KARUK TRIBE
HAZARD MITIGATION PLAN

Updated: April 2010

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The Karuk Hazard Mitigation Plan
Executive Summary

We are the Karuk Araara', the upriver people, defined by our distinct culture and occupying the middle course of the Klamath and lower course of the Salmon Rivers, a remote, forestland area of northwestern California. We have lived in this region since the beginning of time and have survived extermination, termination, and assimilation while retaining our millennial ties to our land. As a modern day culture, we have sustained our traditions and our rights of sovereignty and self-determination.

Prior to 1900, our own "hazard mitigation," measures included burning the forest understory to prevent wildfire disasters. Karuk managed the prevailing natural environment to promote open forests that were naturally stable, safe, and ecologically productive.

As indicated on the maps supplied by FEMA, the land we now own, trust lands and private lands, is distributed over a large geographic area - from Yreka located on Interstate 5 westward to the mid-Klamath River region. The Karuk Araaras' deepest traditions are founded on beliefs that are perpetuated in our yearly ceremonies to "*fix the world,*" where the natural world and socioeconomic well-being of our people and land are enhanced and protected. We have developed this Hazard Mitigation Plan as an investment in our future to take care of our trust lands, ancestral lands, our tribal resources, and our people.

The Karuk Hazard Mitigation Plan (KHMP) will help alleviate disturbances that are detrimental to our safety, livelihoods, natural resources, and our material assets including homes, community facilities, utilities, roads, trails, animals, and spiritual places. This plan will put us in a better position to compete for grants that further protect our resources and people, mitigating future threats to life and property.

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

The Tribal Council has reviewed the 2010 Karuk Hazard Mitigation Plan and submitted a formal resolution adopting the plan. We understand this plan to be an evolving document that will be updated every five years. The Karuk Tribe will comply with all applicable Federal statutes and regulations. 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 Tribal Hazard Plan as they are developed and deemed applicable.

The Karuk Tribe held a meeting of it's Natural Hazard Mitigation Team Members on April 22, 2010 and subsequently, in it's open session of the Tribe's Council meeting, the public was given an opportunity to ask questions and comment on the plan. The plan was posted on the Tribes website at www.karuk.us and distributed to each of the Tribes main health, administrative or programmatic offices for public comment. This was provided to help increase the public's awareness and reflect the public's views and opinions. Comments received are incorporated into the plan document if appropriate to the plan.

Requirement §201.7(b), §201.7(c)(1)(i) and (ii): *An effective planning process is essential to businesses, academia, and other private and nonprofit interests to be involved in the planning process.*

The Planning Process

During the first planning process, members of the Tribe's Hazard Mitigation Planning Team (HMPT) met with FEMA on March 3, 2006, to talk about opportunities to repair flood damages experienced locally in January 2006. FEMA and the Tribe identified the flood damages that were subsequently repaired. This updated draft plan has been reviewed by the Karuk Tribal Council. The revised Draft Karuk Hazard Mitigation Plan (KHMP) was prepared in March – April 2010. The Tribe was apprised of its need to complete a revised Hazard Mitigation Plan in order to be eligible to receive FEMA funding to repair the identified storm damage that occurred in January 2010.. FEMA has sent two representatives to the Tribal Offices to provide technical assistance to Rick Hill, KCDC Planner Grantwriter, and Erin Hillman, Director of Administrative Programs & Compliance to update the plan.

The public, or Tribal Members or Descendents, also had the opportunity to review the plan on the website and in Tribal Offices. Hard copies of the Plan documents were made available by request. All other Tribal Governments, tribal or regional agencies and local stakeholders are afforded the opportunity to comment on the plan by reviewing the website. The USFS was informed of the plan updates at a April 16, 2010 Project Coordination Meeting with representatives of the Department of Natural Resources and the Tribe's Administrative Programs. The plan has been designed to express the critical hazard needs and concerns of the Tribal Council and Tribal Community.

The plan itself was only required to be updated, not recreated. All staff positions have been updated and former employee names in those positions removed and replaced with current information. All crosswalk recommendations from the FEMA 2006 review were verified as being changed. The hazard "water contamination" was changed to "water quality" to include not only contamination but other conditions that could occur in the Klamath River and its tributaries. Consequently, dam removal has been added as a mitigation measure for water quality issues.

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Rick Hill, Grantwriter and Resource Developer, KCDC
Sami Difuntorum, Director, Karuk Tribal Housing Authority
Anne Escobar, Operations Manager KTHA

Through an interdisciplinary planning process we have assembled specialists (listed above) who have provided technical expertise to assess our hazard risks. In 2006, the Tribe identified the most prevalent hazards, considered the most feasible ways to avoid or minimize these hazards, and developed mitigation strategies to reduce future losses. The methods used to assess the hazards and needs included: referencing Tribal and National Forest documents; historical interviews; GIS queries; newspapers; photography; data gathering, and Federal, State, and County, information. The information was verified for accuracy and extrapolated for the anticipated outcomes. We identified several of the area's most prevalent hazards, and profiled and inventoried the estimated losses that could result from hazardous incidents. Utilizing the STAPLEE process the Tribe developed hazard mitigation priorities identified under Requirement §201.7(b), §201.7(c)(1)(i) and (ii).

Consulted Resources

- The Karuk Tribe Newsletter
- Historic and current newspaper articles & publications
- Fred Burcell (historic accounts)
- Historical personal accounts of factual information
- Klamath National Forest Land Management Plan
- Six Rivers National Forest Land Management Plan
- U.S. Forest Service
- National Oceanic Atmospheric Administration (NOAA)
- Karuk Department of Natural Resources (DNR)
- Karuk Tribal Housing Authority (KTHA)
- Existing Transportation System and Land Use Plan
- California State HMP
- Siskiyou County Agriculture Department/ Air Quality Control

- North Coast Unified Air Quality Department
- Hoopa Valley Tribe Extended Emergency Response Plan 2008

The Karuk Community Profile

As a modern government, the Karuk Tribe continues to successfully administer a large number of Tribal programs. Karuk Tribal Programs include three health and dental clinics, a People's Center Museum and Interpretive Center, higher education assistance, Low Income Assistance Programs, language restoration, behavioral health, , Tribal Court, Temporary Assistance to Needy Families (TANF), Head Start, senior nutrition programs and Housing in three communities as well as individually owned scattered sites The Tribe employs over 180 people in administrative, health, housing, and natural resource programs.

As indicated on the maps FEMA provided the Tribe on March 20, 2006, the area we serve encompasses a large geographic area. Most Karuk living in our ancestral territory live in three communities within a 140-mile stretch of the mid-Klamath River region. 1,454, or 42% of the 3,681 enrolled Tribal members, live on or near Tribal trust land.

Yreka is our area's largest local community, yet relatively small with a population of 7,500. Siskiyou County, the area that spans most of our Ancestral Territory, has a population of 44,000. The city of Yreka, situated on Interstate 5, is less vulnerable to wildfires and flood events than our Tribal lands west of the Interstate. However, Yreka is more vulnerable to earthquakes, and volcanic eruptions. Yreka, the Siskiyou County seat, has a small town infrastructure and hospital. Because Yreka is located on Interstate 5, it is less vulnerable to being isolated than other Tribal communities west of it. Yreka currently has a Karuk housing complex and medical and dental clinics, as well as a Head Start, and Karuk community center and housing offices,.

Winter storms are the most common hazard disruptions we experience and can produce erosion, flooding, high winds, loss of power service and communication services, landslides, snow storms, and road closures isolating our rural community's. Such disruptions can last for hours to days or longer based on the severity of events.

Happy Camp, Somes Bar, and Orleans are surrounded by National Forests that are highly susceptible to flooding, landslides, and wildfire disturbances. Happy Camp and Orleans have a large concentration of Tribal administration and housing facilities. Happy Camp also has Tribal medical and dental clinics and Orleans has a medical clinic. The Tribe also has facilities and equipment in Somes Bar. There are many Tribal residents located along the Klamath River and in the Salmon River drainage.

Critical Tribal Facilities

The following Tribal Resources and facilities are considered critical to the Tribes functioning and needs.

Orleans Area Facilities

Natural Resources Department

Medical Clinic
Fisheries Offices
Housing Offices and Maintenance Shop
Senior Nutrition Program/ Computer Center
35 Housing Units

Somes Bar Area Facilities
Somes Bar Work Station

Happy Camp Area Facilities
Tribal Head Start
Tribal "Blue House"
Tribal Community Development Corporation
Tribal Administration Offices
Tribal Maintenance/TERO
Tribal Maintenance Shop
Tribal Happy Camp Health/ Dental Clinic
Housing Administrative Office
Tribal/Housing Information Technology and Maintenance Facility
Housing "Headway" Community Facility
35 Housing Units

Yreka Area Facilities
Tribal Head Start
Tribal Health and Dental Clinic
Housing Authority Administrative Office
Tribal Community Center
63 Apartments (15 4-Unit & 1 3-Unit)
48 Housing Units

Karuk Tribal Lands

The land the Karuk own includes approximately 650 acres of trust land and 1000 acres of fee land (fee land is owned by the Tribe but not yet in trust). These lands are mostly isolated parcels dispersed across central & western Siskiyou County and northeastern Humboldt County in California. They are generally located in small communities surrounded by National Forest Lands.

The Klamath Mountains that surround our Tribal lands are geologically and ecologically unique. The complexity of the areas geomorphology consists of: intrusions of shear zones; large dormant slides; moderate to steep mountain slopes; inner gorges; and stream terraces that are covered with hardwood mixed conifer forests. The physical and hydrologic characteristics of our ancestral lands are largely influenced by our climate and topography. Wildfires, severe storm events, floods, and degraded water quality in the Klamath River are the primary hazards

presenting significant threats to our people, fisheries, wildlife, natural and spiritual resources, facilities, homes, and assets.

The Tribe is developing an Tribal Integrated Resource Management Plan (TIRMP) that provides a comprehensive range of resource management integration planning that is compatible with the updated 2010Tribal Hazard Mitigation Plan and Tribal Emergency Operations Plan (TEOP). The 2010 KHMP update is tiered to the overall resource protection and intent of the Karuk Integrated Resource Management Plan.

Requirement §201.7(c)(2)(i): *The Karuk Tribe risk assessment **shall** include a description of the location and extent of all natural hazards that can affect the Tribal planning area. The plan shall, include information on previous occurrences of hazard events, on the probability of future hazard events, using maps where appropriate.*

And

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

Hazard Risk Assessment

Potential Hazards

The Hazard Mitigation Planning Team (HMPT) has identified natural- or human-induced hazards that could cause problems of varying degrees in our area. While the hazards we have identified are not intended to address all potential hazards, we consider these to be:

- ***Floods Events***
- ***Wildfires***
- ***Air Quality***
- ***Landslides***
- ***Dams and Dam Failure***
- ***Road and Bridge Failure***
- ***Water Quality or Contamination***
- ***Volcanic Eruptions***
- ***Earthquakes***
- ***Drought***
- ***Other Events***

Flood Events

Precipitation amounts in our area vary from up to 90 inches to as little as 10 inches, with approximately 90% falling between October and May. Below 3,500' in elevation, rainfall predominates, while above 4,000', snowfall does. Deep snow accumulates in the higher

elevations during the winter. Summer precipitation occurs mainly in the form of thunderstorms, which are usually high intensity, short duration episodes.

Most local flooding is caused by rain-on-snow events. Also, forest openings, roads, or burned areas allow greater snow accumulations, which increases snowmelt runoff.

A Tribal Facilities Vulnerability Map is enclosed in the Attachment section. The map identifies the location of Tribal resources and facilities that are most vulnerable. The Tribe has only limited data available on what specific structures, facilities, and resources are vulnerable to all the possible hazards we have described. The Tribe plans to complete a more detailed vulnerability inventory of Tribal resources at risk in the future as funding is available. These detailed vulnerability site specific inventories will be included in any future plan updates.

Over half of our Tribal facilities and housing tracts are located in low lying areas where floods can occur. Recent flood events occurred locally in 1955, 1964, 1997, and 2005. The most recent flooding did not damage any tribal facilities but flooding comparable to 1955 and 1964 or worse will damage Tribal facilities. Floods generally cut off our communities from outside power service and road access or other services because rivers and streams overflow, wash out roads, and cause landslides that block roads and down trees. In 1955, Happy Camp residents were without electricity for three to six weeks. Helicopters flew in provisions for stranded communities because bridges washed out.

Due to offshore storm events that are saturated with moisture, northwestern California has a chronic and destructive flood history. The largest recorded flood in the area is believed to have been in 1861-62. Despite the construction of dams east of Interstate 5 on the Klamath River, our rural communities remain vulnerable to flooding. Land uses such as logging, agriculture, mining, and road building on steep slopes, from our perspective and experience, contribute to flooding.

