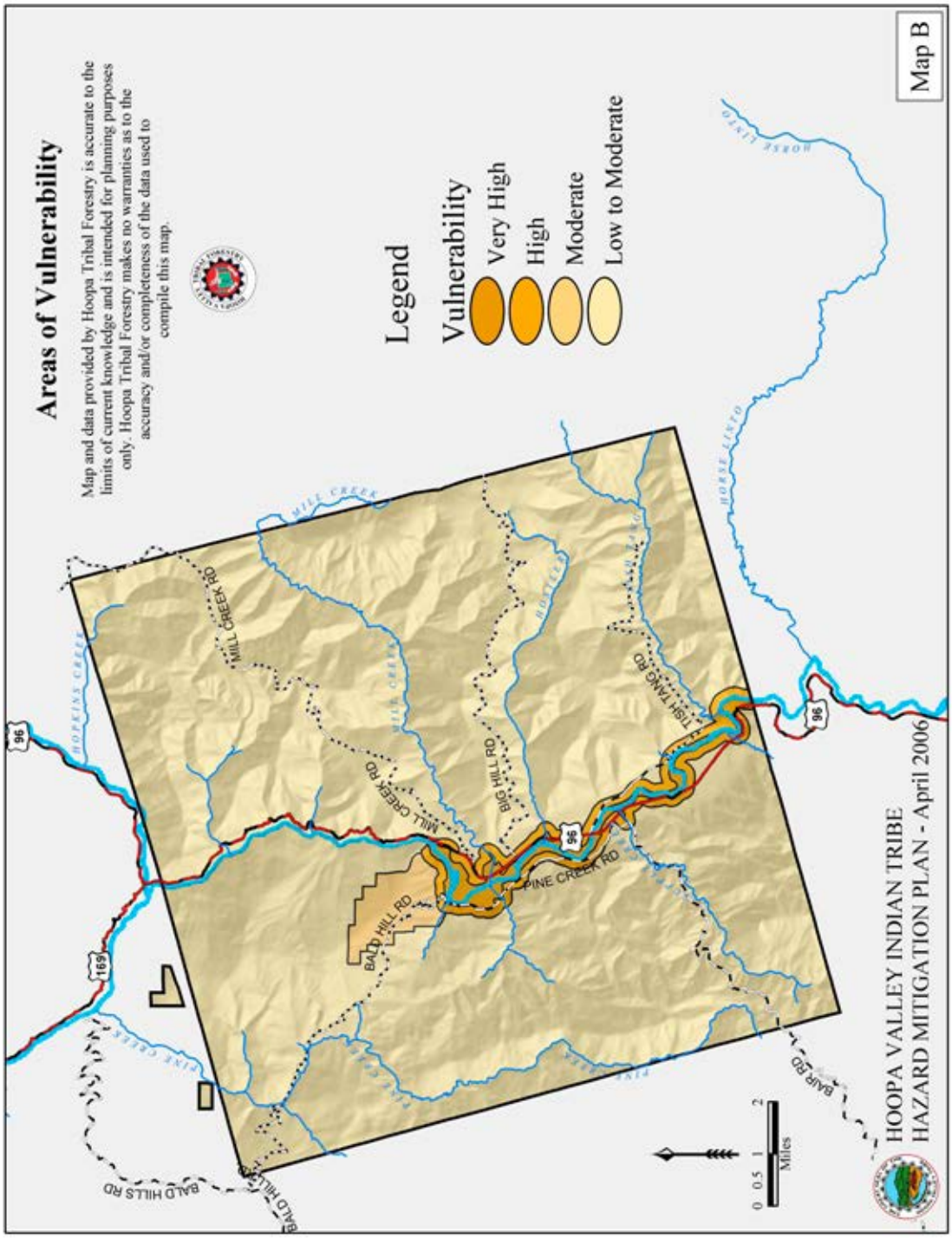
As you can see in Table 6, hazards are analyzed by risk and extent between the three hazard assessment zones (Urban, Upland Residential, and Upland Region) and rated on a scale of High, Low or None or similarly Wide, Limited, and N/A. In an effort to identify highest priority to the Hoopa Tribe a combination of Risk and Extent was considered and the Hazards are given specific actions within Chapter 4, the Mitigation Planning section. Also a STAPLEE form was completed with all the hazard mitigation actions and ranked according to Hoopa Tribal Priority and can be found in Appendix A.

Table 10 – Hazard Risk Occurrence Assessment for Hoopa Valley Reservation

Hazard Assessment	Occurrence									Probability of Reoccurrence								
Hazard Assessment Area	Urban Zone			Upland Residential			Upland Region			Urban Zone			Upland Residential			Upland Region		
Hazards	Frequent	Infrequent	n/a	Frequent	Infrequent	n/a	Frequent	Infrequent	n/a	High	Low	n/a	High	Low	n/a	High	Low	n/a
Dam Failure		x				x			x		x				x			x
Drought		x			x			x			x			x			x	
Earthquake		x			x			x			x			x			x	
Flood		x				x			x		x				x			x
Landslides		x			x			x			x		x			x		
Severe Storm Event		x			x			x		x			x			x		
Wildland Fires	x			x			x			x			x			x		

Table 7 shows by occurrence and probability of reoccurrence between the three hazard assessment zones (Urban, Upland Residential, and Upland Region) and rated on a scale of Frequent, Infrequent or N/A or similarly High, Low, and N/A. In an effort to identify highest risk to the Hoopa Tribe, a combination of Table 6 and Table 7 were considered and the Hazards are given specific actions within Chapter 4, the Mitigation Planning section. Also a STAPLEE form was completed with all the hazard mitigation actions and ranked according to Hoopa Tribal Priority and can be found in Appendix A.

Map B - Areas of Vulnerability, Hoopa Valley Indian Reservation



Dam Failure and Subsequent Flooding

The Trinity River, which flows through Hoopa Valley on the Reservation, has two major dam structures the Lewiston Dam and the Trinity Dam located approximately 95 and 102 miles respectively, upstream from the Reservation (see Map C). These two dams impound approximately 2,462,400 acre feet of water at capacity, of this total 14,700 acre feet is impounded by Lewiston Dam in Lewiston Lake and 2,447,700 acre feet by Trinity Dam in Clair Engle (Trinity) Lake. Both dams are earth filled dams constructed in the early 1960's by the Bureau of Reclamation as part of The Central Valley Water Project in California. The Trinity Dam is the larger of the two dams with a structure height of 530 feet to Lewiston Dam's 91 feet.

The two dams are located in the Klamath Geologic Province of Northern California, which is seismically fairly stable. However there exist the potential for a magnitude 8.9-9.0 earthquake with an epicenter on the Cascadia Subduction Zone some 245 miles west of the two dam sites or a series of moderate to high magnitude earthquakes caused by eruptive activity of Mount Shasta, a historically active volcano, 52 mile Northeast of Lewiston and Trinity Dam sites. These two sources of potential seismic activity pose a threat to both dams.

The release of energy from an 8.9-9.0 magnitude Subduction Zone earthquake or a series of 6.0-7.0 eruption related earthquakes could sufficiently weaken the structural integrity of either the Lewiston or Trinity Dam to the point of failure. The failure of the Trinity Dam would instantly release the 2,447,700 acre feet of water impounded by the dam in Clair Engle Lake. The waters of Clair Engle Lake would surge downstream flow into Lewiston Lake and breach the Lewiston Dam. The combined waters of Clair Engle and Lewiston Lakes, some 2,462,400 acre feet would then surge down the stream channel of the Trinity River as a wave front exceeding at time 150 feet in height and at a velocity of approximately 15 miles/hour. At this rate the wave front would take approximately seven hours to reach Hoopa Valley on the Reservation (see Map C).

The surge of water flowing down the Trinity River channel from the breached Trinity and

Lewiston dams would completely inundate the Hoopa Valley to an average depth of approximately 225 feet above the current Hoopa gage datum of 274.82 feet. At this depth all structures and infrastructure located on the floor of Hoopa Valley would be inundated and would suffer near total destruction from the force of the wave front as it passed through the valley (see Map D).

Highway 96 the principal access to and egress from Hoopa Valley would be severely impacted by the flood waters surging down the Trinity River channel from a breach of Trinity and Lewiston dams. Major sections of the highway, both North and South of Hoopa Valley would be destroyed making Highway 96 impassable eliminating it as a variable emergency route for evacuations or relief efforts. Although immediate relief could be somewhat of an option if this worst case scenario were to occur, as the wave of water would completely destroy every town between Lewiston and the Mouth of the Klamath River creating one of the worst tragedies on US soil over the past century.

It is not unreasonable to expect near 100% lost of all structures and infrastructure in Hoopa Valley caused by the wave front and inundation of the flood waters produced by a breach of both the Trinity and Lewiston dams. According to USBOR Models and calculations, it would take the wave front approximately seven (7) hours to reach Hoopa Valley therefore; there would be adequate time to evacuate the entire resident population thus reducing the probability injuries and/or deaths to near 0%.

Past and Probability of Future Dam Breach/Failures

Prediction of a dam breach based on past occurrences is in this case not possible since nether dam has failed since construction. The probability of both the Trinity and Lewiston dams breaching is extremely low. Both dams were constructed in the early to mid 1960's and as such the design criteria and construction of the dams took in to account the potential seismic activity of the area. In addition both dams are continuously monitored by the Bureau of Reclamation for their structural integrity thus early signs of potential failure would be noted and remedial and corrective action taken. There has never been an occurrence of a dam failure in our region in documented history.

Potential Dam Breach and Flood Losses

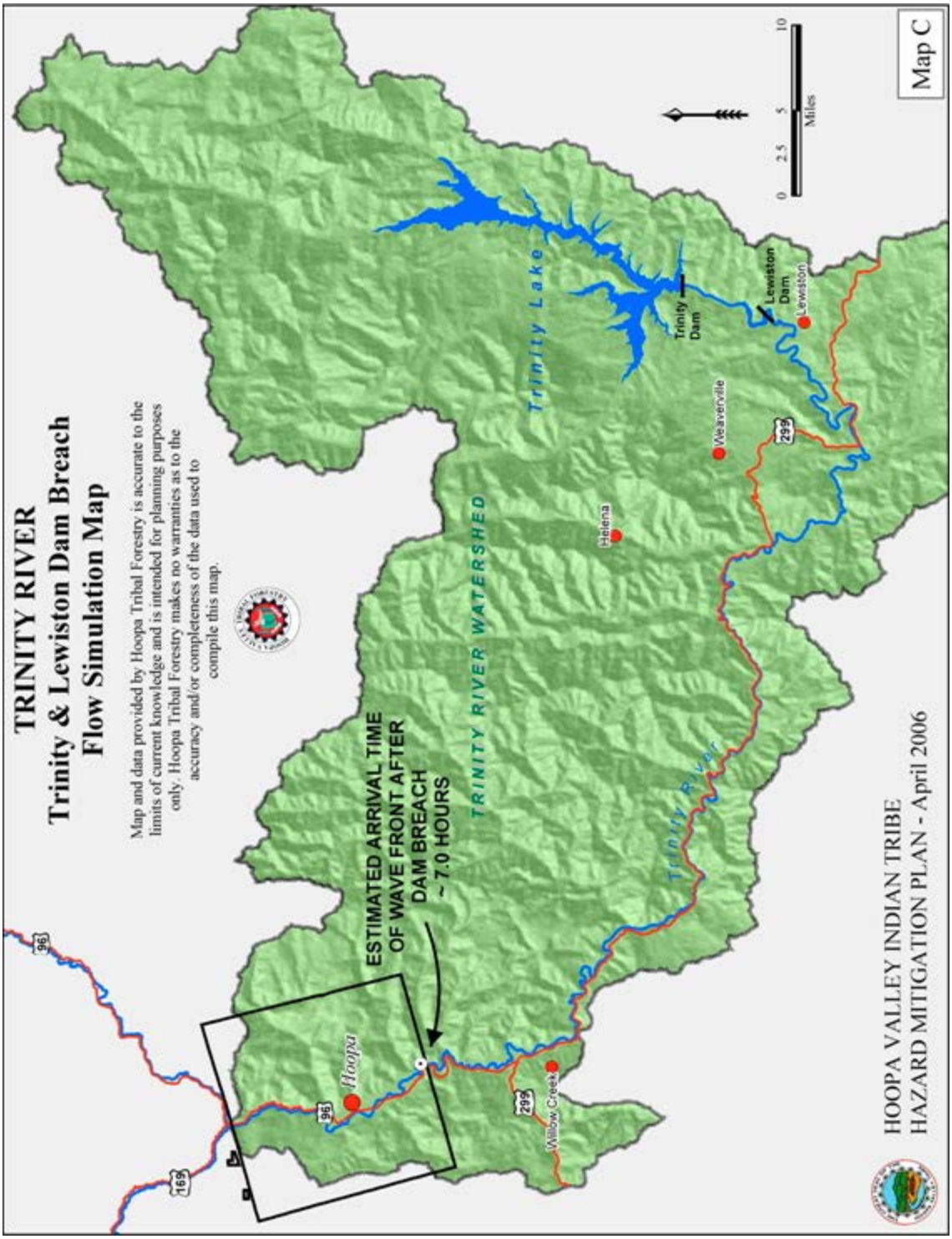
The recover period from such catastrophic events of a dam breach and ensuing flood would be lengthy. Requiring a number of years to rebuild the Hoopa Valley community and costly in terms of the amount of monies necessary to pay for the recovery. Given the length of time for recovery and its high cost, it's fortunate the hazard posed by a dam breach on the Trinity River has a very low probability. Table 8 lists the flood vulnerabilities and potential losses of structures to a dam breach flood event.

Table 11 – Potential Dam Breach Flood Losses

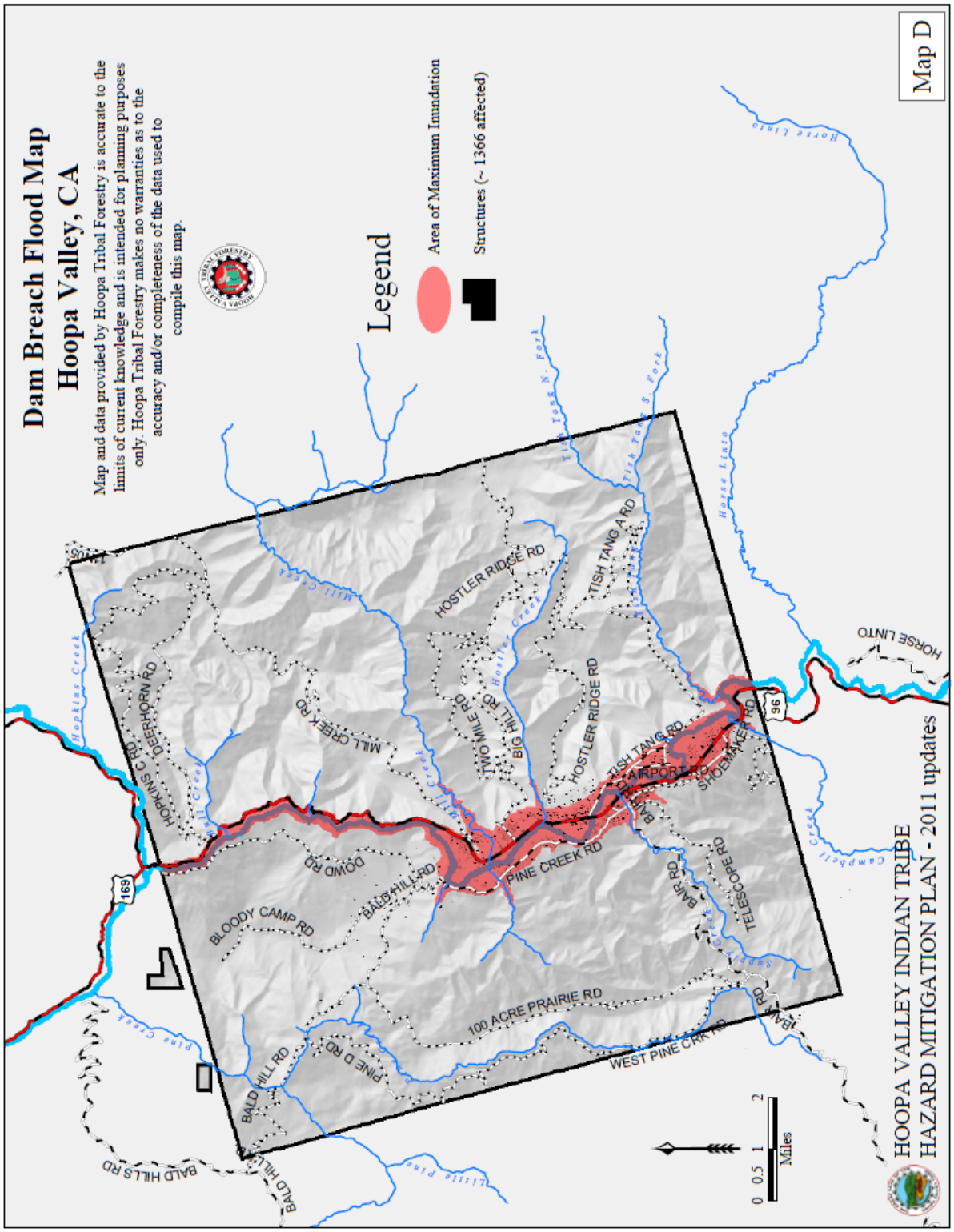
Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	26 1078 5	$34 mil $129 mil $137 mil	$21 mil $22 mil $1.4 mil	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 25 0	$300 k $3 mil n/a	$50 k $510 k n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

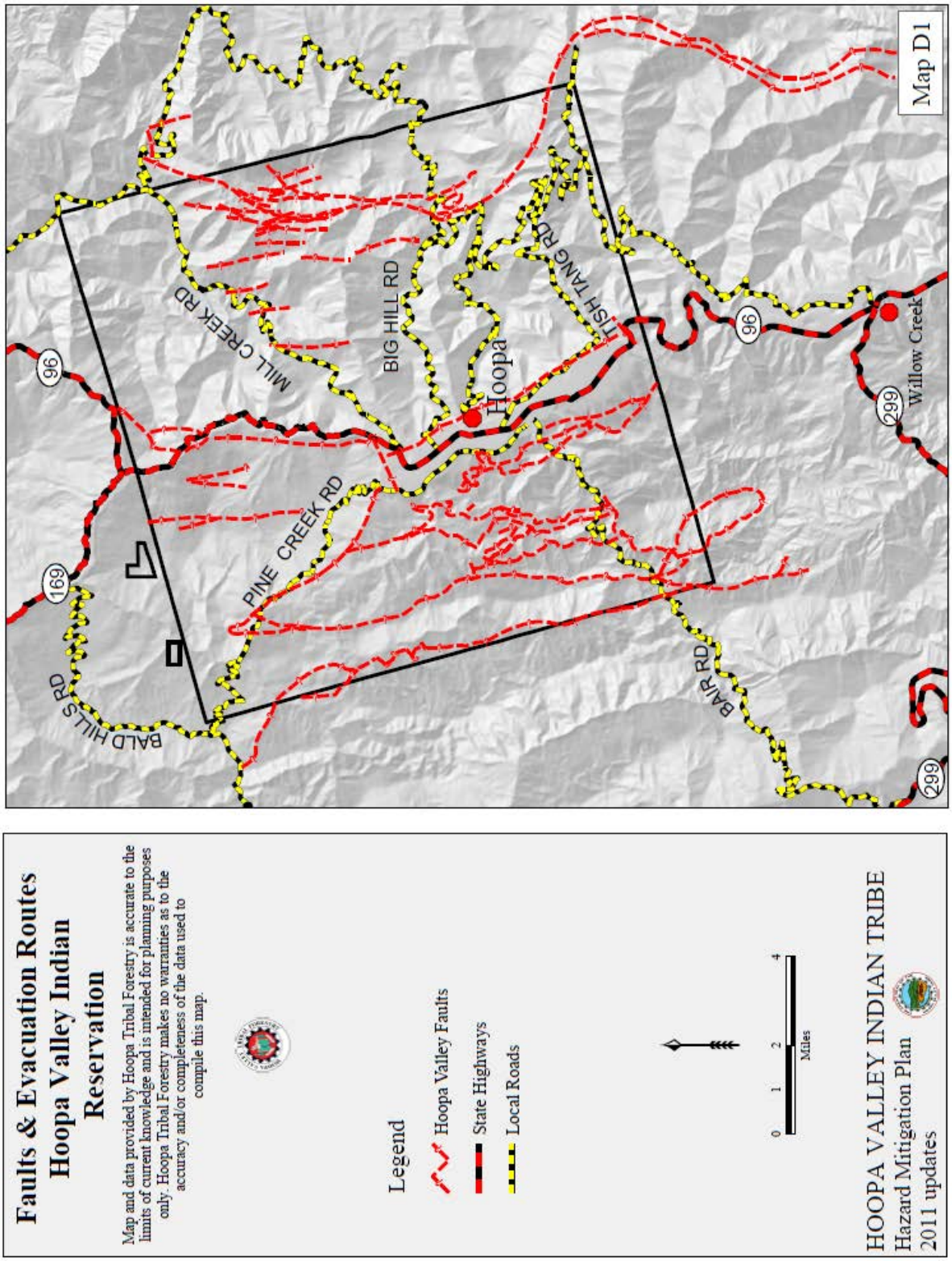
1 – T=Tribal Ownership, P=Private ownership, O= Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, residences, and other structures counted from GIS layer identified on 2005 aerial photos.

Map C - Trinity River, Trinity and Lewiston Dam Breach Flow Simulation



Map D - Dam Breach Flood, Hoopa, CA





Map D1 – Faults and Evacuation Routes, Hoopa, CA

Drought

Drought is a normal, recurrent feature of climate, although many erroneously consider it a rare and random event. It occurs in virtually all climatic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate.

