Biological Assessment

Trinidad Pier Replacement ■ Cher-Ae Heights Indian Community of the Trinidad Rancheria ■ May 2009

ICF Jones & Stokes
an ICF International Company

Biological Assessment
Trinidad Pier Replacement

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Chapter 1. Introduction

This biological assessment (BA) has been prepared to evaluate the potential effects on species protected under the Endangered Species Act that would result from the proposed federal action, issuance of a Clean Water Act Section 404 permit authorizing the Trinidad Pier Reconstruction Project. This BA also incorporates evaluations of the effects of the proposed action on designated critical habitat, Essential Fish Habitat (EFH), and marine mammals within the action area.

1.1. Consultation History

On November 19, 2007, following preliminary email discussions, Randy Brown, Deputy Supervisor of the Arcata office, USFWS, informed David Ammerman of the San Francisco District, U.S. Army Corps of Engineers (Corps) that the U.S. Fish and Wildlife Service would not further participate in the Section 7 consultation for the Trinidad Pier project.

On November 28, 2007, an initial preconsultation meeting was held between David Ammerman of the Corps; Diane Ashton of the National Marine Fisheries Service (NMFS) Arcata office; and Greg Nesty of Trinidad Rancheria. At this meeting the informal consultation process was explained and discussed.

On January 30, 2008, the Corps sent a letter to the NMFS Arcata office requesting informal consultation on the proposed action. This letter included a BA, analysis of expected effects on EFH, and a copy of the public notice for the project, which had been issued on January 25, 2008.

An exchange of e-mails in mid-February, 2008, made it clear to parties representing the Trinidad Rancheria, the Corps, NMFS, the California Coastal Commission, and the California Department of Fish and Game (CDFG) that Trinidad Rancheria had separately commissioned the preparation of a BA. This communication concluded with a Corps commitment to include the Trinidad Rancheria BA in the materials submitted to NMFS in support of the informal consultation.

A teleconference on August 4, 2008 was attended by Corps, NMFS, and Trinidad Rancheria personnel, and addressed the issue of Marine Mammal Protection Act (MMPA) compliance.

Additionally, throughout this period, a correspondence was maintained between NMFS and Trinidad Rancheria that led to performance of a rigorous underwater sound effects analysis and to the preparation of this BA, EFH analysis, and marine mammal analysis.

1.2. Summary Description of the Proposed Action

This project proposes to reconstruct the Trinidad Pier located on Trinidad Bay. The 540 ft. long pier is located on tidelands granted by the State of California to the City of Trinidad and leased by the Trinidad Rancheria. The project area consists of the pier (0.31 acres) and a nearby staging area (0.53 acres). The existing pier was constructed in 1946 to serve commercial fishing and recreational uses. Since that time the creosote-treated wood piles which support the pier, as well as the wood decking, have deteriorated and are proposed to be replaced by cast-in-steel-shell (CISS) concrete piles and pre-cast concrete decking, respectively. This will improve the safety of the pier. Existing utilities which will require replacement include electrical, water, sewer, and phone. Additional dock amenities that will be replaced include lighting, railing, four hoists, three sheds, a saltwater intake pipe used by the Telonicher Marine Laboratory, and a water quality sonde utilized by the Center for Integrative Coastal Observation, Research, and Education. The proposed construction schedule is from August 1, 2010 to May 1, 2011.

The project site is located on Trinidad Bay, approximately one half-mile west of U.S. Highway 101 (Figure 1). This site is in the city of Trinidad, Humboldt County, California, at Township 8N, Range 1W, Section 26. The pier is within Area of Special Biological Significance (ASBS) No. 6 designated in 1974 by the State Water Resources Control Board for protection of the kelp beds located in the bay. The pier is situated between two rock outcroppings: Trinidad Head to the west and Little Head to the east. The staging area is located at the base of Trinidad Head, in a gravel parking lot that serves users of Trinidad State Beach. The parcel containing the staging area is zoned Open Space; the pier has no zoning designation. Land uses surrounding the project site include open space, recreation (boat launch), and commercial (Seascape Restaurant, commercial fishing). Adjacent upland areas are primarily residential.

Figure 1-1. Oblique aerial photograph of project area

Figure 1-2. Photo showing deteriorated condition of existing pier and creosoted piles.

The purpose of the Trinidad Pier Reconstruction Project is to correct the structural deficiencies of the pier, improve the safety of the pier and improve pier utilities for the benefit of the public. The project will indirectly improve water quality conditions and provide improved habitat by replacing the deteriorating creosote-treated Douglas-fir piles and the pressure treated decking on the existing pier (Figure 1-2). There are several additional benefits of the project. The hoists on the pier are approximately 30 years old and need to be replaced to accommodate the landings at the pier. The pier is not currently ADA accessible. The creosote used to treat the piles may have been leaching into the waters of the ASBS over the last 50 years and does not provide appropriate habitat for the macroinvertebrates and algae present in the project area.

Federally listed and proposed species and their designated or proposed critical habitats within the action area were identified through lists obtained from the USFWS and NMFS (Arcata Fish and Wildlife Office, document: 114627335-163041, 2008) for the United States Geological Survey (USGS) 7.5-minute Trinidad quadrangle. To determine the potential occurrence of these species within the project area, project biologists reviewed an array of existing environmental data, chiefly the biological reports prepared for the project by local experts (most associated with Humboldt State University; see text below for specific citations). We also reviewed Federal Register (FR) notices of listing determinations for threatened and endangered species and their critical habitat. Based on the presence of potentially suitable habitat and/or documented species occurrences within the action area, this BA addresses impacts to four federally listed species (Table 1-1).

Table 1-1. Listed species addressed in this BA

Species	Scientific name	Status
California coastal Chinook salmon	*Oncorhynchus tshawytscha*	Threatened
Southern Oregon / northern California Coast coho salmon	*Oncorhynchus kisutch*	Threatened
Northern California steelhead	*Oncorhynchus mykiss*	Threatened
Steller sea lion	*Eumetopias jubatus*	Threatened

This analysis also includes an evaluation of potential effects of the proposed action on essential fish habitat (EFH) and unlisted marine mammals protected under the Marine Mammal Protection Act (MMPA) in the action area. The analysis of effects on EFH and marine mammals are included as Appendix A and B respectively.

Chapter 2. Location

2.1. Project Area

The Trinidad Pier Reconstruction project is located in the city of Trinidad, California, Humboldt County, at Township 8N, Range 1W, Section 26 (41.05597°N, 124.14741°W) (Figure 2-1).

Trinidad Bay is a commercial port located between Humboldt Bay and Crescent City. The bay contains numerous vessel moorings which include permanent commercial vessel anchors as well 100 moorings that are placed for recreational vessel owners (Donahue 2007). The uplands have residential, commercial and recreational land use classifications. The Trinidad Pier parcel was owned by the State of California, but was granted to the City of Trinidad which leases the tidelands to the Cher-Ae Heights Indian Community of the Trinidad Rancheria (Trinidad Rancheria). The parcels to be used for the staging area are owned by Trinidad Rancheria, the City of Trinidad, and the U.S. Coast Guard.

The project area comprises the 0.31 acre pier over marine habitats and a staging area (the gravel parking lot located west of the pier) covering 0.53 acres of upland area.

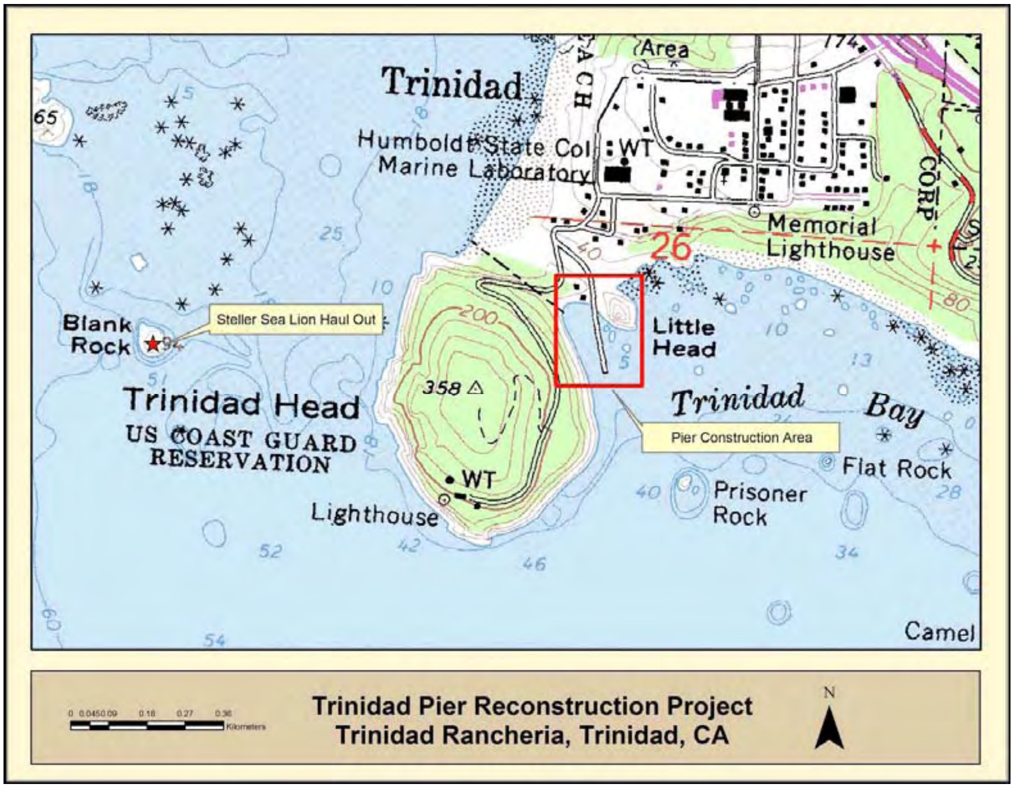

Figure 2-1. Map showing project location.

2.2. Action Area

The action area is defined (50 CFR 402.02) as all areas directly or indirectly affected by the proposed action. Direct effects of the action are potentially detectable in all lands and aquatic areas within the project area, including the staging area. The project would also directly affect 26 feet of the Trinidad Bay shoreline.

Aerial and underwater sound effects would be the most laterally extensive effects of the proposed action and thus demarcate the limits of the action area. Assuming that underwater sound attenuates at a rate of -4.5 dB for each doubling of distance, underwater sound from pile driving (detailed in Section 6) would elevate noise above 120 dB_{RMS} up to 2,625 feet seaward in all areas on a line-of-sight to the pier (Illingworth & Rodkin 2008). The rationale for use of 120 dB_{RMS} as a metric is detailed in Section 6.1.1 but also has a practical value because 120 dB_{RMS} is the lowest threshold currently used to detect underwater sound effects to any of the animals discussed in this analysis. Actual ambient underwater sound levels are probably quite variable in response to sound sources such as wave action and fishing vessel traffic.

Aerial sound would be generated by equipment used during construction; the loudest source of such sound would be vibratory pile driving, which generates a sound intensity of approximately 101 dBA at 50 feet (FHWA 2006). Assuming an ambient background noise level of 56 dBA, typical of residential neighborhoods, and a sound attenuation rate of 7.5 dB for each doubling of distance, the action area for aerial sound would extend 3,200 feet in a unobstructed landward direction from the dock. The action area would extend farther in a seaward direction, because aerial sound attenuates with distance more slowly over water and also because ambient noise levels are potentially quieter in that direction. Assuming an attenuation rate of 6 dB for each doubling of distance and an ambient marine noise background of 47 dBA, the action area for above-water effects would extend 4.8 miles seaward from the pier.

Chapter 3. Project Description

3.1. Background

The Trinidad Pier is the northernmost oceanfront pier in California and has been used for commercial and recreational purposes over the last 50 years. Trinidad harbor and pier serve a fleet of commercial winter crab fishermen and year-round water angling for salmon, and nearshore/finfish species. Trinidad Pier was first built by Bob Hallmark in 1946. Since that time only minor maintenance activities have occurred on the pier. Today, Trinidad's economy is based on fishing and tourism and the pier supports these activities. The pier also provides educational opportunities by accommodating the HSU Telonicher Marine Lab's saltwater intake pipe, and the California Center of Integrated Technology's (CICORE) water quality sonde. Currently, the Trinidad Rancheria plays an important role in the economic development of the Trinidad area through three main business enterprises, one of which is the SeaScape Restaurant and the pier. The Cher-Ae Heights Indian Community of the Trinidad Rancheria (Trinidad Rancheria) is a federally-recognized tribe composed of descendants of the Yurok, Weott, and Tolowa peoples. In 1906 a congressional action authorized the purchase of small tracts of land for landless homeless California Indians. Through this federal authority, 60 acres of land was purchased on Trinidad Bay to establish the Trinidad Rancheria. In 1917 the Secretary of the Interior formally approved the Trinidad Rancheria as a Federally Recognized Tribe.

The community began developing in the 1950's. In January 2000, Trinidad Rancheria purchased the Trinidad Pier, harbor facilities and the Seascape Restaurant. The Rancheria leases a total area of 14 Acres in Trinidad Bay from the City of Trinidad. The Trinidad Rancheria currently operates the pier, and upland improvements including a boat launch ramp and the SeaScape Restaurant. Funds for permitting and designs of the pier were granted to the Trinidad Rancheria by the California State Coastal Conservancy.

The purpose of the Trinidad Pier Reconstruction Project is to correct the structural deficiencies of the pier and improve pier utilities and safety for the benefit of the public, and indirectly improve the water quality conditions and provide additional habitat for the biological community in the ASBS. Currently it is difficult to ensure the continued safety of the pier due to excessive deterioration of the creosote-treated Douglas fir piles and the pressure treated decking.

3.2. Pier Construction Overview

Summary plans for the pier and staging area are presented in Appendix C. Pier improvements are proposed to replace at a one-to-one ratio, the approximately 13,500 ft^2 of pre-cast concrete decking. In addition the project includes 115 concrete piles including batter and moorage piles (18 inches in diameter), four hoists, standard lights, guardrail, and dock utility pipes including water, power, and telephone. A new stormwater collection system will also be incorporated into the reconstructed pier design. The new cast-in-steel-shell (CISS) concrete piles will be separated at 5 ft intervals along 25 ft-long concrete bents. A total of 22 bents separated 25 ft apart shall be used. The decking of the new pier will be constructed of pre-cast 20 ft-long concrete sections. The new pier will be 540 ft long and 24 to 26 ft wide, corresponding to the existing footprint.

A pile bent will be installed at the existing elevation of the lower deck to provide access to the existing floating dock. The existing stairs to the lower deck will be replaced with a ramp that is ADA compliant. The decking of the pier will be constructed at an elevation of 21.0 ft above Mean Lower Low Water (MLLW). The top of the decking will be concrete poured to create a slope for drainage and to incorporate a pattern and a color into the concrete surface in order to provide an aesthetically pleasing appearance. An open guardrail, 42 inches in height shall be constructed of tubular galvanized steel rail bars (approximately 3/4 inch diameter) uniform in shape throughout the length of pier. Lighting will be installed in the decking (and railing in the landing area) along the length of the pier and will be focused and directed to minimize lighting of any surfaces other than the pier deck.

Currently there are four hoists on the pier. Three of the hoists are used to load and unload crab pots from the pier and the fourth hoist located at the end of the pier is suited to load and unload skiffs. The hoists are approximately 30 years old and may have had the Yale motors replaced since the time they were installed. The hoists shall be re-installed at points corresponding to their current location and their current duties.

All design specifications shall conform to the Uniform Building Code.

3.3. Pier Demolition Methods

Removal of the existing pier and construction of the new pier shall occur simultaneously. Construction shall begin from the north (shore) end of the pier. All pier utilities and structures shall first be removed. Utilities to be removed include water, electrical, power and phone lines, temporary bathroom, ladders and pier railing. Structures to be removed include four hoists, two wood sheds, HSU's 20hp (14.9kW) pump and saltwater intake pipes, CICOREs' water quality sonde, and a concrete bench. Then the existing pressure treated decking, joists, and bent beams shall be removed and transported by truck to the upland staging area for temporary storage.

Existing piles located in the section of pier being worked on (active construction area) will then be removed by vibratory extraction. Vibratory extraction is a common method for removing both steel and timber piling. The vibratory hammer is a large mechanical device mostly constructed of steel that is suspended from a crane by a cable. The vibratory hammer is deployed from the derrick and positioned on the top of the pile. The pile will be unseated from the sediment by engaging the hammer and slowly lifting up on the hammer with the aid of the crane. Once unseated, the crane will continue to raise the hammer and pull the pile from the sediment. When the bottom of the pile reaches the mudline, the vibratory hammer will be disengaged. A choker cable connected to the crane will be attached to the pile, and the pile will be lifted from the water and placed upland. This process will be repeated for the remaining piling. Extracted pilings will be stored upland, at the staging area, until the piles are transferred for upland disposal. Each such extraction will require approximately 40 minutes of vibratory hammer operation, with up to five piles extracted per day (a total of 3.3 hours per day).

Douglas-fir pilings are prone to breaking at the mudline. In some cases, removal with a vibratory hammer is not possible because the pile will break apart due to the vibration. Broken or damaged piling can be removed by wrapping the individual pile with a cable and pulling it directly from the sediment with a crane. If the pile breaks between the waterline and the mudline it will be removed by water jetting.

A floating oil containment boom surrounding the work area will be deployed during creosote-treated timber pile removal. The boom will also collect any floating debris. Oil-absorbent materials will be deployed if a visible sheen is observed. The boom will remain in place until all oily material and floating debris has been collected. Used oil-absorbent materials will be disposed at an approved upland disposal site. The contractor shall also follow BMPs: NS-14 – Material Over Water, NS-15 – Demolition adjacent to Water, and WM-4 – Spill Prevention and Control listed in the CASQA Handbook.