The repetitive nature of flood damage is a concern because areas flooded in the past continue to be inundated again and again. Frequent and devastating floods occur locally on the Klamath River and Salmon River and on all local streams.

Siskiyou and Humboldt Counties are subject to a variety of flood hazard types that occur in the various hydrologic regions with varying degrees of frequency. Flooding that occurs in this area is represented by the 1964 late winter storms that caused $213 million in property damage in California.

Historic Flooding Events

Local flooding occurs when streams and rivers are inundated by rain-on-snow events. Historic accounts of flood events are primarily noted in newspaper archives. Newspaper accounts document flood events in: 1861, 1881, 1890, 1927, 1934, 1948-49, 1955, 1961, 1964, 1994, 1997, and 2005.

- In 1861 and 1961 the Klamath River near Seiad crested 37½ feet above the low water mark.
- In February 1927 the Salmon River rose 45 feet at Somes Bar and the Klamath River rose 51 feet at the mouth of the Salmon River.
- The 1955 Christmas flood washed out over 30 bridges in Siskiyou County. Many homes and outbuildings were lost. Bridges along the Klamath were lost and landslides blocked road access in many locations. Residents were without power and road access for over one month in many areas.
- In 1964, a flood brought excessive amounts of logging debris into local stream channels, blocking access. Salmon River area communities were completely isolated for several weeks.
- In 1997, the flood caused road failures on National Forest lands, costing over forty million dollars to repair.

Local flooding information presented below was provided by NOAA for the Klamath River zone in 2006.

Klamath River below Iron Gate Dam (Lat. 41°55'41", Long. 122°26'35") *Historical Crests* (Not official U.S.G.S. crest values):
(1) 13.63 ft on 12/22/1964 (29400 cfs)
(2) 13.1 ft on 01/01/1997 (20600 cfs)
(3) 11.3 ft on 01/16/1974 (18700 cfs)
(4) 9.58 ft on 03/24/1993 (11100 cfs)
(5) 9.24 ft on 03/11/1989 (10200 cfs)

Klamath River near Seiad Valley (Lat. 41°51'14", Long 123°13'52") *Historical Crests* (Not official U.S.G.S. crest values):
(1) 33.75 ft on 12/23/1964 (165000 cfs)
(2) 29.65 ft on 01/16/1974 (126000 cfs)
(3) 29.2 ft on 12/22/1955 (122000 cfs)
(4) 28.72 ft on 01/01/1997 (117000 cfs)
(5) 22.8 ft on 12/20/1981 (71500 cfs)

The floods of 1955 and 1964 constitute the dominant events in the last century.

News Years Eve Flood, 2005-2006:

On Friday, December 30, 2005, the Klamath River flooded low lying areas on Highway 96. In addition, numerous streams flowed over Highway 96 as culverts could not contain the runoff. Debris slides (rocks, logs, and mud) covered Highway 96, the primary access in and out of western Siskiyou and northern Humboldt Counties. Travelers were stranded and cut off in unexpected places. In Happy Camp, a Red Cross shelter was set up at the elementary school where travelers were offered a hot meal and a place to sleep. In the Somes Bar/Orleans area, no services were provided.

Cal-Trans kept Highway 96 open as long as possible, but debris slides and water inundating the Klamath River around Granite Point near Seiad Valley forced the closure of Highway 96 at 5 pm on December 30. Emergency services and law enforcement worked around the clock to take care of the communities' needs for the next several days. Debris slides at Aubrey and Three Creeks south of Happy Camp and a massive debris slide south of Orleans isolated Orleans/Somes Bar from any assistance. As the overflow from streams and rivers dropped, the flood debris, landslides, washouts, and roads that were undermined continued to present hazards and block road access. Travelers were stranded in Happy Camp, Somes Bar, Orleans, and other small, isolated communities in western Siskiyou and northern Humboldt Counties for three days or longer, depending on location and road conditions. In the 2005 flood event, Highway 96 was submerged five (5) feet near Granite Point, just north of Seiad Valley.

Wildfires

The map FEMA provided under the CDF Wild land Fire Threat Category indicates the entire area surrounding Karuk lands qualifies for very high wildfire hazards.

Wildfire outcomes are determined by weather, fuels, terrain, and, to a lesser extent, suppression efforts. Large scale, hot wildfires can cause catastrophic impacts to forests, particularly Karuk Trust lands and resources on National Forest lands we continue to use.

All the Karuk Ancestral Territory, roughly 1.4 million acres, is National Forest and nearly all of the land owned by the Tribe is at a high risk to fires. Each of our Tribal communities in western Siskiyou and northern Humboldt Counties are surrounded by National Forest land that falls into High Wildfire Condition Classes. A century of National Forest management, specifically logging and fire suppression, has diminished the capacity of our local forests to withstand wildfire disturbances. This mismanagement, the Karuk feel, has adversely impaired the ecological integrity of our ancestral homelands. On National Forest lands, for example, there is now an unnaturally high build-up of fuel that promotes intense hot fires. Hot fire events under these conditions:

- Impairs watersheds' ability to hold soil in place and trap sediment before it enters stream systems. Hot wildfires present a significant risk to soil, especially in denuded watersheds, through accelerated erosion potential in the immediate post-fire environment, particularly when subjected to severe rainstorm events prior to vegetation recovery.
- Causes a short-term increase in the quantity and the delivery rate of water entering streams, having significant adverse effects downstream from the site of a fire, due to decreased water absorption because of vegetation killed.
- Increases runoff, which was especially evident at Aubrey Creek in the 2005 flood event, 19 miles south of Happy Camp.

Major wildfires over the past five decades caused wide-scale devastation almost over the entire Karuk Ancestral Territory, costing tax payers millions of dollars. These fires included the 1977 Hog Fire, the 1987 Complex, and the Megram Fire in 1999. These fires burned hundreds of thousand of acres. Other large scale wildfire events included the Dillon Complex in 1994 and

the Pony Fires in 1996-1997 and in 2008 the Panther fire, the Siskiyou and Ukonom Complex. Fire salvage activities can also create undesirable impacts due to additional land disturbances.

National Forest wildfire incidents in the summer of 2006 within the Ancestral Territory of the Karuk Tribe continued to burn as of August 10th, 2006 consuming several thousand acres at a cost of 18 million dollars. Weather, forest fuel conditions, winds, temperature, low humidity, terrain and vegetation types, suppression tactics and availability of suppression resources all are affecting the intensity and scale of the fires. The Karuk Tribe is working with other federal and state agencies as a government to government entity utilizing Tribal advisors, monitors, and Karuk firefighters. Wildfire activity in the region occurs from June through September due to California's dry summers and summer dry-lightning storm events. When conditions cause wildfires to "blow up" engulfing the vegetation canopy they create fire storms that locally become serious threats to life and property.

Additionally large scale wildfires followed by seasonal episodes of heavy precipitation and snow melt inevitably produce high sediment delivery causing chronic landslides, road failures, and adverse wreckage to fisheries, cultural resources sites, ceremonial areas, vegetation, and the resilience of ecosystems.

In the evening of June 20th, 2008 the Karuk Tribes aboriginal territory was hammered by lightening strikes. The resulting wildfires burned from that night on through the end of September. Tragically, two firefighters were lost on the Klamath River that year. One, a Karuk Tribal member and experienced equipment operator was killed on the Siskiyou Complex, near Dillon Creek 18 miles southwest of Happy Camp. The resulting smoke from back burns and burnouts was recorded as hazardous to unhealthy for two months. The Karuk Tribe enacted its Emergency Operations Plan, declaring a state of emergency and sought relief from state and federal agencies for the costs incurred to respond to the emergency.

Air Quality

The primary adverse impact to air quality in the region is smoke from wildfires. Particulate matter created by intense wildfires is a ongoing health and safety threat.. Even small wildfires burning under inversion conditions can have a significant impact on air quality and large scale fires experienced in 2008 in California effected air quality hundreds of miles from the fire for weeks at a time. The Federal Clean Air Act, the California Air Resources Board, and the Siskiyou and Humboldt County Air Pollution Control District also help identify and regulate air quality conditions in the region

The Tribes Hazard Mitigation Plan Air Quality Goal is to reduce health related respiratory risks from smoke emissions created during wildfire incidents.

While wildfires create significant amounts of smoke as they burn across the landscape even greater amounts of smoke are typically created by federal back burning management practices that burn large tracks of forest in an effort to contain wildfires. In Karuk ancestral territory where there is no direct threat to rural communities back burning management practices are controversial. Some Tribal members consider back burning inappropriate in such areas because

it creates prolonged intense smoke and the back burning impacts under some conditions are greater than wildfires that burn without intervention.

Severity of wildfire smoke emissions is random in both time and space depending on fire intensity, fuel type conditions, and meteorological influences. Inhalation of smoke particulates less than 10 microns in size-1 millionth of a meter, have a particularly long residence time in the atmosphere and are a concern because of respiratory toxicity. Carbon monoxide levels from prolonged smoke is a serious health and safety issue.

Although the longterm human health costs of 2008 fires have not been determined, data from local health clinics indicate they are rising rapidly. The Table below indicates 2008 visits for fire-related respiratory problems were 2.67 times 2007 visits, fire-related headaches also more than doubled, and other symptoms caused by poor air quality and low blood oxygen levels (e.g., malaise/fatigue) increased by 18.5%.

Table 4. Wild Fire-related Patient Visits in Tribal Health Clinics

	2007			2008		
	Orleans	Happy Camp	Combined	Orleans	Happy Camp	Combined
Respiratory Problems	58	24	82	68	151	219
Headaches	8	2	10	9	15	24
Malaise/ Fatigue	5	22	27	2	30	32

In 2008 the air quality impacts were not limited to health respiratory issues. Poor visibility suspended air support for fire fighting and air transports to hospitals for emergency patients and it also created poor visibility for fire fighters working under dangerous conditions.

July 16, 2008 the Tribal Council declared a State of Emergency on Tribal Lands and began to immediately assess the risk to the public health and its unmet needs in the communities most impacted by heavy smoke. Mitigation Activities included;

- July 21-OES Meeting- Humboldt County
- July 22- Orleans - priority list for Air Quality Monitor
- July 25- Met with FEMA prepared PDA
- Ordered and distributed 50air purifiers
- Opened the Senior Nutrition Sites in Orleans and Happy Camp as Cleaner Air Centers
- Distributed information regarding Air Quality Alerts from Humboldt Co. and Siskiyou County by email
- Began contact with various county, state and federal agencies

Other issues that affected Tribe's ability to gather a response to the emergency were the lack of formalized department of emergency services (existing staff took on roles and responsibilities in addition to job duties) , available resources from outside agencies due to number of fires in the state (equipment was unavailable), the size of the Karuk Service Territory- 150 miles along Klamath Corridor from Yreka to Bluff Creek and the affected area residents are isolated and separated by great distances, lack power and communication ability in some areas which made it difficult to determine the severity of impacts from the smoke. Knowing the severity of the situation would have been useful in prioritization of the areas to which the Tribe would respond.

Future Mitigation Needs
The air quality in one area does not represent the air quality in all tribal areas, more monitors are needed and they must be placed in strategic areas.
There needs to be a centralized source for information that is EASY to navigate. There are numerous agency representatives that we have to communicate with, providing for a centralized source of information would cut down on time spent repeating the same information.

Landslide Events

Northwestern California's proliferation of steep mountains and erosive soils puts it at high risk for landslides. Any slope of 15 degrees or greater is susceptible to mud flows or landslides. The majority of the terrain within the Karuk Ancestral Territory is greater than 40% slope and especially susceptible to erosion and landslides.

The area's geologic context is predominately metamorphic forms in the Orleans, Somes Bar, and Happy Camp areas, and includes volcanic forms in the Yreka area. Ultramafic bedrock is common in the mid-Klamath area and is highly fractured, containing numerous groundwater concentrations and springs. It has a high potential for slumping and landslides when saturated by storm events. On steep ground, metamorphic soils are usually more deeply weathered and subject to large earthflow landslides. Soils derived from granitic materials are also highly erodible when disturbed. These soils are extremely sensitive to road cuts and fills and are therefore prone to additional landsliding in future rainstorms. According to data collected, road-related landslide rates range from 60-800 times greater than undisturbed rates in granitic soils (de la Fuente and Haessig 1991). These granitic rocks form sandy, easily eroded soil when deeply weathered and are typically referred to as decomposing granite (DG). This soil is susceptible to greatly accelerated surface erosion, channel erosion, and shallow debris sliding. Active earthflows present chronic problems during years of above average rainfall. Karuk lands are located on steep slopes or on flats adjacent to steep terrain and subject to potential landslide hazards. We have high incidences of landslides that close off our roads.