Drought is a hazard of nature. Although it has scores of definitions, it originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Drought should be considered relative to some long-term average condition of balance between precipitation and evapotranspiration (i.e., evaporation + transpiration) in a particular area, a condition often perceived as "normal". It is also related to the timing (i.e., principal season of occurrence, delays in the start of the rainy season, occurrence of rains in relation to principal crop growth stages) and the effectiveness (i.e., rainfall intensity, number of rainfall events) of the rains. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with it in many regions of the world and can significantly aggravate its severity.

For this section on droughts which pose a hazard to the Hoopa Valley Indian Reservation the term drought is used more in its meteorological sense then hydrological. Though all discussions of droughts are focus on some period of below normal water supply, meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

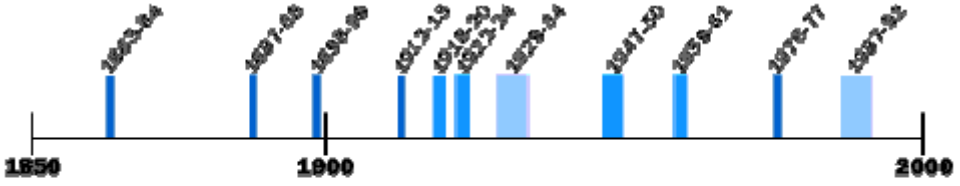
The region of Northern California where Hoopa Valley is located has historically had a number of droughts or more explicitly periods of below normal precipitation. The definition of "normal" precipitation or annual rainfall for Hoopa Valley is 58 inches, but

the “normal or average” precipitation value ranges widely over Northern California from less then 30 inches in the inland areas to over 100 inches for some of the coastal areas. Not only is there a wide range in the values for “normal or average” annual precipitation through out Northern California, but these values change over very short geographical distances, because of the mountainous terrain. The precipitation value of 58 inches for Hoopa Valley is very much site-specific to the Valley, and not for the Reservation as a whole. Due to the nature of droughts and the lack of concrete locations of such an event, there is no location map of the Reservation located in this document as a drought can virtually effect the entire Reservation at any time.

Past and Probability of Future Droughts

The history of past droughts in Northern California can be trace back into prehistoric times using paleoclimatic data. For this document consideration will only be given to past recorded drought events. Figure 1 is a time line representing the years 1850 to 2000 showing the individual episodes of droughts of record. As shown there have been eleven periods of drought of varying severity over the past one hundred and fifty years in Northern California. The majority of the droughts of record, seven (7) in all, have been one to two year events. The remaining four events range from three to five years in duration with the longest period of five years occurring twice in the last one hundred and fifty years from 1929 to 1934 and 1987 to 1992 respectively.

Figure 1 – California's Multi-Year Historical Dry Periods 1850-present



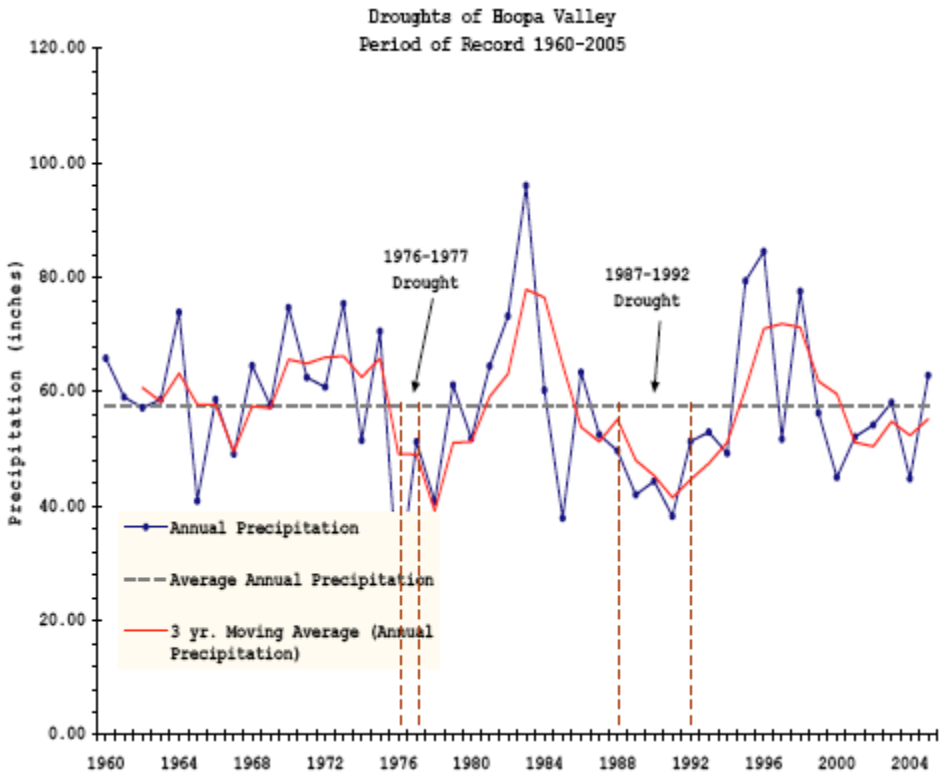
Dry periods prior to 1900 estimated from limited data. Covers dry periods of statewide or major regional extent. (California Department of Water Resources)

The two most recent drought events 1976 and 1987 are documented for Hoopa Valley and the Reservation by the annual precipitation records for the valley for the period 1960 to present. Figure 2 is a chart of this annual precipitation data and includes a plot of the average annual precipitation of 58 inches and a three-year moving average of the annual precipitation. The two drought events 1976 and 1987 are evident by the significant decrease in the annual precipitation and the prolonged periods of recovery form those decreases.

Estimating the probable recurrence interval for droughts is not straightforward because of the high degree of randomness in long-term climactic patterns. This high degree of randomness makes estimating drought recurrence using historic occurrence data problematic. Because of these issues the attempt used here to estimate the probable recurrence of drought for the Hoopa valley Indian Reservation is simplistic in its nature and makes the assumption that the pervious hundred (100) years of record of drought is

representative of the "normal" drought cycle for Northern California where the Reservation is located. The past century's data (1900-2000) records eight (8) periods of drought (see Figure 2) with durations ranging from one to five years. Using this data an eight year average recurrence interval can be calculated which would suggest the Reservation faces the probability on average of a significant drought ever eight years.

Figure 2 – Precipitation in Hoopa Valley Identifying Droughts from 1960-2005



Potential Losses from Drought

At some future date it may be possible to assemble enough data to estimated potential losses by a drought on the Hoopa Valley Indian Reservation but not at this writing. Little if any data is keep on the losses caused by drought to small scale agriculture on the Reservation. In addition the Reservation economy is not based on any large scale agricultural activities other then timber harvest. Since timber harvests are not generally effective by short term drought conditions, calculating potential drought losses using timber sale revenues is not possible. There are also no conceivable structure losses that could be attributed to drought at this time. See Table 9.

Table 12 – Potential Drought Losses

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	High	T	0	$0	$0	Human Health at risk although no structure or content losses.
		P	0	$0	$0	
		O	0	$0	$0	
Upland Residential	Very High	T	0	$0	$0	Vulnerability Very high due to the location off the Tribal water system
		P	0	$0	$0	
		O	0	$0	n/a	
Upland Region	None	T	n/a	n/a	n/a	No impacts to drought
		P	n/a	n/a	n/a	
		O	n/a	n/a	n/a	

1 – T=Tribal Ownership, P=Private ownership, O= Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, residences, and other structures counted from GIS layer identified on 2005 aerial photos.

Earthquakes

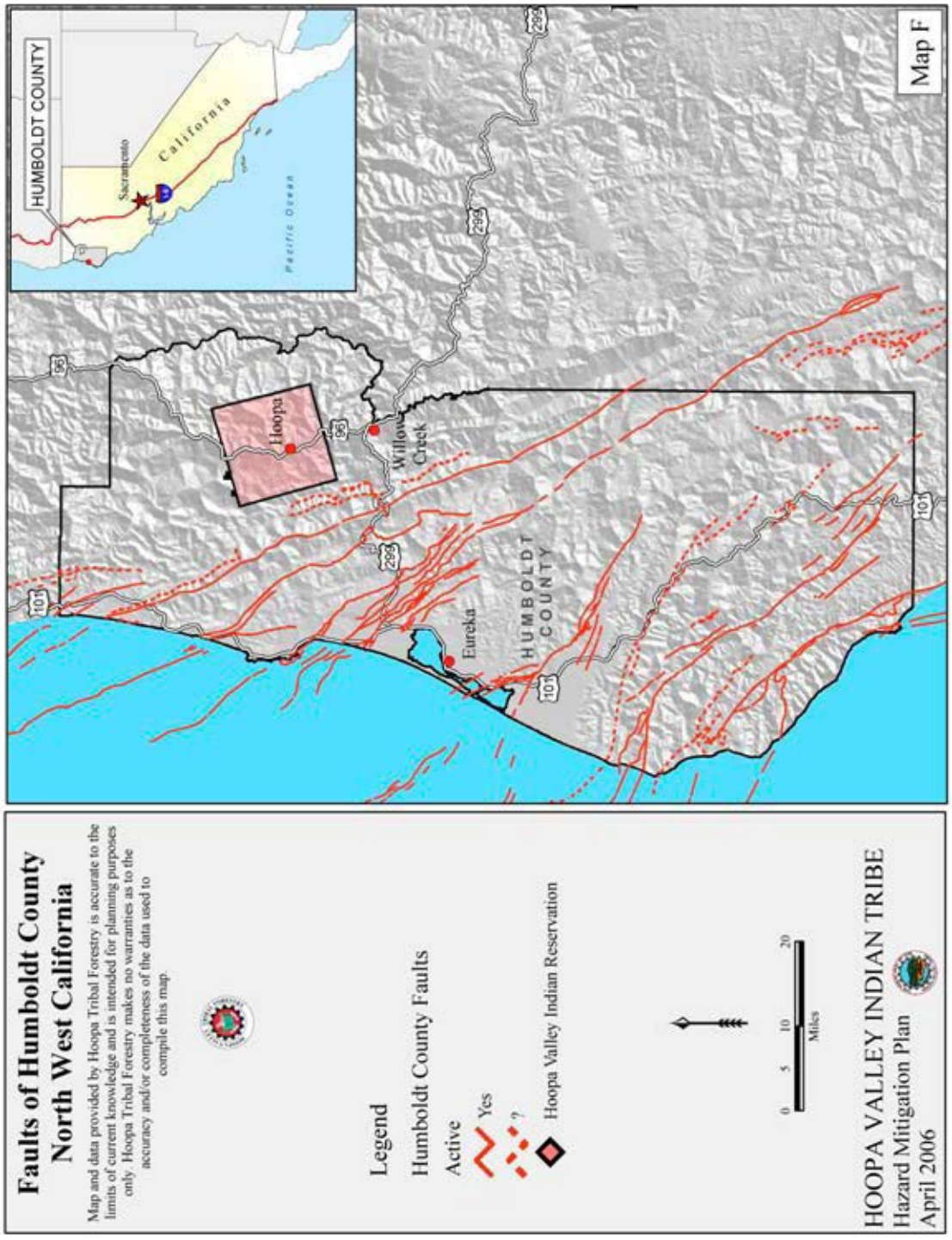
Northwestern California, the location of Hoopa Valley Indian Reservation, is seismically active with both an oral history and geologic record of moderate to large-scale earthquakes. An earthquake is ground shaking that is caused by the sudden release of slowly accumulated pressure within the crust of the Earth or within the tectonic plates below the crust. The movement of tectonic plates towards each other (convergence) generates this pressure. Northwestern California is located above a convergent plate boundary where the Gorda and North American plates meet. This convergent plate boundary or subduction zone extends northwest along the entire length of Oregon, Washington and the Island of Vancouver. This northwestern extension of the subduction zone is a convergent plate boundary where the Juan de Fuca and North American tectonic plates meet. The entire convergent plate boundary extending from Northwestern California to Vancouver Island is called the Cascadia Subduction Zone (see Map E). The Cascadian Subduction Zone "has produced magnitude 9.0 or greather earthquakes in the past and undoubtedly will in the future" (Network). In addition to the Cascadia Subduction Zone, Northwestern California is vulnerable to moderate to large-scale earthquakes produced by ruptures on the San Andreas Fault and the Mendocino Fracture Zone both of which are tectonic plate boundaries.

While earthquakes along these fault zones occur infrequently, plate movement can produce major earthquakes on a more frequent time scale on the large and complex system of faults that underlies Humboldt County in Northwestern California and the Hoopa Valley Indian Reservation (see Maps F & G). Movement on this complex system of faults produces lower magnitude earthquakes. Even thought the magnitudes of these earthquakes are significantly lower than a Subduction Zone earthquake, they produce sufficiently strong ground shaking which can cause substantial damage to nearby structures. Earthquakes can trigger other geologic and soils failures that contribute to total damages. While surface fault rupture can produce damage to facilities and infrastructure astride the fault, such damage is generally less overall than the damage resulting from strong ground shaking and associated ground failures.

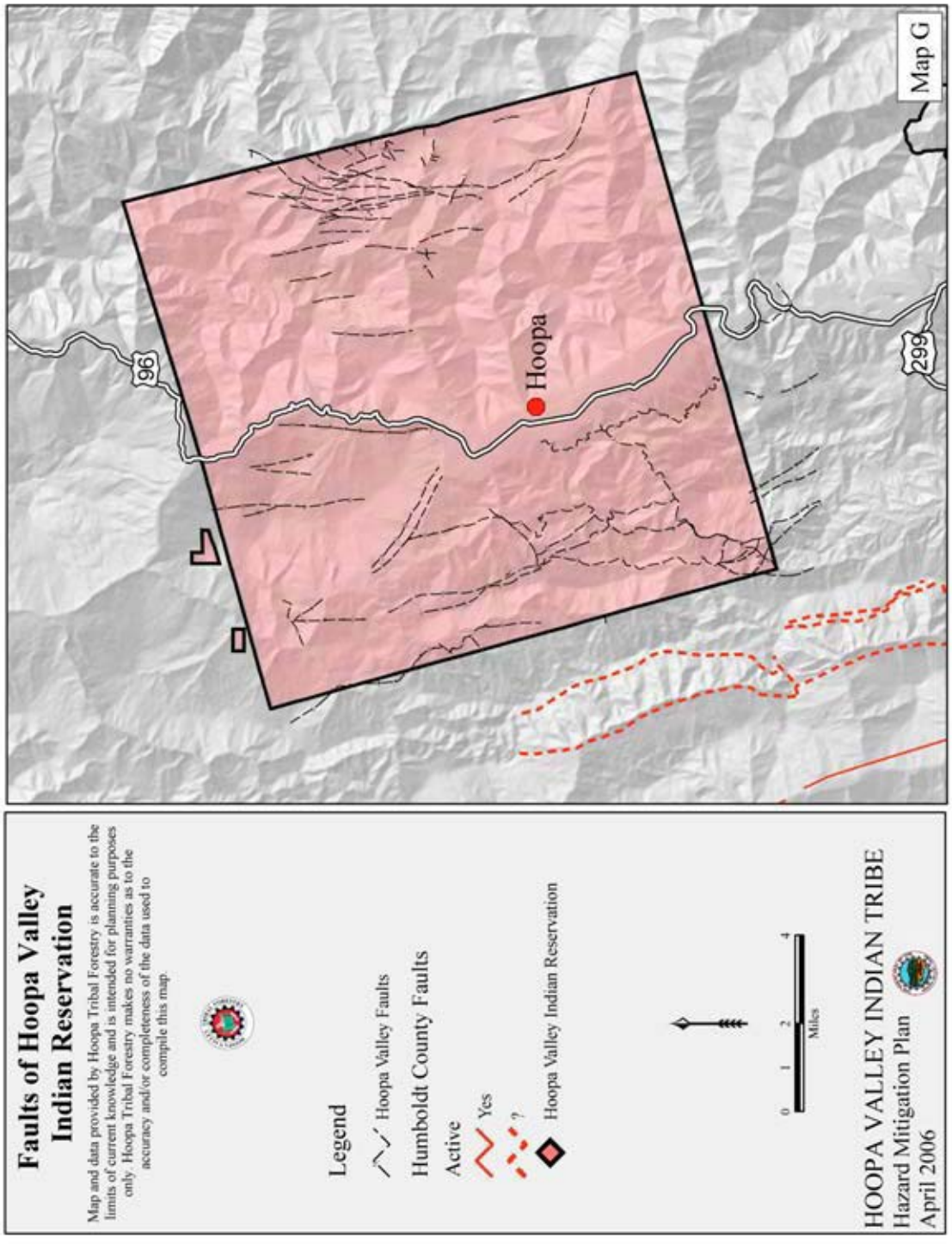
Map E - The Cascadia Subduction Zone*

*** U.S. Geological Survey**

Map F – Faults in Humboldt County



Map G- Faults in Hoopa Valley



These ground failures include landslides and slope failures, lateral spreading and slumping, and liquefaction of soils. Ground shaking, landslides, liquefaction, and amplification are the primary specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake. These four hazards are described below:

- Ground shaking is the motion caused by seismic waves generated by an earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter. Buildings on poorly consolidated and thick soils will typically have more damage than buildings on consolidated soils and bedrock.
- Earthquake-induced landslides are secondary earthquake hazards that result from ground shaking. They can destroy homes and the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake. Most vulnerable are developed areas with steep slopes.
- Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. Liquefaction results in the loss of soil strength and the ability of the soil to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.
- Soils and soft sedimentary rocks near the earth surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. Buildings and structures built on soft and unconsolidated soils can face greater risk. Amplification can also occur in areas with deep, sediment-filled basins and on ridge tops.

The sizes of earthquakes are commonly measured using the Richter magnitude scale, a mathematical tool developed in 1935 to compare earthquakes. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded by

seismographs. Adjustments are included for the variation in the distances between the various seismographs that record the event and the epicenter of the earthquake. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude of 5.3 might be computed for a moderate earthquake, and a strong earthquake might have a magnitude of 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude (i.e., magnitude 8 is 100 times greater than magnitude 6); 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 lower number (USGS 2003a).

The Richter scale is not used to express damage. An earthquake in a densely populated area that results in many deaths and considerable damage may have the same magnitude as an earthquake in a remote area that does no damage. Large magnitude earthquakes that occur beneath the oceans may not even be felt by humans. Recently, another scale called the moment magnitude scale has been devised for more precise study of great earthquakes. Further discussion of this scale and other measurements of earthquake movement and intensity are provided in Section 3.4.2. Most large earthquakes in the Pacific Northwest are shallow crustal, deep intraplate, or subduction zone (megathrust) earthquakes. These three types of earthquakes are summarized in Table 10.

Table 13 – Types of Earthquakes in the Pacific Northwest

Type	Depth	Frequency (Return Period)	Location of Epicenter	Comment
Crustal	Relatively shallow (6-12 miles)	Magnitude < 4: many per year Magnitude > 6: decades or more apart	Many faults in the region, active fault on the Reservation	Most common, but usually mild Potentially Mag. 7 near and/or on Reservation Aftershocks common
Intraplate	Relatively deep (25-40 miles)	Decades apart	Anywhere in the Region (Northern California, Western Oregon, Washington, and Vancouver Island.)	Potentially Mag. 7.5 Potentially near and/or on Reservation Few or no aftershocks
Subduction Zone, or Megathrust	Intermediate depth	500 years, on average (200 to 1,000 years apart)	Most likely under the ocean off the Pacific Coast	Potentially Mag. 9+ not close to Reservation a minute or more of strong shaking large aftershocks

Past and Probability of Future Earthquakes

Geologic evidence shows that the Cascadia Subduction Zone has generated great megathrust earthquakes, most recently about 300 years ago. This Cascadia megathrust earthquake is thought to have been magnitude 9 or greater (like recorded megathrust earthquakes in other regions, including the 1964 southern Alaska earthquake that measured magnitude 9.2). The average recurrence interval of these large Cascadia earthquakes is approximately 500 years, with gaps between events as small as 200 years and as large as 1,000 years. The evidence indicates that 13 great earthquakes have occurred in the Pacific Northwest over the last 6,000 years and a similar offshore event can be expected to happen sometime in the future. Such earthquakes may cause substantial damage to the coastal areas of the region, and they represent a considerable hazard to those who live in the region of Northwestern California where the Hoopa Valley Indian Reservation is located. In the interval between megathrust earthquakes, the tectonic plates become stuck together, yet continue to move towards each other. This causes tremendous strain and deformation of the crust of the Earth in the coastal region, which results in ongoing crustal and/or intraplate earthquake activity. Northwestern California is now in such an interval. Some of these onshore crustal or intraplate earthquakes can be quite large; in the past 153 years (see Table 11) there have been three magnitude 7.0+ earthquakes in the region of Northwestern California where the Hoopa Valley Indian Reservation is located.