The existing Douglas-fir piles are creosote treated. The depth of creosote penetration into the piles varies from 0.25 to 2 inches. Creosote is composed of a mixture of chemicals that are potentially toxic to fish, other marine organisms and humans. Polycyclic aromatic hydrocarbons (PAH), phenols and cresols are the major chemicals in creosote that can cause harmful health effects to marine biota. The replacement of the creosote treated piles with cast-in-steel-shell (CISS) concrete piles is expected to eliminate potential contamination of the water column by PAH, phenols and cresols from the existing treated wood piles.

All removed piles shall be temporarily stored at the upland staging areas until all demolition activities are complete (approximately 6 months). Following the cessation of demolition activities, the creosote treated piles will be transported by the Contractor to Anderson Landfill in Shasta County. This landfill is approved to accept construction demolition, wood wastes, and nonhazardous/nondesignated sediment.

The pressure treated 2 × 4 inch Douglas-fir decking will also be stored at the staging area until demolition is complete. The partially pressure treated decking and railing may be reused and will be kept by the Trinidad Rancheria for potential future use.

3.4. Pile Installation

3.4.1. Design

Two 18-inch diameter battered piles, which are designed to resist lateral load, will be located on each side of the pier at 12:1 slopes. Three vertical piles, which are designed to support 50 tons of vertical loads, will be located between the battered piles separated 5 ft apart.

3.4.2. Overview

New piles will be installed initially from shore and then, as construction proceeds, from the reconstructed dock. Following removal of each existing pile, a steel casings will be vibrated to a depth of approximately 2.5 ft above the tip elevation of the proposed pile (25-35 ft below the mud line). The steel shell of ¾ inch thickness shall extend from above the water surface to below the upper layer of sediment, which consists of sand, into the harder sediment, which consists mostly of weathered shale and sandstone. The steel shell will be coated with a polymer to protect the casings from corrosion. The steel shell shall be used to auger the holes and will then be cleaned and concrete poured using a tremie to seal the area below the shell. The shell will then be dewatered and a steel rebar cage installed prior to pouring concrete to fill the shell. These steps are described in further detail below.

3.4.3. Pile Excavation

Following installation of the steel casing, each hole will be augered to the required pile depth of 25-35 ft below the mud line. An auger drill shall be used to excavate the sediment and rock from the steel shell. Geotechnical studies (Taber 2007) indicate that the materials encountered in the test borings can be excavated using typical heavy duty foundation drilling equipment.

Steel casing members of ¾ inch thickness shall be used to form the CISS concrete foundation columns in underwater locations. In this technique, inner and outer casings are partially imbedded in the ground submerged in the water and in concentric relationship with one another. The annulus formed between the inner and outer casings is filled with water and cuttings, while the inner casing is drilled to the required depth, and the sediment is removed from the core of inner steel casing. Following removal of the core, the outer casing is left in place as the new pile shell.

The sediment and cuttings excavated shall be temporarily stockpiled in 50 gallon drums (or another authorized sealed waterproof container) at the staging area until all excavations are complete and then transferred for upland disposal at the Anderson Landfill or another approved upland sediment disposal site.

The existing piles extend to approximately 20 ft. below the mud line. Each one of the existing 12-inch diameter pile has displaced 15.7 ft^3 of sediment. There are approximately 205 wood piles to be removed. The total amount of sediment displaced by the existing piles is approximately 120 yd^3. Each of the proposed CISS piles requires the displacement of approximately 53 ft^3 of sediment. There are 115 CISS piles to install. A total of approximately 225 yd^3 of sediment would have to be removed in order to auger 115 holes to a depth of 30 ft. below the mudline. It is estimated that 10 -100 yd^3 would have to be removed during pile installation. Many new holes will be augered in the location of existing piles where they overlap. As a result, less sediment will be required to be removed as would be required for the construction of a new pier, however, the exact location and penetration of the old piles is not recorded and will be determined during reconstruction activities. Therefore, a range of quantity of material to be removed is specified. Existing holes created by old wood piles removed and that do not overlap with the location of holes augered for the new piles will collapse and naturally fill with adjacent sediment.

Most of the sediment excavated is expected to be in the form of cuttings if the hole is augered and/or drilled at a location of exiting piles. Sediment removed from the inner core during augering shall be mostly dry due to the compression created in the core during augering. Approximately 50 - 50 gallon drums will be used to store the cuttings and sediment prior to disposal upland. The contractor shall implement BMPs WM-3 – Stockpile Management, WM-4 – Spill Prevention and Control, and WM-10 – Liquid Waste Management listed in the CASQA Handbook (see handbook for detail).

3.4.4. Concrete Seal Installation

A tremie will be used to seal the bottom 3 ft. of the hole below the bottom of the steel shell and above the ground. Before the tremie seal is poured, the inside walls of the pile will be cleaned by brushing or similar method of any adhering soil or debris to improve the effectiveness of the seal. A “cleaning bucket” or similar apparatus will be used to clean the bottom of the excavation of loose or disrupted material.

The tremie is a steel pipe long enough to pass through the water to the required depth of placement. The pipe is initially plugged until placed at the bottom of the holes in order to exclude water and to retain the concrete, which will be poured. The plug is then forced out and concrete flows out of the pipe to its place in the form without passing through the water column. Concrete is supplied at the top of the pipe at a rate sufficient to keep the pipe continually filled. The flow of concrete in the pipe is controlled by adjusting the depth of embedment of the lower end of the pipe in the deposited concrete. The upper end may have a funnel shape or a hopper, which facilitates feeding concrete to the tremie. Each concrete seal is expected to cure within 24-48 hours.

3.4.5. Dewatering Methodology

After the tremie seal has been poured, the water will be pumped out of the steel shells, which will act as a cofferdam. Pumping within the excavation at the various footings may be required to maintain a dewatered work area.

The contractor shall test the pH of the water in each casing one day following pouring of the tremie seal to insure that the pH of the water did not change from the ambient pH. The water shall then be pumped into 50-gallon drums and transported to the staging area for discharge through percolation to eliminate solids. Should the pH of the water change from ambient pH, then the contractor shall haul the water to the Eureka Wastewater Treatment Plant for treatment prior to discharge. The contractor is expected to dewater a volume of approximately 450 gallons (1,720 L) each day during pile installation. For the installation of 115 piles, approximately 49,500 gallons (197,800 L) will be dewatered and discharged at the appropriate location at the staging area. Percolation rates will be verified prior to discharge of the ocean water at the designated location at the staging area, but are not expected to be prohibitive due to the sandy texture of the soil. The Contractor shall implement BMP WM-10 Liquid Waste Management as listed in the CASQA Handbook. Liquid waste management procedures and practices are used to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes. WM-10 provides procedures for containing liquid waste, capturing liquid waste, disposing liquid waste, and inspection and maintenance.

3.4.6. Completion

Following dewatering of the steel shells, steel rebar cages shall be inserted into each shell. Ready-mix concrete placed into the drilled piers shall be conveyed in a manner to prevent separation or loss of materials. The cement-mixer truck containing the concrete shall be located on land adjacent to the north end of the pier. The concrete shall be pumped to the borings through a pipe (at least ¾ inch thick) that will span the length of the pier. When pouring concrete into the hole, in no case shall the concrete be allowed to freefall more than 5 ft. (1.5m). Poured concrete will be dry within at least 24 hours and completely cured within 30 days.

A concrete washout station shall be located in the staging area at the designated location. The contractor shall implement BMP, WM-8 – Concrete Waste Management, as listed in the CASQA Handbook to prevent discharge of liquid or solid waste.

3.5. Pier Deck Construction

Following the installation of the concrete piles, pre-cast concrete bent caps measuring 25 ft. (7.6m) - long shall be installed on top of each row of pilings. The concrete bents act to distribute the load between the piles and support the pier.

Pre-cast 20 ft. (6.1m) - long concrete sections shall be used for the decking. An additional layer of concrete shall be poured following installation of the precast sections. The layer of concrete will allow the decking of the pier to be sloped to the west for drainage purposes and to create an aesthetically pleasing decking. The surface of the decking will be colored and contain an earth tone pattern to match the surrounding environment.

3.6. Utilities

Utilities located on the pier will require relocation during construction and replacement following construction of the pier footings and decking. Utilities include:

Power: A 2-inch PG&E power line that is currently attached to the west side of the pier and PG&E electrical boxes located along the west side of the pier.

Water: Fresh water is delivered to the pier through a 2-inch PVC located on the east and west sides of the pier.

Phone: There is currently an exiting phone line on the pier, which will be replaced.

Sewer: Currently there are no sewer pipes on the pier. Visitors to the pier are served by a temporary restroom located on the south side of the pier. No direct sewer discharge is allowed in the ASBS.

New utilities installed include water, phone and electrical. New pier utilities will be constructed along the east and west side of the pier and will be enclosed within concrete utility trenches. Water pipes shall be routed along both sides of the pier to several locations along the pier. Phone lines shall be routed along the west side of the pier. All electrical switches will be located in one central box towards the west end of the pier by the loading and unloading landings location.

Lighting installed along the pier shall be designed to improve visibility and safety. The proposed lighting will be embedded in the decking and railing of the pier to minimize light pollution from the pier. Lighting shall be designed to minimize light pollution by preventing the light from going beyond the horizontal plane at which the fixture is directed. Currently, there are lighting poles on the pier. The proposed lighting on the pier will be embedded on the west and east side of the decking separated approximately 25 ft. (7.6m) throughout the length of the pier. The lighting fixtures will have cages for protection matching the color of the railing. In addition, on the south side of the pier, lighting will be installed in the railing to provide lighting for the working area on the deck of the pier.

Fish cleaning does not occur at the pier. This activity was formerly pursued by recreational users and was discontinued in 2006 due to water quality concerns.

3.7. Drainage

There is currently no runoff collection system on the pier. Runoff drains from the existing pier directly into the ASBS. A storm water outfall for the City of Trinidad is located near the base of the pier.

The pier decking shall be sloped to the west in order to direct runoff from the pier to the stormwater collection pipe. The runoff shall be routed along the west side of the pier and conveyed by gravity to a new upland manhole and storm chamber containing treatment media. All stormwater will be infiltrated within the storm chamber; there will be no discharge from the system. See Appendix C, drawings C-5 to C-8, for details of the conveyance and treatment system.

3.8. Humboldt State University Facilities

HSU Marine Lab leases space on Trinidad Pier for placement of a pump and associated plumbing to obtain seawater for the Telonicher Marine Laboratory. The existing saltwater intake PVC pipes, located directly under the decking of the pier, will be replaced and the size of the intakes shall be reduced to 4-inches in diameter.

The new intake pumps will be screened in accordance with NMFS standards for such intakes.

A new shed to house the pump will be built on the pier. CICORE have an Acrylonitrile-Butadiene-Styrene (ABS) pipe attached to a piling on the Trinidad pier that contains the water quality sonde. The proposed water quality sonde system is similar to the existing system and will be composed of the YSI 6600 Extended Deployment System, 6200 Data Acquisition System and two solar panels.

The Trinidad Pier is essential for supporting teaching and research conducted at the HSU Marine Lab and provides a service to the general public. More than 11,000 visitors come to the Marine Lab each year. The public display and research tanks are completely dependent on the sea water collection system for the upkeep of marine plants and animals at the lab. The sea water is pumped from the pier up hill in pipes below Galindo Street which also runs on the east side of the marine lab building under the driveway behind the main building. From the storage tanks sea water is gravity fed to a sump, then pumped through sand filters and water chillers, into the building supply, and returned to the sump. A common drain system of stormwater, some lab and the sea water drain system meets under Edwards Street, and then drains to the outfall adjacent to the Marine railway near Little Head (HSU Marine Lab, 2005).

In contrast to many Coastal Marine Labs, this system was designed from the outset to recirculate the water as much as practical to reduce intake/discharge. Over the past 40 years several additional elements have been added to the current system to expand the overall volume needed and to control water temperature (1988), which reduces the need for additional water exchange. Routine maintenance of the system is the only significant discharge back into the ASBS (HSU Marine Lab, 2005).

The total volume of sea water discharged on an annual basis from the HSU Marine varies from year to year (from 160,000 gallons in 2006 to 40,000 gallons 2001). The maintenance of the HSU aquarium systems require back wash of the sand filters on a monthly basis; this usually discharges about 7,000-10,000 gallons. On those years when an entire replacement of the lab's sea water is required, the Marine Lab then discharge and replace more than 75,000 gallons. It is important to note that there is no daily or routine discharge of sea water from the HSU aquarium system (HSU Marine Lab 2005). The HSU Marine Lab sea water is drained to the outfall adjacent to the Marine railway near Little Head.

The Marine Lab submitted a request to extend their exception to discharge recirculated pumped sea water back into the ASBS separately from the Trinidad Rancheria. The Sate Water Resources Control Board is currently reviewing the HSU Marine Lab and other marine labs applications for their request.

The existing saltwater intake PVC pipes, located directly under the decking of the pier, will be replaced and their size shall be reduced to 4-inches in diameter. A new shed to house the pump will be built on the pier.

3.9. Staging Area

The staging area utilized for the project consists of the gravel parking lot located west of the pier and is approximately 0.53 acres. The Contractor shall utilize the staging area to store construction equipment and materials. Removed sediment from CISS pile installation (approximately 10 to 100 yd^3) will also be stockpiled in containers at the staging area until transported by the Contractor to an approved upland disposal site. Seawater removed from the piles will be discharged through percolation within a temporary pit excavated at the staging area. The edge of the staging area will be at least 50 ft from the beach to the west in order to avoid impacts to the beach.

The proposed staging area can be accessed from the pier through Bay Street, an existing paved road leading to the parking lot, located approximately 400 ft. (122m) away from the pier. The staging area can also be accessed from U.S. Highway 101 by taking the Trinidad exit (Main Street) west, proceeding through Trinity Street and then Main Street before continuing onto Edwards Street which leads to the staging area. Edwards Street is a two-lane paved road leading to the staging area from the city of Trinidad and Highway 101(Figure 2).

All applicable temporary construction BMP’s for staging area and site access will be implemented in accordance with CASQA Construction Handbook. BMPs WM-3 - Stockpile Management, WM-4 - Spill Prevention Control, NS-9 Vehicle Equipment and Fueling listed in the CASQA Construction Handbook shall be implemented at the staging area. Those BMP’s may include but are not limited to: fiber rolls, silt fences, straw bales and sandbag barriers.

3.10. Construction Timing & Sequencing

The project is expected to be completed within nine months. Reconstruction of the pier is proposed to commence on August 1, 2010 and terminate on May 1, 2011. Excluding weekends and holidays, a total of 217 working days will be available for work during this period. During the winter months (November to March) severe weather conditions are expected to occur periodically at the project site. The Contractor may have to halt the work during pile installation due to strong winds, large swells, and/or heavy precipitation. Construction during the remainder of the year should not be impeded by large swells, but may be halted due to strong winds or precipitation. The Contractor will work five days per week from 7 a.m. to 7 p.m. Should severe weather conditions cause delays in the construction schedule, the

Contractor will work up to seven days per week as needed to ensure completion by May 1, 2011.

Removal of the existing piles and decking and construction of the new pier will occur simultaneously. The existing decking and piles will be removed and new piles installed from the reconstructed pier. Pile bents will be separated 25 ft. (7.6m) apart. Following the installation of two successive pile bents, a new precast concrete deck section shall be installed. The contractor shall continue in this manner from the north end (shore) to south end (water terminus) of the existing pier.

The contractor is expected to spend approximately six months (August through January) on pile removal and installation and the remaining three months (February through April) on deck and utilities reconstruction. It is estimated that each boring can be lined with a pile and excavated within six to eight hours. Pouring of the concrete seals is expected to take approximately two hours for each pile. The contractor is expected to remove an existing pile and install one new steel shell and pour a concrete seal each day, with a total of six to eight hours required for the process. The final pour of the concrete piles is expected to take approximately two hours to fill the steel shells and is expected to cure within one week.

It is expected that reconstruction of one row of piles and bents will take one week. Pile and bents will be installed over a discontinuous period of approximately 22 weeks. A new pre-cast concrete section of decking will be installed following the installation of two successive rows of piles and associated bents.

The last three months will be used for pouring of the top layer of the decking and utilities construction.

3.11. Project Best Management Practices & Mitigation

Mitigation and best management practices (BMPs) are summarized below and described in greater detail in the foregoing text. These measures include all formal mitigation detailed in the Mitigated Negative Declaration for the project. The complete statement of measures that appears in the Mitigated Negative Declaration is attached to this document as Appendix D.

3.11.1. Mitigation Measures

Timing constraints for underwater noise

To minimize noise impacts on marine mammals and fish, underwater construction activities shall be limited to the period when the species of concern will be least likely to be in the project area. The construction window for underwater construction activities shall be August 1 to May 1.

Implementation Assurance: Provide NMFS advance notification of the start dates and end dates of underwater construction activities.