Landslides that can impact our resources, homes, roads, facilities, and other assets are typically triggered by heavy precipitation events or other cumulative impacts, including wildfire events. The intensity of past logging, road construction, and lack of road maintenance by the United States Forest Service has also aggravated mass landslide incidents.

Intense rainfall that results in widespread landslides increases course sediment deliveries to streams, which degrades spawning habitat and water quality for our salmon subsistence needs. Past landslide incidents that caused considerable disturbance occurred locally in 1955, 1964, 1974, 1997, and 2006.

Dams and Dam Failure

Dams constructed on the Klamath River after 1900 drastically decimated migrating salmon populations by restricting access to over 350 miles of spawning grounds. These dams also degrade water quality downstream. The conservation of native migrating salmon is vital to Karuk culture and well being. The role native fish plays in our diet, health, economy, culture and ceremonies cannot be overstated. Land developments, such as dams, stripping off resources, and overall misuse of our ancestral homelands threatens our subsistence foods and deprives our indigenous people the basic right to food and security. Prior to European settlement and the destruction of fisheries the Karuk people were among the wealthiest in California but today are among the poorest. The poverty rate for Tribal members in Siskiyou County is 88%. In 2005 the Karuk caught less than 200 fish; not enough to provide food for our ceremonial activities or subsistence needs. Prior to 1850 migrations of Salmon populations in the Klamath basin were estimated at over three million annually. Due to 2006 restrictions on commercial salmon fishing California's Governor Schwarzenegger proclaimed a State of Emergency in ten counties providing disaster loan guarantees for commercial salmon fisherman. Although the Tribe is encouraged by actions to help commercial fisherman there has been no effort to address the Tribes needs and no disaster prevention measures.

While the risk of dam failure is reasoned to be low any collapse of up river dams would cause complete devastation of river lowland areas by creating water levels that are many times higher than ever recorded during flood events. Seismic activities, internal erosion, and terrorism could cause failure of Iron Gate, Copco I or II, Dwindell, or the J.C. Boyle dams.

Road or Bridge Failure

During periods of extreme flooding Highway 96 is subject to slides, mud flows, and complete road failure. Alternate dirt or gravel surface road escape routes that climb out of the Klamath River canyon are also subject to closure because of snow, slides or road failure (e.g. Greyback Road). Bridges in Happy Camp, Orleans, Klamath River, and Seiad Valley are susceptible to failure during severe flooding. Bridge failure(s) essentially cut off inhabitants in western Siskiyou and/or northeastern Humboldt Counties. Flood events in 1955 and 1964 caused bridges to fail.

Road density and uncontrolled associated road erosion contribute to excessive stream sedimentation. These events can isolate and endanger Tribal residents. Large concentrations of coarse and fine erosion sediments degrade water quality and fishery habitat.

Tribal mitigation efforts within our ancestral homeland help reduce road sediment problems that threaten streams in National Forest. These mitigation efforts include out-sloping road prisms, and decommissioning roads, or maintaining roads to maximize the utility of out-slope drainage.

Culvert upsizing is also critical in preventing road failures. Road decommissioning can help mitigate water quality issues on those roads that have persistent chronic sedimentation issues. The Karuk Tribe has successfully decommissioned national forest roads with chronic erosion issues and is a proponent of decommissioning all unnecessary National Forest roads that are chronic sediment producers.

Water Quality

The Bureau of Reclamation's massive Klamath Irrigation Project and runoff from pesticides, fertilizers, and animal waste has contaminated the Klamath River, degrading water quality. Additionally, contaminated storm water and high amounts of sediment can pollute the Klamath River. Water contamination affects the health of humans, animals, the ecosystem, and our subsistence use of salmon, eel, and sturgeon.

High water temperatures and low water flows decrease the oxygen supplies that can kill fish and introduce deadly aquatic diseases. The Karuk Tribe has conducted studies of deadly contamination in Iron Gate Reservoir that indicate extremely toxic algae harmful to humans and animals.

Natural and human-induced hazards have significantly diminished the availability and quality of natural resources the Karuk depend on. The decline of our subsistence foods, especially salmon, has dramatically affected our People's quality of life and health. Our traditional diet and food sources have been significantly altered.

Located along the California-Oregon border, the Klamath is a unique River Basin home to many diverse species of wildlife, as well as economically and culturally diverse rural communities. The Klamath River Basin is huge. Ecompassing over 12,000 square miles the Klamath River Basin is about the size of the state of Maryland. The Karuk, Yurok, and Klamath Tribes still harvest salmon and c'wam from the river for cultural and subsistence purposes, family farmers and ranchers use the river for irrigation of diverse crops, and coastal commercial fishing families depend on Klamath salmon to earn their living. For many years, these competing demands have led to uncertainty for all Klamath communities as dwindling fish runs and too many demands on limited amounts of water led groups to fight against one another's interests. Fishing closures, fish kills, and irrigation shut-offs have resulted in a rotating crisis for Klamath communities (www.klamathriverrestoration.org)

Volcanic Eruptions

The Cascade Mountain Range is a volcanically active range as recent as Mount Saint Helens erupted. in southern Washington State. Nearby volcanic Mount Shasta, 35 miles southeast of Yreka is believed to have erupted at least once per 800 years during the last 10,000 years, and about once per 600 years during the last 4,500 years. The last known eruption was thought to occur in 1786. The most recent regional volcanic activity is from Mount Lassen 150 miles south east of Yreka. Lassen erupted in 1915 and remained active to about 1917. The Lassen Peak

eruption blasted a hot pyroclastic flow and a column of volcanic ash & gas more than 30,000 feet that fell on Winnemucca Nevada some 200 miles east. One reference stated Mount Shasta and Mount Lassen have a higher probability of becoming active again over the next few centuries than other dormant volcanic peaks in the Cascade Range. A sign of an impending volcanic eruption is seismic activity beneath the volcanic area. The warning signs appear a few weeks to months before an eruption but can last for centuries without leading to an eruption. Catastrophic impacts due to a major eruption on the northwest face of Mount Shasta could be tremendously devastating to the Karuk domain. Volcanic activities have not impacted any Tribal resources in the past few centuries. Volcanic events pose no significant threats to Tribal resources and therefore were not addressed in depth in the plan and were not addressed in our goals or mitigation considerations.

Earthquakes

Earthquake events in the region are not uncommon considering earthquake frequencies, but seismographic activity is historically less active than the southern California or the San Francisco Bay area. California is considered a high risk area because of major faults and its history of earthquake events. While no major faults run through Siskiyou County, the Cascade Range, near Mount Shasta, is susceptible, as indicated by the FEMA information maps.

Available earthquake data is scarce within our ancestral territory. Supplemental studies conducted in the future may provide more useful data. The Tribe meets or exceeds earthquake safe construction compliance on all facilities constructed since 1990.

The USGS-Earthquake website listed the most recent regional earthquake event as a April 25th 1992 7.2 mg tremor south of Eureka California. Eureka is 80 miles southwest of our southwestern ancestral boundary. The 1992 quake, located off shore was also felt by residents in Siskiyou County, but caused no local structural damages. There have been no reports of significant earthquake damages to any of our Tribal facilities to date. However because our geography is extremely mountainous, the extent of damage from a major earthquake could be crippling and widespread, cutting off access in and out of the area. There is only one primary access route in western Siskiyou County, Highway 96, which is narrow and winds through the mountains along the Klamath River.

The Earthquake Map provided by FEMA indicates that Tribal lands fall into 0-40% gravity, which is a moderate to low rating. Earthquakes are not considered a significant hazard priority so they were not addressed in our goals or mitigation considerations.

Drought Events

Tree ring studies, conducted by the Pacific Southwest Research Center for the Forest Service in Thompson Creek near Happy Camp, indicate that the past century (1900-2000) was the second wettest century in seven hundred years locally. Research also indicates that, prior to 1850, the Karuk landscape was managed for more open grassland oak woodlands, indicating that the previous centuries were dryer.

Drought events in the Klamath Mountains stress trees, as well as promote insect & disease attacks to forests that kill them. Prolonged drought kills forest stands due to lack of water. Drought conditions can encourage wide scale wildfires that can be extremely devastating. Prolonged episodes of drought can also impact domestic and tribal water systems. Local droughts occurred from 1977-87.

Other Natural Hazard Events

Tornados, hurricanes, hailstorms, windstorms, avalanches and snow storms like are not considered significant priority hazard threats to the Tribe.

Previous Approved Plan Deficiencies:
The Karuk Tribe's previous plan was updated to reflect "water quality" instead of "water contamination" as water contamination is only one of several issues that affect the overarching subject of "water quality" in Karuk lands.

***Requirement §201.7(c)(2)(ii)(A)NOT REQUIRED*:** *The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.*

and

Requirement §201.7(c)(2)(ii)(B) NOT REQUIRED: *the plan should describe the vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Hazards to Facilities and Infrastructure

Protecting infrastructure is essential to the health and welfare of our communities. Local infrastructure needs include: roads and bridges that provide access for emergency vehicles, medical care, food, shelter, and water; utilities that provide water, electricity, and communication services; local law enforcement; emergency responders; medical facilities; fire stations; schools; tribal buildings; grocery stores; and other businesses essential to the community's economy and safety. Hazardous materials have the potential to impact public health in a disaster or a hazardous event and must be contained.

This assessment has taken into account the location of Tribal facilities and relevant infrastructure to better determine hazards that are likely to threaten life, specific resources, facilities, housing, and roads. The following hazardous events make our facilities and infrastructure particularly vulnerable:

Flooding: Facilities or homes near lowland rivers or streams are highly vulnerable to flooding. This includes the Tribal Administration Offices and other Tribal facilities in Happy Camp, Tribal housing and facilities in Orleans, the Fish Hatchery in Orleans, Highway 96, and other low lying roads or settings that become inundated by overflowing streams and rivers. Erosion disturbances from flooding can cause significant damage and repair costs to Tribal resources, forest environments, and local rural infrastructure. Floods have a significant impact on accessibility due to landslides, road failure, and flooded roads.

Landslides: Typically landslides are triggered by rain storms that saturate the ground and other disturbances that aggravate geologically instable slopes. The magnitude and occurrences are also exacerbated by a extensive U.S.F.S. road network that is located on steep and sometimes unstable terrain. A direct and immediate threat is when individuals are stranded due to roads blocked by slides or road wash outs or road failures. As stated earlier in this document, there have been numerous occasions where assistance can only be provided by helicopter. A few residents are situated in locations that are vulnerable to landslide and erosion damages. These housing facilities are exposed to unstable slopes.

Earthquakes: In a very large localized earthquake (8.0), Tribal facilities & housing, roads, and bridges will be significantly damaged. Landslides activated by such an earthquake will present catastrophic damage and cripple local communities. An earthquake has the potential to cause major structural and/or non-structural damage to any non-retrofitted facilities. High liquefaction areas and locations susceptible to mass land sliding are likely to sustain the heaviest damages.

Wildfires are very common west of Interstate 5 because the area is heavily forested, difficult to access, and has hot summers with lightning weather. Virtually all the Tribal communities, facilities, and housing west of Interstate 5 are threatened by wildfires.

Cumulative Impacts of Fire and Flood Episodes on Tribal Resources

Due to the unnatural build up of forest fuels, wildfires burn a high percentage of the forest canopy, exposing soils that are then extremely susceptible to storm events. These storm events, which displace large amounts of sediment, create costly damage to downstream Tribal assets such as homes, roads, and other infrastructure. Increased sediment levels can overwhelm stream systems by filling in deep pools and niches used by fish and other aquatic species, causing flooding and deposition in riparian habitats and damaging small-scale and large-scale private, tribal, or community water supply facilities. Moreover, these cumulative fire/storm event disturbances can have long-term adverse impacts on our fishery and other land-based subsistence & cultural resources needs.

Requirement §201.7(c)(2)(ii)(C)NOT REQUIRED/RECOMMENDED): *The plan should describe vulnerability in terms of a general description of land uses and development trends within the tribal planning area so that mitigation options*

And

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

Protection of "Trust Resources" on Federal Lands

While the Karuk have 650 acres of trust lands and over 1000 acres of fee lands, many of the Tribe's most valued resources (i.e. cultural assets) are located on federal lands, which encompass approximately 1.4 million acres of National Forest lands. Karuk cultural resources are trust resources the government is obligated to protect as part of its trust responsibility to Federal Indian tribes. Karuk trust resources include: traditional subsistence foods such as fish, shellfish, wild game, acorns, mushrooms, and plants to make baskets and objects for ceremonial & sacred uses. Many irreplaceable cultural resources are adversely impacted by wildfire fires and floods and activities associated with these events such as fire suppression. Artifact looting and vandalism increase when artifacts are exposed by such events. In the past, floods have washed away burial sites and fires have incinerated cultural resource related settings.

