Environmental Assessment for Providing Funding under the Klamath Commercial Salmon Fisheries Disaster Program for a Fish Processing Facility

On the Yurok Reservation

Requa, CA

Oblique aerial photo of the Klamath River estuary.

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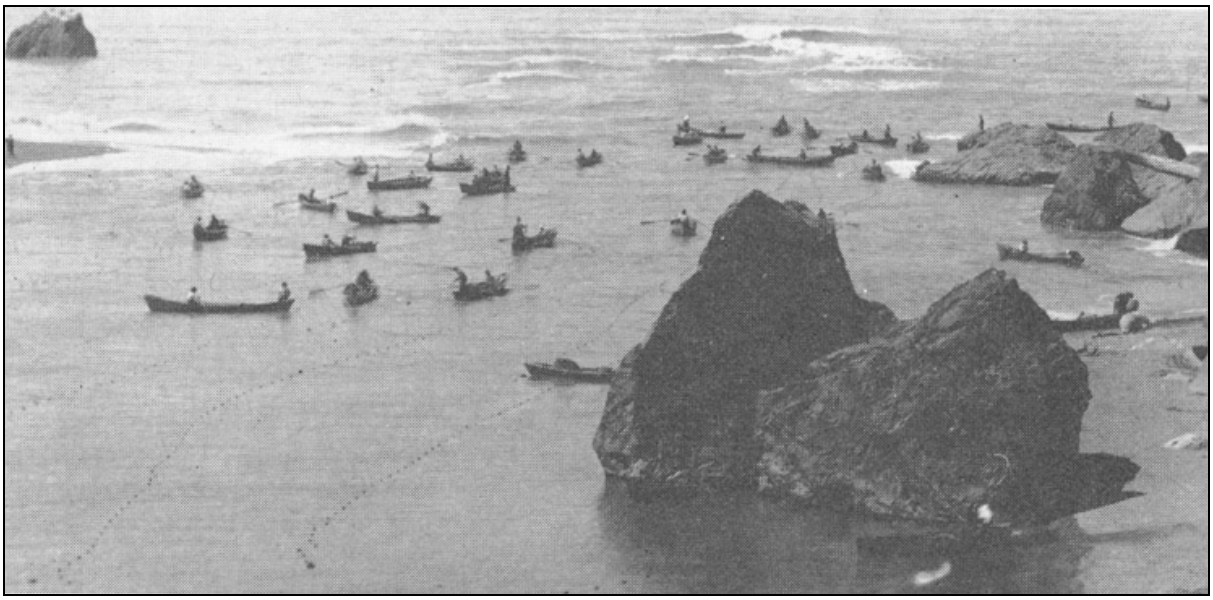

Yurok Tribal members fishing at the mouth of the Klamath River. Photograph by Hazeltine, 1913.

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List of Acronyms

BMPs	Best Management Practices
CIDH	Cast-In-Drilled-Hole pilings for foundation support
CWA	Federal Clean Water Act
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
ESA	Federal Endangered Species Act
EBAM	Environmental Beta Attenuation Monitor
FEMA	Federal Emergency Management Agency
gpd	gallons per day
gpm	gallons per minute
HUD	Housing and Urban Development
ICDBG	Indian Community Development and Block Grant
LCP	Local Coastal Program
NMFS	National Marine Fisheries Service
NCRWQCB	California North Coast Regional Water Quality Control Board
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
ORV	Outstandingly Remarkable Value
PSMFC	Pacific States Marine Fisheries Commission
SF	square foot/feet
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WSR	Wild and Scenic River
YTEP	Yurok Tribe Environmental Program
YTFP	Yurok Tribe Fisheries Program

Introduction

Background

From 2001 through 2005, drought conditions in the upper Klamath Basin resulted in dry water-year type flow conditions in the mainstem Klamath River and its tributaries. These conditions allowed for the proliferation of endemic fish diseases. Juvenile and adult Chinook salmon experienced substantial mortality as a result of these epizootic events. Combined with a decline in ocean conditions the prolonged drought and poor in-river conditions resulted in low numbers of age-3 and age-4 Klamath River Fall Chinook salmon (KRFC) recruiting to the 2006 fishery.

The KRFC is a key stock used by NOAA's National Marine Fisheries Service (NMFS) to manage the mixed stock ocean fishery off the Pacific Coast, in which salmon from different rivers of origin comingle in ocean waters and are harvested together. The 2006 preseason forecast of approximately 25,000 naturally spawning KRFC was close to the record low and less than the minimum escapement of 35,000 salmon required to allow fishing between Cape Falcon, Oregon, and Point Sur, California, (the Klamath impact area) established in the Pacific Coast Salmon Plan. The conservation objective for KRFC established under the Pacific Coast Salmon Fishery Management Plan (Salmon FMP) requires a return of 33-34 percent of potential adult natural spawners but no fewer than 35,000 naturally spawning adults, each year. In compliance with the Salmon FMP, a "conservation alert" is triggered when a stock is projected to fall below its conservation objective. Under such circumstances, the Pacific Fishery Management Council (Council) is required to recommend the closure of salmon fisheries within the Council's jurisdiction that affect the stock.

A complete closure of the Klamath impact area in 2006 was avoided through a collaborative effort by NMFS, Council, state and tribal representatives to identify a limited fishery that will address conservation concerns for KRFC while preventing a total closure of the fishery. NMFS issued a temporary rule for emergency action to implement very restrictive 2006 annual management measures for the west coast ocean salmon fisheries. These regulations closed a majority of the fishery in the Klamath impact area between May 1 and August 31, 2006, reducing fishing opportunity in this area by more than 70 percent from recent years. As a result, catches declined substantially, and the commercial salmon fishery and the shore-based support sector endured severe economic hardship in 2006 along this 700 mile stretch of coastline. For example, catches in California and Oregon in 2006 showed a decline of approximately 83percent from the 2005 season and 87 percent from the 2004 season.

In light of the foregoing facts, Department of Commerce Secretary Gutierrez declared a fishery resource disaster and a commercial fishery failure under section 308(b) of the Inter-jurisdictional Fisheries Act and under section 312(a) of the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended. The findings showed a significant economic impact resulting from limited opportunity to catch salmon due to the low number of fall Chinook salmon returning to the Klamath River to spawn.

In an effort to mitigate the financial effects of the fishery resource disaster and subsequent commercial fishery failure, Congress approved disaster relief funds for dissemination through NOAA's Grants Management Division, in conjunction with the Pacific States Marine Fisheries Commission (PSMFC) under a Cooperative Agreement. The grant funds are to be distributed to eligible recipients affected by the commercial fishery failure. The Yurok Tribe, which was affected by this fisheries disaster, applied for grant funding for the construction of a fish processing facility to process fish harvested by the Yurok Tribe commercial salmon fishery.

Proposed Project

NMFS proposes to authorize grant funding for distribution to the Yurok Tribe to construct a fish processing facility near the mouth of the Klamath River, Requa, California. Funding would be provided under the Klamath Commercial Salmon Fisheries Disaster Program Cooperative Agreement with the PSMFC.

Funding has been contributed toward the proposed fish processing facility from the U.S. Department of Housing and Urban Development (HUD) through the Indian Community Development and Block Grant (ICDBG) Program. These agencies prepared a separate environmental assessment (EA).

Purpose and Need for the Action

The purpose and need of the proposed action of funding of the disaster relief grant is to provide economic assistance to the Tribe following the commercial fisheries loss during the 2006 Klamath River fishery resource disaster. Salmon are an important to the Yurok subsistence, cultural, and economic reasons. Many Yurok Tribal members make a living for themselves, their families and communities through reliance on the Klamath River fishery. .

Project Area

The proposed fish processing plant will be located within the Yurok Reservation on the north bank of the Klamath River Estuary within the Yurok Tribe's Requa Resort (***Figure 1***). The

facility will be on the north bank of Klamath River estuary, approximately one half mile from the mouth. And several miles northwest of Klamath, California. The RV Park and campground is in the NE 1/4, Section 5, Township 13 North, Range 1 East, Humboldt Meridian of the USGS 7.5' Requa, Del Norte County, CA quadrangle. The Requa Resort area contains an abandoned quarry on the northwest side, a RV park and campground, a small store, a set of restrooms, and a boat launch and parking area (**Figure 2**). The project area (i.e., analysis area) includes the entire estuary, the immediate surrounding lands to the estuary, and the community of Requa, California which encompasses the majority of the hillslope along the north side of the estuary (***Figure 1***).

Although not visible in the following figures, Requa Road intersects Highway 101 approximately a mile north of the estuary and then curves around the hill above the Requa Resort. A dirt road approximately 0.4 miles long provides access to the resort from Requa Road. This road was slightly widened and improved to accomadate heavy equipment during the Requa Resort reconstruction in 2000.

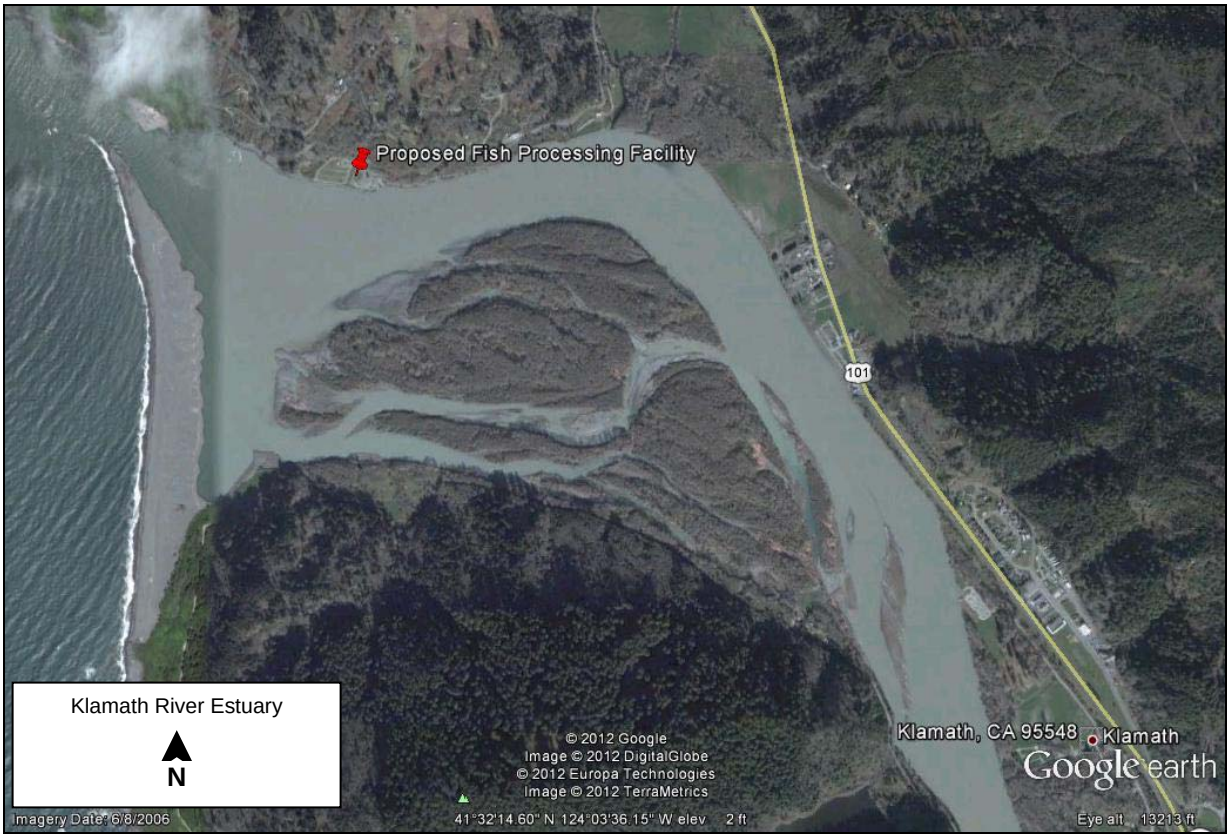

Figure 1. *The project analysis area.*

Figure 2. *Requa Resort area map displaying proposed fish processing facility location, RV Park and campground, boat launch, and Cannery Creek.*

The general area around the Requa Resort has been used for fishing since time immemorial by the Yurok Tribe. It has also been an area of industrial fishing once European immigrants built and operated canneries along the banks of the estuary before the salmonid populations crashed. The area has seen numerous iterations of activity and buildings (**Figure 3**).

Figure 3. *Historic photo circa 1913 of the community of Requa, California.*

Description of the Proposed Action and Alternatives

Alternative 1 (No Action)

Under the No Action Alternative, NMFS would not authorize grant funding for this project; therefore design and construction of the fish processing facility is not likely occur. The Yurok Tribal members would continue to sell their commercial fishery catch to dealers, the majority of the annual Chinook harvest would be processed off of the reservation, and the Tribe would not capture the added value of processing and selling the catch themselves, nor would any additional jobs be created. No changes would occur within the Requa Resort.

Alternative 2 (Preferred Alternative)

Under the Preferred Alternative, NMFS would authorize grant funding to help the Yurok Tribe construct a fish processing facility. The Yurok Tribe will be following standard construction practices and all relevant regulations, ordinances, and laws during the construction (e.g., fuel storage and management) and future operation of the fish processing facility. The Tribe will close the Requa Resort and its access road during the construction of the facility. Construction will likely occur during the spring and summer months outside of the commercial fishing season. The following sections describe the essential and relevant components of the proposed fish processing facility.

Fish Processing Facility

The facility is being designed to process the entire annual Tribal harvest of 15,000 Chinook salmon with an assumed average weight of 12.5 pounds during 48 weeks of the year outside of the commercial fishing season. The fish processing facility will include a raw and a cooked fish handling room, areas to prepare raw fish for smoking, fish smokers, space to process and package smoked fish, tote and rack washing room, office space, restrooms, and space for a future restaurant. Note that the areas where raw fish are handled must be separated from where the finished fish are processed. The processing portion of the building will be 5,700 square feet and will include a 593 square foot freezer. The Yurok Tribe may build a small restaurant in the future alongside the processing plant, however this is not part of the proposed action (i.e., funding).

Under this alternative, the facility will be located near the center of the Requa Resort (**Figure 2**) to the east of the gravel berm, running roughly north to south that separates the campground and the boat launching area. The facility will be in built in the oversized turn around area that currently serves the boat launch and dock. The proposed fish processing facility will require several alterations to the Requa Resort including the removal of a portion of the boat launch parking area and construction of several new parking spaces for facility workers and patrons of the Requa Resort facilities. The Requa Resort will continue to provide access and camping for Tribal fishers and once the facility is built to provide a means for efficient and effective processing and storage of the Tribe's commercial fish harvest.

Fish Processing Activities

During the fishing season, the raw fish will be de-slimed, flash-frozen, glazed and stored offsite for future processing. Every 2 to 3 days, the frozen fish will be trucked offsite to an offsite cold storage facility. The last 20 percent of the allotment can be stored in the onsite freezer.

After the entire catch has been frozen, the employees will begin processing the fish. Periodically as needed, stored fish will be transported from the offsite cold storage facility to the fish processing plant by truck. A 40 foot trailer load of frozen fish ready for processing can be stored on site. Approximately 800 to 1000 pounds of fish (one tote) will be processed in the fish processing building during one eight hour shifeet each day. Expansion of this processing capacity would require a second or third shifeet of operation.

The frozen fish will enter the building from the north-west end and will be placed in a thawing room. Once thawed, the fish will be de-headed, salted fish and cured. The cured fish will then be smoked. Smoked fish will be filleted and packaged. Filleted fish will be packaged, vacuum sealed and palletized. The palletized final product will be returned to the onsite freezer to await transport.

Water System

The facility will need both water and wastewater systems. It is estimated that the peak water needs will occur when the raw fish are processed for storage and that the peak flow rate at that time will be between 25 and 30 gallons per minute (gpm). The proposed project will include, at minimum, a 2,500 gallon storage tank for the fish processing facility, as well as an upgrade of the drinking water storage tank for the Requa Resort RV park to a minimum of a 2,500 gallons, to accommodate project activities during the peak usage during the commercial fishing season.

On-Site Waste Treatment and Disposal System

The facility will generate three types of wastewater: process flows from the fish processing, sanitary wastes emanating from the restrooms, and potentially kitchen wastes from the restaurant, if the latter is built. Approximately 1,000 gallons per day (gpd) or less is expected to discharge from the restrooms and kitchen to the existing septic tanks and leach fields that serve the campgrounds (**Figure 4**). Kitchen wastes will flow through a gravity grease interceptor, capable of handling 50 gallons per minute (gpm) and holding 100 pounds (lbs) of grease, before discharging to the existing septic tanks and leach fields.

Flows from the fish processing operation will vary with the type of operation. For instance, cleaning operations will occur for approximately 2 to 4 weeks each year during the annual Chinook salmon harvest. During this cleaning phase of operations, wash water flows will likely be less than 20,000 gpd (18 gal/fish). The cleaned fish with be flash frozen and placed in cold storage for processing during the rest of the year (48 to 50 weeks). During the rest of the year, the Tribe expects to process about 1,000 lbs of frozen fish to produce about 330 lbs of smoked fish. This will generate approximately 2,000 gpd of wastewater.

Wash water from process operations will flow through floor sinks and drains with screens or grated outlets into two solids capture tanks, plumbed in series. The first tank will have a 2,500 gallon capacity and the second 1,500 gallons. All discharges from the second tank will then be filtered using two Orenco Biotubes, which are designed to remove all solids greater than 0.25 inches. The Biotubes will have a localized alarm that will inform the operator when the filter is clogged and needs to be cleaned. As much of the waste products as possible will be captured "dry" and stored in a plastic totes for offsite rendering. Effluent from these filters will be distributed to four separate leaching areas with a total length of 4,025 linear feet of trench, and with a total sidewall area of 40,250 square feet (**Figure 4**). This system is designed to handle a peak loading rate of about 0.5 gpd/sq feet during the 2 to 4 week fresh fish processing period.

The proposed septic field sites and soils were evaluated, by Winzler & Kelly, an Engineering firm from Eureka, CA, for suitability based on the North Coast Water Quality Regional Control Board (NCWQRCB) and Del Norte County evaluation criteria requirements. The soils texture and percolation rates were found to be suitable, and there was enough area to meet the spacing between leach fields and set back requirements. Winzler & Kelly also determined the "highest anticipated groundwater level," a County requirement, during the wet weather period to determine the depth which the leach fields could be built. Winzler & Kelly used the field data to design the on-site wastewater treatment and disposal system to comply with NCWQRCB and Del Norte County requirements for such systems and to provide the Best Practicable Treatment of the waste streams.