Marine Mammal Monitoring

Marine mammal monitoring and reporting shall be performed consistent with procedures to be directed by NMFS in the terms of an active biological opinion, incidental harassment authorization, and/or other written conditions placed on the proposed action. Such conditions have not yet been placed but are provisionally anticipated to include the following terms:

- An observer trained in identification of marine mammals shall attend the project site one hour prior until one hour after construction activities cease each day throughout the construction window.
- The observer shall be approved by NMFS.
- The observer shall search for marine mammals within behavioral harassment threshold areas to be identified by NMFS but provisionally identified as including areas within the acoustic effect thresholds identified in Section 6, extending up to 2425 feet from the noise-generating activity, depending on the type of noise being generated.
- Should marine mammals other than harbor seals be identified within the threshold area while underwater construction activities are occurring, the observer shall notify the Project Engineer who will notify the Contractor, who shall stop work until the affected species have not been sighted within the behavioral harassment threshold area for 30 minutes.
- Whenever a construction halt is called due to marine mammal presence in the area, the Project Engineer (or their representative) shall immediately so notify the designated NMFS representative.
- If harbor seals are sighted by the observer within the acoustic threshold areas, the observer shall record the number of seals within the threshold area and the duration of their presence while the noise-generating activity is occurring. The observer will also note whether seals appeared to respond to the noise and if so, the nature of that response. These observations will be reported to NMFS in a letter report to be submitted on each Monday, describing the previous week's observations.
- All sightings of marine mammals other than harbor seals will be similarly recorded and documented, and will be included in the weekly letter report.

Implementation Assurance: Monitoring logs submitted to the NMFS.

Tremie Incident Response

The following measures shall be implemented in the event of leaking of concrete into the sediment during tremie pouring:

- Stop construction activities.
- Notify the Regional Water Quality Control Board
- Determine and remedy the cause for leaking of concrete
- Develop response plan with regulatory agencies

Implementation Assurance: Project Manager Daily Logs.

3.11.2. Best Management Practices

Pier Demolition Methods

- Waters shall be protected from incidental discharge of debris by providing a protective cover directly under the pier and above the water to capture any incidental loss of demolition or construction debris.
- A floating oil containment boom surrounding the work area will be used during creosote-treated timber pile removal. The boom will also collect any floating debris. Oil-absorbent materials will be employed if a visible sheen is observed. The boom will remain in place until all oily material and floating debris has been collected and sheens have dissipated. Used oil-absorbent materials will be disposed at an approved upland disposal site.
- All removed piles shall be temporarily stored at the upland staging areas until all demolition activities are complete (approximately 6 months).
- Following the cessation of demolition activities, the creosote treated piles will be transported by the Contractor to an upland landfill approved to accept such materials.
- The pressure treated 2 × 4 inch Douglas-fir decking will also be stored in the staging area until demolition is complete. The partially pressure treated decking and railing may be reused and will be kept by the Trinidad Rancheria for further use.
- The contractor shall also follow BMPs: NS-14 – Material Over Water, NS-15 – Demolition adjacent to Water, and WM-4 – Spill Prevention and Control listed in the CASQA Handbook.

Pile Installation

- The sediment and cuttings excavated shall be temporarily stockpiled in 50 gallon (189L) drums (or another authorized sealed waterproof container) at the staging area until all excavations are complete and then transferred for upland disposal at the Anderson Landfill or another approved upland sediment disposal site.

- The contractor shall implement BMPs WM-3 – Stockpile Management, WM-4 – Spill Prevention and Control, and WM-10 – Liquid Waste Management listed in the CASQA Handbook.
- The contractor shall test the pH of the water in each casing one day following pouring of the tremie seal to insure that the pH of the water did not change by more than 0.2 units from the ambient pH. The water shall then be pumped into 50-gallon drums and transported to the staging area for discharge through percolation to eliminate solids. Should the pH of the water change from ambient pH, then the contractor shall haul the water to the Eureka Wastewater Treatment Plant for treatment prior to discharge.
- The Contractor shall implement BMP WM-10 Liquid Waste Management as listed in the CASQA Handbook. Liquid waste management procedures and practices are used to prevent discharge of pollutants to the storm drain system or to watercourses as a result of the creation, collection, and disposal of non-hazardous liquid wastes. WM-10 provides procedures for containing liquid waste, capturing liquid waste, disposing liquid waste, and inspection and maintenance.
- A concrete washout station shall be located in the staging area at the designated location. The contractor shall implement BMP, WM-8 – Concrete Waste Management, as listed in the CASQA Handbook to prevent discharge of liquid or solid waste.

Pier Construction

- No concrete washing or water from concrete will be allowed to flow into the ASBS and no concrete will be poured within flowing water.
- Waters shall be protected from incidental discharge of debris by providing a protective cover directly under the pier and above the water to capture any incidental loss of demolition or construction debris.

Utilities

- Lighting will be embedded in the decking and railing of the pier to minimize light pollution from the pier. Lighting shall be designed to minimize light pollution by preventing the light from going beyond the horizontal plain at which the fixture is directed so the light is directed upwards.

Drainage

- The pier decking shall be sloped to the west in order to direct runoff from the pier to the stormwater collection pipe. The runoff shall be routed along the west side of the pier and conveyed by gravity to a new upland manhole and storm chamber containing treatment media. Drainage from the storm chamber shall not be conveyed to Trinidad Bay, but will entirely be infiltrated within the storm chamber. See Appendix C, drawings C-5 to C-8, for details.

Humboldt State University Facilities

- The new saltwater intake pumps will be screened in accordance with NMFS standards for such intakes.

Staging Area

- All applicable temporary construction BMP's for staging area and site access will be implemented in accordance with CASQA Construction Handbook. BMPs WM-3 - Stockpile Management, WM-4 - Spill Prevention Control, NS-9 Vehicle Equipment and Fueling listed in the CASQA Construction Handbook shall be implemented at the staging area. Those BMP's may include but are not limited to: fiber rolls, silt fences, straw bales and sandbag barriers.

- Temporary construction BMP's for the staging area will be implemented in accordance with the Contractor's approved Storm Water Pollution Prevention Plan (SWPPP).

Construction Timing & Sequencing

- Noise-generating construction activities, including augering, pile removal, pile placement, and concrete pumping, will only be allowed from 7 a.m. to 7 p.m. These hours shall be further restricted as necessary in order for marine mammal observers to perform required observations.

3.12. Project Benefits

The existing Douglas-fir piles are creosote treated (Figure 4). The depth of creosote penetration into the piles varies from 0.25 to 2 inches. Creosote is composed of a mixture of chemicals that are potentially toxic to fish, other marine organisms and humans. Polycyclic aromatic hydrocarbons (PAH), phenols and cresols are the major chemicals in creosote that can cause harmful health effects. In Puget Sound, for example, the use of creosote-treated wood in the water is prohibited. The replacement of the creosote treated piles with cast-in-steel-shell (CISS) concrete piles is expected to eliminate potential contamination of the water column by PAH, phenols and cresols from the existing treated wood piles.

The existing pier has no stormwater treatment; all stormwater runs off the pier into the ocean. The proposed pier has full stormwater collection, treatment and detention, with no stormwater discharges whatsoever to any surface water body.

The existing HSU seawater intakes do not have screens consistent with NMFS specifications. The proposed intake will have such a screen.

The existing pier has pole lighting that illuminates the water surface; the proposed pier has lighting designed to avoid such illumination.

The existing pier has dark wood and over 200 piles. The proposed pier, with half as many piles and a white concrete construction, will result in less shading of nearshore habitat.

Figure 3-1. Existing pile showing creosote deposits.

Chapter 4. Environmental Baseline in the Action Area

4.1. Vicinity and Land Use

The project site is located on Trinidad Bay, approximately one half-mile west of U.S. Highway 101. This site is within an Area of Special Biological Significance (ASBS) designated by the State Water Resources Control Board for the kelp beds located in the bay. The pier is situated between two rock outcroppings: Trinidad Head to the west and Little Head to the east. The staging area is located at the base of Trinidad Head, in a gravel parking lot that serves users of Trinidad State Beach. The parcel containing the staging area is zoned Open Space; the pier has no zoning designation. Land uses surrounding the project site include open space, recreation (boat launch), and commercial (Seascape Restaurant, commercial fishing). Adjacent upland areas are mainly residential.

4.2. Environmental Baseline

4.2.1. Geology and Sediments

The Trinidad Pier is located near the base of the prominent Trinidad Head and to the southwest of the developed portions of the City of Trinidad. More specifically, the pier starts near the western side of the rock named Little Head and projects approximately 540 ft into Trinidad Bay to the south from a low bench that connects the mainland to Trinidad Head. Geotechnical studies for the proposed action determined the nature and distribution of subsurface materials and conditions by means of four sampled test borings to a maximum depth of -70 ft MLLW. The site is underlain by pre-Cretaceous rocks of the Franciscan Complex and Quaternary marine terrace deposits. This rock is variably weathered, highly fractured/sheared with variable composition, composed predominately of mudstones, greywacke, and metasedimentary rocks, with lesser amounts of igneous and metamorphic rocks (Taber 2007). Earth materials observed during the subsurface investigation can be broken into two general categories (Taber 2007):

1. Recent marine deposits include a thin veneer (3.5 to 7.5 ft thickness) of recently deposited loose to compact gray sand with shell fragments and other debris, which overlies the entire site. Some gravel size rock fragments were also observed in the cuttings (possibly derived from the adjacent Trinidad Head and Little Head). Large (2-3±ft dia) blocks of Franciscan material were observed at the base of both Trinidad Head and Little Head.

2. Bedrock of the Franciscan Formation underlies the recent marine deposits in each sample borehole. This unit predominately consists of gray, green, and black weathered to decomposed mudstone, shale, and sandstone, with some zones of hard grey sandstone. As described in published mapping, decomposed igneous and metamorphic rocks are also likely present. This unit is variably fractured and sheared with significant localized slickensided surfaces. Carbonate (likely calcite) filled fractures and stringers are found throughout, with some zones containing approximately 30-40± percent calcite by volume.

No data have been located that describe whether contaminants exist in marine sediments at the site. However, significant contamination is unlikely for the following reasons:

1. The parent rocks described above do not contain contaminants, thus none are being produced by rock weathering processes.

2. The sediments present at the site are relatively coarse-grained (sand and coarser) and thus contain little or no clay particles that could adsorb contaminants from the water.

3. The water also contains little evidence of contamination (water quality data are described later in this chapter).

4. Sediments on the site are likely reworked annually or more often by wave action associated with storms, and the entire site is heavily flushed by wave and tidal action.

4.2.2. Upland Vegetation

Upland vegetation is not a concern at the project site because neither the site, nor the staging area, nor any of the access routes are vegetated.

4.2.3. Water Quality

Basic water quality measures (temperature, salinity, dissolved oxygen, pH, turbidity, chlorophyll) are collected and available in real-time from the HSU sonde located at the Trinidad Pier (http://cencoos.humboldt.edu/). These data indicate generally excellent water quality at the pier, with regard to the measured parameters. However, the proximity of potential sources of coliform bacteria, organic compounds, and metals raises concern about possible contamination form these sources.

A number of sources exist that contribute pollutants to Trinidad Head ASBS, including runoff from the City's storm water conveyance system, several streams and seeps, and the Trinidad Pier and associated facilities. There are few historical data available regarding the water and sediment quality of the ASBS, precise type and quantity of pollutants, overall impact of the discharges, or up-to-date biological conditions of the kelp beds and the marine life in the ASBS. Grab sampling and field measurements associated with several monitoring efforts in recent years have produced a limited amount of data for discharges from the municipal storm water system, local streams, and seeps/springs, as well as data for receiving water and sediment quality in Trinidad Bay.

City of Trinidad Storm Water

Of the 66 acres of developed land within the City, about 19.5 acres of impervious surface area - including streets, a school, and private and commercial properties – discharge directly to Trinidad Head ASBS or indirectly via a small stream. With an average rainfall of 48 inches, an estimated 12 million gallons of storm water runoff occurs each year. Pollutants entering the City's storm water conveyance system may include metals, PAHs, bacteria and sediment from streets and parking lots; and chemical fertilizers, pesticides, pet wastes and sediment from residential lots. Storm water grab sampling data for a suite of chemical constituents was collected May 23, 2006 during a late-season rain event. Indicator bacteria exceeded SWRCB Water Contact Standards (>24,000 MPN/100 ml and as high as 11,199 MPN/100 ml for total and fecal coliform, respectively). Total PAHs were detected at a concentration of 93.5 ng/L. Copper was detected at a concentration of 13.7 µg/L. No quantitative studies have been performed on pollutant loading to Trinidad Head ASBS from the City's storm water discharges.

Local Streams

Three streams drain to the ASBS. Mill Creek drains about 856 acres of low-density, rural residential and timber land and discharges to the Pacific Ocean just outside of the northern boundary of the ASBS. Parker Creek drains about 235 acres of low-density rural residential and timber land, as well as the Trinidad Quarry, and discharges to Trinidad Bay near the southern boundary of the ASBS. McConnahas-Mill Creek drains about 745 acres of low-density rural residential and timber land

and discharges to Trinidad Bay just outside of the southern boundary of the ASBS. Pollutants currently identified in these streams include sediment, nutrients and indicator bacteria. Recent monitoring efforts have collected data on temperature, pH, turbidity, nutrients (ammonia, nitrate, orthophosphate) and optical brighteners for these streams. No quantitative studies have been performed on pollutant loading from these streams to Trinidad Head ASBS and adjacent waters.

Groundwater/Seeps

At the base of the bluffs below the City are numerous seeps or springs that have been identified as sources of indicator bacteria and sediment that discharge to the beaches north and south of Trinidad Head. A combination of natural groundwater and filtrate from Onsite Wastewater Treatment Systems (OWTS) throughout the City feed these seeps and springs. Recent monitoring efforts have collected data on temperature, pH, conductivity, turbidity, dissolved oxygen, chloride, nitrate, ammonia, and indicator bacteria for these seeps.

Trinidad Harbor Parking Area

A paved access road to the harbor and paved parking for the both the harbor and a small restaurant covers approximately 1 acre. Runoff from this area sheet flows over sand and rock before entering the waters of Trinidad Bay. Some runoff flows down from the City’s Edwards Street and mingles with the parking runoff; the parking area is owned by the Trinidad Rancheria. At times, part of the parking area is used as a temporary storage and staging area for crab fishing operations. A one-time water quality sampling effort was performed on the combined runoff as part of the City’s 2006 Application for an Exception, and found that runoff from street and parking areas contains a variety of pollutants such as some metals and PAHs, oil & grease, and bacteria. No pollutant loading data exists for this source of discharge.

Humboldt State University Telonicher Marine Lab

Storm water and seawater from Humboldt State University’s marine lab facility is routed in a storm drain that parallels the lower portion of the City’s main storm water conveyance and discharges to Trinidad Bay at the same location. The seawater system has been upgraded to circulate the water as much as practical and minimize the amount of discharge. The laboratory recently constructed a storm water effluent treatment system, including installing an oil/water separator for their parking lot. Within the laboratory’s wet labs, no toxicity or bacterial infections have been observed as an indirect result of the husbandry and maintenance of the marine organisms in captivity. The ocean receiving water near the outfall is regularly monitored for temperature and salinity; no changes to the natural water quality of the ASBS have been detected.

Trinidad Pier and Boat Launch

The Trinidad Pier is an aging structure originally constructed in 1946 out of creosoted wood pilings and chemically preserved wood decking. The Pier deck has an approximate impervious surface area of 0.31 acres; based on an average rainfall of 48 inches, an estimated 1.25 acre feet of rain water hits the pier deck annually and creates prohibited discharges in the form of nonpoint source runoff directly into the Trinidad ASBS. Pollutants entering the Trinidad ASBS may include: bacterial indicators, hydrocarbons as gas or diesel, metals, and PAHs (as the constituent parts of creosote compounds). Direct evidence of the presence of pollutants in the pier deck runoff has been provided in a series of sampling events, as follows:

- Sampling conducted in May, 2006 to support the Trinidad Pier ASBS discharge Exception Application.
- Ocean's edge sampling conducted adjacent to Trinidad Pier as part of the pre-project monitoring for Trinidad Rancheria's Clean Beaches grant for harbor wastewater improvements.
- Sampling conducted in August, 2008 (generating runoff by sprayer or hose in the absence of rainfall) in response to the ASBS Prop 84 review team's request for additional data.

This sampling demonstrated that pier runoff produces exceedances of California Ocean Plan limits for indicators of bacterial contamination and exceedances of the North Coast Water Quality Control Board Basin Plan, as outlined in the narrative objective for Toxicity, for petroleum hydrocarbons (gas and diesel). The bacterial contamination results, particularly those with high *Enterococcus* levels, are what would be expected of any urban surface, indicating contamination from both non-mammalian and mammalian species. Sporadic mammalian fecal contamination might come from dogs being walked on the pier or from contaminated shoe soles (however, there is no temporary portable restroom facility on the pier). Gas and diesel detections would be expected from the nature of the operations on the pier and the observation of oil stains on the pier decking.

The pier replacement has been identified as the most important action that can be taken to eliminate discharges at Trinidad Harbor. The pier is a 0.31 acre urban surface discharging approximately 1.25 acre feet of urban runoff directly to the ASBS during an average rainfall season. All other urban surfaces in the harbor are at least some distance from the water, allowing for treatment by sunlight, decomposition by micro-organisms, or sand filtering. In winter, with frequent storms producing an average of about 48" of rainfall, pollutants falling on the pier are immediately washed into the ASBS. Any catastrophic spill on the pier can immediately enter the ASBS with no opportunity for spill response, whereas spills at other locations in the harbor can be cleaned up. Additionally, replacement of the pier will eliminate 205 creosote-treated 12" diameter pilings with an above ground surface area of 26,084 ft^2 and a below-sea floor surface area of 13,204 ft^2.

4.2.4. Marine Habitat

Waters adjacent to the project area were surveyed for marine life by Humboldt State University researchers during pre-project planning. These surveys focused on the intertidal and subtidal zones within the project area (Janiak et al. 2007, Donahue et al. 2007), and on identifying the extant fish diversity (Mulligan 2007).