The Karuk Tribe maintains Fire/Fuels and Watershed Restoration programs as well as MOUs with local National Forest Offices that encourage the Karuk Tribe's involvement in wildfire suppression, fuel reduction projects, and watershed restoration (road decommissioning) activities. This allows the Tribe to monitor fire suppression, pro-actively reduce fuel loads, and reduce the threat posed by un-maintained road miles in its Ancestral Territory. In addition, the Tribe meets monthly with the U.S.F.S. to address other activities that may impact Karuk resources. When fire events occur, the Karuk Tribe encourages the U.S.F.S. to implement responsible mitigation to protect Tribal resources and needs. In some instances, there is not enough time to take the action(s) needed. For this reason, safeguarding our irreplaceable natural and cultural resources in advance is critical.

The December 31, 2005, flood impacted locations where ceremonial activities occur. It also affected areas where the Karuk are dependent on forest resources and road access to them. These resources include, but are not limited to:

- Ceremonial Grounds
- Gathering Sites for Subsistence
- Trails
- Road Access
- Fish Hatchery

Requirement §201.7(c)(3)(i): *The Tribal mitigation strategy shall include a description of Tribal mitigation goals to reduce or avoid longterm vulnerabilities to the identified hazards.*

General Mitigation Goals include*:*

Continue bi annual updates of the Tribal Emergency Response Operations Plan; apply for a FEMA Pre-Disaster Planning Grant; developing policies that improve coordinated planning and emergency response & preparedness among Tribal and non-Tribal communities; and educating the Tribal membership on how they can make their residences more defensible against hazardous incidents.

Specific Hazard Mitigation Goals include:

<u>Dam(s) Failures</u>

(Mitigation Goal D)
Failure of dams and water storage facilities located upriver on the Klamath River could do severe damage to Karuk people, communities, and resources. See Flooding and Severe Storm Events below.

Mitigation Goal D1: Minimize losses to human life and public safety.

Objectives:

- **D1.1** Designate person responsible for an early warning system.
- **D1.2** Conduct yearly workshops that increase Tribal community awareness of mitigation activities and responses to emergency situations.
- **Mitigation Goal D2: Minimize losses to homes and facilities.**

Objectives:

- **D2.1** Prepare detailed GPS mapping of residences, structures, and infrastructure.
- **D2.2** Re-channel altered stream courses that may threaten structures and create plan to divert flood waters by 2008.
- **D2.3** Where possible, relocate or decommission structures and take actions that minimize hazard threats to Tribal infrastructure and resources by 2011.

Mitigation Goal D3: Protect cultural and environmental resources.

Objectives:

- **D3.1** Maintain database of cultural resources at risk and implement protective measures.
- **D3.2** Re-channel altered stream courses that may threaten resources and divert or stop flood waters.
- **D3.3** Place cultural monitors on emergency and clean-up crews to establish Tribal cultural boundaries and supervise activity near them.
- **D3.4** Where impossible to protect resources through pre-planning, create priority list for mitigation and post-recovery efforts.

Drought Events

(Mitigation Goal DH)

Drought episodes impact not only Karuk communities' water supplies and the people's health, but also essential cultural and subsistence resources due to low water levels and increased flammability of forest fuels. See Wildfires below.

Mitigation Goal DH1: Protect public health and safety.

Objectives:

- **DH1.1** Install water storage facilities for communities at risk by 2011.
- **DH1.2** Continue an assistance program for elders and others in Karuk communities during times of extreme heat (air conditioned facilities for use by public).
- **DH1.3** Conduct planning aimed at reducing the severity of droughts with federal, state and Tribal government and other non governmental stakeholders so that fish species will be protected and water quality improved with quantity.
- **DH1.4** Adopt ordinances that conserve water during declared drought emergencies and maintain adequate flows for fish by 2015.
- **DH1.5** Reduce flammable fuels on Tribal lands and adjacent National Forests over the next 5 years.
- **DH1.6** Conduct workshops that increase awareness of water conservation measures.

Mitigation Goal DH2: Protect cultural and environmental resources.

Objectives:

- **DH2.1** Conduct planning aimed at reducing the severity of droughts with federal, state , Tribal government and non governmental stakeholders that fish species will be protected and water quality improved with quantity.
- **DH2.2** Adopt ordinances that conserve water during declared drought emergencies and maintain adequate flows for fish.
- **DH2.3** Reduce flammable fuels on Tribal lands and adjacent National Forests over the next 5 years.
- **DH2.4** Place cultural monitors on fire crews to establish Tribal cultural boundaries and supervise activity near them.

Floods Events

(Mitigation Goal F)

Located along the Klamath River, the Karuk communities of Happy Camp and Orleans are prone to flooding and high water episodes, which are primarily caused by winter rain-on-snow events. Flooding along the River and its tributaries has historically resulted in losses of lives, homes, and cultural resources as well as structural damages. See Dam Failure above.

Mitigation Goal F1: Minimize losses to human life and public safety.

Objectives:

- **F1.1** Designate person responsible for an early warning system.
- **F1.2** Identify and distribute real time escape routes and safe zones to the community.
- **F1.3** Identify and adopt preparedness measures to reduce the disruption of: electrical power; food and water shortages; communications; medical services; and travel during storms and flood events.
- **F1.4** Conduct yearly workshops that provide search and rescue training as well as increase Tribal members' awareness of mitigation strategies and responses to emergency situations.

Mitigation Goal F2: Minimize losses to homes and facilities.

Objectives:

- **F2.1** Prepare detailed GPS mapping of residences, structures, and infrastructure.
- **F2.2** Re-channel altered stream courses that may threaten structures and create plan to divert flood waters.
- **F2.3** Where possible, relocate or decommission structures and take actions that minimize hazard threats to Tribal infrastructure and resources by 2011.
- **F2.4** Conduct yearly workshops that provide search and rescue training as well as increase Tribal members' awareness of mitigation strategies and responses to emergency situations.

Mitigation Goal F3: Protect cultural and environmental resources.

Objectives:

- **F3.1** Identify 100% of cultural resources at risk and implement protective measures based on findings.
- **F3.2** Re-channel altered stream courses that may threaten resources and create plan to divert or stop flood waters.
- **F3.3** Place cultural monitors on emergency and clean-up crews to establish Tribal cultural boundaries and supervise activity near them.
- **F3.4** Where impossible to protect resources through pre-planning, create priority list for post-recovery efforts.

Objectives

- **E1.** Assess the current status of earthquake safe infrastructure facilities**.**
- **E2** Develop earthquake vulnerability and potential damage data report for administrative oversight review**.**
- **E3** Coordinate with other local agency planning efforts that address earthquake mitigation and disaster planning activities.

Air Quality

Mitigation Goal AQ

The primary adverse impact to air quality in the region is smoke from wildfires. Particulate matter created by intense wildfires is a ongoing health and safety threat.. Even small wildfires burning under inversion conditions can have a significant impact on air quality and large scale fires experienced in 2008 in California effected air quality hundreds of miles from the fire for weeks at a time. The Federal Clean Air Act, the California Air Resources Board, and the Siskiyou and Humboldt County Air Pollution Control District also help identify and regulate air quality conditions in the region

The resulting smoke from these fires and the related suppression activities of the Forest Service contribute to the unhealthy and often hazardous air quality conditions that occur in the Karuk Tribe Aboriginal Territory.

Mitigation Goal AQ1: Minimize impacts to public health and safety.

- **AQ1.1** Through government to government agreements with the United States Department of Agriculture, Six River and Klamath National Forests the Karuk Tribe will work with both forests to exercise sound forest management practices that do not jeopardize the health and safety of the residents in the surrounding area.

  AQ1.2 Purchase three portable air quality monitors that are compatible with local county (Siskiyou and Humboldt) monitoring equipment. Tribal staff will be trained to operate the monitors. They will be strategically placed so that the Tribe will be able to coordinate with local county air quality officials and the Forest Service to provide timely notification to community members of hazardous air quality conditions.

Objective AQ2. Develop Air Quality assistance for elders and other at risk Tribal communities during wildfires.

- **AQ2.1** Provide air filters for elders and others with respiratory health issues in times when smoke health risks are high.
- **AQ2.2** Provide Clean Air Centers for individuals with respiratory health issues for smoke related incidents.
- **AQ2.3** Monitor Air Quality and distribute information regarding Air Quality Alerts and coordinate mitigation with individuals at various county, state and federal agencies.

Landslides and Road & Bridge Failures

(Mitigation Goal LR)

Much of the Klamath region contains unstable soil, steep mountains, and many roads. During winter rains, storms, and floods, especially rain-on-snow events, saturated soils frequently slide.

Landslides block roads, threaten & destroy homes and facilities, and make public safety perilous to maintain.

Mitigation Goal LR1: Minimize impacts to public health and safety.

Objectives:

- **LR1.1** Prepare detailed GPS mapping of residences, structures and infrastructure to aid clearing strategies and evacuation in an emergency.
- **LR1.2** Identify critical road infrastructure and current condition.
- **LR1.3** Identify and distribute real time escape routes and safe zones to the community over the next 2 years.
- **LR1.4** Identify hazards, post warnings, and develop alternative travel routes.
- **LR1.6** Conduct workshops that increase Tribal awareness of mitigation strategies and responses to emergency situations.
-
- **LR1.7** Designate person responsible for an early warning system.
-

Mitigation Goal LR2: Minimize impacts to homes and other property.

- **LR2.1** Prepare detailed GPS mapping of residences, structures, and infrastructure.
- **LR2.2** Where possible, relocate or decommission structures and take actions that minimize hazard threats to Tribal infrastructure and resources by 2011.

Mitigation Goal LR3: Minimize impacts to cultural and natural resources.

Objectives:

- **LR3.1** Identify 100% of cultural resources at risk and implement protective measures based on findings.
- **LR3.2** In collaboration with U.S.F.S., continue implementing pro-active restoration projects and vigorously storm-proof identified critical road infrastructure with Tribal crews.
- **LR3.3** Where impossible to protect resources through pre-planning, create priority list for post-recovery efforts.

Wildfires

(Mitigation Goals WF)

Wildfires are a constant threat to Karuk communities during warmer months. Fires often start with lightening strikes, but extremely hot fires result from imbalances in nature such as bare, logged land; logging roads; and land with excessive fuel due to fire suppression practices. Wildfires that burn in these environments are especially dangerous for people and the environment. In the forest, bare soils become too hot and their composition becomes vulnerable to erosion and, in wet weather, landslides. Logging roads cut into mountains exacerbate this phenomenon. See Droughts and Extreme Heat above.

Mitigation Goal WF1: Minimize losses to human life and public safety.

Objectives:

- **WF1.1** Reduce flammable fuels on Tribal land and in adjacent National Forests over the next 5 years.
- **WF1.2** Prepare detailed GPS mapping of residences, structures and infrastructure to aid clearing strategies and evacuation in an emergency by 2008.
- **WF1.3** Develop an assistance program for elders and others in Karuk communities during times of wildfire disturbances.
- **WF1.4** Identify and distribute real time escape routes and safe zones to the community over the next 2 years.
- **WF1.5** Designate who will be responsible for the early warning systems.
- **WF1.6** Conduct workshops that increase Tribal awareness and mitigation strategies..

Mitigation Goal WF2: Protect cultural and natural resources

Objectives:

- **WF2.1** Reduce flammable fuels on Tribal lands and adjacent National Forests over the next 5 years.
- **WF2.2** Identify 100% of cultural resources at risk and implement protective measures.
- **WF2.3** Place cultural monitors on fire crews to establish Tribal cultural boundaries and supervise activity near them.

Mitigation Goal WF3: Minimize losses to homes and facilities.

Objectives:

- **WF3.1** Prepare detailed GPS mapping of residences, structures, and infrastructure.
- **WF3.2** In collaboration with the U.S.F.S., direct Tribal hand crews to clear forest under-story fuels.
- **WF3.3** Where possible, relocate or decommission structures and take actions that minimize hazard threats to Tribal infrastructure and resources by 2011.
- **WF3.4** Clear around homes and buildings to reduce fuels.

Water Quality

(Mitigation Goal WQ)

Large amounts of silt behind dams, combined with pesticide by-products in irrigation run-off, pose a water contamination risk for Karuk communities situated down river, especially during storm or flood events. High water events of any kind create a concern for both public water supplies and traditional subsistence foods, especially fish, which are near the Klamath River and its tributaries. Water contamination concerns coincide with both Dam Failure and Flooding and Severe Storm Events, discussed above.