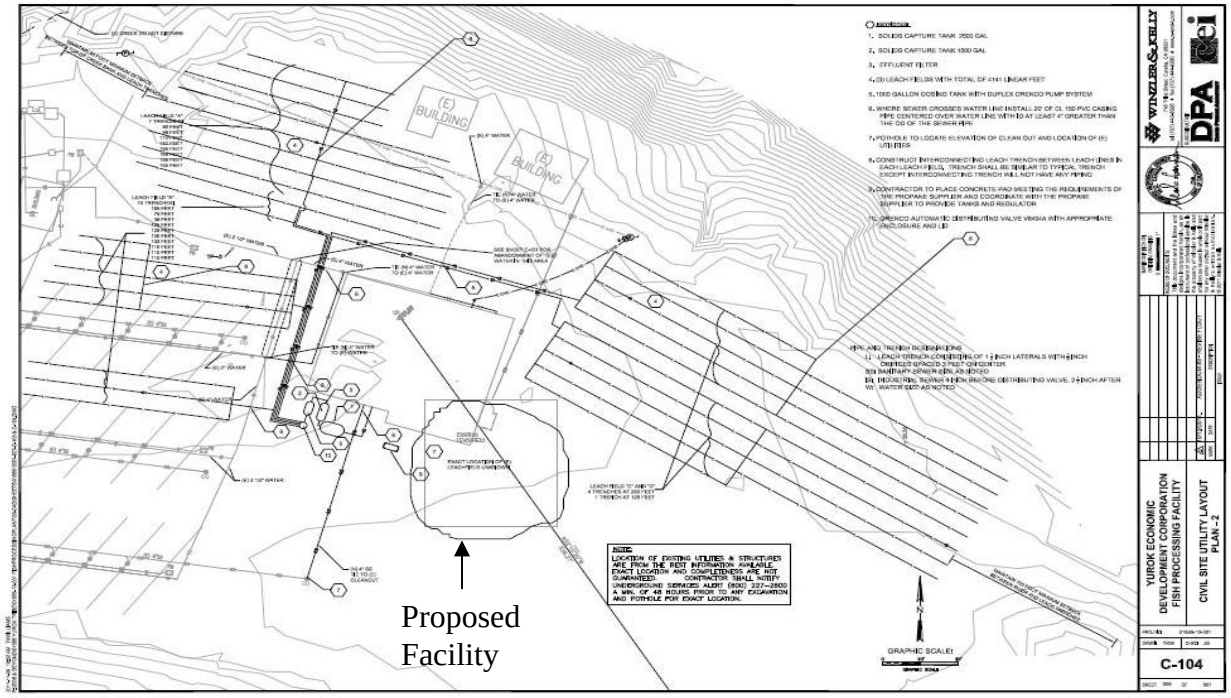

Figure 4. *Proposed facility location and leach field plan.*

Alternatives Considered But Not Further Analyzed

Two alternative locations for the facility were considered but dismissed following further analysis. The locations were within the estuary or along the lower river and were eliminated due to the flooding potential or inadequate roads. The first alternate location was in the Riverside RV Park along the Lower Klamath River just downstream (north) of the Highway 101 sign in figure 1. This location was the subject of a feasibility study by GreenWay Partners. This study identified a limitation on buildable space that created land use conflicts with the existing use of the site. In addition, the facility would need to be elevated above the existing 100-year flood plain which would make construction cost prohibitive. This site was known to have flooded in 1997 and 2005.

The second location considered but dismissed from further analysis was in the old quarry to the west of the RV park and campground within the Requa Resort (**Figure 2**). This location was slightly higher in elevation and further removed from the adjacent campground. However, the unconsolidated fill underlying much of the proposed building location would necessitate the drilling of 18 inch diameter Cast-In-Drilled-Hole (CIDH) pilings to support the foundation.

These pilings would need to pass through the unconsolidated fill soils found beneath the proposed building location and at least 10 feet into competent rock (Williams, 2011). This significantly increased the cost of the project and eliminated it from consideration. In addition, this location would require access over Cannery Creek which flows under the access roads (loop) and along the base of the quarry area.

Affected Environment

The Affected Environment describes the relevant historic and current resource conditions with which to evaluate the Alternatives' effects.

Tribal Trust Assets

Within the Klamath River Estuary the primary Tribal Trust responsibilities involve historic and cultural resources, fishing rights and wildlife and vegetation resources.

Historic and Cultural Resources

The Klamath River Estuary has been a site of occupation and cultural activity by the Yurok Tribe since time in immemorial. The Tribe recognizes the special setting of the Requa area which includes the historic Rek-woi and Wehl-kwel Village sites, the Sister Rocks, the ecosystem of the estuary, traditional Tribal fishing sites and extensive cultural history. In recognition of these and other important historic and cultural aspects the Tribe designated the entire area as the Klamath Riverscape Traditional Cultural Property. Although the campground and boat launch complex is within the designation the area has seen.

Effects to Historic, Cultural and Religious Properties are regulated by the National Historic Preservation Act (NHPA, 36 Code of Federal Regulations (CFR) 800). The entire project is within the external boundaries of the Yurok Reservation and falls under the jurisdiction of the Yurok Tribal Heritage Preservation Officer (YTHPO), which has assumed the responsibilities of the State Historic Preservation Officer (SHPO) for tribal lands under the provisions of 36 CFR §800.3. The NHPA process is therefore completed upon receipt of YTHPO Concurrence on a Determination of Effect for NHPA per 36 CFR 800. A cultural resources study for this project has been prepared, "Cultural Resources Inventory for the Yurok Fish Plant Project, Requa, CA". This report is confidential under the provisions of 36 CFR §800.11, but the report has identified that the project is located within a potentially eligible Traditional Cultural Property.

Socioeconomics Resources

Klamath River Chinook Salmon Fishery

The Klamath River and its fisheries provide essential sustenance, commercial products for export from the Yurok Reservation, and significant spiritual and ceremonial elements for the Yurok people and their culture. Fishing is an essential part of Yurok Tribal members' lives, and provides vital economic resources for members and the Tribe as a whole.

The Klamath River supports fall and spring-run Chinook salmon, which are temporally and spatially separated in most cases. The native salmon runs are supplemented with hatchery fishfrom hatcheries below Iron Gate Dam on the Klamath and below Lewiston Dam on the Trinity River. These hatcheries release millions of juvenile Chinook salmon each year at predetermined times in the spring and fall. The Trinity River Hatchery facility produces 1.4 million spring-run Chinook salmon annually as mitigation for habitat lost above Trinity and Lewiston dams. The Iron Gate Hatchery produces 5.1 million sub-yearling juvenile and 0.9 million yearling juvenile fall-run Chinook salmon.

The Yurok and Hoopa Valley Tribes are entitled to 50 percent of the available harvest within the Klamath and Trinity River Watersheds, and agree to an 80/20 percent split, respectively. Yurok Tribe members fish from the Klamath River mouth upstream to the Trinity River confluence, and the Hoopa Valley Tribal members fish the Trinity River within the Hoopa Indian Valley reservation above the confluence with the Klamath River. The Yurok Tribe harvests the fall-run Chinook salmon for commercial purposes and the spring-run for subsistence purposes.

In 2009, the Hoopa Valley and Yurok Tribes harvested 28,565 fall and 3,562 spring-run Chinook salmon (including jacks). In 2010 the combined Tribal Chinook salmon harvest was 29,996 adults and 436 jacks. An estimated 3,035 adult and 1,832 jack Chinook salmon were also harvested in-river by recreational fishers. In 2009, the average Chinook salmon sold for approximately 40 dollars per fish to regional processors.

Currently, tribal fishers process their fish in the campground or boat launch area and store the fish in individual coolers with non-commercial grade ice. The processed fish are then collected and sold to outside brokers who sell to stores, restaurants, or food processing facilities.

Employment and Income

The proposed project area is on the Yurok Reservation, an area with little development and sparse economic opportunities. According to the most recent census data available (2000), the rate of unemployment for all people 16 years and over residing within the Yurok Reservation

(836) was 48 percent. This high rate of unemployment is compounded by the fact that 31 percent of households on the Reservation (413) were making less than $10,000 a year in 1999. The next highest percentage of people (17.9 percent) make between $15,000 and $24,999. Moreover, median household income that same year was $20,592. (U.S. Census Bureau, 2000) The largest employer in the immediate area is the Yurok Tribe with over 200 employees.

Currently, Tribal members sell their commercial salmon catch before processing directly to buyers off the reservation which reduces the potential economic benefit for the Tribe. Contracts are negotiated individually and the product quality varies depending on the processing time, quality of equipment and ice, etc. To improve the product the Tribe applied for grants under the same 2006 Klamath Disaster Relief funds to purchase a commercial ice machine and coolers and nets for Tribal members. This grant funding was approved.

Recreation

The Klamath River and estuary have been used as a recreational area by the Yurok Tribe since time in immemorial. Currently, the area's major recreational uses and attractions include: fishing, tourism, and scenic qualities. The Requa Resort has principally been used by tribal members for fishing and recreational access to the estuary, ocean, and river via boat. The resort's RV Park and campground has only seen limited use outside of the fall commercial season.

Wild and Scenic Rivers

In recognition of its Outstandingly Remarkable Value, anadromous fishery, and historic recreational uses the Klamath River, 100 feet below Iron Gate Dam to the Pacific Ocean, was designated as recreational under the California State Wild and Scenic Rivers Act (CA Public Resources Code Sec. 5093.50 et seq.) and from 3,600 feet below Iron Gate Dam to the Pacific Ocean was designated under the Federal Wild and Scenic Rivers Act (Public Law 90-542; 16 U.S.C. 1271 et seq.) in 1972 and 1981 respectively. The federal designation extends a quarter mile outward from each river bank and includes the proposed fish processing facility location. These acts established requirements applicable to water resource projects affecting wild, scenic, or recreational rivers within the National Wild and Scenic Rivers System, as well as rivers designated on the National Rivers Inventory. Under the federal WSRA, a federal agency may not assist with the construction of a water resources project (e.g., roads and boat launches) that would have a direct and adverse effect on the free-flowing, scenic, and natural values of a wild or scenic river. If the project affects the free-flowing characteristics of a designated river or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area, such activities should be under-taken in a manner that minimizes adverse impacts. The Yurok Tribe is the designated river-administrating agency and is responsible for the WSRA Section 7

evaluation and determination. The Yurok Tribe Environmental Program Director is responsible for completing the Wild and Scenic Rivers Act Determination for the Project. The purpose of this evaluation is to determine whether the proposed project will adversely affect the free-flowing characteristics of the river or alter its ORVs.

Wild and scenic river designations ensure the river and its immediate environment shall be administered and protected for the benefit and enjoyment of present and future generations. The Wild and Scenic Rivers Act (WSRA) describes recreational river areas are "those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." For comparison, scenic river are "those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

Physical Resources

Physical Setting

The entire Requa Resort area (i.e., old quarry, RV park and campground and boat launch, See figure 2) was once a sand and gravel bar that was built up with outside fill material. Figure 5 shows the multiple sand and gravel bars that line the estuary within project area, as well as, the Requa Resort area. At some point in time, a riprap levee was built along the outer edge of the project area to prevent erosion during floods. According to Yurok Tribal Fisheries staff records, the 1997 New Year's Day flood overtopped the edge of the resort area and the riprap by approximately 1 foot (see additional discussion in the Water Resources section).

Figure 5. *Oblique photo of the Klamath River Estuary showing the scenic resources, project area, and sand and gravel bars lining the estuary.*

A one and a half lane dirt road, the North Bank Road, connects the project area to the Requa Road (***Figure 1***) which connects to State Highway 101. The North Bank Road is partially cut into the hillside and parallels the river for approximately half a mile. The entire north side of the project area and North Bank Road are lined by steep cliffs and hillslopes. Past quarrying activity created sheer rock face along the northwest end of the project area. Roads within the Requa community have a history of closures resulting from debris slides along the road cuts (**Figure 6**).

Figure 6. *Recent debris slide (January 2012) blocking the Requa Road which provides access to the Requa Resort.*

Aesthetic Resources

The Klamath River Estuary provides visually rich scenic views, especially from several roadside vantages and from boats on the ocean, river, and estuary (**Figure 5**). The primary factors for this scenic quality are the sparse population, relatively few roads, buildings and structures, relatively few artificial light sources, the abundant hillslope and riparian vegetation, the river, ocean, and estuary waters, sand beaches, and the unique geologic features (e.g. Sisters Rocks).

There is relatively little noise and light pollution within the Klamath River Estuary. Light and noise pollution, as defined in this document, originate from artificial sources. The town of Klamath and community of Requa, Highway 101, several rural roads (***Figure 1***), and the boats are

the primary sources of noise and light pollution. Wind, weather, vegetation, and openness help reduce the noise and light pollution. Although the estuary can be filled with noise and light pollution during the fall commercial fishing season due to increased traffic and boats, the area is rather quiet and has the sounds and lights found within a typical waterfront rural area. For example, the sounds of the highway 101 and the town of Klamath will often be heard in the estuary or at the campground. There is clearly enough noise and light pollution to dominate a calm day or night but not enough to significantly retract from the rural environment.

Geology, Geomorphology, and Associated Hazards

Regional geology and tectonics, quaternary sea level rise, tsunamis, and landslides have shaped the Klamath River Estuary and the North Coast region. The project area lies within the Pacific Coast Ranges of California, which are characterized by "discontinuous northwest-trending mountain ranges, ridges, and intervening valleys composed of ancient seafloor rocks (National Park Service, 2004, pg III-1)." These rocks are highly faulted and sheared altered mafic volcanic, greywacke sandstone, limestone, serpentinite, shale, and high-pressure metamorphic rocks. These rocks are part of an accreted terrane called the Franciscan Assemblage. The local hillslope soils have not been mapped in detail, but they are likely typical of soils derived from the Franciscan Assemblage and have little cohesion and very low sheer strength.

This project area lies within the highly seismically active Cascadia Subduction Zone (CSZ) which extends from northern California to Vancouver Island. Within this zone, multiple oceanic plates, from north to south, the Explorer, Juan de Fuca, and Gorda Plates are being subducted under the North American plate. At the southern end of the zone three crustal plates, the Pacific Plate, the Gorda Plate, and the North American Plate intersect to form the Mendocino Triple Junction (MTJ). This is the transition area between the strike-slip faulting of the San Andreas Fault Zone and the CSZ.

Long-term regional uplift is approximately 0.4 ± 0.1 mm/year but is dominated by periodic pulses driven by earthquakes releasing accumulate strain along the Cascadia subduction zone. The MTJ and CSZ generates numerous earthquakes and the CSZ periodically generates large (>8.0 magnitude) subduction earthquakes with an estimated recurrence interval between 300 to 900 years. The last large subduction earthquake occurred on January 26, 1700 with an estimated magnitude of 8.7 to 9.2 This date and the magnitude of the earthquake were determined using extensive field studies along the Pacific Northwest Coast, Native American stories, and written tsunami records from Japan. Earthquakes especially large CSZ earthquakes can generate surface fault ruptures, ground surface liquefaction and subsidence, tsunamis, and landslides. Given the project area's fill material, surrounding steep hillslopes, location within the estuary,

and proximity to the ocean, it is highly susceptible to land subsidence and liquification, tsunamis, and landsliding during and immediately following a large CSZ earthquake.

Although, there are no specific major faults mapped through the project area (California Department of Conservation, 2002) the Klamath River likely follows a major fault similar to the majority of the north coast rivers. Therefore, a surface rupture cannot be completely ruled out as a possibilty, yet the pricipal issue would be liquifaction of the fill material rather than a surface rupture. Liquefaction is a phenomenon where a saturated soil substantially looses strength in response to an applied stress, usually from ground shaking associated with large earthquakes. Liquefaction is primarily a hazard in alluvial and fill deposits such as the project area, and it can cause severe differential settling and cracking of building foundations.

A tsunami is highly likely if there is a large CSZ earthquake. Large subduction earthquakes can produce powerful tsunamis that can destroy low lying coastal areas as the recent Tohoku (Japan 2011) and Sumatra (Indonesia 2004) tsunamis effectively demonstrated. Tsunami hazard mapping generated for the Lower Klamath River area (**Figure 7**) documents the potential hazard associated with a large CSZ earthquake. Figure 7 documents the expected run-up elevation of 33 feet which will overtop the project area and fish processing facility. The facility's foundation will be at approximately 20 to 22 feet above mean sea level. Although this may inflict substantial damage to the facility, the Yurok Tribe is prepared to alert and evacuate all humans using the Requa Resort area: the proposed facility is within a tsunami siren's reach and there is an existing evacuation plan and signed trail at the campground.

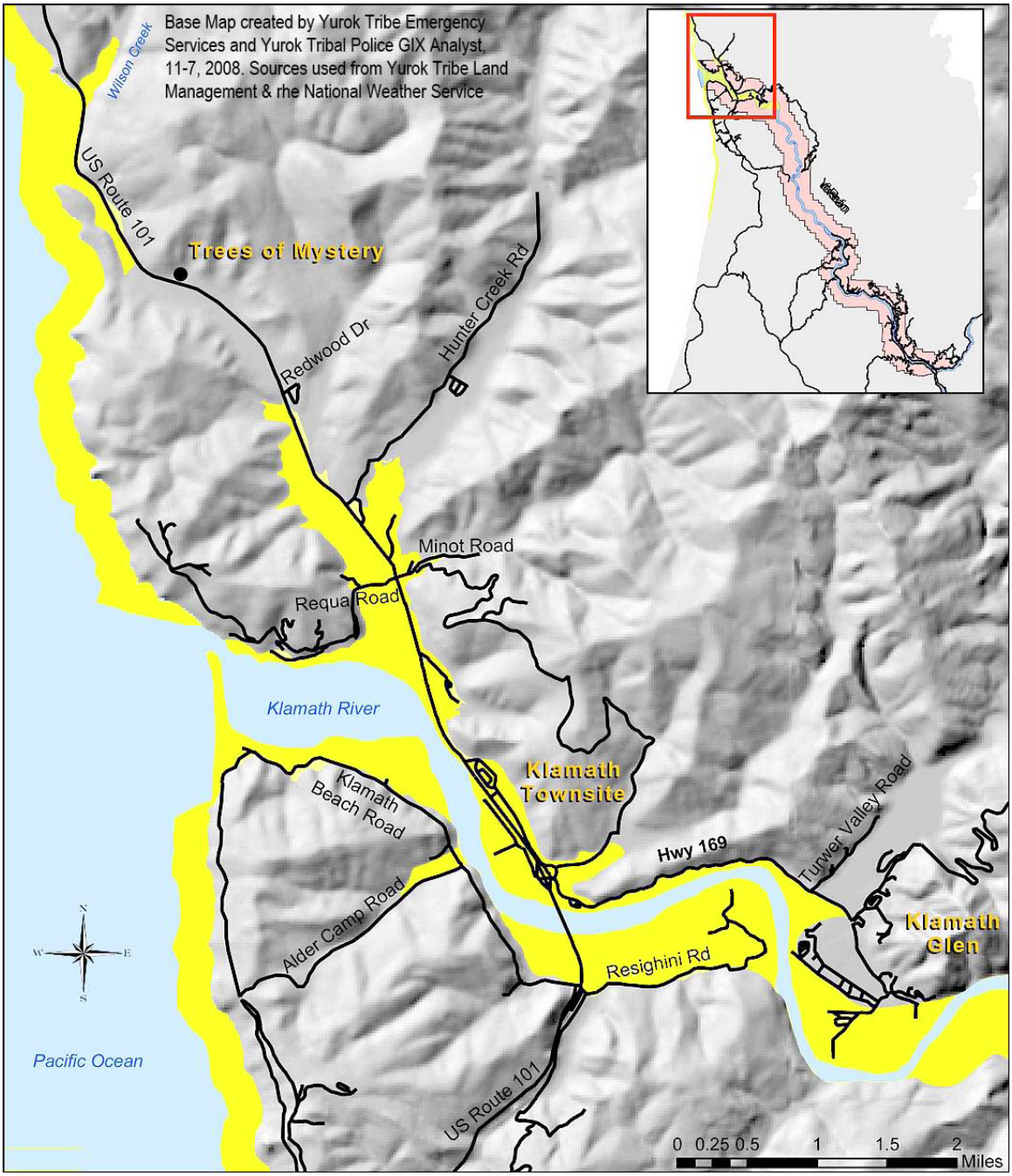

Figure 7. *Tsunami hazard map for the lower Klamath River and estuary.*

Landslides are natural geomorphic processes that shape mountainous regions and transport sediment to river systems and lower lying areas. Landslides are typically described and classified by the type of material and transport process (e.g. rock falls, earth flows, and rock slides). Landslides are typically triggered by ground shaking or high pore pressures (within soils) during earthquakes and intense rainstorms. Landslides can create a hazard for human structures placed in landslide prone areas. In addition, human activities can exacerbate the hazard by changing the landscape through such activities as cutting into hillslopes and cliffs to build roads or other structures or deforesting an area (reduced root strength). Portions of the soil mantled hillslopes above the site are subject to landslides (Kitzman, 2011) and have closed the Requa and Mouth of the Klamath Roads several times in recent years (**Figure 6**. Rock quarrying along at the north western end of the project area left sheer cliffs of exposed rock (**Figure 8**) that is suceptable to rock fall, affecting the area immediately below the cliff face. There is the potential for a large landslide to close the access roads to the facility or the tsunami evacuation trail or hit the facility.