Intertidal Habitat

The intertidal survey examined marine life along 5 transects in the vicinity of the Trinidad Pier. Each transect ran from the uppermost occurrence of marine life to the lowest intertidal elevation accessible to the researchers. All substrates were hard, including bedrock benches, boulders, small tide pools, and concrete slabs. A total of 104 species were observed, including 53 species of algae. The algae included a diversity of life forms representing all kingdoms (green, brown and red), while the observed animals were all invertebrates, including a diversity of barnacles, limpets, littorine snails, and anemones (Janiak et al. 2007).

Subtidal Habitat

The subtidal survey (Donahue et al. 2007) was performed using the widely-adopted CRANE and PISCO protocols for kelp bed survey, described on the PISCO web site (http://www.piscoweb.org/research/community/subtidal/protocols). This survey method is appropriate for sampling abundant demersal and mid-water fishes, but is generally best for identification of sessile or slow-moving organisms. Transects ran perpendicular out from the pier, at each of three depths (shallow subtidal, midpoint, and at the end of the pier). Substrates evaluated included sand and bedrock/boulder; and the wood substrate of the existing pilings.

Sand substrates dominated the shallow and midpoint transects, shifting to dominance of boulder substrates in the deep transects. The sand substrate areas had low cover (25% in the shallow transects, 20% in the midpoint transects) of algae and animals. Boulder areas were about 40% bare substrate, with the remainder most commonly covered with coralline, non-calcified and fleshy forms of red algae. The kelp *Pterogophora californica* was the most abundant brown alga around the pier, and was almost entirely confined to the shallow transect on the east side of the pier. *Pterogophora* reached densities of 2 – 2.5 m^{-2}. The algae *Cystoseira osmundacea* and *Laminaria setchelli* were also present in hard substrate areas at densities of 0.5 – 1 m^{-2} and 0.25 m^{-2}, respectively. The invertebrate assemblage was dominated by a few species. In the shallow transects, the polychaete *Pista pacifica* and several species of sea star were most common. The midpoint transects were dominated almost exclusively by *Pista pacifica*, but it disappeared in the deep transects, where sea stars were again most abundant along with the sea cucumber *Cucumaria miniata* and several species of *Cancer* crabs.

Relatively few fish species were observed. Speckled sanddab was most common, especially in the midpoint transects. Other fish species included lingcod, kelp greenling, cabezon, *Gibbonsia* sp., and an unidentified Pholidae.

Surveys of the existing wood pilings identified four communities corresponding to increasing water depth: the algae zone (-1.6 m MLLW), bryozoan zone (-2.8 m), amphipod zone (-3.8 m), and bare zone (near bottom, where sand scour and darkness contribute to poor survivorship). The algae zone was most productive, with appreciable cover of green, red and brown algae, barnacles, and bryozoans. The bryozoans zone was dominated by bryozoans with common amphipod tubes. The crustacean zone consisted primarily of amphipod tubes, while the bare zone had a few amphipod tubes and little else. Algal species found on the pier pilings included predominantly the red algae *Polyneura lastissima* at 50-75% cover, and several kelps (*Alaria marginata*, *Nereocystis luetkeana*, *Pterogophora californica*, and *Laminaria* spp.) at up to 25% cover. Habitat value of the pilings is attested by juveniles of *Cancer magister*, common in the bryozoan and amphipod zones; and the presence of 14 YOY rockfish in the kelp attached to two of the four pier pilings sampled.

Fish Survey

The most comprehensive data set available for nearshore fishes is provided by Dr. Tim Mulligan (2007), who for 18 years has been sampling fishes around Trinidad Pier with students from his classes at HSU. Sampling was typically done two times per year, once in September and once in December. Two beach sites were sampled, one just south of the boat ramp, and one just north of the pier, adjacent to Trinidad Head. Sampling gear consisted of a 150' x 8' beach seine with 6 mm stretch mesh. Five to six, non-overlapping, repetitive sets (seine hauls) were taken in the surf zone to a depth of 2 m at each site during each sampling period. Fishes were identified to species, assigned to life history stage and released. A total of 52 species representing 18 families have been observed.

Chinook salmon were the only salmonid collected in the surf zone. A total of four have been found, three adults and one juvenile. Pacific herring were also rarely found in the vicinity of Trinidad Pier although winter spawning is evident in the subtidal kelp beds south of the boat ramp. Northern anchovy have been found, sporadically, usually in mixed schools with smelt species. Juvenile black rockfish have been the dominant rockfish found, while other rockfish species have been rare. The most common flatfish encountered have been sand sole and English sole. Relative abundance of all fish species observed is provided in Table 2.

Table 4-1. Fish species in the vicinity of Trinidad Pier, 1989-2006

Species	Common Name	Occurrence
Clupea pallasi	Pacific herring	Rare
Engraulis mordax	northern anchovy	Common
Allosmerus elongates	whitebait smelt	Common
Hypomesus pretiosus	surf smelt	Abundant
Spirinchus starksi	night smelt	Abundant
Oncorhynchus tshawytscha	Chinook salmon	Rare
Microgadus proximus	Pacific tomcod	Rare
Gobiesox meandricus	northern clingfish	Common
Atherinops affinis	topsmelt	Abundant
Atherinops californiensis	jacksmelt	Common
Aulorhynchus flavidus	tube-snout	Rare
Gasterosteus aculeatus	threespine stickleback	Rare
Syngnathus leptorhynchus	bay pipefish	Rare
Scorpaenichthys marmoratus	cabezon	Common
Sebastes melanops	black rockfish	Common
Sebastes mystinus	blue rockfish	Rare
Sebastes rastrelliger	grass rockfish	Rare
Sebastes caurinus	copper rockfish	Rare
Hexagrammos lagocephalus	rock greenling	Common
Hexagrammos decagrammus	kelp greenling	Rare
Ophiodon elongatus	lingcod	Rare
Cottus asper	prickly sculpin	Rare
Hemilepidotus spinosus	brown Irish lord	Rare
Leptocottus armatus	Pacific staghorn sculpin	Common
Nautichthys oculofasciatus	sailfin sculpin	Rare
Blepsias cirrhosus	silverspotted sculpin	Rare
Enophrys bison	buffalo sculpin	Rare
Clinocottus acuticeps	sharpnose sculpin	Rare
Oligocottus snyderi	fluffy sculpin	Common
Oligocottus maculosus	tidepool sculpin	Common
Pallasina barbata	tubenose poacher	Rare
Stellerina xyosterna	pricklebreast poacher	Rare
Liparis pulchellus	showy snailfish	Common
Liparis rutteri	ringtail snailfish	Rare
Liparis florae	tidepool snailfish	Rare
Amphistichus koelzi	calico surfperch	Abundant
Amphistichus rhodoterus	redtail surfperch	Rare
Cymatogaster aggregata	shiner surfperch	Abundant
Embiotoca lateralis	striped surfperch	Abundant
Hyperprosopon anale	spotfin surfperch	Abundant
Hyperprosopon argenteum	walleye surfperch	Abundant
Hyperprosopon ellipticum	silver surfperch	Common

Species	Common Name	Occurrence
Phanerodon furcatus	white seaperch	Common
Rhacochilus vacca	pile perch	Common
Apodichthys flavidus	penpoint gunnel	Common
Pholis ornata	saddleback gunnel	Common
Citharichthys sordidus	Pacific sanddab	Rare
Citharichthys stigmaeus	speckled sanddab	Common
Parophyrs vetulus	English sole	Abundant
Platichthys stellatus	starry flounder	Common
Psettichthys melanostictus	Pacific sandsole	Abundant
Pleuronichthys decurrens	curlfin turbot	Rare

Source: Mulligan (2007).

Chapter 5. Occurrence of Listed Species and Critical Habitat

Four federally listed species and species proposed for listing, potentially present in the action area, were identified by the USFWS and NMFS (Table 5-1). There is no critical habitat for any of these species within the action area.

Table 5-1. ESA-listed and Proposed Species that May Occur in Action Area

Species	Listing Status	Agency	Occurrence in the Action Area
Chinook salmon, California coastal ESU	Threatened	NMFS	Habitat marginally suitable, species has been observed but is rare.
Coho salmon, Southern Oregon/ Northern California Coast ESU	Threatened	NMFS	Habitat marginally suitable, species has not been observed in 18 years of beach seining.
Steelhead, Northern California DPS	Threatened	NMFS	Habitat marginally suitable, species has not been observed in 18 years of beach seining.
Steller sea lion (Eastern DPS)	Threatened	NMFS	Habitat present; species has been observed but is rare.

DPS: Distinct Population Segment

ESU: Evolutionarily Significant Unit

NMFS: National Marine Fisheries Service

USFWS: United States Fish and Wildlife Service

5.1. Species that May Occur in the Action Area

5.1.1. Chinook Salmon, California Coastal ESU

Status

The California coastal ESU of Chinook salmon was listed as threatened on June 28, 2005 (70 FR 37160). Critical habitat was designated on September 2, 2005 (70 FR 52488). Currently there is no approved recovery plan for this species.

Available historical Chinook salmon abundance information are summarized by Myers et al. (1998), who assert that "escapement of this ESU was estimated at 73,000 fish, predominantly in the Eel River (55,500) with smaller populations in Redwood Creek, Mad River, Mattole River (5,000 each), Russian River (500), and several small streams in Del Norte and Humboldt Counties. … Data available to assess trends in abundance are limited. Recent trends have been mixed, with predominantly strong negative trends in the Eel River Basin, and mostly upward trends elsewhere. Previous assessments of stocks within this ESU have identified several stocks as being at risk or of concern. Nehlsen et al. (1991) identified Redwood Creek, Mad River, and Eel River stocks as stocks of concern." None of the stocks identified in this paragraph are particularly close to the action area; the closest, Mad River, enters the ocean approximately 7 miles due south of the project area.

Biological Requirements

Healey (1991) describes two basic life history strategies (races) for Chinook salmon, stream-type and ocean-type. Both types occur within the California coastal ESU, but as there are no Chinook-bearing streams in the action area, any fish occurring in this nearshore habitat likely are ocean-type. Fall-run Chinook salmon are unambiguously ocean-type (Moyle 2002). Adults move into rivers and streams from the ocean in the fall or early winter in a sexually mature state and spawn within a few weeks or days upon arrival on the spawning grounds (Moyle 2002). Juveniles emerge from the gravel in late winter or early spring and within a matter of months, migrate downstream to the estuary and the ocean (Moyle 2002, Quinn 2005).

Critical Habitat

There is no designated critical habitat for Chinook salmon within the action area.

5.1.2. Coho Salmon, Southern Oregon/Northern California Coast ESU

Status

The southern Oregon / northern California coast ESU of coho salmon was listed as threatened on June 28, 2005 (70 FR 37160). Designated critical habitat was designated on May 5, 1999 (64 FR 24049). Currently there is no approved recovery plan for this species.

Although there are few data, the information that is available for this ESU indicates the component populations are in decline and strongly suggests the ESU is at risk (Weitkamp et al. 1995, CDFG 2002, Good et al. 2005). The most recent status review concluded that coho salmon populations in this ESU "continue to be depressed relative to historical numbers, and [there are] strong indications that breeding groups have been lost from a significant percentage of streams within their historical range (Good et al. 2005)."

Biological Requirements

Coho salmon adults migrate and spawn in small streams that flow directly into the ocean, or tributaries and headwater creeks of larger rivers (Sandercock 1991, Moyle 2002). Adults migrate upstream to spawning grounds from September through late December, peaking in October and November. Spawning occurs mainly in November and December, with fry emerging from the gravel in the spring, approximately 3 to 4 months after spawning. Juvenile rearing usually occurs in tributary streams. They may spend 1 to 2 years rearing in freshwater (Bell and Duffy 2007), or emigrate to an estuary shortly after emerging from spawning gravels (Tschaplinski 1987). Emigration from streams to the estuary and ocean generally takes place from March through May.

Critical Habitat

There is no designated critical habitat for coho salmon within the action area.

5.1.3. Steelhead, Northern California DPS

Status

The northern California DPS of steelhead was listed as threatened on January 5, 2006 (71 FR 834). Critical habitat was designated on September 2, 2005 (70 FR 52488). Currently there is no approved recovery plan for this species.

Steelhead abundance estimates are summarized in the most recent NMFS west coast steelhead status reviews (Good et al. 2005). The Biological Review Team (BRT) made a few conclusions, albeit with limited data: (1) population abundances are low, compared to historical estimates; (2) recent trends are downward (except for a few small summer-run stocks), and (3) summer-run steelhead abundance was "very low" (Good et al. 2005).

Biological Requirements

Steelhead probably have the most variable life history of any salmonid (Quinn 2005). There are two basic steelhead life history patterns, winter-run and summer-run (Quinn 2005, Moyle 2002). Winter-run steelhead enter rivers and streams from December to March in a sexually mature state and spawn in tributaries to mainstem rivers, often ascending long distances (Moyle 2005). Summer steelhead (also known as spring-run steelhead) enter rivers in a sexually immature state during receding flows of spring and migrate to headwater reaches of tributary streams where they hold in deep pools until spawning the following winter or spring (Moyle 2002). Spawning for all runs generally takes place in the late winter or early spring. Eggs hatch in 3-4 weeks and fry emerge from the gravel 2 to 3 weeks later (Moyle 2002). Juveniles spend 1 to 4 years in freshwater before migrating to estuaries and the ocean where they spend I to 3 years before returning to freshwater to spawn (Moyle 2002).

Critical Habitat

There is no designated critical habitat for steelhead within the action area.

5.1.4. Steller Sea Lion

Status

Steller sea lion populations located east of 144°W were designated by NMFS as threatened on April 5, 1990 (55 FR 49204). Designated critical habitat for this species is associated with habitats used for breeding. Critical habitat was designated on August 27, 1993 (58 FR 45269) and refined on June 15, 1994 (59 FR 30715). No critical habitat occurs within the action area. A recovery plan for the species was issued on February 3, 2006 (70 FR 37175).

The most recent stock assessment (Angliss and Outlaw 2006) indicates that the eastern DPS of Steller sea lion has a stable or increasing population trend with a total population size of approximately 45,000 animals. There is a minimum population estimate for California of 2,396 animals, also with a stable or slightly increasing trend.

Biological Requirements

The Steller sea lion is the largest of 14 species in the eared seal family, Otariidiae. Males are often over 10 feet long and weigh 2,200 pounds, while females are usually 8 feet long and weigh about 660 pounds (Ridgeway 1972). Steller sea lions typically occur as individuals or in small groups of up to a dozen individuals.

The Steller sea lion is found around the North Pacific Rim from the Channel Islands of Southern California to northern Hokkaido, Japan. The center of distribution is in Alaska (NMFS 1992). Within this distribution, land sites used by Steller sea lions are referred to as rookeries and haul-out sites. Rookeries are used by adult males and females for mating, pupping, and nursing from late May to early July. Haul-outs are used by all size and sex classes but are generally not sites of reproductive activity. Presumably, these sites were chosen and continue to be used because they provide protection from predators, some measure of protection from severe climate or sea surface conditions, and (perhaps most importantly) are in close proximity to prey resources.

Steller sea lions are not known to migrate, but individuals disperse widely outside of the breeding season. Exchange between rookeries by breeding adult males and females appears low. Steller sea lions feed in open water between the nearshore zone and the edge of the continental shelf (NMFS 1992).

Declines in species abundance have been linked to reduced prey supply, which is in turn tied chiefly to overfishing. Reported mortality due to incidental take is primarily associated with troll, trawl and gillnet fisheries, and with predator control at aquaculture facilities (in British Columbia) (Angliss and Outlaw 2006).

Steller sea lions are migratory and appear to be most abundant in the Humboldt County area during spring and fall. The nearest documented haul-out site for Steller sea lions is Blank Rock, situated approximately 1 km due west of the Trinidad Pier, on the opposite side of Trinidad Head (Figure 3). Surveys have documented absence of Steller sea lions at this haul-out between the months of October through April, and very few have been observed in the months of August and September (Sullivan 1980). Furthermore, when leaving haul-outs, sea lions generally travel seaward to forage in deeper waters where their prey is more abundant (National Marine Fisheries Service 2008). Steller sea lions have not been documented within Trinidad Bay over eight years of surveys conducted at the site (Dr. Dawn Goley, 2008, pers.comm). The areas surrounding the project site could be used by non-breeding adults and juveniles and by sea lions after the breeding season (National Marine Fisheries Service 2006).

Chapter 6. Project Effects

This section discusses anticipated effects from the proposed action. The ESA requires that federal agencies consider several types of effects, as defined below.

Direct effects are effects from actions that would immediately remove or destroy habitat, harm (injure or kill) species, or adversely modify designated critical habitat. Direct effects include actions that would potentially remove or destroy habitat, or displace or otherwise influence the species, either positively (beneficial effects) or negatively (adverse effects).

Indirect effects are those effects that are caused by the proposed action and occur later in time, but are still reasonably certain to occur. Indirect effects may include impacts on food resources, or foraging areas, and impacts from increased long-term human access/activities.

Effects from interdependent and/or interrelated actions. These include effects from actions that (1) have no independent utility apart from the primary action, or (2) are part of a larger action and depend on the larger action for their justification, and/or (3) are required as part of the action, including maintenance and/or use of the project, as well as other actions that would be carried out to implement, maintain, and/or operate the project.

Conservation measures (or mitigation measures) are measures proposed to minimize or compensate for project effects on the species under review. Unless stated otherwise, the effects determinations, as defined below are based on the assumption that conservation measures will be incorporated into the project.