Mitigation Goal WQ1: Protect public health and safety

Objectives:

- **WQ1.1** Prepare detailed GPS mapping of potentially threatened contaminated water resources over next year.
- **WQ1.2** Encourage the Bureau of reclamation, the federal government, agricultural industries, and private power companies to take measures to protect the quality of water downstream from their activities.
- **WQ1.3** Work to establish Tribal Water Quality Standard.
- **WQ1.4** Continue fishery recovery programs that help restore the health of aquatic systems.
- **WQ1.5** Conduct workshops that increase Tribal awareness of water quality and implement water conservation measures that preserve the quality of water on Tribal lands.
- **WQ1.6 Remove dams to improve water quality.**

Mitigation Goal WQ2: Minimize interruptions to public water supplies during an emergency

Objectives:

- **WQ2.1** Coordinate clean-up activities and adopt ordinances that help recover water quality in response with other agencies.

WQ2.2 Conduct workshops that increase Tribal awareness of water quality mitigation measures that can be undertaken by individual land owners on Tribal Lands and in surrounding communities.

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

Pre- and Post-Disaster Program Capacities

The Karuk Tribe's pre- and post-hazard management capacity is limited because our programs and organization are entirely dependent on available federal funding. Our situation is compounded by the fact that our geographic location makes us highly vulnerable to disaster events that further isolate our rural communities.

While the Karuk Tribe has been mostly dependent on local government responses to disaster relief, coordinating with law enforcement, search and rescue, the Red Cross, the Forest Service, State, and County agencies we are the only medical provider in Orleans and Happy Camp. During the 2006 flood event we provided continuous emergency medical care, coordinating relief with the Red Cross and other agencies where communities were cut off from the outside world.

We have medical plans and general emergency management policies, but lack funding to develop more detailed comprehensive hazard mitigation program. We are interested in grant opportunities such as FEMA's Hazard Mitigation Grant Program (HMGP) and Flood Mitigation-FMA.

The Tribe has limited experience in post hazard damage assessments and response. Additional training is needed. The Tribe is developing the Karuk Emergency Response & Operations Plan (KEROP) that will comply with Federal and State Incident Management Systems. To refine and develop the plan in greater detail, we have an unmet need of $40,000. For emergency response operations training we have an unmet need of $ 25,000.

The Karuk Tribe has established agreements with the Klamath and Six Rivers National Forests and Cal-Trans to facilitate a coordinated mitigation effort aimed at protecting Tribal resources within our Ancestral Territory from hazards. These agreements allow the Tribe to monitor federal and state activities during and after hazard incidents that may impair tribal lands and natural & cultural resources. In addition, Tribal preventative pre- and post-disaster mitigation planning activities include:

- Establishing property protection measures for structures located in hazard areas;
- Establishing partnerships at all levels of government and in each community to improve and implement methods that help protect property;
- Reducing or eliminating repetitive property losses due to flood, fire, and earthquake events; and
- Researching, developing, and adopting measures to mitigate damage to land-based resources, such as low-intensity, prescribed hand crew fuel reductions, road decommissioning, and storm-proofing roads on forest lands.

Implementing Effective Emergency Management Response Activities

The Tribe's infrastructure may be at risk for failure during or after an hazardous threatening event. Maintaining partnerships with other emergency response entities will be important. Ensuring that critical facilities and infrastructure are retrofitted or built to standards that make them less vulnerable in a hazard event is important, though problematic due to the costs involved. Additionally the Karuk Tribe is developing its capacity to having equipment available and work force services to better respond to emergency fire and flood events and to other hazards.

Incident Readiness & Responsiveness

When a hazard is pending, the Tribe will assemble a team to analyze high-risk areas and develop mitigation strategies that address the risks. The Team will utilize the Hazard Mitigation Plan and the Karuk Emergency Response Operations Plan to guide initial responses that help ensure the safety & health of tribal members and the protection of life & property. During an incident the Council and Tribe will be updated at daily briefings.

Local hazard events frequently cause power outages and create significant disruptions to our communities and infrastructure. It is especially important that facilities designated as emergency shelters have back-up power generators. In flood events, many Tribal residents are often cut off from services due to road closures and without electrical power. Tribal heavy equipment, once acquired, will be utilized to re-open roads and assist in any manner deemed necessary to alleviate conditions. Generators can provide residents emergency power if the Tribe can purchase or rent generators. Tribal facilities that have emergency generators may be utilized also if residents have access to these facilities.

Individual households should be prepared for emergency situations. Assuring that Tribal households are informed of the necessity of maintaining a five day supply of provisions is critical. This includes a: five-gallon supply of water per person stored in sealed, unbreakable containers; supply of non-perishable packaged or canned food; non-electric can opener; first aid kit; prescription medications; battery-powered radio, flashlight; and extra batteries.

The Tribe will utilize GIS software to aid in reducing the risk of hazards. GIS will be used to: determine of areas of high risk and exposure; plan for road and utility network needs; and update and maintain data so there is consistency and coordination among all Tribal emergency response activities.

Restoration activities after a hazard event will be carried out in a responsible manner in order to: minimize impacts to the extent possible, conserve natural resources and ecosystems, as well as maintain natural drainage courses. Property owners should use effective pollution prevention measures and maintain adequate water quality.

Flood/Landslide Prevention Measures

Flood and landslide prevention measures will include referencing past data and prioritizing prevention activities that can be addressed realistically. Flood/landslide hazard measures include: evacuation awareness and relocating resources, if practical; having policies and procedures in place that are readily available and useful; and providing provisions, shelter, and transportation, as needed. These measures may also include: sand bag diversions if time permits; emergency stream diversions; and clearing debris and reopening roads. Relocating structures that are now in flood planes is more problematic because of the cost involved.

Karuk Tribal Landslide Prevention Measures

Past and present exploitation of natural resources under the U.S.F.S. has led to significantly degraded watershed health with severe consequences. Extensive logging and the labyrinth of associated roads have led to severe and ongoing erosion and sedimentation problems. The Karuk Tribe is working diligently with the Forest Service and other partners to address these problems.

As with most federal agencies, the Forest Service is inadequately funded and does not have the resources to address the wide-array of issues related to watershed health. Specifically, chronic

erosion problems related to logging roads that were poorly engineered plague U.S.F.S. lands. A declining budget has decreased road maintenance leading to a steadily degenerating road system.

The potential for landslides and other erosion-causing events is abnormally high within the Ancestral Territory. For example, according to data collected in the Salmon River sub-basin, rates of road-related landslides range from 60 to 800 times greater than undisturbed rates in similar granitic soils (de la Fuente and Haessig 1991).

The Karuk Tribe addresses persistent erosion and subsequent deposition problems. The high likelihood of debris torrents poses the greatest threat during severe storm events. Reestablishment of historic hydrology is the primary objective.

In addition to the chronic sediment transport from these roads, the high number of stream crossings has a high potential for failure during a significant storm event. Stream crossing failures result in debris torrents that scour stream channels. Depending on slope position and channel gradient, these debris torrents can trigger successive debris torrents as they move downstream. As mentioned above, road related landslides rates in a nearby watershed ranges from 60-800 times greater than undisturbed rates in granitic soils (de la Fuente and Haessig 1991).

Specific management strategies adopted by the Karuk Tribe are to minimize hydrologic and erosion concerns by addressing the high road density and implementing restoration activities that include decommissioning & storm-proofing.

"Proper road closure is essential in preventing future erosion and sedimentation from abandoned roads and skid trails. Proper closure incorporates removal of temporary structures in watercourses, returning stream crossing approaches to their original grades (Kochenderfer, 1970; Rothwell, 1978).

Road decommissioning projects remove unstable fill at stream crossings, swales, springs, and seeps and reestablish the natural hillslope drainage pattern along the intervening road reaches. Our treatment specifications detail the work schedule by itemizing: excavation & disposal sites and post-project erosion & sediment control measures. The treatment specifications require the removal of road fill from stream crossings, swales, and other unstable areas. Stream crossings are excavated to original width, depth, and slope to expose natural channel and buried topsoil. Unstable fill material with high failure potentials is excavated to reduce erosion hazard and expose buried topsoil. Excavated material is moved to stable road locations, placed along cutbanks, and then shaped to specific slope and compaction requirements.

Since 1997, our unique relationship with the Six Rivers and Klamath National Forests has allowed for cost-effective road decommissioning projects to occur within our Ancestral Territory. Since the inception of this program, we have removed approximately 301,136 cubic yards of fill material and designed over 46 miles of road decommissioning. To visualize this, imagine 30,114 dump trucks filled with fill material lined bumper-to-bumper for 114 miles.

Karuk Tribal Fire Prevention Measures

Our Karuk Ancestral Territory is one of the most rugged, rural environments in the United States. Steep, densely forested terrain and hot summers makes suppressing wildfires difficult, at best. The flammable National Forest lands that surround our Tribal facilities, homes, and lands are a serious concern of the Tribe.

Due to federal policies of fire suppression and logging, there is an unprecedented accumulation of forest fuel west of Interstate 5 that has built up over the past eight decades. 1.4 million acres of our Ancestral Territory is managed by the U.S.F.S., which is faced with the daunting task of restoring our forests. From the Karuk perspective, additional federal funding should be made available to pre-treat these flammable lands, rather than trying to suppress destructive wildfires, which cost tax payers millions of dollars.

The Tribe supports initiatives that introduce low-intensity prescribed fire as well as mechanical & hand piling and brush burning to minimize chronic wildfire hazards. The Tribe has a twenty person fire crew working on federal and tribal lands to help reduce fire hazards, including thinning the understory and utilizing under-burning practices; however, due to federal funding, these critical mitigation activities are restricted.

Fires that do not pose a threat to life or property should *not* be suppressed because low-intensity fires can actually benefit forests by cleaning up the vegetation understory fuels.

Flammable Forest Conditions

Changes in the natural sequence of vegetation occur over time in response to current disturbances and forest types, past disturbances, and climate. Logging activities and a relatively wet climate over the past century, combined with fire exclusion, have altered local forests settings considerably. Two years after a fire on logged areas where the forest canopy has been removed, there may be more than 300 live hardwood sprouts and more than 1900 live brush sprouts per acre. With no overstory vegetation shading, sprouting brush competes with young trees and decaying wood does not hold moisture during the hot summer. The subsequent forest recovery cycle is prolonged due to successive fires across our homeland.

In the Klamath Mountains, low intensity fires are the natural, primary force for sustaining the vitality and natural resiliency of the forests. Before it was illegal to do so, Karuk people burned the forest understory. Wildfires were not a threat because prearranged fires promoted fire-resilient forest environments.

There is no complete substitute for fire as the natural force for promoting resilient, vigorous ecological processes. The challenge is how to integrate prearranged fire back into the land management process. Many forests are so flammable they need to be pre-treated before reintroducing fire.

The following Tribal fuel reduction activities have been completed on Tribal Forest lands that abut Tribal housing or facilities:

- A prescribed fire treatment on 12 acres in the Orleans near the mouth of Camp Creek;
- Mechanical and hand treatment fuels reductions surrounding Happy Camp housing, housing administration facilities, Head Start, and Economic Development;
- Hand crews have treated another estimated 10 acres around ceremonial grounds and Tribal owned trust lands in western Siskiyou County and northeastern Humboldt County.

The 20 person Karuk Fire Crew has been reducing concentrations of National Forest fuels on National Forest lands that adjoin the community of Happy Camp. To date, 70 acres have been treated by mechanical and hand treatments. The Happy Camp Ranger District has coordinated rural community fuels reduction activities with the Tribe, striving to provide opportunities that utilize our Fire Crew to reduce wildfire hazards. In 2006, federal funding has been cut drastically for such programs. The funding cuts are a concern of the Tribe given the fact that forest fires are burning many large areas of our ancestral homeland as this plan is being completed.

Reducing Tribal Facilities/Housing Fire Hazards

The following protection measures are being applied around our Tribal facilities and housing resources in Happy Camp, Orleans, Yreka, and Somes Bar:

- Removal of flammable materials from roofs, rain gutters, decks, sidewalks, and parking areas;
- Removal of pine needles, leaves, and other flammable materials within 50' of structures;
- Lawns are kept green and watered in the summer;
- Vegetation within 100' of structures is being thinned to a 10' spacing between individual trees and shrubs. Trees are trimmed 10' or 1/3 of their crown; and
- Fire breaks have been cut around some residences and facilities.

The Karuk Tribe has a comprehensive ongoing environment review policy in place to evaluate development in all hazard prone areas. The existing policies are consistent the 2010 plan and FEMA Tribal Multi Hazard Mitigation Guidance manual. Please see attached tables which evaluate the potential threats.