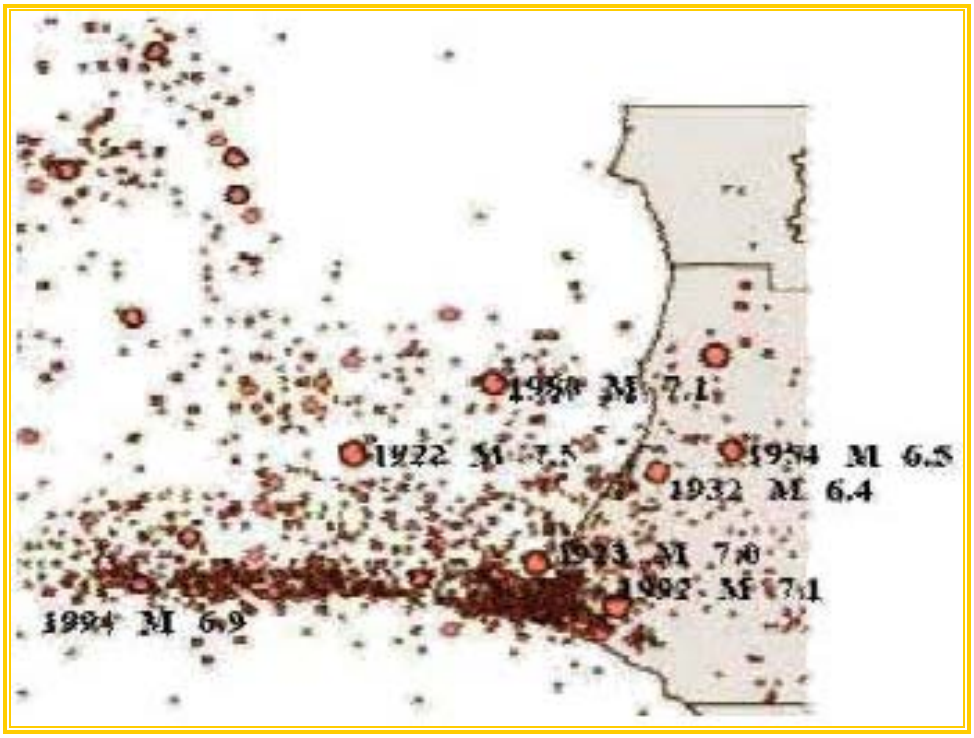
Northwestern California, in particular Humboldt County, the location of the Hoopa Valley Reservation, has an active history of earthquakes and a high probability of future earthquakes. This history of earthquakes and probability of future earthquakes includes all three types of earthquakes, crustal, intraplate, and subduction zone. Map H shows the location and magnitude of crustal and intraplate earthquakes (M>=5.5) which have occurred over the past one hundred fifty (150) years in or adjacent to Humboldt County, CA. Map I shows the location of M>=5.5 which have occurred within a 50 km radius of the Hoopa Valley Indian Reservation over the same time period including one magnitude 6.1 which occurred on the Reservation in 1884.

Table 14 – Magnitude 5.0 or Greater Earthquakes, NW California, 1853-1997*

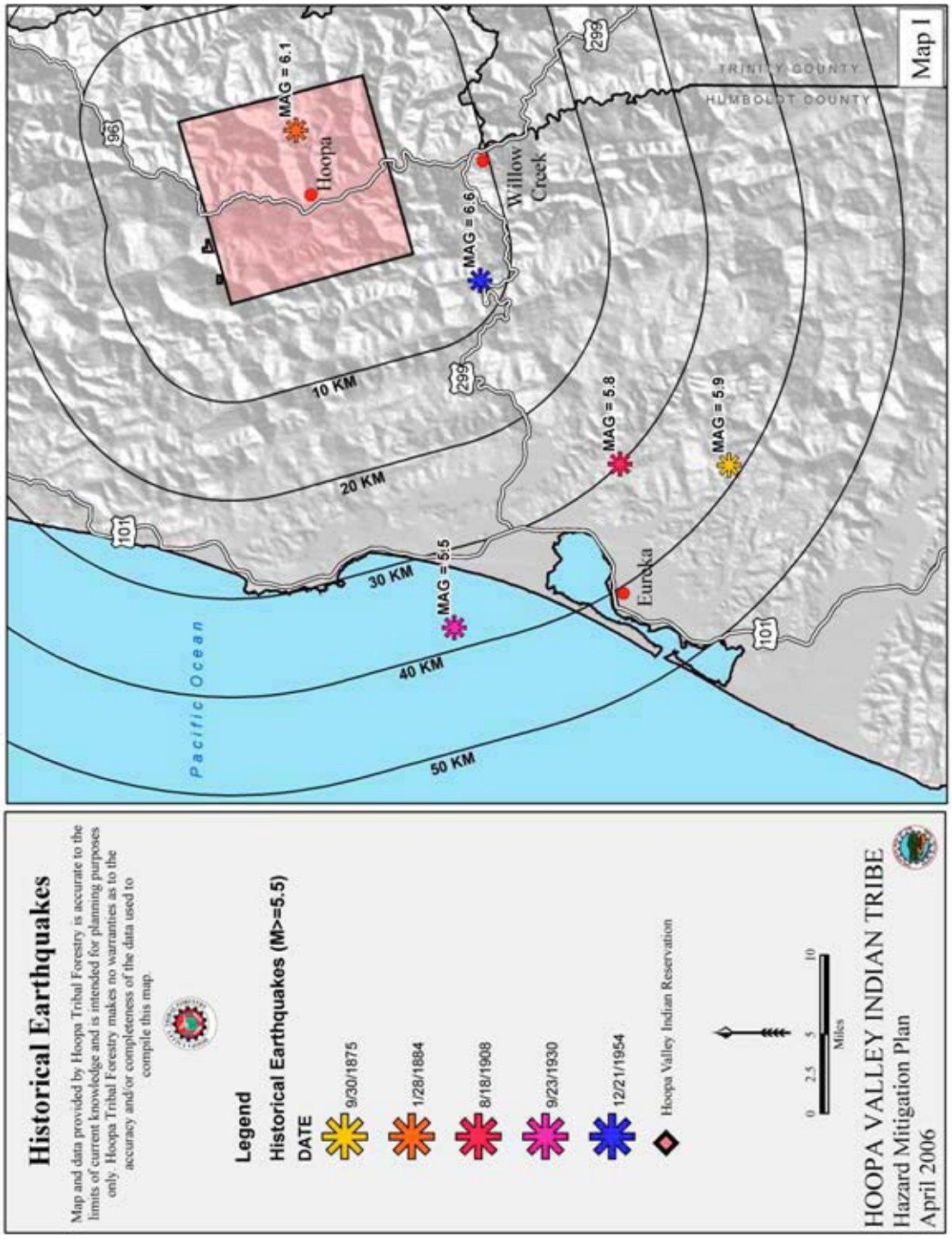
Date	Time GMT	LONG	LAT	MAG.	Notes
10/23/1853	11:00	-124.200	40.8000	5.5	Only reported from Eureka, MMI VI+
03/20/1855	0:30	-124.200	40.8000	5.5	Eureka
11/13/1860	0:00	-124.200	40.8000	5.5	Only reported from Eureka, MMI VI+
10/01/1865	17:15	-124.200	40.8000	5.5	Eureka, MMI VII
03/02/1871	21:05	-124.200	40.4000	6.3	Cape Mendocino
09/30/1875	12:30	-124.000	40.7000	5.9	Eureka vicinity
01/28/1884	7:30	-123.600	41.1000	6.1	Klamath Mountains
07/26/1890	9:40	-124.200	40.5000	6.3	Cape Mendocino
09/30/1894	17:36	-124.500	40.3000	6.5	Cape Mendocino region
04/23/1906	9:10	-124.500	41.0000	6.4	Located roughly offshore of Arcata
08/18/1908	10:59	-124.000	40.8000	5.8	Humboldt
10/29/1909	6:45	-124.200	40.5000	6.0	Cape Mendocino
01/22/1923	**9:04**	**-124.900**	**40.4000**	**7.2**	**Off Cape Mendocino**
09/23/1930	2:58	-124.200	40.9500	5.5	Arcata
12/11/1930	9:00	-124.800	40.4000	5.5	Offshore Cape Mendocino
06/06/1932	8:44	-124.300	40.8000	6.4	Eureka
10/03/1941	16:13	-124.800	40.4000	6.4	West of Cape Mendocino
10/08/1951	4:10	-124.500	40.2500	6.0	Cape Mendocino
12/21/1954	19:56	-123.780	40.9300	6.6	East of Arcata
06/06/1960	1:17	-124.880	40.8200	5.7	Arcata
08/23/1962	19:29	-124.330	41.8500	5.6	Offshore Trinity Co.
12/10/1967	12:06	-124.700	40.5000	5.6	West of Cape Mendocino
11/08/1980	**10:27**	**-124.670**	**41.1200**	**7.4**	**West of Eureka**
08/24/1983	13:37	-124.830	40.3800	5.6	Offshore of Cape Mendocino
07/31/1987	23:56	-124.410	40.4200	6.0	Offshore of Cape Mendocino
08/17/1991	19:29	-124.238	40.2872	6.2	11km Southwest of Petrolia
04/25/1992	**18:06**	**-124.229**	**40.3327**	**7.2**	**Cape Mendocino area**
04/26/1992	7:41	-124.596	40.4272	6.6	West of Cape Mendocino
04/26/1992	11:18	-124.585	40.3753	6.6	West of Cape Mendocino
01/22/1997	7:17	-124.394	40.2720	5.6	Punta Gorda

* California Geological Survey

Map H - Earthquake Occurrence Humboldt County, CA 1853-2003



Map I - Earthquakes M=>5.5 with in 50 km of the Hoopa Valley Reservation



The most recent Cascadia Subduction Zone earthquake occurred in 1700 and was estimated as a magnitude 9, which makes it one of the largest recorded earthquakes on the Earth. The undersea Cascadia thrust fault ruptured along a six hundred twenty five (625) mile length, from Northern California to the middle of Vancouver Island, producing tremendous shaking and a huge tsunami that sweep across the Pacific. This earthquake was identified through Japanese records of the tsunami, which did considerable damage in Japan and through the geologic record of this event found in the costal regions of the Pacific Northwest. Along the Pacific Northwest coast, it raised some land elevations up to fifty (50) feet, caused underwater landslides, and caused the subsidence and drowning of coastal old growth trees. Oral traditions of native peoples living on the coast of Northern California indicate the tsunami destroyed coastal villages and the ground shaking destroyed other inland villages. The shaking was reported so violent people could not stand, and so prolonged it made them sick.

In the past one hundred and fifty years two crustal/intraplate earth quakes have occurred with the potential to cause moderate damage to structures and infrastructure on the Reservation plus injury and/or death to its inhabitants. One of these earthquakes (M= 6.1) occurred on the Hoopa Valley Indian Reservation on January 28, 1884. An earthquake of this magnitude with an epicenter located on the Reservation could have most certainly caused damage to structures in Hoopa Valley and had the potential to cause injury and/or death, but the exact extent of damage or casualties is not known. The other earthquake with the potential of impacting the Reservation occurred on December 21, 1954. The epicenter of this earthquake was some 20km to the southwest of Hoopa Valley and it is reported to have caused over two million ($2,000,000) dollars of damage plus an unknown number of injuries and one death. The reports of the damages and casualties from this earthquake are not specific, so it is not possible to state what effect the earthquake had on the Hoopa Valley Indian Reservation. However, due to the close proximity to fault lines – earthquake has the potential to affect the Hoopa Valley Indian Reservation in its entirety.

Probability of Reoccurrence

The sizes of earthquakes are described using several methods that quantify the magnitude and intensity in different ways. The Richter Scale measures earthquake magnitude using the amplitude of seismograph waves. A more recent logarithmic method, Moment Magnitude, measures the energy released at the source of the earthquake, and is also determined from measurements on seismographs. Moment magnitude measurements are thought to describe the strength of large earthquakes more accurately than the Richter Scale (USGS 2003a). The Modified Mercalli Intensity (MMI) measures the strength of shaking produced by an earthquake at a certain location; it is determined from effects on people, human structures, and the natural environment. The MMI value for each earthquake varies from location to location (USGS 2002). Table 12 shows the relationship between moment magnitudes and MMI levels of earthquakes, as well as the associated perceived motion and level of damage typically observed at locations near the epicenter of an earthquake. Commonly, sites on soft ground or alluvium have intensities two to three units higher on the Modified Mercalli Intensity scale than sites on bedrock. This is important on the Hoopa Valley Indian Reservation because the floodplain of the Trinity River, the Urban Zone, is comprised of alluvium.

Table 15 – Relationship between Moment Magnitude and Modified Mercalli Intensity*

Moment Magnitude	Modified Mercalli Intensity	Description of Perceived Motion and Level of Damage Associated with Each Intensity Level
1.0 - 3.0	I	**I -** Not felt except by a very few people under especially favorable conditions
3.0 - 3.9	II - III	**II** -Felt only by a few persons at rest, especially on upper floors of buildings. **III -** Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.
4.0 - 4.9	IV - V	**IV -** Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. **V -** Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0 - 5.9	VI - VII	**VI -** Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight. **VII** - Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6.0 - 6.9	VII - IX	**VIII -** Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. **IX -** Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.0+	X or higher	**X -** Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent. **XI -** Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly. **XII -** Damage total. Lines of sight and level distorted. Objects thrown into the air.

* U.S. Geological Survey (2002)

One measure of the strength of earth movement in an earthquake is peak ground acceleration (PGA), which is expressed as a percentage of the force due to gravity (g). For example, a PGA of 20 represents acceleration equal to 20 percent of the force due to gravity. The PGA is the maximum acceleration of the ground during the course of the earthquake motion, and is related to the force a building will receive during an earthquake. This force will vary between locations based on the distance from the earthquake epicenter and on the nature of the soils or rock in a location. Table 13 shows the correlation between the Modified Mercalli Intensity scale, PGA values, perceived shaking, and potential damage. A PGA of nine to eighteen would be perceived as strong shaking and would potentially result in light overall damage (FEMA 2001a). A PGA of

about ten may be the approximate threshold of damage to older (pre-1965) dwellings or dwellings not made to resist earthquakes (USGS 2003b). This value should not be used in the case of particular buildings because (1) the relation between intensity and peak acceleration is quite variable; (2) for more distant sites, longer duration ground motions may cause damage at lower acceleration values; and (3) buildings differ greatly in their vulnerability (USGS 2003b).

Table 16 – Modified Mercalli Intensity, PGA Equivalents, and Potential Effects*

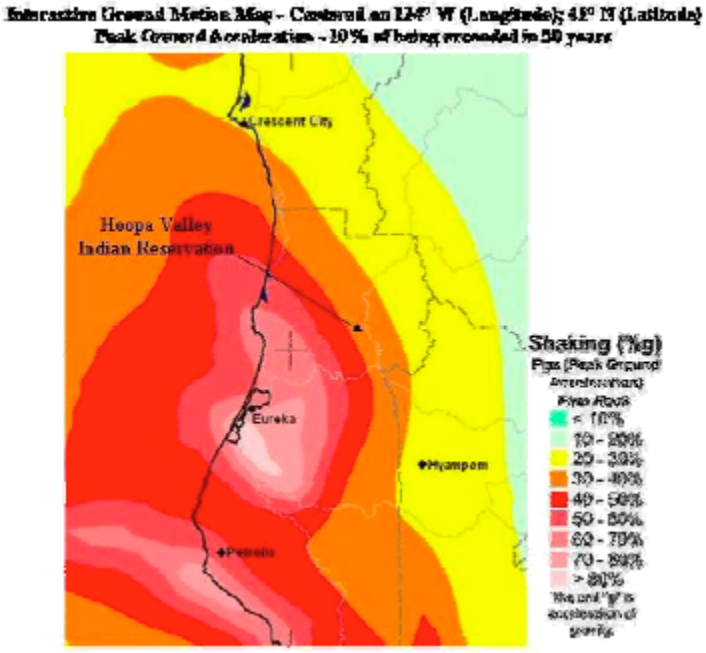
MMI	PGA	Perceived Shaking	Potential Damage
IV	1.4 - 3.9	Slight	None
V	3.9 - 9.2	Moderate	Very Slight
VI	9.2 - 18	Strong	Slight
VII	18 - 34	Very Strong	Moderate
VIII	34 - 65	Severe	Moderate to High
IX	65 - 124	Violent	High
X	> 124	Extreme	Very High

*Federal Emergency Management Agency (2001)

The National Seismic Hazard Mapping Project of the United States Geological Survey (USGS) Earthquake Hazards Program (see Map J) indicates that an earthquake producing a PGA ranging from 30-40 on the Hoopa Valley Indian Reservation has a ten percent probability of exceedance over 50 years (or an average occurrence of once in 475 years, or approximately a 0.2 percent chance of occurring in any one year). The USGS data and the information in Table 12 indicate that, since the MMI categories represent a range of PGA values, the chance the Reservation will experience an earthquake that produces very severe shaking and which results in moderate to high potential damage (i.e., a PGA greater than 34) is somewhat greater than ten percent over 50 years (or more frequent than once in 475 years). It is important to realize that the PGA probabilities described above were calculated using all known potential earthquake sources and all magnitudes for each source that were believed possible in the vicinity of the location (USGS 2001b). An average probability was determined for each magnitude-location pair and the probabilities were added to provide the overall probability for a specific level of ground

motion. The presence of unknown or underestimated earthquake sources would mean the chance of a strong earthquake is greater.

Map J - Peak Ground Acceleration, Humboldt County



In considering potential damage to structures on the Reservation, it is important to realize that impacts will vary with the local geologic conditions and the extent to which mitigation measures were taken during either construction or retrofitting of structures. Sites and structures on soft soil or alluvial deposits, such as the Trinity River floodplain may experience damage that is one to two categories higher than the average potential damage on the Reservation. The level of seismic design incorporated into structures is an important factor to consider in these areas of greater potential vulnerability.

Potential Earthquake Losses

Without reliable records of past earthquake damage on the Reservation and given the most potentially damaging earthquake would be a Cascadia Subduction Zone event, it is difficult to predict earthquake losses for the Reservation. A megathrust earthquake of magnitude 8-9 with an epicenter on the Cascadia Subduction zone would produce a strong motion of 30-40 PGA, which is sufficient energy to cause moderate to heavy damage (see Table 14). But the extent of the damage is dependent on adherence to

existing standards in the Uniform Building Code during construction practices of structures and infrastructure on the Hoopa Valley Indian Reservation

Table 17 – Vulnerability and Potential Losses to Structures from an Earthquake

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	26 1078 5	$34 mil $129 mil $137 mil	$21 mil $22 mil $1.4 mil	All structures and infrastructure are vulnerable.
Upland Residential	High	T P O	0 25 0	n/a $3 mil n/a	n/a $510 k n/a	All structures and infrastructure vulnerable
Upland Region	High	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	No structures

1 – T=Tribal ownership, P=Private ownership, O=Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, private residences, and other structures counted from GIS layer of all structures identified on 2005 aerial photos.

Floods

Riverine flooding is a naturally occurring event and occurs when the discharge of a river or stream exceeds the capacity of its channel to contain the volume of water flowing through it. This excess volume of water over tops the river or stream banks inundating the adjacent land area to a depth related to the quantity of excess discharge. This section will describe past flood events, flood vulnerability, and potential flood losses on the Reservation.

Past and Probability of Future Flood Events

Past flood events on the Hoopa Valley Indian Reservation have been caused by the Trinity River over topping its banks inundating areas of Hoopa Valley. During the period of record for Trinity River flows in Hoopa Valley, 1912-present (93 years), there has been one severe flood event in 1964, one major flood event in 1955, one near flood event in 1973, and two monitor events in 1940 and 1958 respectively (see Table 15). Flood stages for the Trinity River based on stage heights at the USGS Hoopa gage are detailed in Table 16 (Flood Stages Hoopa Valley, CA) and Map K - Flood Stages Hoopa Valley, CA. A description of the December 22, 1964 flood event and extent of damage caused by it is covered in this section. Documentation of the other reported flood events is not possible because of a lack of readily available records concerning extent of flooding and damage caused by them.