Figure 8. *Steep cliffs lining the quarry.*

Quaternary sea level rise has raised sea level nearly 300 feet along the north coast since the last major glaciation. During the past several decades, sea level measured at tide gages along the California coast has risen at a rate of approximately 6.5 to 8 inches per century. This rate is expected to increase during this century due to global climate change effects. In anticipation of this expected sea level rise, California's Governor ordered state agencies to take into account sea level rises of 16 inches by 2050 and 55 inches by 2100 when planning projects in low-lying coastal areas (Walters 2012). These increases could exacerbate flooding and tsunami issues in the future.

Water Resources

Klamath River

The Klamath River watershed drains approximately 12,100 square miles of forested, mountainous terrain and flows approximately 260 miles from its headwaters in the Crater Lake region of southwest Oregon to Pacific Ocean along California's north coast. The upper Klamath River is dominantly snowmelt runoff and highly regulated by dams and diversions. In contrast, the lower three quarters of the watershed are predominately rainfall dominated and free flowing especially during the storm runoff periods.

Floods pose serious risks for structures located near river channels. The fish processing facility is proposed to be built along the north bank of the Klamath River within the Requa Resort which has historically been subject to periodic flooding. For example, the 1997 New Years Day flood waters destroyed the majority of the Requa Resort's RV park and campground and boat launch including the roads, electricity, telephone, and cable lines, sewage facilities, the restroom and shower facility, and the caretaker's house (FEMA 2000).

Executive Order 11988 Floodplain Management (42 F. R. 26951) requires federal agencies "to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." Executive Order 11988 defines "floodplain" as the lowland and relatively flat areas adjoining inland and coastal waters and, at a minimum, the area subject to flooding during a 100-year recurrence interval (RI) flood. It is important to differentiate between an actual floodplain and the 100-year RI elevation or floodway. The floodplain is a relatively flat surface adjacent to the channel and topped with fine sediment found along sections of most alluvial rivers and is typically overtopped by the 1.5 to 5 year RI flow. Most rivers also have multiple terraces, floodplain surfaces tectonically uplifeeted or abandoned following a climatic shifeet leading to channel incision. The 100-year RI flood substantially inundates the floodplain and depending on the valley topography and confinement, may occur along a hillslope, terrace, or other geomorphic feature. From this point onward, NMFS will use the 100 and 500-year RI flood elevations as the relevant elevations to evaluate the flooding potential. NOAA's working drafeet Implementing Procedures for Executive Order 11988 (NOAA 2011) require that for critical actions, which this project is considered, the 500-year RI flood be used as the minimum standard for evaluation, mitigation, and protection. Executive Order 11988 states, that a flood map such as Federal Emergency Management Agency's (FEMA) flood hazard maps or a more detailed map of the area should be used to determine the 100-year RI flood elevation. FEMA's most current map (**Figure 9**) has mapped the Requa Resort within the 100-year RI floodway.

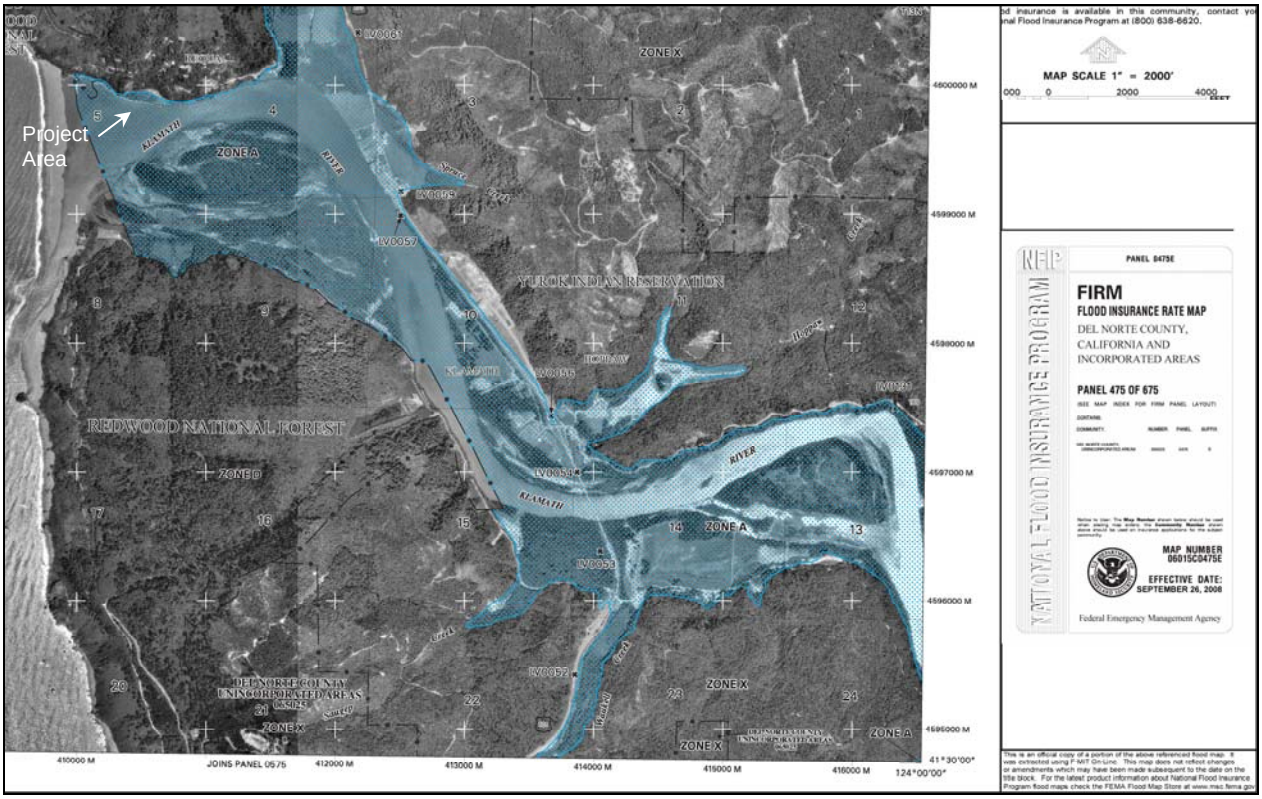

Figure 9. *Current FEMA 100-year recurrence interval flood inundation map. Note FEMA still has the project area mapped within the Zone A floodway.*

Flood frequency analysis provides historic context and a means for the estimation of a river's potential future peak flows as defined by their magnitude and frequency (i.e., the 100-year RI flood). Frequency is typically expressed as a recurrence interval (years) or an exceedence probability and flow magnitude in cubic feet per second (cfs). To determine a flow recurrence interval (RI), data from a gaging station are fit to a probability curve, typically a Pearson Type III distribution (USGS 1982). Guidelines for Determining Flood Flow Frequency, Bulletin 17B of the Hydrology Subcommittee (USGS 1982) provides standardized procedures for estimating flood frequencies from historic peak flow records.

A flood frequency curve was generated using USGS gaging data and PKFQwin sofeetware program for estimating the expected recurrence interval of an annual peak flood event (**Figure 10** and **Figure 11**). The USGS operates a streamflow and sediment monitoring station, Klamath River near Klamath, California (gage #11530500) approximately 7.2 miles upstream of the project area. Annual peak streamflow data is available for water years (WY) 1861, 81, and 90,

and 1911 to 1927 and 1932 to 2010. Figure 10 plots RI versus discharge (cubic feet per second) directly from the measured peak flows and using the computed PKFQwin output data. Annual exceedence probability (*p*) in figure 10 is related to recurrence interval (RI) by the following equation:

$$RI = 1/p$$

Figure 10 displays the computed Bulletin 17B flows and associated confidence limits for each recurrence interval. The 100-year RI flood is approximately 616,500 cfs with 95 percent confidence intervals of 508,100 cfs and 708,700 cfs and the 500-year RI flood is approximately 851,400 cfs with 95 percent confidence intervals of 681,800 cfs and 1,120.000 cfs (**Figure 10**). A time series presentation of the annual peak flows () provides a chronological perspective of floods over the last 100+ years. The larger storms (>10 year RI) occurred in WY1953, 55, 64, 72, 75, and 97, similar to most other gaged north coast rivers and creeks.

FEMA estimated the 100-year RI flood to be approximately 580,000 cfs for their mapping purposes (**Figure 9**). The difference between FEMA's and NMFS's (616,500 cfs)100-year RI flood estimates were likely a product of the length of flow records used and the probability curve fit to the data. However, the estimates are well within the 95 percent confidence intervals.

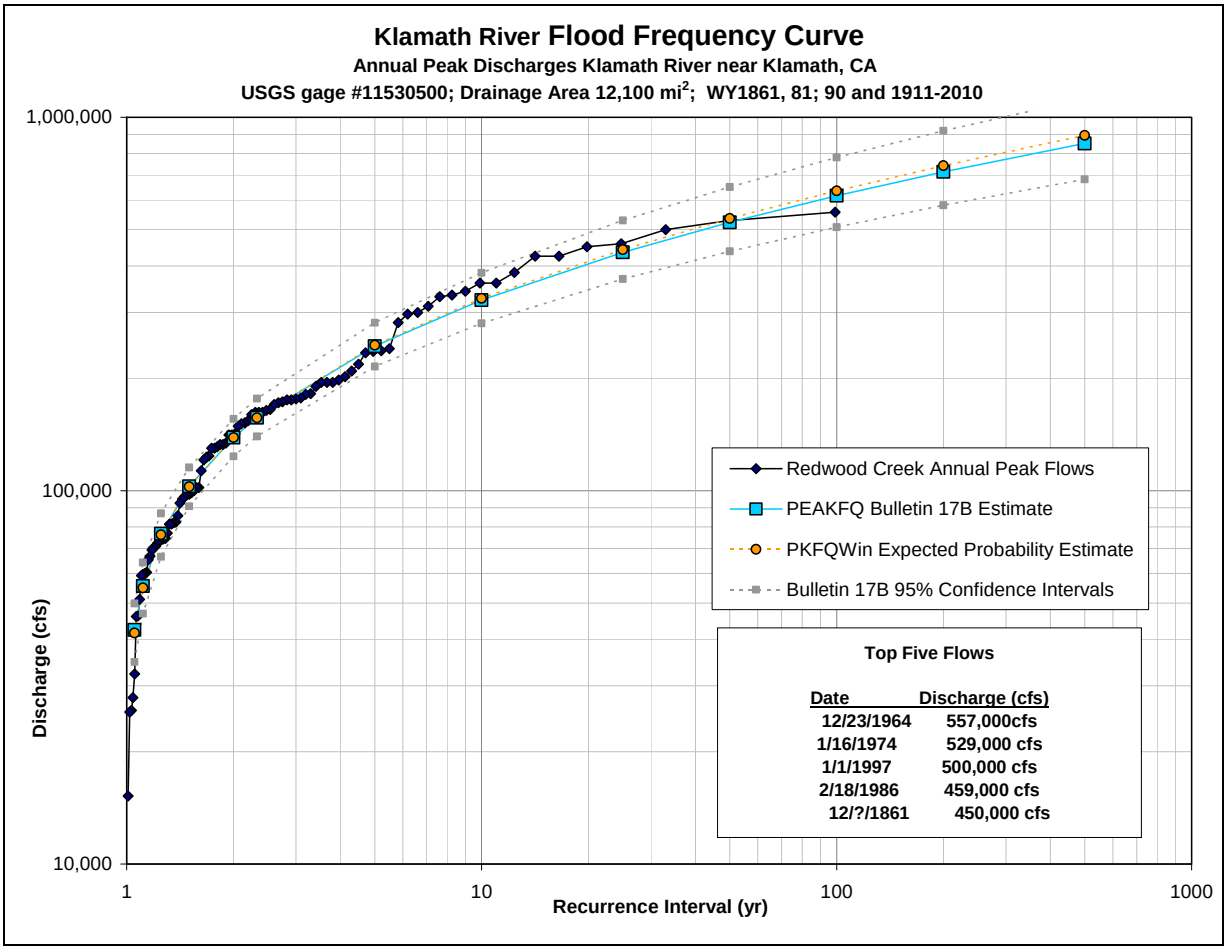

Figure 10. *Flood frequency curve for the USGS's Klamath River near Klamath, California streamflow gaging station (#11530500).*

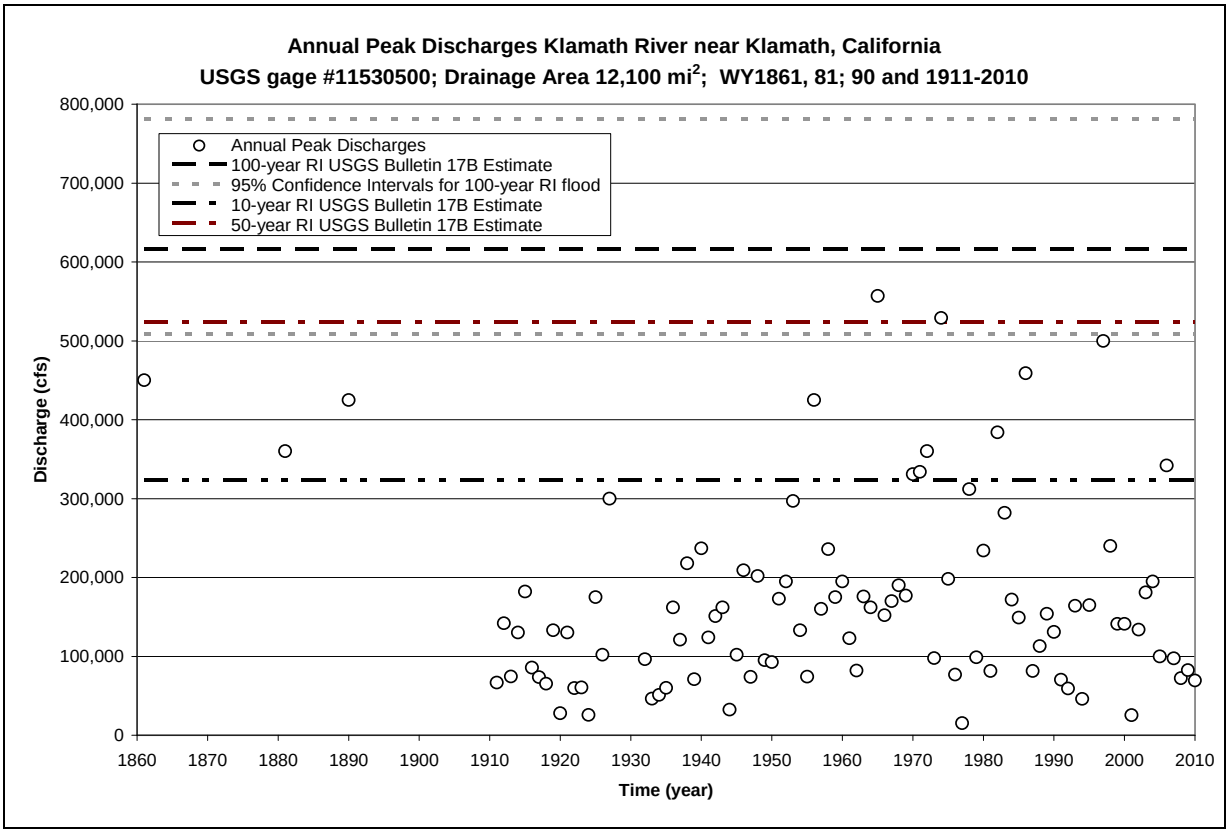

Figure 11. *Annual peak flows from the USGS's Klamath River near Klamath, California streamflow gaging station.*

The January 1, 1997 flood, an approximately 40-year RI flow (500,000 cfs) (**Figure 10**), washed away most of the Requa Resort's RV park and campground, infrastructure including roads, electricity and telephone lines, sewage facilities, the restroom and shower facility, and small boat house (FEMA 2000). Under FEMA's Final Programmatic Environmental Assessment for Typically Recurring Actions Resulting from Flood Disasters in California (FEMA 1998), FEMA provides funds to "repair, restore, or replace public facilities damaged in such events" (FEMA 1998). According to the Supplemental Environmental Assessment (FEMA 2000) for the Requa Resort area, the Tribe requested and received grant funding from FEMA to repair infrastructure and raise the majority of the ground surface within the resort area. The Yurok Tribe raised the majority of the RV park/campground and boat launch area to provide approximately 2 feet of freeboard above the base flood elevation (FEMA's minimum 100-year RI flood elevation) of 15.2 feet (North American Vertical Datum of 1988) in compliance with the National Flood Insurance Program (FEMA 2000). FEMA was not able to provide documentation (e.g., surveys, flow modeling, or Tribal Data) for how the base flood elevation was estimated or how the elevation correlates to known flood RI flows. The Tribe rebuilt the resort's infrastructure, raised

the ground elevation using approximately 15,000 cubic yards of fill and approximately 900 tons of riprap. The riprap was placed on top of the existing riprap along the campground and boat launch area (**Figure 12**). According to the Yurok Tribe, the work was preformed to FEMA's requirements. Even with these efforts, FEMA determined that "because of the very substantial 100-year RI discharge at this location, placing approximately 15,000 CY of fill in the floodplain would have a negligible effect on the 100-year water surface elevation" (FEMA 2000); therefore the Requa Resort is still mapped within the 100-year RI floodway (**Figure 9**). FEMA circulated a public notice explaining the proposed project and the reasons for rebuilding the Requa Resort in the same location.

Figure 12. *Looking upstream at riprap installed with FEMA grant funds to protect the campground and boat launch area. The satellite antenna (grey pole on lefeet) for the Yurok Tribe's lower estuary gaging station provides a marker for the location map.*

Cannery Creek

Cannery Creek drains the hillslope along the north side of the campground and boat launch area. It is diverted along the base of the hill to the west between the old quarry and the RV park and campground (**Figure 2**). The creek flows through two culverts under the access road to the quarry. During the majority of the year it runs underground before reaching the second culvert. There is no identifiable outlet structure for the creek to flow through the riprap levee directly to the Klamath River. Riparian and wetland vegetation grows along the base of hillslope and the creek channel. The creek does not support perennial flows over the length of its channel, but storm flows appear to be significant and year round flows persistent enough to provide some aquatic habitat. The creek, therefore, would be considered to be a "Water of the U.S." by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. A CWA Section 404 or 401 permit is not required because there will not be any discharges or fill entering Cannery Creek during this project. However, a Yurok Tribe Water Quality Certification was obtained to meet Tribal regulations to protect water quality due to the close proximity of the proposed project to Cannery Creek.