Tribal Capability Assessment- Funding Limitations

Current Challenges-
The Karuk Tribe is a non gaming tribe located in a large economically depressed area. There are few opportunities for economic development due to the remoteness of its geographic location. State and federal grant opportunities have steadily decreased due to the recession and the budget crisis in the state. Many grant opportunities require matching funds, and the Tribe is unable to provide funding for match due to the lack of discretionary resources. The limited amount of discretionary resources that the Tribe has is used for support of existing programs.

Wildland Fire Crew

The Karuk Wildland Fire Crew needs an annual operating budget of $300,000 for a fire engine, $500,000 for a thirty man Suppression and Fuels Reduction Crew, and $300,000 for supervision, fire equipment, and training. The unmet annual need is currently $1,100,000.

Watershed Restoration Crew:
The Karuk Watershed Restoration Crew needs an initial investment of:
Caterpillar D7R Dozer: $407,825
Caterpillar 325DL Excavator: $290,000
Caterpillar 950 Loader: $240,000
Caterpillar 140H Grader: $293,000
Annual operating budget: $120,000
Personnel costs: $350,000
The unmet need is currently $1,700,825.

Search and Rescue:
The Tribe would like to establish a collaborative, multi-agency search and rescue capacity and has an unmet need of $150,000 annually for a vehicle, equipment & training, and a coordinator who would work with local agencies.

Emergency Communication Services
The Karuk Tribe is planning to develop an Emergency Services Department that would be compatible with county, state, federal communications systems. The current cost of the equipment and unmet need is $20,000.

Emergency Power Systems
An assessment of emergency power generator needs to support our critical services that are currently unmet total $200,000.

Tribal Transportation Planning & Tribal Infrastructure Needs
In order to asses the transportation needs and prepare a plan the Tribe has an unmet need of $50,000. The Tribe needs to maintain improve and repair access to our rural housing, facilities, ceremonial, fisheries and transportation access for road maintenance with an unmet estimated unmet need of $300,000.

Emergency Storage Facilities
The Tribe has no adequate secure facilities for storing emergency provisions. The Tribe would like to construct facilities and has an unmet need of $250,000 to construct a storage building.

Emergency Response Coordinator
The Tribe has no Hazard Emergency Response positions. The Tribe would like to develop the position but has an unmet need of $70,000 annually to support the program. This program could address HAZMAT, emergency response, training, and preparedness.

Planning and the Development of Karuk Emergency Response Operations

The Karuk Tribe has developed an Emergency Response Operations Plan (EROP) that identifies pre- & post-disaster emergency procedures and mitigation actions to address hazards. The EROP strengthens the mitigation initiatives identified in this Hazard Mitigation Plan. The EROP focuses on preparedness, prevention, and disaster response. In a disaster situation, Karuk Emergency Response Teams will work in partnership with other agencies to help ensure there is sufficient water, food, evacuation if needed, medical care, shelter, fire services, and order.

The Karuk Tribe is an interdisciplinary player working directly under Incident Command with planning and operations on Wildfire incidents. We have been an interdisciplinary agency participant on at least twelve wildfire incidents within our Territory in the past decade. The Tribe's EROP is similar to what is used by State and Federal Wildland Fire Agencies. The Karuk Tribe's EROP is enclosed.

During hazard events, the Tribe will collaborate with the Forest Service, County, State, community services, Red Cross, and law enforcement, as needed. The Karuk EROP's pre-disaster and recovery-response activities include:

- Hazard Warnings
- Evacuation
- Education, including First Aid
- Shelter
- Food and Water
- Emergency Transportation
- Medical Care
- Emergency Power & Communication
- Damage Repair/Restoration

The designated Karuk Emergency Manager Coordinator (KEMC) will oversee the response activities, facilitating hazard relief and recovery/ restoration efforts. The KEMC will be responsible for implementing the Karuk Tribe's Hazard Mitigation Plan (HMP) and directing the response of Tribal departments, services, and operations to any situation deemed necessary by the Tribal Council. When a threat is present, the KEMC will meet with the Tribal Council prior to taking action, and then provide briefings daily or as needed.

Tribal emergency response teams under the supervision of the KEMC may participate in post-disaster repair work & emergency relief activities or may be deployed in relief instances where disasters are foreseen.

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

and

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

The Karuk Tribe complies with the National Environmental Policy Act (NEPA) and environmentally sound assessments prior to building facilities. Any disaster relief activities are conducted in such ways as to protect water quality and the environment. Hazardous materials are dealt with according to strict HAZMAT regulations, taking all appropriate safety measures.

Any hazard mitigation activity will be conducted in a cost effective manner consistent with our fiscal and project management policies. The Karuk Tribe applies contract and fiscal policies to all projects through internal services or the management, advertising, bidding, award, and closeout processes. Our Director of Administrative Programs and Compliance monitors all project activities to ensure that procurement and contract management policies are followed.

To the best of our ability, we will evaluate disaster incidents carefully and prioritize the hazard mitigation recovery activities as technically feasible as possible by using experienced and knowledgeable professionals. We will develop more detailed responses as each incident disturbance is evaluated.

The Karuk Tribal Council has prioritized the mitigation needs in the following sequence of importance based on our assessment and capabilities. Utilizing the STAPLEE process the Tribal hazard plan mitigation team came up with priority hazard mitigation actions requested under ***Requirement §201.7(c)(3)(iii):*** These priorities will be contingent on available funding.

The STAPLE+E process permitted the KTOC to identify and prioritize hazard mitigation activities. After identifying mitigation goals, these goals were listed and ranked using the STAPLE+E Criteria worksheets. Using the Priority Totals on the STAPLE+E Criteria worksheets, the KTOC evaluated and ranked the six highest priorities for mitigation, many of which may operate to mitigate for more than one hazard. These priorities focus on hazard mitigation activities.

Priorities:
The Updated 2010 KTHMP is consistent with the 2006 KTHMP long term mitigation goals that reduce vulnerabilities of all the hazard risks.
The following priorities for the 2006 plan are explained below for:
1. Hazard Forest Fuels,
2. GIS Mapping,
3. Education/Awareness Tribal Community Outreach,
4. Relocating structures in flood plains,
5. Identifying critical road infrastructure,
6. Address needed road restoration projects and storm proof road infrastructure, and
7. Rechanneling Streams.

For the 2010 update the Tribe has determined that 5. Identifying critical road infrastructure and 6. Determining the current road conditions and addressing road restoration projects and storm proofing road infrastructure and 7, rechanneling streams are no longer priorities now.

For 2010 KHMP Priorities continue to prioritize hazards for: 1). Fuels, 2) GIS Mapping, 3) Education and Tribal Community Awareness Outreach and, 4) Relocation of structures out of flood zones. However the 2010 KHMP also includes decommissioning 4 upstream Klamath River Dams and purchasing Air Monitors to monitor air quality as new priorities.

1) Reduce fuels on U.S.F.S and Tribal lands over the next five years, including Tribal homes and structures; collaborate with U.S.F.S. to clear forest under-story fuels (DH 1.5, DH 2.3, WF 1.1, WF 2.1, WF 3.3, WF 3.4)

Reducing forest land fuels which feed wildfires that cause heavy smoke episodes that are long lasting is important for sustaining high quality air. Chipping hazard fuels is an effective smoke prevention activity considering land management agencies are under greater scrutiny to meet strict air quality controls. The Tribe has a machine chipper that is utilized to mitigate and reduce smoke emissions for slash treatment.

From 2006-2008 the Tribal Hazard Fuel Reduction Crew treated 15 acres of Tribal land adjacent the Tribal housing complex in Happy Camp Ca and National Forest interface locations elsewhere to promote defensible space that also helps lower smoke emission impacts. In 2009 the Tribe treated 30 acres of hazard fuels on trust lands at the Ish kaysh Ranch in Happy Camp Ca.

2) Prepare detailed GPS mapping of residences, structures, and infrastructure by 2008. (D 2.1, F 2.1, LR 1.1,LR 2.1, WF 1.2, WF 3.1, WC 1.1)

The Tribe has completed additional inventories of infrastructure and added two facilities but due to no funding the Tribe was not able to provide GIS/GPS mapping other than what was completed for the 2006 KHMP.

3) Educate Tribal communities through regularly-scheduled workshops that increase awareness of hazards and hazard mitigation (D 1.3, DH 1.6, F 1.5, F 2.4, LR 1.6, WF 1.6, WC 1.5, WC 2.2)

The Tribe received FEMA-Hazard Mitigation Grant Program funding in 2007 and purchased a printer and mailed out 2000 brochures to Yreka, Seiad, Happy Camp, Orleans, and Somes Bar for a community education awareness outreach activity. With State CSD funding the Tribe purchased Emergency Preparedness Kits for elders and low income residents, CERT (Community Emergency Response Team) kits for Incident Operations Centers identified in our Tribal EOP. The 2006 THMP identified a goal as providing annual workshops to increase awareness of potential hazards. Due to no funding shortfalls and geographic considerations the Tribe decided that disseminating Hazard and Emergency Preparedness information would be more effective. The mitigation action for this activity is to utilize the radios, emergency vests, and GPS equipment in preparedness situations and during actual incidents.

4) Where possible, relocate or decommission structures; take actions that minimize hazard threats to Tribal infrastructure and resources by 2011. (D 2.3, F 2.3, LR 2.2, WF 3.3)

In 2009 the Karuk applied for a five million dollar HRSA grant to relocate Tribal Medical Facilities out of a flood plain in Happy Camp but the Tribe was not a provided that grant funding. The Tribe is looking further into funding opportunities to relocate structures out of the flood plain. The Karuk Tribe was not able to mitigate any activities that actually relocated structures.

5) Identify critical road infrastructure and determine its current condition; address needed road restoration projects and storm-proof road infrastructure; see also Priority 4) (LR 1.3, LR 3.2)

The majority of the Mid-Klamath Regions critical road infrastructure is not under the Tribes jurisdiction. The Tribe however works closely with Cal-Trans and the Forest Service on road management issues and activities. Emergency escape routes for flood and fire have been identified by the Tribe.

6) Re-channel altered stream courses that may threaten resources by 2008 (F 2.2, F 3.2, D 3.2)

Rechanneling stream courses is problematic in terms of environmental compliance, cost and current Tribal management capacity considering lack of program and project hazard funding available. This goal was directed at a Camp Creek Fish Hatchery facility the Tribe uses for monitoring fisheries that was impacted by 2006 flood event and engineering a system that will divert water to reduce potential flooding impacts.

Additions to 2010 Plan:

7.) Dam Removal Priority: Removing upstream Dams will help restore water quality, reduce dam failure threats, and provide better protection for fisheries and also reduce health risks due to algae-bloom threats.(WQ1.6)

8. 0 Air Monitors: Purchase and maintain air quality monitors for three communities for emergency air quality monitoring to help determine the magnitude of potential threats. (AQ1.2)

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

And

Requirement §201.7(c)(4)(ii) and (v): *The Tribal Plan Maintenance Process shall include a system for monitoring implementation of mitigation measures and project closeouts; and a*

system for reviewing progress for achieving goals as well as activities and projects outlined in the mitigation strategy.

Maintaining the Plan:

Monitoring, Evaluating, and Updating

An analysis of the 2006 Tribal Hazard Mitigation Plan was completed with FEMA on April 12, 2010. Tribal staff revised the plan to substitute current statutory requirement language for the outdated 2006 state plan language, updated staff and Council rosters. The Tribe's Natural Hazard Mitigation Team reviewed the plan and recommendations were made to update and improve the plan.

The Karuk Tribal Council Designee will oversee each mitigation project. Activities will be monitored until repairs or relief activities are completed. Project activities will be undertaken in a manner that ensures activities are completed within a reasonable schedule. The Tribal Council Designee will identify any obstacles and resolve issues to complete the activity within scheduled time-frames. Annual reports will be submitted to the Tribal Council. Budget requests will be submitted to the Tribal Council on an annual or as needed basis.

Monitoring Activity	***Date Due***
Hazard Mitigation Plan	
Development with Hazard Mitigation Team	April- June 2010
Progress Report to Tribal Council	June 2010
Final HMP for FEMA	June 2010
Progress Report to Tribal Council/ Hazard Mitigation Team	June 2010
HMP Review with Council	April 2011
Progress Report to Tribal Council/ Hazard Mitigation Team	June 2011
HMP Review with Council/ Hazard Mitigation Team	April 2012
Progress Report to Tribal Council	June 2012
HMP Review with Council/ Hazard Mitigation Team	April 2013
Progress Report to Tribal Council	June 2013
HMP Review with Council/ Hazard Mitigation Team	April 2014
Progress Report to Tribal Council	June 2014
HMP Update with Council/ Hazard Mitigation Team	April 2015
Progress Report to Tribal Council	June 2015
Budget Requests	Indeterminate

The Tribal Council, through designated staff will identify on-going projects and activities in support of the mitigation goals identified in the Tribes Hazard Mitigation Plan. They will integrate necessary technical and fiscal resources to implement projects and activities. The Department of Administrative Programs and Compliance will assist the Tribal Council in ensuring that all contracts and grants are managed in accordance with specified terms and conditions. This department will monitor project progress and will work with project managers

to prepare close-out documents for submission to FEMA and include that information in reports to the Council. Activity reports will be prepared and submitted monthly to the Tribal Council. Programs and activities, and requirements will be coordinated to assure project implementation(s) attain the desired mitigation goals.