Table 18 – Trinity River Peak Flow Events from 1919-2004, at USGS Hoopa Gauge

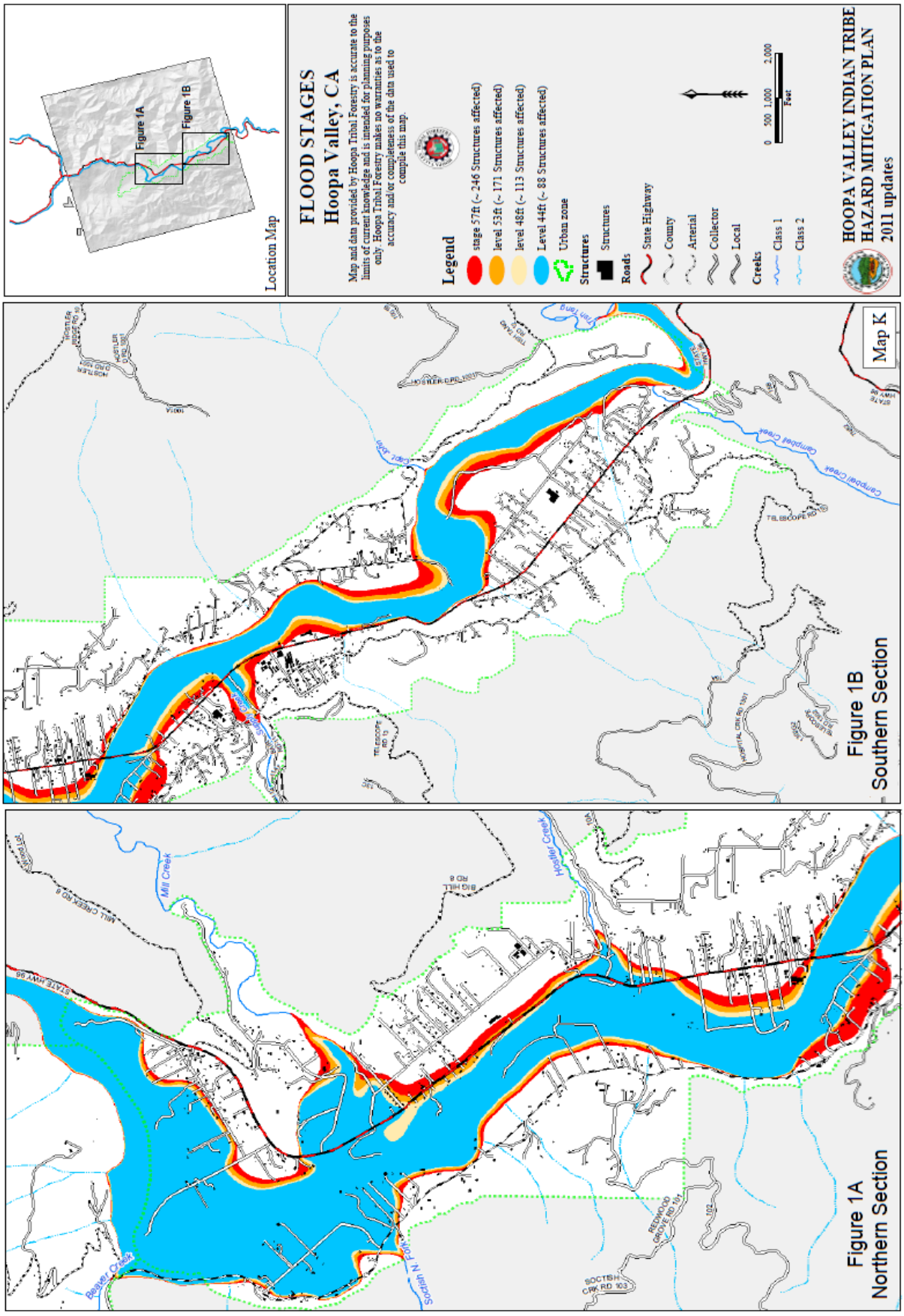
Year	Date	Flow	Gage Height	Adjusted Gage Height[1]	Return Period[2]	Year	Date	Flow	Gage Height	Return Period[2]
1912	Jan. 25, 1912	63,100	23.00	33.55	n/a	**1965**	**Dec. 22, 1964**	**231,000**	**57.00**	**300**
1913	Nov. 06, 1912	17,800	13.20	23.04	n/a	1966	Jan. 05, 1966	46,500	31.33	n/a
1914	Dec. 31, 1913	89,000	28.10	38.75	n/a	1967	Jan. 29, 1967	56,400	33.38	n/a
1917	Feb. 25, 1917	71,200	24.60	35.24	n/a	1968	Feb. 23, 1968	51,300	32.36	n/a
1918	Nov. 30, 1917	20,900	14.00	23.82	n/a	1969	Jan. 21, 1969	71,400	36.17	n/a
1932	Mar. 19, 1932	27,400	16.00	25.41	n/a	1970	Jan. 24, 1970	115,000	39.97	n/a
1933	Mar. 28, 1933	22,500	14.58	24.21	n/a	1971	Jan. 18, 1971	96,900	37.42	n/a
1934	Mar. 28, 1934	20,600	13.96	23.74	n/a	1972	Mar. 03, 1972	97,700	37.53	n/a
1935	Apr. 08, 1935	30,200	16.80	26.09	n/a	1973	Jan. 16, 1973	45,000	31.02	n/a
1936	Jan. 15, 1936	73,100	24.60	35.63	n/a	**1974**	**Jan. 16, 1974**	**145,000**	**45.98**	**n/a**
1937	Apr. 14, 1937	39,700	18.25	28.34	n/a	1975	Mar. 19, 1975	66,000	33.85	n/a
1938	Dec. 11, 1937	105,000	28.70	41.68	n/a	1976	Feb. 26, 1976	32,000	26.71	n/a
1939	Dec. 03, 1938	31,800	16.25	26.48	n/a	1977	Mar. 09, 1977	2,690	15.59	n/a
1940	**Feb. 28, 1940**	**124,000**	**31.20**	**44.87**	**18**	1978	Jan. 17, 1978	62,200	33.33	n/a
1941	Mar. 01, 1941	79,000	24.85	36.81	n/a	1979	Jan. 11, 1979	28,000	25.70	n/a
1942	Feb. 06, 1942	69,000	23.25	34.78	n/a	1980	Jan. 13, 1980	63,800	33.63	n/a
1943	Jan. 21, 1943	64,100	22.45	33.76	n/a	1981	Feb. 14, 1981	40,900	28.90	n/a
1944	Feb. 03, 1944	13,200	11.45	21.87	n/a	1982	Dec. 20, 1981	104,000	40.46	n/a
1945	Feb. 03, 1945	34,800	16.90	27.19	n/a	1983	Jan. 27, 1983	122,000	43.16	n/a
1946	Dec. 29, 1945	74,500	23.92	35.91	n/a	1984	Dec. 10, 1983	42,000	28.23	n/a
1947	Feb. 12, 1947	34,000	16.70	27.00	n/a	1985	Nov. 12, 1984	43,300	28.54	n/a
1948	Jan. 08, 1948	73,000	23.70	35.61	n/a	1986	Feb. 18, 1986	116,000	42.43	n/a
1949	Mar. 18, 1949	54,100	20.65	31.60	n/a	1987	Mar. 13, 1987	38,500	27.42	n/a
1950	Mar. 19, 1950	34,000	16.70	27.00	n/a	1988	Dec. 11, 1987	44,400	28.79	n/a
1951	Feb. 05, 1951	72,500	23.63	35.50	n/a	1989	Mar. 10, 1989	47,100	29.37	n/a
1952	Feb. 02, 1952	88,400	25.92	38.64	n/a	1990	Jan. 08, 1990	39,700	27.70	n/a
1953	Jan. 18, 1953	98,200	27.28	40.46	n/a	1991	Mar. 04, 1991	26,900	24.59	n/a
1954	Jan. 17, 1954	60,600	21.73	33.01	n/a	1992	Feb. 22, 1992	16,700	21.62	n/a
1955	Dec. 31, 1954	22,100	15.40	24.11	n/a	1993	Jan. 20, 1993	68,800	34.01	n/a
1956	**Dec. 22, 1955**	**190,000**	**36.90**	**53.51**	**100**	1994	Jan. 24, 1994	13,300	20.50	n/a
1957	Feb. 25, 1957	61,900	22.21	33.29	n/a	1995	Jan. 10, 1995	83,600	37.06	n/a
1958	**Feb. 19, 1958**	**125,000**	**29.15**	**45.03**	**20**	1996	Dec. 12, 1995	47,000	29.45	n/a
1959	Jan. 12, 1959	77,800	23.80	36.57	n/a	1997	Jan. 01, 1997	122,000	42.97	n/a
1960	Feb. 08, 1960	85,700	28.60	38.12	n/a	1998	Mar. 23, 1998	73,900	34.75	n/a
1961	Feb. 11, 1961	36,300	17.16	27.55	n/a	1999	Mar. 01, 1999	33,400	25.94	n/a
1962	Feb. 14, 1962	23,800	14.42	24.53	n/a	2000	Feb. 14, 2000	47,800	29.41	n/a
1963	Feb. 01, 1963	54,700	20.53	31.73	n/a	2001	Mar. 05, 2001	13,200	19.85	n/a
1964	Jan. 20, 1964	62,300	21.68	33.38	n/a	2002	Jan. 02, 2002	46,500	29.10	n/a
						2003	Dec. 28, 2002	59,800	31.98	n/a
						2004	Feb. 18, 2004	78,400	35.61	n/a

1 - Gage heights for water years 1912-1964 adjusted to new gage datum established after December 22, 1964 flood event. **2 -** In years

Table 19 – Flood Stages, Hoopa Valley Reservation

Stage Height[1]	Flood Stage	Extent and Effects of Flooding
57	Severe	Roads, bridges, and structures in low areas of the Trinity River flooded. Hwy. 96 closed at several locations between Willow Creek and Weitchpec.
55	Extensive	Numerous structures in valley areas flooded. Hwy 96 closed between Willow Creek and Weitchpec.
53	Major	Major flooding along Hwy 96 North and South of Hoopa of structures and residences located in this area.
51	Moderate	Low lying areas adjacent to the Trinity River including Hwy 96 flooded with significant damage to structures in these areas possible.
48	Minor	Low lying areas adjacent to the Trinity River likely to be flooded including sections of Hwy 96 with possible damage to structures and residences. 48 foot stage height is flood stage for Hoopa Valley.
46	Near	Probable flooding of low lying areas adjacent to the Trinity River including sections of Hwy 96 between Willow Creek and Hoopa.
44	Monitor	Monitor stage, possible minor flooding of low lying area adjacent to the Trinity River.
1 - Elevation in feet above gage datum of 274.82 feet.		

Map K - Flood Stages Hoopa Valley, CA



Trinity River Floods

The Trinity River is the largest tributary to the Klamath River, which flows from Southern Oregon through Northwestern California emptying into the Pacific Ocean at Klamath, California. The mainstem Trinity River originates in the Scott and Eddy Mountains, and the Salmon-Trinity Alps of Northern California, approximately 64 miles Northeast of Hoopa Valley. From its headwaters, the mainstem and East Fork Trinity Rivers flow approximately 60 river miles (RM) before discharging into Clair Engle Reservoir, and then into Lewiston Reservoir. From Lewiston Dam, the regulated mainstem Trinity River flow approximately 112 RM to its confluence with the Klamath River at Weitchpec, picking up the North and South Fork Trinity Rivers and numerous tributaries along the way. The total watershed area of the Trinity River system is approximately 2036 miles. The Hoopa Valley Indian Reservation is located astride the Trinity River 0.32 miles upstream of its confluence with the Klamath River at Weitchpec, California.

The Trinity River as with all other rivers and streams has a history of flooding. Past flooding has occurred during the peak precipitation months of December and January when it is not uncommon to receive over half the annual rainfall for any given year in a series of strong winter storms averaging five inches of precipitation.

The single most extreme flood event to occur during the past 93 years of record was the December 22, 1964 flood, which was a 300-year event. The winter weather pattern that preceded this flood event is not uncommon for Northwestern California. A series of cold winter storm systems originating in the Gulf of Alaska had passed through area in late November early December. These storm systems were followed by a series of warmer storms flowing out of the Tropics, locally known as “Pineapple Expresses”. What was uncommon was the amount of snow deposited on the upper elevations of the Mountains in the region. During the late November and early December an exceedingly deep snow pack had accumulated. The warmer precipitation which ensued caused this snow pack to melt and combine with the runoff from the storms during the week of December 22, 1964. The combined runoff exceeded the channel capacity of all the river and streams in

Northern California including the Trinity River even thought the newly completed Lewiston and Trinity dams were able to impound a large percentage of the excess runoff from the upper watershed of the Trinity River.

The flood waters which surged down the Trinity River on December 22, 1964 inundated a significant area of Hoopa Valley on the Reservation. The peak gage height recorded during the flood was 57 feet above the gage datum of 274.82 feet above sea level. At this level the Trinity River was eleven feet above flood stage and caused considerable damage to all structures and infrastructure in the low lying areas of Hoopa Valley. The floodwaters of the Trinity River also isolated the Reservation from outside assistance washing out or flooding sections of State Highway 96 the principle route into or out of Hoopa Valley and the Reservation. In addition to the isolation of the Reservation, flooding of the approaches to the Highway 96 Bridge crossing the Trinity River mid valley isolated the western and eastern sections of Hoopa Valley from each other.
The problems caused by the flooding of Hoopa Valley by the Trinity River were compounded by flood stage flows on tributary streams to the Trinity River in the Valley. Flooding on these streams further blocked access to areas of the Reservation and increased the amount of flood damage to structures and infrastructure in areas of Hoopa Valley above the flood stage of the Trinity River. The exact total cost of the flood damage caused by the1964 flood is unknown; however it was in the tens of millions. Of this amount, a large amount was spent repairing the roads and other infrastructure on the Reservation plus for stream channel realignment and levees to protect areas of Hoopa Valley from flooding by the Trinity River and its tributaries.

Floods can occur at any time; however winter storms and snow melt contribute to the larger floods of the past and generally occur between the months of November to February. The 1964 flood was designated as a 1000 year flood event, which means there is a 1 in 1000 chance that this flood could occur on any given year. A 50 year flood, which falls in the Minor to Moderate Flood Stage Levels, has a 1 in 50 chance of occurring on an annual basis. This is often confused with meaning that such a flood could only occur every 50 years, when in actuality it could occur 3 years in a row despite the odds of this not happening. Therefore the probability of a flood is dependent on the actual

magnitude of a flood, where the probability of a monitor stage flood is much higher than a severe flood.

Potential Flood Losses

2011 MHMP Update planning determined that vulnerability to Hazard Risk Assessment for flood remains constant. Potential losses from a flood event on the Hoopa Valley Indian Reservation are dependent on the level of the flood stage. The greatest losses would occur from a severe flood event (see Table 17). It follows that with each successive lower flood stage the losses would decrease. Tables 18 to 20 show the estimated losses for the flood stages Major, Minor, and Monitor according to Table 16. Estimated losses for flood stages Extensive, Moderate, and Near stages are not shown but can be easily interpolated as an incremental increase over the proceeding flood stage losses.

Table 20 – Vulnerability and Potential Losses of Structures to a Severe Flood Event

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	3 157 2	$3.9 mil $18.8 mil $52.8 mil	$2.4 mil $3.2 mil $560 k	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 ? 0	$300 k n/a n/a	$50 k n/a n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

1 – T=Tribal ownership, P=Private ownership, O=Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, private residences, and other structures counted from GIS layer of all structures identified on 2005 aerial photos.

Table 21 – Vulnerability and Potential Losses of Structures to a Major Flood Event

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	2 117 2	$2.6 mil $14 mil $52.8 mil	$1.6 mil $23.9 mil $560 k	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 ? 0	$300 k n/a n/a	$50 k n/a n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

1 – T=Tribal ownership, P=Private ownership, O=Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, private residences, and other structures counted from GIS layer of all structures identified on 2005 aerial photos.

Table 22 – Vulnerability and Potential Losses of Structures to a Minor Flood Event

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	1 83 0	$1.3 mil $9.9 mil n/a	$800 k $1.7 mil n/a	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 ? 0	$300 k n/a n/a	$50 k n/a n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

1 – T=Tribal ownership, P=Private ownership, O=Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, private residences, and other structures counted from GIS layer of all structures identified on 2005 aerial photos.

Table 23 –Vulnerability and Potential Losses of Structures to a Monitor Flood Event

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	0 47 0	n/a $5.6 n/a	n/a $964 k n/a	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 ? 0	$300 k n/a n/a	$50 k n/a n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

1 – T=Tribal ownership, P=Private ownership, O=Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, private residences, and other structures counted from GIS layer of all structures identified on 2005 aerial photos.

Landslides

Landslides were determined by technical advisors and tribal department personnel in the LEPC meetings to be a standalone hazard as Landslides occur on the Hoopa Valley Indian Reservation during Severe Storm events and during dry seasons. Although Landslides are minimally or theoretically possible, there is a lack of sufficient data. A landslide is the mass movement of soil, rock, and debris down slope which 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 may 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.

Landslides are classified by the type of slope failure and movement which has taken place. Debris slides and creeps are both slope failures which occur at relatively shallow depths but differ greatly in the rate of movement and type of material involved. Debris slides move very rapidly and are composed of material ranging in size from small pebbles to large boulders the size of small structures, while creeps as the name implies move very slowly (inches/year) and are composed of just the soil layer on a slope. Rotational and Translational slides are types of landslides with deep seated slope failures. While the

types of material involved in these two types of landslides are the same, the form of the failure is different. Rotational slides fail along an arcuate failure plane causing the mass of the slide to rotate out of the slope before moving down slope. Translational slides on the other hand fail along a deep seated planar surface moving down slope from the point of failure. All types of landslides pose a hazard ranging from the small scale of blocking segments of roads to large scale events which can destroy all or parts communities in their path. The exact location of landslides cannot be mapped as it can occur virtually anywhere on the Reservation; therefore a map is not included in this document for landslides.

Past and Probability of Future Landslides

The Hoopa Valley Indian Reservation is located in the coastal mountain range of Northwestern California. The morphology of this mountain range is characterized by steep slopes forming narrow stream valleys and acute ridges. The slopes of the stream valleys are bifurcated by numerous small streams forming a dense principally dendritic drainage system. Geologically the coastal mountains are part of the Klamath Mountain geologic province of Northwestern California and Southern Oregon. This province is composed of a series of terrains of differing bedrock units. The bedrock units forming the mountains in the locale of the Reservation are primarily the Rattlesnake Creek Terrain and the Galice Formation both of which are composed of moderate to extremely weathered metamorphic rocks. The morphology, bedrock geology and potential for seismic activity of the mountainous terrain of the Hoopa Valley Indian Reservation when combined with a relatively high annual precipitation rate creates conditions for very unstable slopes which are susceptible to landslide activity. Added to these natural conditions for landslides, the decades of timber harvest and associated road building on the Reservation have in some cases further enhance the possibility of landslides.

Geomorphic evidence exists on the Reservation for a range in scale and type of past landslide activity. The characteristic morphology of large scale rotational/translational landslides as well as debris slides has shaped the slopes of many of the narrow stream valleys in the Upland Region of the Reservation. These large scale landslide events

occurred some three hundred (300) years ago during the last major subduction zone earthquake to strike Northwestern California. Smaller scale landslide activity is ongoing particularly during the winter wet season. A significant number of these smaller scale landslides are either the reactivation of segments of larger landslides, particularly large scale debris slides, or the continuing activity of existing landslides which have not stabilized. As with the past large scale landslide activity the current ongoing landslide activity occurs largely in the Upland Region of the Reservation.

The reoccurrence probability of landslides on the Hoopa Valley Indian Reservation is extremely high given its location within a mountainous terrain with highly unstable slopes. It to be expected because of this that during each annual winter wet season landslides of varying sizes will occur with the potential for causing damage principally to the road system of the Hoopa Valley Indian Reservation.

Potential Losses from Landslides

The greatest threats that landslides pose are to the 400-mile network of forest roads on the Reservation. This network of roads was constructed and is maintained to facilitate the annual timber harvest on the Reservation which is the Hoopa Valley Indian Tribes principal source of revenue. Secondary to the threat posed to the network of forest roads of the Upland Region of the Reservation, landslides also pose a threat the access roads on the perimeter of Hoopa Valley in the Urban Zone of the Reservation. Currently one such landslide, the Beaver Creek slide has blocked Pine Creek Road, the principal access to the Upland Residential area. This landslide is an ongoing issue which has cost the Tribe over $1,000,000 to date in its efforts to stabilize it and keep Pine Creek Road open.
Landslides do not pose a threat to any of the Tribes structures or infrastructure other than that mention nor to the majority of residences because of their location with on the valley floor of Hoopa Valley. See Table 21.

Table 24 – Potential Landslide Losses

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	Very High	T P O	26 1078 5	$34 mil $129 mil $137 mil	$21 mil $22 mil $1.4 mil	All structures and infrastructure are vulnerable.
Upland Residential	None	T P O	1 25 0	$300 k $3 mil n/a	$50 k $510 k n/a	All structures and infrastructure above flood elevation.
Upland Region	None	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	All infrastructure above flood elevation.

1 – T=Tribal Ownership, P=Private ownership, O= Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, residences, and other structures counted from GIS layer identified on 2005 aerial photos.

Severe Storm Events

Severe Storm Events were determined in the 2011 MHMP Update to remain a significant standalone hazard event due to the complexity of cascading issues to include: power outages, flooding, and financial impacts. Severe winter storm events of Northern California originate as low pressure systems which develop in the Gulf of Alaska. These low pressure systems with associate cold fronts carried southward by the jet stream frequently make landfall on the coast of Northern California. The precipitation and winds associated with these storms can be large in magnitude with precipitation intensities exceeding an half an inch per hour (0.50 in/hr) and winds speeds approaching and/or exceeding gale force. The exact location of severe storms cannot be mapped as it can occur virtually anywhere on the Reservation; therefore a map is not included in this document for Severe Storms. Severe Storm events can equally affect the entire reservation.

Past and Probability of Future Severe Storm Events

Northern California where the Hoopa Valley Indian Reservation is located has a Mediterranean-type of climate. A Mediterranean climate is characterized by a winter wet summer dry pattern of precipitation. The winter-wet period for the Hoopa Valley starts general in early October and last until late March or April. During this time period the most severe storms occur during the months of December through February. It is not uncharacteristic that during this period the Reservation will experience a number of storms with precipitation values exceeding three inches and wind speeds in excess of 40 miles per hour.

The most recent severe storm event the “2005 New Year’s Eve Storm” is a good example of the type of severe weather which occurs almost on an annual basis. The storm which developed as an intense low pressure in the Gulf of Alaska move through Northern California on December 28th through the 30th, 2005 produced precipitation totals of 7.78 inches with 4.40 inches accumulated in one 24 hour period on the 29th and wind speeds exceeding 90 miles per hour during one period on the morning of the 29th according to Hoopa Tribal Weather monitoring stations. The damage caused by this storm was almost

entirely focused on the network of roads on the Hoopa Valley Indian Reservation with minor damage to structures reported on the Reservation. The amount of road damage was very significant with a dollar loss estimated in the amount of $4,000,000 plus. An additional significant effect of this storm was the loss of electricity to the Reservation for over a week. The loss of electrical power hampered the Hoopa Valley Indian Tribes efforts to recover from the storm

The probability of future severe storms is very high given the overall worldwide climactic changes over the past few decades. If storms are linked directly with global warming and the severity of said storms can be linked directly to the changes in local climates and weather patterns, then it can be expected that the Hoopa Valley Tribe will endure more and more severe storms in the future.

Potential Losses from Severe Storm Event

The most vulnerable of the Tribe's assets to a severe storm event, is the four hundred (400) mile network of roads on the Reservation. This network of roads is primarily unpaved with numerous stream crossing and was designed and constructed to facilitate the Tribes annual timber harvest and sale. Other Tribal assets in jeopardy by severe storm events are the Tribe's drinking water supply system and sewage system. Damage to these systems can leave Hoopa Valley residents without potable water and proper sewage treatment for prolonged periods of time. It is impossible to estimate the losses caused by a severe storm to structures or contents as it can really vary depending on the strength of the storm and said structure; however it can be safely assumed that all structures are at risk depending on the severity of the storm. Therefore as you can see in Table 22, we have designated a question mark for the number of structures column although the estimated costs are considering a total loss of structures as a possible result of a severe storm.