The ***effect determinations*** are the specific conclusions of the biological assessment concerning the overall effect of the covered activities on each species and/or critical habitat type. The possible effect determination categories for listed species and their designated critical habitat are (1) No Effect; (2) May Affect, Not Likely to Adversely Affect; Or (3) May Affect, Likely to Adversely Affect.

6.1. Direct Effects

The primary direct effects of the authorized activities within this RGP include

- underwater noise generated from vibratory pile removal and placement;
- subaerial noise generated from vibratory pile removal and placement, and operation of construction equipment;
- construction effects on water quality from demolition, turbidity, uncured concrete, minor fuel and oil spills, and surface erosion;
- operational effects due to lighting and shading;
- operational effects on water quality from stormwater and minor material spills; and
- beneficial effects.

The following sections describe these direct effects in detail.

6.1.1. Underwater Noise

Background

When a pile is vibrated, the vibration propagates through the pile and radiates sound into the water and the ground substrate as well as the air. Sound pressure pulse as a function of time is referred to as the waveform. The peak pressure is the highest absolute value of the measured waveform, and can be a negative or positive pressure peak (see Table 6-1 for definitions of terms used in this analysis). The RMS level is determined by analyzing the waveform and computing the average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy(Richardson et al. 1995, Illingworth & Rodkin 2008). This RMS term is described as $RMS_{90\%}$ in this report. This has been approximated in the field for impact pile driving sounds by measuring the signal with a precision sound level meter set to the "impulse" RMS setting ($RMS_{impulse}$). Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The total sound energy in the pulse is referred to in many ways, such as the "total energy flux"'. The "total energy flux" (Finerran et al. 2002) is equivalent to the un-weighted sound exposure level (SEL) for a plane wave propagating in a free field, a common unit of sound energy used in airborne acoustics to describe short-duration events. The unit is dB re $1\mu Pa^2/sec$. In this analysis, underwater peak pressures and RMS sound pressure levels are expressed in decibels re 1µPa; however, in other literature they can take other forms such as a Pascal or pounds per square inch. The total sound energy in an impulse accumulates over the duration of that impulse.

Table 6-1. Hydroacoustic terminology

Term	Definition
Peak Sound Pressure, unweighted (dB)	Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1µPa) but can also be expressed in units of pressure, such as a µPa or PSI.
RMS Sound Pressure Level, (NOAA Criterion), dB re:1µPa	The average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for one pile driving impulse.
Sound Exposure Level (SEL), dB re:1µPa^2/sec	Proportionally equivalent to the time integral of the pressure squared and is described in this report in terms of µPa2/sec over the duration of the impulse. Similar to the unweighted Sound Exposure Level (SEL) standardized in airborne acoustics to study noise from single events.
Waveforms, µPa over time	A graphical plot illustrating the time history of positive and negative sound pressure of individual pile strikes shown as a plot of µPa over time (i.e., seconds).
Frequency Spectra, dB over frequency range	A graphical plot illustrating the distribution of sound pressure vs. frequency for a waveform, dimension in rms pressure and defined frequency bandwidth.

Baseline Underwater Noise Level

Currently, no data are available describing baseline levels of underwater sound in Trinidad Bay. Relevant index information can be derived from underwater sound baselines in other areas. The quietest waters in the oceans of the world are at Sea State Zero, 90 dB at 100 Hz (National Research Council 2003, Guedel 1992). Underwater sound levels in Elliott Bay near Seattle, WA, representative of an area receiving moderately heavy vessel traffic, are about 130 dB_{RMS} (WSDOT 2006). In Lake Pend Oreille, ID, an area which, like Trinidad Bay, receives moderate to heavy traffic from smaller vessels, underwater sound levels of 140 dB_{RMS} are reached on summer weekends, dropping to 120 dB_{RMS} during quiet midweek periods (Cummings 1987). Since Trinidad Bay receives daily, year-round use by a variety of recreational and fishing vessels, a background underwater sound estimate of 120 dB_{RMS} is a conservative estimator for daytime underwater noise levels, and was used to calculate the action area for the proposed action.

Noise Thresholds

There has been extensive effort directed towards the establishment of underwater sound thresholds for marine life. Interim criteria for fish were recently adopted. Various criteria for marine mammals have been established through precedent. Acoustical data are presented in terms of the criteria metrics.

Fish

On June 12, 2008 the Fisheries Hydroacoustic Working Group released a memo with the subject being an Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. Representatives from Federal Highway Administration, NMFS, USFWS, California Department of Fish and Game, and the Departments of Transportation from California, Oregon, and Washington signed this memo. The agreed upon criteria identify sound pressure levels of 206 dB peak and 187 dB accumulated sound exposure level (SEL) for all listed fish except those that are smaller than 2 grams. In that case, the criterion for the accumulated SEL is 183 dB.

Marine Mammals

Current NMFS practice[1] regarding exposure of marine mammals to high-level sounds is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB RMS or above, respectively, have the potential to be injured (i.e., Level A harassment). NMFS considers the potential for behavioral (Level B) harassment to occur when marine mammals are exposed to sounds below injury thresholds but at or above 160 dB RMS threshold for impulse sounds (e.g., impact pile driving) and 120 dB RMS threshold for continuous noise (e.g., vibratory pile driving).

Extent of Underwater Project Noise

Pile Driving

There are several sources of measurement data for piles that have been driven with a vibratory hammer. Illingworth & Rodkin (2008) collected data at several different projects with pile sizes ranging from 13-inch to 72-inches. The most representative data from these measurements would be from the Ten Mile River Bridge Replacement Project[2] and the Port of Anchorage Marine Terminal Redevelopment Project. At Ten Mile, ninety-six 30-inch CISS piles were measured in cofferdams filled with water in the Ten Mile River at 33 feet and 330 feet from the piles. The sound level in the water channel ranged from <160 to 182 dB peak and from <150 to 166 dB RMS. The SEL levels were not measured, however the SEL_{1sec} would be similar to the RMS due to the constant sound of the vibratory hammer. Levels generally increase gradually with increasing pile size. These sound levels are, therefore, considered a conservative (credible worst case) estimate of the expected levels given that the size of the piles proposed for this project are smaller in diameter (18 in.) than the piles measured at Ten Mile.

Illingworth & Rodkin (2008) gathered data at the Port of Anchorage during the vibratory driving of steel H piles. These data, and data gathered by others, were used as the basis for the Environmental Assessment (EA) that was prepared by NMFS for

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[1] Environmental Assessment on the Issuance of an Incidental Harassment Authorization and Subsequent Rule Making for Take of Small Numbers of Marine Mammals Incidental to the Port of Anchorage Terminal Redevelopment Project, Anchorage, Alaska, prepared by National Marine Fisheries Service, July 2008.

[2] Memos from K, Pommerenck (Illingworth & Rodkin, Inc.) to Lisa Embree of Caltrans dated 4/25/2007 through 8/28/2007 transmitting underwater noise measurement results for CISS piles at Bents 5, 6, 7 and 8 of the Ten Mile River.

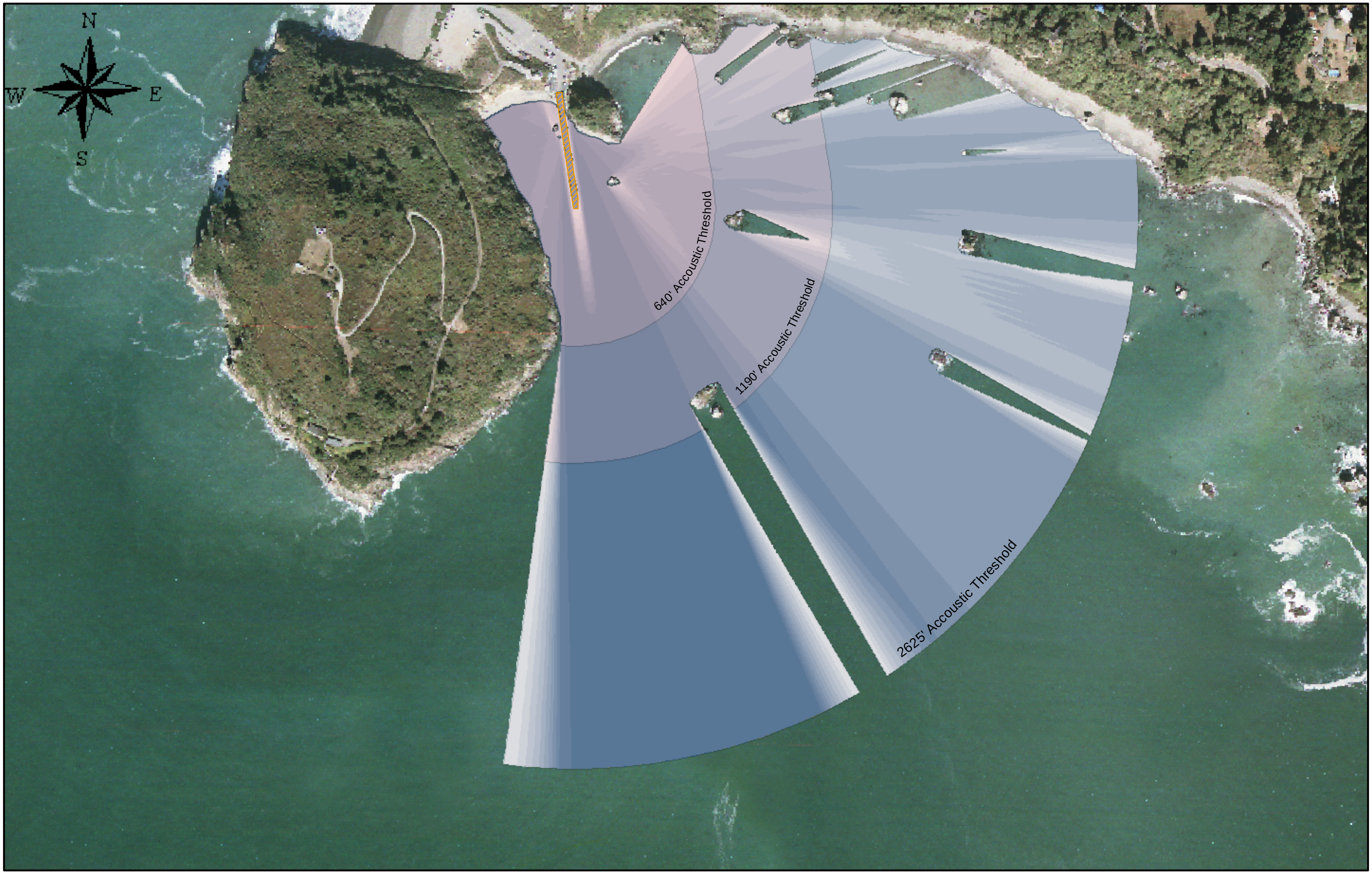
the issuance of an incidental harassment authorization (IHA). These data were summarized in the IHA. The Port of Anchorage IHA concluded that average sound levels of vibratory pile driving sounds would be approximately 162 dB re:1µPa at a distance of 20 meters. Furthermore, for vibratory driving, the 190 and 180 dB levels would occur at distances of less than 33 feet and the 120 dB level would occur out to about 2,625 feet from the vibratory hammer. Data are summarized in Table 6-2. The data correlate well after accounting for the difference in distance between the two measurement positions.

Table 6-2. Sound Level Data

Source	Distance	Peak dB re:1µPa	RMS dB re:1µPa	SEL (1 sec) dB re:1µPa^2/sec
10 Mile	33 feet	182	166	166
10 Mile	330 feet	<160	<150	<150
Anchorage IHA	66 feet	NA	162	NA

Source: Illingworth & Rodkin (2008).

For this analysis, close to the pile, it is assumed that there would be a 4.5 dB decrease for every doubling of the distance. Levels of 180 dB_{RMS} or 190 dB_{RMS} are not expected to occur in the water. Peak sound pressures would not exceed 190 dB_{peak} in water. Long distance sound propagation in shallow water varies considerably. Limited measurements of vibratory pile driving made at distances where levels approached 120 dB_{RMS} indicate that the 2,625-feet distance identified in the Port of Anchorage IHA would be a conservative and reasonable prediction for where the 120 dB_{RMS} level would occur during the installation of the CISS piles for the Trinidad Pier Reconstruction Project. The accumulated SEL is both a function of the received sound level and the duration of exposure. The maximum number of piles that would be driven in any given day is two (more typically only one pile would be vibrated in in a day). It is estimated based on past projects that each pile would be driven for approximately 15 minutes (900 seconds per pile, 1800 seconds per day maximum). A conservative assessment assumes fish would be within the ensonified area all day to receive the sound and all of the driving would produce the maximum SEL. Under this scenario, the accumulated SEL would be 197 dB at about 40 feet. The distance to the 187 dB accumulated SEL would be approximately 150 ft and the distance to the 183 dB accumulated SEL would be about 260 ft. Results are summarized in Table 6-3 and in Figure 6-1, which shows both the area of effect and the relative exposure risk based on the presence of shielding features (headlands and sea stacks). Under no circumstances would the peak threshold for fish, or the Level A (injury) threshold for cetaceans or pinnipeds, be exceeded.



Legend

Trinidad Pier

Accoustic Thresholds

Visibility from individual pilings.*

1 - 10	40 - 50	80 - 90
10 - 20	50 - 60	90 - 100
20 - 30	60 - 70	100 - 115
30 - 40	70 - 80	

0 250 500 1,000 Feet

*Value represents number of pilings in direct line of site from each square meter cell within the Action Area.

Figure 6-1. Area of Effect For Underwater Noise.

ICF Jones & Stokes

Table 6-3. Predicted Distances to Acoustic Threshold Levels for the Trinidad Pier Reconstruction

Construction Activity	Distance from activity to Effect Threshold		
	Fish (>2gm) Daily Accumulated SEL 187 dB	Fish (<2gm) Daily Accumulated SEL 183 dB	Marine Mammal level B 120 dB RMS
18" pile Installation	150 ft	260 ft	2625 ft
Augering	Not expected to occur	Not expected to occur	640 ft
Wood Pile Removal	Not expected to occur	Not expected to occur	1190 ft

Noise Levels from Augering

An attempt was made to measure the noise from augering out the 30-inch piles at the Ten Mile Bridge Replacement Project. The levels were below the peak detector of the equipment, 160 dB_{peak}, and so measurements were stopped. Based on this the levels for augering the 18-inch piles would be below 160 dB_{peak}, and the SEL would be below 150 dB re:1μPa^2/sec. Augering is expected to generate noise levels at or below the lower end of this range (Illingworth & Rodkin 2008).

Noise Levels from Removal of Wood Piles

Removal of the existing wood piles would be accomplished with the use of a vibratory hammer. It would take approximately 30 to 45 minutes to extract each pile. Typically the noise levels for installing and removing a pile are approximately the same when a vibratory hammer is used. The noise generated by installing woodpiles is generally lower than steel shell piles. I&R has had only one opportunity to measure the installation of woodpiles and this was with a 3,000-pound drop hammer. The levels measured at a distance of 10 meters were as follows: 172 - 182 dB_{peak}, 163 - 168 dB_{RMS}, the SEL was not measured. For a comparable CISS pile, using a 3,000-pound drop hammer, the levels measured were 188 - 192 dB_{peak}, 172 - 177 dB_{RMS} and again the SEL was not measured. The noise generated during the installation of the wood pile was approximately 10 dB lower than the CISS piles. Following this logic, the sound produced when removing the wood piles would be about 10 dB lower than when installing the CISS piles.

Levels of 180 dB or 190 dB RMS are not expected to occur in the water as a result of pile removal. Peak sound pressures would not be expected to exceed 190 dB in water. The average sound level of vibratory woodpile removal would be approximately 152 dB re:1μPa at a distance of 66 feet. Using the transmission loss rate assumed in the Anchorage IHA, the distance to the 120 dB RMS level is calculated to be about 1,190 feet. As noted earlier, the accumulated SEL received is both a function of the received sound level and the duration. The maximum number of piles that would be removed in any given day is five and the engineer estimates that each pile would take between 30 to 45 minutes to remove. Assuming that it would take an average of 40 minutes per pile, there would be about 2,400 pile removal seconds for each pile, or approximately 12,000 seconds per day (3.3 hours over the course of a day if five piles were removed – more typically fewer piles would be removed in a day). A conservative assessment assumes fish would be there all day to receive the sound and all of the driving would produce the maximum SEL. NMFS methodology states that when the single strike SEL (or SEL_{lsec}) is less than 150 dB (Effective Quiet) the SEL would not accumulate to cause injury. Under this scenario, the accumulated SEL at about 33 ft (10m) would be less than 150 dB and therefore the SEL would not be accumulated. Results are summarized in Table 6-3.

Biological Effects

Based on the foregoing analysis, the proposed action could result in underwater acoustic effects to all fish, bird, and mammal species addressed in this analysis.

Any Chinook and coho salmon present in the action area would almost certainly all be larger than 2 gm because the nearest stream supporting these species, the Mad River, is approximately 7 miles south of the project area. Thus any fish present in the area would be fingerlings or larger. For these fish, the 187 dB SEL daily threshold would be exceeded within 150 feet of pile installation activities, which would be performed during the months of August through January (possibly February if winter storms result in excessive work delays). The exceedance would occur on approximately 30% of days during this period. The work period comes after these species have migrated to the ocean, and there is very little likelihood that either Chinook or coho salmon would be present in the action area when the work occurs. This presumption is further supported by the beach seine data of Mulligan (2007), who has collected a total of four Chinook and zero coho salmon during 18 years of June and December seines at Trinidad Bay.