To ensure that the Karuk Hazard Mitigation Plan (KHMP) is effective, it will be evaluated and updated every five years. Designated Staff will make recommendations and provide for adequate Tribal Council oversight; oversee monitoring and mitigation strategies to assure the document reflects current hazard/risk analyses, development needs, and ordinance changes; meet annually with department managers and Tribal staff to assess and prioritize the cost-benefit analysis methodology that FEMA and the Tribe have developed; and coordinate with relevant departments or program managers in preparation for the five year plan update. Updates will be added to the back of the Plan as an addendum. Any new hazards will be analyzed in the addendum.

The Tribal Council will provide an opportunity for the members of the Tribe to review and consider the updates before submitting it to FEMA for approval and formally adopting it. In addition to the duties listed above, designated staff will also develop and coordinate the Karuk Tribe's emergency management and preparedness programs; plan, oversee, and provide training in all aspects and phases of emergency management; coordinate the biannual update of the Karuk Emergency Response Operations Plan; establish partnerships with local governments; and initiate public awareness and education campaigns for all hazards.

Public awareness programs can provide information about mitigation measures for different hazards as well as preparedness, response, and recovery measures after a disaster event. To increase the community's awareness of hazards, we will distribute information about them, develop a preparedness packet for Tribal members, provide workshops and training programs that address specific issues related to the hazards, and post and distribute hazard incident briefings as needed.

The Tribe has updated the plan to include a description of the grants management process institutionalized within the Tribe's Fiscal Policy that requires that all funding requests made by departmental directors are subjected to a review by compliance and finance staff prior to submission. The process has been added to the plan to make the review and monitoring of the plan consistent with Tribal policy.

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

The Tribe's current funding and assistance sources include: BIA-Fire Suppression, Fuels Reduction, EPA - Water Quality Sampling and Watershed Restoration, NOAA Salmon Recovery, Fish & Wildlife- Program Funding, and Bureau of Reclamation - AFA Funding.

Potential Funding Sources

U.S. Natural Resource Conservation Service
U.S. Forest Service
U.S. Environmental Protection Agency
U.S. Geological Survey
Federal Emergency Management Agency
U.S. Bureau of Indian Affairs Roads Maintenance Program
U.S. Indian Health Service
Humboldt Area Foundation

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

The Karuk Tribe will incorporate information from the Hazard Mitigation Plan when considering the development of a facilities construction "master plan", which at this time, the Karuk Tribe does not have.

The Karuk Tribe has been a participating member of a nine tribe collaboration named the North West Tribal Emergency Management Agency. The new collaborative relationship between the North West California Tribes has been instrumental in encouraging Humboldt County to recognize the importance of annexing Tribal Emergency Operations Plans and Hazard Mitigation Plans to their county plans.

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

The Tribal council will designate staff to review and update the Karuk Hazard Mitigation Plan. The plan will be posted on the Tribe's website, easily accessible to the public. Notices will be posted in the Tribal Community as to the date of availability of the plan and the locations it may be found for review. Hard copies will be bound and placed in each of the Tribes administrative offices in the three communities. The plan will be presented to the general public for comment at the Regular Tribal Council meeting in April each year.

Requirement 201.7(c)(3)(vi): *An Indian Tribal government may request the reduced cost share…under FMA and SRL programs…if they have an approved Tribal Mitigation Plan meeting the requirements of 201.7 and that: identifies actions the Indian Tribal government has taken reduce the number of repetitive loss properties, (which must include properties identified as severe repetitive loss properties), and specifies how the Indian Tribal government intends to reduce the number of such repetitive loss properties.*

Not applicable, there are no repetitive loss properties in the Karuk Tribe's Hazard Mitigation Plan.

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

Not applicable, the plan is not a multijurisdictional plan.

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

The Karuk Tribe will perform a complete update its Hazard Mitigation Plan every five years, but will do a review each year and update staff or council information if needed. The Karuk Tribe will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 13.11(c) of this chapter.

Karuk Tribe of California's "Near Reservation" Service Area

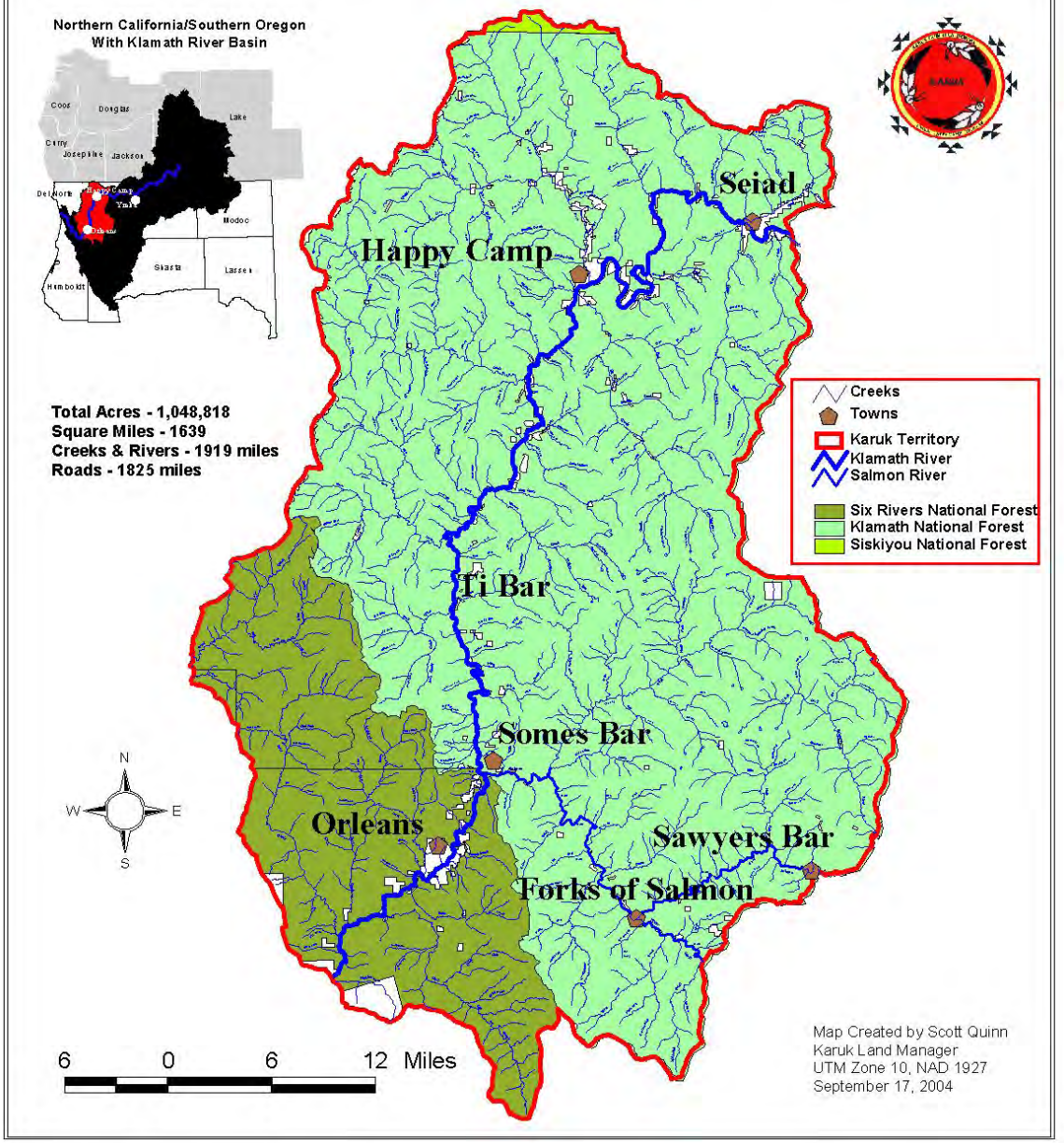
Total Service Area - 4,264,880 Acres

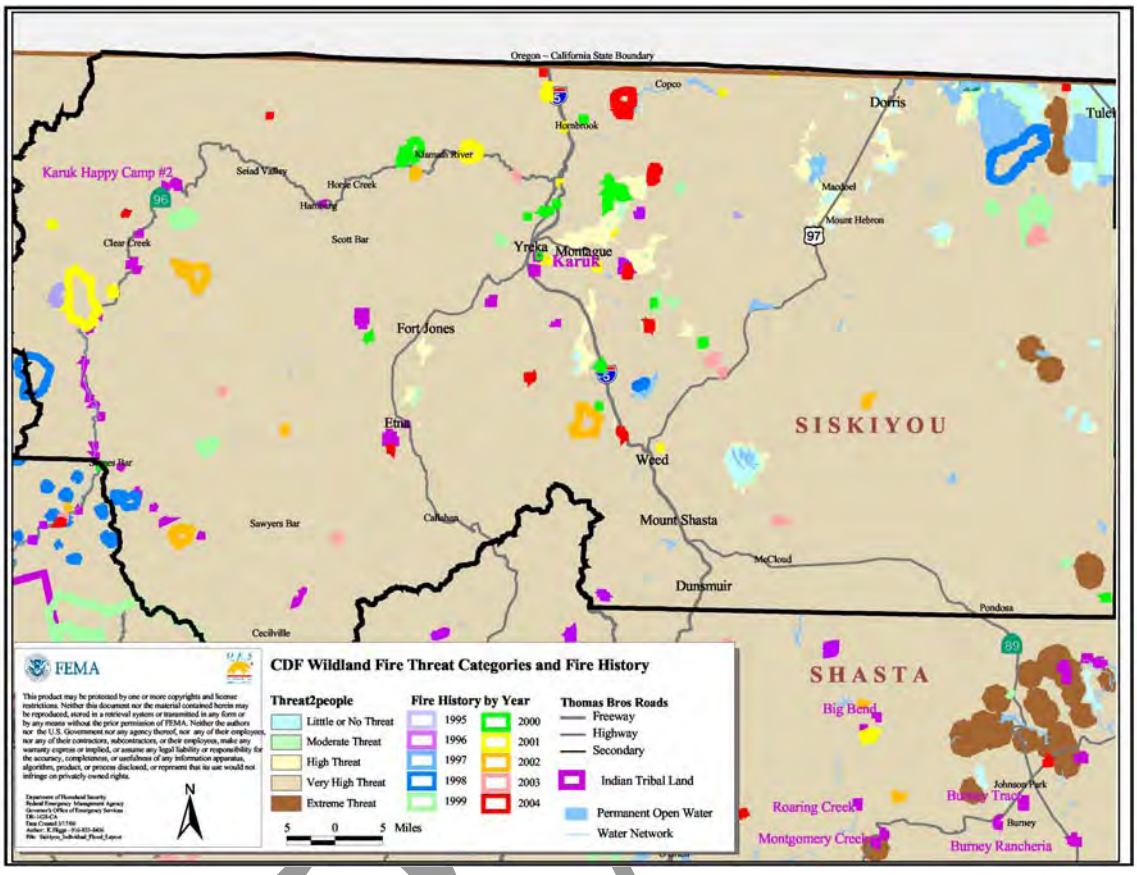
The Karuk Tribe of California's Service Area was Designated by the Bureau of Indian Affairs.

Federal Register, Vol. 65, No. 95
Tuesday, May 16, 2000
Tribe: Karuk Tribe of California
"Near Reservation" locations:
"The counties of Siskiyou, northeastern Humboldt from State Highway 96 milepost HUM 28.61 north to the Siskiyou County Line in the State of California."