Table 25 – Potential Severe Storm Losses

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	High	T P O	? ? ?	$34 mil $129 mil $137 mil	$21 mil $22 mil $1.4 mil	All structures and infrastructure are vulnerable.
Upland Residential	High	T P O	? ? ?	$300 k $3 mil n/a	$50 k $510 k n/a	All structures could be vulnerable.
Upland Region	High	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	Mostly Road Damage

1 – T=Tribal Ownership, P=Private ownership, O= Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, residences, and other structures counted from GIS layer identified on 2005 aerial photos.

Wildland Fires

In 2002, the HVTC adopted an amended Fuels Management Plan. The Fuels Management Plan provides direction to reduce fuel hazards and minimize the loss of assets from a wildfire on the Reservation. The entire Reservation has been identified as an urban-wildland interface community that is at high risk from fire as experienced annually due to the high human caused occurrence. There are 150-200 human caused ignitions on the Reservation each year; bringing the probability of a wildfire on the Hoopa Valley Indian Reservation to 100% per year. Vegetation structure has changed and fuel hazards have increased because successful fire suppression efforts have replaced the frequent low intensity fires that once burned on the Reservation. This historical fire regime has been replaced by a less frequent, but more intense, fire regime. As a result of successful suppression efforts, conifers have encroached on all vegetation types resulting in fuel ladders becoming the norm in most stand structures. Evenaged silvicultural (clear-cutting) practices have additionally resulted in large acres of plantations that are more susceptible to high rates of wildfire spread since, from a fire behavior standpoint they react with fire in the same manner as a brush field. The exact location of wildland fires cannot be mapped as it can occur virtually anywhere on the Reservation, therefore a map is not included in this document for Wildland Fires or structure fires.

Past and Probability of Future Wildland Fires

The wildland fire season ranges from May to October with the highest risk occurring between July and September. Structure fires can occur anytime throughout the year as they are mostly dependent on human caused ignitions. As stated above, the Hoopa Valley Tribe and the Wildland Fire Department responds to 150 to 200 ignitions a year while the Volunteer Fire Department responds to anywhere from 10 to 50 structure fires annually. As shown in Chapter 2 in Table 5 there have been 1313 fires on the Hoopa Reservation between 1999 and 2005 responsible for consuming 7,261 acres of land.

Cultural burning has occurred in the Hoopa Valley for thousands of years as our Native people traditionally burned areas for crops, basketry materials and hunting. Traditional burning and naturally occurring fires were used the “cleanse” the land according to

Elders of the Hoopa Valley and were allowed to burn out naturally instead of extinguishing them as modern management requires. Therefore, modern fires are much more of a threat as they tend to burn at much higher intensities and durations due to the collection of ladder fuels and increased vegetation. The winter of 1998/1999 affects of the La Nina ocean currents altered weather patterns in Northern California, causing a particularly dry winter and spring. This led to an extremely dry summer and an increased susceptibility to wildfires. A total of 93,702 wildfires covering 5,661,976 acres burned Nationwide in 1999 resulting mostly from lightning strikes. In August 1999 heavy fuels, extreme high winds and dozens of lightning strikes set off the Big Bar/Megram fire complex East of Hoopa. This fire engulfed 140,947 acres and burned from August 23rd to November 3rd 1999. Intensified by autumn season inversions, smoke from this fire filled local valleys like Hoopa and increased air-born particulate matter (PM10) from a normal average of 22 μg/M3 to over 800 μg/M3 for up to 24 hours or more. The Megram Fire was declared a Tribal, Local and California State of Emergency due to the high particulate matter levels and impacts of smoke inhalation to the community of Hoopa Valley. Hoopa Tribal EPA was prepared for this event by using a Tapered Element Oscillating Microbalance (TEOM) unit to monitor PM10 levels throughout the fire.Due to the seasonal nature of wildland fire suppression the majority of the resources are themselves, seasonal in nature. There is not a month during the calendar year that the Reservation has not experienced a wildland fire however based on favorable weather conditions for fire to burn. During the slow fire season the Wildland Fire Department still maintains a “skeleton crew” to staff an engine 365 days a year. Volunteer Fire generally has at least 3-5 volunteers on call 24 hours a day and 365 days a year. Both programs are trained in ICS and pertinent emergency response programs. Map L shows Wildland Fire and Volunteer Fire as well as other Critical or Emergency Facilities on the Hoopa Valley Indian Reservation. The probability of reoccurrence of Wildland Fires is extremely high and the Tribe responds to anywhere from 200 to 400 fires a year and the majority of these fires are a result of human error or arson. There is no way to determine the actual number of naturally occurring fires locally and despite the fact that arson is heavily monitored and rewards are offered for conviction of arsonists, the Hoopa Valley Tribe remains one of the highest risks for arson related fires and incidences in the State of California.

Potential Losses from Wildland Fires

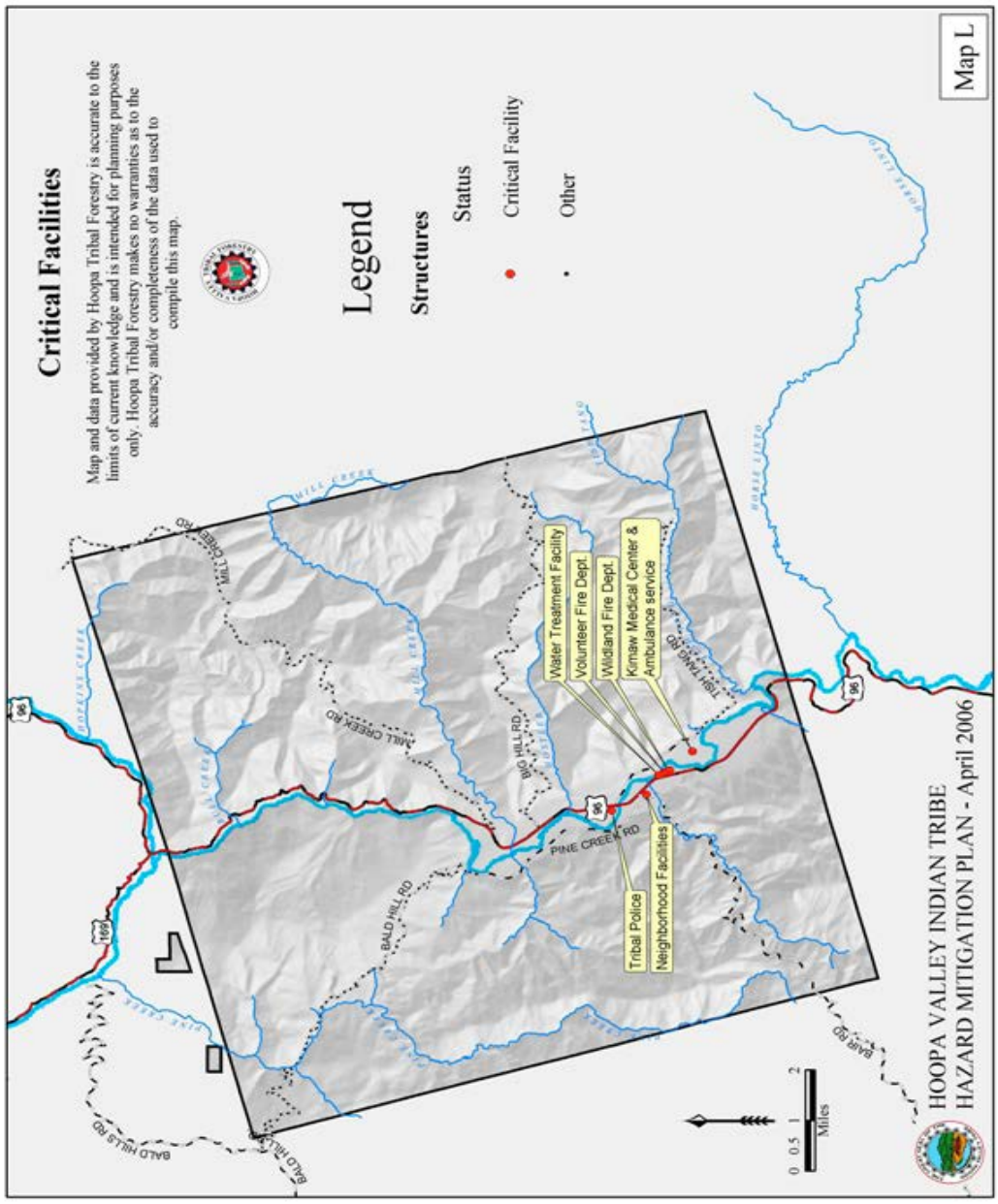
Almost the entire Reservation could potentially be at risk if the conditions were perfect and there were not enough responders or fireman to properly contain the blaze. The entire Reservation is surrounded by burnable conifer forests that given the correct weather conditions and moisture content could prove to be unstoppable despite the fact that the Reservation is bisected by the Trinity River. All Tribal and Private Structures could potentially be destroyed in a catastrophic wildland fire and human health would also be at serious risk as identified in past fires. PM10 levels proved to be well above standards identified as a risk to human health during the Megram fire in 1999. The potential loss would be enormous as value of the Timber is in the hundreds of millions of dollars.

Table 26 – Potential Wildfire Losses

Assessment Area	Estimated Vulnerability	Owner[1]	Number of Structures[2]	Structure Losses	Contents Losses	Location/Comments
Urban Zone	High	T P O	26 1078 5	$34 mil $129 mil $137 mil	$21 mil $22 mil $1.4 mil	All structures and infrastructure are vulnerable.
Upland Residential	Very High	T P O	1 25 0	$300 k $3 mil n/a	$50 k $510 k n/a	All structures at Very High risk of Fire
Upland Region	Very High	T P O	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	Mostly Loss of Timber and Revenue

1 – T=Tribal Ownership, P=Private ownership, O= Other ownership (Federal, State, County, School District, etc.)
2 - Tribal buildings, residences, and other structures counted from GIS layer identified on 2005 aerial photos.

Map L - Critical Facilities Map of Hoopa Valley



Chapter 4 – Mitigation Strategy

Hazard Mitigation Goals and Objectives

The following goals and objectives are meant to guide the MHMP in our ability to properly mitigate and reduce the impacts to naturally occurring hazards on the Hoopa Valley Indian Reservation. The goals and objectives of the plan were developed, reviewed and adjusted to meet the community's ever changing needs. From 2006 to 2012 – there were personnel changes, climate change and Tribal administration changes however the goals remain solid. The LEPC, the public, employees of the Tribe and outside entities all agree and the goals and objectives remain the same.

Goals: The goals of the Hoopa Valley Tribe MHMP are to:

1. Reduce the threats to public health and safety posed by natural hazards;
2. Reduce the structural damages 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.
5. Mitigate threats of illegal terrorist activities that result in health and safety impacts to humans and the watershed, including sensitive wildlife and salmon species.

Objectives: The objectives of the MHMP are the following:

1. Prevent new development in areas that are vulnerable to hazards or ensure that development occurs in such 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 is consistent with applicable Tribal 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 the Tribe's ability to eliminate hazards;
6. Manage floodplains, rivers, streams, and other water resources for multiple uses, including flood and erosion hazard reduction, fish and wildlife habitat, water supply, and cultural/traditional practices;
7. Implement activities under the Tribe's FMP to reduce the risk of wildland fires and maintain urban interface activities to reduce the risk of structure fires;
8. Improve coordination, continuity and consistency between the Hoopa Valley Tribe and other jurisdictions, as appropriate, in emergency management activities;
9. Increase public awareness of natural hazards and improve appropriate preparation for and response to such hazards; and
10. Improve hazard warning and emergency response systems.

Coordination with the LEPC and the Hoopa Tribal Cultural Committee will be completed prior to commencement of any future mitigation projects to ensure that construction activities will not involve or impede cultural areas used during the White Deerskin Dance, Jump Dance, or other Ceremonial sites on the HVIR.

It is possible that unrecorded prehistoric and historic cultural resources exist in parts of future proposed project areas based upon survey reports, historic and ethnographic information, and consideration of settlement patterns. In the event of accidental discovery of archaeological materials in a future project area, all soil disturbing work will be stopped. Subject to the implementing regulations under Section 106 of the NHPA (36 CFR Part 800) and the Archaeological Resources Protection Act of 1979 (ARPA) (16 U.S.C. 470 aa-mm) and it's implementing regulations on Indian Trust lands (25 CFR 262); a qualified archaeologist will complete a significance evaluation of the find(s)

before any soil disturbing activities are resumed. If any find is determined to be significant by the qualified archaeologist and the State Historic Preservation Office, then representatives from the Tribe will meet to determine the appropriate course of action.

Tribal Capability Assessment

Introduction

This section will discuss the pre and post disaster hazard management policies, programs, and mitigation capabilities of the Hoopa Valley Tribe and the other jurisdictions that provide support services to the Hoopa Valley Tribe during disasters on the Hoopa Valley Reservation. This discussion will include an evaluation of Hoopa Valley Tribe laws, regulations, policies, and programs that are related to hazard mitigation and to development activity in hazard prone areas. Funding capabilities for hazard mitigation projects are also discussed. The local capability assessment includes a general description and analysis of the mitigation policies, programs, and capabilities of local organizations on the Reservation.

Tribal Capability Assessment

Land use planning is a necessary and useful tool for addressing natural hazards. With land use planning and associated regulations, a jurisdiction is able to reduce future damages by controlling the density, location, construction, and type of development that occurs in a hazardous area. The Hoopa Valley Tribe Land Management Department, with input from other Natural Resources Departments, and the Hoopa Cultural Committee administer regulations that control development in environmentally and culturally sensitive and hazardous areas on the Reservation.

The Hoopa Valley Tribe is striving to reduce potential hazards by regulating where and how development occurs. Hoopa Tribal Policies and Regulations include the Hoopa Valley Uniform Building Code; Hoopa Valley Land Use Plan and Development Standards, Hoopa Forest Management Plan; the Water Quality Control Plan, and various

Tribal Ordinances related to the preservation of human health and our natural resources. The Uniform Building Code includes seismic design standards and wind design standards. These standards have been in place since the Uniform Building Code was adopted by the Hoopa Valley Tribe in 1975 and amended in 2000 (Title 26). The Hoopa Valley Tribe plans to adopt the International Building Code when it is adopted by other jurisdictions in the near future.

The HVTC incorporated the environmental review and permitting provisions of a Tribal Environmental Protection Agency (TEPA) into various environmental Ordinances (Titles 35, 37 and 49). These provisions formalize an environmental review by the HVTC to ensure that all activities on the Reservation must undergo some form of environmental review prior to construction or activity. To improve the permitting system and ensure sound decision making processes, the Hoopa Valley Tribe has developed the Riparian Review Committee, the Tribal Interdisciplinary Team, the Land Commission, and the Hoopa Cultural Committee. The purpose of these groups are to refine the HVTC environmental review capacity so that the Hoopa Valley Tribe's goals related to resource protection and compliance with federal and tribal laws could be supported, while the development needs of Reservation could also be met.

Both the Riparian Review Committee and the Tribal Interdisciplinary Team incorporate provisions of the National Environmental Policy Act (NEPA) into permit applications and development activities on the Reservation. These applications are generally compatible with the environmental review checklist required off-Reservation under the California Environmental Quality Act (CEQA). Completed permit applications are distributed to all department representatives. The representatives assemble comments for consideration at the weekly regular meetings. Usually TEPA or the Forestry department will complete an environmental assessment (EA) in accordance with pertinent Federal funding requirements. Depending on the project a project could qualify as exempt, categorically excluded, or require further investigation under an Environmental Impact Statement (EIS). Once completed and a public hearing is held on the project, the Chairman will sign off for approval to move forward with the project.

An Environmental Review will incorporate the basic aspects of the NEPA process into its review process, including an environmental checklist; the concept of avoiding, minimizing, and mitigating impacts to consider the effects of major projects. If it appears that a project will have a significant impact on natural or public resources and there is a federal nexus (e.g., federal permitting or federal funding), an EA or an EIS is required to comply with the NEPA.

Upon completion, the EA or EIS is evaluated by the Tribe to determine project approval, conditioned approval, or denial. This environmental review process allows the Hoopa Tribe to ensure that the method and type of development that occurs in hazard areas minimizes the potential for future damages.

In 1968, the federal government began the National Flood Insurance Program (NFIP) as a way to limit future development in flood-prone areas and thereby prevent additional flood damages. The NFIP, which is administered by FEMA, qualifies residents of communities that adopt and administer minimum floodplain regulations for federally subsidized flood insurance. The Hoopa Valley Tribe adopted floodplain regulations in 1997 in the form of the Title 35 the Riparian Protection Ordinance. The availability of flood insurance and regulation of development within the floodplain will help reduce overall damage and costs on the Reservation after future floods. In addition, by joining the NFIP, the Hoopa Valley Tribe is eligible to apply for state and federal grant programs to reduce flood hazards and repair flood damages.

Flood Damage Reduction Plan Policies

An extensive list of policies recommended to guide floodplain and watershed management activities are described in the Hoopa Valley Tribe Riparian Protection Ordinance, adopted by the HVTC in 1997 (Title 35). These policies provide a set of operating principles to guide flood mitigation efforts over the long term. The policies are divided into seven categories: general policies; floodplain land use; watershed management; flood mitigation projects; river channel maintenance; flood warning

information and education; and emergency response. These policies will help the Hoopa Valley Tribe meet its goals and objectives for hazard mitigation.

Wildfire Policies and Programs

The Hoopa Forest Management Plan (FMP), adopted in 1994 designated the Hoopa Tribal Forestry Department to be responsible for forest management on the Reservation. Section IV (C)(1) of the FMP established Standards and Guidelines for Reservation-wide Wildland Fire Management Elements, which included the following general Tribal goals for wildland fire:

1. Protect and enhance Tribal natural resources and cultural sites from wildland fire commensurate with the natural resources values at risk.
2. Conserve and develop natural resources for the present and future benefit of the Hoopa Tribe, while promoting tribal cultural integrity.
3. Preserve forests in their natural state wherever it is considered and authorized.
4. Promote soil conservation and reduce erosion to as great an extent as possible.
5. Support efforts to reduce arson fire due to high wildland resource values.
6. Protect the forest from insects, disease and fire commensurate with the values at risk.

The implementation of the FMP wildland fire elements will require or encourage management practices that will reduce the probability of wildfires on the Reservation. The current Forest Management Plan (FMP) is being revised during this fiscal year and when this plan is completed and approved this document will be amended to reflect the changes.

All Hazards

The Hoopa Valley Tribe has developed an Emergency Operations Plan (EOP) and a Hazardous Materials Spill Prevention and Response Plan, so that it will have guidelines in place to direct HVTC actions in the event of a disaster or hazardous material spill.

These plans will be updated to coincide with the MHMP and will enable all of these plans to serve as a Comprehensive Emergency Management Protocol that will help the HVTC coordinate a step by step process to respond to any hazard or disaster that the Hoopa tribe may face. Coupled with other plans and ordinances, it will establish procedures for HVTC departments to follow in case of an emergency. These plans will instruct responsible officials and employees how to respond in order to minimize the effects of such a disaster.

Local Capability Assessment

The Hoopa Valley Tribe currently responds to all disasters with its limited resources and by enlisting the assistance of local construction contractors to provide services. The HVTC policy is to coordinate with and support of the Humboldt County Division of Emergency Management both on and off the Reservation. Currently the Chief of Police for the Hoopa Valley Police Department and the Director of the Land Management Department are members of the Humboldt County Emergency Response Team. The Director of Hoopa OES is now the HVTC representative to the California Homeland Security Region 1 Council and the primary HVTC contact person with the Humboldt County Division of Emergency Management. This participation by the Hoopa Valley Tribe provides an important communication role by providing the county with the Hoopa Valley Tribe perspective on possible responses to a disaster and helps ensure an effective response.

Because property tax revenue from fee lands on the Reservation is currently paid to Humboldt County, the HVTC has limited revenue and generally has higher funding priorities than hazard mitigation. Outside funding is therefore necessary to implement mitigation projects that have significant costs. The Hoopa Valley Tribe is eligible for and has received funds when a disaster has been declared in California. Other sources indirectly related to hazard mitigation, such as Economic Development grants, Environmental Justice grants, or Environmental Protection Agency grants, may help fund projects that have implications for hazard mitigation. In addition, the HVTC may be able to implement some inexpensive mitigation actions, such as public education, with current

staffing. For example, the HVTC has a communication office that publishes a community

newspaper (the Hoopa Valley People) and provides community information through a local tribally owned and operated radio station KIDE 91.3 FM. The Hoopa Valley Tribal also manages its own website (www.hoopa-nsn.gov) and will disseminate information in this area. These and other media (e.g., flyers, home visits, and telephone calls) are used to

2012 UPDATE

In discussion with the TERC/MPT – the consensus was to add a line to the Hoopa Valley Tribe Emergency Operations Plan (EOP) to direct the Planning Section Chief of ANY emergency or declaration that is related to a natural hazard to review the mitigation plan. It has been determined that the RISK ASSESSMENT section would be beneficial to review. Also, the Tribal Council & Administration (TC&A) must be made aware of any changes to the EOP; therefore, this will require the EM to make the TC&A aware of the mitigation plan changes. The TERC/MPT has also adopted the concept of a permanent mitigation discussion point for every TERC meeting.

Monitoring and evaluation methodologies and schedule described in the 2006 plan – a review of the current processes will be conducted by the TERC/MPT. The mitigation plan reviewed after every disaster or emergency declaration. Bi-annually, the Emergency Manager (EM) formally presents information to the Tribal Council and Administration. The EM is responsible for updating and educating the Tribal Council and Administration in current events in national tribal emergency management policies, programs and requirements.