Estuary Water Quality

The estuary is the portion of the river where marine and freshwater mix. Within the Klamath River, this region can extent several miles up river depending on the streamflow, tides, and whether the mouth has closed. High flows and ocean storm waves create and maintain multiple complex channels, sloughs, a deep-water fore dune area, a sand spit, and a dynamic river mouth that typically closes during the late summer or early fall. Tidal exchanges in the Klamath River estuary are thought to influence the lower 4 miles of the river. Periodically the river mouth will close causing streamflow to backup into channels and sloughs. The Klamath River estuary provides a morphologically diverse and complex set of geomorphic elements, riparian vegetation, and aquatic habitats for spring and fall-run chinook salmon (*Oncorhynchus tshawytscha*), SONCC coho salmon (*O. kisutch*), steelhead trout (*O. mykiss*), coastal cutthroat trout (*O. clarki clarki*), green sturgeon (*Acipenser medirostris*), eulachon (*Thaleichthys pacificus*), and Pacific lamprey (*Lampetra tridentata*).

The California State Water Resources Control Board's Water Quality Control Policy for the enclosed bays and estuaries of California was published as guidelines to prevent water quality degradation. The Bays and Estuaries Policy (as adopted in 1974 and amended in 1995) concluded that municipal wastewater and industrial process water discharges should not be allowed unless such discharges enhance the quality of the bay or estuary.

Under the Federal Water Pollution Control Act, commonly known as Clean Water Act (CWA), States and federally recognized Tribes have the primary responsibility for maintaining and restoring the chemical, physical, and biological integrity of the Nation's waters. Section 303 (33 U.S.C. § 1313) of the CWA requires states and Tribes to define water quality objectives, water quality standards, and beneficial uses. The North Coast Regional Water Quality Control Board (NCRWQCB) and the U.S. Environmental Protection Agency (USEPA) adopted and approved the Water Quality Control Plan for the North Coast Region (NCRWQCB, 2011). In addition, the Yurok Tribe has adopted the Yurok Tribe Water Quality Control Plan (WQCP) and Water Pollution Control Ordinance for the Yurok Indian Reservation, regulating discharges into waters on the Reservation (Yurok Tribe 2004). Both plans define beneficial uses, narrative and numeric water quality standards, and implementation plans. The two plans are in similar for the lower Klamath River and estuary. The WQCP is a regulatory document used by the Tribe to permit, deny, or condition proposed actions that may affect beneficial uses of Reservation waters.

Water bodies with pollutants that exceed protective water quality standards are placed on the State's 303(d) List. The Lower Klamath River Hydrologic Unit was placed on the 2010 CWA Section 303(d) List of Water Quality Limited Segments for temperature, organic enrichment/low dissolved oxygen, sedimentation/siltation, and microcystin water quality standard impairments. This list is revised every two years under CWA Section 305(b) and resubmitted to the USEPA for review and approval. Total Maximum Daily Load allocations (TMDL) are developed for water bodies placed on the 303(d) List. On December 28, 2010, the USEPA approved the TMDLs for the Klamath River in California pursuant to CWA Section 303(d)(2).

Water quality on the Yurok Reservation is currently monitored and assessed by the Yurok Tribal Environmental Program (YTEP). The Yurok Tribe has an extensive monitoring program with real-time monitoring station (http://exchange.yurokTribe.nsn.us/lrgsclient/stations/stations.html) and numerous reports documenting their annual and targeted water quality monitoring (http://www.yurokTribe.org/departments/ytep/water_reports.htm). The Tribe works with the Klamath River Water Quality Monitoring Coordination Workgroup to reduce redundancy and share information and data among other Klamath and Trinity River Tribes and land management agencies. YTEP collects bi-weekly (every other week) samples between May and October (YTEP 2004). This time period was selected because it is when nutrients and algae impair water quality in the mainstem Klamath River. Late spring through fall is also an important time for juvenile salmonid (chinook, coho, steelhead) emigration, adult spring and fall chinook migration into the Klamath basin, and migration of lamprey and green sturgeon. The following brief description outlines the relevant water quality data and standards necessary to describe the existing condition of the estuary. The Yurok Tribe collects water quality samples at the Lower Estuary Surface (LES) gage (**Figure 12**and **Figure 13**) which is located at the downstream end of the RV park and campground. The majority of the data presented is from this gage.

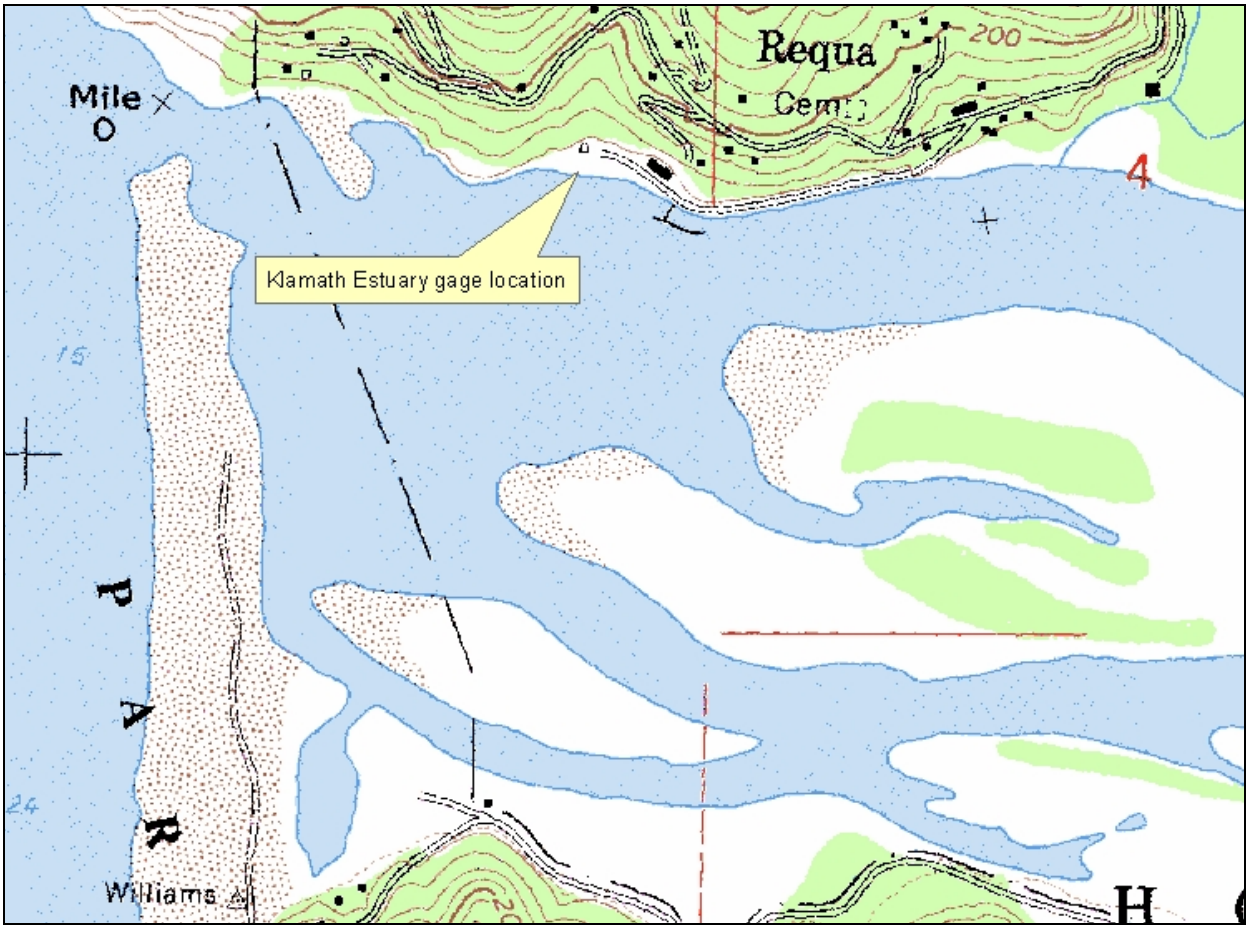

Figure 13. *The Yurok Tribe's Klamath River estuary gaging station location.*

Figure 14. *LES gaging station location at the downstream end of the RV park and campground. Note ocean waves in the distance.*

From 1991 to 1994, the California Department of Fish and Game (CDFG) collected temperature and dissolved oxygen data at multiple locations within the Klamath River estuary (Wallace 1998). The Yurok Tribe sampled water temperature, dissolved oxygen, and salinity at the same locations within the estuary from 2001 to 2003 (Hiner 2006). The CDFG and Yurok Tribe estuary studies documented similar water quality conditions (Hiner 2006). Winter (December to February) water surface temperatures ranged from 43 to 54 degrees Fahrenheit (F, 6 to 8 degrees Celsius, C) while low-flow summertime (June to August) water temperatures typically range from 68 to 75 degrees F (20 to 24 degrees C). The studies also found cooler bottom temperatures, 41 to 54 degrees F (5 to 8 degrees C) when salt wedge formed in the estuary

(Hiner 2006). In 1994 and 2001, the near closure and closure of the river mouth inhibited saltwater intrusion and prevented a salt wedge from forming (Hiner 2006). These same trends occur in the years since 2003 as evident in the more recent WY 2010 data (**Figure 15**). The EPA (1986) set 68 degrees F (20 degrees C) as the water quality standard for temperature, which is commonly exceeded during portions of the summer (**Figure 15**).

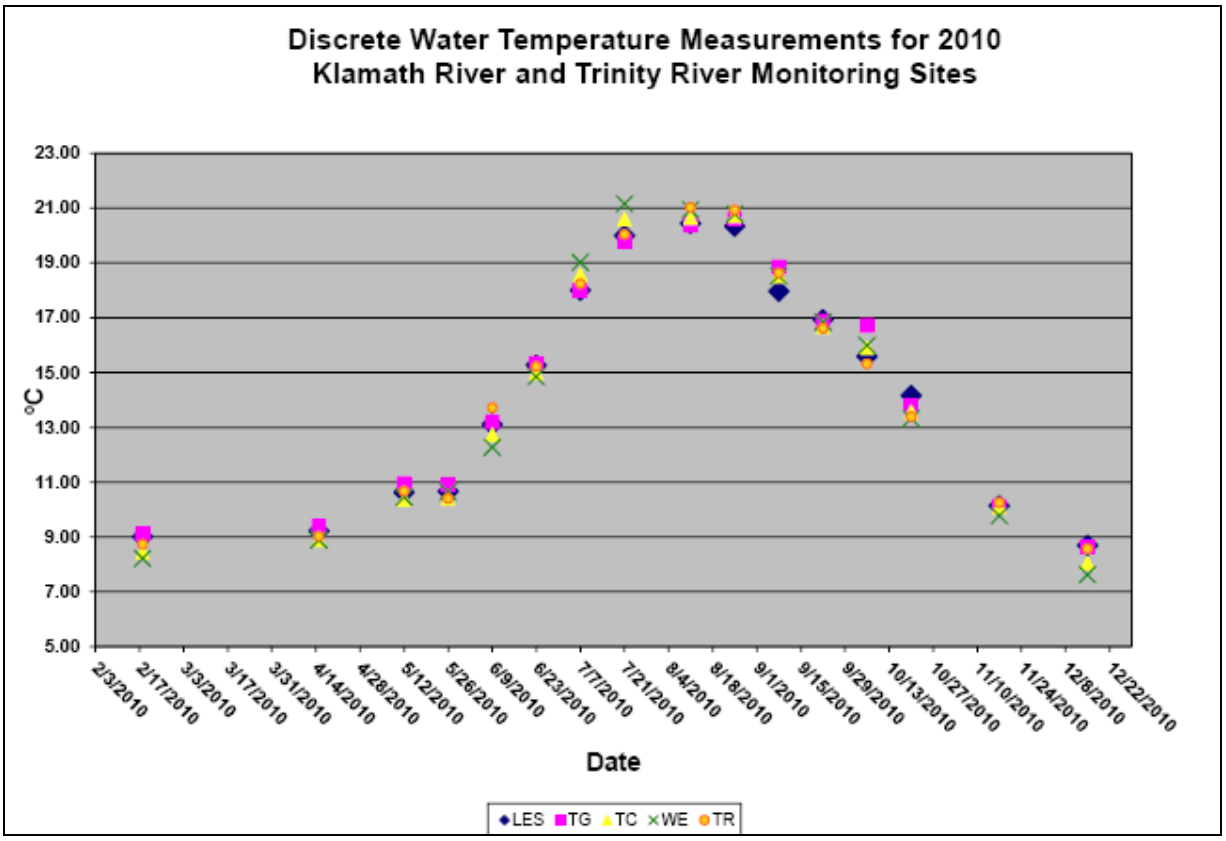

Figure 15. *Discrete water temperature measurements. 2010 Lower Estuary measurements were collected at LES by the Yurok Tribe (Yurok Tribe 2011). WY2010 was a normal water year in the lower Klamath River.*

The CDFG and Yurok studies also found that dissolved oxygen exceeded 6 to 7 parts per million (ppm) throughout the year, except for periodic readings ranging between 2.5 to 5.5 ppm in deep pools or shaded side channels. The Tribe sets a year round objective within the water column, 7-day moving average with daily minimum concentrations of 8 mg/l. This is commonly exceeded

as evident from the WY2010 data (**Figure 16**). If the data is expressed as a percentage the WY2010 data (**Figure 17**) also show exceedences of the EPA's dissolved oxygen standards (Table 1).

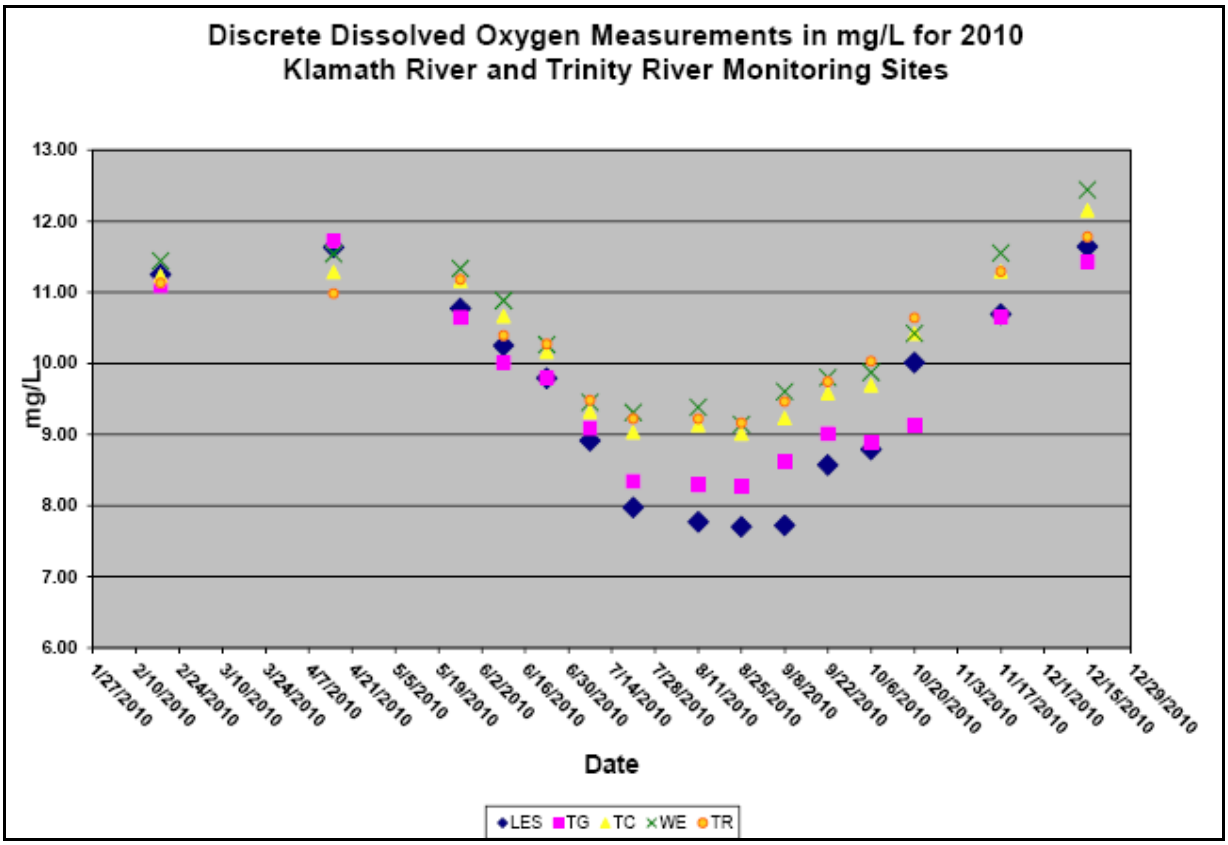

Figure 16. *Discrete dissolved oxygen measurements (mg/l). 2010 Lower Estuary measurements were collected at LES by the Yurok Tribe (Yurok Tribe 2011). WY2010 was a normal water year in the lower Klamath River.*

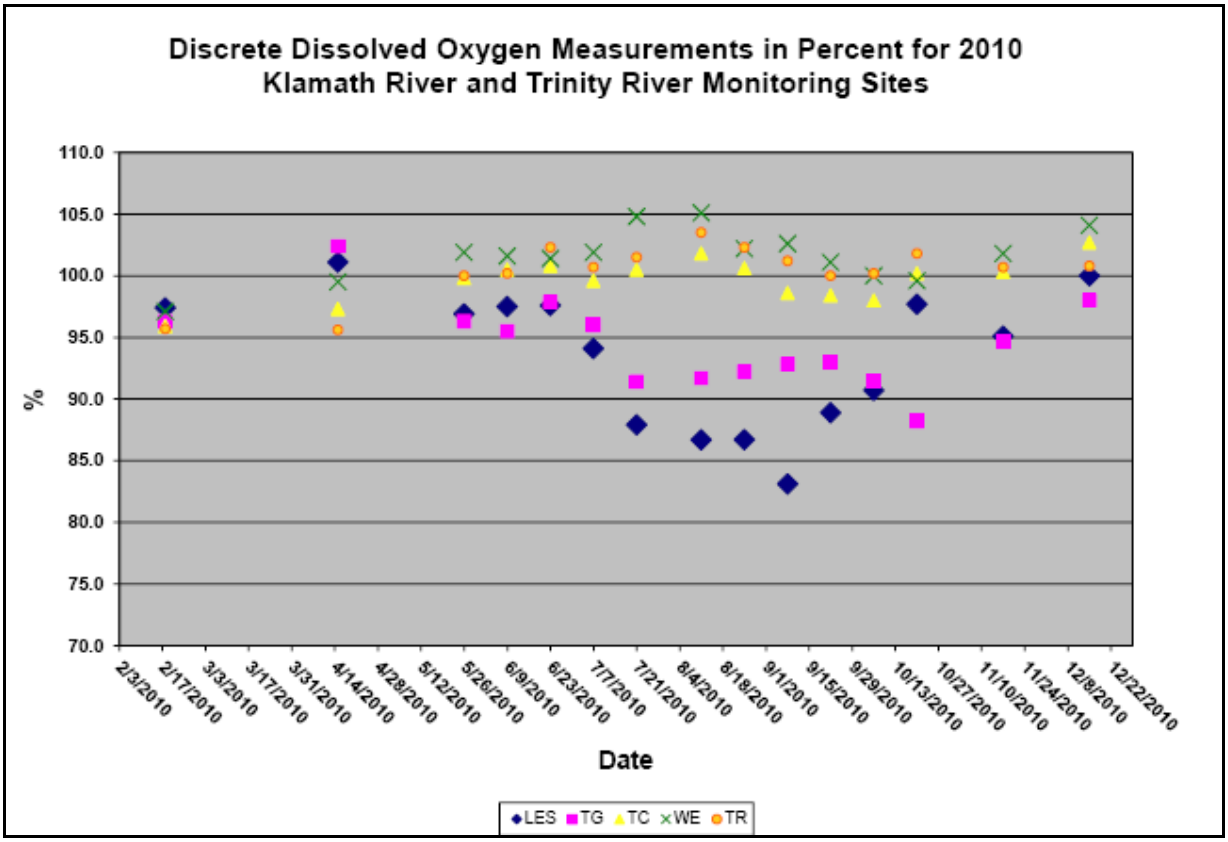

Figure 17. *Discrete dissolved oxygen measurements (percent). 2010 Lower Estuary measurements were collected at LES by the Yurok Tribe (Yurok Tribe 2011). WY2010 was a normal water year in the Lower Klamath River.*

Table 1. *Dissolved oxygen standards.*

Upper and Middle Estuary	80 percent	August 1 through August 31
	85 percent	September 1 through October 31 and June 1 through July 31
	90 percent	November 1 through May 31
Lower Estuary	For the protection of estuarine habitat (EST), the dissolved oxygen content of the lower estuary shall not be depressed to levels adversely affecting beneficial uses as a result of controllable water quality factors.	