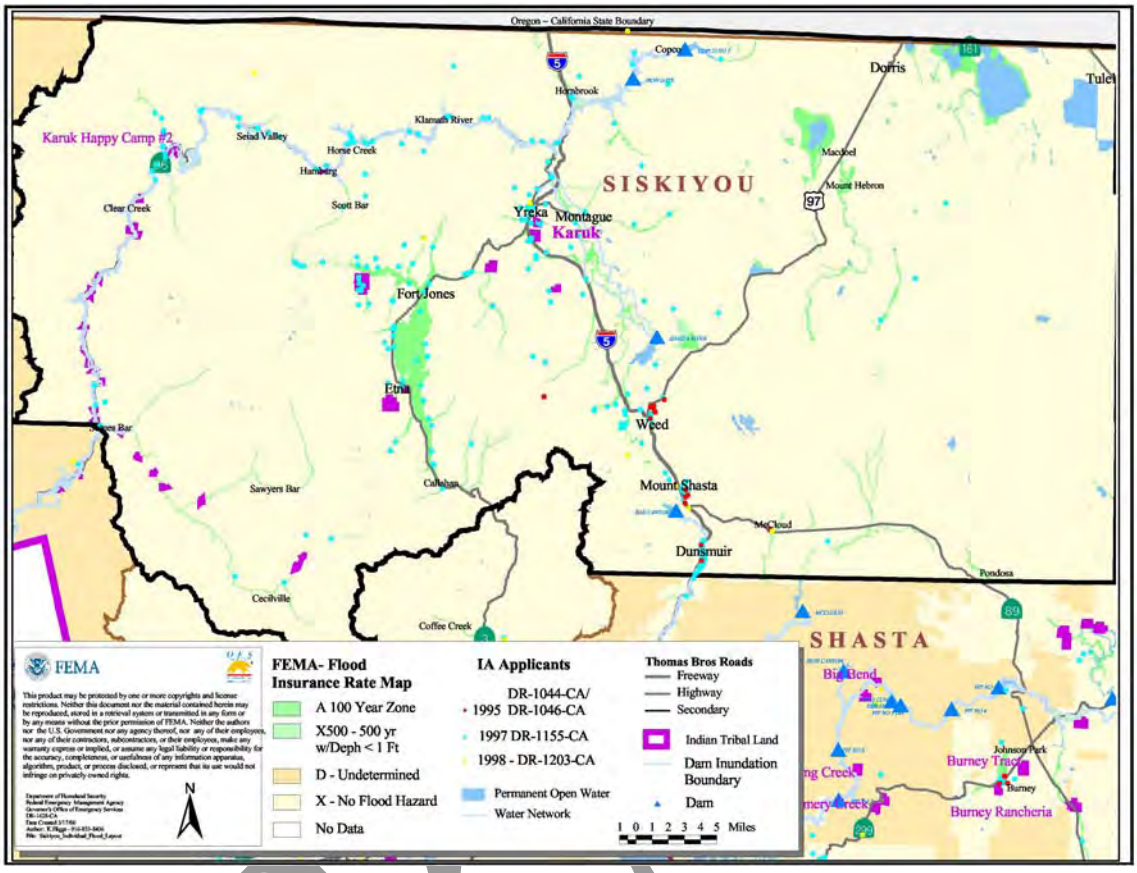
Map Created By Scott Quinn
Karuk Tribe of California
February 11, 2005
UTM Zone 10, NAd 27

KARUK ABORIGINAL TERRITORY

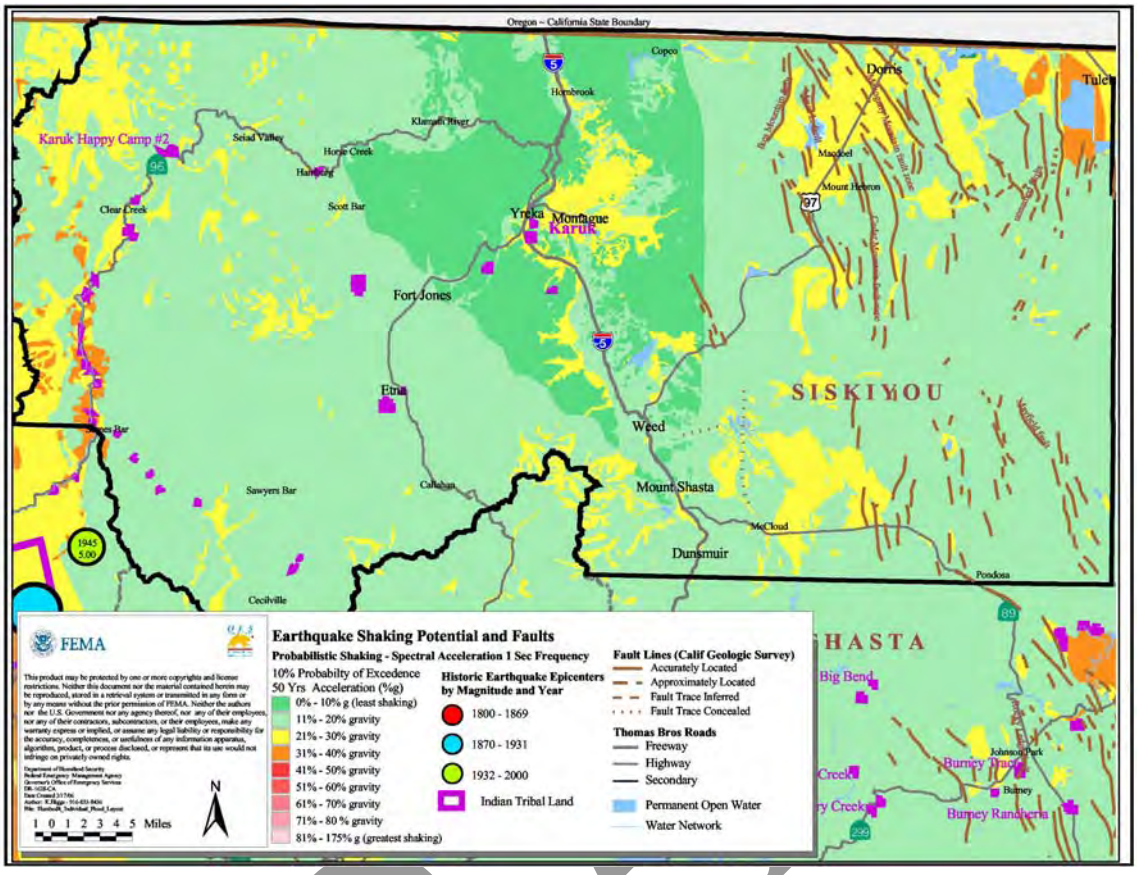




Karuk Tribe Wildfire Threat and Fire History Map



Karuk Tribe Flood Location Map



Karuk Tribe Earthquake Map

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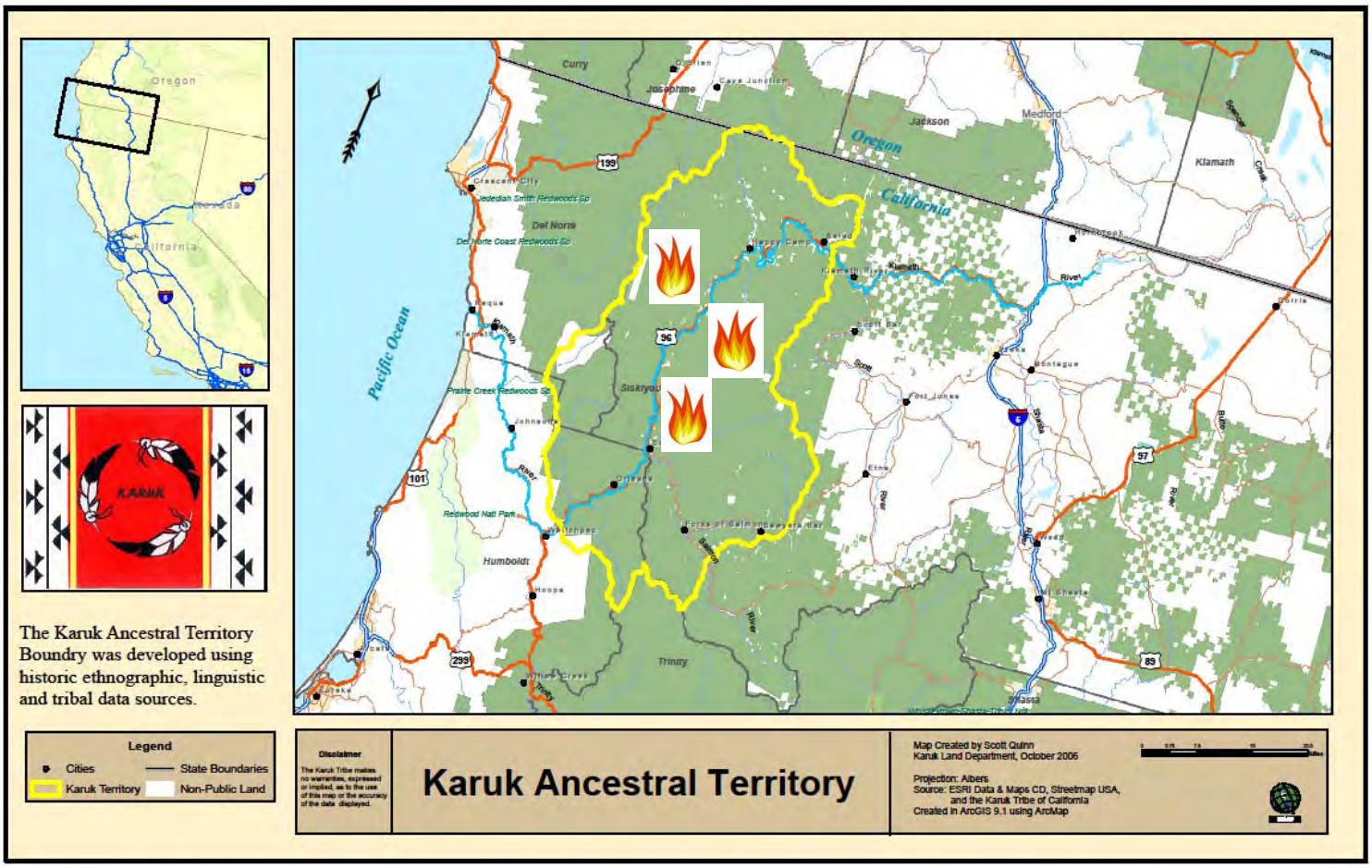

2008 Wildfires (approximate locations)- From top left clockwise : Siskiyou Complex, Panther Fire, and Ukonom Complex.

Threats Commonly Recognized by the Karuk Tribe

Hazards	Location	Size/Severity	Previous Occurrences	Likelihood
1. Floods	Within entire Ancestral Territory near water courses (see Ancestral Territory Map).	Frequent small events; occasional significant events.	Major flooding has occurred about once a decade, with the most recent floods in 1964, 1997, and 2005- 2006. These floods caused significant damage to property and resources.	High
2. Drought	Ancestral Territory.	Periodic, but with significant impact to domestic water systems.	1905, 1941, and 1977-1987.	Moderate
3. Wildfires	Entire Ancestral Territory.	Small to large events, with serve impacts.	Small events annually. Major fires in 1977, 1987, 1994, and 1999.	Very High
4. Landslides	Roadways and water coursers west of Interstate 5.	Confined to impact to roads & streams, and a few structures.	Continual, especially during periods of heavy rainfall.	High
5. Earthquakes	Entire area but higher east of Interstate 5.	Moderate seismic risk.	Mount Shasta and Pacific Coastal areas, 1979.	Moderate
6. Air Quality	Entire Ancestral Territory	Frequently Moderate Severity	1987, 1994, 2003, 2008	High
7. Volcanoes	Entire region.	Spectacular events.	Mt. Shasta last erupted in 1786.	Low
8. Pandemic	Widespread.	Undetermined public health risk.	N/A	High

Risk Identification Summary Assessment the Karuk Tribe

Hazard Type	Potential Threat	Hi Risk	Low Risk	Extent Wide	Extent Limited	Frequent	Infrequent	Probability High	Probability Low
Wildfire	♦	♦		♦		♦		♦	
Flood	♦	♦		♦		♦		♦	
Landslides	♦	♦		♦		♦		♦	
Drought	♦	♦		♦			♦	♦	
Air Quality	♦	♦		♦		♦		♦	
Water Quality	♦	♦		♦		♦		♦	
Dam Failure	♦		♦	♦			♦		♦
Volcanoes	♦		♦	♦			♦		♦
Earthquakes	♦		♦	♦			♦		♦
Road and Bridge Failure	♦	♦		♦			♦	♦	

Karuk facilities threatened by Wildfires and/or Floods.

Facility Threats	Flood	Wildfires
Happy Camp Administration Building Complex	high	high
KTHA Administration Building	high	high
KTHA Happy Camp Housing Complex	low	high
People's Center Museum	high	high
Happy Camp Health & Dental Clinic	high	high
Happy Camp Head Start Building	no	high
Happy Camp Mechanic Maintenance Facilities	low	high
Happy Camp Storage Facility	no	high
Somes Bar Work Center and Housing Complex	no	high
Orleans DNR Offices and Medical Clinic Complex	low	high
Orleans Panamnik Center	high	high
KTHA Orleans Housing Complex	high	high
Camp Creek Fish Hatchery	high	high
Happy Camp Community Development Building	no	high
Oak Knoll Center	no	high