The injury thresholds for pinnipeds and cetaceans would not be attained, but the behavioral response threshold of 120 dB RMS would be attained during use of the vibratory pile driver (for wood piling removal and for CISS pile placement), and during augering of the CISS pile placements. Effect distances for these activities are shown in Table 6-3, and range from 640 feet to 2,625 feet. The duration of exposure varies between activities. Pile installation would occur for approximately 30 minutes on each of 58 days, resulting in sound levels exceeding the behavioral effect threshold within 2,625 feet of the activity. Pile removal, the next-noisiest activity, would require approximately 50 hours total distributed over approximately a 180 day period, with activity primarily occurring on approximately 60 days evenly distributed during the period. Sound levels would exceed the behavioral effect threshold within 1,190 feet of the activity. Augering is estimated to require 1 hour per pile with activity occurring on each of approximately 60 days evenly distributed during a 180-

day period. Sound levels would exceed the behavioral effect threshold within 640 feet of the activity. These activities could be performed on the same day, but more often they would occur on consecutive days, with a cycle of pile removal - pile installation - augering - grouting occurring as each of 25 successive bents is placed.

Steller sea lions are extremely unlikely to be exposed to elevated underwater sound levels. Surveys performed between October through April have not documented any Steller sea lions at the Blank Rock haul-out (Figure 3), which is the closest haul-out to the action area. Very few animals have been seen at this haul-out in August or September (Sullivan 1980). Furthermore, when leaving haul-outs, sea lions generally travel seaward to forage in deeper waters where their prey is more abundant (National Marine Fisheries Service 2008). Steller sea lions have not been documented within Trinidad Bay over eight years of surveys conducted at the site (Dr. Dawn Goley, 2008, pers. comm.). Thus they are extremely unlikely to enter within the 2,625-foot radius within which behavioral harassment might occur. Due to the shallow waters in the affected area and the large size of these animals, they would quickly be detected by the marine mammal monitor (see Section 3.11.1) and work would be stopped until after the animals departed. Thus it is unlikely that they would be exposed to elevated underwater sound levels, and any exposure that did occur would be very brief.

6.1.2. Subaerial Noise

Noise Sources

The principal source of subaerial noise would be the vibratory pile driver used to extract old wood piles and to place the new CISS piles. In measurements of 44 vibratory pile drivers, the Federal Highway Administration (2006) determined that the maximum noise production of a vibratory pile driver operating at full power is 101 dBA at 50 feet. All other power equipment that would be used as part of the proposed action (trucks, pumps, compressors, etc.) produces at least 10 dB less noise and thus has much less potential to affect listed species.

Effects of Subaerial Noise

Data on sensitivity to subaerial noise are not available for Steller sea lions, but the nearest recorded Steller sea lion haul-out is on the other side of Trinidad Head from the pier. The mass of Trinidad Head blocks sound transmission in that direction, and the haul-out is located approximately 3,400 feet from the pier (Figure 3). Surveys performed between October through April have not documented any Steller sea lions at the Blank Rock haul-out (Figure 3), which is the closest haul-out to the action area. Very few animals have been seen at this haul-out in August or September (Sullivan 1980). Thus it is very unlikely that any Steller sea lions would be exposed to noise from construction at the pier.

6.1.3. Construction Effects on Water Quality

During construction, proposed activities may affect water quality by demolition activities, generation of turbidity, seawater contact with uncured concrete, minor fuel and oil spills, and surface erosion. The anticipated effects under each of these mechanisms are explained below.

Demolition activities include the removal of structures on the old pier, removal of the old pier superstructure, and removal of pilings supporting the old pier. There is minimal risk of affects to water quality during structure and superstructure removal due to implementation of the pier demolition BMPs described in section 3.11.2. Those BMPs include suspending a protective cover beneath the pier and above the water, placing a floating oil containment boom around the work area, and removal of creosote-treated wood to an approved upland disposal area.

Removal of the pilings has the potential to cause local turbidity and the release of toxic organic compounds if the creosoted piles are fractured or broken. The duration and intensity of turbidity depends upon the quantity of materials in suspension, the particle size of suspended sediments, the currents in the affected area, and the physical and chemical properties of the suspended sediments (NMFS 2001). Turbidity within the immediate vicinity of the construction activity (several meters) would likely exceed the background levels by a significant margin and potentially affect fish and their prey by plugging gills, temporarily depleting the affected area of dissolved oxygen, and by burying bottom-dwelling benthic communities (USACE 2002, Martin et al. 1977, Carrasquero 2001). Given that sediments in the dock area are described as sand-size or coarser (Taber 2007) due to the presence of heavy wave action and tidal currents, turbidity effects are expected to be minor, with disturbed material primarily consisting of sand that settles to the bottom within a distance of a few meters. Release of toxic organic compounds is similarly expected to be a minor concern due to the extent of leaching since the pilings were installed in 1946. However, as noted above, the work area will be enclosed with a floating oil containment boom. Oil-absorbent materials will be deployed if a visible sheen is detected on the water. These precautions are intended to minimize introduction of organic chemicals to the marine environment. Any chemicals released will also be rapidly dispersed and diluted by the energetic wave and tidal environment. Exposure of marine animals to such contaminants would be brief, primarily occurring during the 50 minutes (approximately) on each of 60 days (approximately) when wood pile removal is occurring. Given the brief exposure time, small dose, and rapid dilution of organic chemical releases, no detectable biological effects are anticipated beyond the necessary mortality of sessile algae and invertebrates living on the pilings.

For the same reasons cited above, turbidity associated with piling installation is expected to have minimal effects on water quality. During augering-out of the CISS piles, augered material will be prevented from falling into the water by the design of the auger. Augered material will be placed in 55 gallon drums and the drums sealed before removing the material from the dock to the staging area, thereby minimizing the risk of material entering the water due to spillage on the dock.

Seawater will only be allowed to contact uncured concrete when a tremie is used to seal the lower end of each CISS pile after the pile has been driven and augered out. As described in Section 3.11.2, BMPs for tremie use include allowing an overnight curing period, testing the pH of the water in the CISS shell after curing and delivering the water to a certified wastewater treatment facility if a pH excursion of more than 0.2 units is detected, dewatering the CISS shell to an upland settling basin before placing rebar and filling the shell with concrete, and additional precautions intended to prevent any accidental concrete spillage during the filling process. Wet concrete will also be applied to the deck of the pier after the precast decking pieces have been laid on. Drainage from this concrete will be collected by the stormwater collection system (which will have been constructed by that time) and conveyed to the upland treatment vault. Implementation of these measures is expected to entirely avoid the risk of water quality impacts associated with uncured concrete.

Machinery required for the construction will operate near the water, either from the shoreline or, primarily, from atop the existing pier. No machinery will operate directly within waters, other than the auger and tremie that will operate under water inside of a driven CISS pile. Although no machinery will operate directly within waters, there is a risk that petroleum products will leak or spill into the water. The risk to marine organisms would depend on the type of contaminant spilled, time of the year, spill amount, and success of containment efforts (USACE 2002). As noted above, the work area will be enclosed with a floating oil containment boom. Oil-absorbent materials will be deployed if a visible sheen is detected on the water. These precautions are intended to minimize the risk of introducing contaminants to the marine environment. The level of effect to the aquatic environment is expected to be minor because of the small amounts of petroleum products likely to be spilled during typical construction activities and because of required spill containment measures.

The only location where surface erosion may potentially occur and thereby carry sediment to a surface water, is at the staging area, which is an existing graveled parking lot. Turbidity and sedimentation effects from use of the staging area will be avoided by placement of temporary erosion and sedimentation control measures, to be detailed in the project stormwater pollution prevention plan. Given implementation of those measures, sedimentation and turbidity effects are expected to be avoided entirely.

6.1.4. Construction Lighting

Artificial lighting in the vicinity of docks and other aquatic structures has been shown to have a variety of effects on fish and wildlife. Effects observed in juvenile salmon include an attraction to the light/dark interface (Nightingale and Simenstad 2001), reduced visual acuity during adaptation to sudden changes in illumination, and patterns of seeking out or avoiding artificial lights (Rich and Longcore 2005). These studies have generally not looked at essential behaviors such as foraging, migration and predator avoidance, but it seems likely that there is a potential for adverse effects. For instance, predator and prey detection is likely impaired while a fish is adapting to a suddenly changed light environment.

It is thus plausible that construction lighting at the pier could have a detrimental effect on fish in the area. These effects will be minimized by limiting construction and intense illumination in the work area to the hours of 7 AM to 7 PM. On the shortest day of the year, this corresponds to lighting of the site for 2 hours and 47 minutes before sunrise or after sunset, and for 1 hour and 37 minutes after the end of civil twilight. During the remainder of the night, the only lighting used will be low-intensity security lighting. Moreover, lights will be positioned and directed to focus on the work areas, and to minimize delivery of incident light into the sky or onto the water surface. With these precautions, measurable effects on fish due to construction lighting are not likely to occur.

6.1.5. Operational Effects

Stormwater and Water Quality

Currently storm water discharges into the bay through gaps in the pier decking. A new storm water system shall be incorporated into the design of the new pier. All runoff from the new pier shall be collected and routed upland, where it will be treated and infiltrated. The pier shall be sloped from the east to west and drainage from the pier shall be routed upland through a storm water utility pipe discharging via gravity feed to a treatment cell buried beneath the upland gravel parking area (drawings in Appendix C). The treatment cell will provide settling, infiltration, and active filtration. No surface water discharge will occur. As such there is no potential to affect habitat of listed species or their prey, and the potential effects are much reduced compared to baseline conditions at the site.

There is also a possibility of materials spills during operations. Although no bulk material transfers occur at the dock, routine handling of containers of fuel, lubricants, and hydraulic fluid occurs and will continue to occur. Normally, the volumes are small enough to be hand-carried in standard containers. The presence of curbs around the dock and an impervious concrete dock surface would produce a high likelihood that material spills on the dock could be cleaned up without delivering any contamination to the waters of the bay.

Effects of Lighting after Construction

The completed pier may potentially affect lighting in one of two ways: by artificial illumination of the water surface at night, or by shading of the water surface due to the presence of the overwater structure represented by the pier.

Lighting design for the pier calls for a design that avoids illumination of the water surface. Instead, the pier will be lit by horizontally-directed lights along the sides of the pier that illuminate the structure's surface without casting light on the water surface. This lighting design also minimizes direction of light upwards, so it has minimal potential to affect birds as well. Thus the project design effectively minimizes the potential effects of artificial lighting.

The pier does, however, shade a portion of the water surface. As described by Nightingale and Simenstad (2001), "by virtue of light refraction from the water's surface, the underwater light environment is by nature a light- reduced environment. Overwater structures enhance this light reduction through an increased loss of underwater light energy." This reduction in light energy may be expected to result in decreased algal and diatom productivity near the pier structure, and this outcome is reflected in the current distribution of algae near the existing pier, described in Chapter 4. Relatively little algae now grows beneath the pier, except in the shallowest (intertidal) waters and on the shallow portions of the existing pilings. The replaced pier structure is likely to perpetuate these effects, but to a slightly reduced extent because the new structure will contain approximately half as many pilings, and the new structure will be lighter in color, being composed of concrete rather than treated wood. Thus more incident light will be reflected from the pier onto the water surface, and fewer structural members beneath the pier deck will cast shade, in comparison to current conditions. Given the relatively energetic wave- and tide-influenced environment, and the nearby presence of highly productive kelp beds, it is likely that the new pier structure will have little potential to materially alter the existing site potential to provide habitat for Chinook or coho salmon, or to alter the existing potential to provide forage fish utilized by marine mammals. Thus effects of the proposed action on lighting are expected to be insignificant.

6.1.6. Beneficial Effects

The principal beneficial effects that will accrue from the proposed action are:

- Existing creosote-treated wooden piles will be completely removed and disposed at an approved upland site, being replaced by approximately half as many CISS pilings. This will eliminate on ongoing source of organic toxin contamination and provide a more suitable substrate for colonization by marine life.

- The existing pier has no stormwater collection and treatment system. The replacement pier will have an impervious deck with curbs enclosing a space where all stormwater is collected and routed by gravity feed to an upland treatment cell that will provide detention, settling, and active filtering prior to complete infiltration. This will eliminate an ongoing source of contaminants including dirt, organic waste, and petrochemical derivatives, resulting in a likely measurable improvement in water quality near the pier.
- The stormwater treatment system described above will also facilitate detection, control and cleanup of any materials spills that may occur on the dock.
- The renovated dock will have reduced shading and artificial lighting effects compared to the existing structure.
- The marine lab water intake associated with the dock will be fitted with NMFS approved screens, minimizing the risk of entrainment of juvenile salmon or forage fish.

6.2. Indirect Effects

Effects associated with operation of the renovated pier are described above. These effects will commence during the latter stages of construction and will continue indefinitely, and are thus treated as direct effects of the proposed action. Apart from those effects, the proposed action:

- Does not create a new facility or increase the capacity of the existing facility. The renovated pier will be in the same location and of the same size as the existing facility, and will provide the same services to the same number of users.
- Is not required for any other proposed or approved development action.
- Is not expected to result in any other development proposals.

For these reasons, no indirect effects are anticipated to result from the proposed action, and no interrelated or interdependent actions are known to exist.

Chapter 7. Effect Determinations

This chapter presents effect determinations for listed species potentially affected by the Project. Effect determinations are summarized in Table 7-1. There is no critical habitat in the action area.

Table 7-1. Effect Determinations Summary

Species/ Critical Habitat	Effect on Species	Justification
Chinook salmon, California coastal ESU	May affect, not likely to adversely affect	Species has very rarely been observed in action area despite many years of surveys, and all observed fish have been relatively large and highly mobile, thus unlikely to be harmed by action.
Coho salmon, southern Oregon/ northern California coast ESU	May affect, not likely to adversely affect	Species has never been observed in action area despite many years of surveys, and action area does not contain suitable habitat for species.
Steelhead, northern California DPS	May affect, not likely to adversely affect	Species has never been observed in action area despite many years of surveys, and action area does not contain suitable habitat for species.
Steller sea lion,eastern DPS	May affect, not likely to adversely affect	Although underwater sound will exceed behavioral modification threshold, animals are very unlikely to be present at the time this activity occurs.

ESU = evolutionarily significant unit

DPS = distinct population segment

7.1. Chinook Salmon, California Coastal ESU

Chinook salmon have rarely been observed in the action area. Mulligan (2007) relates the results of 18 years of biannual (June and December) beach seines in the action area, which produced a total of four Chinook salmon, including three adults and one juvenile. The action area is seven miles from the nearest Chinook spawning stream (the Mad River), and at the time when construction occurred, no Chinook salmon would be expected to enter the action area except potentially as adults. Adult salmon are normally highly mobile, so it is unlikely that an adult would enter the zone of elevated underwater sound and would then remain there for long enough to exceed the SEL criterion. Thus the potential of harm by the mechanism of underwater sound is discountable due to the extended exposure needed to exceed the SEL, the small area within such exposure could occur, and the very low probability of Chinook salmon presence at the time of the activity. Other potential mechanisms of harm are all related to water quality effects that are extremely small in magnitude and/or would only occur in the event of an accident. Since the potential effects are all of very low severity or very unlikely to occur, and since in any event Chniook salmon are not expected to be present during the construction period, the proposed action may affect but is not likely to adversely affect Chinook salmon.

7.2. Coho Salmon, Southern Oregon/ Northern California Coast ESU

The effect analysis for coho salmon is the same as that described for Chinook salmon, except that the surveys reported by Mulligan (2007) have never detected any coho salmon. This is consistent with the known life history of coho salmon, which would be expected to head to sea very soon after leaving their natal river. Thus coho salmon would be even less at risk of harm, and the proposed action may affect but is not likely to adversely affect coho salmon.

7.3. Steelhead, Northern California DPS

The effect analysis for steelhead is the same as that described for Chinook salmon, except that the surveys reported by Mulligan (2007) have never detected any steelhead. This is consistent with the known life history of steelhead, which would be expected to head to sea very soon after leaving their natal river. Thus steelhead would be even less at risk of harm, and the proposed action may affect but is not likely to adversely affect steelhead.

7.4. Steller Sea Lion, Eastern DPS

Steller sea lions are migratory and are known to occupy waters in the vicinity of Trinidad Bay during spring and fall. The nearest documented haul-out site for Steller sea lions is Blank Rock, approximately 1 km due west of the Trinidad Pier, on the opposite side of Trinidad Head (Figure 3).

The principal mechanism of potential effect to Steller sea lions is underwater sound, which would exceed the behavioral modification criterion of 120 dB RMS within a radius of not more than 2,625 feet from the activity, and which would under no circumstances exceed the criterion for physical injury. Surveys performed between October through April have not documented any Steller sea lions at the Blank Rock haul-out (Figure 3), which is the closest haul-out to the action area. Very few animals have been seen at this haul-out in August or September (Sullivan 1980). Furthermore, when leaving haul-outs, sea lions generally travel seaward to forage in deeper waters where their prey is more abundant (National Marine Fisheries Service 2008). Steller sea lions have not been documented within Trinidad Bay over eight years of surveys conducted at the site (Dr. Dawn Goley, 2008, pers.comm). Thus they are extremely unlikely to enter within the 2,625-foot radius within which behavioral harassment might occur. Due to the shallow waters in the affected area and the large size of these animals, they would quickly be detected by the marine mammal monitor (see Section 3.11.1) and work would be stopped until after the animals departed. Thus it is unlikely that they would be exposed to elevated underwater sound levels, and any exposure that did occur would be very brief. Accordingly, the proposed action may affect, but is not likely to adversely affect Steller sea lions.