From 2006 to 2010, the YTEP sampled total phosphorus, soluble reactive phosphorus, total nitrogen, ammonia, nitrate plus nitrite, alkalinity, chlorophyll-a, pheophytin-a, non-filterable residue, and total organic carbon (YTEP 2010). According to the annual reports (see webpage), the the estuary exceeded the known standards for these parameters in most years. The main source of nutrient loading during high precipitation is from agricultural land, and during low-flow summer months is from the Upper Klamath Lake (YTEP 2010). High nutrient loading was typically associated with low stage height in the estuary.

The Yurok Tribe collects bacteria samples once a month at the LES sampling station, as well as, above and below the community wastewater treatment facility. The Tribe samples for Escherichia coli and enterococci bacteria and establishes bacteriological criteria. Bacteria sampling revealed no impairment.

The poor water quality within the estuary is attributed to high nutrient loads, seasonal high water temperatures, and low dissolved oxygen. The nutrient pollution in the Lower Klamath River causes elevated pH and dissolved ammonia and depressed dissolved oxygen. The annual monitoring reports consistently show pH, temperature, algae, and dissolved oxygen impairement from June through October while total phosphorous and total nitrogen are impaired from May through October. The river has been repeatedly listed on the 303(d) list for these impairments.

Coastal Zone

The Federal Coastal Zone Management Act (CZMA) regulates activities that occur within the coastal zone. Coastal development permit authority is delegated to the appropriate local government agency, but the California Coastal Commission (Commission) retains permit jurisdiction over certain specified lands (such as tidelands and public trust lands). Provisions of the federal CZMA "give state coastal management agencies (i.e., Commission) regulatory control (federal consistency review authority) over all federal activities and federally licensed, permitted or assisted activities, whether they occur landward or seaward of the respective coastal zone boundaries fixed under state law if the activity affects coastal resources (http://www.coastal.ca.gov/whoweare.html)." The proposed facility will be located within the coastal zone; therefore NMFS evaluated the project and submitted a consistency determination to the Commission for review. The results of the determination and Commission review are presented in the effects section.

Air Quality

The U.S. Environmental Protection Agency (EPA) and California EPA's Air Resources Board (ARB) adopt and regulate ambient (outdoor) air quality standards for known air pollutants. The standards are designed to protect human health and welfare. The North Coast Unified Air Quality Management District, under the ARB regulates the project area which is a part of the North Coast Air Basin. The basin is classified as a Class II air shed which allows moderate deterioration that might accompany well-planned growth.

Of the 11 regulated air pollutants, this project most likely to produce particulate matter (PM) from the fish smoking process. The ambient air quality standards for PM define the maximum amount of airborne particles that can be present in outdoor air without threatening the public's health. PM is a complex mixture consisting of dry solid fragments (e.g., metals, soot, soil and dust), solid cores with liquid coatings, and small droplets of liquid that varies in shape, size and chemical composition. The federal EPA and California ARB adopted air quality standards for respirable PM up to 10 microns (PM10) and fine PM up to 2.5 microns in size (PM2.5) (Table 2).

Table 2. *Federal and State Ambient Air Quality Standards for Particulate Matter (California ARB webpage)*

	California ARB Standard PM10	**Federal EPA Standard PM10**
Annual Average	20 µg/m^3	N/A
24-Hour Average	50 µg/m^3	150 µg/m^3
	California ARB Standard PM2.5	**Federal EPA Standard PM2.5**
Annual Average	12 µg/m^3	15.0 µg/m^3
24-Hour Average	--------	35 µg/m^3

Air quality for the North Coast Air Basin is monitored on the Yurok Reservation, in Redwood National and State Parks, in Eureka, and in Crescent City. The Yurok Tribe Environmental Program has two permanent air quality monitoring stations on the Reservation: one at Klamath Glen, about 5 linear miles away, and another at the Elementary School in Weitchpec, California, approximately 30 linear miles from the proposed project. The Klamath Glen monitoring station likely samples pollution from most sources within the Klamath Estuary (i.e., project area),

Highway 101 corridor, the town of Klamath and the communities of Requa and Klamath Glen. At the Klamath Glen station, the Tribe began measuring wind speed/direction, temperature, humidity, barometric pressure, rainfall, and fuel moisture and temperature in 2001 and solar radiation and dew point in 2007. The Tribe also deploys three Mini-vol samplers on a rotating basis at four schools across the Reservation to monitor and help define baseline PM10 and 2.5 levels. To measure PM the Tribe installed continuous PM10 monitors at the two permanent air quality weather stations in 2005 and PM2.5 monitors in 2006. Real-time data is available from these stations at http://exchange.yurokTribe.nsn.us/lrgsclient/stations/stations.html.

According to data collected from the Klamath Glen monitoring station, the 24-hour average for air quality in this area has not been exceeded the PM10 standards or the established federal and state 24-hour average for PM2.5 since its installation in 2006.

Biological Resources

Vegetation

The general project area has been significantly disturbed by human activities. It supports typical riparian salt zone vegetation, heavily impacted by exotic, invasive plant species.

The plant communities within and adjacent to the project area are spruce, *Picea sitchensis* dominant, with *Alnus sp.* and willows, *Salix sp*. also present. Shrubs include coyote brush, *Baccharis pilularis* and silktassel, *Garrya sp*. The slopes above the site also support more mature spruce, *Picea sitchensis*. Other native plants are also found, such as native coltsfoot, *Petasites palmatus* and swordfern, *Polystichum munitum*. On the hillside above creek, native herbs persist in spite of the encroachment of invasive species present in the area.

Threatened and Endangered Plants

The project area and existing access roads have not been surveyed for threatened and endangered plant species.

Invasive Species

There are multiple plant and animal invasive exotic or non-native species currently in the project area or adjacent lands. For example, pampas grass (Cortaderia selloana) is thriving in the old quarry (**Figure 18**). The vegetation along the Cannery Creek is heavily impacted by invasive species, primarily Himalayan blackberry, *Rubus armeniacus* and English ivy, *Hedera helix*. There are a few stands of native alders, willows, *Salix sp.* and thimbleberry, *Rubus parviflorusin the Cannery Creek riparian corridor.* Ground cover is predominated by non-native invasives,

such as perennial ryegrass, *Lolium perenne*, clovers, *Trifolium sp.* and thistle, *Cirsium sp*. Invasive Himalayan blackberry, *Rubus armeniacus*, Pampas Grass *Cortaderia selloana*, and English ivy, *Hedera helix*. are ubiquitous.

Figure 18. *Invasive pampas grass within the old quarry.*

Wildlife

The area surrounding the project area contains some relatively pristine areas that support native wildlife populations including deer, elk, bear, mountain lion, beaver and numerous species of song birds and raptors. The project area, however, is heavily impacted by human activities and no longer supports habitat necessary for wildlife to thrive. Occasional strays may be seen on or near the project area but it is unlikely to support any suitable breeding sites or provide significant foraging resources. Several animal species within the U.S.G.S. 7.5' Requa Quadrangle are listed as sensitive species by federal and/or state agencies (U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office).

Migratory birds are protected by the Migratory Bird Treaty Act and are required to be addressed if a federal action might affect them. Bald eagles are commonly found within the project area or in upstream reaches of the Klamath River. There is an occasional golden eagle sighting in the assessment area. USFWS did not identify any other migratory bird species or habitat during technical assistance within the immediate project area. Therefore, migratory species other than bald and golden eagles will not be discussed any further.

Threatened and Endangered Terrestrial Species

The Federal Endangered Species Act (ESA) protects all species that have been listed or candidates for listing as a Threatened or Endangered Species. Section 7 of the ESA requires the action agency to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species of threatened species or result in the destruction or adverse modification of designated critical habitat (Sec. 7:(a)(2) ESA as amended)." It is also the action agency's responsibility to consult with the respective service. For terrestrial species, the Section 7 consultation process was initiated in September 2010 with the U.S. Fish and Wildlife Service. There are several federally listed species that may occur within the general area in which the project is proposed:

Birds

*Brachyearamphus marmoratu*s	Marbled murrelet
Strix occidentalis caurina	Northern spotted owl
Synthliboramphus hypoleucus	Xantus's murrelet
Coccyzus americanus	Western yellow-billed cuckoo
Charadrius alexandrinus nivosus	Western snowy plover

Mammals

Martes pennanti	Fisher, West Coast DPS

It is unlikely that these species will be found within the project area (RV park and campground and boat launch area) however these species are known to occur in the general area. The murrelets and the spotted owls nest in mature or old growth forests and the West Coast fisher also requires a forested habitat. The Western snowy plover nests on beaches and USFWS found none during their surveys.

During a previous project with the Indian Health Service in Requa, USFWS evaluated the potential effects on northern spotted owl (Strix occidentalis caurina) and marbled murrelet

(Brachyearamphus marmoratus) in the project vicinity. USFWS concluded that the young-growth forest was not sufficiently developed to provide suitable habitat structure. There are also few, if any, known breeding sites for either species within about one mile of the seashore.

The USFWS provide the following information regarding the other listed species. Following repeated survey attempts, the USFWS concluded that there is no beach or river bar habitat suitable for western snowy plover (Charadrius alexandrinus nivosus). They did not detect any feeding or breeding activity the in the project or surrounding areas. Xantus's murrelet (Synthliboramphus hypoleucus) is confined to small nearshore islands of which there area none in the project or surrounding areas.

There is a large patch of unsurveyed riverine hardwood habitat south of the Klamath River near the river's mouth that may be suitable habitat for western yellow-billed cuckoo (Coccyzus americanus) but it is separated from the project site by the width of the river and the project does not present any noise or visual issues that are not already occurring along the Requa waterfront.

Pacific fisher (Martes pennanti) may or may not be present within forested areas around Requa, but we would certainly expect them to avoid the kind of high-density human use found within or near the project area.

Threatened and Endangered Aquatic Species

The following Federally listed species under NMFS' jurisdiction occur within the action area:

- Southern Oregon and Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) were listed as threatened on June 28, 2005 (70 FR 37160).
- Southern DPS green sturgeon (*Acipenser medirostris*) were listed as threatened on April 7, 2006 (71 FR 17757);
- Southern DPS eulachon (*Thaleichthys pacificus*) were listed as threatened under the ESA (75 FR 13012) on March 18, 2010;
- Gray whales (*Eschrichtius robustus*) were listed as endangered on December 1970 under the ESA (35 FR 18319);
- Steller Sea Lions (*Eumetopias jubatus*) were listed under the ESA as threatened throughout their range on December 4, 1990 (55 FR 49204). On June 4, 1997, the Western DPS population was listed as an endangered under the ESA (62 FR 24345).

- Tidewater goby (Eucyclogobius newberryi) was listed as an endangered species under the Endangered Species Act on March 7, 1994.

NMFS has jurisdiction over all of these listed marine and anadromous fish except the tidewater goby which is under the U.S. Fish and Wildlife Service's jurisdiction. There is no designated critical habitat for any of the listed species within the Yurok Reservation. Therefore critical habitat will not be discussed any further.

Two other salmonid species found "not warranted" for federal listing in March 9, 1998, the upper Klamath-Trinity Rivers Chinook salmon (*Oncorhynchus tshawytscha*) and Klamath Mountains Province steelhead (*Oncorhynchus mykiss*), are also found in the Klamath River watershed along with coast range and prickly sculpin (*Cottus asper*), speckled dace (*Rhinichthys osculus*), three-spine stickleback (*Gasterosteus aculeatus*), and Pacific lamprey (*Gasterosteus aculeatus*). NMFS is currently reviewing a petition to list the upper Klamath-Trinity Rivers Chinook salmon but a decision has not been made at this time.

All these species are dependent on aquatic environments. Suitable habitat for these species could occur either in the adjacent Klamath River or in the marine environments beyond the mouth. Stellar sea lions are ofeeten present in the Klamath Estuary and on the sand spit near the mouth of the river. While it is extremely rare, species of sea turtles and whales occasionally enter the Klamath River and spend time in the Klamath Estuary. For example, two Gray whales entered and remained in the Klamath Estuary for over two months during the summer of 2011. However, the Klamath River is not the preferred habitat for these species.

SONCC Coho Salmon

SONCC coho salmon were listed as a Threatened species under the Endangered Species Act (ESA) on May 6, 1997 (62 FR 24588; May 6, 1997). Designated critical habitat (64 FR 24049; May 5, 1999) encompasses accessible reaches of all rivers substrate, and adjacent riparian zones between the Mattole River in California and the Elk River in Oregon, inclusive. However, the following areas were excluded: (1) areas above specific dams identified in the Federal Registry notice; (2) areas above longstanding natural impassible barriers (*i.e.*, natural waterfalls), and (3) tribal lands.

A regional population perspective of the SONCC coho salmon provided by Weitkamp *et al.* (1995), estimated that in the California portion of the SONCC coho salmon ESU approximately 7,000 naturally spawning and 17,000 hatchery coho salmon returned to the rivers. This estimate included approximately 4,500 native fish from tributaries with little history of supplementation

with non-native fish. Weitkamp *et al*. (1995) concluded that SONCC coho salmon were likely to become endangered in the foreseeable future. Good et al. (2005), the latest status review by NMFS, reached a similar conclusion.

Other Important Species

Chinook Salmon

Populations of Klamath River Chinook salmon are divided into Upper Klamath and Trinity Rivers Chinook Salmon ESU upstream of the Trinity River confluence and the Southern Oregon and Northern California Coastal Chinook Salmon ESU for populations downstream of the confluence. Neither ESUs is listed under the ESA. However, there is a petition to consider listing the Upper Klamath and Trinity Rivers Chinook Salmon ESU, including both spring-run and fall-run.

Chinook salmon are the primary species of commercial and recreational harvest in the Klamath watershed. The entire estuary and upstream river is Essential Fish Habitat. Two life-history types of Chinook salmon, spring and fall-run, occur in the Klamath River. Spring-run adults ascend the river from April through September, and hold in deep pools downstream until spawning in September through November. Fall-run Chinook salmon migrate upstream from August to December and spawn mid-October through December. Fry, juvenile, and adult Chinook salmon use the estuary to migrate or as holding habitat.

The Hoopa Valley, Yurok and Karuk Tribes, USFWS, CDFG, U.S. Forest Service, U.S. Geological Survey, have conducted adult salmonid population surveys on the Klamath and Trinity Rivers since 1993. The information collected provides data for managers to make estimates and predictions of Klamath basin fall Chinook salmon run size (See the USFWS webpage http://www.fws.gov/arcata/fisheries/activities/adultSalmonidMonitoring/default.html). Figures 18 and 19 provide adult return abundances for fall and spring-run Chinook salmon for the Klamath and Salmon Rivers respectively.

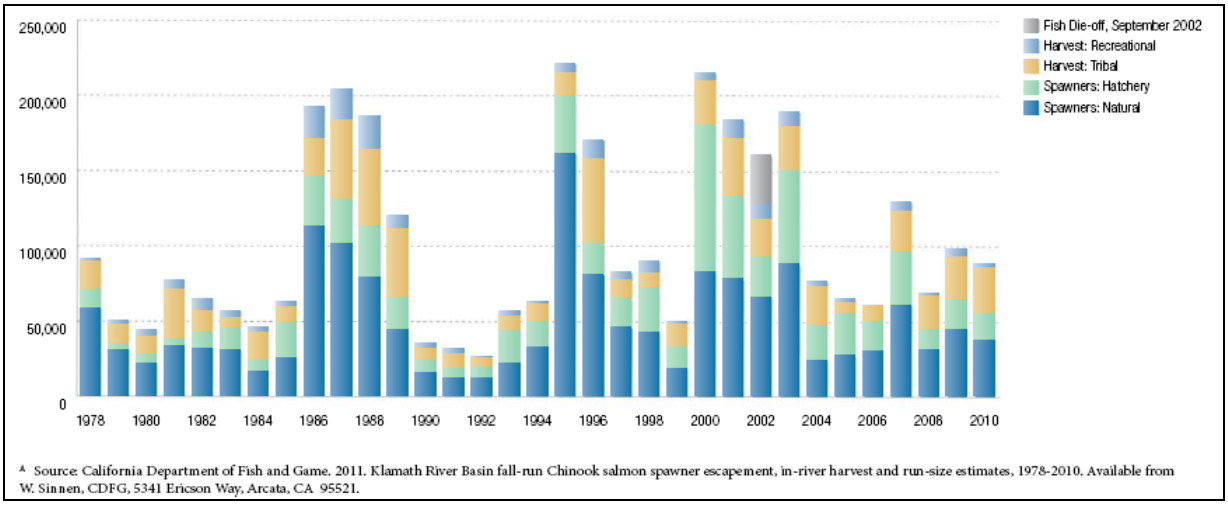

Figure 19. *Estimated abundance of fall-run Chinook salmon adult returns in the Klamath River (modified from NOAA 2011).*

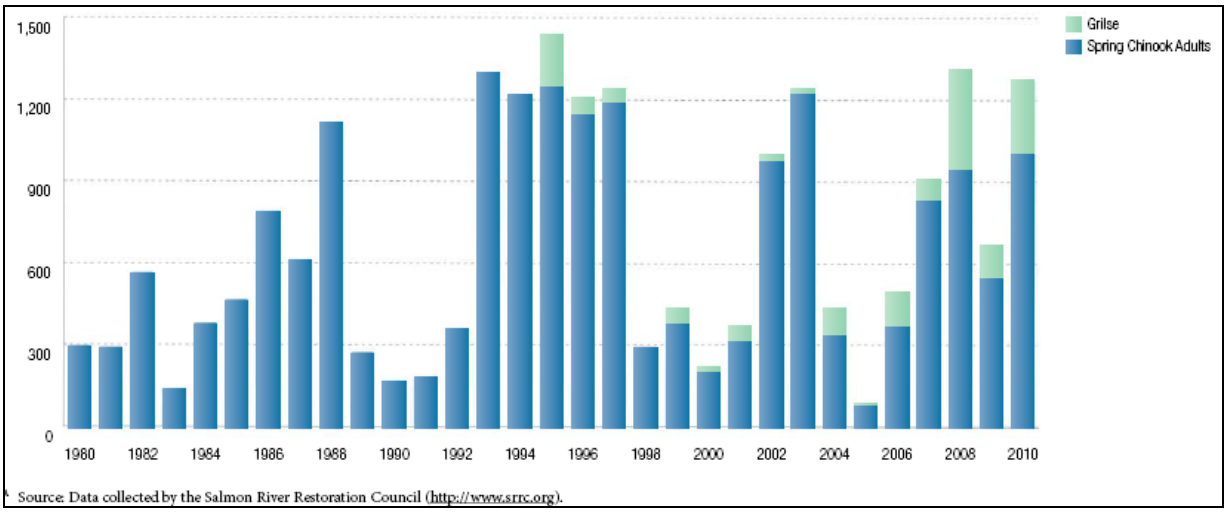

Figure 20. *Estimated abundance of fall-run Chinook salmon adult returns in the Salmon River (modified from NOAA 2011).*

The project involves the purchase and commercial processing of salmon caught in the Klamath River by the Yurok Tribe Commercial Fishery. This fishery, however, is managed independently of the project. The Commercial Fishery and commercial fishing season occurs every year. The Yurok Tribe Commercial Fishery always harvests the maximum quota assigned it each year (Dave Hillemeier, 2010). The quantities of fish caught are dependent on quotas set by the Yurok

Tribe Fisheries Program, under oversight of fish and game management programs. These quotas are set based on the needs and health of the fishery, not the expectations of those who buy the harvested fish. Buyers do not determine, in any way, the number of fish harvested or the methods by which they are harvested.