Contract editor will review federal grants related to hazard mitigation and provide a table of the sources, match, and capabilities.Mitigation Actions

This section will identify, evaluate, and prioritize feasible and environmentally sound mitigation actions currently in use or under consideration by the Hoopa Valley Tribe. This discussion will include an explanation of how each activity contributes to the overall mitigation strategy for the Hoopa Valley Tribe. For the purposes of this Plan, short-term actions are those actions that the Hoopa Valley Tribe 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 those actions that cannot occur or be completed over the next two-year period.

provide public education or information to the community.

Wildfire

In response to the 2000 fire season, the National Fire Plan (NFP) was updated. In 2002, the HVTC adopted an amended Fuels Management Plan and again in 2008. The Fuels Plan provides direction to reduce fuel hazards and minimize the loss of assets from a wildfire on the Reservation. The entire Reservation has been identified as an urban-wildland interface community that is at high risk from fire (Federal Register 66 (160):43384-43435 [August 17, 2001]) as experienced annually due to the high human caused occurrence. There are 150-200 human caused ignitions on the Reservation each year. Vegetation structure has changed and fuel hazards have increased because successful fire suppression efforts have replaced the frequent low intensity fires that once burned on the Reservation. This historical fire regime has been replaced by a less frequent, but more intense, fire regime. As a result of successful suppression effort, conifers have encroached on all vegetation types resulting in fuel ladders becoming the norm in most stand structures. Even-aged silvicultural (clear-cutting) practices have additionally resulted in large acres of plantations that are more susceptible to high rates of wildfire spread since, from a fire behavior standpoint they react with fire in the same manner as a brush field. (HVIR FMP)

Building in or near woodlands increases the potential loss from wildfires. Successful suppression efforts have created a paradox of having changed the vegetative model over time. Within the interface, the risk of fire has increased with the successful suppression effort but the need to provide protection to the public from fire has increased due to the increased fuel loading. Structures are often built with minimal awareness of the need for protection from wildfires and though there are requirements of defensible space the public often seems oblivious to the message. Public education about reducing hazards from wildfires and planning escape routes is necessary. Early-warning systems are essential to save lives. There are a number of ways to reduce wildland fires and minimize

injury and property loss. Currently the Hoopa Valley Tribe implements the following actions for wildland fire preparation:

- Develop ordinances and educate people regarding wildfire risks and mitigation measures;
- Develop fire detection programs and emergency communications systems;
- Exercise warning systems and evacuation plans;
- Road closures during fires;
- Maintain appropriate defensible space around homes;
- Provide access routes and turnarounds for emergency equipment;
- Minimize fuel hazards adjacent to homes;
- Use fire-resistant roofing materials;
- Maintain water supplies; and
- Ensure that home address is visible to first responders

Current Mitigation Actions

The Hoopa Valley Tribe has the following current mitigation actions for wildfire and urban area structure fires:

- The Tribal Fire Management Officer implements a Valley Wide ban on open burning when conditions are appropriately dry;
- 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;
- There are two fire stations on the Reservation, one for the volunteers (that have structure fire responsibility) and one for wildland, along Highway 96 south of the downtown area;
- The Hoopa Tribe adopted the Arson Reward Ordinance (Title 20) and informs the community about the We-Tip Program to help discourage arson and human caused fires;

- Brush and weed mitigation activities that reduce under story growth and ladder fuels are conducted by the Tribal Forestry Department.

UPDATE 2012 – Hoopa Fire Safe Council

A Fire Safe Council has been initiated and is still in its infant phases of development. The current Chairman for the Hoopa Fire Safe Council is Jack Jackson. Jack can be reached at 530-625-4220 ext 521. This is an important step in the development of a Community Wildfire Protection Plan (CWPP). As the plan is developed in the next 15 months, the fire safe council will be instrumental in developing the strategic components of the CWPP. The Fire Safe Council will be scheduling a working session with the Tribal Council to explain what the Fire Safe Council is, what the goals and objectives are and ask for support while it is in its infant stages of development. A Fire Safe Council is an effective component of the strategical planning for priorities of work to be completed in the wildland urban interface. The Fire Safe Council is an OES initiative and will be part of the development of our Community Wildfire Protection Plan. The Hoopa Fire Safe Council will oversee maintenance of the wildfire section of the mitigation plan.

Proposed Mitigation Actions

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of wildland fires and arson as identified in the STAPLEE form in Appendix A:

Short-Term Actions:

1. Educate the community regarding fire prevention, burn seasons, permit processes and enforce burning permits and regulations in order to ensure effective fire prevention on the Reservation;
2. Investigate potential funding opportunities for immediate individual mitigation projects;
3. Continue to reduce under story and ladder fuels through sound silviculture practices under the FMP;
4. Ensure adequate water storage to meet increasing demands for water;

5. Inventory alternative firefighting water sources and encourage the development of additional sources such as river access points for drafting water that can be utilized in the event of power outages or water system failure;
6. Continue to ensure that the wildland urban interface fuel reduction practices are included during all environmental review processes for new construction as well as for existing structures;
7. Research fire insurance for home and landowners and educate the community on fuels reduction practices, also deliver air filters for those in immediate need;
8. 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 or hydrant system in particular during fire seasons; and
9. Monitor Particulate Matter (PM10) for levels throughout the year, in particular during fire season in order to ensure that PM10 levels are not impacting human health and ensure an effective evacuation routine if levels exceed health standards developed by TEPA.
10. Pursue funding opportunities through the Bureau of Indian Affairs and Homeland Security for funding Fire Prevention Programs for Wildland and Structural Fire Protection.

Long-Term Actions:

1. Seek increased funding for wildland and structure fire response including equipment, supplies and necessary trainings;
2. Develop a Valley wide fire hydrant system, that will serve all urban zone homes as well as upland residential areas even during the lowest water conditions;
3. Increase communication, coordination, and collaboration by developing a universal communications system with mobile base stations and backup power supplies;

4. Develop a warning system for Wildland and uncontrolled fires as well as established evacuation routes, which will taught to the community through public outreach which includes individual home evacuation plans;
5. Establish water tanks throughout the Upland Regions of the Hoopa Tribe for areas that are too far away from water holes to effectively respond to Wildland fires in those areas;
6. Train or Hire a certified and qualified arson investigator in order to reduce the arson on the Hoopa Reservation; and
7. Ensure that the Uniform Building Code (Title 26) has adequate fire prevention requirements, which includes regular inspections and mitigation measures such as fireproof roofing on new residential homes and sprinkler systems on all new commercial buildings.

Severe Storms

Current Mitigation Actions

The Hoopa Valley Tribe currently responds to severe storms on a case by case basis as we never know what to expect or where to expect it. Severe storms can strike anywhere on the reservation and can range in severity also. The following are current protocols in place to help the Hoopa Tribe in preparing for winter storms as well as reducing the impacts of the storms.

- Early warning of storms is provided by the National Weather Service, the HVTC Safety Officer, Humboldt County DEM, radio, or television;
- Tribal offices and schools commonly close when roads are hazardous;
- During severe storms, the Hoopa Tribal Roads Department has coordinated road clearing with local contractors and with Humboldt County and implement BMP's in accordance with the FMP and other currently applicable standards;
- Vulnerable citizens typically receive assistance from family members, friends, or neighbors;
- The Uniform Building Code adopted by reference in the Hoopa Valley Tribe Title 27 Building Code sets a wind design standard of 80 mph;
- Some pertinent entities, such as the Tribal Office and K'ima:w Medical Center have power supply backup in the form of a generator during black outs;
- Review of proposed projects by the Riparian Review Committee as part of the land use permitting process (Title 35) may result in the recommended removal of hazardous trees or branches that are close to structures.

Proposed Mitigation Measures

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of severe storms as identified in the STAPLEE form in Appendix A:

Mitigation actions should focus on providing public information on emergency preparedness and self-help, warning and notification of the public, prioritization of roads and streets to be cleared for evacuation routes, provision of emergency services, generators for power supply backup in necessary departments such as Tribal Police and Wildland Fire Department, mutual aid with other public entities, and procedures for requesting state and federal assistance if needed. The primary ways to reduce direct damage from high winds is to build wind resistant structures and to keep debris, particularly trees, from falling onto the structures. The Hoopa Valley Tribe already has a building code with a wind speed standard, and works both through the land use permitting process and with local utility providers to reduce the hazard presented by falling trees. Hoopa Tribal Forestry and Hoopa Roads Department both provide services such as road betterment and clearing during severe storms, however a definitive plan needs to be developed and implemented during severe storm emergencies.

Short-Term Actions:

1. Develop coordinated management strategies for de-icing roads, plowing snow, ensuring utility service, clearing roads of fallen trees, and clearing debris from public and private property and implement into FMP;
2. Develop and implement maintenance programs to keep trees from threatening lives, property, and public infrastructure during windstorm events;
3. Collect, design, and disseminate useful educational information, such as evacuation routes and property maintenance, to landowners to reduce risk from falling trees and to learn how to better prepare and survive severe storm events; and
4. Develop partnerships with utility providers to document known hazard area and implement actions to ensure timely response for power outages and other utility problems caused by severe storms.

Long-Term:

1. Increase public awareness of severe storm mitigation measures to ensure effective response to severe storms and minimize impacts of the storms;

2. Work with utility companies such as Verizon, and PG&E for developing an underground utility plan, which delineates all underground utilities for mapping, as well as encourages all future development to go underground;
3. Using existing infrastructure and equipment develop a regular maintenance program for road betterment, tree maintenance, landslide prevention and power backup;
4. Lobby local, state and Federal agencies for funding to finance the unmet need for conducting the necessary road maintenance and betterment projects for the entire Hoopa Valley. The Hoopa Tribe is currently only at 11% of the total need for all projects on the Reservation.

Floods

The Trinity River flows in a northwesterly direction, through the entire length of the Reservation. The majority of the Reservation's population lives on the valley floor on both sides of the river. In the past 50 years there have been three floods in the Valley: 1955, 1964, and 1974. The 1964 flood has been called the "greatest known in the history of northern California". Botanic and geomorphic evidence indicates that floods exceeding the magnitude of the December 1964 floods may not have occurred since about 1600 (Helley and LaMarche, 1973). A flood is a 100-year flood if the discharge has exceeded that value on average once every 100 years in the past. In this case the probability of such a flood occurring in the next year is 1/100 or 1%. This is especially true in California where a "pineapple express" storm might bring warm precipitation that rapidly melts the snow pack in the Upper Trinity. However, there may be back-to-back flood years or conversely decades might pass between them. Thus the likelihood is not eliminated that the Hoopa Valley Reservation will experience a flood of this magnitude in the near-term until 2085. This is because floods are random events and each incident is independent of the previous events.

Current Mitigation Actions

The Hoopa Tribe along with various governmental agencies in the Trinity River basin has used five different approaches to reduce the costs and impacts of flooding:

- Flood control structures;
- Channel maintenance;
- Flood warnings;
- Land use plans; and
- Development regulations.

Flood control structures, channel maintenance, and flood warnings are used to protect existing properties in flood hazard areas. Land use plans and development regulations are

used to prevent future development that would be vulnerable to flooding and reduce the impacts of new construction on flooding.

Flood Control, Elevation, and Flood-proofing

There are currently no primary flood control measures protecting the Reservation. There are no levees constructed, or dykes preventing overflow of our tributaries. The main source of flood control is the USBOR regulation of the output from the Trinity and Lewiston Dams. Some areas of the Hoopa Reservation need levees constructed to prevent flooding of certain sections of roads during flood stage levels.

Land Use Plans and Development Regulations

One area the Hoopa Tribe administers regulations is, to control the development in flood hazard areas on the Reservation. All new construction on the Reservation undergoes an Environmental Review process in which the determination must be made on whether or not the site is within the 100-year floodplain. The Hoopa Valley Tribe is striving to reduce potential hazards by regulating where and how development occurs. There are existing structures within the floodplain that were built prior to these protocols being implemented, and some of these structures will need to undergo an assessment as to whether or not it will be cost effective to raise, move, or completely remove a structure from a flood prone area.

To reduce flood vulnerability, the Hoopa Valley Tribe will continue to educate the community on flood prone areas in particular those structures that are already within these zones. The Hoopa Tribe will encourage business and homeowners to seek out other private flood insurance options. The Hoopa Valley Tribe has not joined the National Flood Insurance Program (NFIP) due to possessing our own private flood insurance. The Hoopa Valley Tribe will continue to access the availability of flood insurance and regulation of development within the floodplain can help reduce the overall damage and costs on the Reservation after future floods. In addition, by joining NFIP, the Hoopa Valley Tribe would be eligible to apply for state and federal grant programs to reduce flood hazards and repair flood damages.

All Critical facilities (e.g., hospitals, schools, nursing homes, police stations, fire stations, and facilities for hazardous waste storage), with the exception of the Hoopa Valley Public Utilities District Water Treatment Facility are, to the extent possible, located outside the 100-year floodplain. The HVPUD Water Treatment Plant has mitigation measures in place in preparation for future flooding without impeding continual operation. All toxic substances are protected from exposure to floodwaters and elevated access routes are provided, to the extent possible, to all critical facilities.

Proposed Mitigation Measures

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of floods as identified in the STAPLEE form in Appendix A:

Short-Term Actions:

1. Identify funding to support a 1.0 FTE Hoopa OES Director, who would be responsible for coordinating the Multi-Hazard Mitigation Team and the implementation of hazard plans;
   1.1 Action Accomplished in 2008
2. Utilize models to identify and prioritize high-risk structures and conduct a cost-benefit analysis to rank the sites for priority;
3. Develop an early warning system based on stream gage heights to determine flood levels for reservation tributaries as well as the Trinity River, which will notify pertinent staff and emergency response.
   3.3 Action Accomplished in 2011
4. Consider floodplain levels in all future planning and construction and develop a permit system through Hoopa OES;
5. Follow all currently applicable road construction standards and FMP Best Management Practices for all new road construction and betterment projects;
6. Educate the public regarding NFIP and other flood insurance to raise awareness and create a website to further disseminate information.

Long Term:

1. Raise structures located within the USBOR identified 100 year floodplain and relocated if necessary;
2. Protection of Existing Development in Flood-Prone Areas;
3. Identify all the flood prone areas and construct levees to protect them;
4. Construct a bridge at the North end of the valley connecting lower Pine Creek
5. to Highway 96 to allow emergency exit from that area.

Earthquakes

Earthquakes are considered one of the most potentially destructive threats to life and property. The triple junction, the Cascadia subduction zone and numerous smaller thrust and strike-slip faults makes Humboldt County the most active region in California. A moderate to severe seismic incident on any of the numerous fault zones will cause:

- Extensive property damage, particularly to older structures, structures located on liquefaction soil, and mobile homes;
- Significant number of causalities with some fatalities;
- Damage to water and sewage systems;
- Broken propane cylinders resulting in hazardous conditions and fires;
- Disruption of surface transportation;
- Competing requests for scarce mutual aid response resources.

Northern California, Oregon, Washington and British Columbia are the site of the Cascadia subduction zone, where an oceanic tectonic plate is being pulled and driven beneath the continental plate. Evidence leads to the conclusion that an earthquake as large as 9 on the Richter scale will devastate the area. Historical evidence indicates that this megathrust hits every 200 to 1000 years and the most recent occurred 300 years ago. A megathrust quake could trigger reactivity of one or both area volcanoes, Mount Lassen and Mount Shasta. The South Fork Mountain thrust fault located along the west boundary of the reservation and the newly discovered Pine Creek fault bisecting the valley can rupture independently or in conjunction with one of the major faults. A complete study of the potential destruction needs to be conducted.

While it is possible to design structures to withstand earthquakes, it can be prohibitively expensive to design for significant events. Most new buildings are currently designed with sufficient integrity for the occupants to safely survive the event and evacuate, but not necessarily to protect the building from damage. Thus, the main advantage of improved seismic design requirements is that they can protect lives as well as maintain the functionality of the structure in lesser magnitude events. Buildings that were not built

to an adequate seismic standard can often be retrofitted and strengthened to help withstand earthquakes and provide personal safety. Further, developing knowledge of seismic hazards in specific areas before development can potentially reduce or prevent property destruction and loss of lives.

Since the Reservation faces an infrequent but significant earthquake hazard, identifying seismic-prone locations, adopting strong policies, implementing damage reduction measures, and utilizing other mitigation techniques are essential to reducing risk from seismic hazards on the Reservation. This section describes current and proposed mitigation actions on the Reservation.

Current Mitigation Actions

The HVTC originally adopted a Uniform Building Code, Title 22 of the Hoopa Valley Tribe Code of Laws, on January 5, 1968; an amended code was adopted in January 2004. The original Building Code adopted the Uniform Building Code (UBC) of the International Conference of Building Officials (1975) by reference to govern construction within all areas of the Reservation. Thus when the Uniform Building Code is updated, the changes take effect immediately on the Reservation. The UBC includes earthquake standards that are scaled to the earthquake hazard of an area. In the near future, the Hoopa Valley Tribe plans to adopt the International Building Code, which applies seismic design standards based on Peak Ground Acceleration (PGA) values instead of seismic zones.

Proposed Mitigation Measures

The following actions are recommended to meet the Hoopa Valley Tribe's goals and

Objectives for mitigation of earthquakes as identified in the STAPLEE form in;

Appendix A.

<u>Short-Term Actions:</u>

1. Create and distribute an earthquake preparedness plan for the community;

1.1 Action Initially Accomplished 2011

2. Research and inform the community of insurance benefits education and possibilities as well as possible funding sources for retrofits or upgrades;
3. Revise the Tribe's Uniform Building Code to incorporate current earthquake retrofit information;
4. Generate a list of all certified CPR, First Aid, First Responders and create a master list of emergency contacts for use by Hoopa OES.

Long-Term Actions:

1. Identify at risk structures particularly critical structures such as childcare centers, schools, elderly centers and tribal administration;
2. Seek funding and lobby for support in retrofitting all necessary structures;
3. Research seismic zones, fault lines, all past earthquakes over the past 100 years within a 25 mile radius of Hoopa, no new earthquake criteria cited in 2011 update;

   3.3 Acton Accomplished 2011
4. Reduce earthquake hazards in homes, businesses, and community facilities through public education and outreach.

   4.4 Action Initially Accomplished 2011

Landslides

Landslide problems are often compounded by poor land use management practices. Applying established ordinances where geological hazards have been identified will prevent some landslide losses. However, the Reservation already has several areas of established homes that are above or below unstable slopes. Careful maintenance of vegetation on slopes, prevention of erosion, engineered drainage of slopes, and other mitigation using qualified expertise is necessary to protect these areas.

Current Mitigation Actions

- The Hoopa Tribe has conducted studies on soil types, gradients, and likelihood of failure and incorporated into a GIS model for identifying high risk areas;
- TEPA and Forestry monitor erosion through turbidity sampling total suspended sediment sampling and bed load sampling and can determine when landslides occur for each major stream in Hoopa.
- Review of land use permit applications by TEPA provides an opportunity to reduce erosion and loading of slopes by improper drainage.
- Insuring Implementation of Best Management Practices is followed for any road construction or decommission on the Reservation.
- An inventory of active landslides is maintained and used for future funding opportunities.

Proposed Mitigation Actions

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of landslides as identified in the STAPLEE form in Appendix A:

<u>Short-Term Actions</u>:

1. Retrofit roads to reduce landslide activity by implementing BMP's
2. Identify all high risk landslides and educate the public about these areas.
   1.1 Action Accomplished in 2010

3. All future construction and planning must consider landslides in the bidding process and apply for a Hoopa OES permit.
4. Prohibit construction or activity in identified high risk zones.

Long-Term Actions:

1. Protect cultural areas from known and potential landslides or erosion by constructing diversions or blockades.
2. Limit construction in identified potential and historical landslide areas through regulation and public outreach.
3. Complete and distribute a model in GIS mapping soil types, slope, stability, and source water to predict slides.

Drought

Although the North Coast normally is a high rainfall area, drought cycles occur approximately every 7 to 11 years. Drought increases the wildland fire danger and adversely affects agriculture and hence, the economy. Water for domestic use is obtained from perennial streams as well as the Trinity River. These streams and the River are subject to drought conditions as well as to man made contamination.

In general, drought effects on domestic and municipal water supplies are historically corrected by building another reservoir, a larger pipeline, a new well, or some other facility. Short-term measures, such as using large capacity water tankers to haul and supply domestic potable water, have also been used.

Current Mitigation Actions

Proper management of water resources can reduce the damages that may otherwise result from a drought. Drought information collection assists in the response to a drought and in the formulation of programs for future droughts. Drought forecasting information and mitigation strategies used in California that may influence the effects of a drought on the Reservation include:

- Irrigation before a forecasted drought
- Advance warning of changes in stream flows
- Measurement of snow pack conditions
- Limit irrigation and sprinkling
- Study of ground water supplies
- Shut down of logging operators
- Water catchment and conservation measures
- Reduce hydroelectric power use
- Voluntary energy conservation programs
- Purchase of out-of-region energy
- Apply for federal drought relief programs

- State drought legislation
- Consider emergency supplemental ground water permits
- Coordinate with local non-profits drought education and outreach
- Plant drought resistant gardens for food sustainability

The Water Resources Division has an on-going ground water monitoring program that tracks water levels in Reservation aquifers. This effort is improving the understanding of water resources on the Reservation and will help manage potential water shortages in the future. In addition, the LWRD is currently developing a Hoopa Valley Tribe Water Conservation Plan that will include actions applicable to reducing drought effects.

Proposed Mitigation Actions

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of drought as identified in the STAPLEE form in Appendix A:

Short Term Actions:

1. Enforce Tribal Guaranteed Water Rights and continue to litigate any opposition to the Tribe's Senior Rights;
2. Keep informed on Tribal Water Law issues and maintain support of other Tribal Water Issues;
3. Keep enforcing the 2000 Record of Decision (ROD) and the Trinity River Flow
4. Evaluation (TRFE) Recommendations
5. Conduct Public Outreach to inform about water conservation practices and give away conservation equipment.