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Appendix A. Essential Fish Habitat

Background

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established a requirement to describe and identify "essential fish habitat" (EFH) in each fishery management plan. The Act requires all federal agencies to consult with NMFS on all actions or proposed actions that are permitted, funded or undertaken by the agency that may adversely affect EFH. Only species managed under a federal fishery management plan are covered under EFH regulations.

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of essential fish habitat, "waters" includes aquatic areas and their associated physical, chemical, and biological properties that are used by fish (this may include areas historically used by fish, where appropriate). "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means habitat required to support a sustainable fishery and a healthy ecosystem. "Spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

EFH for Pacific coast groundfish, coastal pelagic species and Pacific salmon occurs in waters off the northern California coast. The project action area supports EFH for each of these groups.

In addition to EFH, the MSA encourages fishery management councils to designate habitat areas of particular concern (HAPCs). These are specific habitat areas, a subset of the much larger area identified as EFH, that play a particularly important ecological role in the fish life cycle or that are especially sensitive, rare, or vulnerable. Designating HAPCs allows managers to focus their attention on conservation priorities during review of proposals, gives those habitats extra management protection, and gives the fish species within HAPCs an extra buffer against adverse impacts. To date, the Pacific Fishery Management Council has only designated HAPCs in EFH for groundfish species.

EFH in the Action Area

EFH for groundfish includes all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. There are five HAPCs for groundfish EFH, including estuaries, canopy kelp, seagrass, rocky reefs, and “areas of interest” (a variety of submarine features, such as banks, seamounts, and canyons). Of these, the canopy kelp and rocky reef HAPCs occur in the action area.

EFH for coastal pelagic species is based on the temperature range where they are found, and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. The EFH for CPS also takes into account where these species have been found in the past, and where they may be found in the future. The east-west boundary of CPS EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the limits of the EEZ (the 200-mile limit) and above the thermocline where sea surface temperatures range between 10° and 26° Celsius. The northern boundary is changeable and is defined as the position of the 10° C isotherm, which varies seasonally and annually. In years with cold winter sea surface temperatures, the 10° C isotherm during February is around 43° N latitude offshore, and slightly further south along the coast. In August, this northern boundary moves up to Canada or Alaska. Based on this criterion, EFH for coastal pelagic species will occur within the action area for much or all of the time construction is occurring.

EFH for Pacific coast salmon includes waters and substrate necessary for salmon production needed to support a long-term, sustainable salmon fishery and a healthy ecosystem. To achieve that level of production, EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies (and most of the historical habitat) accessible to salmon in Washington, Oregon, Idaho, and California. In estuarine and marine areas, salmon EFH extends from the near shore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone, 200 miles offshore of Washington, Oregon, and California north of Point Conception. Thus all waters in the action area are included within EFH for Pacific coast salmon.

Effects of the Proposed Action

The effects of the proposed action are detailed in Section 6 of the biological assessment. The described effects on the marine environment would also affect EFH, and no further effects on EFH have been identified. Those effects are summarized here:

- During construction, water quality could be affected due to demolition, turbidity, uncured concrete, minor fuel and oil spills, and surface erosion. Mitigation measures and best management practices described in Section 3.11 would be used to avoid or minimize the risk of demolition material entering the water, excessive turbidity, exposure of seawater to uncured concrete or runoff from uncured concrete, and surface erosion. These measures and a spill response plan would we used to minimize the potential damage from spills. These precautions and response measures would result in a small overall risk of habitat impairments due to water quality effects.
- Similar precautions and a similar conclusion proceed from the potential effects on water quality from stormwater runoff and material spills during operations and maintenance of the renovated pier. Moreover, the renovated pier will have a stormwater system where none currently exists, resulting in a beneficial change in water quality.
- Following construction, lighting and shading could affect habitat beneath the pier. As detailed in Section 6, those effects would be small and would be reduced compared to baseline conditions, as the renovated pier would have lighting that is directed away from the water surface.
- Beneficial effects on habitat, detailed in Section 6.1.6, include replacement of existing creosote-treated pilings and pier decking with CISS pilings and a concrete deck. Surveys (Donahue et al. 2007)) have documented juvenile rockfish use of macroalgae growing on existing pilings; the algae will colonize the new pilings and will support a similar habitat function, without exposing marine organisms to the bioaccumulative toxins found in creosote.

Determinations of Effects to EFH

Proposed construction activities may have an adverse impact on EFH for groundfish, coastal pelagic and salmon due to short-term effects of construction activities on water quality. The project has been designed to minimize the risk and magnitude of these potential effects, and the institution of stormwater treatment measures and replacement of treated wood with concrete in the structure will provide long-term benefits to EFH in the action area.

Appendix B. Marine Mammal Analysis

Introduction

The proposed action may result in effects to species protected under the Marine Mammal Protection Act. Within the action area, the principal such species are:

- Harbor seal
- California sea lion
- Steller sea lion (note that a detailed analysis of potential project effects on the Steller sea lion is presented in the BA)
- Transient killer whale
- Gray whale

A variety of other marine mammal species could very rarely occur in the action area, but would experience effects substantially similar to those experienced by the pinnipeds and cetacean species named above.

The preceding BA details the proposed project, delineates the project and action areas, and describes the environmental baseline in the action area. Section 6 of the BA details the anticipated project effects on habitat and organisms; please refer to that section for a discussion of the environmental effects of the proposed action. The analysis hereunder focuses on how those effects may be expressed upon marine mammal species that may occur in the action area.

Status of Species in the Action Area

Species status in the action area is presented in detail by Goley et al. (2007), "Gray Whale and Harbour Seal Distribution and Abundance in Northern California: A report to supplement the Trinidad Pier Reconstruction Project." In view of the comprehensive and relevant nature of this report, it is included *in toto* as Attachment 1 to this analysis.

Potential Effects on Marine Mammals

Gray Whales

Table 1 of Goley et al. (2007) lists the sighting rates for gray whales during 8 years of monthly observations at Trinidad Bay. Sighting rates varied from 0 to 1.38 whales per hour of observation time. The average detection rate during the period when pile removal and placement would occur, in the months from August through January, was 0.21 whales per hour of observation time. In contrast, the average detection rate in the months of February through July was 0.48 whales per hour. As shown in Figure 2 of Goley et al. (2007), the majority of these detections were within 2 km of the shoreline, and about 15 of 92 detections (16%) were within the 2,625-foot radius where underwater sound levels during CISS pile placement were greater than 120 dB RMS, the behavioral effect threshold for marine mammals. Thus these data suggest that the effect rate for gray whales would be approximately 16% of 0.21 whales per hour, or 0.034 whales per hour. Since vibratory driving of CISS piles would occur for a total of approximately 28.75 hours (115 piles at 15 minutes drive time apiece), vibratory pile driving activities would be expected to affect $0.034 \times 28.75 = 0.98$ or approximately one gray whale on one occasion.

Acoustic effects would also be expected to result from pile removal, which is a quieter activity performed for a longer time. For this activity, noise levels of 120 dB RMS would be exceeded within 1,190 feet of the pile driving, so the affected area would be $1{,}190^2 / 2{,}625^2 = 21\%$ as large as for pile placement. Thus the average detection rate would be 21% of 0.034, or 0.0070 whales per hour. Approximately 205 piles will be removed, with 40 minutes of vibratory pile driver noise for each pile, resulting in a total exposure of 136 hours and 40 minutes. Thus this activity would be expected to affect $0.007 \times 136.7 = 0.96$ or approximately one gray whale on one occasion.

No mechanism other than underwater sound generation is expected to affect gray whales in the action area.

Harbor Seals

Goley et al. (2007) details harbor seal abundance at varied sites in Humboldt County, including the haul-out at Indian Beach, which generally refers to beaches in Trinidad Bay. In actuality, seals haul out on a variety of rocks within the Bay, some of which are as little as 70 m from the pier (Dawn Goley pers. comm.. 2009.03.23). Seals haul out at rocks in the Bay regularly throughout the year and many or most of these haul-outs are within 2,625 feet from the pier, thus seals approaching or departing these haul-outs would be subject to underwater noise from pile driving at levels that would exceed the 120 dB RMS criterion for noise above ambient levels and thus, potential behavioral modification. The area so affected is shown in Figure 6-1, which also shows the relative exposure in the area based on the presence of noise-shielding features such as headlands and sea stacks. Table 7 in Goley et al. (2007) lists the sighting rates for harbor seals during 9 years of monthly observations at Trinidad Bay. A sighting rate of zero occurred only 3 times in a total of 62 observations, and the average number of animals observed per month ranged from a low of 25 in November to a maximum of 67 in July. On four occasions, over 120 seals were counted at the haul-out. The average sighting rate during the period when pile removal and placement would occur, in the months from August through January, was 36.5 seals per observation. In contrast, the average detection rate in the months of February through July was 50.7 seals per observation. In practice, seals are almost always present in the water or on haul-outs near the dock (Dawn Goley pers. comm.. 2009.03.23).

No data were collected on how much time the seals spend in the water near the haul-out. Goley et al. (2007) note that they "are typically less abundant during the winter months as seals tend to spend more time foraging at sea during this time. Seals are more abundant in the area in spring and summer. During this time both male and females increase their use of near shore habitat for hauling out and feeding (Thompson et al. 1994, Coltman et al. 1997, Van Parijs et al. 1997, Baechler et al. 2002)." From early March to June harbor seals in Trinidad Bay bear and rear pups, and in June and July the seals molt; both activities tie them closely to land and correlate to intensive use of available haul-outs. It is not clear whether seals may disperse to use alternative haul-outs. The Trinidad Bay harbor seal population, which consists of approximately 200 seals, shows very little interchange with the nearby Humboldt Bay population. However, there is also a much larger population of over 1,000 seals at Patrick's Point, a few miles to the north. It is not known whether seals move back and forth between the Trinidad Bay and Patrick's Point populations. If not, then Trinidad Bay seals are highly dependent upon available haul-outs in Trinidad Bay (Dawn Goley pers. comm.. 2009.03.23).

At the beginning of the construction period, in August, the average number of harbor seals observed at the haul-out is 63.5 (based on one observation of 121 animals and 3 observations of 33 to 52 animals). At this time it is highly probable that harbor seals require frequent use of this haul-out for essential activities such as rearing pups and molting, and that, given the limits on animal mobility imposed by these activities, much activity occurs nearshore within the area affected by pile-driving noise. Thereafter, seal use of the haul-out declines greatly (average of 30.3, 25.2, 32.5 and 27.6 animals recorded in September, October, November, December, and January, respectively), and most foraging occurs in offshore areas unaffected by pile driving noise.

The probability of an individual seal being exposed to pile driving noise is difficult to quantify. As an example, driving of CISS piles would occur for a total of approximately 0.5 hours per day on each of 58 days within a 180-day period (August 1 to January 31). Pile driving would occur during daylight hours, at which time harbor seals would be periodically coming to or leaving from haul-outs, and possibly foraging within the 2,625-foot radius of effect around the pile driving activity. If each seal were to visit a haul-out once during the day, and if each such seal spent 10 minutes within the radius of effect, then the total number of seal-minutes in the water per day would average 2 × 36.6 seals/day × 10 minutes = 732 seal-minutes per day. On days when CISS pile driving occurred, pile driving would occur 0.5/12 = 4.2% of the day, producing an average exposure to pile driving noise of 4.2% × 732 = 30.5 seal-minutes on each pile-driving day, or 29.5 seal-hours of exposure for the entire pile-driving season. That number could increase if more seal trips occurred per day or if seals spent more time within the radius of effect. A comparable total exposure would result from pile removal activities, subject to the same uncertainties regarding seal behavior.

Harbor seals could also be affected by subaerial noise and activity associated with construction at the pier. Seals at Trinidad Bay haul-outs are presumably habituated to human activity to some extent due to the daily coming and going of fishing and recreational vessels, and to existing activities at the pier such as operation of the hoists and the loading and unloading of commercial crab boats. These activities may occur at any time of the day and may produce noise levels up to approximately 80 dBA (at 50 feet) for periods of up to several hours at a time. However the operation of loud equipment, including the vibratory pile driving rig and the auger, are outside of the range of normal activity at the pier and could cause seals to leave a haul-out. This would constitute behavioral harassment, and during sensitive life history stages such as pupping could lead to injury or death of affected seals (Dawn Goley pers. comm. 2009.03.23).

As discussed in Section 6 of the Biological Assessment, the principal source of subaerial noise would be the vibratory pile driver used to extract old wood piles and to place the new CISS piles. In measurements of 44 vibratory pile drivers, the Federal Highway Administration (2006) determined that the maximum noise production of a vibratory pile driver operating at full power is 101 dBA (at 50 feet). All other power equipment that would be used as part of the proposed action (trucks, pumps, compressors, etc.) produces at least 10 dB less noise and thus has much less potential to affect harbor seals.

Assuming that sound generated on the pier attenuates at the rate of 6 dB for each doubling of distance, the noise of the vibratory pile driver would attenuate to approximately 80 dBA at approximately 500 feet from the pier. Greater attenuation would occur at locations where headlands or sea stacks interfere with sound transmission, as shown in Figure 6-1. Regardless, at distances of more than 500 feet from the pier, the noise received by the seals may be quieter than the sound of surf or wind at the haul-out; certainly it is of the same order of magnitude. Few data are available on potential impacts of such acoustic disturbance on receptor species. Some information can be derived from existing guidance intended to protect nesting bald eagles and marbled murrelets from excessive noise levels. The current bald eagle guidelines (USFWS 2006) restrict loud noise-generating activity (the example given is aircraft operation, a sound considerably louder than vibratory pile driver operation) within 1,000 feet of active nests, while a disturbance threshold for nesting murrelets has been set at 70 dB (WSDOT 2006). Murrelets, however, nest in locations that normally have an extremely quiet background noise level.

Based on these examples it appears unlikely that the seals at haul-outs more than about 500 feet from the pier would show a behavioral response to noise at the pier, particularly in view of their existing habituation to noisy activities at the pier. However, at least one minor haul-out is as close as 230 feet from the pier (Dawn Goley pers. comm.. 2009.03.23) and thus there is a small but definite risk of incidental harassment. Therefore the marine mammal monitor (Section 3.11) will also monitor seal activity at visible haul-outs during pile driver operation, and periodically at other times during construction. If there is evidence of seals abandoning the haul-out in response to construction activities, NMFS will be contacted immediately.

Other Marine Mammals

Steller sea lions are analyzed in Section 6 of the Biological Assessment. As described there, they are unlikely to be affected by the proposed project because their local haul-out is acoustically isolated, their foraging activities are directed away from the action area, and in any event they are absent from the area for most of the proposed construction period.

California sea lions, although abundant in northern California waters, have seldom been recorded at Trinidad Bay. This may be due to the presence of a large and active harbor seal population there. Any sea lions that did visit the action area during construction activities would be subject to the same type of impacts described above for harbor seals.

Killer whales are rare visitors to Trinidad Bay, but there is currently a very high awareness of their potential presence due to an incident in May, 2008 when a transient killer whale was observed to take a seal on the beach at Trinidad Bay (Driscoll 2008). Any killer whales that did visit the action area during construction activities would be subject to the same type of impacts described above for gray whales.

Appendix D. Mitigation Measures

PROPOSED MITIGATED NEGATIVE DECALRATION
TRINIDAD PIER RECONSTRUCTION PROJECT

September 2007

Lead Agency
City of Trinidad
P.O. Box 390
Trinidad, CA 95570
Phone (707) 677-0233
Contact: Mr. Gabe Adams, City Clerk

Project Proponent
Trinidad Rancheria

PROJECT DESCRIPTION

The Trinidad Pier is the northern most oceanfront pier in California and has been used for commercial and recreational purposes over the last 50 years. Trinidad harbor and pier serve a fleet of commercial winter crab fishermen and year-round water angling for salmon, and nearshore/finfish species. Trinidad Pier was first built by Bob Hallmark in 1946. Since that time only minor maintenance activities have occurred on the pier. Today, Trinidad's economy is based on fishing and tourism and the pier supports these activities. The pier also provides educational opportunities by accommodating the HSU Telonicher Marine Lab's saltwater intake pipe, and the California Center of Integrated Technology's (CICORE) water quality sonde.

Currently, the Trinidad Rancheria plays an important role in the economic development of the Trinidad area through three main business enterprises, one of which is the SeaScape Restaurant and Pier. The Cher-Ae Heights Indian Community of the Trinidad Rancheria is a federally-recognized tribe composed of descendants of three tribes, the Yurok, Weott, and Tolowa. The Trinidad Rancheria was established in 1906 by a United States Congressional enactment. In 1908, 60 acres of land were purchased on Trinidad Bay for homeless Indians. The community began developing in the 1950's. In January 2000, Trinidad Rancheria leased a total area of 14 Acres in Trinidad Bay and currently owns and operates the pier, and upland improvements including a boat launch ramp and the SeaScape Restaurant. Funds for permitting and designs of the pier were granted to the Trinidad Rancheria by the California State Coastal Conservancy.

The purpose of the Trinidad Pier Reconstruction Project is to correct the structural deficiencies of the pier and improve pier utilities for the benefit of the public, and indirectly improve the water quality conditions and provide additional habitat for the biological community in the ASBS. Currently it is difficult to maintain the safety of the pier due to excessive deterioration of the creosote-treated Douglas fir piles and the pressure treated decking.