Environmental Justice Setting

According to the 2000 U.S. Census, the Yurok Reservation has a total population of 1,103 persons, of which, approximately one-half designated themselves as American Indian and/or Alaska Native. The median age is 40.1 years old, with the highest percentage of residents (16.4 percent) being between 45 and 54 years old (U.S. Census Bureau 2000). The conditions on the Hoopa Reservation and surrounding communities are similar.

Living conditions within the Reservations vary some by the community in which one resides. A large segment of the Upper Yurok Reservation is without electrical and telephone services. Additionally, there are only community/public water systems in certain communities, all other households are on private wells, springs, or surface water sources.

There are 441 total households on the Yurok Reservation and the average household size is 2.46, compared to the average family size, which is 3. Of those total households, 32 percent have individuals under 18 and 28 percent have individuals 65 years and over. Thirty-five percent of residents have a high school degree and 68 percent have a high school degree or higher. Of the civilian population 18 years and over, 20.4 percent are veterans (U.S. Census Bureau 2000).

Environmental Consequences

Effects of Alternative 1 (No Action)

Under the no action alternative NMFS would not authorize Klamath River Disaster Relief funding for the Yurok Tribe to construct a fish processing facility. .

Tribal Trust Assets

Under the No-Action Alternative there would be no change to Tribal Trust assets.

Cultural and Historical Resources

There will be no change to the Yurok Tribe’s cultural and historical resources under the No Action Alternative

Socioeconomic Resources

There will be no change to the socioeconomics under the no action alternative.

Klamath River Chinook Salmon Fishery

Under the No Action alternative, there will be no change to the Klamath River Chinook salmon fishery.

Employment and Income

Under this alternative, there will be no change to the existing economics of the community, including job creation and the retention of a larger portion of the commercial fishery value.

Recreation

Selection of the no action alternative will not change the existing recreational activities within the Lower Klamath River or its Estuary.

Wild and Scenic Rivers

No change to the Wild and Scenic Rivers will occur under this alternative.

Aesthetic Resources

There will be no change to the aesthetic resources under the no action alternative.

Physical Resources

Physical Setting

There will be no change to the aesthetic resources under the no action alternative.

Geologic, Geomorphology, and Associated Hazards

Under this alternative, there will be no change to existing conditions.

Water Resources

Under this alternative, there will be no change to the Klamath Estuary or Klamath River water resources.

Klamath River

Under this alternative, there will be no change to existing conditions.

Cannery Creek

Under this alternative, there will be no change to existing conditions.

Estuary Water Quality

Under this alternative, there will be no change to existing conditions.

Coastal Zone

Under this alternative, there will be no change to existing conditions.

Air Quality

No change to air quality would occur under this alternative.

Biological Resources

Vegetation

There will be no change in the vegetation with selection of the No Action Alternative.

Invasive Species

There will be no change in the in the current number of introductions and rate of spread of invasive species within the project area

Threatened and Endangered Plants

The No Action Alternative will not change the existing conditions.

Wildlife

Terrestrial Species

No changes will occur under this alternative.

Aquatic Species

The no action alternative will not change to the existing conditions.

Irreversible and Irretrievable Commitments of Resources

No changes will occur under this alternative.

Cumulative Impacts

Under this alternative, there will be no change to existing conditions. There are no other projects planned for the Klamath River estuary area in the next five years; therefore no cumulative impacts will occur under this alternative.

Effects of Alternative 2 (Preferred Alternative)

Tribal Trust Assets

The preferred alternative will not change Tribal Trust Assets.

Historic and Cultural Resources

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470F) and the implementing regulations found at 36 CFR 800.6, the proposed Alternative was evaluated to determine if there were effects to cultural resources eligible or potentially eligible for the National Register of Historic Places. The project is within the external boundaries of the Yurok Reservation and falls under the jurisdiction of the Yurok Tribe's Heritage Preservation Officer (THPO). The evaluation process was significantly aided by technical assistance from the Yurok Tribe and Robert McConnell, the Yurok THPO who prepared a cultural resources study, "*Cultural Resources Inventory for the Yurok Fish Plant Project, Requa, CA*". This report is confidential, but the report identified that the project is located within the potentially eligible Traditional Cultural Property, the Klamath Riverscape. The report finds that the proposed alternative will not have an Adverse Effect on this TCP. The

final recommendation of the report is that the Lead Agency, NMFS, make a determination of "No Adverse Effect." NMFS evaluated and determined that funding the proposed Yurok Tribe fish processing facility will result in No Adverse Effects to cultural resources eligible or potentially eligible for the National Register of Historic Places. There were no known eligible cultural resources within the campground and boat launch area (Clayburn 2011). The NHPA process was completed upon receipt of the THPO Concurrence on a Determination of Effect for NHPA (McConnell, 2011). As part of the evaluation process the following considerations were taken into account.

The proposed project was evaluated to ensure compatibility with the Tribe's designated Klamath Riverscape Traditional Cultural Property which required that the facility would not affect the traditional fishing sites and activities in the estuary or campground complex. The facility will not displace or change traditional fishing activities but it will promote the efficient collection and processing of the commercial Chinook salmon harvest. In addition, the building was designed with input from the Tribe's cultural committee to ensure the building's exterior had a traditional Yurok Tribal architecture.

The facility's operations and building design were evaluated for how the facility might affect the Yurok Ceremonial Grounds and the annual three-day Brush Dance. The Yurok Ceremonial Grounds are located at Tribe's former Wehl-Kwel village site across the estuary from the proposed facility site. The Brush Dance, a healing ceremony for a Klamath-area child, is held every summer. The primary issues were visual, noise, and light pollution. The Tribe determined internally that the traditional Yurok architecture improved the visual aspects of the campground by placing the facility in front of the campground and boat launch's existing buildings. The Tribe will consult annually with the two families that host the Brush Dance by ensure that the facility would not affect the ceremony. In addition, if the restaurant is built it will not serve food or alcohol and the fish processing facility will not operate during the ceremony. However, the restaurant is not part of this proposed action. The facility designs also include shields for all external lights and noise containment structures for the generators.

The Yurok Tribe's Policy and Procedures for Inadvertent Discovery of Yurok Cultural Items, as adopted on September 23, 2009, will be followed in the event that Cultural Resources or Artifacts are discovered during project construction.

The Tribe is considering installing interpretative signage to inform guests about the special setting of Requa area such as the Rek-woi village, the Sister Rocks, the ecosystem of the estuary, Yurok Culture and the historical period of the area. The Yurok Tribe Culture Committee will need to be consulted for any interpretive signage.

Socioeconomics

Klamath River Chinook Salmon Fishery

There will be no effects to the Chinook salmon fishery with implementation of the preferred alternative. This alternative will not affect the fishery or its management and operations, nor will it have any effect on the local recreational and sports fishing activities associated with the Klamath River. Funding the fish processing facility will not change the annual Klamath River Yurok Tribe salmon allocation.

Following the funding and construction of the facility the Tribe will purchase and process commercially caught fall-run Chinook salmon from Tribal fishers. This fishery, however, is managed independently of the project and will not be affected by the project. Whether this fish processing plant is built or not, there will still be a Commercial Fishery and a commercial fishing season. The Yurok Tribe Commercial Fishery always harvests the maximum quota each year, and the development of a fish processing plant to buy this catch will not change this (Dave Hillemeier, 2010). The quantities of fish caught are dependent on quotas set by the Yurok Tribe Fisheries Program, under the larger Klamath River allocation program run by the Pacific States Marine Fisheries Commission. These quotas are set based on the needs and health of the fishery and will be unaffected by who buys the harvested fish. Whether an outside broker buys the fish or they are purchased by a processing plant owned and operated by the Yurok Tribe, will not determine, in any way, the number of fish harvested or the methods by which they are harvested. Therefore, selection of this alternative is not expected to affect Chinook salmon fishery.

There will be a shift in income to the Tribe because the Tribe will be able to process its commercial harvest into various products for sale instead of using other processers. Currently, the individual tribal members clean their fish and then collectively hand them over to brokers who sell the fish to regional (non-local) processors. The Tribe negotiates with various brokers annually over contracts. The price for fish and the brokers used are negotiated each year and vary depending on the quantity of the annual harvest, local market conditions, etc. The Tribe will still use some brokers to help sell the fish and smoked fish products but be able to provide a higher quality product, negotiate or sell for a higher price, and return more of the income from the sale of the fish products to the local community.

Employment and Income

The proposed project would provide local employment opportunities and allow the local community to capture more of the economic value from its commercial fishing resources. The facility will provide a means for the Tribe to effectively and efficiently processed their Klamath salmon on the Yurok Reservation, and attain a predictable and fair poundage price for the Tribal

fishermen. A Tribal processing facility will also provide a value added economic multiplier to the Klamath area and Del Norte County economy.

The funding will help the Tribe design and construct a fish processing facility which will create between 12 to 20 full-time processing jobs and 6 to 8 seasonal construction jobs. The majority of the fish processing jobs at the facility will be readily available for tribal members. This will provide Tribal employment at the facility and a secondary benefit if employees spend their earnings in the local economy. It is unclear how many construction workers will be employed or how many might be tribal members. However, the construction crews will likely stay in one of the local motels and eat at the local restaurants during construction. Workers may also spend a portion of their earnings in the campground store. This alternative would provide economic benefits to the community including job creation and the retention of a larger portion of the commercial fishery value.

The preferred alternative would have beneficial impacts on employment and income.

Recreation

Under the proposed action recreational users will be able to use the Requa Resort facilities for camping or launching boats, as in the past. Construction of the fish processing facility will require the closure of the Requa Resort for several months however there are other boat launch facilities to access the Klamath River and estuary. Operation of the facility will have only minor effects because the resort is primarily used seasonally and on weekends when the facility will be closed, except during the commercial fishing season when it is needed for fish processing. The Tribe decided, in part, to place the facility within this area because the resort is hardly used by non-tribal members and very few members or non-members camp in this location outside of the commercial fishing season.

Wild and Scenic Rivers

Under Section 7 of the Wild and Scenic Rivers Act (WSRA), the Yurok Tribe as the river-administrating agency for the lower Klamath River is required to evaluate and make a determination regarding whether the proposed project will adversely affect the free-flowing characteristics of the river, the recreational designation or the outstandingly remarkable values, the anadromous fishery. Under Section 7, the federal agency (NMFS) assisting with the construction of the project is required to consult with the river-administering agency. The Section 7 determination process is outlined in the Wild and Scenic Reference Guide (IWSRCC 2004) and other supporting documents compiled by the Interagency Wild and Scenic Rivers Coordinating Council. During the initial informal consultation process, it was determined that

the proposed facility does not warrant a Section 7 determination because the project is not proposed within the bed or banks (i.e., below the ordinary high water mark) of the designated river (Table 3). In addition, the proposed facility supports the sustainable use of the Chinook salmon fishery and the building will be constructed using traditional Yurok Tribal architecture to ensure the scenic qualities within the river corridor. Therefore, NMFS does not anticipate any effects to the recreational designation or to the outstandingly remarkable values.

Table 3. WSRA Section 7 Determination Process

WHEN IS A DETERMINATION UNDER SECTION 7 REQUIRED?	
Project proposed in *bed or banks* of a designated river or congressionally authorized study river	Project proposed in *bed or banks of river below, above or on a stream tributary* to a designated river or congressionally authorized study river
AND	**AND**
Project is proposed by a federal agency or it requires some type of federal assistance such as a permit, license, grant or loan	Project is proposed by a federal agency or it requires some type of federal assistance such as a permit, license, grant or loan
	AND
	Project is likely to result in effects within a designated river or congressionally authorized study river
Only when both of the above conditions exist is a determination required under Section 7	**Only when all of the above conditions exist**

Aesthetic Resources

The Yurok Tribe provided design input and oversight to ensure that the facility incorporated a traditional Yurok Tribal architecture and selection of colors. This will provide a visually appealing structure that will blend in with the surrounding area. Therefore, the facility is not expected to affect the scenic resources within the estuary or surrounding areas.

As stated previously, the estuary and surrounding hills currently have noise and light pollution levels similar or less than most rural waterfront areas. Light pollution, in this case, is defined as

unshielded point sources creating unnatural light illuminating the surrounding environment (e.g., estuary waters). Light will be emitted by the facility and vehicles. An increased number of vehicles driving in and out of the facility will temporarily shine their lights out over the estuary, as well as, during parking depending on the orientation and proximity of the parking spaces. To ensure the light pollution is kept to a minimum, all outside lights will be shaded to prevent illumination of the surrounding environment. The facility's outside lights will be shaded but will shine light onto the side of the facility and parking areas. The light illumination cone for the restaurant's multiple windows is expected to disperse adequately before reaching the estuary approximately, nearly 200 feet away. As a result of the shading measures, NMFS does not expect that light pollution will significantly alter the aesthetic resources of the area.

The operation and construction of the facility and vehicles will generate various sounds from mechanical devices (e.g., heat pumps, ventilation systems, and increased vehicle traffic) and impacts (e.g., metal on metal contact). Noise pollution is an unwanted or unnatural sound which is transmitted via sound waves and measured by volume/loudness (decibels) and frequency. Construction will create the loudest (typically <90 decibels) and lowest frequency sound waves while the operations will generate a more continuous but less intense and intrusive level of noise. Noise from construction would be temporary. The construction activities will increase the noise pollution over the short-term but this is not completely out of character for this type of rural environment. The noise pollution levels are not expected to significantly affect the people, animals, or general nature of the area given the existing strong seasonal fluctuations in the noise levels within the estuary. For example, the current noise pollution from the existing motor boats, boat ramp vehicles, and campground activity during the fall Chinook salmon harvest season are likely at levels comparable to the proposed construction activities. Once the facility is built and running the noise pollution levels will slightly increase. The facility is designed with noise reduction materials within the walls to prevent generate and other machinery noise from extending very far outside of the buildings. Therefore, the noise pollution from the facility is not expected to result in a significant impacts.

Physical Resources

Geology, Geomorphology, and Associated Hazards

The exposed rock face of the former quarry near this site poses a potential rock fall hazard, particularly during ground shaking events. Therefore, the Foundation Investigation report recommended not locating any structures within 50 feet of the base of the cliff (Kitzman, 2011). This recommendation is reflected in the proposed site plan which ensures that the proposed building will be hundreds of feet away from the cliffs and the hillslopes.

The area is known to be subject to seismic/fault hazards, including ground shaking and liquefaction associated with MTJ and CSZ earthquakes. These concerns are being taken into account in the building design and engineering. While the potential damage to buildings and structures cannot be completely eliminated, building design criteria can minimize the hazards to building inhabitants, protecting human life to the maximum extent feasible (Kitzman, 2011). The building design will use the expected ground shaking event and existing building codes to ensure human safety. This will conform to the Uniform Building Code; therefore be in compliance with Executive Order 12699, Seismic Safety of Federal or Federally Regulated New Building Construction.

The facility is proposed within an area of tsunami hazard and subject to tsunami inundation (**Figure 7**). In the event of a large earthquake and tsunami, existing building codes and design are expected to protect human life and allow evacuation during the earthquake. However, the building is expected to suffer serious property damage during a large earthquake (>8 M) and definitely during the associate tsunami. The potential damage to the proposed structure that could result either directly from a ground shaking event or its potential consequent tsunami, however, would not be a significant addition to the general property loss that would occur throughout the entire region should such a significant event occur. The Tribe is aware of the large earthquake and tsunami potential and is planning to move ahead with the project. A tsunami evacuation plan exists for the campground and boat launch area and will be modified as necessary to accommodate the fish processing facility employees (e.g., trainings and drills). No significant impacts from geologic hazards are expected to occur to humans or the surrounding environment under this alternative.

Water Resources

Klamath River

Given the close proximity of the proposed fish processing facility (**Figure 1** and **Figure 2**) to the Klamath River there is always the potential for flooding. According to FEMA and the Yurok Tribe (FEMA 2000), the ground surface in the campground and boat launch area was elevated above the base flood elevation following the 1997 New Years Day flood. The Tribe used a FEMA grant to raise the ground surface and re-enforce the riprap lining the campground and boat launch area (**Figure 12** and **Figure 13**). The Tribe provided some contractual information and FEMA's supplemental EA (FEMA 2000) documenting that the work was preformed to FEMA's standards. Even with this work, FEMA has the campground and boat launch area mapped within the Zone A 100-year RI flood zone (**Figure 9**). FEMA defines Zone A as "areas with a 1 percent annual chance of flooding (i.e., 100-year RI) and a 26 percent chance of flooding over the life of

a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations (i.e., 100-year RI flood elevations) are shown within these zones." Based on this definition, the most up to date FEMA flood hazard map, YTEP field observations following the more recent December 31, 2005 flood, NMFS's flood frequency analysis, the large range in the 95 percent confidence intervals around the 100-year RI flood estimate, NMFS also assumes the proposed site will be inundated during a 100-year RI flood event. In fact NMFS expects that the buildings foundation may be flooded by a 50-year RI or greater flood. NMFS performed its own assessment based on YTEP field observations (YTEP staff 2012), NMFS's flood frequency analysis, and recent spot elevation data within the campground and boat launch area by Winzler & Kelley (unpublished 2011).