Long-Term Actions:

1. Implement the mitigation actions for water recommended by the Hoopa Valley Tribe Public Utilities Department.
2. Implement Conservation Plan, both before and after drought conditions occur.

3. Develop a valley wide irrigation system from the Trinity River.
4. Ensure PUD’s backup systems are in place, upgraded and operational throughout the year.
5. Develop a 10-year water plan, a Drought Plan, and a Water Regulation Ordinance along with HVPUD.

Dam Failure

The Trinity River has two dams approximately 100 miles upstream, the Trinity Dam and the Lewiston Dam. There are several dams on the Klamath River, which flows along the north edge of the reservation. The Trinity River flows into the Klamath River at the far north end of the valley. While the prospect of a Klamath dam failure affecting the populated areas of the Reservation is minimal, the higher Klamath River will cause the Trinity River to back up.

- Trinity Dam: The Trinity Dam has a gross storage capacity of 2,448,000 acre-feet also with a controlled maximum release of 33,000 cfs. A breach of this dam would also cause a breach of the smaller down river Lewiston Dam. The results would flood the valley with a column of water 110 feet to 160 feet high depending of the height of the water in the river at the time.
- Lewiston Dam: The Lewiston Dam is the smaller of the two Trinity River earth filled dams and has a gross storage capacity of 14,660 acre-feet of water with a maximum controlled release of 33,000 cubic feet per second (CFS). A breach of this dam would result in a column of water approximately 40 feet above the water height in the river at the time of breach. If the river is already at flood stage, 48 feet, the resulting water would increase the water height to 88 feet.
- Klamath River Dams: A breach of the any one of or all of the Klamath River dams would cause a back flow of water where the Trinity River merges with the Klamath River. If the breach of these dams occurred during a flood stage, the back flow and subsequent damming effect could possibly flood and destroy the valley. This is because of the simultaneously higher elevation of the Trinity River.

Current Mitigation Actions

The managers of the dams have performed analysis to determine the effects of a dam failure. However there have been no efforts by the Tribe to mitigate this disaster because there is little that the Tribe can do in this event.

Proposed Mitigation Measures

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of dam breach as identified in the STAPLEE form in Appendix A:

Short Term Actions:

1. Develop set evacuation routes and alternative routes as well as designated safe zones on high ground for dam breach possibilities;
   1.1 Action Initially Accomplished in 2011
2. Create a system of transportation for the disabled and elderly to safe zones in a timely and effective manner using set vehicles or buses;
   2.2 Action Initially Accomplished 2011
3. Develop a sensitive records (tribal archives) and priceless artifacts (such as museum regalia) evacuation plan and practice as necessary;
   3.3 Action Partially Accomplished 2011
4. Collaborate with K'ima:w to develop their mass tragedy triage plan and include in the Emergency Planning Actions and conduct drills;
5. Conduct community outreach on the possibilities of dam breach and how to respond in that situation; and
   5.5 Action Partially Accomplished 2011
6. Generate and distribute timeframe maps showing in maximum inundation levels and times of waterfront movement from a dam breach for Hoopa.

Long Term Actions:

1. Install an early warning siren system valley wide and conduct monthly tests to educate and inform community;
   1.1 Action Accomplished 2011
2. Buy and deploy a secure data storage server out of the area to backup Tribal Files;

3. K’ima:w Medical Center will update their Mass Tragedy Triage Plan and incorporate it into the EOP and MHMP; and
4. Continue to conduct community outreach on the possibilities of dam breach and how to respond in the most effective and timely manner.

4.4 Action Initially Accomplished 2011

Dam Inundation mitigation activities should closely match those listed for floods.

All Hazards

Current Mitigation Actions

As described in Section 4.2, current mitigation actions employed by the Hoopa Valley Tribe that apply to all hazards include land use plans and development regulations, emergency management and spill response plans, and coordination with the Humboldt County Emergency Response Team. For early warning of impending hazard events, the HVTC relies on communication with the Humboldt County Division of Emergency Management as well as pertinent local, federal and state agencies. Residents on the Reservation receive warnings from public news outlets as well as through the HVTC and their departments.

Proposed Mitigation Actions

The following actions are recommended to meet the Hoopa Valley Tribe's goals and objectives for mitigation of all hazards as identified in the STAPLEE form in Appendix A:

<u>Short Term Actions:</u>

1. Establish and maintain a Local Emergency Planning Committee comprised of representatives from pertinent HVTC departments and other organizations on the Reservation and establish a Hoopa Office of Tribal Emergency Services;
    1) Ongoing
2. Establish a Comprehensive Emergency Management Protocol that is aligned with the Hoopa EOP, Hazardous Materials Spill Prevention Plan, Tribal Ordinances, and the recommendations of this Plan in order to effectively respond to any emergency;
    1) Ongoing
3. To help disseminate the MHMP, expand knowledge of hazard mitigation on the Reservation, and encourage further mitigation actions, this plan should be posted on the Hoopa Valley Tribe web site (www.hoopa-nsn.gov), and links

to further hazard mitigation information (e.g., www.disasterhelp.gov) should be posted as time and resources permit;

1) Ongoing

4. Coordinate HVTC emergency response efforts, and disaster preparedness activities as appropriate, with those of Humboldt County and other federal, state, and local agencies;

    1) Ongoing

5. Begin stockpiling of water, food and shelter on both the east and west sides of the Trinity River Highway 96 Bridge that can sustain the population during extended periods of isolation;

    1) Ongoing

6. Conduct Public Outreach informing the community on emergency response skills and issue Emergency Kits to the community;

    1) Ongoing

7. Generate support for developing a community garden and co-op for produce and livestock in order to become less reliant on outside food sources.

    1) Ongoing

Long Term Actions:

1. Pursue funding for the Hoopa Valley Tribe mitigation priorities and recommendations described below, including funding for needed staff and infrastructure;

    1.1 Action 50% Complete 2010

2. Establish 24-hour emergency medical response capability located on both the east and west sides of the Trinity River Highway 96 Bridge with stockpiles of emergency supplies;

    2.2 Action 60% Accomplished in 2011

3. Develop an emergency response fund from Tribal, Local and Federal funds to be used in local Emergencies as a match for potential Federal funding requirements;

3.3 Action Recommended and Advocated 2011

4. Improve and sustain public information and education programs aimed at mitigating natural hazards and continue providing emergency preparedness kits;
5. Pursue funding and training for a Hazardous Material Spill Response Team in Hoopa;

   5.5 Action Initiated and Advocated 2011
6. Purchase generators and alternative power backup systems for critical tribal department operations during emergencies.

   6.6 Action Accomplished 2011

Both the LEPC and the Hoopa OES will play a major role in hazard mitigation activities, including the development, updates and monitoring of this MHMP Update. Establishing a permanent team and Hoopa OES is important because it would be the only Hoopa Valley Tribal organization focused on coordination of multi-hazard mitigation. The HVTC resolution that adopts this MHMP must authorize the formation of a LEPC and direct the HVTC to coordinate the formation, staffing, and operations of the Hoopa OES and to ensure its effectiveness. Currently the Hoopa Valley has a new HVTC Safety Officer position who will receive specific training in IC emergency response for the Hoopa Valley Tribe.

Establishing benchmarks for mitigation will help maintain focus on the goal of developing a disaster-resilient Indian Reservation. These benchmarks will track progress towards institutionalizing preparedness and hazard mitigation, including the characterization of natural hazards; the presence 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 and being accountable to the HVTC, the chances of success will increase.

Creation of a disaster and hazard mitigation fund would allow financial commitments to be made quickly to support hazard mitigation. However, with the current lack of property

tax revenue and other competing needs of Reservation residents, the availability of funding to meet immediate emergency needs, including early hazard mitigation activities, and support disaster preparedness efforts is a major concern. Federal assistance programs require various matching fund contributions from applicants and are not guaranteed to exist in the future. Hence, creation of a hazard fund is necessarily a long-term action; the importance of this action will depend on the availability of future outside funding.

Many post-disaster reports note the need to strengthen and sustain public information, education, and training efforts by providing additional resources. While 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. This serves as both a short and long term activity.

Clearly funding streams have not been accessed due to other priorities (health care, education, etc.) have taken tribal resources. The federal coffers remain a vital resource however the current outlook is somewhat bleak. Therefore, many actions remain untouched. The commitment to hazard mitigation remains resilient but funding remains weak.

Mitigation Priorities

In accordance with the Hoopa Valley Tribes STAPLEE form (Appendix A), we have established the following recommendations and priorities under the implementation portion of the MHMP. All alternative actions have been ranked according to seven main criteria including Social, Technical, Administrative, Political, Legal, Economic, and Environmental with a feasibility rank attached to each sub-criteria. The rank is based on feasibility and ranges from 1 (very feasible) and 5 (not likely). The lowest total numbers were considered highest priority and are as follows:

1. Wildfires

1. **WF 8.1 -** Seek increased funding for equipment, training and supplies for wildland fires. (30 Points)
2. **WF 8.6** – Create a valley wide warning system and evacuation plan for wildland fires and uncontrolled fires. (32 Points)
3. **WF 8.10** – Ensure Wildland/Urban interface practices are implemented in all new construction as well as existing structures. (33 Points)
4. **WF 8.4** – Continue to reduce under story through sound silviculture planning under the FMP. (34 Points)
5. **WF 8.7** – Ensure proper water storage areas and tanks for pumping water during fire season. (35 Points)
6. **WF 8.3** – Educate the public on burning materials, seasons, and enforce burn permits issued through wildland fire and TEPA. (36 Points)
7. **WF 8.8** – Monitor PM10 levels to ensure that human health is not impacted by smoke or inhalation of toxic material. (36 Points)
8. **WF 8.12** – Research fire insurance for homeowners and educate how to reduce fire hazards and give air filter systems. (36 Points)
9. **WF 8.5** – Develop a valley wide universal communications system with mobile base stations. (37 Points)
10. **WF 8.9** – Establish and mark known River Access Points and boat Ramps. (37 Points)

11. **WF 8.11 –** Hire and train qualified Arson investigators to eliminate or reduce the arson in Hoopa. (41 Points)
12. **WF 8.2 -** Create a valley wide fire hydrant system built into the valley wide irrigation system with necessary pump houses. (45 Points)

2. Severe Storms

1. **SS 7.5** - Conduct public outreach on how to prepare and survive a severe storm and establish evacuation routes. (32 Points)
2. **SS 7.4** - Lobby for additional unmet needs in road maintenance in Hoopa as we are only at 11% of the total need. (34 Points)
3. **SS 7.3** - Implement regular tree and roadside cleanup maintenance. (35 Points)
4. **SS 7.1** - Develop a debris management strategy to clear power lines, clean roads, and plowing material with heavy equipment. (38 Points)
5. **SS 7.2** - Work with PUD and PG&E to research and develop an underground utilities and power plan for implementation. (49 Points)

3. Floods

1. **FL 6.4** - Develop an early warning system based on stage on both the creeks as well as the Trinity River for pertinent staff. (31 Points)
2. **FL 6.9 –** Educate the public on flood insurance and conduct outreach for flood awareness. Create a website. (33 Points)
3. **FL 6.3** – Utilize models to identify and prioritize high risk structures and conduct a cost benefit analysis for implementation. (34 Points)
4. **FL 6.8** – Follow all currently applicable Best Management Practices and Standards in all road construction. (34 Points)
5. **FL 6.1 –** Hoopa OTE Director will implement MHMP, EOP and Emergency Response Mechanisms and coordinate ICS with EMS. (34 Points)
6. **FL 6.7** – Consider floodplain levels in all future construction activities and apply for permit from Hoopa OES. (35 Points)
7. **FL 6.5 –** Identify flood prone areas and roads and build levees. (42 Points)
8. **FL 6.2 –** Raise structures located within the 100-year floodplain or relocate if necessary. (46 Points)
9. **FL 6.6** - Construct a bridge at the north end of the valley connecting Pine Creek and Highway 96. (54 Points)

4. Earthquakes

1. **EQ 4.4** - Research and inform the community of insurance benefits and possibilities. (31 Points)
2. **EQ 4.3** - Create and distribute an earthquake preparedness plan for the community. (32 Points)
3. **EQ 4.6** - Generate a list of all certified CPR, First Aid, First Responders and create a master list of emergency contacts. (34 Points)
4. **EQ 4.8** - Reduce earthquake hazards in homes, businesses, and community facilities through public outreach. (36 Points)
5. **EQ 4.2** - Seek funding and lobby for support in retrofitting all necessary structures. (38 Points)
6. **EQ 4.1** - Identify at risk structures particularly critical structures such as schools and elderly centers. (39 Points)
7. **EQ 4.7** - Research seismic zones, fault lines, all past earthquakes over the past 100 years within a 25-mile radius of Hoopa. (41 Points)
8. **EQ 4.5** - Revise the tribe's Uniform building Code to incorporate current earthquake information. (44 Points)

5. Landslides

1. **LS 5.3 -** Identify all high-risk landslides and educate the public about these areas. (30 Points)
2. **LS 5.4** – Generate a model in GIS mapping soil types, slope, stability, and source water to predict slides. (32 Points)
3. **LS 5.6** – Prohibit construction or activity in identified high-risk zones. (35 Points)
4. **LS 5.5** – All future construction and planning must consider landslides in the bidding process and apply for a Hoopa OES permit. (41 Points)
5. **LS 5.2** – Retrofit roads to reduce landslide activity by implementing BMP's. (42 Points)
6. **LS 5.1 -** Protect cultural areas from known and potential landslides by constructing diversions or blockades. (55 Points)

6. Drought

1. **DR 3.1** - Update and implement the Hoopa Tribe's Water Conservation Plan in an ongoing basis. (31 Points)
2. **DR 3.7** - Develop a 10-year water plan, a Drought Plan, and a Water Regulation Ordinance along with HVPUD. (34 Points)
3. **DR 3.3** - Keep informed on Tribal Water Law issues and maintain support of other Tribal Water Issues. (38 Points)
4. **DR 3.8** - Conduct Public Outreach to inform about water conservation practices and give away conservation equipment. (38 Points)
5. **DR 3.6** - Ensure PUD's backup systems are in place, upgraded and operational throughout the year. (40 Points)
6. **DR 3.4** - Keep enforcing the 2000 ROD and the Trinity River Flow Evaluation Recommendations (41 Points)
7. **DR 3.2** - Enforce Tribal Guaranteed Water Rights and continue to litigate any opposition to the Tribe's Senior Rights. (42 Points)
8. **DR 3.5** - Develop a valley wide irrigation system from the Trinity River. (49 Points)

7. Dam Failure

1. **DF 2.2 -** Develop set evacuation routes and alternative routes as well as designated safe zones on high ground. (25 Points)
2. **DF 2.7** - Conduct community outreach on the possibilities of dam breach and how to respond in that situation. (28 Points)
3. **DF 2.8 -** Generate and distribute timeframe maps showing in maximum inundation levels and times for Hoopa. (29 Points)
4. **DF 2.3** – Create a system of transportation for the disabled and elderly to safe zones in a timely manner. (34 Points)
5. **DF 2.4** – Develop a sensitive records and priceless artifacts evacuation plan and practice as necessary. (34 Points)
6. **DF 2.6** – Get K'ima:w to develop their massive tragedy triage plan and include in the Emergency Planning Actions. (34 Points)
7. **DF 2.1** – Install an early warning siren system valley wide and conduct weekly tests to inform community. (36 Points)
8. **DF 2.5** – Purchase and deploy a secure data storage server out of the area to backup pertinent Tribal Files. (41 Points)

8. All Hazards

1. **AH 1.1 -** LEPC needs to identify a Hoopa OES Director, office space, infrastructure and staffing needs. (28 Points)
2. **AH 1.3** - Disseminate MHMP online and amongst Local and County Agencies for collusion. (28 Points)
3. **AH 1.2** - Hoopa OES Director will coordinate plans such as EOP, Hazard Spill Plan, and other Tribal Ordinances. (31 Points)
4. **AH 1.8** - Develop an emergency response fund from Tribal, Local and Federal funds to be used in local Emergencies. (33 Points)
5. **AH 1.7 -** Conduct Public Outreach informing the community on emergency response skills and issue Emergency Kits. (34 Points)
6. **AH 1.4 -** Conduct Disaster Preparedness activities along with Humboldt County OES. (38 Points)
7. **AH 1.6 -** Pursue funding and training for a Hazardous Material Spill Response Team in Hoopa. (40 Points)
8. **AH 1.5** – Create Eastern and Western stockades of medical supplies, food, water and shelter for emergency purposes. (42 Points)
9. **AH 1.10 –** Generate support for developing a community garden and co-op for produce and livestock. (42 Points)
10. **AH 1.9 -** Purchase Generators and Alternative Power Backup systems for critical emergency departments of the Tribe. (43 Points).

Mitigation Funding Sources

In this section, current and potential sources of federal, tribal, state, local, or private funding for mitigation activities are identified. This plan may help the Hoopa Valley Tribe acquire funding from the following programs or agencies:

- **Pre-Disaster Mitigation Program**, which provides funds to develop mitigation plans and implement mitigation projects, is administered by FEMA (by submitting a state level plan, the Hoopa Valley 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 the California Emergency Management Division (by submitting this hazard mitigation plan to the state, the Hoopa Valley Tribe will qualify as a sub-grantee);
- **Small Watershed 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), is administered by the Natural Resource Conservation Service and the California Department of Water Resources, respectively;
- **Flood Mitigation Assistance Program**, which provides funds for flood mitigation on buildings that carry flood insurance and have been damaged by floods, is administered by FEMA;
- **Department of Homeland Security funding**, in addition to FEMA programs;
- **U.S. Fire Administration**, which provides wildfire program funds;
- **Environmental Protection Agency**, which could provide funds for projects with dual hazard mitigation and environmental protection goals as well as updates to this HMP and related planning efforts such as spill prevention and response planning;
- **Indian Health Service**, which could provide funds for hazard mitigation projects that address public health and safety;

- **Rural Development Agency, USDA**, which provides loan and grant funds for housing assistance, business assistance, community development, and emergency community water and wastewater assistance in areas covered by a federal disaster declaration;
- **Community Development Block Grant**, which provides funds for a variety of community development projects, is administered by the Department of Housing and Urban Development;
- **Small Business Administration Loans**, which help businesses recover from disaster damages, is administered by the Small Business Administration; and
- **Bureau of Indian Affairs**, which provides funds to support tribal activities.

In the past, Reservation residents and the Hoopa Valley Tribe have received disaster relief funds from FEMA directly, or indirectly through the programs administered by California. In addition, the Hoopa Valley Tribe has secured grant funding from FEMA to develop a Flood Damage Reduction Plan and this Multi-Hazard Mitigation Plan.

Local potential funding sources for pre-disaster mitigation activities on the Reservation are limited. Currently, the only potentially significant sources are the HVTC and income from Tribal Enterprises. However, the HVTC has a very limited tax base (essentially only employment/income taxes, permit fees, and license fees as no property taxes are collected on trust properties and taxes on fee land are collected and retained by Humboldt County) and largely relies on funding from annual appropriations negotiated through the Bureau of Indian Affairs Office of Self-Governance and grant funds from other federal and state agencies.

Net revenues from the Lucky Bear Casino shall be used only for the following purposes: to fund Tribal government operations and programs; to provide for the general welfare of the Tribe and its members; to promote Tribal economic development; to make donations to charitable organizations; or to help fund operations of local government agencies. This distribution is based on initial casino profits being used to repay loans secured to build the casino and the remainder allocated pursuant to a formula approved by the HVTC. As

a result, financial support for hazard mitigation projects will largely rely on off-Reservation sources in the foreseeable future.

The ability of private citizens on the Reservation to pay for mitigation measures is also limited. The median per capita income of tribal members ($17,000 according to the 2000 Census) is significantly lower than the median income of Humboldt County residents. Hence, the ability of many tribal members to pay for hazard mitigation is limited, and hazard mitigation may fall low on the priority list for people struggling to pay for food, housing, energy, and other basic necessities.

There are other private companies and public agencies that could potentially help fund pre-disaster mitigation projects on or near the Reservation. Local public agencies and private companies that could fund such projects include Humboldt County, and local businesses. These organizations would benefit from some of the mitigation projects proposed in this plan.

2012 UPDATE

After much research the following table demonstrates the DHS/FEMA grants available. Although this information is from 2012 the funding streams are valid. The funding streams are listed in Appendix F.

Mitigation Action Plan

The alternative actions identified in Section 4.5 above were proposed to meet the Hoopa Valley Tribe's goals and objectives for hazard mitigation. Each action has been prioritized according to the STAPLEE criteria and once the actions were prioritized, all hazards were listed according to the most critical to the least critical action according to the rank as seen in Appendix A.

The LEPC will now use the ranked action plans to develop an implementation strategy addressing the following questions:

1. Who/which agency is the lead for the action?
2. Where is the money going to come from?
3. When is the estimated start/completion date?
4. What needs to happen before the action item can be implemented?

The implementation strategy will serve as the basis for any future grant applications the Hoopa Valley Tribe may pursue and develop.