Existing pier improvements are proposed to be replaced one-to-one with approximately 13,500 ft^2 ($1,254m^2$) of pre-cast concrete decking, 115 concrete piles including batter and moorage piles (18 inches (45.7cm) in diameter)), four hoists, standard lights, guardrail, and dock utility pipes including water, power, phone. In addition, a new stormwater collection system will be incorporated into the reconstructed pier design. The new cast-in-steel-shell (CISS) concrete piles will be separated at 5 ft. (1.5m) intervals along 25 ft. - long (7.6m) concrete bents. A total of 22 bents separated 25 ft. (7.6m) apart shall be used. The decking of the new pier will be constructed of pre-cast 20 ft. - long (6.1m) concrete sections. The new pier will be 540 ft. (164.6m) - long and will vary in width. The southern part of the pier will be 26 ft. (7.9m) - wide and the remaining part of the pier will be 24 ft. (7.31m) - wide (corresponding to the existing footprint).

An additional pile bent will be installed at the existing elevation of the lower deck to provide access to the floating dock. The existing stairs to the lower deck will be replaced with a ramp that is ADA compliant. The decking of the pier will be constructed at an elevation of 21.0 ft. above Mean Lower Low Water (MLLW). The top of the decking will be concrete poured to create a slope for drainage and to incorporate a pattern and a color into the concrete surface in order to provide the pier with an aesthetical pleasing look. An open guardrail, 42 inches (106.7 cm) in height shall be constructed of tubular galvanized steel rail bars (approximately 3/4 inch ((1.2cm)) - diameter)) uniform in shape throughout the length of pier. Lighting will be installed in the decking (and railing in the landing area) along the length of the pier to prevent light pollution. The hoists shall be installed at their current location. A new fish cleaning station will be constructed on the upland area (as a separate project). All design specifications shall conform to the Uniform Building Code.

HSU Marine Lab leases space on Trinidad Pier for placement of a pump and associated plumbing to obtain seawater for the Telonicher Marine Laboratory which will also be replaced. The existing saltwater intake PVC pipes, located directly under the decking of the pier, will be replaced and their size shall be reduced to 4-inches (10.2cm) in diameter. A new shed to house the pump will be built on the pier. CICORE have an Acrylonitrile-Butadiene-Styrene (ABS) pipe attached to a piling on the Trinidad pier that contains the water quality sonde. The proposed water quality sonde system is similar to the existing system and will be composed of the YSI 6600 Extended Deployment System, 6200 Data Acquisition System and two solar panels.

The project is expected to be completed within nine months. Reconstruction of the pier is proposed to commence on August 1st, 2008 and terminate on May 1st, 2009. Excluding weekends and holidays, a total of 217 working days will be available for work during this period. Public access during crab and salmon season will be maintained to the extent possible. During the winter months (November – March) severe weather conditions are expected to occur periodically at the project site. The Contractor may have to halt the work during pile installation due to strong gales winds, large swells, and/or heavy precipitation. Construction of the rest of the pier should not be interfered by large swells, but may be halted due to strong winds or precipitation. The Contractor will work five days per week from 7 a.m. to 7 p.m.

Construction of the new pier will facilitate the use of the existing pier during construction. The existing piles will be removed by vibratory extraction and new piles will be installed from the existing dock. All removed piles shall be temporarily stored at the upland staging areas until all demolition activities are complete (approximately 6 months). Following the cessation of demolition activities, the creosote treated piles will be transported by the Contractor to an approved upland disposal site. Following the removal of the existing piles, steel casings will be vibrated to a depth of approximately 2.5 ft. (0.8 meters) above the tip elevation of the proposed pile (25-35 ft. (7.6-10.7m) below the mud line). The steel shell will be coated with a polymer to protect the casings from deteriorating in the salt-water environment. The steel shell shall be used to augur the holes and then left permanently in the ground to support the integrity of the hole. The steel shell is cleaned and concrete is poured underwater using a tremie to seal the area below the shell. The holes are dewatered and steel cages are installed prior to pouring concrete to fill the holes and form the piles.

The staging area utilized for the project consists of the gravel parking lot located west of the pier and is approximately 0.53 acres. The Contractor shall utilize the staging area to store construction equipment and materials. Removed sediment from CISS pile installation (approximately 10 - 100 yd^3, (7.7 - 67.5 m^3) will also be temporarily stockpiled at the staging area until transported by the Contractor to an approved upland disposal site. Seawater removed from the holes will be discharged through peculation at the staging area. The edge of the staging area will be at least 50 ft. (15m) from the beach to the west in order to prevent impacts to the beach.

PROJECT LOCATION

The Trinidad Pier is located on the northern California coast in Humboldt County, approximately 300 miles north of San Francisco. The project site is located in Trinidad Bay, and is bounded from the north by the City of Trinidad. The project site is bounded from the east and west by two large rocks named Little Head and Trinidad Head respectively. The pier is located on Tidelands granted by the State of California to the City of Trinidad and are leased by the Trinidad Rancheria. The project site is located on APN 042-071-014, which encompass approximately 0.30 acres (Figure 1, Vicinity Map).

PROPOSED FINDING OF NO SIGNIFICANT EFFECT ON THE ENVIRONMENT

Based on the attached Initial Study and other pertinent information, with the recommended mitigation measures, the project will not have a significant effect on the environment. Mitigation measures have been added to the project to reduce potentially significant impacts to a less than significant level.

MITIGATION MEASURES

The mitigation measures below are compiled from the attached Initial Study (their numbers are keyed to the environmental checklist). These mitigation measures have been added to the project, and they will reduce all potentially significant impacts of the proposed project to less than significant.

<u>IMPACT IV-1:</u> Potential impacts to mammals and fish from noise levels generated underwater as result of construction activities.

<u>MITIGATION IV-1:</u> To insure that no impacts occur to fish and mammals during pile installation, the Contractor shall perform a noise study to confirm that noise levels are not above the thresholds specified by NMFS.

The noise study will be conducted by Illingworth & Rodkin, Inc. based in Petaluma, California. Illingworth & Rodkin, Inc. has unique experience in measuring and assessing the impacts of underwater sounds on the marine environment and has made presentations of the sound pressures from these activities to a number of agencies on the behalf of Caltrans and several different construction companies. Illingworth & Rodkin, Inc will measure the ambient sound levels in the air and water in Trinidad Harbor and will measure noise levels generated from drilling and steel casing installation for the piles.

"Based on past experience Illingworth and Rodkin , Inc. had with NMFS, noise levels would be measured simultaneously at 10m (32.8 ft.) from pile installation and an attempt would also be made to measure the sound levels at 20 - 100m (6.1 ft. – 328 ft.) depending on conditions. "Measurements will be made using G.R.A.S. 10CT hydrophones with PCB in-line charge amplifiers (Model 422E13) and PCB Multi-Gain Signal Conditioners (Model 480M122) or equivalent systems. The signals will be fed into Integrating Sound Level Meters (SLM) and Solid State Recorders (SSR) or equivalent equipment (Keith Pommerenck Email comm., 2007)."

"The peak pressure and root-mean square average sound pressure levels ($RMS_{impulse}$ levels) will be measured 'live' using the SLM. The SLM will have the ability to measure the unweighted peak sound pressure and RMS sound pressure levels over the relative short periods (e.g., less than 50 milliseconds). Many SLMs can measure the RMS sound pressure level of these pulses using the standard 'impulse exponential-time weighting' (35 millisecond rise time) function.

Additional subsequent analyses of the acoustical impulses will be performed using a Real Time Analyzer capable of providing narrow band frequency and corresponding pressure over time analysis (waveform), (Keith Pommerenck Email comm., 2007)."

"Quality Control. The measurement systems will be calibrated prior to use in the field. For example, an acoustical pistonphone and hydrophone coupler could be used to send known sound signals to the underwater sound measurement system. This type of pistonphone used with the hydrophone coupler, produces a continuous 145 dB (re 1 μPa) tone at 250Hz. The SLMs are calibrated to this tone prior to use in the field. The tone is then measured by the SLM and is recorded on to the beginning of the digital audiotapes that will be used. The system calibration status would be checked at the end of the measurement event by both measuring the calibration tone and recording the post-measurement on the tape. The taped calibration tones are used to calibrate the real time analyzer prior to analysis of tape-recorded pulses."

All field notes would be recorded in water-resistant field notebooks. Such notebook entries would include calibration notes, measurement positions, pile-installation information, system gain setting, and equipment used to make each measurement (Keith Pommerenck Email comm., 2007).

Timing for Implementation/Compliance: During Construction.
Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc Project Manager/NMFS, USAOCE, CDFG.
Monitoring Frequency: Once during CISS pile installation.
Evidence of Compliance: Submit report to USACOE, CCC, NMFS, CDFG, and the City of Trinidad.

MITIGATION IV-2: Daily work windows would be enforced for noisy work. Any work that is above peak ambient levels would be restricted to the period between 7 AM and 7 PM except for concrete pouring.

Timing for Implementation/Compliance: During Construction.
Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc Project Manager
Monitoring Frequency: Daily
Evidence of Compliance: Project Manager Daily Logs.

MITIGATION IV-3: Minimize noise impacts during pile installation of CIP piles by vibrating steel plates into place, drilling the holes, and pouring the concrete.

Timing for Implementation/Compliance: During Construction.
Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager
Monitoring Frequency: During CISS pile installation.
Evidence of Compliance: Project Manager Daily Logs.

MITIGATION IV-4: Two trained personnel in identification of marine mammals shall attend the project site one hour prior until one hour after construction activities cease each day throughout the construction window. The trained personnel shall be trained by Dr. Dawn Goley, which prepared the biological assessment for the Harbour seals and Gray whales for the project. Should the trained personnel identify marine mammals within 500m (1640 ft.) of the project area, they shall notify the Project Manager/Engineer whom will notify the Contractor. When working on pile removal or installation, the Contractor shall temporarily stop work to allow the species to move away from the project site. The Contractor will not be required to stop the work when working on the removal or construction of the pier decking. The trained personnel shall invoke clapping motion to force the mammals to move away from the project site. All sighting will be recorded and documented for future references.

> Timing for Implementation/Compliance: During pile replacement.
> Person/Agency Responsible for Monitoring: Trained personnel and Pacific Affiliates, Inc Project Manager/NMFS, USAOCE, CCC, and CDFG.
> Monitoring Frequency: Daily during reconstruction work.
> Evidence of Compliance: Monitoring logs submitted to the USACOE, CCC, NMFS, and the CDFG.

IMPACT V-1: Potential impacts to historical, archeological and human remains.

MITIGATION V-1: The Trinidad Rancheria will employ an elder of the Yurok Tribe qualified by the State Historical Preservation Officer to monitor the construction site for cultural and archeological resources. The monitor will be present during pile removal and pile installation activities. The Tribe monitor will inspect the sediment removed from the construction area for cultural or archeological resources. The Tribe monitor will inspect the material as it is bored out of the holes and will also be able to continuously inspect the material at the temporary stockpiling location.

> Timing for Implementation/Compliance: During pile replacement activities.
> Person/Agency Responsible for Monitoring: Certified Cultural Monitor, Elder of the Yurok Tribe.
> Monitoring Frequency: As needed during pile replacement activities.
> Evidence of Compliance: Reports to the NCIC, USACOE, CCC, NMFS, and the CDFG

MITIGATION V-2: The Contractor will be notified of, and required to monitor for signs of potential undiscovered archeological, ethnic, religious, or paleontological resources. If cultural/archeological resources are discovered during pile removal or pile installation, operations will be halted until a qualified cultural resources specialist is consulted. Subsurface surveys shall be conducted to determine the boundaries of the resource. If human remains are discovered, the County Coroner must be contacted. Required procedures to be followed in the event of accidental discovery of cultural materials or human remains are described in sections 15064.5(e) and 1564.5(f) of the State CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387). A protocol to follow in the event that cultural/archeological resources are discovered shall be prepared by the contractor prior to commencement of the project. A copy of this protocol shall be submitted to the City of Trinidad and the Yurok Tribe.

> Timing for Implementation/Compliance: During Construction.
> Person/Agency Responsible for Monitoring: NCIC and Yurok Tribe.
> Monitoring Frequency: As needed.
> Evidence of Compliance: Reports to the NCIC, USACOE, CCC, NMFS, and the CDFG.

IMPACT VII-1: Potential impacts to water quality from the use of hazardous construction materials and fueling of construction equipment.

MITIGATION VII-1: The contractor shall submit to the Project Engineer a Hazardous Materials Spill Prevention Plan that will include a list of all materials and equipment to be used, a list of equipment that shall be used in case of a spill and the necessary resource and regulatory agencies that must be notified in case of an accidental spill of any hazardous material. A copy of this plan will be submitted to the City of Trinidad.

> Timing for Implementation/Compliance: Submit plan prior to construction/during project.
> Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager/RWQCB, USACOE, CCC and the City of Trinidad.
> Monitoring Frequency: Implement as needed.
> Evidence of Compliance: Daily project logs.

Additional Mitigation Measures and BMP's to prevent impacts to water quality and the biological resources from the use of Hazardous Materials during construction activities are described in Section IV - Biological Resources and Section VIII - Hydrology and Water Quality.

IMPACT VIII-1: Potential impacts to water quality during reconstruction activities.

MITIGATION VIII-1: The following measures are proposed to reduce the effect of potential project impacts to water quality and will be implemented at the staging area and the project site:

- The demolition plan as described in Section IV.B.3, shall be implemented including provision that no debris shall be allowed to fall into Trinidad Bay.

- Sediment and cuttings from CISS pile installation shall be removed from the work site into closed containers and shall receive appropriate treatment, as required by the Regional Water Quality Control Board prior to disposal.

- The contractor shall test the pH of the water one day following pouring of the concrete seal to insure that the pH of the water did not change by more than 0.2 units from the ambient pH. The water shall then be pumped into 50-gallon drums and transported to the staging area for discharge through percolation to eliminate solids. Should the pH of the water change by more than 0.2 units from ambient pH, then the contractor shall haul the water to the Eureka Wastewater Treatment Plant for treatment prior to discharge.

- No concrete washing or water from concrete will be allowed to flow into the ASBS and no concrete will be poured within flowing water.

- Temporary construction BMP's for the staging area will be implemented in accordance with the Contractor's approved Storm Water Pollution Prevention Plan (SWPPP). BMP's for the staging area may include, but are limited to: mulches, silt fences, fiber rolls, straw bales, and sandbag barriers. The contractor shall utilize those BMPs listed in the CASQA Handbook and throughout this document as they apply.

- Temporary construction BMP's for the project area in accordance with the Contractor's approved Storm Water Pollution Prevention Plan (SWPPP). BMP's for the construction site include protecting the waters from incidental discharge of debris by providing a protective cover directly under the pier and above the water to capture any incidental loss of demolition or construction debris. A copy of the SWPPP shall be provided to the City of Trinidad.

  Timing for Implementation/Compliance: During Construction.
  Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager/RWQCB, USACOE, CCC, and the City of Trinidad.
  Monitoring Frequency: Daily.
  Evidence of Compliance: Daily project logs.

IMPACT VIII-2: Potential impacts to substrate and water quality during tremie concrete seal pouring.

MITIGATION VIII-2: The following measures shall be implemented in the event of leaking of concrete into the sediment during tremie pouring:

- Stop construction activities.
- Notify the Regional Water Quality Control Board
- Determine the cause for leaking of concrete
- Develop mitigation restoration plan with regulatory agencies

  Timing for Implementation/Compliance: During Construction.
  Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager/RWQCB, USACOE, CCC.
  Monitoring Frequency: Daily.
  Evidence of Compliance: Daily project logs.

IMPACT IX-1: Potential temporary impacts to public access to the pier during construction of the pier.

MITIGATION IX-1: The following BMP shall be implemented by the contractor to insure that public access is maintained to the extent possible while securing the safety of the public:

- The Contractor shall clearly mark with orange barrier fencing the perimeter of the working area and the staging area to insure the safety of the public and to alert the public of the areas that are closed for use.
- Signs shall be installed in the vicinity of the pier and the parking lots to alert the public of the construction activities.
- The contractor shall submit a detailed plan to the Project Engineer describing the procedures that will be followed to maintain public access to the pier and upland parking lot to the extent possible during construction activities.
- The Project Engineer shall coordinate all construction activities with the Trinidad Pier Harbor Master.

Timing for Implementation/Compliance: During Construction.
Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager/USACOE, CCC, and the City of Trinidad.
Monitoring Frequency: Daily.
Evidence of Compliance: Daily project logs.

IMPACT XI.-1: Potential increase in noise levels above the NAC value of 67 Leq within 450 ft. (137m) of the project site.

MITIGATION XI-1: **Construction site tool or equipment noise.** The following shall apply to construction noise from tools and equipment: Hours of Construction. The operation of tools or equipment used in construction, drilling, repair, alteration or demolition shall be limited to between the hours of 7 A.M. and 7 P.M. Monday through Friday, and between 9 A.M. and 7 P.M. on Saturdays. No heavy equipment related construction activities shall be allowed on Sundays or holidays. Concrete pouring shall be allowed after 7 P.M. in order to allow the concrete to cure during the night. **Stationary and construction equipment noise.** Trucks used for transport and all stationary and construction equipment shall be maintained in good working order, and fitted with factory approved muffler system. A sign shall be posted at the project site notifying the public of the hour of work.

Timing for Implementation/Compliance: During Construction.
Person/Agency Responsible for Monitoring: Pacific Affiliates, Inc. Project Manager/USACOE, CCC, and the City of Trinidad.
Monitoring Frequency: Daily.
Evidence of Compliance: Daily project logs.

All Best Management practices (BMP) specified in the Initial Study in addition to the mitigation measures described above are referenced to the California Storm Quality Association (CASQA) Construction Handbook.