NMFS estimated the flow RIs using the USGS's Bulletin 17B methods (See Affect Environment Section) which is similar to methods commonly used by FEMA. Based on NMFS's flood frequency analysis using data from the USGS's Klamath River near Klamath River gaging station, approximately five miles upstream, and the PKFQwin program the 100-year RI flood is approximately 616,500 cfs with 95 percent confidence intervals of 508,100 cfs and 708,700 cfs (**Figure 10**).

Tribal field observations during the last two large floods provide approximate elevation data for the most recent two recent floods, January 1, 1997 and December 31, 2005. The 1997 flood overtopped the old campground and boat launch area by roughly 4 to 5 feet and caused extensive damage. This flow was approximately 500,000 cfs, a 40-year RI flow, a 23.4 percent smaller flow than the estimated 100-year RI flow. No direct measurements were made of this flood so it is unclear what real-world elevation the flood obtained. However, based on Tribal descriptions, a recent spot elevation survey from Winzler & Kelley (Winzler and Kelly 2011), NMFS assumes that the Requa Resort area was raised to at least the 1997 flood elevation, approximately 18.5 feet. This estimate is extremely rough and with an estuary in a constant state of flux this estimate needs to be viewed with caution.

The YTEP staff documented that the December 31, 2005 flood of 324,000 cfs, a 11-year RI flow, just overtopped the edge of the campground and covered the ground surface at the LES gage (**Figure 14.** LES gaging station location at the downstream end of the RV park and campground. Note ocean waves in the distance.) with approximately one foot of water. The approximate real-world ground surface elevation at the base of the gage is approximately 15 feet. Based on the Tribal water elevation observation and the spot elevation data from Winzler & Kelley (Winzler and Kelly 2011), the December 31, 2005 flood reached approximately 16 feet during a moderate high tide of approximately 3.5 feet. Unfortunately, the LES gage's orifice shifted during the WY2006 peak flow; therefore the relative stage height data could not be used to verify the field observation. The LES stage height data and USGS's Klamath River near Klamath, California

data for WY2006 are plotted in figure 20 to show the correlation and approximate height estimate. The LES gage height is not related to real-world elevations.

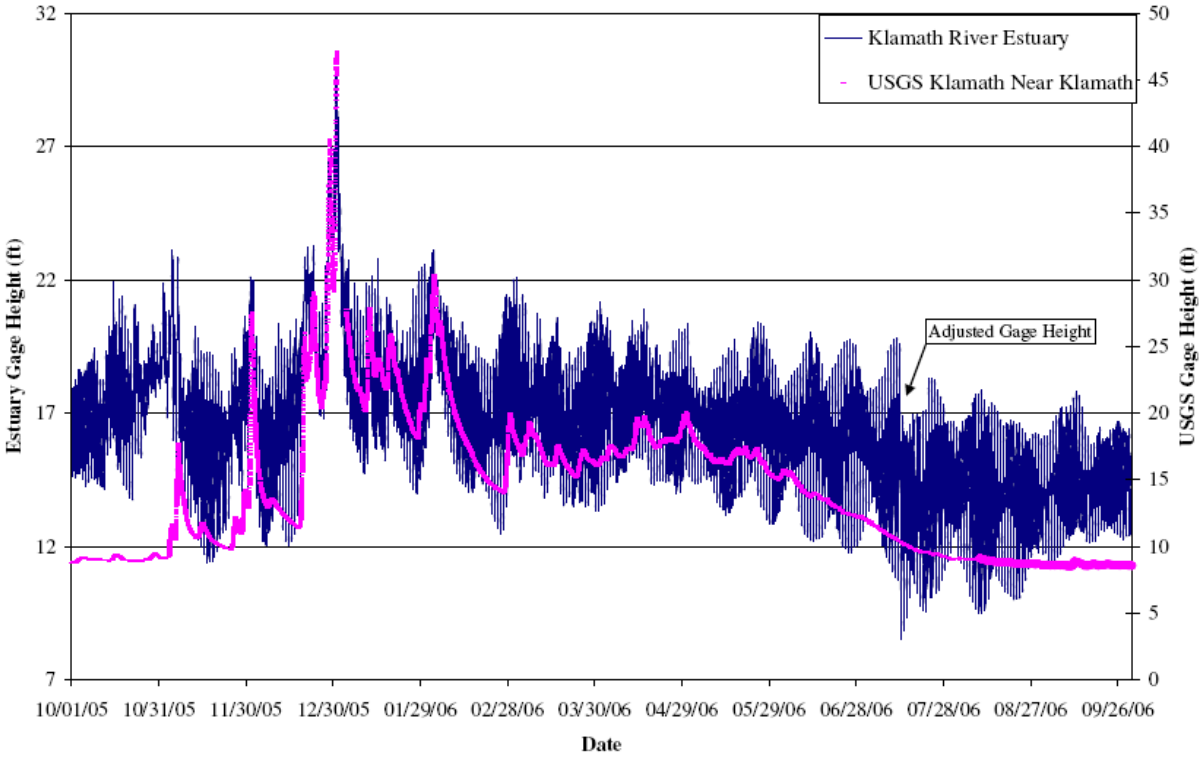

Figure 21. *Klamath River near Klamath, CA streamflow (pink), USGS gaging station (#11530500) and Klamath River estuary height, Yurok gaging station "Lower Estuary Surface."*

The ground surface elevation under the proposed fish processing facility will be approximately 19 feet and the facility's floor will be at approximately 22 feet. Therefore, the floor will be approximately 3.5 feet higher than the WY1997 peak flow, 6 feet higher than the WY2006 peak flow, and approximately 7 feet above FEMA's base elevation, 15.2 feet. However, based on FEMA's flood hazard map and flooding conclusion (FEMA 2000), the wide range in 95 percent confidence intervals for the various floods (e.g., 100-year RI flood: 508,100 to780,700 cfs), and the large uncertainty associated the approximated flood heights NMFS assumes the proposed site is within the 100-year RI flood zone and will likely be inundated during a 50-year RI flood or greater and may be substantially damaged during a 100-year RI flood or greater. However, it is unlikely that humans will be under threat from flooding given the current ability to forecast large storms events, especially the 50-year RI or greater floods which commonly require multiple days

of rainfall to produce. To ensure human safety the Tribe will establish a flood warning program for workers or other users of the fish processing facility during 25-year RI or greater flood warnings as forecasted by NOAA's Nevada-California Forecast Center (See http://www.cnrfc.noaa.gov/graphicalRVF.php?id=KLMC1).

Executive Order 11988 requires that federally assisted projects:

> *"to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative."*

Compliance with Executive Order 11988 requires that evaluation of all practical alternatives prior be evaluated before construction within the 100-year RI flood zone is approved. NMFS in conjunction with the Yurok Tribe visited and evaluated all other potential sites early in the evaluation process. The site location needed to be near the estuary to allow Tribal fishers access to the facility during the commercial season as well as the recently purchased commercial ice machine. This ice machine will be housed within the fish processing facility and was purchased with Klamath Disaster Relief funds to preserve the quality of the fish during harvest. In addition, the project needed to be located on Tribal land and fit within their budget to be financially feasible for the Yurok Tribe. One of the two primary areas after some consideration was a lot along the Klamath River and Highway 101 north of Klamath, California (***Figure 1***). This area was flooded with approximately 5 to 6 feet of water during the January 1, 1997 flood and many of the buildings were destroyed or displaced. The edge of the Requa Resort was overtopped but approximately one foot of water in December 31, 2005 but receive little damage because several of the buildings were raised above the 1997 flood level. The other area was the old quarry, campground, and boat launch area evaluated under the preferred alternative. After an initial site visit and discussion, the Yurok Tribe and NMFS decided that the old quarry (**Figure 2**) was the best location given the proximity to the commercial boat launch, slightly higher ground, and other needs. However, after geotechnical evaluations of the quarried hillslopes (**Figure 8**) and the bore tests it was deemed impractical. The geotechnical studies found that the quarried hillslopes were prone to rock failure and the bore tests discovered that the ground was elevated fill requiring extensive and very expensive pilings. This left only one site, at the north end of boat launch parking area (**Figure 2**). This site fit all the requirements except that it may be within the 100-year RI flood zone and likely the 50-year RI flood zone. It is the best practical alternative for the Tribe based on its location to the fall commercial fishing operations that all occur within the estuary, ocean/river mouth, or just upsteam within the Klamath River. Additionally, the ground within the campground and boat launch area was also raised after the 1997 flood with FEMA grant funds to reduce future flooding.

Executive Order 11988 also states in Section 2 (a)(1) that,

> *"If an agency has determined to, or proposes to, conduct, support, or allow an action to be located in a floodplain, the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains. If the head of the agency finds that the only practicable alternative consistent with the law and with the policy set forth in this Order requires sitting in a floodplain, the agency shall, prior to taking action, (i) design or modify its action in order to minimize potential harm to or within the floodplain, consistent with regulations issued in accord with Section 2(d) of this Order, and (ii) prepare and circulate a notice containing an explanation of why the action is proposed to be located in the floodplain."*

If the preferred alternative is selected these actions will be done in accordance with all applicable regulations. Executive Order 11988 further states in Section (3),

> *"If, after compliance with the requirements of this Order, new construction of structures or facilities are to be located in a floodplain, accepted floodproofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, wherever practicable, elevate structures above the base flood level (i.e., the 100-year RI flood level) rather than filling in land."*

NMFS determined that the proposed site location is the best practical alternative and that although there is risk of structural damage during a 50-year RI flood or greater that funding the facility will not significantly impact the Klamath River estuary or floodplain resources or endanger human safety. In compliance with Executive Order 11988 and NOAA's Implementing Procedures, NMFS will circulate a notice explaining the reasoning for proposing to fund the construction of the fish processing plant within the 100-year RI flood zone.

Cannery Creek

The building site in this alternative is well away from Cannery Creek. No vegetation removal within the creek is expected to result from project construction and impacts from stormwater runoff would be minimized by the Stormwater Pollution Prevention Plan and Best Management Practices (BMPs) as described above.

The wastewater treatment system for this project has been designed to have no point source discharges to Cannery Creek. The proposed septic field sites and soils were evaluated, by Winzler & Kelly, an Engineering firm from Eureka, CA, for suitability based on the NCWQRCB and Del Norte County evaluation criteria requirements. The soils texture and percolation rates were found to be suitable, and there was enough area to meet the spacing between leach fields and set back requirements. Winzler & Kelly also determined the "highest anticipated groundwater level" during the wet weather period to determine the depth the leach fields could

be built. Winzler & Kelly used the field data to design the on-site wastewater treatment and disposal system to comply with NCWQRCB and Del Norte County requirements for such systems and to provide the Best Practicable Treatment of the waste streams to protect water quality in Cannery Creek. Therefore, no impacts to Cannery Creek would occur under this alternative.

Estuary Water Quality

Any activity causing site disturbance has the potential to produce runoff and sediment that might impact downstream waters. In this case, the downstream waters include the Klamath River estuary, which is directly adjacent to the site. Projects disturbing greater than one acre of area are required by the Federal Clean Water Act to apply for coverage under EPA's Stormwater General NPDES Permit for Construction Activities. This requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes the Best Management Practices (BMPs) that will prevent or limit the discharge of stormwater runoff into receiving waters. In addition, the Tribe requires that construction activities follow standard erosion prevention practices (i.e., BMPs) to prevent construction related erosion or sediment from reaching water bodies. These measures will ensure that impacts to the Klamath River Estuary will be minimal.

The wastewater treatment system for this project has been designed to have no point source discharges to the Klamath River Estuary. The proposed septic field sites and soils were evaluated, by Winzler & Kelly, an Engineering firm from Eureka, CA, for suitability based on the NCWQRCB and Del Norte County evaluation criteria requirements. The soils texture and percolation rates were found to be suitable, and there was enough area to meet the spacing between leach fields and set back requirements. Winzler & Kelly also determined the "highest anticipated groundwater level" during the wet weather period to determine the depth the leach fields could be built. Winzler & Kelly used the field data to design the on-site wastewater treatment and disposal system to comply with NCWQRCB and Del Norte County requirements for such systems and to provide the Best Practicable Treatment of the waste streams to protect water quality in the Klamath River Estuary. Therefore, no significant impacts to the Klamath Estuary or Klamath River water quality are expected to occur under this alternative.

Coastal Zone

The proposed project was evaluated by NMFS for consistency with California's Coastal Zone Management Plan, as reqruied by the Coastal Zone Management Act (CZMA). A determination of consistency was submitted to the California Coastal Commission on August 8, 2011. Funding and building a fish processing facility represents a coastal-dependent, commercial fishing

industry activity which the California Coastal Act states, "The economic, commercial, and recreational importance of fishing activities shall be recognized and protected" (California Coastal Act, Section 30234.5). It also states that, "Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded" (California Coastal Act, Section 30234). The Act also requires that new commercial or industrial development be located in or near existing developed areas (California Coastal Act, Section 30250). The Yurok Tribe has used the site and general project area as a primary fishing and related activity center for centuries. In the 20th century, uses of the site were predominantly fishery-related, including, at times, the operation of a cannery. It is currently used as a commercial recreational vehicle (RV) park, and the site includes a boat ramp. Access to a dock where fish can be brought directly to the facility from boats fishing in the Klamath River was a major factor in site selection, and is of prime importance in project operations. The project location within and adjacent to previously developed areas is consistent with the pattern of development encouraged by Federal and State coastal zone management acts.

With these considerations and the NMFS determination, the Commission staff evaluated the project and presented their recommendation to the Commission on October 7, 2011. The Commission conditionally concurred with NMFS's consistency determination that the project was consistent with the California Coastal Management Program provided that either: (1) the project will be modified so that the project footprint and/or design will provide a 50feet. buffer from Cannery Creek…; OR (2) the creek will be restored through (i) the removal of invasive species in and adjoining the project area; (ii) the removal of refuse; (iii) replanting of native riparian species on both sides of the creek to establish a vegetated, multi-layered, riparian corridor; and (iv) improve channel and culvert configuration to pass high flows." (California Coastal Commission, 2011). Under this alternative, all construction activities and the building footprint will be farther than 50 feet from Cannery Creek.

Therefore, no significant impacts to the Coastal Zone are expected to occur under this alternative, and the proposed action is consistent to the maximum extent practicable with California's Coastal Zone Management Plan.

Air Quality

Air quality in the general area is considered good to excellent because of the low population, scarcity of air pollutant sources, and prevailing westerly ocean winds providing significant mixing and dispersion. The proposed project will emit odors, exhaust gases, and particulate matter. Odors will arise from a variety of sources including from exposed storage fish, or dirty fat traps and filters. Exhaust gages are produced by construction equipment, worker vehicles, and process facility equipment such as boilers and backup generators. Particulate matter is produced by the fish smoking operations and the burning of fossil fuels for plant operations. The latter

will likely occur in another area as the plant will be primary powered by electric power from an outside source. In addition, the facility will is designed to be a smoke house and will process the entire annual commercial Chinook harvest. The facility will be built with scrubbers and filters which if cleaned regularly will not emit significant quantities of PM 10 or PM 2.5. In addition, construction activities have the potential to generate airborne dust and vehicle exhaust. Standard practices such as watering disturbed areas will minimize these impacts. The short-term increase in construction equipment and traffic should be minimal with construction taking approximately 4 to 5 months.

The project is not expected to be a significant source of odors, although project processes could produce detectable odors in two distinct ways. First, during the Commercial Fishing season when the entire season's catch is being processed and frozen, there is the potential for a fishy odor near the plant and in the surrounding RV park. This odor, however, is not likely to be significantly different than the odor associated with the existing commercial fishing operations that involve bringing fish from the dock to staging areas set up by the brokers buying the fish and packing the fish in ice. In addition, the RV park is dominated by Tribal members actively engaged in the commercial fishery during the season. The second potential odor source from the project would be associated with the smoking of the fish throughout the rest of the year. This odor, however, should be similar to that from tribal member smokehouses, the campfires and woodstoves used by visitors to the RV park and in many residences in the surrounding area. Smoking fish is a traditional cultural practice for the Yurok.

The exhaust gases and particulate matter (e.g., diesel emissions and dust) generated during construction equipment will create a daily reduction in the local air quality but it is not expected to significantly reduce the project area’s air quality. This reasoning is based on the limited number of construction vehicles and equipment needed for a job of this size, low levels of existing pollution and the prevailing westerly winds off the ocean that provide strong mixing and dispersion. NMFS estimates that there will be several days to a week of grading and earth work requiring a grader and backhoe for septic system and foundation work. The rest of the construction will likely only require a large generator and a small crane and/or forklift for heavy equipment. In additional, there will be numerous regular vehicles in and out of the job site but not likely running for the majority of the days. Therefore, no significant impacts to air quality are expected to occur under this alternative.

Biological Resources

Vegetation

Construction activities and new permanent development would trample and displace existing site vegetation. However, there is little or no native vegetation on the site, and no significant biological communities. The building and parking facilities are sited in an area already disturbed by human activities and are primarily vegetated by exotic, invasive species of little habitat value to local fauna. No plant species of traditional cultural value were observed in the area that will be disturbed by site construction activities. There are no intact biological communities or significant vegetative resources at this site. Therefore, no significant impacts to vegetation are expected to occur under this alternative.

Invasive Species

There are numerous pampas grass plants, blackberry bushes, and other non-native or exotic species bordering the RV park and campground and boat launch area as well as covering the majority of the abandoned quarry. A minor portion of the invasive plant species will be cleared during construction of the project. There will be no change in the current number of introductions and rate of spread of invasive species within the project area.

Threatened and Endangered Plants

There will be no change to the threatened and endangered plants.

Wildlife

The general developed and degraded habitat value of the project area means that the proposed construction activities will have little or no impact on local wildlife individuals or populations. The project area does not contain habitat for any listed or special status terrestrial species.

Bald eagles and golden eagles are also protected under the Bald and Golden Eagle Protection Act. Bald eagles are very common within the estuary but do not appear attracted to the project area likely due to the lack of habitat and human activity in the campground and boat launch area. Golden eagles have seen in the estuary but rarely. The proposed project is not likely to change the behavior of habitats of these prey species.

Of the listed species, only the western yellow-billed cuckoo (Coccyzus americanus) was thought to have potential habitat within the estuary. There is a large patch of unsurveyed riverine hardwood habitat south of the Klamath River at the river's mouth that may be suitable habitat for western yellow-billed cuckoo but it is separated from the project site by the width of the river and the project does not present any noise or visual issues that are not already occurring along

the Requa waterfront. The only species that might frequent the vicinity of the project area are the Pacific fisher, which is a federal Candidate species, but it is unlikely to be attracted to such a high use area.

The Yurok Tribe requested and received technical assistance from the USFWS regarding threatened and endangered species under the USFWS regulatory authority. Following several technical discussions the Yuork Tribe determined that there would be no effect to any listed species. The USFWS agreed with the Tribe's no effect determination for the proposed project (Brubaker 2010). In addition, NMFS reviewed the technical assistance communications and the Tribe's no effect assessment and concurred with the no effects determination. Therefore, no significant impacts to terrestrial species are expected to occur under this alternative.

Aquatic Species

The construction and operation of the fish processing facility and restaurant may produce the following stressors on the environment: (1) odors from the fresh fish processing, solid waste treatment and disposal, and the fish smoking processes; (2) light pollution from building, security, and vehicle lights; (3) noise from the facility operations (e.g., freezer machinery), vehicles, and facility construction; (4) waste water effluent from the fish processing, human generate sewage, and stormwater pollutants from delivery, maintenance, employees, and restaurant patrons' vehicles. Each potential stressor is examined for its potential effect and then for whether listed species are exposed, if they respond to the exposure, and what type of response: none, sub-lethal, lethal, or behavioral modification.