2012 UPDATE
Action Items – SEVERE STORMS

Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
SS 7.4	Lobby for additional unmet needs in road maintenance in Hoopa as we are only at 11% of the total need.	OES/ROAD	8/14	Tribal/TRAN	$500,000	1
SS 7.5	Conduct public outreach on how to prepare and survive a severe storm and establish evacuation routes	OES/ROADS	8/14	OES/LEPC	$5,000	2
SS 7.1	Develop a debris management strategy to clear power lines, clean roads and plowing material with heavy equipment.	ROADS/BIA	On-going	ROADS/Tribal	$25,000	3
SS 7.3	Implement regular tree and roadside maintenance.	ROADS/BIA	On-going	Tribal/ROAD	$75,000	4
SS 7.2	Work with PUD and PG&E to research and develop an underground utilities and long term power plan for implementation.	ROADS/PUD	8/14	PUD/Tribal	$250,000	5

2012 UPDATE

Action Items – FLOODS

Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
FL 6.9	Educate the public on flood insurance and conduct outreach for flood awareness. Create a website..	OES/INS	10/14	FEMA	$20,000	1
FL 6.3	Utilize models to identify and prioritize high risk structures and conduct a cost benefit analysis for implementation.	OES	10/14	FEMA	$15,000	2
FL 6.8	Follow all currently applicable Best Management Practices and Standards in all road construction	ROADS	10/14	BIA/Tribal	$20,000	3
FL 6.5	Identify flood prone areas and roads and build levees.	OES/ROADS	10/14	Tribal	$500,000	4
FL 6.7	Consider floodplain levels in all future construction activities and apply for permit from Hoopa OES.	OES/INS	10/14	Tribal	$10,000	5
FL 6.2	Raise structures located within the 100-year floodplain or relocate if necessary.	OES	6/15	FEMA	$250,000	6
FL 6.6	Construct a bridge at the north end of the valley connecting Pine Creek and Highway 96.	OES	10/16	FEMA	$500,000	7
FL 6.1	Hoopa OES Director will implement MHMP, EOP and Emergency Response Mechanisms and coordinate ICS with EMS.	OES/LEPC	In-progress	Tribal	$50,000	In-progress
FL 6.4	Develop an early warning system based on stage on both the creeks as well as the Trinity River for pertinent staff.	OES	Completed	FEMA	$57,000	Completed

2012 UPDATE

ACTION ITEMS – LANDSLIDES

Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
LS 5.3	Identify all high-risk landslides and educate the public about these areas.	OES/ROAD	8/14	BIA/ROADS	$100,00	1
LS 5,5	All future construction and planning must consider landslides in the bidding process and apply for a Hoopa OES permit	HVHA/OES	On-going	HVHA/OES	$10,000	2
LS 5.6	Prohibit construction or activity in identified high-risk zones.	ROAD/HVHA	On-going	HUD/BIA	$10,000	3
LS 5.1	Protect cultural areas from known and potential landslides by constructing diversions or blockades	ROAD/LEPC	8/15	FEMA	$500,000	4
LS 5.2	Retrofit roads to reduce landslide activity by implementing BMP's	ROADS/OE	8/15	FEMA	$500,00	5
LS 5.4	Generate a model in GIS mapping soil types, slope, stability, and source water to predict slides	ROADS	Completed	BIA	$50,000	Completed

2012 UPDATE

Action Items – DROUGHT

Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
DR 3.7	Develop a 10-year water plan, a Drought Plan, and a Water Regulation Ordinance along with HVPUD.	OES/PUD	6/14	BIA/Tribal	$10,000	1
DR 3.8	Conduct Public Outreach to inform about water conservation practices and give away conservation equipment	RCA/NCRS	6/14	USDA	$10,000	2
DR 3.6	Ensure PUD's backup systems are in place, upgraded and operational throughout the year	PUD	6/14	BIA	$5,000	3
DR 3.1	Update and implement the Hoopa Tribe's Water Conservation Plan in an ongoing basis.	OES/PUD	6/14	BIA/Tribal	$10,000	4
DR 3.3	Keep informed on Tribal Water Law issues and maintain support of other Tribal Water Issues	BIA/BOR	On-going	BIA/Tribal	$25,000	5

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2012 UPDATE

Action Items – ALL HAZARDS

Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
AH 1.8	Develop an emergency response fund from Tribal, Local and Federal funds to be used in local Emergencies	OES	8/15	Tribal	$500,000	1
AH 1.7	Conduct Public Outreach informing the community on emergency response skills and issue Emergency Kits	OES	8/15	Tribal	$100,000	2
AH 1.4	Conduct Disaster Preparedness activities along with Humboldt County OES.	OES	9/15	SCH/Tribe	$50,000	3
AH 1.6	Pursue funding and training for a Hazardous Material Spill Response Team in Hoopa	VOL FIRE	7/14	Tribal	$125,000	4
AH 1.5	Create Eastern and Western stockades of medical supplies, food, water and shelter for emergency purposes	OES/ FOOD	7/14	Tribal	$250.000	5
AH 1.10	Generate support for developing a community garden and co-op for produce and livestock	USDA	7/14	Tribal	$150,000	6
AH 1.9	Purchase Generators and Alternative Power Backup systems for critical emergency departments of the Tribe	OES/ Plant	10/14	Tribal	$125,000	7
AH 1.3	Disseminate MHMP online and amongst Local and County Agencies for collusion.	OES	8//14	OES	$1,500	8
AH 1.2	Hoopa OES Director will coordinate plans such as EOP, Hazard Spill Plan, and other Tribal Ordinances	OES	8/14	OES	$25,000	In-progress
AH 1.1	LEPC needs to identify a Hoopa OES Director, office space, infrastructure and staffing needs	OES	Completed	BIA/Tribal	$58,000	Completed

Chapter 5 – Local Mitigation Planning and Coordination

Local Mitigation Planning Coordination

The Hoopa Valley Tribal Council is the sole governing body with specific jurisdiction over the Hoopa Valley Indian Reservation. Hence, unlike a state, there are no local jurisdictions within the Reservation that have a responsibility to develop a multi-hazard mitigation plan as required by the Disaster Mitigation Act of 2000. Local public organizations of the Hoopa Valley Reservation (e.g. Klamath Trinity Unified School District, etc.) fall under the jurisdiction of the Hoopa Valley Indian Reservation and are to be served by this multi-hazard mitigation plan (MHMP). These and those that fall under the category of "public organization" will be encouraged to develop appropriate site plans or measures to prepare for and respond to the hazards that pose the greatest threats to people and buildings.

For the development of the MHMP and the initial phases of developing the Hoopa Office of Emergency Services (Hoopa OES), the Local Emergency Planning Committee (LEPC) was developed from pertinent Tribal Departments and entities such at Roads, Forestry, Fisheries, Wildland Fire, Emergency Services, Tribal Police, Environmental Protection, and Public Utilities District. LEPC has coordinated with local businesses, the school district, and other community clubs and committees for the development of this document. LEPC will continue to conduct regular meetings and planning sessions until the Hoopa Tribe can find sustaining funding for Hoopa OES.

Local Funding and Technical Assistance

Once established and operating the Hoopa OES will be an agency that can provide various types of assistance to local organizations, businesses, or individuals that are trying to identify appropriate mitigation measures for their facilities. These include providing current hazard vulnerability estimates and technical information, improving communications between local organizations and hazard-related agencies, and coordinating hazard mitigation training. In addition, the LEPC can provide public education materials or presentations to organizations or residents on the HVIR. This team

will proactively identify additional mitigation measures and present them to local organizations, businesses, and/or individuals as well as Hoopa OES when necessary. The Hoopa Valley Tribe has limited funds to provide direct funding for many of the Mitigation Measures and Actions outlined in Chapter 4. However, the Hoopa Tribe can apply for and pass on funds from outside sources to local entities and/or implement activities that directly or indirectly help local organizations, businesses, and/or individuals implement mitigation measures. Hoopa OES will become the Tribal entity responsible for researching funds for implementing actions outlined in the Mitigation Chapter of this document. This department will also provide technical assistance to departments, local businesses, clubs, and community membership once operational.

Local Plan Integration Process

Since this MHMP was developed to serve all organizations and individuals on the Hoopa Reservation, the Hoopa Valley Tribe does not anticipate integrating local mitigation plans into this MHMP. However, site plans or lists of mitigation measures or strategies developed by local organizations will be attached as appendices to revisions of this MHMP, which are required every three years. For example, it is anticipated that various departments of the Hoopa Valley Tribe will identify future pertinent mitigation measures that should be incorporated into this plan, therefore every three years there will be an amendment process to include current information. The LEPC, or its current representatives from the HVTC and the Hoopa OES, will be responsible for compiling and incorporating into the MHMP if necessary, specific mitigation measures that will be identified by local organizations. The Hoopa Tribe has developed an Emergency Operations Plan (EOP) to guide the actions of officials during hazard emergencies, and will be updated and managed by Hoopa OES to coincide with the MHMP. One goal of the EOP is to provide greater coordination between the HVTC and other local emergency services or emergency management agencies. In addition, the Hoopa Tribe has developed a Hazardous Materials Spill Prevention and Response Plan to provide guidance to officials in case of a hazardous materials spill on or near the Reservation. The goal of these plans is to help the Hoopa Tribe deliver a coordinated response to future natural and human-caused hazard events. Among these plans, there are current Tribal Ordinances and

Management Plans approved by the HVTC that will be integrated into the maintenance of the MHMP.

Local Assistance Prioritization

The Hoopa Valley Tribe in 2009 received one of two federal grants given to Tribes from NOAA for improving Emergency Responders Communications, and in 2010 received the CA Disaster Relief Initiative for improving Critical Disaster Response Facilities on the Hoopa Valley Indian Reservation. With no local jurisdictions within the Hoopa Indian Reservation, the Hoopa Valley Tribe does not anticipate receiving grant applications under its Multi-Hazard Mitigation Plan that it will need to prioritize. The Hoopa Tribe will however receive funding from various State and Federal agencies to support the Hoopa OES. In order to use its limited resources and funding most efficiently and effectively, the Hoopa Valley Tribe will prioritize the areas of the Reservation that are most vulnerable to hazards and the projects that are most appropriate and effective in mitigating those hazards using the STAPLEE form. The form will be adopted as a tool by the LEPC and Hoopa OES to conduct updates to the Mitigation Action Planning process and assistance will be granted according to this priority tool. In general, the following criteria will be used by the LEPC and Hoopa OES to prioritize mitigation actions and to seek potential funding for local organizations or projects on the STAPLEE form:

- Projects that provide the greatest enhancement to public health and safety;
- Projects in which the benefits are maximized according to a benefit-cost review of proposed projects and their associated costs;
- Organizations with or projects that address the highest risks of hazard damage;
- Projects that involve repetitive loss properties; and
- Projects that address the most intense development pressures.

The LEPC and Hoopa OES will use the STAPLEE ranking system that weights various factors and provides a relative score that reflects the importance of a project to the Hoopa Valley Tribe and the residents of the Reservation. The LEPC and Hoopa OES will use

these scores to rank proposed mitigation projects and to prioritize mitigation activities for action by the Hoopa Tribe. The ranking system will include the following criteria:

- Reduction of threats to public health and safety;
- Reduction of potential structural damages;
- Reduction of potential economic losses;
- Effects on environmental and cultural resources;
- Degree of support for the MHMP goals and objectives; and
- The cost/benefit ratio of the project.

Since most hazard mitigation funding from federal and state sources requires a cost-benefit ratio greater than one, this ratio will be an important factor in the assessment of projects. Unless a project involves overriding public health and safety or cultural factors, the LEPC and Hoopa OES will only consider projects in which project benefits at least exceed project costs. In seeking to maximize public benefits, the LEPC and Hoopa OES will acquire the information and/or assistance necessary to determine the best possible benefit-cost ratio for high priority projects before submitting applications for these projects to funding agencies. Projects that are recommended for funding will be those that best document their ability to reduce future impacts of natural disasters as well as demonstrate cost effectiveness through a benefit-cost review.

Chapter 6 – Plan Maintenance Process

Introduction

The federal hazard mitigation planning regulations (44 CFR 201.7) require state-level plans such as this MHMP to be reviewed, revised, and submitted for approval to the FEMA Regional Director every three years. The regulations require a plan maintenance process that includes 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 Hoopa Valley Tribe. The MHMP can be revised more frequently than five years if the conditions under which it was developed change significantly (e.g., a major disaster occurs or funding availability changes). This section details the Hoopa Valley Tribe's method and schedule for monitoring, evaluating, and updating the MHMP and for monitoring the progress of mitigation actions.

Responsibility for Plan Maintenance

The HVTC resolution adopting this plan directs the pertinent HVTC department directors to form a Local Emergency Planning Committee (LEPC) by appointing appropriate representatives from their departments to be members of the LEPC. The core of the LEPC should include the HVTC's Insurance and Risk/Safety Officer as well as representatives from the Planning, Natural Resources, Law Enforcement, Medical, Utilities, Fisheries, and Cultural Resources departments. Other HVTC divisions may be incorporated into the team as needed. The Hoopa Valley Tribe will establish a department to specifically handle Emergency Planning and Operations under the recommendations of the LEPC. LEPC will continue in an advisory capacity to the Hoopa Office of Tribal Emergency Serves (Hoopa OES) who will operate directly under the Hoopa Valley Tribal Council. The LEPC and the Hoopa OES will be responsible for coordinating the implementation of mitigation measures and the maintenance of the plan. Hoopa OES will

be responsible for annual progress reports to be submitted to the HVTC and for the three-year update to be submitted to the HVTC and subsequently to FEMA for approval. LEPC will continue as a working as an assistance committee, meeting quarterly with Hoopa OES.

Monitoring, Evaluating, and Updating the Plan

The Hoopa OES along with assistance from the LEPC will update this MHMP annually, after each disaster and will continue ongoing updates until the MHMP is up review and approval by FEMA Region IX in the next five year cycle. The annual review process will be supported by the addition of a "mitigation moment" to the monthly LEPC agenda. Through this process – the mitigation plan will remain dynamic and the process effortless. The mitigation plan will be a highlight to every meeting and become a normal process. Monthly reviews will identify progress made on the implementation of mitigation measures and projects. Monthly reviews will also assess the impacts of disasters in the Reservation region to determine whether the MHMP should be revised based on the new information. The annual review will occur during the last quarter of each calendar year to coincide with the tribal fiscal year and community reporting requirements. Assuming that FEMA will approve this MHMP, this timeline will ensure that the annual review every fourth year will occur during the period when the plan will be updated for re-approval by FEMA. Hazard mitigation progress and needs identified in the annual review will be described in an annual progress report for the HVTC. 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 44 CFR 201.7 Tribal Mitigation Plans and submitted directly to FEMA. The process of updating the MHMP will include a review of hazard assessments, vulnerability assessments, potential losses, tribal capability, and coordination with other planning efforts, funding sources, and recommended and potential new mitigation measures. In support of the three-year update, the Hoopa OES will:

- Examine and revise the Hazard Risk Assessment (Chapter 3) 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 HVTC departments and to improve coordination with other jurisdictions and agencies; and
- Review and, if desirable, revise the MHMP Action Plan.

The updated MHMP will be presented to the Hoopa Departments and Entities identified in Chapter 1 (Planning Process) for approval, and then to the HVTC for adoption before it is submitted to FEMA for re-approval.

Monitoring Progress of Mitigation Actions

Hoopa OES staff will continue to meet with the LEPC on a regular bi-monthly basis to ensure consistent progress on the implementation of mitigation actions and reduced to quarterly meetings once this is established. Representatives to the LEPC will report on the progress made by their respective departments. Departments not represented on the LEPC will be invited to meetings as needed to report on activities in their departments. The Hoopa OES will monitor the implementation of all short-term mitigation actions with assistance from the LEPC 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 by Hoopa OES. Long-term actions planned for the future will be reviewed during plan updates every three 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 objectives and actions. Hoopa OES and the LEPC will review this checklist annually along with representatives of the HVTC. As described in the previous section, progress on mitigation actions will be described in an annual report to the HVTC and in the three-year update of the MHMP. For any projects funded under the MHMP Mitigation Action Plan there will be consistent reporting requirements from the grantee. There must be approved work plans, quarterly or semi-annual performance reports identifying accomplishments, a discussion of the work performed, a discussion of

any existing or potential problem areas, budget status, and planned activities for the subsequent quarter. For State or Federally funded projects, this information will be submitted to the funding agency by the assigned Tribal Authorized Representative (TAR) or by the Director of Hoopa OES. The agency-specific final grant closeout documents will also be prepared by the HVTC Project Officer and Tribal CFO at the conclusion of the performance period and submitted to the funding agency.

2012 UPDATE

- The TERC/MPT has decided to formally add a mitigation section to the monthly meeting agenda to discuss mitigation progress, actions, activities, policies, etc. The mitigation review will allow the TERC/MPT to keep mitigation activities dynamic, engaging all departments and educating new comers.
- The TERC/MPT has decided to strongly suggest to the Tribal Council and Administration a new policy to review plans for new construction and modifications that would incorporate an OEM review.
- The TERC/MPT has taken full responsibility as a team to oversee all components (maintenance, review, updates) to the hazard mitigation plan.

Chapter 7 – Hoopa MHMP Summary

The Hoopa Reservation has significant exposure to natural hazards, and all three Hazard Assessment areas on the Reservation are vulnerable to most of these hazards. The Urban assessment area is the most vulnerable to all hazards and the Upland area is least vulnerable. On a scale from low to high, the risk and extent of all hazards on the Reservation areas is moderate to high for most of the hazards. With the exception of Dam Failure, we can expect to endure all of the hazards at least once every 5-10 years if not annually for some hazards. Although the probability of occurrence for Dam Failure is low, the potential for damage, however rare, is very real. With the combination of high vulnerability and high probability of both Trinity River and creeks flooding, the flood hazard on the Reservation poses a great natural hazard in terms of potential annual damages to structures, government services, and economic activity.

Some areas face a higher vulnerability to certain hazards. Structures in woodland areas have a greater risk of damage from wildfires and severe storms events. Urban areas generally have greater vulnerability to earthquakes, dam failure and floods. With many areas of the Reservation vulnerable to multiple natural hazards, there is a cumulative effect on overall potential losses. For example, a single earthquake may damage the same structures in the Trinity River floodplain areas via ground motion, liquefaction, and subsidence; at the same time could cause dam failure resulting in complete devastation. A severe storm could damage individual structures with downed trees, with the multiple effects of a power outage, and possible drought as occurred in the 2005-06 winter storms.

Insurance coverage is afforded to all tribal buildings and property listed on the Hoopa Valley Tribal Council's Inventory. The Hoopa Valley Tribal Council's Insurance Program is a self-insured program, All Lines Aggregate. Should a loss occur coverage is determined on replacement value using the Marshall Swift Guide. Factors include building type, location, occupancy, construction code, construction type, square feet, year built, installed sprinklers, building cost, and contents value. Where there is a cumulative effect on potential losses, there will also be a cumulative effect on the benefits derived from mitigation actions. For example, development regulations or property buyouts that

keep or remove structures from hazard areas will avoid the damages associated with all of the hazards that uniquely affect the property. Likewise, the establishment of home emergency kits and improved emergency response capabilities will benefit residents during all hazard events. It is important to consider both cumulative impacts and cumulative benefits when assessing mitigation measures.

Achieving the objective of becoming a disaster-resistant Indian Reservation will require significant investment of funds that the Hoopa Valley Tribe does not currently possess. Expensive measures necessary to reach this objective include relocation or acquisition and removal of many structures that are in highly vulnerable locations, construction of substantial flood protection structures, and possible seismic retrofitting of older structures (replacement of some structures may be more cost effective). Given the high cost of these projects, acquiring outside funds for these measures is a high priority action item. In addition to pre-disaster mitigation, recovery from disasters will also present a financial challenge to both the HVTC and individuals. Given the low median income for tribal members, the damages and economic disruption caused by a hazard event will be difficult to recover from without assistance.

Threats to public health and safety from natural hazards are also significant on the Reservation. Floods, earthquakes, severe storms, wildfires, and droughts all pose public health and safety hazards. Structural mitigation measures, especially those proposed in this MHMP, are important in addressing public safety hazards, and public education measures that improve preparation for and response to natural hazards may be equally important, or in many cases, more important than structural measures.

This MHMP represents a step toward disaster resistance. The Hoopa Valley Tribe has already taken significant steps, including implementation of development and construction regulations (e.g., the Uniform Building Code) and monitoring of hazard conditions. The mitigation actions and measures described in this plan offer the potential for significant progress toward reducing future natural hazard damages. Consistent

attention and adequate funding to implement identified mitigation measures will be required to realize the potential for damage reduction.

2012 UPDATE

The TERC/MPT has used the Tribal Radio station to communicate with the public updates for all of emergency management to include mitigation. The TERC/MPT also uses the annual public events to communicate and educate the public. Sovereign Days and other public events are the most popular & will be documented.

Conclusion

We are the Hoopa People. We have lived on these lands in co-existence with Mother Nature for thousands of years. We have endured earthquakes, wildfires, floods, and other human caused threats to our People, yet we remain in the same place our ancestors lived. We dance to keep our world in balance; our river flowing; our fish returning; our acorns flourishing; our people healthy; and as long as this balance remains so will the Hoopa People.

List of Acronyms

CFR –	Code of Federal Regulations
CVP –	Central Valley Project
DHS -	Department of Homeland Security
EOP –	Emergency Operations Plan
FEMA –	Federal Emergency Management Agency
FMP -	Forest Management Plan
GIS –	Geographic Information System
Hoopa OES –	Hoopa Office of Tribal Emergency Services
HVIR –	Hoopa Valley Indian Reservation
LEPC –	Local Emergency Planning Committee
HVTBC –	Hoopa Valley Tribal Business Council
HVTC –	Hoopa Valley Tribal Council
HVPUD –	Hoopa Valley Public Utilities District
IRMP -	Integrated Resource Management Plan
KMC -	K'ima:w Medical Center
KTJUSD -	Klamath-Trinity Joint Unified School District
LUPDS -	Land Use Plan and Development Standards
OES -	Office of Emergency Services
MHMP –	Multi-Hazard Mitigation Plan
MMI -	Modified Mercalli Intensity
NIMS -	National Incident Management System
NWS –	National Weather Service
PGA -	Peak Ground Acceleration
RM -	River Miles
TEPA –	Tribal Environmental Protection Agency
TRD –	Trinity River Diversion
USBOR –	United States Bureau of Reclamation
USGS -	United States Geological Survey
WQCP -	Water Quality Control Plan

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