Odors

The odors emanating from the fish processing, fish smoking, and restaurant operations may be a nuisance attractant for some species that can smell and are attracted to the odors. The waste water will be treated to a level that is not expected to produce odors or smell.

The odors from fish processing should be significantly reduced compared to the current practice of cleaning the fish in boats within the estuary or the campground. In addition, each fish's guts and head will be contained in sealed containers within the processing plant before being trucked away for rendering while the current practice is to dump this waste into the estuary or local dumpsters.

Coho salmon, green sturgeon, and eulachon are not expected to be attracted to the fish processing odors because the airborne chemicals producing the odor will not likely accumulate in the water column before dispersing. Stellar Sea Lions will be exposed to the odors but they

are not expected to change their behavior. This is based on the fact that the odors do not currently affect the sea lions behavior. Gray whales have been sighted in the estuary on rare occasions such as this summer. However, given this rather rare occurrence, the last confirmed sighting was in 1989 (North Coast Journal 2011), and the whales diet these odors are not expected to elicit a response.

Light Pollution

Light pollution, in this case, is defined as unnatural light illuminating the waters of the estuary. Light will be emitted by the facility, restaurant, and vehicles. The facility's outside lights will be shaded but shine light onto the side of the facility and parking areas. An increased number of vehicles driving in and out of the facility will temporarily shine their lights out over the estuary, as well as, during parking depending on the orientation and proximity of the parking spaces.

Light pollution generated from the fish processing facility, restaurant, and vehicles is not expected to expose the listed species to any significant direct stressors. The listed anadromous species, Steller sea lions, and gray whales, are not known to be attracted to diffuse artificial light. However, the Steller sea lions or other non-listed pinnipeds, California and Steller sea lions and Pacific harbor seals, may opportunistically use the light to hunt fish such as coho salmon and sturgeon in the evening and night. Reports documenting pinniped predation on salmon in the Klamath River Estuary (Williamson and Hillemeier 2001a; 2001b) found that most predation occurred during daylight hours with limited pinniped presence or activity occurring at night. However the lights from the facility and restaurant could be an issue if they sufficiently light the estuary waters for pinnipeds to hunt. The predation studies estimated approximately 3,055 and 1,800 salmon and steelhead (20 and 63 coho salmon) were eaten by pinnipeds in 1998 and 1999. To ensure the light pollution is kept to a minimum, all outside lights will be shaded to prevent illumination of the estuary. The light illumination cone for the restaurant's multiple windows is expected to disperse adequately before reaching the estuary approximately, nearly 200 feet away. As a result of the shading measures, we do not expect that light pollution will alter the distribution of predators within the estuary such that we would expect increased predidation by pinnipeds.

Noise Pollution

The operation and construction of the facility and associated vehicles will generate various sounds from mechanical devices (e.g., heat pumps, ventilation systems, and increased vehicle traffic) and impacts (e.g., metal on metal contact). Noise pollution is an unwanted or unnatural sound which is transmitted via sound waves and measured by volume/loudness (decibels) and frequency. Construction will create the loudest (typically <90 decibels) and lowest frequency

sound waves while the operations will generate a more continuous but less intense and intrusive level of noise. Construction and fish processing operations are expected to occur during the normal business hours of the day.

Sound waves generated during construction may penetrate the water but are not expected at intensities or duration to expose coho salmon, green sturgeon, or eulachon to noise pollution that will elicit a response. Noise pollution will expose Steller Sea Lions to potential stressors and possibly gray whales. Low numbers of Steller Sea Lions have been documented in the estuary during the fall Chinook salmon run (Williamson and Hillemeier 2001a; 2001b) and may be present during other periods. They appear to have adapted to the current noise pollution from the existing motor boats, boat ramp vehicles, and campground activity; therefore we do not expect the regular operations of the facility and restaurant to affect this species. Heavy equipment operations (e.g. cement truck operation) during construction, January through June 2012, may startle or temporarily disrupt pinnipeds from their normal activities but we expect them to relatively quickly return to their normal activities. On the extremely rare occurrence that a gray whale enters the action area, we would expect similar responses by the gray whale.

Waste Effluent

Currently, fish are processed in the RV Park and the waste byproducts (e.g., fish heads and guts) are disposed of in dumpsters or directly into the Klamath River estuary. The facility will captured all solid wastes and transfer them to a rendering plant for processing. Therefore, the fish processing facility will eliminate exposure from the solid waste fish processing byproducts and any associated waste water effluent. The latter will be fully treated before returning to the Klamath River through the groundwater table.

Based on this effects analysis funding the proposed fish processing facility, and their subsequent construction and use is not likely to effect aquatic habitat or any aquatic species including listed resources.

Irreversible and Irretrievable Commitments of Resources

Implementation of the Proposed Action Alternative would result in an irretrievable commitment of energy (i.e., fossil fuels) and other nonrenewable resources used in the construction and future operations. In addition, the continued operations of the fish processing facility will commit future generations to operate and maintain the facility and the access roads. Either effort would expend more energy resources. Since these resources are not in short supply and the material

requirements for this project would be relatively minor compared to the overall demand for such materials, the use of these materials would not have a significant adverse effect on their continued availability. Additionally, the project purpose and need justify the expenditure of these resources.

Cumulative Impacts

The cumulative impacts assessment area is the same as the affected environment analysis area, the Lower Klamath River estuary. The temporal assessment window for past and reasonably foreseeable future actions is approximately the past 10 years to 5 years into the future based on information provided from the Yurok Tribe. Within the assessment area, there has been no new Federal or non-federal actions within the past 10 years. The Tribe has (approximately 20+ years) and will continue to operate the Requa Resort including the RV park and campground and boat launch facilities. In the next 5 years, the only known potential action is the construction of a small restaurant next to the fish processing facility. The restaurant will only be build if the Yurok Economic Development Corporation can obtain funding for its construction. For this assessment NMFS assumes the restaurant will be built within 5 years. The restaurant was designed in conjunction with the fish processing facility and the slab foundation will likely provide space for the restaurant. Existing impacts in the assessment area are produced by the use of the RV park, campground, boat launch, and small seasonal store, vehicle traffic, and in some circumstances activities within the community of Requa (e.g, firewood burning for heat). After an initial assessment NMFS determined that there were several potential resource areas that may be affected by cumulative impacts from the proposed project, previous actions, and the reasonably foreseeable projects: water and air quality.

The Environmental Consequences section of this EA summarized the impaired state of the Klamath River and its estuary's water quality. These waters are considered impaired by the Yurok Tribe and the USEPA who have worked together with other Klamath River users to develop TMDLs and other substantial efforts to improve the water quality (e.g., Klamath Dam removal and timber land restoration and road improvements by the Yurok Watershed Restoration Program (YWRP). The fish processing facility and restaurant will have a well designed and effective waste water treatment system that will return fully treated water through the groundwater table into the estuary. This system is discussed extensively in several subsections of the Environmental Consequences section. Therefore, NMFS does not expect any cumulative effects beyond the existing impairments with the addition of this project or the restaurant. The other existing regulatory and restoration programs are in motion or in place and working toward improving the existing water quality. For example, the YWRP has worked with Green Diamond Resource Company to upgrade and/or decommission roads in numerous Lower Klamath River tributaries to reduce the fine sediment inputs associated with industrial timber operations.

The existing air quality with the assessment area is considered high quality with a sparsely populated area, few industries, strong air mixing, and a large and relatively continious flow of clean oceanic air flow. Existing air pollutants are devived from wood fuel burning for household heat, motor vehicle and boat emissions, occasional campground fires, and other household emissions from the community of Requa. The air quality monitoring station at Klamath Glen also samples emissions from Highway 101, fish smoker facilities along Highway 101, the town of Klamath, and the community of Klamath Glen. Even with these additional influences the air quality measured at the Klamath Glen station is considered of moderate to high quality. The addition of the fish processing facility and restaurant will increase the year round air pollution by a relatively small to moderate amount from odors, exhaust gases, and the fish smoking process. Of these activities, the smoking process will introduce a potentially measureable amount of particulate matter in the 10 and 2.5 micron size classes. The relatively low emissions and high rates of mixing found along the coast are expected to prevent cumulative impacts from occurring. Although, there will be consecutive windless days where the fish smoking portion of the operation will help degrade the air quality in the estuary.

In summary, the cumulative impacts assessment and environmental consequences section discussed the existing degraded water quality of within the assessment area and outlined the multiple watershed restoration efforts, regulatory mechanisms, and monitoring efforts that are working toward improving water quality. The affected environment and environmental consequences sections described the existing air quality and the potential impacts of the proposed project on the existing air quality. The proposed funding of the fish processing facility is not expected to have a cumulative impact on the air quality or any other resource.

Compliance with Applicable Laws

Endangered Species Act, Section 7

NMFS independently evaluated the effects of the proposed action on threatened and endangered species under the ESA. Section 7(a)(2) of the ESA requires that each federal agency shall insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When a federal agency's action "may affect" a protected species, that agency is required to consult with NMFS or the U.S. Fish and Wildlife Service (FWS), depending upon the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR 402.14(a)). Federal agencies are exempt from the requirement for formal consultation if they have concluded that an action is "not likely to adversely affect" endangered species, threatened species, or designated critical habitat and NMFS or the FWS concur with that conclusion (50 CFR 402.14(b)(1)).

National Marine Fisheries Service

NMFS' internally consulted regarding the effects of the proposed action on threatened and endangered marine mammals and anadromous fish species and their critical habitat within the action area. The following Federally listed species under NMFS' jurisdiction occur within the action area:

- Southern Oregon and Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) were listed as threatened on June 28, 2005 (70 FR 37160).
- Southern DPS green sturgeon (*Acipenser medirostris*) were listed as threatened on April 7, 2006 (71 FR 17757);
- Southern DPS eulachon (*Thaleichthys pacificus*) were listed as threatened under the ESA (75 FR 13012) on March 18, 2010;
- Gray whales (*Eschrichtius robustus*) were listed as endangered on December 1970 under the ESA (35 FR 18319);
- Steller Sea Lions (*Eumetopias jubatus*) were listed under the ESA as threatened throughout their range on December 4, 1990 (55 FR 49204). On June 4, 1997, the Western DPS population was listed as an endangered under the ESA (62 FR 24345).

The NMFS informal section 7 consultation examined the significance of multiple stressors, whether listed resources are exposed to the identified stressors, the nature of those exposures, the probable responses from exposure, and the risks those responses might pose to individual fish or mammals, the populations those individuals represent, and the species those populations comprise. The potential stressors are wastewater runoff, odors, smoke, light, and noise emissions.

In summary, the proposed action will increase the amount of noise, light, and storm water runoff pollution within the action area but there are multiple design measures to limit this pollution. The amount of noise, light, and storm water runoff pollution was considered discountable. The proposed action will also reduce fish processing related odors and wastes from the action area by providing multiple enclosed systems to filter and remove odors and wastes. This is a general improvement over the current open air processing done by individual fishermen, and the effects are expected to be insignificant. NMFS determined that funding the proposed fish processing facility and restaurant, and their subsequent construction and use is not likely to adversely affect the ESA listed resources under the jurisdiction of NOAA Fisheries.

U.S. Fish and Wildlife Service

The Yurok Tribe requested technical assistance from the USFWS regarding the federally-listed species. The USFWS agreed with the Tribe's No Effect determination.

Essential Fish Habitat Consultation

National Marine Fisheries Service

"Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." NMFS internally consulted on essential fish habitat (EFH) for species managed under the following Fishery Management Plans (FMPs), pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 *et seq*.

- Pacific Groundfish Fishery Management Plan
  –82 species (e.g., flatfish, rockfish, sharks)
- Coastal Pelagic Fishery Management Plan
  –anchovy, sardine, Pacific mackerel, jack mackerel, and market squid
- Pacific Salmon Fishery Management Plan
  –Chinook and coho salmon

Pacific Fisheries Management Council identifies and describes EFH in the FMPs. EFH for the Pacific Groundfish Fishery "is identified as the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow." The Coastal Pelagic Fishery EFH is "all marine and estuarine waters from the shoreline to the limits of the exclusive economic zone." EFH for Chinook and coho salmon includes all streams and other water bodies occupied or historically accessible to salmon. Based on the latter FMP descriptions, the entire Klamath River estuary or action area is considered EFH for Pacific salmon, coastal pelagic species, and Pacific groundfish species.

The action area is also considered a Habitat Area of Particular Concern (HAPC) because the Klamath River Estuary is ecologically important i.e., a rare habitat type for the watershed, and particularly sensitive to human-induced degradation. Designated HAPC are not afforded any additional regulatory protection under MSA; however federal funded projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process. An adverse effect to EFH is any impact reducing quality and/or quantity.

The proposed action will produce: limited amounts of light pollution, increased noise pollution, reduce fish processing waste effluent, and less fish processing odors but increase fish smoking

odors. By its nature, the light and noise pollution along with the odors will not change the EFH for any species. There is expected to be a reduction in the fish processing waste effluent as the majority of individual fishers will no longer be processing their salmon in the campground or along the river banks. Therefore, the proposed action will have no effect on the EFH within the action area.

The Klamath River is Essential Fish Habitat (EFH) for SONCC coho salmon as managed under the Pacific Coast Salmon Fishery Management Plan developed by the Pacific Fishery Management Council and implemented by NMFS pursuant to the Magnusson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801 *et seq*.). Amendment 14 to the Pacific Coast Salmon Plan (Pacific Fishery Management Council 1999) titled, “Description and Identification of Essential Fish Habitat Adverse Impacts and Recommended Conservation Measures for Salmon,” contains information on potential impacts to salmon EFH from fishing and non-fishing activities and provides recommendations on ways to minimize adverse affects of these activities on salmon habitat.

Multiple studies (e.g. HVT and USFWS 1999) have documented the loss and severe degradation of habitat from extensive in-channel mining, timber harvest and road construction, and the construction of the Trinity River Diversion Project. This loss and alteration eventually lead to extensive restoration efforts such as the 2000 Record of Decision that outlines a restoration plan for the upper Trinity River and its fish and wildlife populations. However, these watershed wide impacts have significantly affected Essential Fish Habitat as defined by Congress, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Within the project area, EFH is limited to the mainstem Trinity River that has deep cool pools and provides adult holding habitat.

The Klamath River is Essential Fish Habitat for upper Klamath-Trinity Rivers and Coastal Chinook salmon ESUs as managed under the Pacific Coast Salmon Fishery Management Plan developed by the Pacific Fishery Management Council and implemented by NMFS pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended (16 U.S.C. 1801 *et seq*.). Within the project area, EFH is limited to the mainstem deep cool pools that provide adult holding habitat.

Marine Mammal Protection Act

The Marine Mammal Protection Act (16 U.S.C. 1361 et seq.) prohibits harassment, any act of pursuit, torment, or annoyance, of a marine mammal or stock, that has the potential to injure (Level A Harassment) or disrupt behavior patterns such as migration, breathing, nursing,

breeding, feeding, or sheltering (Level B Harassment). Based on NMFS's informal consultation and analyses within the EA, the proposed action will not harass marine mammals.

Clean Water Act Compliance

The Yurok Tribe made extensive efforts to comply with the State and County On-Site Waste Treatment and Disposal Requirements in order to ensure Clean Water Act compliance. A letter describing the compliance efforts was reviewed by the U.S. Environmental Protection Agency, San Francisco, California office. They concurred with the determination that the Tribe will meet or exceed all State and County On-Site Waste Treatment and Disposal Requirements. The Yurok Tribe determined that a Clean Water Act Section 404 permit is not necessary for this project because the location relative to the Klamath River estuary.

The NCRWQCB and Del Norte County require site evaluations to determine the appropriate on-site waste treatment and disposal system design and demonstrate compliance with site suitability criteria for a new on-site waste treatment and disposal system (NCWQCB 2011). Del Norte County's Public Health and Building Inspection Departments regulate on-site septic systems but the regulations (Del Norte County 2011) mirror the on-site sewage disposal system and site evaluation requirements of the NCRWQCB's Basin Plan. In addition, the County relies heavily on knowledgeable professionals (California Registered Civil Engineers, Environmental Health Specialists, Geologists, and Soil Scientists) to evaluate the site conditions and make determinations regarding the appropriate type and size of treatment system. The primary requirements in the County's regulations and the NCWQRCB Basin Plan that project proponents must ensure are: adequate area between treatment systems to prevent hydraulic interference; set backs to allow adequate treatment and disposal; soils with suitable texture and percolation rates; and adequate soil depth to build the leach field above the "highest anticipated groundwater level." Winzler & Kelly designed the system to provide adequate spacing and setbacks from the Klamath River to prevent hydraulic interference between the systems and allow the waste water to process (**Figure 2** and **Figure 4**).

Soil texture, percolation, and groundwater level are determined by direct observation and measurement during site evaluations. The groundwater level needs to be measured during wet weather conditions: between January 1st and April 30th, following ten inches of rain in a thirty-day period and after one-half of the annual average precipitation has fallen. For design purposes, the minimum depth below the bottom of the leaching trench to the highest anticipated groundwater level is determined according to soil texture and percolation suitability. Soil texture is determined using the U.S. Department of Agriculture's soil texture classification (based on the percentage of clay, silt, and sand) while the soil percolation suitability is directly measured or inferred using the soil texture.

The Tribe's consulting firm incorporated all the necessary requirements into the system design including the soil texture, percolation rates, depth to groundwater and existing systems. The plans are detailed in the engineering designs which provide the appropriate setbacks and relative positioning of the proposed and existing leach fields. Using the information and field data collected by the consulting firm, the Tribe believes that the site conditions and the proposed treatment and disposal system meet the NCWQRCB and County on-site waste treatment system requirements.

Executive Order 12898 Environmental Justice

Executive Order 12898 Environmental Justice requires all federal agencies to conduct its "activities that substantially affect human health or the environment, in a manner that ensures that such activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin."

The fish processing facility was proposed by the Yurok Tribe and there has been a continuous dialog between the Tribe and the NMFS regarding the proposed project. Therefore, NMFS is confident that the Yurok Tribe is fully informed regarding the Proposed Action. However NMFS will continue to coordinate and consult the Yurok Tribe. Under the No Action Alternative no change will occur, and under the Proposed Action the Yurok Tribe will benefit from the facility construction. The proposed action will not disproportionally negatively impact a minority or low income population.

Executive Order 11988 Floodplain Management

Executive Order 11988 Floodplain Management (42 FR 26951) requires federal agencies "to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative." As discussed earlier in this document, NMFS in conjunction with the Yurok Tribe evaluated all practical alternatives and determined that the Requa Resort area was the best alternative even though it is within the 100-year RI flood zone.

Executive Order 11990 Protection of Wetlands

Executive Order 11990 Protection of Wetlands (42 F.R. 26961) requires federal agency "to avoid to the extent possible the long and short term adverse impacts associated with the destruction or

modification of wetlands and to avoid direct or Indirect support of new construction in wetlands wherever there is a practicable alternative." The only potential wetlands within the campground and boat launch project are along the north side of the area where Cannery Creek's alluvial fan border with the access road. There will be no changes to this highly modified area; therefore no impacts to wetlands will occur.

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